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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Forty-seventh Meeting
Montreal, 21-25 November 2005

PROJECT PROPOSALS: COLOMBIA

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

Phase-out

• National phase-out plan for Annex A (Group I and II) substances: second implementation programme	UNDP

Process agent

• Phase-out of CTC as process agent in the elimination of nitrogen trichloride during chlorine production at Prodesal S.A.	World Bank

PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS
COLOMBIA

PROJECT TITLE	BILATERAL/IMPLEMENTING AGENCY
National phase-out plan for Annex A (Group I and II) substances: second implementation programme	UNDP

NATIONAL CO-ORDINATING AGENCY:	Ministry of Environment, Housing and Territorial Development (MAVDT)

SUB-PROJECT TITLES

(a)	Terminal phase-out of CFCs in the commercial refrigeration manufacturing sector	UNDP
(b)	Technician-licensing programme for the refrigeration and air-conditioning service sector	
(c)	Technical assistance for strengthening the legal framework	
(d)	Technical assistance for information and awareness	
(e)	Technical assistance for implementation and monitoring	
(f)	Halon bank management programme	

LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT

A: ARTICLE-7 DATA (ODP TONNES, 2004, AS OF SEPTEMBER 2005)

Annex A Group I	CFC: 898-50	Annex A Group II	0
Annex A Group I	CTC: 0.8		

B: COUNTRY PROGRAMME SECTORAL DATA (ODP TONNES, 2004, AS OF SEPTEMBER 2005)

ODS	Foam	Ref.	Aerosol	ODS	Solvents	Process agent	Fumigant
CFC-11	41.88	50.32	2.80	CFC-113	1.75		
CFC-12	16.33	779.25	5.28				
CFC-115		0.88					

CFC consumption remaining eligible for funding (ODP tonnes)	0

CURRENT YEAR BUSINESS PLAN: Total funding: US $2,529,668: total phase-out: 419 ODP tonnes.

PROJECT DATA		2003	2004	**2005**	2006	2007	2008	2009	2010
Annex A, Group I (ODP tonnes)	Montreal Protocol limits	2,208	2,208	**2,208**	1,104	1,104	331.2	331.2	331.2
	Annual consumption limit	1083.35	1057.4	**1020.4**	750	330.8	247.8	152.5	0
	Annual phase-out from ongoing projects	0	25.9	**0**	132.8	123.2	0	0	0
	Annual phase-out newly addressed	0	0	**37**	137.65	296	83	95.3	152.50
	Annual unfunded phase-out	0	0	**0**	0	0	0	0	0
Annex A, Group II (ODP tonnes)	Montreal Protocol limit	187.7	187.7	**187.7**	93.85	93.85	93.85	93.85	0
	Annual consumption limit	4.4	4.4	**4.4**	4.4	3.3	2.2	1.1	0
	Annual phase-out from ongoing projects	0	0	**0**	0	0	0	0	0
	Annual phase-out newly addressed	0	0	**0**	0	1.1	1.1	1.1	1.1
	Annual unfunded phase-out	0	0	**0**	0	0	0	0	0
TOTAL ODS CONSUMPTION TO BE PHASED OUT		0	25.9	**37**	270.45	420.3	84.1	96.4	153.6
Total ODS consumption to be phased-in (HCFCs)									
Total project funding UNDP (US $):		2,146,820		**2,353,180**					
Total support costs UNDP (US $):		161,012		**176,488**					
TOTAL COST TO MULTILATERAL FUND (US $)		2,307,832		**2,529,668**					
Project cost effectiveness (US $/kg)									5.58

FUNDING REQUEST: Approval of funding for the second tranche (2005) as indicated above.

SECRETARIAT'S RECOMMENDATION	Blanket approval at the costs indicated above

PROJECT DESCRIPTION

1. The Government of Colombia, through UNDP, has submitted for consideration by the Executive Committee at its 47th Meeting, a request for the second and last funding tranche for the implementation of the national CFC phase-out plan (Colombia NPP) project, being implemented by UNDP.

Background

2. The Colombia NPP was approved by the Executive Committee at its 41st Meeting (UNEP/OzL.Pro/ExCom/41/29 and Corr.1 and Add.1). Under the NPP, the Government of Colombia committed to phasing out all CFCs and halons by 1 January 2010. The Executive Committee approved in principle US $4.5 million for implementation of the NPP, according to the schedule contained in the agreement between the Government of Colombia and the Executive Committee. Also at its 41st Meeting, the Executive Committee approved the first funding tranche at US $2,146,820 for implementation of the first phase covering the 2004–2005 period.

