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

**PROJECT PROPOSAL: SUDAN (THE)**

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

Phase-out

- HCFC phase-out management plan (stage II, first tranche)

UNIDO

**PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS**  
**Sudan (The)**

<b>(I) PROJECT TITLE</b>	<b>AGENCY</b>
HCFC phase-out plan (Stage II)	UNIDO (lead)

<b>(II) LATEST ARTICLE 7 DATA (Annex C Group I)</b>	Year: 2014	52.7 (ODP tonnes)
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<b>(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)</b>								<b>Year: 2014</b>	
Chemical	Aerosol	Foam	Fire fighting	Refrigeration		Solvent	Process agent	Lab use	Total sector consumption
				Manufacturing	Servicing				
HCFC-123									
HCFC-124									
HCFC-141b		40.1							40.1
HCFC-142b									
HCFC-22					12.6				12.6

<b>(IV) CONSUMPTION DATA (ODP tonnes)</b>			
2009 - 2010 baseline:	52.7	Starting point for sustained aggregate reductions:	50.6
<b>CONSUMPTION ELIGIBLE FOR FUNDING (ODP tonnes)</b>			
Already approved:	16.15	Remaining:	34.45

<b>(V) BUSINESS PLAN</b>		2015	2016	2017	2018	2019	2020	Total
UNIDO	ODS phase-out (ODP tonnes)	0	2.0		2.0		2.0	6.0
	Funding (US \$)	0	96,886		175,091		175,091	447,068

<b>(VI) PROJECT DATA</b>			2015	2016	2017	2018	2019	2020	Total
Montreal Protocol consumption limits			47.43	47.43	47.43	47.43	34.20	34.20	n/a
Maximum allowable consumption (ODP tonnes)			47.43	42.13	36.89	36.89	30.81	30.81	n/a
Project costs requested in principle (US\$)	UNIDO	Project costs	2,383,572	0	0	330,441	0	36,716	2,750,729
		Support costs	166,850	0	0	23,131	0	2,570	192,551
Total project costs requested in principle (US \$)			2,383,572	0	0	330,441	0	36,716	2,750,729
Total support costs requested in principle (US \$)			166,850	0	0	23,131	0	2,570	192,551
Total funds requested in principle (US \$)			2,550,422	0	0	353,572	0	39,286	2,943,280

<b>(VII) Request for funding for the first tranche (2015)</b>		
Agency	Funds requested (US \$)	Support costs (US \$)
UNIDO	2,383,572	166,850

<b>Funding request:</b>	Approval of funding for the first tranche (2015) as indicated above
<b>Secretariat's recommendation:</b>	For individual consideration

## PROJECT DESCRIPTION

1. On behalf of the Government of Sudan, UNIDO, as the designated implementing agency, has submitted to the 75<sup>th</sup> meeting stage II of the HCFC phase-out management plan (HPMP) at the amount of US \$3,345,672, plus agency support costs of US \$234,197. The implementation of stage II of the HPMP will phase out 34.45 ODP tonnes of HCFCs and enable a complete phase-out of HCFCs by 2030, as originally submitted.

2. UNIDO has also submitted a request for funding the first tranche of stage II of the HPMP at the amount of US \$2,400,732, plus agency support costs of US \$168,051 as originally submitted, together with a progress report on the implementation of stage I of the HPMP<sup>1</sup>.

### Report on HCFC consumption

#### *HCFC consumption*

3. The Government of Sudan reported a consumption of 52.70 ODP tonnes of HCFC in 2014. The 2010-2014 HCFC consumption is shown in Table 1.

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

HCFC	2010	2011	2012	2013	2014	Baseline
<b>Metric tonnes</b>						
HCFC-22	227.00	240.00	253.00	207.00	229.09	218.50
HCFC-141b	384.00	380.00	409.00	362.33	364.54	369.50
Total (metric tonnes)	<b>611.00</b>	<b>620.00</b>	<b>662.00</b>	<b>569.33</b>	<b>593.63</b>	<b>588.00</b>
<b>ODP tonnes</b>						
HCFC-22	12.49	13.20	13.92	11.39	12.60	12.02
HCFC-141b	42.24	41.80	44.99	39.86	40.10	40.65
Total (ODP tonnes)	<b>54.73</b>	<b>55.00</b>	<b>58.91</b>	<b>51.25</b>	<b>52.70</b>	<b>52.67</b>

4. HCFC consumption increased in 2011 and 2012, when no restrictions were applied. All HCFC-22 consumption occurs in the refrigeration and air-conditioning (RAC) servicing sector. The major uses are for servicing split air-conditioning units and commercial refrigerators. HCFC-141b is used as a foam for the production of polyurethane (PU) foam and insulation foam for refrigeration equipment.

