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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Fifty-sixth Meeting
Doha, 8-12 November 2008

PROJECT PROPOSAL: INDIA

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

Aerosol

- National strategy for transition to non-CFC MDIs and plan for phase-out of CFCs in the manufacture of pharmaceutical MDIs — Italy/UNDP and UNEP

Production

- Accelerated CFC production phase-out (agreement) — World Bank

PROJECT EVALUATION SHEET – NON-MULTI-YEAR PROJECT
INDIA

PROJECT TITLE(S)	BILATERAL/IMPLEMENTING AGENCY
(a) National strategy for transition to non-CFC MDIs and plan for phase-out of CFCs in the manufacture of pharmaceutical MDIs	Italy / UNDP / UNEP
NATIONAL CO-ORDINATING AGENCY	Ozone Cell, Ministry of Environment and Forests

LATEST REPORTED CONSUMPTION DATA FOR ODS ADDRESSED IN PROJECT

A: ARTICLE-7 DATA (ODP TONNES, 2007, AS OF OCTOBER 2008)

CFC	998.5		

B: COUNTRY PROGRAMME SECTORAL DATA (ODP TONNES, 2007, AS OF SEPTEMBER 2008)

ODS	MDIs	Subsector/quantity	Subsector/quantity	Subsector/quantity
CFC-11	186.2			
CFC-12	421.9			
CFC consumption remaining eligible for funding (ODP tonnes)				0.0

CURRENT YEAR BUSINESS PLAN ALLOCATIONS		Funding US $ million	Phase-out ODP tonnes
	(a)	Italy 2’000,000	50
	(b)	UNEP 400,000	0
	(c)	UNDP 3’200,000	79.4

PROJECT TITLE:	(a)
ODS use at enterprise (ODP tonnes):	
ODS to be phased out (ODP tonnes):	704.0
ODS to be phased in (ODP tonnes):	n/a
Project duration (months):	60
Initial amount requested (US $):	
Investment component (US $):	60,531,934
Non-investment component: (US $):	1,170,000
Total cost (US $):	61,701,934
Counterpart funding plus adjustments (US $):	(34,942,615)
Amount requested (US $):	26,759,319
Final project costs (US $):	
Incremental Capital Cost: (US $):	10,164,000
Product Development Costs (US $):	10,325,000
Incremental Operating Cost:	4,615,668
Adjustment Foreign Ownership (US $):	(3,971,386)
Adjustment Export Component (US $):	(905,115)
Counter part funding (US $):	(7,531,400)
Adjustment to the India NPP (US $):	(2,894,500)
Transition strategy (US $):	120,000
Project implementation and monitoring (US $)	280,000
Requested grant (US $):	10,202,267
Cost-effectiveness (US $/kg):	
Implementing agency support cost (US $):	851,770
Total cost of project to Multilateral Fund (US $):	11,054,037
Status of counterpart funding (Y/N):	Y
Project monitoring milestones included (Y/N):	Y

(*) 2.97% of foreign ownership for Cadila; 18.42% for Cipla; 50.67% for GSK and 19.24% for Sun Pharma.
(**) 5.6 by Cipla.

SECRETARIAT’S RECOMMENDATION[S]	For Individual Consideration

PROJECT DESCRIPTION

1. On behalf of the Government of India, UNDP as the lead implementing agency has submitted a national strategy for transition to non-CFC MDIs, and a plan for phase-out of CFCs in the manufacturing of pharmaceutical metered dose inhalers (MDI Sector Plan), for consideration by the Executive Committee at its 56th Meeting. The total cost of the project, as submitted is US $26,759,319 plus agency support costs of US $2,123,543.

2. The project will be implemented by UNDP (US $24,639,400 plus agency support costs of US $1,847,955), UNEP (US $350,000 plus agency support costs of US $45,500), and the Government of Italy (US $1,769,919 plus agency support costs of US $230,088).

Project summary

3. According to the MDI Sector Plan, there are currently five MDI manufacturers in India. Three of these manufacturers produce both CFC- and HFA-MDIs.

4. The total estimated cost of the MDI Sector Plan in India, before any adjustments due to foreign ownership or counterpart funding, is US $61,701,934 as shown in Table 1.

Table 1. Total estimated cost of the MDI project in India

Description	Cadila	Cipla	GSK	Midas Care	SunPharma	Total
CFCs (ODP tonnes)	3.5	526.6	31.7	18.8	5.9	586.5
Investment costs (US$)						
Capital cost	1,218,000	11,175,600	1,178,600	780,000	780,000	15,132,200
Product development	840,345	37,890,000	-	765,000	660,490	40,155,835
Operating cost	124,842	4,411,716	330,680	308,850	67,811	5,243,899
Total investment costs	2,183,187	53,477,316	1,509,280	1,853,850	1,508,301	60,531,934
Non-investment costs (US$)						
Technical assistance						350,000
Policy/regulatory support						70,000
Awareness						350,000
Monitoring/management						400,000
Total non-investment costs						1,170,000
Total costs (US $)						61,701,934
Overall CE (US$/kg)						105.20

5. Of the total cost of the project, the Government of India is requesting US $26,759,319 after deducting the foreign ownership component of one enterprise, adjustments due to 4.9 per cent export of MDIs to non-Article 5 countries and a 57 per cent counterpart contribution by the enterprises as requested in decision 54/5. The breakdown of the incremental costs of the MDI Sector Plan is shown in Table 2.

Table 2. Total incremental costs of the MDI project in India

Description	Cadila	Cipla	GSK	Midas Care	SunPharma	Total
CFCs (ODP tonnes)	3.5	526.6	31.7	18.8	5.9	586.5
Investment costs (US$)						
Capital cost	852,600	7,208,262	223,934	546,000	546,000	9,376,796
Product development	588,242	11,367,000	-	535,500	462,343	12,953,085
Operating cost	87,389	2,845,557	62,829	216,195	47,468	3,259,438
Total investment costs	1,528,231	21,420,819	286,763	1,297,695	1,055,811	25,589,319
Non-investment costs (US$)						
Technical assistance						350,000
Policy/regulatory support						70,000
Awareness						350,000
Monitoring/management						400,000

Description	Cadila	Cipla	GSK	Midas Care	SunPharma	Total
Total non-investment costs						1,170,000
Total costs (US $)						26,759,319
Overall CE (US$/kg)						45.62

6. A copy of the MDI Sector Plan submitted by UNDP is attached to the present report.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

7. The Secretariat has reviewed the project to address the CFC-MDI sector in light of the following:

(a) The policy papers on the MDI sub-sector submitted to the 37th, 49th and 51st Meetings;

(b) UNDP work programme amendments submitted to the 54th Meeting (paragraphs 19 to 31 of document UNEP/OzL.Pro/ExCom/52/22);

(c) The MDI phase-out projects that have been approved for Bangladesh, Cuba, Egypt, Islamic Republic of Iran, Mexico and Uruguay; and

(d) Relevant decisions by the Executive Committee on MDIs, in particular decision 52/25(a) on the approval of funding for the preparation of the MDI project in India.

8. Given the complexity of the MDI Sector Plan, the Secretariat's comments are organized according to the following categories:

(a) Analysis of the MDI production facilities in India;

(b) Essential use exemptions for CFCs;

(c) CFC consumption used for manufacturing of MDIs;

(d) Product development;

(e) Capital and operating costs;

(f) Technical assistance activities, including transitional strategy;

(g) Adjustment from the funding approved for the NPP for India; and

(h) A proposal by the Secretariat.

