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EXECUTIVE COMMITTEE OF
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Addendum

PROJECT PROPOSALS: INDONESIA

This document is being issued to add text to the part “Secretariat’s comments and recommendations”:

- **Add** the following paragraphs to Section 1 - HPMP document:

55 (bis). Subsequent to the dispatch of the documents to Executive Committee members, the Secretariat continued discussing the HPMP for Indonesia and the sub-sector phase-out plans contained therein. Given the sectoral distribution of HCFCs in Indonesia the Secretariat suggested that the total HCFC-141b consumption in Indonesia (i.e., 595.0 mt used in the foam manufacturing sector, and 413.0 mt used in the manufacturing of commercial and industrial refrigeration equipment) could be completely phased out during implementation of Stage I of the HPMP. Implementation of a few activities was also suggested in the refrigeration servicing sector for, *inter alia*, continued training and certification programmes for refrigeration service technicians, development of technical product standards, technical review and adaptation of alternative refrigerants to local conditions, awareness-raising, capacity-building, support for policies and regulations, and monitoring and reporting.

55 (ter). In responding to the suggestion by the Secretariat UNDP, as the lead implementing agency, indicated that the Government of Indonesia, the national stakeholders and the agencies who jointly developed the overarching strategy and associated components of the country’s HPMP, concluded that it was not possible to meet the 2013 and 2015 compliance targets through phase-out of HCFC-141b alone. There is a need to also address HCFC-22 consumption at an early stage, otherwise the rapid growth of this substance used in the manufacturing and servicing sectors would nullify the reductions achieved through HCFC-141b. Consistent with the Executive Committee’s guidance, the Government of Indonesia has already prioritized the phase out of HCFC-141b. Of the total 2009 consumption of 130 ODP tonnes of HCFC-141b, 95 ODP tonnes will be phased out by 2015. In the foam sector, 26 out of the 73 enterprises will be converted to low-GWP technologies. The remaining 47 enterprises are small and medium size enterprises (SMEs) with a very low consumption where mature, cost-effective and low-GWP alternatives might be available within the next two-three years. Furthermore, consistent with

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

decision XIX/6 for maximizing climate benefits from HCFC phase-out and consistent with Indonesia's voluntary national CO₂ emission reduction targets, the Government and stakeholders would like to avoid proliferation of appliances with high-GWP refrigerants, while promoting energy-efficiency in appliances, equipment and buildings. Addressing HCFC-22 consumption at an early stage, in conjunction with targeted regulations, will not only control the growth in the population of HCFC-22 based equipment, but will be significantly more cost effective for equipment manufacturing conversions (than if left for the future) as well as reducing costs for addressing the servicing sector post-2015.

55 (qua). In regard to both the air conditioning and refrigeration manufacturing sectors, UNDP indicated that intensive consultations were undertaken between compressor manufacturers and manufacturers of air conditioning and refrigeration equipment. The compressor manufacturers have assured there will be availability of compressors suitable for the alternative refrigerant chosen.

- **Add** the following paragraph to Section 2 - Sector plan for HCFC phase-out in the foam sector (World Bank) and an umbrella project for the phase-out of HCFCs by four foam enterprises (UNIDO):

58 (bis). In regard to the introduction of methyl formate technology; while this technology is being used in other countries, it is not yet considered as mature in the Asia-Pacific region, mainly because of the absence of infrastructure including supply issues. Pre-blended methyl formate systems are currently difficult to procure cost-effectively, given the long procurement cycles and uncertainties, particularly for SMEs. None of the local systems houses in Indonesia offer such systems. It is expected that this technology, along with other technologies based on aliphatic compounds (i.e., methylal), may become viable in the future. However, establishing the required supply chain, logistics and infrastructure for this technology in Indonesia is expected to take about two years. Furthermore, the costs suggested for the introduction of this technology has not take into account any increase in foam density of methyl formate-blown foam or potential safety requirements due to flammability of methyl formate. On this basis, the stakeholders concluded that this technology cannot be introduced immediately, to enable the required reductions in HCFC consumption for compliance with the 2013 and 2015 targets to be achieved.