3. At the 44th Meeting of the Executive Committee, UNDP submitted a progress report on the implementation of the Colombia NPP, covering the period from January to August 2004. The majority of the projects under the NPP target the refrigeration servicing sector.

ODS consumption

4. According to the agreement under the NPP, total CFC consumption in 2004 and 2005 should be below 1,057.4 and 1,020.4 ODP tonnes, respectively. In 2004, the Government of Colombia reported CFC consumption of 898.5 ODP tonnes under Article 7 of the Montreal Protocol. Based on an analysis of the data, the level of CFC consumption for 2005 has been estimated at 566.9 ODP tonnes. This estimate considers the possibility that some of the importers did not use their import quota during the period established due to a change in the CFC legislation; thus, a higher level of consumption may be expected in 2006 but still below the maximum allowable level of consumption in the Colombia NPP.

5. The 2004 halon consumption reported by the Government of Colombia to the Ozone Secretariat is zero. As of September 2005, no imports of halon had been reported for 2004 or 2005. According to the Colombia NPP, the complete phase-out of halon consumption was proposed by 2009.

6. A number of results have been achieved so far during 2004-2005 implementation of the Colombia NPP, including:

(a) Several resolutions and decrees to control the import/export of ODS and ODS-containing equipment, and to support the implementation of projects under the Colombia NPP;

(b) Preliminary work in the commercial refrigeration manufacturing sector to purchase polyurethane injection machinery for the 22 participating companies.

The groundwork has also been laid to purchase and provide basic equipment to refrigeration servicing technicians, with over 450 refrigeration service companies visited, evaluated and informed about the implementation of the Colombia NPP;

(c) Start of implementation of the licensing system for servicing technicians, with the establishment of a national force of 282 evaluators, and the identification of a group of technician candidates for certification in environmentally safe handling of refrigerants. The technical specifications have been prepared for the equipment required for the refrigeration training centres, and widespread awareness-raising on the certification program and on the Colombia NPP has been conducted through seminars and information material;

(d) National and regional workshops were held on the national strategy for halon management, a resolution to control halon imports and use was drafted, and data on halon stocks and users was updated; and

(e) Information was gathered and nine regional units were created to assist in the implementation and monitoring of the Colombia NPP.

Breakdown of the approved project budget

7. The breakdown of the approved project budget (in US $) is presented in the table below:

Project component	**Approved**	**Expenditure***	**Balance**
Phase-out of CFCs in the commercial refrigeration manufacturing sector	450,000	450,000	0
Technician-licensing programme for the refrigeration and air conditioning service sector	1,338,820	495,040	843,780
Technical assistance for legal framework	20,000	4,305	15,695
Technical assistance for information and awareness	80,000	62,550	17,450
Halon bank management programme	58,000	5,703	52,297
Technical assistance for implementation and monitoring	200,000	82,004	117,996
Totals	2,146,820	1,099,602	1,047,218

* Expected expenditure as of December 2005

Independent verification

8. In 2005, an audit on the 2004 consumption verification report was undertaken by an independent auditor who concluded that “the data on imports reported by the Ozone Technical Unit are totally reliable; and Colombia is accomplishing its targets on internal consumption as agreed”.

Second tranche work programme

9. From 2006 until the completion date, the work programme of the Colombia NPP will be based on the following main strategies:

(a) The industrial conversion and sectoral elimination of 150 ODP tonnes of CFC, through the certification of approximately 500 refrigeration technicians, initiation of a second phase of purchases of basic servicing tools and recovery/recycling equipment; structuring the recovery and recycling programme, providing training equipment and material for instruction in the refrigeration sector;

(b) Strengthening national capacity for implementing the Montreal Protocol, through the preparation of a technical assistance project and coordination meetings with the relevant authorities to reduce/avoid illegal trade of ODS, the preparation of additional norms for controlling unregulated ODS, and the elimination of import duties on HFC-134a while imposing duties on CFC; and

(c) Institutional coordination within the relevant ministries and other government departments in Colombia.

10. The following tables summarize the CFC and halon phase-out targets and industry actions for the 2006-2009 period, when the Colombia NPP will be completed. Annual implementation reports will be submitted to the last Meeting of the Executive Committee of each year, detailing the specific action plan of the next year:

Indicators		2005*	2006-2010	Reduction**
Supply of CFC	Import	566.91	0.00	566.91**
	Total	566.91	0.00	566.91
Demand of CFC	Manufacturing	123.15	0.00	123.15
	Servicing	443.76	0.00	443.76**
	Stockpiling	0.00	0.00	0.00
	Total		0.00	566.91
Supply of halon	Import	4.4	0.00	4.4
	Total	4.4	0.00	4.4

* Estimated import. Real value could vary from the estimated value.