Analysis of the MDI production facilities in India

9. In reviewing the information presented in the MDI Sector Plan, the Secretariat noted as follows:

(a) The total production levels of MDIs in India in the 2003-2007 period are shown in Table 3 below as follows:

Table 3. MDI manufacturers in India

Manufacturer	Total production (million MDIs)				
	2003	2004	2005	2006	2007
CFC-MDIs					
Cadila Healthcare Ltd.	0.15	0.30	0.42	0.69	0.71
Cipla Ltd.	26.27	33.04	28.18	35.44	27.39
GlaxoSmithKline Pharmaceuticals Ltd.	1.15	0.94	1.21	0.79	0.94
Midas-Care Pharmaceuticals Ltd.	0.97	1.02	1.65	1.85	1.76
Sun Pharmaceutical Industries Ltd.	0.29	0.39	0.31	0.39	0.39
Subtotal CFC-MDIs	**28.83**	**35.69**	**31.77**	**39.16**	**31.19**
HFA-MDIs					
Cipla Ltd.	0.47	1.21	4.03	11.01	24.06
Midas-Care Pharmaceuticals Ltd.	0.00	0.024	0.035	0.15	0.26
Sun Pharmaceutical Industries Ltd.	0.00	0.00	0.00	0.029	0.00
Subtotal HFA-MDIs	**0.47**	**1.23**	**4.06**	**11.19**	**24.32**
Total	**29.30**	**36.92**	**35.84**	**50.35**	**55.51**

(b) The level of CFC consumption for the manufacturing of MDIs increased from 578.9 ODP tonnes in 2003 to 763.6 ODP tonnes in 2006. In 2007, CFC consumption decreased to 608.1 ODP tonnes, as shown in Table 4:

Table 4: Levels of CFC consumption for the manufacturing of MDIs in India

Manufacturer	CFC consumption (ODP tonnes)				
	2003	2004	2005	2006	2007
Cadila	2.9	5.9	7.5	11.6	8.5
CIPLA	526.6	687.6	670.9	698.2	537.7
GSK	24.6	20.1	25.9	16.9	20.1
Midas-Care	18.8	21.3	29.8	29.0	34.0
Sun Pharma	6.0	7.9	6.3	7.9	7.8
Total	**578.9**	**742.8**	**740.4**	**763.6**	**608.1**

(c) The forecast of CFC and HFA demand for MDIs in India in 2008-2013 is shown in Table 5:

Table 5. Forecasted CFC and HFA consumption for the manufacture of MDIs

Propellant	CFC and HFA consumption (metric tonnes)*					
	2008	2009	2010	2011	2012	2013
CFC	604	484	338	203	71	0
HFA	566	760	983	1,205	1,405	1,556
Total	1,170	1,244	1,322	1,408	1,476	1,556

(*) Based on growth rates over the last five years, with the presumption of technical and financial assistance for the transition from CFC to HFA technologies, in the absence of which an additional three years will be needed for the complete phase-out of CFCs.

(d) The production of CFC-MDIs has increased from 28.8 million in 2003 to almost 31.2 million in 2007. However, domestic sales of CFC-MDIs have decreased from 15 million units to just over 10 million units over the same period. The levels of domestic sales and export to Article 5 and non-Article-5 countries of CFC-MDIs manufactured in India are shown in Table 6:

Table 6. Domestic sales and exports of CFC-MDIs in India

Parameter	Total (million MDIs)				
	2003	2004	2005	2006	2007
Domestic sales	14.90	15.72	16.21	18.27	10.33
Exports to non-Article-5 countries	0.42	0.05	0.42	0.47	1.75
Exports to Article-5 countries	13.52	19.93	15.16	20.43	19.30
Total exports	13.94	19.98	15.57	20.90	20.82
Total production	28.83	35.69	31.77	39.16	31.19
Export to non-Article-5 countries (%)	1.5%	0.1%	1.3%	1.2%	5.6%

Essential use exemptions for CFCs

10. Through its decision 51/34 the Executive Committee requested, *inter alia,* that countries with MDI manufacturing plants should be advised of the timing for beginning to consider the need for essential use exemptions beyond the 2010 phase-out date. Also, through its decision 54/5 the Committee requested, *inter alia,* that MDI project proposals should clearly describe "the volumes of stockpiled CFCs currently and in the past in order to facilitate the smooth transition from CFC-MDIs and to mitigate the need for a temporary essential-use exemption request". According to the project proposal, it is estimated that the conversion will be completed by December 2013, i.e., four years after the mandatory date for the complete phase-out of CFCs. However, the need for essential use exemptions for CFCs, or for stockpiling pharmaceutical aerosol grade CFCs (including amounts) for the transitional period (i.e., two to three years or more) has not been fully considered in the MDI Sector Plan. On this basis, the Secretariat asked whether this issue was addressed with major stakeholders in India.

11. UNDP advised that the MDI Sector Plan will ensure that conversion to non-CFC MDIs would be completed by December 2012 (i.e., 3 years after the mandatory CFC phase-out). There are no CFC stockpiles available with MDI manufacturers to cover needs during the transition period. Stakeholders have been fully briefed by the Government on the essential use nomination process. Accordingly, the Government of India, with the assistance of the implementing agencies and MDI manufacturers, would be in a position to request essential uses by January 2009.

CFC consumption used for manufacturing of MDIs

12. In the context of the Executive Committee decision on strategic planning, the Committee agreed that further funding must be predicated on a commitment by the country to achieve sustainable permanent aggregate reductions in consumption and production, as relevant. It also acknowledged that some future years' reported consumption might go above or below the levels that result from the agreed calculation, but if consumption numbers went above the resulting levels, such increases in consumption would not be eligible for funding (decision 35/57). At the 42nd Meeting, the Executive Committee approved the national CFC phase-out plan covering all remaining CFC consumption eligible for funding in India (i.e., 847 ODP tonnes). The phase-out plan was based on the level of CFC consumption in 2003. On this basis, the Secretariat pointed out that the level of CFC consumption to be addressed through the MDI project is 586.5 ODP tonnes (CFC consumption in 2003) and not on the 2007 consumption of 704 ODP tonnes.

13. UNDP reported that the MDI Sector Plan was formulated based on eligibility criteria relating to 2003. Accordingly, only products developed and commercialized with production lines in place in 2003 have been considered. Incremental operating costs calculated as prevailing in 2003 would be significantly higher, because at that time the cost differences between CFC and HFA valves were higher and also there was a significant cost difference between CFC and HFA propellants. Therefore, operating costs calculated on the 2007 levels of consumption are lower.

Product development

14. In 2003, CFC-MDIs with thirteen different active ingredients were manufactured in India, as shown in Table 7. Several of the CFC-MDIs have been formulated in multiple strengths (i.e., different concentrations of the same active ingredient).

Table 7. CFC-MDIs by active ingredient and manufacturing plant (2003)

No.	Ingredient	CFC-MDIs manufactured by enterprise						
		Cadila	Cipla	GSK	Midas-Care	SunPharma	Total MDI	%lMDIs
1	Salbutamol	30,010	16,905,000	1,044,505	611,800	56,600	18,647,915	64.6%
2	Beclomethasone		4,663,000	107,475	117,900		4,888,375	16.9%
3	Beclomethasone/Salbutamol		1,925,000		27,400		1,952,400	6.8%
4	Salmeterol/Fluticasone		778,000		10,000	163,771	951,771	3.3%
5	Ipratropium	20,070	786,000		43,000		849,070	2.9%
6	Budesonide	10,010	300,000		15,200	51,738	376,948	1.3%
7	Ipratropium/Salbutamol	20,070	293,000		61,200		374,270	1.3%
8	Budesonide/Formoterol	69,293	191,000		75,900	27,379	363,572	1.3%
9	Salmeterol		154,000				154,000	0.5%
10	Fluticasone		134,000				134,000	0.5%
11	Sodium cromoglycate		66,000				66,000	0.2%
12	Tiotropium		45,000				45,000	0.2%
13	Formoterol	1,910	31,000		11,700		44,610	0.2%
	Total MDIs	**151,363**	**26,271,000**	**1,151,980**	**974,100**	**299,488**	**28,847,931**	**100.0%**
	% of total by enterprise	0.5%	91.1%	4.0%	3.4%	1.0%	100.0%	