### Progress report on the implementation of stage I of the HPMP

5. Stage I included the conversion of four locally-owned enterprises using HCFC-141b as blowing agent in the manufacture of domestic refrigerators and freezers and insulated panels at the cost of US \$1,056,341 for the phase-out of 11.87 ODP tonnes. Additional funding amounting to US \$400,000 was provided for technical assistance in the refrigeration servicing sector, training for customs officers and enforcement of legislation, and project monitoring, to phase out an additional 4.28 ODP tonnes of HCFC-22.

#### *Legal framework*

6. The National Ozone Unit (NOU) was established within the Ministry of Industry, and is supervised by the Higher Council for Environment and Natural Resources (HCENR) and supported by a National Committee (NC) for the Implementation of the Montreal Protocol consisting of all relevant stakeholders.

<sup>1</sup> Stage I of the HPMP was approved at the 66<sup>th</sup> meeting to meet the 30 per cent reduction of HCFC consumption by 1 January 2017.

7. The country has reported that it has an operational licensing and quota system for HCFC import control, implemented in collaboration between the NOU and the general customs authority. The efficiency of the import control has been further improved by developing a shared electronic database on quotas and actual imports, and import documents including trade names, code numbers, and labelling have to be submitted to customs and the NOU. The importers are informed of the HCFC control measures.

8. In decision 62/30, the Executive Committee requested that UNIDO provides progress reports on the collection of accurate data in line with the objectives of decision 55/43(b) at the end of each year of the umbrella project's implementation period. UNIDO's submission indicates that an enhanced survey and data collection was carried out from August 2014 to March 2015, and that the foam sector operators and stakeholders are fully covered in stage II HPMP.

#### *Foam manufacturing sector*

9. The foam umbrella project is related to the conversion of four enterprises (Modern Refrigerator Co., Amin Company, Akadabi Steel Co. and Coldair Engineering) using 11.87 ODP tonnes of HCFC-141b in rigid PU foam manufacturing to pentane. The installation and commissioning of the equipment was planned from September to December 2014; however, due to security concerns and in the absence of an agreement between the counterparts and the equipment supplier on the payment of their cost-sharing for commissioning and training activities, completion of the project has been extended to the end of 2015.

#### *Servicing sector*

10. A number of activities have been implemented under the second tranche, in particular: training equipment was purchased for Sudan University for Science and Technology (SUST) and 110 technical students were trained; three professionals and one technician were trained on low-global-warming potential (GWP) alternatives; 300 participants, including 200 technicians, took part in the celebration of the International day for the protection of the ozone layer; and there was continued exchange of information between the NOU and stakeholders (including SUST and the Association of Refrigeration and Air-Conditioning Technicians).

#### Level of fund disbursement under stage I

11. As of October 2015, of the US \$1,416,341 approved so far, US \$1,329,841 (94 per cent) has been disbursed. The balance of US \$86,500 will be disbursed by 2017, when stage I is completed.

#### **HCFC phase-out strategy and proposed activities in stage II**

12. The remaining HCFC consumption eligible for funding in Sudan is 34.45 ODP tonnes, of which 7.32 ODP tonnes is for HCFC-22 and 27.13 ODP tonnes for HCFC-141b. Stage II of the HPMP as originally submitted targets the complete phase-out of HCFC-141b as foam blowing agent by 2019. The imports of HCFC-141b will be banned when the conversion project will be completed. The remaining HCFC-22 consumption of 3.11 ODP tonnes is planned to be completely phased out by 2030.

#### Activities in the foam manufacturing sector

13. The foam sector plan proposes the conversion of six foam enterprises and technical assistance for a number of smaller foam manufacturers. In the servicing sector there is a need to address a few large workshops and an increasing number of small service workshops involved with RAC equipment maintenance, and to upgrade SUST equipment.

*Conversion cost for the six enterprises*

14. Stage II of the HPMP plans to phase out 164.42 mt of HCFC-141b used in Mina Refrigeration Co., which manufactures RAC equipment, and Target Steel Co., which manufactures insulation panels. The technology selected for these enterprises is cyclopentane. The introduction of the conversions of Mina Refrigeration Co. and Target Steel co. include replacing low-pressure dispensers with high-pressure dispensers (US \$170,000 per unit); retrofitting high-pressure dispensers (US \$100,000 per unit); replacing premixing units (US \$60,000-US \$85,000 per unit); and safety measures, works and technology-transfer activities.

