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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 PROPOSALS: ECUADOR**

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

Fumigant

- Technical assistance to eliminate the remaining consumption of methyl bromide to be in compliance with the total phase-out UNIDO/UNEP

Phase-out

- HCFC phase-out management plan (stage I, first tranche) UNIDO/UNEP

**PROJECT EVALUATION SHEET – NON-MULTI-YEAR PROJECT  
ECUADOR**

**PROJECT TITLE(S)****BILATERAL/IMPLEMENTING AGENCY**

(a) Technical assistance to eliminate the remaining consumption of methyl bromide to be in compliance with the total phase-out in Ecuador	UNIDO/UNEP
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**NATIONAL CO-ORDINATING AGENCY**

Ministry of Industries and Productivity

**LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT****A: ARTICLE-7 DATA (ODP TONNES, 2010, AS OF SEPTEMBER 2011)**

Annex E, MB	40.80		
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**B: COUNTRY PROGRAMME SECTORAL DATA (ODP TONNES, 2010, AS OF SEPTEMBER 2011)**

ODS	Subsector/quantity	Subsector/quantity	Subsector/quantity	Subsector/quantity
MB	QPS/0.00	Non QPS/40.80		

**CURRENT YEAR BUSINESS PLAN ALLOCATIONS**

Funding US \$ million

Phase-out ODP tonnes

0.0

0.0

<b>PROJECT TITLE:</b>		
ODS use at enterprise (ODP tonnes):	40.80	
ODS to be phased out (ODP tonnes):	40.80	
ODS to be phased in (ODP tonnes):	0	
Project duration (months):	36	
	<b>UNIDO</b>	<b>UNEP</b>
Initial amount requested (US \$):	553,750	29,800
Final project costs (US \$):		
Incremental Capital Cost:	288,636	12,500
Contingency (10 %):	28,864	0
Incremental Operating Cost:	0	0
Total Project Cost:	317,500	12,500
Local ownership (%):	100%	
Export component (%):	N/A	
Requested grant (US \$):		
Cost-effectiveness (US \$/kg):	N/A	
Implementing agency support cost (US \$):	23,813	1,625
Total cost of project to Multilateral Fund (US \$):	341,313	14,125
Status of counterpart funding (Y/N):	N/A	
Project monitoring milestones included (Y/N):	Y	

**SECRETARIAT'S RECOMMENDATION[S]**

Individual consideration

## PROJECT DESCRIPTION

1. On behalf of the Government of Ecuador, UNIDO has submitted to the 65<sup>th</sup> meeting of the Executive Committee a request for funding for technical assistance to eliminate the remaining consumption of methyl bromide (MB) to be in compliance with total phase-out. The total cost of the project is US \$583,550 plus agency support costs of US \$41,531 for UNIDO and US \$3,874 for UNEP, as originally submitted. This technical assistance programme will assist the Government of Ecuador to completely phase-out all controlled uses of MB by 1 January 2015.

2. Floriculture in Ecuador has been growing rapidly, from about 300 hectares (ha) in 1990 to over 3,800 ha at present. The maximum growth occurred between 1992 and 1997 when the cropping area increased by 500 per cent. Rose production increased very quickly, and represents 73 per cent of the total volume of flowers exported. Eighteen per cent of the production is related to a group of cut flowers known as “summer flowers” (i.e., Gypsophyla, Hypericum, Delphinium, Lisianthus among others), which are often grown in fields, unlike roses, which are always grown in greenhouses. Summer flowers cover a surface area of 900 ha.

3. “Agrocalidad” (a division of the Ministry of Agriculture and Livestock) is in charge of regulating pesticide imports into Ecuador. Presently, there are no regulations related to dosages, formulations or application methods for MB. In 2010 the MB registration, which had been valid until that time, was cancelled. Since then, there has been only one importer of MB (Rodel Flowers) who is in the process of registering a 50:50 mixture of MB and chloropicrin. The Ministry of Industry and Productivity, through its Technical Ozone Unit, established a licensing system in 2004. The current import quota is 51.0 ODP tonnes, which represents the maximum allowable amount to be in compliance with Montreal Protocol consumption limits. MB is now exclusively used to control the soil-borne pathogens, mainly nematodes and fungi, which affect summer flowers.

4. The project proposes to demonstrate all possible alternative technologies to the use of MB for the production of cut flowers through pilot trials conducted at the farms of growers who are willing to evaluate them. The proposed alternative technologies to be tested in three different flower types (namely, Gypsophyla, Hypericum and Lisianthus), include alternative chemicals (i.e., metam sodium, dazomet and 1,3 dichloropropene combined with chloropicrin), steam pasteurization, soil-less substrates, biological products, biofumigation and solarization, all of them in combination with integrated pest-management practices. Criteria for the selection of growers will include commitment, and willingness to introduce alternatives and share results with other growers. The results of the pilot trials will then be disseminated among all MB users, and training will be provided for the introduction of the most viable alternative technologies, that will be selected by each farmers. During this stage, technical assistance will be provided to ensure efficient adoption of the technologies, so that the country can comply with the 2015 phase-out deadline. This stage will further be supported by the Ecuadorian Association of Flower Exporters (EXPOFLORES) through their “floriculture school”, with training and dissemination of the results of the activities. Training programmes will be conducted with the assistance of UNIDO and UNEP.

5. The total cost of the project has been estimated at US \$583,550. It includes two steam boilers and two injection machines for alternative chemicals (US \$320,500); national and international expertise (US \$60,000); subcontract to local institutions for the establishment of pilot demonstrations, training and study tours (US \$105,000); and a national project coordinator (US \$45,000). The project will be implemented by UNIDO in cooperation with UNEP and under the coordination of the Technical Ozone Unit. Major stakeholders include MB users, largely represented by EXPOFLORES. A steering committee will be established to take part in project coordination.

6. Upon completion, this technical assistance project is expected to achieve the complete phase-out of all controlled uses of MB; the use of proven and viable alternative technologies by growers; the

establishment of regulations banning all controlled uses of MB; and the introduction of environmentally sustainable production practices by the floriculture sector. The estimated time frame for the implementation of the project is three years.

## SECRETARIAT'S COMMENTS AND RECOMMENDATIONS

### COMMENTS

#### Issues with MB consumption

7. The MB baseline for consumption for Ecuador has been established at 66.2 ODP tonnes. In 2001, the Government of Ecuador imported 369.80 ODP tonnes of MB to establish stockpiles for future years; this resulted in zero imports of MB for 2003 and 2004. However, 153.00 ODP tonnes of MB were imported in 2005, which brought the country into non-compliance with its Montreal Protocol obligations, as shown in Table 1.