15. With regard to the data presented in Table 7 and information presented in the MDI project, the Secretariat noted as follows:

(a) In 2003, almost 82 per cent of all CFC-MDIs contained salbutamol (64.6 per cent) or beclomethasone (16.9 per cent). An additional 10 per cent contained a combination of beclomethasone/salbutamol or salmeterol/fluticasone;

(b) One enterprise, Cipla, manufactures more than 91 per cent of all CFC-MDIs manufactured in India;

(c) GSK, the second largest manufacturer of CFC-MDIs, with 4 per cent of total production, is partially owned by a non-Article 5 company (50.67 per cent) foreign ownership;

(d) Several CFC-MDIs have not been produced for at least the last one or two years, namely: formeterol (Cadila, Cipla, Midas Care); ipratropium (Cadila, Midas Care); and sodium cromoglycate (Cipla). Therefore, the request for reformulation to HFA technology for these active ingredients would not be eligible for funding;

UNDP indicated that all the above MDIs were manufactured in 2003. If 2003 is to be used as the reference year for eligibility, the development and other costs for reformulating these products are eligible. Some of the products indicated are specialized with precise therapeutic profiles and are usually needed in low volumes. The requirement of these products can vary from year to year. Furthermore, it has been confirmed by all MDI manufacturing enterprises that all of their CFC-MDIs manufactured in 2003 will be converted to HFA technology.

16. The total cost associated with the development of HFA-MDIs for each active ingredient is over US $40 million as shown in Table 8. Of this cost, the Government of India is requesting US $12,953,085 (which represents 32.3 per cent of total costs).

Table 8. Total estimated costs for product development (US $)

Ingredient	Cadila	Cipla	GSK	Midas-Care	SunPharma	Total $	% Total$
Beclomethasone		4,200,000		90,000		4,290,000	10.7%
Beclomethasone/Salbutamol		2,100,000		45,000		2,145,000	5.4%
Budesonide	109,528	4,200,000		90,000	132,098	4,531,626	11.3%
Budesonide/Formoterol	226,610	2,100,000		90,000	132,098	2,548,708	6.4%
Fluticasone		4,200,000		90,000	132,098	4,422,098	11.0%
Formoterol	54,764	2,100,000		45,000		2,199,764	5.5%
Ipratropium	54,764	4,200,000		45,000		4,299,764	10.7%
Ipratropium/Salbutamol	113,305	2,100,000		45,000		2,258,305	5.6%
Salbutamol	54,764	2,100,000		45,000	66,049	2,265,813	5.7%
Salmeterol		2,100,000				2,100,000	5.2%
Salmeterol/Fluticasone	226,610	4,200,000		90,000	132,098	4,648,708	11.6%
Sodium cromoglycate		2,100,000		45,000		2,145,000	5.4%
Tiotropium		2,100,000		45,000	66,049	2,211,049	5.5%
Total cost (US$)	840,345	37,800,000	-	765,000	660,490	40,065,835	100.0%
Total requested cost (US$)	588,242	11,367,000	-	535,500	462,343	12,953,085	

17. In reviewing the total costs for product development, the Secretariat noted as follows:

(a) Although only 13 different active-ingredient CFC-MDIs were manufactured in 2003, the MDI Sector Plan is proposing the reformulation of 55 different CFC-MDIs, including several active ingredients for which two different strengths are presented as two different products;

UNDP indicated that MDIs with the same active ingredient still involve several of the product development steps for each strength, such as development and stability studies in order to register products. Where there are three or more strengths, it is common practice to develop the highest and lowest strength and conduct formal stability evaluations, whereas only bridging studies would be conducted for the middle strengths (due consideration of this has been taken into account).

(b) No funding has been requested for development of HFA-MDIs by GSK (i.e., the costs will be covered by the company). However, the reformulated MDI will have higher operating costs due to the need for a more expensive canisters and valves;

(c) The costs for product development include several CFC-MDIs that started production after 2003, namely: salmeterol/fluticasone (Cadila); tiotropium/formoterol and levosalbutamol (Cipla); and fluticasone and tiotropium (Sun Pharma). Therefore, costs associated with the reformulation to HFA technology of these active ingredients are not eligible;

UNDP stated that these MDIs entered commercial supply in 2004; the commercial scale batches were already produced in 2003 and submissions for registration filed. On this basis, these MDIs were included in the MDI Sector Plan.

(d) The cost of product development for each active ingredient varies widely among manufacturing enterprises. Nevertheless, the same level of funding is being requested for development of each product, irrespective of the quantities of MDIs produced annually (i.e., Cipla is requesting US $2.1 million for the development of salbutamol MDIs with a total production of 16.9 million units and an additional US $2.1 million for the development of tiotropium MDIs with a total annual production of only 45,000 units). Furthermore, for CFC-MDIs formulated in multiple strengths, funding is being requested for at least two of the strengths (typically the lowest and the highest strengths);

(e) Addressing these issues, UNDP pointed out that the costs of product development are a function of specific situations prevailing in a country/enterprise, and depend on the baseline technical capacity available and internal systems/overheads. Moreover, the regulatory demands for overseas markets can increase development costs. In case of the MDI manufacturing enterprises in India, particularly Cipla, which has a significant export market, this can significantly affect development costs. The development costs represent fixed expenditures regardless of the volumes being manufactured and are needed to ensure that the product is carefully developed, appropriately registered and is safe and effective. In reformulating MDIs with two different active ingredients, two analytical methods need to be developed for two strengths; component screening for compatibility with the individual strength and the interaction of the two strengths need to be undertaken; and double the number of analyses need to be performed at all the time points during the stability phase.

<u>Capital and operating costs and technical assistance activities</u>

18. Upon a request for additional information on the foreign ownership component of the MDI manufacturing plants in India, UNDP reported as follows: 2.97 per cent of foreign ownership for Cadila; 18.42 per cent for Cipla; 50.67 per cent for GSK and 19.24 per cent for Sun Pharma.

19. For each MDI manufacturing line that was established before 2003, the Secretariat and UNDP had detailed discussions on the installed capacity, technological upgrade, eligibility of the equipment items in light of the baseline equipment, and cost of the equipment. Operating costs have been calculated on the basis of 2007 production levels, not 2003 levels.

20. The MDI Sector Plan includes a request of US $1,170,000 for the following non-investment components:

(a) Technical assistance for implementation of the national strategy for transition to non-CFC MDIs (US $350,000) for, *inter alia*, preparing specifications of equipment to be procured, evaluating bids from suppliers, providing guidance to beneficiary enterprises during start-up with the new equipment and process; assisting in the evaluation of production and product quality trials, project commissioning including destruction of the CFC-based equipment where applicable, verification of depletion of CFC stocks, and verifying that the non-CFC production process is in operation; clearance of project completion and reporting requirements;

(b) Support for policy and regulations (US $70,000), which includes control of supply of CFC-MDIs and promotion of non-CFC alternatives;

(c) Awareness and capacity-building (US $350,000), which includes information dissemination and awareness activities, development and distribution of promotional materials and promoting public awareness; and

(d) Management and monitoring unit (US $400,000), which will be responsible for the coordination of the implementation of various components of the strategy, progress reporting, coordination of enterprise-level implementation and phase-out activities, and verification and certification of CFC phase-out at the enterprise level.