15. The proposal for the foam sector also includes four enterprises, Adison, Al Ikram, Sroji & Hamza (Safari) and Al Magdi, which use HCFC-141b for manufacturing PU-foam insulated products. The only feasible alternative for the conversion is water and CO<sub>2</sub> blend. For the four enterprises, which have consumption lower than 20 mt, assistance includes the replacement of low pressure dispenser (US \$75,000-US \$90,000 per unit); the replacement of premixing units (US \$60,000 per unit); the redesign of jigs to increase the thickness of the insulation (US \$2,000-US \$6,000 per enterprise); trials, prototyping, testing and commissioning (US \$20,000 per enterprise); and technology transfer and training (US \$10,000 per enterprise).

16. There are a number of small enterprises manufacturing PU foam products and consuming HCFC-141b. Stage II plans to address those enterprises by providing technical assistance to replace HCFC-141b with water/CO<sub>2</sub> blend. Table 2 contains details on the phase-out targets and proposed cost for all the enterprises included in stage II of the HPMP.

**Table 2. Level of funding proposed for the phase-out of HCFC-141b in Sudan**

Enterprise	HCFC-141b (mt)	HCFC-141b (ODP tonnes)	Estimated Cost (US\$)	CE (US\$/kg)
Mina Refrigeration Co.	97.13	10.68	950,690	9.79
Target Steel Co.	67.29	7.40	658,801	9.79
Adison	15.57	1.71	170,712	10.96
Al Ikram	18.37	2.02	201,383	10.96
Sroji & Hamza (Safari)	18.75	2.06	205,460	10.96
Al Magdi	19.50	2.15	213,686	10.96
Small enterprises*	10.03	1.10	109,940	10.96
<b>Total</b>	<b>246.64</b>	<b>27.13</b>	<b>2,510,672</b>	10.18

\*Mainly technical assistance supported by demonstration

Activities in the servicing sector

17. The action plan for the servicing section includes the upgrade of the legislation and regulatory measures. The SUST will be upgraded with 20 recovery machines, 10 recovery and recharging units, two multi-refrigerant identifiers and service tools. Also, the training of at least 20 customs officers and 500 technicians as well as the procurement and distribution of recovery and recycling equipment to service workshops is being planned. Stage II further proposes to include the improvement of non-reusable refrigerant management through either destruction of substances abroad or safe handling in Sudan, in anticipation of the establishment of a feasible destruction method.

18. Demonstration activities to increase awareness about the use of CO<sub>2</sub> technology are also included. It is expected that the refrigeration industry will co-finance the activity. In addition, a feasibility study is being planned to enhance the production and use of “desert coolers” based on water evaporation that are currently produced in small amounts at the Mina Refrigeration and several small enterprises.

Total cost of stage II of the HPMP

19. The total cost of the activities proposed in stage II of the HPMP amounts to US \$3,345,672 (excluding agency support costs) as originally submitted, is shown in Table 3.

**Table 3. Overall cost of stage II of the HPMP for Sudan**

Description	Costs US \$)
<b>Foam manufacturing sector</b>	<b>2,510,672</b>
Investment in the foam sector	2,400,732
Technical assistance in the foam sector	109,940
<b>Servicing sector</b>	<b>680,000</b>
Upgrade of the SUST and procurement of demonstration equipment	580,000
Training of technicians and recovery and recycling equipment	
Training of customs officers	
Awareness demonstration, natural refrigerant conversions (supermarket, cold stores, central A/C system)	10,000
Feasibility study to enhance the production and use of "desert coolers"	40,000
End-of-life refrigerant management	50,000
<b>Legal framework</b>	<b>95,000</b>
Training of customs officers and procurement of multi-refrigerant identifiers	55,000
Update of legislation and regulatory measures	40,000
<b>Project Management Unit (PMU)</b>	<b>60,000</b>
<b>GRAND TOTAL</b>	<b>3,345,672</b>

**SECRETARIAT'S COMMENTS AND RECOMMENDATION****COMMENTS**

20. The Secretariat reviewed stage II of the HPMP for Sudan in light of the existing guidelines with the criteria for funding HCFC phase-out in the consumption sector for stage II of the HPMPs (decision 74/50), subsequent decisions on HPMPs, and the 2015-2017 business plans of the Multilateral Fund.