**Table 1. MB consumption reported under Article 7 of the Montreal Protocol**

Year	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
ODP t	369.80	40.80	-	-	153.00	51.00	122.40	51.00	51.00	40.80

8. At their 18<sup>th</sup> meeting, the Parties to the Montreal Protocol noted that Ecuador was in non-compliance with the MB control measures under the Protocol for 2005, and requested the Government to submit for consideration by the Implementation Committee a plan of action with time-specific benchmarks to ensure a prompt return to compliance (decision XVIII/23). Subsequently, at their 20<sup>th</sup> meeting, the Parties recorded Ecuador's submission of such a plan of action, under which, without prejudice to the operation of the financial mechanism of the Montreal Protocol, Ecuador specifically committed itself to, *inter alia*, reducing MB consumption to no greater than: 52.8 ODP tonnes in 2008 and in each subsequent calendar year until 2014; and zero ODP tonnes in 2015, save for critical uses that may be authorized by the Parties (decision XX/16).

9. As shown in Table 1 above, MB consumption levels were 51.00 ODP tonnes in each 2008 and 2009 and 40.80 ODP tonnes in 2010.

#### MB projects approved so far for Ecuador

10. The Executive Committee has approved the following MB projects for Ecuador:

- (a) Demonstration/technical assistance project for testing MB alternatives in soil treatment for the flower growing industry, at a total cost of US \$244,244 for the World Bank (26<sup>th</sup> meeting). This project was approved as "a demonstration project" without an associated amount of MB to be phased out.
- (b) Technology change for the phase-out of 37.2 ODP tonnes of MB in the rose plant nursery sector at an additional cost of US \$597,945 for the World Bank (38<sup>th</sup> meeting), on the understanding that, *inter alia*, Ecuador had a baseline consumption of 66.2 ODP tonnes; Ecuador would maintain compliance with the MB freeze during 2003 and 2004; a 56 per cent reduction in the MB baseline consumption would be achieved through implementation of the project, bringing the maximum level of consumption of controlled uses of MB to 29.0 ODP tonnes by January 2005; the Government committed to permanently sustaining this reduction at the maximum level of consumption of 29 ODP tonnes through implementation of the project and the use of import restrictions and other policies that it might deem necessary;

- (c) Given the delays in the implementation of the demonstration project approved at the 26<sup>th</sup> meeting, and the fact that an investment project for the phase-out of MB used in flowers was approved at the 38<sup>th</sup> meeting, at its 40<sup>th</sup> meeting the Executive Committee decided to reclassify the project as a technical assistance project (rather than cancelling it) and noted that it would achieve additional phase-out of 15 ODP tonnes.

11. Based on the MB baseline consumption in Ecuador, the amount of MB to be phased out through the two phase-out projects, and the commitment by the Government to permanently sustain reduction at the maximum level of consumption of controlled uses of MB, the remaining MB consumption eligible for funding is 14.0 ODP tonnes.

#### Technical and cost related issues

12. During the project review process, UNIDO explained that the project has been designed as a technical assistance programme rather than an investment project. Only a few equipment items are being requested to demonstrate all potential viable technologies for cut flowers to MB users. Pilot trials will be conducted at the farms of end-users who are willing to test the alternatives voluntarily. The results of the trials and the know-how for the technologies will be communicated to all users through training programmes and seminars with the assistance of local and international experts. During project preparation, several growers expressed their interest in participating in the trials and representatives from EXPOFLORES also indicated their strong support for the implementation and development of the project as proposed.

13. With regard to the medium and long term sustainability of the steam technology, UNIDO explained that the project focuses on the demonstration of alternatives that are technically and economically viable for conditions prevailing in the country. Given that Ecuador is an oil exporting country, the cost of diesel is very low (less than US \$0.30 per litre), and the technology could be introduced to the cut-flower sector. However, the project also proposes to demonstrate other alternative technologies. Once the results of the demonstrations are disseminated, farmers will select the technology they would like to introduce at their farms at their own cost.

14. UNIDO further explained that during project implementation relevant research institutes will be contacted to consider the feasibility of coordinating their research with the needs of controlling soil pathogens in the production of summer flowers. Under the concept of sustainability the project would also evaluate and assess the cost of all alternatives to MB (including investment on equipment items and operational costs) and provide such information to the growers, so they would be able to select the most cost-effective technology according to their specific needs. UNEP will assist in the integration of the results of the pilot demonstrations into the curricula of the institutes involved in training field technicians and agriculture engineers in the production of flowers (i.e., the training centre under the EXPOFLORES, agriculture universities, and other technical institutes). Through this approach, the sustainability of the project could be guaranteed.

15. Issues were raised in relation to the costs of the technical assistance programme. It was agreed to include one steam boiler and one injection machine instead of two of each as originally proposed, at a resulting total cost of US \$150,500; the cost for national and international experts was adjusted to US \$67,000, and the subcontract for establishment of pilot trials and a national coordinator was also adjusted to US \$82,500. The total level of funding agreed is US \$330,000 including 10 per cent contingency (i.e., US \$317,500 for UNIDO and US \$12,500 for UNEP).

#### **RECOMMENDATIONS**

16. The Executive Committee may wish to consider approving the technical assistance request to eliminate the remaining consumption of methyl bromide to be in compliance with the total phase-out in

Ecuador at a total cost of US \$317,500 plus agency support costs of US \$23,813 for UNIDO and US \$12,500 plus agency support costs of US \$1,625 for UNEP, on the understanding that no additional funding will be provided for Ecuador for the phase-out of controlled uses of methyl bromide in the country.

**PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS**
**Ecuador**

<b>(I) PROJECT TITLE</b>						<b>AGENCY</b>							
HCFC phase out plan (Stage I)						UNEP, UNIDO (lead)							
<b>(II) LATEST ARTICLE 7 DATA</b>				Year: 2010				14.3 (ODP tonnes)					
<b>(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)</b>											<b>Year: 2010</b>		
Chemical	Aerosol	Foam	Fire fighting	Refrigeration		Solvent	Process agent	Lab Use	Total sector consumption				
				Manufacturing	Serviceing								
HCFC123					0.3						0.3		
HCFC124											0.0		
HCFC141b		0.8									0.8		
HCFC141b in Imported Pre-blended Polyols		26.5									26.5		
HCFC142b					0.3						0.3		
HCFC22				3.4	9.7						13.1		
<b>(IV) CONSUMPTION DATA (ODP tonnes)</b>													
2009 - 2010 baseline:		17.4			Starting point for sustained aggregate reductions:					38.2			
<b>CONSUMPTION ELIGIBLE FOR FUNDING (ODP tonnes)</b>													
Already approved:		0.0			Remaining:					17.1			
<b>(V) BUSINESS PLAN</b>		<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>Total</b>	
UNIDO	ODS phase-out (ODP tonnes)	16.2			15.3							31.5	
	Funding (US \$)	1,370,381	0	0	1,279,381	0	0	0	0	0	0	2,649,762	
UNEP	ODS phase-out (ODP tonnes)	0.5		0.5								1.0	
	Funding (US \$)	52,907	0	52,907	0	0	0	0	0	0	0	105,815	
<b>(VI) PROJECT DATA</b>		<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>Total</b>	
Montreal Protocol consumption limits (estimate)		n/a	n/a	17.5	17.5	15.7	15.7	15.7	15.7	15.7	11.4	n/a	
Maximum allowable consumption (ODP tonnes)		n/a	n/a	17.5	17.5	15.7	15.7	15.7	15.7	15.7	11.4	n/a	
Project Costs requested in principle(US\$)	UNEP	Project costs	30,000	0	20,000	0	0	30,000	0	25,000	0	10,000	115,000
		Support costs	3,900	0	2,600	0	0	3,900	0	3,250	0	1,300	14,950
	UNIDO	Project costs	1,531,940	0	86,500	0	0	86,500	0	86,500	0	55,000	1,846,440
		Support costs	114,896	0	6,488	0	0	6,487	0	6,487	0	4,125	138,483
Total project costs requested in principle (US \$)		1,561,940	0	106,500	0	0	116,500	0	111,500	0	65,000	1,961,440	
Total support costs requested in principle (US \$)		118,796	0	9,088	0	0	10,387	0	9,737	0	5,425	153,433	
Total funds requested in principle (US \$)		1,680,736	0	115,588	0	0	126,887	0	121,237	0	70,425	2,114,873	
<b>(VII) Request for funding for the first tranche (2011)</b>													
<b>Agency</b>		<b>Funds requested (US \$)</b>					<b>Support costs (US \$)</b>						
UNEP		30,000					3,900						
UNIDO		1,531,940					114,896						
<b>Funding request:</b>			Approval of funding for the first tranche (2011) as indicated above										
<b>Secretariat's recommendation:</b>			Individual consideration										

## PROJECT DESCRIPTION

17. On behalf of the Government of Ecuador, UNIDO, as the lead implementing agency, has submitted to the 65<sup>th</sup> meeting of the Executive Committee stage I of the HCFC phase-out management plan (HPMP) at a total cost of US \$2,358,864<sup>1</sup> plus agency support costs of US \$168,290 for UNIDO and US \$14,950 for UNEP, as originally submitted, to implement activities that will enable the country to comply with the Montreal Protocol's compliance targets up to the 35 per cent reduction in HCFC consumption by 2020.

18. The first tranche for stage I of the HPMP being requested at this meeting amounts to US \$1,000,000 plus agency support costs of US \$75,000 for UNIDO and US \$30,000 plus agency support costs of US \$3,900 for UNEP, as originally submitted.

### Background

19. Ecuador, with a total population of 14 million inhabitants, has ratified all the amendments to the Montreal Protocol except the Beijing Amendment, for which the process of ratification will be completed by the end of 2012.

### ODS policy and regulatory framework

20. The implementation of the Montreal Protocol in Ecuador is coordinated by the National Ozone Unit (NOU) placed within the Ministry of Industries and Productivity (MIPRO). Since 1992, the Government of Ecuador has a regulatory and legal framework for the control and monitoring of ozone depleting substances (ODS). The ODS import and export licensing system, including CFC and methyl bromide quotas (i.e. the two main ODS used in the country in the past), is in force since 2004 and works properly. HCFCs are still not included in the current licensing system; the process to include them is expected to be completed by November 2011.

### HCFC consumption and sector distribution

21. HCFC-22 and HCFC-141b are the main HCFCs imported into the country, followed by small amounts of HCFC-123 and HCFC-142b. HCFC consumption has shown a growing trend during recent years, except for 2010 when imports decreased due to a generalized drop in economic activity. The Government of Ecuador expects the growing trend in HCFC consumption to return from 2011. HCFC consumption is shown in Table 1.

**Table 1. HCFC consumption in Ecuador**

	2007	2008	2009	2010	Baseline
<b>HPMP survey (metric tonnes)</b>					
HCFC-22	194.00	346.36	362.12	238.16	300.14
HCFC-123	0.80	2.86	13.57	13.89	13.73
HCFC-142b	0.06	13.91	0.00	2.76	1.38
HCFC-141b	0.78	4.26	4.20	6.99	5.60
HCFC-141b in imported pre-blended polyols	160.23	202.53	201.44	240.82	n.a.
<b>Total HPMP survey (metric tonnes)</b>	<b>355.87</b>	<b>569.92</b>	<b>581.33</b>	<b>502.62</b>	
<b>Article 7 data (metric tonnes)</b>	<b>0.00</b>	<b>367.39</b>	<b>379.89</b>	<b>261.80</b>	<b>320.85</b>
Difference	355.87	202.53	201.44	240.82	
<b>HPMP survey (ODP tonnes)</b>					

<sup>1</sup> Additional US \$507,871 will be submitted to a future meeting as part of stage I for the phase-out of 5.71 ODP tonnes HCFC-141b contained in imported pre-blended polyols.

	2007	2008	2009	2010	Baseline
HCFC-22	10.67	19.05	19.92	13.10	16.51
HCFC-123	0.02	0.06	0.27	0.28	0.27
HCFC-142b	0.00	0.90	0.00	0.18	0.09
HCFC-141b	0.09	0.47	0.46	0.77	0.62
HCFC-141b in imported pre-blended polyols	17.63	22.28	22.16	26.49	n.a.
<b>Total HPMP survey (ODP tonnes)</b>	<b>28.40</b>	<b>42.76</b>	<b>42.81</b>	<b>40.82</b>	
<b>Article 7 data (ODP tonnes)</b>	<b>0.00</b>	<b>20.48</b>	<b>20.65</b>	<b>14.32</b>	<b>17.49</b>
Difference	28.40	22.28	22.16	26.49	

22. Except for 2007 when no HCFC consumption was reported under Article 7 as it was not recorded, the difference between the HPMP survey data and the Article 7 data reported is due to the amount of HCFC-141b contained in imported pre-blended polyols.

#### *Refrigeration and air-conditioning (RAC) servicing sector*

23. HCFC-22 is used for servicing RAC equipment, mostly in the commercial refrigeration sector and the domestic air-conditioning sector, and is provided by an estimated 1,600 technicians, many of whom are grouped in servicing companies. The ten largest companies use 60 per cent of the HCFC-22 in the country. HCFC-22 and HFC-134a each represent 30 per cent of the total market of refrigerants sold in Ecuador. The remaining 40 per cent includes refrigerant blends (R-404A, R-406 and R-407), R-507, HCFC-123, and HCFC-141b (the later imported in bulk for flushing refrigeration and air-conditioning circuits). There are ten HCFC importers in Ecuador, the largest of which has 30 per cent of the import market. The distribution of HCFC-22 consumption per application is shown in Table 2.