21. With regard to the non-investment activities, the Secretariat noted as follows:

(a) The population affected by asthma and treated with MDIs in India is very small and has been decreasing over the last several years;

(b) There is a major penetration of HFA-MDIs in the country. In 2007, HFA-MDIs represented almost 44 per cent of total MDI production in India. HFA-MDI manufacturing is expected to continue to increase annually, replacing CFC-MDIs. Furthermore, dry powder inhalers are currently being manufactured by Cipla and Sun Pharma;

UNDP indicated that the main barriers for market penetration of HFA-MDI technology are increased costs, coupled with statutory controls on the selling price of drugs and devices, inadequate widespread information and experience with HFA-MDIs even among healthcare providers, and the need to strengthen the relevant policies/regulations. Due to these barriers, MDI manufacturers have inadequate compensation for domestic sales and therefore exports become preferential. These barriers can be overcome only through technical and financial interventions available through the Montreal Protocol mechanisms. The rationale for developing DPI single-dose products locally was to cover the needs of a specific group of elderly patients that have difficulties applying the MDI products, but not with the intention of replacing CFC MDIs as therapeutic treatment for asthma and COPD for all patients. However, the DPI single-dose products have not been well accepted by patients and doctors in India.

(c) Although there are several MDI manufacturing enterprises in India, over 91 per cent of the total production is by one enterprise; several manufacturing lines have been converted to HFA technologies and three of the enterprises are already manufacturing HFA-MDIs;

UNDP indicated that although one of the MDI manufacturers is by far the largest one in India, the transition strategy is complex, involves a wide spectrum of stakeholders and takes into account sensitive social and health repercussions. It cannot be treated as a simple phase-out project, as that would underestimate the challenges involved.

Adjustment from the funding approved for the NPP for India

22. Taking into consideration that the remaining consumption eligible for funding already includes the amount of CFCs that were used for manufacturing MDIs, the overall level of funding for the MDI Sector Plan should be adjusted by US $2,894,500 to avoid double-counting. For the calculation of this adjustment, the Secretariat notes as follows:

(a) The phase-out plan for India was approved at the 42nd Meeting based on the 2003 level of CFC consumption;

(b) According to the phase-out plan, only 120 ODP tonnes of CFCs were used for the production of CFC-MDIs. The level of CFC consumption reported in the phase-out plan is much lower than the 639.2 ODP tonnes of CFCs reported in the proposal for the preparation of an MDI phase-out project in India submitted by the Government to the 52nd Meeting, and also lower than the CFC consumption of 578.9 ODP tonnes reported in the project proposal submitted to the 56th Meeting;

(c) The cost of the phase-out plan for India (as well as for the majority of NPPs for non-LVC countries) was calculated using a cost-effectiveness value of US $5.00/kg of CFC used in the refrigeration servicing sector, plus the cost-effectiveness threshold applied to each manufacturing sector where CFCs were still used, plus additional funding for monitoring and reporting.

23. Taking the above into account, the adjustment to the MDI Sector Plan would be calculated on the basis of the 2003 CFC consumption of 578.9 ODP tonnes (representing the most accurate consumption in the MDI sector), and a cost-effectiveness value of US $5.00/kg.

Proposal by the Secretariat

24. Based on the issues raised and observations made by the Secretariat in reviewing the MDI Sector Plan submitted by UNDP; the large number of MDIs with different active ingredients and strengths; additional information gathered during the project review; as well as on the experience that has been gained in the Multilateral Fund in the MDI sector, the Secretariat proposed to UNDP the alternative methodology set out below for determining the incremental cost of the MDI Sector Plan. This methodology is consistent with the current policies and guidelines of the Multilateral Fund and has successfully addressed all policy and costs issues that were raised by the Secretariat during the project review process.

Transition strategy

25. The MDI Sector Plan has identified several key elements that would allow for the transition from CFC to non-CFC alternatives in the MDI sector. These elements include support for the review of ODS policy and regulations, including consideration of fiscal incentives for adopting non-CFC alternatives and fast track procedures for approval of non-CFC MDIs; consideration of the request for essential use exemptions beyond the 2010 phase-out date, and public awareness and information dissemination. Considering the number of manufacturing plants, their geographical distribution and the number of active ingredients in MDIs that will be converted to an HFA technology, the cost of the transition strategy would be US $120,000.

Product development

26. The proposal to calculate the cost for developing HFA-MDIs is based on the following considerations:

(a) Thirteen active ingredients in MDIs were manufactured in India in 2003. Six of them were developed in more than one strengthen. UNDP has received confirmation that all of these CFC-MDIs will be converted to HFA technology;

(b) About 95 per cent of the total MDIs manufactured contained the following active ingredients: salbutamol, beclomethasone, beclomethasone/salbutamol, salmeterol/fluticasone and ipratropium (Table 7 above). US $750,000 is being proposed for the development of HFA-MDI for each of these active ingredients (this level of funding is slightly below that for some of the already approved MDI projects). If more than one enterprise manufactures MDIs with the same active ingredient, an additional US $100,000 is being proposed for each of those additional enterprises to cover costs associated with *in situ* testing, preparation of technical dossiers and registration. For example, US $1,050,000 would be the total cost for the development of MDIs with salbutamol, which is manufactured by four enterprises;

(c) US $375,000 is being proposed for the development of a second strength of the five most active ingredients. If more than one enterprise manufactures the same active ingredient, an additional US $100,000 is being proposed for each of those additional enterprises to cover costs associated with preparation of technical dossiers, registration and approval by health authorities;

(d) A similar approach is being proposed for the remaining eight active ingredients (i.e., ipratropium, budesonide, ipratropium/salbutamol, budesonide/formoterol, salmeterol, fluticasone, sodium cromoglycate, tiotropium, formoterol), with the following level of funding:

(i) US $300,000 for the development of each of the above active ingredients. If more than one enterprise manufactures the same active ingredient, an additional US $100,000 is being proposed for each of those additional enterprises for technical dossiers, registration and approval; and

(ii) US $150,000 is being proposed for the development of a second strength of each of the above active ingredients. If more than one enterprise manufactures the same active ingredient, an additional US $100,000 is being proposed for each of those additional enterprises technical dossiers, registration and approval;

(e) Development costs for beclometahsone manufactured by GSK will be covered by the enterprise.

27. The total cost associated with the development of the HFA technology would be US $10,325,000 (before considering any adjustment as per relevant decisions).

Capital and operating costs

28. The level of funding for the conversion of the manufacturing lines in the five MDI manufacturing plants is as follows:

(a) US $726,000 for each of the four facilities with mid-sized production outputs (i.e., production outputs between 20 and 32 can/min) based on a quotation of a new two-stage production line;

(b) US $7,260,000 for the only plant with a CFC consumption of more than 520 ODP tonnes in 2003, calculated on the basis of 5 stand-alone production lines at a unitary cost of US $1,452,000.

29. Therefore, the total capital cost associated with the conversion to HFA-technologies amounts to US $10,164,000 including, installation, commissioning and contingency costs.

30. The operating costs are calculated on the basis of the total number of MDIs produced in 2003 (i.e., about 28.8 million MDIs), and a unitary cost of US $0.16/MDI which is the incremental cost associated with the new valve for HFA as documented in India and additional US $0.01 for additional compounds. The resulting operating costs amount to US $4,615,668.

31. Given the number of different active ingredients in MDIs produced by several manufacturing production lines in five different enterprises, the Secretariat proposed the establishment of a project implementation and monitoring unit at a total cost of US $280,000, that would be responsible for, among other things, providing assistance for preparing specifications of equipment to be procured, evaluating bids from equipment suppliers, providing technical guidance to the beneficiary enterprises during start-up with the new equipment and process, addressing technical issues with the phase-in of the new coordination of the implementation of various components of the strategy, and monitoring and verification.