Report on HCFC Consumption

21. The Government of Sudan has already issued HCFC import quotas for 2015 in accordance with the Montreal Protocol control targets.

HPMP strategy and proposed activities in stage II

22. The Secretariat noted the overlap between stage I (2010-2017) and the proposed stage II of the HPMP (2015-2030). This does not contradict decision 66/48(b)(iv)<sup>2</sup>, which allows Sudan to submit prior to 2015 a proposal to achieve a reduction in HCFC consumption beyond that addressed under stage I.

23. Considering that the activities under stage II will focus mainly on the foam sector, and that the funds requested for the servicing sector will be used from 2019 or 2020, the Secretariat recommended that the duration of stage II be revised to 2015-2020 to allow a complete phase-out of HCFC-141b while implementing a reduced level of activities in the servicing sector. UNIDO agreed with the Secretariat's recommendation and resubmitted a proposal for stage II with the revised Agreement.

<sup>2</sup> The approval of stage I of the HPMP does not preclude Sudan from submitting, prior to 2015, a proposal to achieve a reduction in HCFC consumption beyond that addressed in stage I of the HPMP.

24. The Secretariat noted the commitment of the Government of Sudan to ensure a complete phase-out of HCFC-141b by 2019. If the reduction targets under stage I (16.15 ODP tonnes) and stage II (31.34 ODP tonnes) are met, Sudan will phase out 47.49 ODP tonnes of HCFC, representing a reduction of 94 per cent from the starting point and 90 per cent from the baseline for compliance by 2020. Nevertheless, the Government of Sudan set its maximum allowable total consumption in 2020 at 30.81 ODP tonnes, representing a reduction of only 41.5 per cent from the baseline for compliance by 2020.

#### Proposed activities in stage II of the HPMP

##### *Foam manufacturing sector*

25. The Secretariat discussed with UNIDO the technical and cost-related issues associated with the foam project. The Secretariat requested UNIDO to provide additional information on the criteria used to select the alternatives for the conversion (cyclopentane and CO<sub>2</sub>/water), and on possible issues to consider during the implementation of the conversion project. UNIDO explained that the selection of technology was influenced by global trends for environmentally safe and sustainable technologies, quality of end products, energy savings and efficiency of manufacturing process. Alternative foaming technology and PU insulation techniques are applicable in Sudan and substances have been imported directly from the manufacturers (Bayer, Wan Hua) or through the systems house (Baalbaki Chemical Industries). With regard to small enterprises included in technical assistance component, UNIDO clarified that they will be using locally available imported systems, mostly through Baalbaki Chemical Industries.

26. The cost of the equipment was adjusted as follows: the replacement of low pressure foam dispensers with high pressure dispensers was revised to US \$150,000; while the replacement of low pressure dispensers was adjusted to US \$60,000; and the cost for replacement of premixing units was revised to US \$40,000.

27. Subsequent to the discussion and taking into account the revised cost of the equipment to be procured, the total cost of the project was adjusted to US \$2,457,893, of which US \$2,383,572 will be requested from the Multilateral Fund with an average cost-effectiveness of US \$9.97/kg as shown in Table 4.

**Table 4. Level of funding agreed for the phase-out of HCFC-141b in Sudan**

Enterprise	Max eligibility	Max. CE (US\$/kg)	HCFC-141b		Funding (US \$)				MLF cost	CE (US\$/kg)
			mt	ODP t	Capital	Operating	Total	Co-financing		
Mina Refrigeration Co	950,932	9.79	97.133	10.68	1,048,300	(95,999)	952,301	1,369	950,932	9.80
Target Steel Co.	658,808	9.79	67.294	7.40	643,500	(56,074)	587,426		587,426	8.73
Adison	170,669	10.96	15.572	1.71	212,300	5,952	218,252	47,583	170,669	14.02
Al Ikram	201,346	10.96	18.371	2.02	211,200	8,597	219,797	18,451	201,346	11.96
Sroji & Hamza (Safari)	205,445	10.96	18.745	2.06	149,600	5	149,605		149,605	7.98
Al Magdi	213,720	10.96	19.500	2.15	214,500	6,138	220,638	6,918	213,720	11.31
Small enterprises*	109,874	10.96	10.025	1.10	109,940	-	109,874	-	109,874	10.97
<b>Total</b>	<b>2,510,795</b>		<b>246.641</b>	<b>27.13</b>	<b>2,589,340</b>	<b>(131,381)</b>	<b>2,457,893</b>	<b>74,321</b>	<b>2,383,572</b>	<b>9.97</b>