**Table 2. Distribution of HCFC-22 installed capacity and consumption per application in Ecuador in 2010**

Sub-sector	Capacity installed refrigeration	Capacity installed air-conditioning	Total installed capacity	Estimated HCFC used for servicing
<b>metric tonnes</b>				
Commercial	145.87	49.15	195.01	58.50
Industrial	68.30	9.83	78.13	31.25
Maritime	150.50		150.5	37.63
Domestic		432.51	432.51	86.50
<b>Total (mt)</b>	<b>364.66</b>	<b>491.49</b>	<b>856.15</b>	<b>213.88</b>
<b>ODP tonnes</b>				
Commercial	8.02	2.70	10.73	3.22
Industrial	3.76	0.54	4.30	1.72
Maritime	8.28		8.28	2.07
Domestic		23.79	23.79	4.75
<b>Total (ODP tonnes)</b>	<b>20.06</b>	<b>27.03</b>	<b>47.09</b>	<b>11.76</b>

24. The current prices of HCFCs and alternative refrigerants per kilogram in the country are: US \$6.30 for HCFC-22, US \$6.60 for HCFC-141b, US \$7.35 for R-402A, US \$6.60 for HFC-134a, US \$6.23 for R-410A, US \$5.13 for R-404A, US \$5.50 for R-409A, and US \$4.40 for R-507. The use of hydrocarbons (HC) is currently limited, but it is expected to increase in the next years with the implementation of the HPMP.

*Foam manufacturing sector*

25. Pre-blended polyols containing HCFC-141b are imported for use in the manufacturing of rigid and flexible polyurethane (PU) foam. HCFC-141b contained in imported pre-blended polyols has not been included in the HCFC consumption reported under Article 7. The 2007-2009 average consumption of HCFC-141b contained in imported pre-blended polyols is 187.93 mt (20.67 ODP tonnes). The consumption in 2010 increased to 240.82 mt. The main rigid PU foam applications in Ecuador are for insulation in the refrigeration sector (domestic refrigerators, cold stores and warehouses) and the construction sector (insulation of ceilings, floors, acoustic walls, structural panels and pipeline insulation). Integral skin and shoe soles are the main flexible moulded PU foam applications in Ecuador. One company in the domestic refrigeration manufacturing sector (Indurama) consumes 72 per cent of the HCFC-141b contained in imported pre-blended polyols, another 14 identified enterprises consume 18 per cent, and a group of smaller, non-identified companies consume the remaining 10 per cent. The 2007-2009 average consumption of HCFC-141b contained in imported pre-blended polyols per company is presented in Table 3 below.

**Table 3: HCFC-141b contained in imported pre-blended polyols (average 2007 – 2009)**

	Average consumption 07 -09 HCFC-141b mt	Average consumption 07 -09 HCFC-141b ODP tonnes
<b>Rigid PU foams</b>		
<b>Rigid PU refrigeration</b>		
Indurama (1)	136.00	14.96
Ecasa (1)	6.00	0.66
Infri	1.20	0.13
Other small companies not identified	8.10	0.89
<i>Subtotal rigid PU refrigeration</i>	<i>151.30</i>	<i>16.64</i>
<b>Rigid PU construction</b>		
Verton	2.40	0.26
Acimco	1.10	0.12
Mafrico (1)	11.80	1.30
Novacero	1.30	0.14
Rooftec	1.00	0.11
Kubiec	1.70	0.19
Other small companies not identified	7.00	0.77
<i>Subtotal rigid PU construction</i>	<i>26.30</i>	<i>2.89</i>
<b>Subtotal rigid PU foam</b>	<b>177.60</b>	<b>19.54</b>
<b>Flexible PU foams</b>		
<b>Integral skin</b>		
Elasto (2)	1.90	0.21
Esprom	0.60	0.07
Cepolfi	0.84	0.09
Other small companies not identified	2.74	0.30
<i>Subtotal integral skin</i>	<i>6.08</i>	<i>0.67</i>
<b>Shoe soles</b>		
La Fortaleza	2.40	0.26
Milenium	0.90	0.10
Tecnistamp	0.90	0.10
<i>Subtotal shoe soles</i>	<i>4.20</i>	<i>0.46</i>
<b>Subtotal flexible PU foam</b>	<b>10.28</b>	<b>1.13</b>
<b>Grand Total PU foams</b>	<b>187.88</b>	<b>20.67</b>
<b>Consumption by companies that previously received assistance from the Multilateral Fund</b>	<b>155.70</b>	<b>17.13</b>

(1) Second-stage conversion. Original project (ECU/FOA/09/INV/10) was approved to convert three companies (Indurama, Ecasa and Durex) from CFC-11 to water/carbon dioxide (companies converted to HCFC-141b). Mafrico was added during implementation. Each company received assistance to convert one foam dispenser. The project was completed in November 1995 and phased out 126.4 ODP tonnes of CFC-11.

(2) Second stage conversion. Original project (ECU/FOA/26/INV/24) approved to convert Elasto from CFC-11 to methylene chloride. The project was completed in November 1998 and phased-out 32 ODP tonnes of CFC-11. Technology phased in was water/carbon dioxide

Starting point for aggregate reduction in HCFC consumption

26. The HPMP estimated the HCFC consumption baseline for compliance at 41.83 ODP tonnes, which took into account the amount of HCFC-141b contained in imported pre-blended polyols. The starting point was calculated as the estimated HCFC consumption baseline (41.83 ODP tonnes).

HCFC phase-out strategy

27. The Government of Ecuador has adopted a two-staged approach to phase out HCFCs: stage I, to meet the freeze on HCFC consumption in 2013, the 10 per cent reduction from the baseline by 2015, and the 35 per cent reduction from the baseline by 2020; and stage II, to completely phase out HCFC consumption by 2030. The activities proposed for stage I of the HPMP, as originally submitted, are presented below.