Funding summary

32. The total level of funding proposed for the complete phase-out of CFCs used in the manufacturing of MDIs in India is as follows:

Description	US $
Product development	10,325,000
Capital costs	10,164,000
Operating costs	4,615,668
Sub-total project cost	25,104,668

33. From this figure of US $25,104,668, the following amounts need to be discounted:

Description	US $
Foreign ownership	(3,971,386)
Export to non-Article 5 countries	(905,115)
Counterpart funding (30%)	(7,531,400)
Adjustment to the India NPP	(2,894,500)
Sub-total adjustments	(15,302,401)

34. Accordingly, the total cost of the MDI Sector Plan in India is as follows:

Project cost	US $9,802,267
Transition strategy	US $120,000
Project implementation and monitoring unit	US $280,000
Grand total	US $10,202,267

35. This level of funding proposed by the Secretariat has been agreed with the bilateral and implementing agencies. The distribution among the agencies of the level of funding is presented below:

Funding (US $)	Italy	UNDP	UNEP	Total
Project cost	2,000,000	8,082,267	120,000	10,202,267
Agency support cost	230,000	606,170	15,600	851,770
Total cost	2,230,000	8,688,437	135,600	11,054,037

36. The Government of India will have flexibility to use the funding available under the MDI Sector Plan for activities it deems adequate to achieve the complete phase-out of CFCs in the MDI sector and in accordance with relevant decisions and guidelines of the Multilateral Fund.

RECOMMENDATION

37. Noting the substantial counterpart contribution from the MDI manufacturing enterprises, the urgent need to complete the conversion of the MDI sector to non-CFC alternatives, and in light of comments by the Secretariat, the Executive Committee may wish to consider approving the national strategy for transition to non-CFC MDIs and plan for phase-out of CFCs in the manufacture of pharmaceutical MDIs in India at US $10,202,267 plus agency support costs of US $851,700, distributed as follows:

(a) US $2,000,000 plus agency support costs of US $230,000 for the Government of Italy;

(b) US $8,082,267 plus agency support costs of US $606,170 for UNDP; and

(c) US $120,000 plus agency support costs of US $15,600 for UNEP.

ACCELERATED CFC PRODUCTION PHASE-OUT (Agreement)

Introduction

38. The World Bank is submitting to the 56th Meeting of the Executive Committee, on behalf of the Government of India, the revised draft agreement between India and the Executive Committee for the accelerated CFC production phase-out contained in Annex I to the present document. To facilitate reading, the changes that have been introduced to the original draft agreement are in bold.

Background

39. At its 54th Meeting in April 2008, the Executive Committee decided

"(a) To approve in principle US $3.17 million for closing down CFC production in India by 1 August 2008, 17 months ahead of the existing phase-out schedule with the understanding that additional production of CFCs from 1 January – 31 July 2008, dedicated primarily to metered-dose inhaler (MDI) applications, would not exceed 690 metric tonnes;

(b) To request the Fund Secretariat and the World Bank to prepare and submit a draft agreement on accelerating the CFC production closure project to the 55th Meeting of the Executive Committee. The draft agreement should include the Government's commitment to ensure that the remaining stock of CFCs (1,363 metric tonnes) at the end of 2007, except a quantity of up to 135 metric tonnes that might be required to meet the needs of the MDI sector, was exported no later than 31 December 2009;

(c) To request India to confirm in the draft agreement its domestic demand for CFCs for the MDI sector in 2008 and 2009 in order to establish the exact quantity of CFCs to be exported;

(d) That the draft agreement should describe and include the necessary steps for completing the dismantling activities required and the verification confirming that production closure and dismantling had taken place.

(decision 54/37)"

40. At the same meeting, the Executive Committee also decided to assist India in complying with the phase-out targets under the Agreement for the phase-out of CFC consumption, which is related to the integrated management of the phase-out of CFC production and consumption in the country, as follows:

"(g) In respect of the CFC consumption sector agreement, that:

(i) India would produce no more than 690 metric tonnes of CFCs, primarily for the manufacturing of metered-dose inhalers (MDIs), up until 1 August 2008;

(ii) India's CFC producers would sell no more than 825 metric tonnes of CFCs for MDI production in the years 2008 and 2009, comprising 690 metric tonnes of new production and 135 metric tonnes reprocessed from existing stock;

(iii) India would export 1,228 metric tonnes of CFCs no later than 31 December 2009;

(iv) India would not import any more CFCs of any kind.

(decision 54/35)"

41. The World Bank submitted to the 55th Meeting of the Executive Committee the draft agreement to formalize the decision on the accelerated CFC production phase-out. However, it withdrew it at the meeting due to the need to further clarify the extent of the coverage of the penalty clause in the draft.

SECRETARIAT'S COMMENTS AND RECOMMENDATION

COMMENTS

42. The revised draft agreement covers all the provisions in the above decisions. The penalty clause in paragraph 7 of the revised draft is clearly worded to cover the commitments mentioned in paragraphs 2 and 5. The proposed disbursement is conditioned on the results of the verification to be conducted by the World Bank and the scheduling of the two payments at the first meeting in 2009 and 2010 is reasonable since it is the time when the World Bank submits the annual work programme with the verification reports.

RECOMMENDATIONS

43. The Secretariat recommends the Executive Committee to approve the revised draft agreement.

Annex I

AGREEMENT BETWEEN INDIA AND THE EXECUTIVE COMMITTEE OF THE MULTILATERAL FUND FOR THE ACCELERATED CFC PRODUCTION PHASE-OUT

1. This Agreement supplements the Consensus Agreement for the Indian production sector for which the Executive Committee and India entered into at the 29th Meeting ("the Existing Agreement"). This Agreement represents the understanding of India ("the Country") and the Executive Committee with respect to the Accelerated Phase-out of the CFC Production by 1 August 2008.

2. The Country agrees to revise its CFC production phase-out schedule with the understanding that:

(a) India would produce no more than 690 MT of CFCs, primarily for the manufacturing of metered-dose inhalers (MDIs) up until 1 August 2008;

(b) India's CFC producers would sell no more than 825 MT of CFCs for MDI production in the years 2008 and 2009, comprising 690 MT of new production and 135 MT reprocessed from existing stock;

(c) India would export 1,228 MT of CFCs no later than 31st December, 2009;

(d) India would not import any new virgin CFCs;

(e) Any by-product non-pharmaceutical grade CFCs generated from the production under (a) are counted against the limit in row 2 of Table 1 in Appendix 1 and could be released to the market;

(f) This Agreement does not cover any CFC production that may be agreed by the Parties to meet essential uses for India; and

(g) Other conditions in the Existing Agreement, in addition to the above, are applied to this Agreement.

3. The Country accepts that, by its acceptance of this Agreement and performance by the Executive Committee of its funding obligations described in Table 2 of Appendix 1, it is precluded from applying for or receiving further funding from the Multilateral Fund in respect to the phase-out of the production of CFCs.

4. 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 of Table 2 in Appendix 1 (the "Funding") to the Country. The Executive Committee will provide the funding tranches associated to the new accelerated phase-out at the ***57th and 60th Executive Committee Meetings.*** For the subsequent tranche in 2009 under the Existing Agreement, the release of this tranche will follow the terms and conditions stipulated in the Existing Agreement.

5. The Country will meet the production limits as indicated in row 2 of Table 1 in Appendix 1. The Country also agrees to allow for independent technical audits administered by the Implementing Agency (World Bank) in order to confirm the production, reprocessing limit, sales (both export and domestic) and stock of CFCs in accordance with the agreement.

6. 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 fulfill the obligations under this Agreement. The Country also agrees to establish policies or enforcement mechanisms to ensure coordination of CFC phase-out efforts in both the production and consumption sectors by implementing policy and regulatory measures set out in Appendix 2.

7. Should the Country, for any reason, not meet the Targets for the elimination of the Substances or otherwise does not comply with this Agreement, then the Country agrees that it will not be entitled to the Funding. In the discretion of the Executive Committee, funding will be reinstated according to a revised Funding Disbursement 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 installment of Funding under the Funding Disbursement Schedule. In addition, India understands that the Executive Committee may reduce the funding of the subsequent tranches on the basis of US $1,000 per ODP tonnes of reductions not achieved ***for the commitments mentioned in paragraphs. 2 and 5 of this Agreement.***

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

9. ***The Country, the Executive Committee and the World Bank may mutually agree to take steps to facilitate implementation of this Agreement***. In particular, it will provide access by the World Bank to information necessary to verify compliance with this Agreement.