(\*) Including technical assistance and training

*Refrigeration and air-conditioning sector*

28. The activities in the action plan for the RAC for stage II will be implemented in 2019 and 2020, once the activities under stage I are completed (i.e. 2017). These activities include: upgrade of the legislation and regulatory measures; upgrade of the SUST and vocational training centres; training of customs officers and technicians; provision of equipment and tools; and awareness activities on the use of CO<sub>2</sub> technology. The action plan is at a total cost of US \$835,000 for phasing-out the remaining eligible consumption of HCFC-22 of 7.32 ODP tonnes by 2030. With the revision of the duration of stage II HPMP for the period 2015-2020, the funding requested for the RAC sector has been revised downwards at the level of US \$367,157 for the phasing-out of 4.21 ODP tonnes by 2020.

Budget and implementation plan revision

29. Taking into consideration the new cost agreed for the foam sector component and revision of the total duration of stage II, UNIDO submitted a revised cost breakdown for each component (Table 5). If approved, the country is committed to phase-out 4.21 ODP tonnes from the servicing sector and 27.13 ODP tonnes from the foam manufacturing sector during stage II HPMP.

**Table 5. Overall revised cost of stage II of the HPMP for Sudan**

<b>Description</b>	<b>Costs (US \$)</b>
<b>Foam manufacturing sector</b>	<b>2,383,572</b>
Investment component in the foam sector	2,273,698
Technical assistance in the foam sector	109,874
<b>Servicing sector</b>	<b>251,441</b>
Upgrade of the SUST and procurement of demonstration equipment; procurement of 50 recovery kits, 3 identifiers and other tools; training of technicians and customs officers	221,441
Demonstration of natural refrigerant conversions (supermarket, cold stores, central A/C system) and	15,000
Awareness activities (Organization of an annual Ozone Day)	5,000
Demonstration equipment and didactic models for natural refrigerant conversions	10,000
<b>Legal framework</b>	<b>93,715</b>
Training of 20 customs officers	22,000
Procurement of 10 multi-refrigerant identifiers	50,000
Update of legislation and regulatory measures	21,715
<b>Project Management Unit (PMU)</b>	<b>22,000</b>
<b>Total</b>	<b>2,750,728</b>

Introduction of natural refrigerants (hydrocarbon)

30. The Secretariat noted decision 72/17<sup>3</sup> and 73/34<sup>4</sup> with regard to hydrocarbons being introduced in domestic and smaller commercial equipment. UNIDO informed the Secretariat that the issue of flammability of hydrocarbon has been discussed during both stage I submission and stage II preparation. The concerned officials as well as technical representatives of SUST and the Association of refrigeration and air-conditioning technicians have participated in seminars and workshops on natural refrigerants, including hydrocarbon and ammonia. Retrofitting current HCFC-containing equipment to hydrocarbon or ammonia is not a technically recommended solution and therefore not formally supported. Regarding the

<sup>3</sup> To include in the approval of HCFC phase-out management plans, tranches, projects or activities that proposed the retrofit of HCFC-based refrigeration and air-conditioning equipment to flammable or toxic refrigerants that the Executive Committee notes that, if the country engages in retrofitting HCFC-based refrigeration and air-conditioning equipment to flammable or toxic refrigerants and associated servicing, it does so on the understanding that they assume all associated responsibilities and risks.

<sup>4</sup> If a country were to decide, after taking into account decision 72/17, to proceed with retrofits that used flammable substances in equipment originally designed for non-flammable substances, it should be done only in accordance with the relevant standards and protocols.



new hydrocarbon-containing equipment and its maintenance, the training curricula covers the issue of flammability.

#### Impact on the climate

31. Calculations of the impact on the climate of the conversion activities in the foam sector to be implemented in stage II have been carried out based on the GWP values of HCFCs and alternative substances and their level of consumption (Table 6).