- **Add** the following paragraphs to Section 3 - Sector plan for HCFC phase-out in the air conditioning sector (UNDP):

63 (bis). Subsequent to the preparation of document UNEP/OzL.Pro/ExCom/62/35, the Secretariat received additional information on the sector plan for the HCFC phase-out in the air conditioning sector (AC sector). The AC sector consists of 21 eligible enterprises, of which one, PT Panasonic Gobel, has 60 per cent non-article 5 country ownership. Of the remaining enterprises, four are addressed individually, namely Fatasarana Makmur, Gita Mandiri Teknik, Industri Tata Udara, and Metropolitan Bayutama; these enterprises have a consumption between 9.8 and 79 mt (0.54 to 4.3 ODP tonnes) per year. A further group of 16 enterprises addressed in an umbrella approach collectively have an aggregated consumption of 233.6 mt (12.85 ODP tonnes) of HCFC-22 per year.

63 (ter). The PT Panasonic Gobel as well as the 16 enterprises in the umbrella approach will convert their consumption of, in total, 417.6 mt (53.0 ODP tonnes) to HFC-410A. The four enterprises addressed individually, with their total consumption of 169.1 mt (9.3 ODP tonnes) of HCFC-22, will convert to HFC-32 as a replacement. UNDP informed that in meetings with component suppliers the availability of HFC-32 components in Indonesia would be assured in the timeframe needed for the implementation of the project. UNDP provided a list of baseline equipment and necessary changes and amendments to that equipment in order to enable the companies to use non-ODS refrigerants. The determination and discussion of the incremental cost for the conversions took into account the baseline equipment of the companies, the specifics of the different refrigerants, in particular the difference in flammability between the replacements, and costs savings in several items related to training and technical assistance where, due to the large amount of enterprises to be addressed at the same time, savings could be realized. The conversion request for PT Panasonic Gobel includes the conversion of the heat exchangers, which is an

issue discussed at this Executive Committee meeting under agenda item 8. The related additional cost would be US \$52,800 if the heat exchange manufacturing is found to be eligible. The IOCs for Panasonic Gobel was limited by the threshold of US \$6.3 per kilogramme. The IOC for the other enterprises are, on average, US \$1.47 per kilogramme for the four medium size enterprises and US \$4.09 per kilogramme for the 16 small enterprises. The budget for the sector phase out includes also technical support for the sector.

63 (qua). The cost of the phase-out sector plan, which has a cost effectiveness of US \$8.89 if the foreign ownership of PT Panasonic Gobel is not taken into account and US \$7.59 if it is, is shown in Table 11. Should the Executive Committee decide under agenda item 8 to fund the conversion of heat exchanger manufacturing, the cost effectiveness would increase to a level of US \$7.68 per kilogramme of HCFC-22 phased out.

Table 11. Costs of the AC sector plan in Indonesia

No	Item	ICC (US \$)	IOC (US \$)	Total (US \$)	Funding (US \$)	Requested for heat exchangers conversion (US \$)
Investment						
1	Residential air conditioning (Panasonic)	313,500*	1,161,342	1,474,842	589,937	+ 52,800
2	Commercial air conditioning (4 enterprises)	1,571,500	248,416	1,819,916	1,819,916	
3	Commercial air conditioning (16 enterprises)	968,000	954,800	1,922,800	1,922,800	
Sub-total		2,853,000	2,364,558	5,217,558	4,332,653	+ 52,800
Non-investment						
1	Sector technical support	120,000	0	120,000	120,000	
Sub-total		120,000	0	120,000	120,000	
Grand total					4,452,653	4,505,453
Total ODS phase out (mt)						586.8
Cost-effectiveness (US \$/kg-ODS/yr)					7.59	7.68

*Funding does not include cost items related to the conversion of the manufacturing of tube-and-fin heat exchangers

63 (quin). UNDP informed that, with this sector plan, the HCFC consumption in the AC manufacturing sector will be completely phased out in Indonesia by 2015. The Government of Indonesia will prohibit import and manufacturing of HCFC-22-containing air conditioners with effect from 1 January 2015. This will significantly support the Government in achieving subsequent Montreal Protocol reduction targets, as it will help to reduce the future service demand for HCFC-22. The Government of Indonesia has agreed to make the enactment of this regulation a pre-condition for the submission of the request for the 2015 funding tranche.