** Reduction at the end 2009 will be 100 per cent phase-out of the actual consumption in 2005.

Sector	**Consumption 2005**	**Consumption 2006-2010**	**Reduction**	**No. of projects completed**	**Servicing activities**	**ODP tonnes**
Manufacturing sector						
Aerosol	0.00	0.00	0.00	0		0.00
Foam	123.15	0.00	123.15	4		123.15
Refrigeration	0.00	0.00	0.00	2		0.00
Solvents	0.00	0.00	0.00	1		0.00
Other				1		
Total	123.15	0.00	123.15	8		123.15
Servicing sector						
Refrigeration	443.76*	0.00	443.76*	0	4	443.76*
Solvent	0.00	0.00	0.00	0	0	0.00
Total	443.76*	0.00	443.76*	0	4	443.76*
Grand total	566.91*	0.00	566.91*	12	4	566.91*

Halons are not included in the above table for simplicity. There is only one activity directed to the sector.

* Reduction at the end 2009 will be 100 per cent phase-out of the actual consumption in 2005.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

11. The Secretariat noted the comprehensive and well written progress report on the implementation of the Colombia NPP, together with the supporting documents, including the verification report on the national ODS consumption in Colombia. The Secretariat also noted the results achieved so far by the Government of Colombia, with the assistance provided by UNDP, in phasing out its CFC and halon consumption, i.e., a 2004 CFC consumption of 898.5 ODP tonnes, which is below the total allowable consumption of 1,057.5 ODP tonnes, and zero consumption of halon while the allowable consumption was 4.4 ODP tonnes.

12. The Secretariat sought additional information from UNDP in regard to the status of implementation of the recommendations proposed by the independent auditor in its verification report. UNDP indicated that the Ozone Unit has already started to implement the recommendations by the auditor. Specifically, the Ozone Unit has been working closely with the Directorate of National Taxes and Customs (DIAN) and the Ministry of Commerce in order to improve different procedures, focusing especially on:

(a) Improving mechanisms for exchanging information amongst the entities;

(b) Improving control of ODS and equipment;

(c) Implementing procedures to identify irregularities; and

(d) Applying related sanctions.

13. UNDP also indicated that there are currently several documented cases of identified illegal trade in CFC. DIAN is generating an investigation-sanction process. The country's new sanction system related to environment violations has just begun operating.

14. With regard to the National Department of Statistics, it is being proposed that this office will systematize the ODS import/export data (as well as their alternatives) and will become an essential reference point on the subject for the country. Regarding the recommendation on taxes and incentive measures to promote the use of alternatives to ODS, Colombia has provisions on tax exemptions for owners of large equipment not manufactured in the country (i.e., chillers). A consultancy is being undertaken to explore the possibility of extending such benefits to other end-users. Finally, the recommendation on ODS trade control system has been taken into consideration and will be implemented in the following phase of the customs training programme.

RECOMMENDATION

15. The Secretariat recommends blanket approval of the second (and last) tranche of the national CFC phase-out plan for Colombia, at the level of funding indicated in the table below:

	Project Title	Project Funding (US $)	Support Cost (US $)	Implementing Agency
(a)	National phase-out plan for Annex A (Group I and II) substances: second implementation programme	2,353,180	176,488	UNDP

PROJECT EVALUATION SHEET
(NON-MULTI-YEAR PROJECTS)
COLOMBIA

PROJECT TITLE	BILATERAL/IMPLEMENTING AGENCY
Phase-out of CTC as process agent in the elimination of nitrogen trichloride during chlorine production at Prodesal S.A.	World Bank

NATIONAL CO-ORDINATING AGENCY	Ozone Technical Unit

LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT

A: ARTICLE-7 DATA (ODP tonnes, 2004, as of 22 September 2005)

CTC	0.88		

B: COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes, 2004, as of 29 April 2005)

ODS Name	Sub-sector/quantity	Sub-sector/quantity	Sub-sector/quantity	Sub-sector/quantity.
CTC	0.79			

CFC consumption remaining eligible for funding (ODP tonnes)	n.a.