**Table 6. Climate impact**

Substance	GWP	(mt)	CO <sub>2</sub> -eq (mt/year)
<b>Before conversion</b>			
HCFC-141b	714	246.64	176,100.96
<b>Total CO<sub>2</sub> emission in MT</b>			<b>176,100.96</b>
<b>After conversion</b>			
c-pentane	20	100.3	2,006.00
CO <sub>2</sub> /water	1	33.27	33.27
<b>Total CO<sub>2</sub> emission in MT</b>		<b>133.56</b>	<b>2,039.29</b>
<b>Net Impact</b>			<b>174,062</b>

32. The proposed activities in stage II, which include introduction of better servicing practices, improved refrigerant management, technical assistance to various RAC sub-sectors and enforcement of HCFC import controls, will reduce the amount of HCFC-22 used for refrigeration servicing. Each kilogramme of HCFC-22 not emitted due to better refrigeration practices results in a savings of approximately 1.8 CO<sub>2</sub>-equivalent tonnes. The activities planned by Sudan, including efforts to improve servicing practices and enhance refrigerant recovery and reuse, indicate that the implementation of the HPMP will reduce the emission of refrigerants into the atmosphere therefore resulting in benefits on the climate. However, at this time, a more accurate quantitative assessment on the impact on climate cannot be conducted. The impact might be established through an assessment of implementation reports by, *inter alia*, comparing the levels of refrigerants used annually from the commencement of the implementation of the HPMP, the reported amounts of refrigerants being recovered and recycled, the number of technicians trained and the HCFC-22 based equipment being retrofitted.

#### Co-financing

33. As shown in Table 5 above, beneficiary enterprises will provide an additional US \$74,321 to implement activities in the foam sector. The Government of Sudan also plans to co-finance some activities in the servicing sector.

#### 2015-2017 business plan of the Multilateral Fund

34. UNIDO is requesting US \$2,750,729, plus agency support costs, for the implementation of stage II of the HPMP in Sudan. The total value requested for the period 2015-2017 of US \$2,550,422 including support cost is above the total amount in business plan, noting that the cost related to the foam manufacturing sector was not included in the business plan.

#### **Draft Agreement**

35. A draft Agreement between the Government of Sudan and the Executive Committee for the phase-out of HCFCs in stage II of the HPMP is contained in Annex I to the present document.

## RECOMMENDATION

36. The Executive Committee may wish to consider:

(a) Noting:

- (i) The progress report on the implementation of the second tranche of stage I of the HCFC phase-out management plan (HPMP) for Sudan;
- (ii) The commitment by the Government of Sudan to ban imports of HCFC-141b when the conversion projects in the foam sector will be completed;

(b) Approving:

- (i) In principle, stage II of the HPMP for Sudan for the period 2015 to 2020 to reduce HCFC consumption by 41.5 per cent of its baseline in the amount of US \$2,750,729, plus agency support costs of US \$192,551 for UNIDO;
- (ii) Deducting 31.34 ODP tonnes of HCFCs from the remaining HCFC consumption eligible for funding;
- (iii) The draft Agreement between the Government of Sudan and the Executive Committee for the reduction in consumption of HCFCs, in accordance with stage II of the HPMP contained in Annex I to the present document; and
- (iv) The first tranche of stage II of the HPMP for Sudan, and the corresponding 2015-2019 tranche implementation plan, in the amount of US \$2,383,572, plus agency support costs of US \$166,850 for UNIDO, on the understanding that if Sudan were to decide to proceed with retrofits and associated servicing to flammable and toxic refrigerants in refrigeration and air-conditioning equipment originally designed for non-flammable substances, it would do so assuming all associated responsibilities and risks and only in accordance with the relevant standards and protocols.

## Annex I

### **DRAFT AGREEMENT BETWEEN THE GOVERNMENT OF SUDAN (THE) AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE REDUCTION IN CONSUMPTION OF HYDROCHLOROFLUOROCARBONS IN ACCORDANCE WITH STAGE II OF THE HCFC PHASE-OUT MANAGEMENT PLAN**

#### **Purpose**

1. This Agreement represents the understanding of the Government of Sudan (the) (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 30.81ODP tonnes by 1 January 2020 in compliance with Montreal Protocol schedule.
2. The Country agrees to meet the annual consumption limits of the Substances as set out in row 1.2 of Appendix 2-A (“The Targets, and Funding”) in this Agreement as well as in the Montreal Protocol reduction schedule for all Substances mentioned in Appendix 1-A. The Country accepts that, by its acceptance of this Agreement and performance by the Executive Committee of its funding obligations described in paragraph 3, it is precluded from applying for or receiving further funding from the Multilateral Fund in respect to any consumption of the Substances that exceeds the level defined in row 1.2 of Appendix 2-A as the final reduction step under this Agreement for all of the Substances specified in Appendix 1-A, and in respect to any consumption of each of the Substances that exceeds the level defined in rows 4.1.3 and 4.2.3 (remaining consumption eligible for funding).
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 stage II of the HCFC phase-out management plan (HPMP) approved (“the Plan”). 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.