- **Add** the following paragraphs to Section 4 - Sector plan for HCFC phase-out in the refrigeration sector (UNDP):

67 (bis). Subsequent to issuing document UNEP/OzL.Pro/ExCom/62/35, UNDP provided additional information regarding the enterprises in the refrigeration sector. The consumption in the refrigeration sector comprises of 165 mt (9.08 ODP tonnes) of HCFC-22 as a refrigerant and 413 mt (45.43 ODP tonnes) of HCFC-141b as a foam blowing agent. The approach in the sector focuses on three individual enterprise conversions with an associated consumption between 19.1 and 28.9 mt of HCFC-22 (1.05 to 1.59 ODP tonnes) and 28.7 to 44.1 mt of HCFC-141b (3.16 to 4.85 ODP tonnes). A group of 12 smaller enterprises, addressed in an umbrella approach, has an aggregate HCFC-22 consumption of 50.3 mt (2.77 ODP tonnes) and aggregated HCFC-141b consumption of 126 mt (13.86 ODP tonnes). The third

group of enterprises, again addressed through an umbrella approach, consists also of 12 enterprises that do not blow insulation foam and consumes an aggregated 38.1 tonnes of HCFC-22 (2.10 ODP tonnes).

67 (ter). UNDP provided a list of baseline equipment and necessary changes to the equipment in order to enable the companies to use non-ODS refrigerants and foam blowing agents. UNDP had informed in its originally submission that, of the 33 manufacturers in the sector using HCFC, nine enterprises form part of three major organized industrial groups. These three major industrial groups are represented in the project proposal by the three companies with an individual approach, namely PT. Sumo Elco Mandiri, PT. Rotaryana Prima and PT. Alpine Cool Triutama. The remaining six companies belonging to the major organized industrial groups will consolidate their foam blowing and refrigeration consumption with the three companies mentioned, which will enable the cost effective funding of hydrocarbon foam blowing technology for the three companies. Determination and discussion of the incremental cost for all conversions took into account the baseline equipment of the companies, the specifics of the different refrigerants and foam blowing agents, in particular in regard to flammability, and cost savings in several items related to training and technical assistance where, due to the large number of enterprises to be addressed at the same time, savings could be realized. An overview of the proposed funding levels is provided in Table 12. Table 13 provides an overview of the ICC and IOC of the different parts of the conversion as well as the amounts of HCFCs phased out in each company and the cost effectiveness of the conversion.

Table 12. Overview over the proposed funding levels

No	Item	ICC (US \$)	IOC (US \$)	Total (US \$)
Investment				
1	Group I (3 enterprises)	1,669,250	121,476	1,790,726
2	Group II (12 enterprises)	1,293,600	191,520	1,485,120
3	Group III (12 enterprises)	501,600	125,203	626,803
Sub-total		3,464,450	438,199	3,902,649
Non-investment				
1	Sector technical support	120,000	0	120,000
Sub-total		120,000	0	120,000
Grand total				4,022,649
Total HCFC-141b phase out (mt)				413
Total HCFC-22 phase out (mt)				165
Total phase-out (mt)				578
Total phase-out (ODP tonnes)				54.51
Cost-effectiveness (US \$/metric kg per annum)				6.96

Table 13. Enterprise-specific project cost for the conversion of the refrigeration and foam part as well related consumption and cost effectiveness

	PT. Sumo Elco Mandiri	PT. Rotaryana Prima	PT. Alpine Cool Triutama	Group II	Group III	Blowing agent consumption of 6 enterprises to be consolidated	Total
ICC refrigeration (US \$)	272,250	173,250	200,750	567,600	501,600		1,715,450
ICC foam (US \$)	341,000	341,000	341,000	726,000	0		1,749,000
IOC refrigeration (US \$)	56,020	25,296	40,160	191,520	125,203		438,199
HCFC-22	28.6	19.1	28.9	50.3	38.1		165.0