*Activities in the RAC servicing sector*

28. The strategy for the RAC servicing sector is based on the following principles: HCFC supply limitation, reduction of existing demand for HCFCs, prevention of new demand for HCFCs, and monitoring of the application of the plan and of HCFC uses. The following activities at a cost of US \$630,000 are included in stage I:

- (a) Strengthening of the legal framework to establish regulation to limit the import of HCFC-based RAC equipment; regulation on handling, transportation, recycling, reclaiming and storage of refrigerants; and quotas for imports of HCFCs and HCFC-based blends (quotas will also be extended to pre-blended polyols containing HCFC-141b);
- (b) Technical assistance for end-users of RAC equipment, including training on conversion of HCFC-based equipment and handling of alternative refrigerants such as HCs, CO<sub>2</sub> or ammonia; strengthening of the recovery, recycling and reclaiming network established; and distribution of service tool kits to technicians that have been certified in good servicing practices through the CFC national phase-out plan (NPP);
- (c) Technical assistance for the strengthening of ODS control, which includes training for customs officers, law enforcement officers and importers; supplying additional ODS identifiers to the Customs Department; and promoting coordination with enforcement bodies to control imports of HCFC-based equipment and to prevent illegal traffic in HCFCs;
- (d) Technical and institutional assistance for management of ODS-related information, which includes a proper information system to improve recording and monitoring of the activities in the servicing sector and their impact in ODS consumption; and
- (e) HPMP monitoring and evaluation.

*Activities in the foam manufacturing sector*

29. Stage I of the HPMP also includes the phase-out of HCFC-141b contained in imported pre-blended polyols. The Government of Ecuador is including in the present submission a request for funds to convert of the largest consumer (Indurama) to cyclopentane. The remaining companies consuming HCFC-141b are small and medium-sized enterprises (SMEs) for which there is no zero ODP and low global warming potential (GWP) alternative available in the market at present. These companies will be addressed in the future.

30. Indurama is a 100 per cent Article 5-owned company established in 1972. It is the largest manufacturer of domestic refrigerators and freezers (230,000 units in 2010) and the major consumer of HCFC-141b in Ecuador. It employs around 2,000 people and has a currently installed capacity of 1,200 units per day. The company's total sales in 2009 were US \$135 million including all manufactured/imported products (kitchens, equipment for homes and the commercial sector, etc). In 1993 Indurama received US \$162,500 from the Multilateral Fund<sup>2</sup> to reduce the use of CFC-11 using CO<sub>2</sub>/water. The project phased out 15.9 ODP tonnes of CFC-11 in Indurama and introduced HCFC-141b instead of CO<sub>2</sub>/water. Since the completion of the project in 1995, Indurama has grown substantially adding three PU injection machines to its capacity, two of them before 2007, and the last one, which is suitable to operate with cyclopentane, was installed in 2010.

31. Currently Indurama manufactures 17 different models of domestic refrigerators, refrigerated displays and freezers. They are produced with 4 PU injection machines (2 for cabinets, 1 for doors and 1 for freezers), 8 injection jigs and around 70 interchangeable injection moulds for the cabinets, and one carousel with 7 beds and 28 interchangeable moulds for the doors. Cabinets and doors are pre-assembled, pre-heated at 45 degrees Celsius, manually put in the moulds (also pre-heated), and injected with PU. Between 3 to 6 minutes after injection, the cabinet/door is separated from the mould and send to final assembly process.

32. The conversion of Indurama to cyclopentane consists of the installation of a pre-mixer system, polyol buffer tank and pumps (US \$234,500); retrofitting of one high-pressure foam machine and replacement of two high-pressure foaming machines by high-pressure units of similar capacity (US \$520,000); modification to jigs and moulds (US \$300,000); installation of safety-related equipment and systems for the use of cyclopentane and civil works (US \$316,400); system optimization, technology transfer, trials, safety audit (US \$230,000) and contingencies. Incremental operating costs have been estimated at US \$209,118. The total cost of the conversion is US \$1,970,108, of which US \$1,728,864 is being requested for funding, with a cost-effectiveness of US \$9.79/kg. The remaining US \$241,244 will be contributed as counterpart funding by the company. The project implementation time is 24 months. Implementation of the project as submitted will result in the phase-out of 176.64 mt (19.43 ODP tonnes) of HCFC-141b contained in imported pre-blended polyols in Ecuador.

Total cost of stage I of the HPMP

33. The total cost of stage I of the HPMP is presented below in Table 4:

**Table 4: Cost of stage I of the HPMP in Ecuador**

Component	Agency	Impact ODP tonnes			Funds Requested (US \$)
		HCFC-22	HCFC-141b	Total	
<b>RAC servicing sector</b>					
Strengthening of the legal framework and actions related with ODS	UNEP				26,000
Technical assistance for large end-users in the refrigeration and air-conditioning sector	UNIDO				351,000
Technical assistance for the strengthening of ODS traffic control	UNEP				89,000
Technical and institutional assistance for management of ODS-related information	UNIDO				38,000
HPMP monitoring and evaluation	UNIDO				126,000
<b>Sub-total RAC Servicing sector</b>		<b>6.12</b>		<b>6.12</b>	<b>630,000</b>
<b>Foam manufacturing sector</b>					

<sup>2</sup> ECU/FOA/09/INV/10 approved for US \$665,000 to reduce 51 ODP tonnes of CFC-11 in three domestic refrigerators manufacturers using CO<sub>2</sub>/water. A fourth company (Mafrico) was included in the project during implementation. Each company converted one foam dispenser.

Component	Agency	Impact ODP tonnes			Funds Requested (US \$)
		HCFC-22	HCFC-141b	Total	
Conversion of Indurama SA to cyclopentane (176.64 mt)	UNIDO		19.43 (*)	19.43 (*)	1,728,864
<b>TOTAL</b>		<b>6.12</b>	19.43 (*)	<b>25.55</b>	<b>2,358,864</b>

(\*) HCFC-141b contained in imported pre-blended polyols

## SECRETARIAT'S COMMENTS AND RECOMMENDATION

### COMMENTS

34. The Secretariat reviewed the HPMP for Ecuador 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 60<sup>th</sup> 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 UNIDO and UNEP, which were satisfactorily addressed as summarized below.

#### ODS regulations

35. The Secretariat noted that HCFCs have not been included yet in the ODS import/export licensing system of Ecuador and drew UNIDO's attention to decision 54/39(e) that requires confirmation of the implementation of the HCFC control measures in legislation, regulations and licensing systems as a pre-requisite for funding the implementation of the HPMP. UNIDO explained that the inclusion of HCFCs in the operating ODS licensing system was requested to the Official Registry of the Foreign Trade and Investment Council, and is expected to be approved at the latest in November 2011 prior to the 65<sup>th</sup> meeting of the Executive Committee. Noting the firm commitment from the Government of Ecuador to extend the import licensing systems, the Secretariat continued with the review process. However, UNIDO was advised and agreed that if HCFCs had not been included in the licensing system by the time of the 65<sup>th</sup> meeting, the HPMP would be deferred.