#### **Conditions for funding release**

5. The Executive Committee will only provide the Funding in accordance with the Funding Approval Schedule when 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 has 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;
  - (b) That the meeting of these Targets has been independently verified for all relevant years, unless the Executive Committee decided that such verification would not be required;
  - (c) That the Country had submitted a Tranche Implementation Report in the form of Appendix 4-A (“Format of Tranche 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; and

- (d) That the Country has submitted a Tranche 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 tranches that are due on the year(s) after the date of completion of the previous stage of the HPMP (as defined in paragraph 14 of the Agreement associated to the previous stage), all tranches from the previous stage have been completed, remaining funds have been returned to the Multilateral Fund (as established in paragraph 7 of the Agreement associated to the previous stage) and the corresponding project completion reports have been submitted to the Executive Committee.

### **Monitoring**

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 Tranche Implementation Plans in accordance with their roles and responsibilities set out in the same appendix.

### **Flexibility in the reallocation of funds**

7. The Executive Committee agrees that the Country may have the flexibility to reallocate part or all of the approved 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 a Tranche Implementation Plan as foreseen in sub-paragraph 5(d) above, or as a revision to an existing Tranche 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 Tranche Implementation Plan, or removal of an activity in the Tranche 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 Tranche Implementation Plan, under implementation at the time, and reported to the Executive Committee in the subsequent Tranche Implementation Report;
- (c) Should the Country decide during implementation of the Agreement to introduce an alternative technology other than that proposed in the Plan, this would require approval by the Executive Committee as part of a Tranche 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 related to the change of technology would decrease the overall funding level under this Agreement accordingly;

- (d) Any enterprise to be converted to non-HCFC technology included in the Plan and that would be found to be ineligible under the policies of the Multilateral Fund (i.e., due to foreign ownership or establishment post the 21 September 2007 cut-off date), would not receive financial assistance. This information would be reported as part of the Tranche Implementation Plan;
- (e) The Country commits to examining the possibility of using pre-blended hydrocarbon systems instead of blending them in-house, for those foam enterprises covered under the Plan, should this be technically viable, economically feasible and acceptable to the enterprises; and
- (f) Any remaining funds held by the bilateral or implementing agencies or the country under the Plan will be returned to the Multilateral Fund upon completion of the last tranche foreseen under this Agreement.

### **Considerations for the refrigeration servicing sector**

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

- (a) The Country would use the flexibility available under this Agreement to address specific needs that might arise during project implementation;
- (b) The Country would take into consideration the need to minimize adverse climate impact when phasing out HCFC in the refrigeration servicing sector; and
- (c) The Country would be encouraged to consider, as needed and feasible, the development of regulations and codes of practice, and the adoption of standards for the safe introduction of flammable and toxic refrigerants given the potential risk of accidents and negative effects on health associated with their use; measures to limit the import of HCFC-based equipment and to facilitate the introduction of energy-efficient and climate-friendly alternatives; and focusing activities in the refrigeration servicing sector on training of technicians, good practices, the safe handling of refrigerants, containment, recovery and recycling and reuse of recovered refrigerants rather than retrofitting.

### **Implementing agencies**

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") 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 the Lead IA taking part in this Agreement.

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

### **Non-compliance with the Agreement**

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 kilogram 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 decisions are taken, the specific case of not compliance with this Agreement will not be an impediment for the provision of funding 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 decisions that may affect the funding of any other consumption sector projects or any other related activities in the Country.

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

#### **Date of completion**

14. The completion of the Plan 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 at that time there still be activities that are outstanding, and which were foreseen in the last Tranche Implementation Plan and its subsequent revisions as per sub-paragraph 5(d) and paragraph 7, the completion of the Plan 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 of the Plan unless otherwise specified by the Executive Committee.

#### **Validity**

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	11.6
HCFC-141b	C	I	39.0
Total	C	I	50.6