	PT. Sumo Elco Mandiri	PT. Rotaryana Prima	PT. Alpine Cool Triutama	Group II	Group III	Blowing agent consumption of 6 enterprises to be consolidated	Total
phase-out (mt)							
HCFC-141b phase-out (mt)	42.8	28.7	44.1	126.0	0	171.4	413.0

67 (quater). The replacement technologies of the different enterprises are specific to those enterprises, namely, PT. Sumo Elco Mandiri and PT. Alpine Cool Triutama will use HFC-32 as replacement to HCFC-22, while PT. Rotaryana Prima will HFC-134a. All three intend to use cyclopentane as a replacement to HCFC-141b in foam blowing. The second group of enterprises will use HFC-134a as a replacement for HCFC-22, and methyl formate or HFC-245fa in pre-blended polyol as a replacement for HCFC-141b; the selection between the two alternatives to HCFC-141b will be taken depending on applicability, local availability and costs of the alternative, the latter creating a preference for methyl formate. The third group of enterprises will use HFC-32 as a replacement for HCFC-22. This will lead to the introduction of alternatives to the HCFC phased out under this sector plan as shown in Table 14 below.

Table 14. HCFC to be phased out and respective alternative technologies used

ODS before conversion	HCFC-22	HCFC-22	HCFC-141b*	HCFC-141b
Amount of ODS to be replaced (mt)	96	69	287	126
ODS post conversion	HFC-32	HFC-134a	Cyclopentane	Methyl formate or HFC-245fa**

* Figure includes HCFC-141b phase-out due to consolidation

** Technology uncertainty due to limited availability and unknown applicability of methyl formate at time of HPMP preparation

67 (quin). UNDP informed that with this sector plan, HCFC consumption in the refrigeration manufacturing sector will be completely phased out in Indonesia by 2015. Government of Indonesia will prohibit imports and manufacturing of HCFC-22-containing refrigeration products with effect from 1 January 2015. This will significantly support the Government of Indonesia in achieving subsequent Montreal Protocol reduction targets, as it will help to reduce the future service demands for HCFC-22. The Government of Indonesia has agreed to make the enactment of this regulation a pre-condition for the submission of the request for the 2015 funding tranche.

- **Add** the following paragraph to Section 5 - Sector plan for HCFC phase-out in the fire fighting sector (UNDP):

68 (bis). UNDP indicated to the Secretariat that, at this point of HCFC phase-out, a lower priority for the phase-out of HCFC-123 in the fire fighting sector can be accepted. However, it appears important to avoid that fire fighting technologies using HCFC-123 take a stronger foothold in Indonesia, and to initiate the process of system conversions, to allow subsequently for more efficient phase-out effort. UNDP proposes to undertake a small technical assistance activity to educate the stakeholders and prepare them for planning new HCFC-123-free fire fighting systems, as well as for considering retrofitting of existing systems. At the same time, such an activity would allow, to the degree necessary, the transfer of technology for alternatives to HCFC-123 based fire fighting systems, through a series of three or more stakeholder workshops. UNDP proposed a technical assistance component for the fire fighting sector at a

level of US \$30,000 plus support costs for UNDP. While the costing appears reasonable for such an activity, the Secretariat maintains that, since HCFC-123 has the lowest ODP of all common HCFCs, phase-out in the sector could not be considered as a priority to meet the 2013 and 2015 control targets.