#### Starting point for aggregate reduction in HCFC consumption

36. The HPMP estimated the HCFC consumption baseline for compliance at 41.83 ODP tonnes, which took into account the amount of HCFC-141b contained in imported pre-blended polyols. However, the baseline for compliance, based on the HCFC consumption reported under Article 7 of the Montreal Protocol, did not take into account the amount of HCFC-141b contained in imported pre-blended polyols, and was established at 17.49 ODP tonnes.

37. Based on decision 60/44 (d) (on the starting point for aggregate reduction in HCFC consumption) and 61/47 (on consumption arising from HCFC-141b in imported pre-blended polyols), the starting point for Ecuador is 38.16 ODP tonnes, calculated as the HCFC baseline for compliance established under Article 7 of 17.49 ODP tonnes plus the 2007-2009 average amount of HCFC-141b contained in imported pre-blended polyols of 20.67 ODP tonnes.

#### Technical and cost issues related to the RAC servicing sector

38. The Secretariat reviewed the activities proposed for the RAC servicing sector in light of the status of implementation of the NPP in Ecuador. The Government of Ecuador submitted to the 65<sup>th</sup> meeting a progress report on the implementation of its CFC national phase-out plan (NPP) (document UNEP/OzL.Pro/ExCom/65/12). It was noted that notwithstanding the total phase-out of CFCs achieved by 1 January 2010 there were still in the NPP activities that had not been started. Furthermore, the progress reports submitted by UNIDO and UNEP to the 64<sup>th</sup> meeting indicated that as of December 2010 the NPP had an unspent balance of US \$465,339 (US \$272,184 with UNIDO and US \$193,155 with

UNEP). UNIDO informed the Secretariat that US \$272,000 had been disbursed at the time of submission of the HPMP and that the technical assistance component under UNIDO's responsibility would be completed by December 2011. UNEP advised that the agreement between the Government of Ecuador and UNEP had just been signed in September 2011 and that the following activities will be implemented by March 2012: training of technicians (US \$100,000); start-up and operation of reclaim and destruction centre (US \$50,000); audit reports for 2009 and 2010 (US \$30,000); and reports and contingencies (US \$13,500).

39. Given the current situation in the implementation of the NPP the Secretariat proposed that rather than having a separate action plan, the remaining activities associated with the NPP should be refocused to phase out HCFCs. UNIDO and UNEP agreed to this proposal and presented an adjusted action plan. The remaining funds from the NPP will be used to extend the refrigeration certification and training on HCFC alternatives to an additional 120 technicians, to add two customs training workshops on the licensing system to 40 medium level custom officers in Quito and Guayaquil and to add a training module to operate recovery, recycling and reclaiming centres. Furthermore, UNEP assured that the unspent balance from the NPP would allow the implementation of the above activities to start immediately while the HPMP funds become available to the country. All NPP components will be completed by July 2012.

40. Upon a request for the justification of the technical assistance for end-users proposed in stage I of the HPMP, UNIDO explained that this component will focus on 39 RAC servicing companies, which are the largest consumers of HCFCs in the country. The project aims to reduce HCFC consumption by providing each company with training and certification for their technicians, as well as a set of basic service tools. It will also help large end-users (i.e. supermarkets and hotels chains) to reduce HCFC consumption and equipment maintenance costs through good practices. The technical assistance project will be complemented by the update of the legal framework to introduce HCFC quotas and control of HCFC-based equipment imports, regulation on handling, transportation recycling, reclaiming and storage of refrigerants, and strengthening of the Customs Department.

41. Considering the emissive nature of the use of HCFC-141b in flushing refrigeration circuits during servicing, the Government of Ecuador committed to achieve, during stage I of the HPMP, total phase-out of the 5.60 mt of HCFC-141b used for this purpose, and to ban the import of HCFC-141b in bulk as of January 2017.

#### Technical and cost issues related to the foam sector

42. In justifying the need to convert foam enterprises to an alternative technology at this time, as HCFC-141b contained in imported pre-blended polyols is not part of Ecuador's consumption, UNIDO explained that the conversion of Indurama was necessary as competitors in the region were being converted to non-HCFC based technologies, leaving the company at a disadvantage. Indurama, which is also the largest consumer of HCFC-141b in the country, expressed its interest in converting to cyclopentane and is willing to provide the counterpart funding needed for a successful introduction of the non-HCFC technology. In addition, the Government of Ecuador is interested in assisting Indurama to convert as soon as possible since it will be the provider for a Government programme on energy efficiency that will replace 330,000 domestic refrigerators. The programme will result in 174,115 CO<sub>2</sub> equivalent tonnes not emitted into the atmosphere as these units will be manufactured with cyclopentane foam. The remaining foam companies, which are categorized as SMEs, with a total consumption of 51.93 mt (5.71 ODP tonnes) of HCFC-141b, will be converted in the future when proven cost-effective and commercially available low GWP technologies are available. The Government will submit during stage I of the HPMP a proposal for the conversion of those SMEs (at an estimated cost of US \$507,871 using the cost-effectiveness threshold for foams as reference). As per decision 61/47 (c)(iv) of the Executive Committee, the Government of Ecuador commits to banning imports of HCFC-141b contained in imported pre-blended polyols once the projects are completed.

43. The review of the investment project in the foam sector was done in light of decisions 61/47 and 63/15. The HCFC consumption baseline for Indurama was adjusted from the proposed latest consumption (176.64 mt) to the average consumption between 2007 and 2009 (136.00 mt).

44. In reviewing the proposal for Indurama, it was noted that one of the foam dispensers in the plant was not eligible for funding as it was installed after 2007. It was also noted that a second foam dispenser was not eligible since the company had already received funds to convert it to CO<sub>2</sub>/water (as indicated in paragraph 13). UNIDO explained that the budget proposed already discounted the foam dispenser installed after 2007, and removed from the incremental capital cost the second foam dispenser and related items.

45. Other cost-related issues were discussed and satisfactorily addressed. The pentane storage tank cost was reduced to US \$70,000; the number of jigs and moulds modifications was reduced, decreasing the cost to US \$170,000; connection piping and system optimization were also rationalized. The incremental operational costs were adjusted based on the 2007-2009 level of HCFC-141b consumption and the funding for eligible lines to US \$74,557. The total agreed cost for the project was US \$1,363,152. However, given the cost-effectiveness threshold for foam conversion projects of US \$9.79/kg, the total level of funds available for this project is US \$1,331,440, with the remaining balance of US \$638,668 to be covered by Indurama (including the conversion of the two non-eligible lines). While the cost-effectiveness of US \$9.79/kg was calculated based on the 136 mt tonnes (2007-2009 average ) used as reference in line with decision 61/47 (c)(ii), the company will actually phase out 176.64 mt (2010 consumption), which results in a cost effectiveness of US \$7.53/kg.