10. All of the agreements 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 Protocol unless otherwise defined herein.

Appendix 1 Targets and Funding

Table 1. Production targets

Description	Year		
	2008	**2009**	**2010**
1. Targets under the Existing Agreement (ODP tons)	2,259	1,130	0
2. Production under this Agreement (ODP tons)	690	0	0

Table 2. Funding

Description	Year		
	2008	**2009**	2010
1. Funding under the Existing Agreement (US $' 000s)	6,000	6,000	0
2. Support cost under the Existing Agreement (US $' 000s)	450	450	0
3. Total adjusted funding for this Agreement (US $' 000s)	-	2,113	1,057
4. Support cost for the adjusted funding for this Agreement (US $ 000s)	-	0	238
5. Total funding to be released to the Country and IA	6,450	8,563	1,295

Appendix 2 Policy and Regulatory Measures

1. As per the Plan of Action submitted by the Country at the 54^{th} Meeting of the Executive Committee, the Country agrees to undertake the following measures:

(a) Ban the production of CFCs, excluding any production for essential uses that may be agreed by the Parties in the future, by 1 August 2008;

(b) Ensure consistency of the consumption schedule of the Ozone Rules and the consumption limits in row 3 of Appendix 2 – A of the Agreement between India and the Executive Committee for the national phase-out of CFC consumption in India focusing on the refrigeration service sector;

(c) India will not import any more new/virgin CFCs; and

(d) Strengthening of the system for monitoring movement of CFC stocks and imports, if any.

MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL ON SUBSTANCES THAT DEPLETE THE OZONE LAYER

PROJECT COVER SHEET

COUNTRY:	INDIA		**IMPLEMENTING AGENCY:**	UNDP
			COOPERATING AGENCY:	UNEP
			BILATERAL AGENCY:	Italy

PROJECT TITLE: National Strategy for Transition to non-CFC MDIs and Plan for phase-out of CFCs in the manufacture of pharmaceutical Metered Dose Inhalers (MDIs) in India

PROJECT IN CURRENT BUSINESS PLAN:			Yes	
SECTOR:			Aerosols	
SUB-SECTOR:			Pharmaceutical MDIs	
ODS USE IN SECTOR:	Baseline (Average of 2003 & 2004):		693.97	ODP tonnes
ODS USE IN SUB-SECTOR:	(Average of last 3 years):		704.03	ODP tonnes
PROJECT IMPACT:			704.03	ODP tonnes
PROJECT DURATION:			60	months
PROJECT COSTS:	**<u>Investment Components</u>**			
	Incremental Capital Costs:	US$	13,756,545	(UNDP)
	Contingencies (10%):	US$	1,375,655	(UNDP)
	Product Development Cost	US$	40,155,835	(UNDP)
	Incremental Operating Costs:	US$	5,243,899	(UNDP)
	Sub-total:	***US$***	***60,531,934***	
	<u>Non-Investment Components</u>			
	Technical Assistance:	US$	350,000	(UNDP)
	Policy/regulatory Support:	US$	70,000	(UNDP)
	Awareness Actions:	US$	350,000	(UNEP)
	Monitoring and Management:	US$	400,000	(UNDP)
	Sub-total:	***US$***	***1,170,000***	
	Total Costs:	**US$**	**61,701,934**	
LOCAL OWNERSHIP (Net overall):			98.4%	(Funding request adjusted)
EXPORT COMPONENT (To non-Article-5 countries):			4.9%	(Funding request adjusted)
ESTIMATED COUNTERPART FUNDING:		US$	34,942,615	(@57% from recipients)
REQUESTED GRANT:		US$	**26,759,319**	
COST EFFECTIVENESS:		US$/kg/y	38.00	
AGENCY SUPPORT COSTS:		US$	1,847,955	(UNDP)
		US$	45,500	(UNEP)
		US$	230,088	(Italy, executed by UNDP)
TOTAL COST TO MULTILATERAL FUND:		**US$**	**28,882,862**	
STATUS OF COUNTERPART FUNDING:			Letters from beneficiary enterprises obtained	
PROJECT MONITORING MILESTONES:			Included	
NATIONAL COORDINATING BODY:			Ozone Cell, Ministry of Environment & Forests	

PROJECT SUMMARY

This project articulates India's national strategy for transition to non-CFC MDIs and will result in the elimination of CFC consumption in the manufacture of pharmaceutical Metered Dose Inhalers (MDIs) in India by 2012. The project involves development of suitable alternative products including HFA-based metered dose inhalers at five enterprises who currently manufacture CFC-based MDIs in this sub-sector. Under this project, the enterprises will develop alternative formulations and implement conversions for several of their CFC-based MDI products. The substantial counterpart funding envisaged from the enterprises supplementing the requested funding, will cover formulation development and conversion of remaining products and result in complete conversion of all CFC-based MDIs in India to non-CFC alternatives.

This project is presented as an aggregate of technology conversion costs covering incremental capital and operating costs, technical assistance costs and contingencies, covering equipment and technology for manufacturing HFA-based MDIs, product development and technology transfer, project supervision and implementation and also eligible costs for provision of policy/regulatory support, institutional and technical assistance, awareness actions and monitoring & management

IMPACT OF THE PROJECT ON THE COUNTRY'S MONTREAL PROTOCOL OBLIGATIONS

The approval of this project will help India in meeting its Montreal Protocol obligations, such as phased reductions in ODS consumption as per the agreed schedules and eliminate the use of ODS in the pharmaceutical MDI sector in India by 2012.

Prepared By: UNDP with inputs from UNEP **Reviewed By:** Under review **Version:** 02 August 2008

56th Meeting of the Executive Committee of the Multilateral Fund
for the Implementation of the Montreal Protocol

NATIONAL STRATEGY FOR TRANSITION TO NON-CFC MDIS AND PLAN FOR PHASE-OUT OF CFCS IN THE MANUFACTURE OF PHARMACEUTICAL METERED DOSE INHALERS (MDIS) IN INDIA

Prepared By

OZONE CELL, MINISTRY OF ENVIRONMENT AND FORESTS
GOVERNMENT OF INDIA

IN BILATERAL COOPERATION WITH
GOVERNMENT OF ITALY

With the assistance of

UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP)
Lead Implementing Agency

UNITED NATIONS ENVIRONMENT PROGRAMME (UNEP)
Cooperating Agency

EXECUTIVE SUMMARY

The conversion of the majority of CFC consuming sectors in Article 5 countries under the Montreal Protocol has been completed or is in an advanced stage of implementation, however, to date only few projects to convert the production of CFC-based pharmaceutical Metered Dose Inhalers have been funded by the Multilateral Fund. The Montreal Protocol control schedule requires a complete phase out of CFCs by 2010; however, if the CFC consumption in manufacturing of MDIs is not addressed fully, it may present a significant risk of non-compliance in Article-5 MDI manufacturing countries. Since the manufacture of these drugs is essential for ensuring effective therapeutic treatment to asthma and COPD patients in these countries, there is a justifiable need for CFCs in this sector until the manufacturing can be adapted to use alternative technologies. Decisions 49/33, 50/19 and 50/20 of the Executive Committee of the Multilateral Fund, recognized this risk in countries manufacturing MDIs including India, and urged for the preparation of conversion projects in this sector, to address this issue as soon as possible.

In response to Decisions 50/19 and 50/20, India, with assistance from UNDP, has prepared a National Strategy for Transition to non-CFC MDIs that provides an overall framework to address, in a coordinated way, the sustainable phase-out of CFC use in the manufacture of MDIs in India, ensuring that its obligations under the Montreal Protocol are complied with, potential economic losses to the indigenous MDI manufacturing industry are minimized and most importantly, asthma and COPD patients are not deprived of essential and cost-effective inhaled therapy. The plan for phase-out of CFC-based pharmaceutical MDIs in India is an integral component of the National Strategy for Transition to non-CFC MDIs and prepared with assistance from UNDP as Lead Agency, UNEP as Cooperating Agency and Government of Italy as the Bilateral Cooperating Agency (with a contribution of US$ 2 million). The provisions of Executive Committee Decisions 51/34 and 54/5 have been duly considered in the preparation of this proposal.