CURRENT YEAR BUSINESS PLAN ALLOCATIONS		Funding US $ million	Phase-out ODP tonnes
	(a)	54,000	6.0

PROJECT TITLE:	Prodesal
ODS use at enterprise (ODP tonnes):	2.05
ODS to be phased out (ODP tonnes):	2.05
ODS to be phased in (ODP tonnes):	
Project duration (months):	24
Initial amount requested (US $):	452,400
Final project cost:	
Incremental Capital Cost (US $)	414,000
Contingency (10%) (US $)	38,400
Incremental Operating Cost (US $)	0
Total Project Cost (US $)	452,400
Local ownership (%):	96%
Export component (%):	18%
Requested grant (US $):	452,400
Cost-effectiveness (US $/kg) (Investment part):	206.0
Implementing agency support cost (US $):	33,930
Total cost of project to Multilateral Fund (US $):	486,330
Status of counterpart funding (Y/N):	
Project monitoring milestones included (Y/N):	Yes

SECRETARIAT'S RECOMMENDATION	Pending

PROJECT DESCRIPTION

16. On behalf of the Government of Colombia, the World Bank has submitted a request for funding of US $452,400 plus support costs of US $33,930 to provide assistance to Prodesal S.A, to eliminate its consumption of carbon tetrachloride (CTC) used as a process agent in the manufacture of chlorine. The project describes three possible alternatives to eliminate CTC use ,and proposes implementation of the alternative judged to be the most feasible on commercial and technical grounds. The project will eliminate 2.05 ODP tonnes. In addition to the investment component, a small technical assistance component is requested to allow the government to phase out all remaining CTC consumption by small users.

Background

17. Colombia does not produce CTC. The baseline consumption level for CTC is 6.62 ODP tonnes. Annual consumption data reported to the Ozone Secretariat under Article 7 is indicated below:

Imports of CTC in Colombia in ODP tonnes (ODP_{CTC} = 1.1)

1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
24.63	26.98	23.19	7.33	11.97	0.57	13.37	0.92	1.38	0.88

18. In 2003, results from a national CTC consumption survey indicated that most of the remaining consumers were universities, laboratories and Prodesal S.A., with roughly 12%, 8% and 76% of the total consumption, respectively. In 2006, the Ozone Technical Unit (UTO) will conduct awareness raising campaigns to eliminate all non-essential uses of CTC in universities and laboratories. A capacity building component of this project will provide training and disseminate information. The conversion of Prodesal S.A., as proposed by this document, will address the remaining consumption of CTC in the country. By 2008, all CTC consumption in Colombia will have been phased out.

19. Prodesal S.A is the only Colombian manufacturer of chlorine. Ninety six percent of the company is Colombian owned. The remaining 4% is owned by the International Finance Corporation (IFC). The company commenced operations in July 1989. It exports its products to several Article 5 countries. There are no exports to non-Article 5 countries.

20. The company uses CTC as a process agent to remove nitrogen trichloride, an explosive chemical, from the chlorine. This application is included in the list of approved process agent uses specified in decision X/14 of the Parties. Annual CTC consumption for the last three years is indicated in the table below. The annual CTC consumption varies because it is necessary to periodically replace the CTC contained in the process equipment.

Annual consumption of CTC (ODP tonnes) over the last three years

2002	2003	2004
0.68	1.71	2.05

21. Substitution of CTC as a process agent in the production of chlorine is recognized as being technically challenging. Individual production facilities tend to have different configurations and each process needs to be addressed on a case by case basis. For Prodesal S.A., three alternatives have been identified. They are:

(a) Replacement of the three compressors that control both the pressure and temperature of chlorine gas during the liquefaction process;

(b) The use of chloroform as a substitute for CTC. Chloroform has been singled out by the 2001 TEAP Process Agent Task Force report as the only non-ODS compound with similar properties to those of CTC. However, chloroform may react with chlorine during the removal of sodium trichloride to produce CTC. Since there are no destruction facilities that can handle chlorinated compounds in Colombia, all CTC produced must be packaged and exported to a waste disposal facility abroad; and

(c) The thermal decomposition and chemical destruction of sodium trichloride by caustic soda solution. This alternative can be linked to the commercial production of other chemicals at Prodesal S.A. The technical details and specific conditions for this alternative technology are currently unknown. A technical visit to selected enterprises in China with similar operating conditions is then requested through this project, to identify both technical and commercial details required to implement the technology in Colombia.