#### Revised overall cost of stage I of the HPMP

46. The revised overall cost of stage I of the HPMP is presented in Table 5 below.

**Table 5: Revised overall cost of stage I of the HPMP**

Component	Agency	Impact ODP Impact			Funds Requested(US \$)
		HCFC-22	HCFC-141b	Total	
<b>RAC servicing sector</b>					
Strengthening of the legal framework and actions related with ODS	UNEP				26,000
Technical assistance for large end-users in the refrigeration and air-conditioning sector	UNIDO				351,000
Technical assistance for the strengthening of ODS traffic control	UNEP				89,000
Technical and institutional assistance for management of ODS-related information	UNIDO				38,000
HPMP monitoring and evaluation	UNIDO				126,000
<b>Sub-total RAC servicing sector</b>		<b>5.50</b>	<b>0.62</b>	<b>6.12</b>	<b>630,000</b>
<b>Foam manufacturing sector</b>					
Conversion of Indurama SA to cyclopentane (136 mt)	UNIDO		14.96(*)	14.96(*)	1,331,440
<b>TOTAL</b>		<b>5.50</b>	<b>15.58</b>	<b>21.08</b>	<b>1,961,440</b>

(\*) HCFC-141b contained in imported pre-blended polyols

#### Impact on the climate

47. A calculation of the impact on the climate of the HCFC-141b contained in imported pre-blended polyols to be phased out from the conversion of Indurama is as follows: 136 mt of HCFC-141b will be phased out (2007-2009 average consumption), 85 mt of cyclopentane will be phased in, and 96,900 CO<sub>2</sub> equivalent tonnes that would have been emitted into the atmosphere will be avoided (Table 6).

Furthermore, the phase-out of 5.60 mt of HCFC-141b used for flushing refrigeration circuits will avoid the emission of an additional 4,060 tonnes of CO<sub>2</sub>-equivalent into the atmosphere.

**Table 6. Calculation of the impact on the climate (foams)**

Substance	GWP	Tonnes/year	CO <sub>2</sub> -eq (tonnes/year)
<b>Before conversion</b>			
HCFC-141b	725	136	98,600
<b>After conversion</b>			
Cyclopentane	20	85	1,700
<b>Net impact</b>			-96,900

48. 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<sub>2</sub>-equivalent tonnes saved. Although a calculation of the impact on the climate was not included in the HPMP, the intention by the Government of Ecuador of promoting alternatives with low GWP in the servicing sector, combined with the calculated emission reduction of CO<sub>2</sub>-equivalent tonnes in the foam sector, indicate that it is likely that the country will achieve the 6,876.1 CO<sub>2</sub>-equivalent tonnes emission reductions into the atmosphere estimated in the 2011-2014 business plan. However, at this time, the Secretariat is not in a position to quantitatively estimate the impact on the climate. The impact might be established through an assessment of implementation reports by, *inter alia*, comparing the levels of refrigerants used annually from the beginning of HPMP implementation, the reported amounts of refrigerants being recovered and recycled, the number of technicians trained and the HCFC-22-based equipment being retrofitted.

#### Co-financing

49. 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, UNIDO indicated that the company Indurama will contribute with counterpart funding of US \$638,668 for the conversion of its plant to cyclopentane. Furthermore, the Government of Ecuador is searching for short and medium term synergies between ODS reduction and improved energy efficiency to mobilize funds that would assist in accomplishing both objectives.

#### 2011-2014 business plan of the Multilateral Fund

50. UNIDO and UNEP are requesting US \$1,961,440 plus support cost for implementation of stage I of the HPMP. The total value requested for the 2011-2014 period of US \$1,796,323 including support costs is below that in the business plan. The reason is that the business plan had forecasted a bigger reduction of HCFC-141b of in the foam sector (30.4 ODP tonnes).

51. Based on the estimated HCFC baseline consumption in the servicing sector of 320.85 mt, Ecuador's allocation up to the 2020 phase-out should be US \$630,000 in line with decision 60/44, plus funding for the investment project for which it is eligible for.

#### Draft Agreement

52. A draft Agreement between the Government of Ecuador and the Executive Committee for HCFC phase-out is contained in Annex I of the present document.

**RECOMMENDATION**

53. In the event that the Government of Ecuador confirms that it has already introduced HCFCs into its ODS import licensing system, the Executive Committee may wish to consider:

- (a) Approving, in principle, stage I of the HCFC phase-out management plan (HPMP) for Ecuador for the period 2011 to 2020 to meet the 35 per cent reduction in HCFC consumption, at the amount of US \$2,114,873, consisting of US \$1,846,440 plus agency support costs of US \$138,483 for UNIDO, and US \$115,000 plus agency support costs of US \$14,950 for UNEP, on the understanding that:
  - (i) US \$630,000 are provided to address HCFC consumption in the refrigeration servicing sector to reach up to and include the 35 per cent reduction in 2020 in line with decision 60/44; and
  - (ii) US \$1,331,440 are provided for the investment component for the phase-out of 14.96 ODP tonnes of HCFC-141b in imported pre-blended polyols used in the foam manufacturing sector;
- (b) Noting that the Government of Ecuador has agreed to establish as its starting point for sustained aggregate reduction in HCFC consumption an estimated baseline of 17.49 ODP tonnes, calculated using actual consumption of 20.65 ODP tonnes and 14.32 ODP tonnes reported for 2009 and 2010, respectively, under Article 7 of the Montreal Protocol, plus 20.67 ODP tonnes of HCFC-141b contained in imported pre-blended polyol systems, resulting in 38.16 ODP tonnes;
- (c) Deducting 21.08 ODP tonnes of HCFCs from the starting point for sustained aggregate reduction in HCFC consumption;
- (d) Approving the draft Agreement between the Government of Ecuador 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 of any potential related impact on the eligible funding level, with any adjustments needed being made when the next tranche was submitted; and
- (f) Approving the first tranche of stage I of the HPMP for Ecuador, and the corresponding implementation plan, at the amount of US \$1,680,736, consisting of US \$1,531,940 plus agency support costs of US \$114,896 for UNIDO, and US \$30,000 plus agency support costs of US \$3,900 for UNEP.