The primary objective of this project is to sustainably phase out the consumption of CFCs used in the manufacture of pharmaceutical Metered Dose Inhalers (MDIs) in India by 2012. This involves the development of suitable alternative products, including HFA-based MDI formulations and the conversion to HFA-based MDI manufacturing technology at five eligible enterprises in India. There are over twenty MDI formulations produced in India and over forty products/strengths commercialized. This project will result in the conversion or replacement of all the current CFC-based formulations/products, taking into account the specific characteristics, status of progress in the formulation process and registered eligible products of each one of the enterprises involved. The enterprises will take responsibility of addressing the conversion of non-eligible formulations through their own resources and through the capacity built in this project. In order to achieve these conversions, each enterprise will require the development of a number of new MDI formulations and installation of suitable manufacturing equipment to allow them to produce HFA-based MDIs.

The cost of the proposed strategy and plan is presented as an aggregate of industrial conversions encompassing product development, technical assistance, incremental capital costs and incremental operating costs involved in conversion to HFA-based formulations and also support for awareness, policy and regulations, institutional and technical support and monitoring & management. All eligible drugs will be converted, keeping in mind their relevance to and specific needs of patients and ease of conversion. The funding requested covers cost of production equipment and installation, product development and transfer to the enterprises including stability testing and laboratory analysis, along with overall project supervision and implementation. The beneficiary enterprises will finance the cost of product registration and overheads.

Although the transition process from CFC-based MDIs to HFA-based MDIs in India is now partially underway, it involves an interim period during which production of both CFC-based MDIs and HFA-based MDIs need to occur simultaneously to ensure continuity in availability of proven products in the market in the interests of asthma and COPD patients. This therefore means that HFA-based MDI manufacturing equipment needs to be installed and operationalized prior to shutting down CFC-based MDI manufacturing lines.

Given the CFC consumption limits established for India currently and for the future, it is imperative to accelerate phase-out of CFCs in pharmaceutical MDIs, while ensuring availability of non-CFC MDIs as soon as possible. Considering the current situation of production of pharmaceutical grade CFCs at the global level, it is necessary to make provisions for making pharmaceutical grade CFCs available to meet the requirement of MDIs during the transition period. In this regard, the enterprises in collaboration with the Government, will determine the amount of pharmaceutical grade CFCs that would be required ensure availability of proven drugs to patients, while the HFA-based MDIs are being developed, tested and registered, leading to full-fledged commercial production.

The funding of this project by MLF to cover the eligible incremental costs is considered to be a critical component of the success of this project. In addition, flexibility in deploying approved funding by the Government is also considered an important factor, enabling Government and the beneficiary enterprises to conclude phase out of CFCs in pharmaceutical MDIs in a timely manner while protecting patients’ interests and needs.

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LIST OF ABBREVIATIONS

CDSCO	Central Drugs Standard Control Organization
CFC	Chloro Fluoro Carbons
CP	Country Programme
CTC	Carbon Tetra Chloride
ExCom	Executive Committee of the Multilateral Fund
DPI	Dry Powder Inhaler
GWP	Global Warming Potential
GTZ	Gesellschaft für Technische Zusammenarbeit, Germany
HCFCs	Hydrochlorofluorocarbons
HFA	Hydro Fluoro Alkanes
IA	Implementing Agency
MDI	Metered Dose Inhaler
MLF	Multilateral Fund for the Implementation of the Montreal Protocol
MOEF	Ministry of Environment and Forests, Government of India
MP	Montreal Protocol
MT	Metric Tonnes
ODP	Ozone Depleting Potential
ODS	Ozone Depleting Substances
SMEs	Small and Medium-sized Enterprises
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme

1. INTRODUCTION

1.1 BACKGROUND OF CFC CONSUMPTION, PRODUCTION AND PHASE-OUT

India became a party to the Vienna Convention on 19 June 1991 and acceded to the Montreal Protocol on Substances that Deplete the Ozone Layer on 17 September 1992. Table-1 shows the dates of ratification by India of the Protocol and its amendments. Since the annual calculated consumption of controlled substances in India, listed in Annex-A of the Montreal Protocol, was less than 0.3 kg per capita, India was classified as a party operating under Paragraph-1, Article-5 of the Montreal Protocol and thus qualified for technical and financial assistance, including transfer of technology, through the financial mechanism of the Montreal Protocol.

Table-1: India - Dates of Ratification of Montreal Protocol and Amendments

Agreement/Amendment	Date of Ratification
Vienna Convention	19 June 1991
Montreal Protocol	17 September 1992
London Amendment	17 September 1992
Copenhagen Amendment	03 March 2003
Montreal Amendment	03 March 2003
Beijing Amendment	03 March 2003

India's Country Programme for phase-out of ozone depleting substances under the Montreal Protocol was finalized in August 1993 with the assistance of United Nations Development Programme (UNDP), The Energy and Resources Institute (TERI) and representatives of various ministries, industries and scientific institutions. The Country Programme was submitted to and approved at the 11th Meeting of the Executive Committee of the Multilateral Fund for Implementation of the Montreal Protocol, in November 1993.

India's first Country Programme Update was carried out during 2003-2006 and was submitted to and approved at the 49th Meeting of the Executive Committee in July 2006. Among the key tasks identified for the future of the Montreal Protocol programme in India, were completion of all ongoing CFC and CTC phase-out activities in various sectors by 2010, combating illegal trade in CFCs and fine-tuning ODS regulations for sustained compliance and long term management of HCFCs.

Since the approval of the original Country Programme for Phase-out of Ozone Depleting Substances in 1993, India has made significant progress in controlling the production and consumption of ODS. From a consumption level of 10,370 metric tonnes of ODS in 1991, the unconstrained demand was forecasted at about 96,000 metric tonnes by 2005.

The actual consumption of ODS by end-2006 was less than 2,000 metric tonnes annually. These reductions were achieved through technical and financial assistance from the Multilateral Fund, support from implementing agencies in implementation of approved projects and activities and due to proactive policy and regulatory actions by Government of India.

Table-2 below summarizes approved ODS phase-out activities, both completed and ongoing, in various sectors:

Table-2: Summary of ODS Phase-out Activities in All Sectors (as of end-2006)

Sector	Number of Projects	Funding (US$)	Phase-out (ODP tonnes)
Aerosols Sector	27	3,227,739	689
Foams Sector	159	34,785,641	4,373
Firefighting Sector (Halons)	18	2,458,701	2,162
Refrigeration & Air Conditioning Sector	49	32,254,823	3,203
Solvents Sector	41	61,358,042	12,966
Production Sector (including Halons)	2	84,600,000	22,988
Total	**296**	**218,684,946**	**46,381**

Of the above-mentioned activities, over 80% of the activities in terms of ODS phase-out are now completed. All of the individually approved projects have been completed. The implementation of performance-based sector and national-level phase-out plans in the Foams, Refrigeration & Air Conditioning, Solvents and Production sectors is mostly completed, with the respective agreed annual phase-out targets met or exceeded so far.