22. The total costs of the three alternatives and the cost-effectiveness values are indicated in the table below:

	Alternative 1 Equipment replacement (US$)	**Alternative 2 Switch to chloroform** (US$)	**Alternative 3 Switch to caustic soda** (US$)
Incremental Capital Costs	1,838,400	373,400	384,000
Contingency (10%)	183,840	37,340	38,400
Incremental Operating Costs	431,500	100,000	0
Total Project Costs	**2,453,740**	**510,740**	**422,400**
Cost effectiveness (US$/Kg ODP)	**1196.9**	**249.1**	**206.0**

23. Alternative 3 has been selected as the technology of choice to phase out CTC use as process agent at Prodesal S.A. The technology has been demonstrated in China under similar production conditions as those existing in the Colombian plant. The technology does not involve any environmental risks and completely eliminates sodium trichloride from the chlorine. This option has the lowest capital investment costs as well as training costs of all the technologies

evaluated. Although the costs associated with this alternative remain high, it is believed to be the most feasible and sustainable option.

24. The objective of the technical assistance component of the project is to complete the phase-out of CTC consumption by all small users that have not yet converted to alternative technologies. The technical assistance program will include an update of the 2003 CTC survey; training and capacity building workshops; the introduction of regulations to control the use of CTC, and; an information dissemination campaign. US $30,000 is requested for this activity.

25. No cost-effectiveness threshold has been established for CTC as a process agent. Therefore, the proposed request by the government of Colombia amounts to the total cost of the project, namely US $452,400, comprising an investment component of US $422,400 and the technical assistance component of US $30,000.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

26. The Secretariat reviewed the project for the phase-out of CTC at Prodesal S.A. on the basis of established rules and policies governing incremental costs, including in the process agent sector. Incremental costs are determined by consideration of the most cost-effective alternative technology. The Secretariat therefore focussed on the second option listed in the project document, since the second option provided the most cost-effective solution for the Multilateral Fund as indicated below.

27. The original proposal anticipated costs for technical assistance and design plus the cost of a technical visit to a plant in the USA or Canada for benchmarking. The use of chloroform is a means of providing CTC within the plant without actually purchasing and handling CTC, because the chloroform is converted to CTC in the process. Therefore, overseas study visits for benchmarking appear to be neither essential nor eligible. Technical assistance and design is eligible, but could be combined with any benchmarking requirements at the indicated cost of US $50,000.

28. The original proposal also contained an allowance of US $100,000 for a new chloroform drier and boiler. Because the system will continue to operate with a fluid that becomes CTC after it is introduced into the process equipment, the proposal for new drying and boiling equipment does not represent an incremental cost and is not eligible for funding.

29. Funding for testing, training and quality control is eligible, particularly since the operating procedures will be different from normal operation with CTC. However, the switch to chloroform is expected to pose less of a problem than would be encountered in the third option, preferred by Prodesal - changing to neutralisation with caustic soda. Additionally, compensation for lost revenue arising from down-time during conversions has never been included in incremental costs. Thus the eligible costs for testing training and quality control will be those associated with the need for external assistance and/or materials for trials. On the basis of the

information in the project document a maximum of US $30,000 could be considered for this technical support activity, after removal of compensation for lost production.

30. An additional US $100,000 is requested as incremental operating costs (IOC) for 15 years. The Secretariat notes that where eligible, IOC for process agent projects are calculated for a duration of one year only. However in the case of Prodesal the claimed IOC appear not to be eligible. At present, when the CTC and dissolved chlorine are removed from the system, the mixture is allowed to evaporate "naturally". Chlorine and carbon tetrachloride are both toxic at low concentrations (parts per million). Best practice would require that the CTC that is removed from the system now should be collected and sent for disposal by destruction. However this is not done at present, and so the disposal costs are not associated with the phase-out and are not incremental.

31. The resulting overview of the project is that it amounts to a technical assistance activity since no capital equipment is eligible. The total eligible cost for Prodesal as reviewed by the Secretariat would appear to be some US $84,480 (comprising total costs of US $80,000 for technical assistance plus 10 percent contingency, less 4 per cent foreign ownership). To this would be added the requested US $30,000 for technical assistance to support national CTC phase-out. Total project costs would therefore be US $114,480. The cost-effectiveness for the investment part would be US $41.20, which, while high, is potentially approvable.

32. Because this was the first project received by the Secretariat for this specific process agent application, it was necessary to seek expert advice as part of the review process. Accordingly, at the time of writing, the World Bank has not been in a position to respond to the issues raised in the Secretariat's review. Supplementary advice will be provided prior to the two week deadline for additional information.

RECOMMENDATION

33. Pending.

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