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## Annex I

### **DRAFT AGREEMENT BETWEEN THE GOVERNMENT OF ECUADOR AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN CONSUMPTION OF HYDROCHLOROFLUOROCARBONS**

1. This Agreement represents the understanding of the Government of Ecuador (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 11.37 ODP tonnes by 1 January 2020, 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, with the funding to be adjusted accordingly, as per decision 60/44.
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, 4.2.3, 4.3.3, 4.4.3 and 4.5.3 (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 68<sup>th</sup> 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. UNIDO has agreed to be the lead implementing agency (the “Lead IA”) and UNEP has agreed to be the cooperating implementing agency (the “Cooperating IA”) under the lead of 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). This responsibility includes the necessity to co-ordinate with the Cooperating IA to ensure appropriate timing and sequence of activities in the implementation. The Cooperating IA will support the Lead IA by implementing the activities listed in Appendix 6-B under the overall co-ordination of the Lead IA. The Lead IA and Cooperating IA have reached consensus on the arrangements regarding inter-agency planning, reporting and responsibilities under this Agreement to facilitate a co-ordinated implementation of the Plan, including regular co-ordination meetings. The Executive Committee agrees, in principle, to provide the Lead IA and the Cooperating IA with the fees set out in rows 2.2 and 2.4 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, the Lead IA and the Cooperating IA to facilitate implementation of this Agreement. In particular, it will provide the Lead IA and the Cooperating 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-22	C	I	16.51
HCFC-141b	C	I	0.62
HCFC-123	C	I	0.27
HCFC-142b	C	I	0.09
HCFC-141b (1)			20.67
Total			38.16

(1) Based on 2007-2009 average HCFC-141b contained in imported pre-blended polyols (refer to Appendix 8-A)

**APPENDIX 2-A: THE TARGETS, AND FUNDING**

Row	Particulars	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	n/a	n/a	17.49	17.49	15.74	15.74	15.74	15.74	15.74	11.37	n/a
1.2	Maximum allowable total consumption of Annex C Group I substances (ODP tonnes)	n/a	n/a	17.49	17.49	15.74	15.74	15.74	15.74	15.74	11.37	n/a
2.1	Lead IA UNIDO agreed funding(US \$)	1,531,940	0	86,500	0		86,500	0	86,500	0	55,000	1,846,440
2.2	Support costs for Lead IA(US \$)	114,896	0	6,488	0	0	6,487	0	6,487	0	4,125	138,483
2.3	Cooperating IA UNEP agreed funding (US \$)	30,000	0	20,000	0		30,000	0	25,000	0	10,000	115,000
2.4	Support costs for Cooperating IA (US \$)	3,900	0	2,600	0	0	3,900	0	3,250	0	1,300	14,950
3.1	Total agreed funding (US \$)	1,561,940	0	106,500	0	0	116,500	0	111,500	0	65,000	1,961,440
3.2	Total support cost	118,796	0	9,088	0	0	10,387	0	9,737	0	5,425	153,433
3.3	Total agreed costs (US \$)	1,680,736	0	115,588	0	0	126,887	0	121,237	0	70,425	2,114,873
4.1.1	Total phase-out of HCFC-22 agreed to be achieved under this agreement (ODP tonnes)											5.50
4.1.2	Phase-out of HCFC-22 to be achieved in previously approved projects (ODP tonnes)											n/a
4.1.3	Remaining eligible consumption for HCFC-22 (ODP tonnes)											11.01
4.2.1	Total phase-out of HCFC-141b agreed to be achieved under this agreement (ODP tonnes)											0.62
4.2.2	Phase-out of HCFC-141b to be achieved in previously approved projects (ODP tonnes)											n/a
4.2.3	Remaining eligible consumption for HCFC-141b (ODP tonnes)											0.00
4.3.1	Total phase-out of HCFC-123 agreed to be achieved under this agreement (ODP tonnes)											0.00
4.3.2	Phase-out of HCFC-123 to be achieved in previously approved projects (ODP tonnes)											n/a
4.3.3	Remaining eligible consumption for HCFC-123 (ODP tonnes)											0.27
4.4.1	Total phase-out of HCFC-142b agreed to be achieved under this agreement (ODP tonnes)											0.00
4.4.2	Phase-out of HCFC-142b to be achieved in previously approved projects (ODP tonnes)											n/a
4.4.3	Remaining eligible consumption for HCFC-142b (ODP tonnes)											0.09
4.5.1	Total phase-out of HCFC-141b in pre-blended polyols agreed to be achieved under this agreement (ODP tonnes)											14.96
4.5.2	Phase-out of HCFC-141b in pre-blended polyols to be achieved in previously approved projects (ODP tonnes)											n/a
4.5.3	Remaining eligible consumption for HCFC-141b in pre-blended polyols (ODP tonnes)											5.71

### **APPENDIX 3-A: FUNDING APPROVAL SCHEDULE**

1. Funding for the future tranches will be considered for approval at the second 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 National Ozone Unit (NOU) of Ecuador, within the Ministry of Industries and Productivity, will coordinate the implementation of the project and will be responsible for the national coordination of the whole HPMP program with the assistance of the implementing agencies.
2. The NOU will be responsible for the monitoring of the phase-out implementation plan, making the follow up of the promulgation, and the enforcement of the policies and legislation.
3. The NOU will support the Lead IA and the Cooperating IA in the preparation the annual implementation plans and progress reports for the Executive Committee.
4. The implementation of the phase-out plan will need to be aligned and closely coordinate with the different general instructions, regulatory, fiscal actions, of capacity creation and awareness that the Government of Ecuador executes, to ensure the consistency of the governmental priorities.
5. The phase-out plan will be managed by a team dedicated to this job that consists of a coordinator that will be designated by the NOU and have the support of the representatives and experts of the implementation agencies and the necessary support infrastructure. In addition, the local distribution of service equipment that will be purchased through the Lead IA acquisition procedure will also be implemented by the coordinator.

#### **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 II 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. The reporting requirements include the reporting about activities undertaken by the Cooperating IA;
  - (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) Co-ordinating the activities of the Cooperating IA, and ensuring appropriate sequence of activities;
- (j) 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 and the Cooperating IA, the allocation of the reductions to the different budget items and to the funding of each implementing or bilateral agency involved;
- (k) Ensuring that disbursements made to the Country are based on the use of the indicators; and
- (l) 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 6-B: ROLE OF THE COOPERATING IMPLEMENTING AGENCY**

1. The Cooperating IA will be responsible for a range of activities. These activities are specified in the overall plan, including at least the following:

- (a) Providing assistance for policy development when required;
- (b) Assisting the Country in the implementation and assessment of the activities funded by the Cooperating IA, and refer to the Lead IA to ensure a co-ordinated sequence in the activities; and
- (c) Providing reports to the Lead IA on these activities, for inclusion in the consolidated reports as per 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 \$180 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.

#### **APPENDIX 8-A: SECTOR SPECIFIC ARRANGEMENTS**

1. In accordance with decisions 61/47 and 63/15, a project to phase out the use of the remaining 5.71 ODP tonnes of HCFC-141b contained in pre-blended polyols will be submitted during stage I of the HPMP, when proven cost-effective and commercially available low global warming potential technology will make it possible to replace the HCFC-141b used by small enterprises.

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