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

Row	Particulars	2015	2016	2017	2018	2019	2020	Total	
1.1	Montreal Protocol reduction schedule of Annex C, Group I substances (ODP tonnes)	47.43	47.43	47.43	47.43	34.20	34.20	n/a	
1.2	Maximum allowable total consumption of Annex C Group I substances (ODP tonnes)	47.43	42.13	36.89	36.89	30.81	30.81	n/a	
2.1	Lead IA (UNIDO) agreed funding (US \$)	2,383,572	0	0	330,441	0	36,716	2,750,729	
2.2	Support costs for Lead IA, (US \$)	166,850	0	0	23,131	0	2,570	192,551	
3.1	Total agreed funding (US \$)	2,383,572	0	0	330,441	0	36,716	2,750,729	
3.2	Total support cost	166,850	0	0	23,131	0	2,570	192,551	
3.3	Total agreed costs (US \$)	2,550,422	0	0	353,572	0	39,286	2,943,280	
4.1.1	Total phase-out of HCFC-22 agreed to be achieved under this Agreement (ODP tonnes)								4.21
4.1.2	Phase-out of HCFC-22 to be achieved in the previous stage (ODP tonnes)								4.28
4.1.3	Remaining eligible consumption for HCFC-22 (ODP tonnes)								3.11
4.2.1	Total phase-out of HCFC-141b agreed to be achieved under this Agreement (ODP tonnes)								27.13
4.2.2	Phase-out of HCFC-141b to be achieved in the previous stage (ODP tonnes)								11.87
4.2.3	Remaining eligible consumption for HCFC-141b (ODP tonnes)								0.00

**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 TRANCHE IMPLEMENTATION REPORTS AND PLANS**

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

- (a) A narrative report, with data provided by tranche, describing the progress achieved since 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 the amount of ODS phased 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 Tranche 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;
- (b) An independent verification report of the Plan results and the consumption of the Substances, 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 during the period covered by the requested tranche, highlighting implementation milestones, the time of completion and 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 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 Tranche Implementation Reports and Plans, submitted through an online database; and
  - (e) An Executive Summary of about five paragraphs, summarizing the information of the above sub-paragraphs 1(a) to 1(d).
2. In the event that in a particular year two stages of the HPMP are being implemented in parallel, the following considerations should be taken in preparing the Tranche Implementation Reports and Plans:
- (a) The Tranche Implementation Reports and Plans referred to as part of this Agreement, will exclusively refer to activities and funds covered by this Agreement; and
  - (b) If the stages under implementation have different HCFC consumption targets under Appendix 2-A of each Agreement in a particular year, the lower HCFC consumption target will be used as reference for compliance with these Agreements and will be the basis for the independent verification.

#### **APPENDIX 5-A: MONITORING INSTITUTIONS AND ROLES**

1. The National Ozone Unit (NOU) will appoint a national institution to monitor all activities of the HPMP. This institute will submit annual progress reports of status of implementation of the HPMP through the NOU to the Lead IA.
2. Project Management Unit (National Project Officer) will coordinate daily work of the project implementation and also assist the enterprises as well as Government and non-government institutions and organizations to streamline their activities for smooth implementation of the project and help the Government with monitoring the progress of implementation, and reporting to the Executive Committee.
3. Verification of the achievement of the performance targets, specified in the Plan, will be undertaken, upon specific request of the Executive Committee, by an independent local company or independent local consultants contracted by the Lead IA.

#### **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 Tranche Implementation Reports and Plans as per Appendix 4-A;



- (c) Providing independent verification to the Executive Committee that the Targets have been met and associated tranche activities have been completed as indicated in the Tranche 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 Tranche Implementation Plans consistent with sub-paragraphs 1(c) and 1(d) of Appendix 4-A;
- (e) Fulfilling the reporting requirements for the Tranche Implementation Reports and Plans and the overall plan as specified in Appendix 4-A for submission to the Executive Committee;
- (f) In the event that the last funding tranche is requested one or more years prior to the last year for which a consumption target had been established, submitting annual tranche implementation reports and, where applicable, verification reports on the current stage of the Plan until all activities foreseen had been completed and HCFC consumption targets had been met;
- (g) Ensuring that appropriate independent technical experts carry out the technical reviews;
- (h) Carrying out required supervision missions;
- (i) Ensuring the presence of an operating mechanism to allow effective, transparent implementation of the Tranche Implementation Plan and accurate data reporting;
- (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 the allocation of the reductions to the different budget items and to the funding of the Lead IA;
- (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 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 \$175 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, on the understanding that the maximum funding reduction cannot exceed the value of the tranche being requested. Additional measures might be considered in cases where non-compliance extends for two consecutive years.

2. In the event that the penalty needs to be applied for a year in which there are two Agreements in force (two stages of the HPMP being implemented in parallel) with different penalty levels, the application of the penalty will be determined on a case-by-case basis taking into consideration the specific sectors that lead to the non-compliance. If it is not possible to determine a sector, or both stages are addressing the same sector, the penalty level to be applied would be the largest.

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