- **Add** the following paragraphs to Section 6 - Overall cost of the HPMP:

71 (bis). The HPMP submitted consists of a number of activities in different sectors proposed for implementation during Stage I. For some of those, the discussions between UNDP and the Secretariat have been completed, and an agreement on the funding level reached. The intention of the Secretariat was to provide the Executive Committee with agreed funding levels for all sectors, in order to allow the Executive Committee to discuss any potential prioritisation of components that might be desired. However, the discussions have not been concluded for the foam sector at this point in time. Agreement might nevertheless be achieved before the Meeting of the Executive Committee, and the Secretariat would inform the Executive Committee accordingly. At this point in time, the Secretariat can present the following activities for possible inclusion in Stage I of the HPMP in Indonesia:

- (a) Phase-out of 413 mt of HCFC-22 (22.72 ODP tonnes) and 165 mt of HCFC-141b (18.15 ODP tonnes) used in the manufacture of industrial and commercial refrigeration equipment at a total cost of US \$4,022,649 plus agency support cost to be implemented by UNDP, on the understanding that HCFC consumption in the refrigeration manufacturing sector for both refrigeration and foam blowing uses will be completely phased out in Indonesia by 2015 without further requests for funding from the Multilateral Fund. The Government of Indonesia will prohibit imports, assembly and manufacturing of HCFC-22-containing refrigeration products as well as the use of HCFC-141b in the manufacture of foam for the insulation of refrigeration equipment, with effect not later than from 1 January 2015, and has agreed to make the enactment of such regulation a pre-condition for the submission of the request for the 2015 funding tranche;
- (b) Phase-out of 586.8 mt of HCFC-22 (32.27 ODP tonnes) used in the manufacture of air conditioning equipment at a total cost of US \$4,452,653, plus agency support cost to be implemented by UNDP, on the understanding that HCFC consumption in the air conditioning manufacturing sector will be completely phased out in Indonesia by 2015 without further requests for funding from the Multilateral Fund. The Government of Indonesia will prohibit import, assembly and manufacturing of HCFC-22-containing air conditioners with effect not later than from 1 January 2015, and has agreed to make the enactment of such regulation a pre-condition for the submission of the request for the 2015 funding tranche. The total provided does not include funding for any of the cost items related to the conversion of the manufacturing of tube-and-fin heat exchangers requested for the enterprise P.T. Panasonic Gobel. The Committee might wish to consider such activities in conjunction with the related policy issue contained in document UNEP/OzL.Pro/ExCom/62/55.
- (c) A technical assistance programme for refrigerant management, at a total cost of US \$300,000 plus agency support cost to be implemented by the Government of Australia, with an associated phase-out of 66.7 mt HCFC-22 (3.67 ODP tonnes; calculated at US \$4.50/metric kg);
- (d) A technical assistance program for the fire fighting sector at a total cost of US \$30,000 plus support cost, to be implemented by UNDP; and
- (e) US \$60,000 for policies and regulations, US \$90,000 for awareness and US \$270,000 for project management, plus respective support cost, to be implemented by UNDP.

71 (ter). UNDP has also informed the Secretariat that, should funding be provided for the activities in the foam sector, the Government of Indonesia is willing to commit prohibiting the use of HCFC-141b for foam blowing for refrigeration equipment insulation as well as for manufacturing thermoware, insulation for refrigerated trucks and integral skin products as of 1 January 2015.

Impact on the climate

71 (quater). At the time of writing this addendum, the Secretariat had no final information on the share of the different technologies to be used as replacement in the foam sector and, to a smaller degree, also not in the refrigeration sector. The different technologies have partially substantially lower, partially higher impact on the climate than HCFC-141b; this is further compounded by the fact that HFC-245fa might be used in a mixture with water, reducing the quantity used substantially. Since any calculations of the climate impact on such an uncertain basis would have resulted in a multitude of alternative figures, the Secretariat felt that such information might at this point in time too arbitrary to be of any value for the Executive Committee. The impact of replacing HCFC-22 by alternative refrigerants has been calculated and is included in document UNEP/OzL.Pro/ExCom/62/56/Add.1.

- **Replace** paragraph 72 **with** the following:

RECOMMENDATIONS

72. The Executive Committee might wish to consider the HPMP for Indonesia in light of the comments presented in documents UNEP/OzL.Pro/ExCom/62/35, its addendum as well as information which might be provided by the Secretariat during the 62nd Meeting of the Executive Committee.