Three main national/sector-level ODS phase-out activities, governed by multi-year performance-based agreements between Government of India and the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol, are currently under implementation:

NCCOPP (National CFC Consumption Phase-out Plan)

This project combines the CFC phase-out activities in the Foams, Refrigeration (Manufacturing) and Refrigeration (Servicing) Sectors, into a single agreement beginning March 2004. The agreed annual consumption and phase-out targets under the NCCOPP are as below:

Table-3: Agreed Annual CFC Consumption & Phase-out Targets under NCCOPP from 2004-2010

Year	2004	2005	2006	2007	2008	2009	2010
ODS Consumption limit (ODP tonnes)	3,489	1,814	960	464	317	172	
ODS Phase-out (ODP tonnes)	1,675	854	496	147	145	172	0

From 2007, the phase-out activities under the Foam Sector and Refrigeration (Manufacturing) Sectors are completed, and the focus of the NCCOPP is predominantly on building sustainable infrastructures to progressively reduce demand for CFCs in the Refrigeration (Servicing) Sector and transition to zero-ODP alternatives. The key challenges identified are as below:

- Availability of adequate CFCs for legitimate servicing needs beyond 2010, through stockpiling, recovery/recycling and reclamation
- Accelerating retrofitting/replacement of CFC-based equipment to reduce dependence on CFCs for servicing
- Adequate capacity building and awareness at the field-level service establishments and technicians to minimize CFC emissions and losses

Intensive monitoring of the investment, technical assistance, training and capacity building components would be needed to ensure that India complies with the agreed phase-out targets.

CTC Phase-out Plan

The project addresses the production and consumption of non-feedstock CTC. The agreed annual production and consumption targets are as below:

Table-4: Agreed Production and Consumption Targets under CTC Phase-out Plan

Consumption/Year	2005	2006	2007	2008	2009	2010
Maximum Consumption (ODP MT)	1,726	1,147	708	268	48	0
Maximum Production (ODP MT)	1,726	1,147	708	268	48	0

The implementation of this project is underway. The key challenges identified are as below:

- Adequate assistance to small scale CTC users in the textile and metal cleaning industry, including cost-effective availability of substitutes
- Ensuring timely phase-out of CTC in the large users in the process agent and solvents sectors

Intensive monitoring of the investment, technical assistance, training and capacity building components would be needed to ensure that India complies with the agreed phase-out targets. Appropriate institutional arrangements are in place to address the additional obligations such as performance verification and reporting.

Production Sector Gradual Phase-out Plan

This agreement is in place since 1999. The agreed annual limits on CFC production are shown in Table-5 below:

Table-5: Agreed Maximum Allowable CFC Production Levels from 1999-2010

Year	Production (metric tonnes)
1999	22,588
2000	20,706
2001	18,824
2002	16,941
2003	15,058
2004	13,176

Year	Production (metric tonnes)
2005	11,294
2006	7,342
2007	3,389
2008	2,259
2009	1,130
2010	0

Mechanisms for monitoring, reporting and verification as per the agreed protocols are already established and would continue to be implemented. So far India has complied with all provisions of the agreement governing this project.

At the 54th Meeting of the Executive Committee in April 2008, India agreed to cease its production of CFCs from 01 August 2008, over a year in advance of the earlier agreed closure date. In accordance with Decision 54/35, India can produce a maximum of 690 metric tonnes of CFCs until 01 August 2008, primarily for use in manufacturing of CFC-based MDIs. An additional quantity of 135 metric tonnes of CFCs can be used from existing stocks after reprocessing, for manufacturing CFC-based MDIs. The Indian producers also would need to export 1,228 metric tonnes of CFCs prior to 31 December 2009.

1.2 CFC CONSUMPTION TRENDS IN MDI MANUFACTURING

There are currently five manufacturers of MDIs in India (more details on these manufacturers are provided ensuing chapters). The production of MDIs has grown significantly in India in recent years, increasing from about 29 million units in 2003 to about 55 million units in 2007.

The pharmaceutical grade CFCs needed for manufacturing CFC-based MDIs are sourced from both domestic CFC producers and through imports. Table-6 below shows the source of CFC consumption in MDI manufacturing in India from 2003 onwards:

Table-6: CFC Consumption in MDI manufacturing in India

CFC Consumption/Year	2003	2004	2005	2006	2007
Consumption (ODP tonnes)	578.91	742.81	740.41	763.62	608.07
Sourced indigenously (ODP tonnes)	578.91	742.81	683.41	591.12	505.47
Sourced through imports (ODP tonnes)	0.00	0.00	57.00	172.50	102.60

While examining the consumption trends for CFCs in India in general and in the MDI manufacturing in particular, the following factors need to be carefully considered:

(a) It would be useful to note that during the preparation of the National CFC Consumption Phase-out Plan (NCCOPP), *the consumption of CFCs in the MDI manufacturing sub-sector was not reported and therefore not taken into account*.

(b) The consumption in the Refrigeration and Air Conditioning Servicing Sector, as reported in the CP progress data reporting was 1,105 ODP tonnes in 2006. While this was below the agreed consumption limit of 1,147 ODP tonnes for 2006 and while it is being addressed through ongoing activities under the NCCOPP, it is evident that the CFC consumption in MDI manufacturing for 2006 (700.02 ODP tonnes) as reported in the CP progress data reporting, constitutes a significant part of the overall national consumption and presents a challenge for future compliance.

(c) Against the backdrop of ExCom Decision 54/35, which stipulates a limit on availability of CFCs for consumption in India, i.e., a maximum of 825 ODP tonnes would be available for consumption during 2008 and 2009, there would be an inevitable "competition" between the needs for CFCs in MDI manufacturing and the needs of the Refrigeration and Air Conditioning Servicing Sector. This situation introduces a peculiar and delicate challenge for designing appropriate policies and regulations to carefully balance the legitimate needs of SMEs in the Refrigeration and Air Conditioning Servicing Sector and the justifiable health needs of vulnerable asthma and COPD patients. Economical access to proven and effective drugs needs to be maintained in a developing country such as India and would remain the cornerstone of future regulatory and policy interventions.

(d) While the consumption of CFCs in MDI manufacturing shows a decline from 2006 to 2007, it still constitutes a significant portion of the agreed allowable total consumption and significantly in excess of the agreed consumption limits in 2008 and 2009. This situation poses a significant risk of non-compliance post-2007 and calls for urgent interventions to ensure timely and smooth transition to non-CFC MDI manufacturing.

2. SITUATION ANALYSIS

2.1 COUNTRY BACKGROUND

2.1.1 Geography and Demographics

Located in South Asia, India is the seventh-largest country by geographical area and the second most populous country in the world. India has a coastline of over 7,000 km, bounded by the Indian Ocean on the south, the Arabian Sea on the west, and the Bay of Bengal on the east. India borders Pakistan to the west; People's Republic of China, Nepal and Bhutan to the north-east; and Bangladesh and Myanmar to the east.

India has a population of about 1.1 billion (2006), comprising approximately one-sixth of the world's population. India occupies 2.4% of the world's land area, but supports over 16% of the world's population and 21% of the world's global burden of disease. Almost 40% of Indians are younger than 15 years of age. About 70% of the people live in more than 550,000 villages, and the remainder in more than 200 towns and cities. The standard of living in India is projected to rise sharply in the next half-century; it currently battles high levels of poverty, persistent malnutrition, and environmental degradation.

The weather conditions in India are strongly influenced by the Himalayas in the north and the Thar Desert in the northwest. Meteorologists divide the year into four main seasons for most of the country: monsoon, summer, winter and a mild autumn.

India is categorized as a tropical country with high propensity to infectious diseases. These include food or waterborne diseases such as bacterial diarrhea, hepatitis A and E, typhoid, vector borne diseases such as dengue and malaria, water contact diseases such as leptospirosis and animal contact disease such as rabies. The geographical spread of the country frequently affected by floods and storms and low levels of per capita income with significant poverty particularly in rural areas, essentially drive the need for extensive and affordable healthcare solutions. WHO in their Country Cooperation Strategy Brief has indicated that India is experiencing high growth in tuberculosis and chest related diseases.

2.1.2 Asthma and COPD in India

Asthma and Chronic Obstructive Pulmonary Disease (COPD) are considered a serious health problem worldwide owing to their magnitude in terms of morbidity, mortality and disability especially in ill-managed patients. Their impact on patients and their relatives as well as consequent social costs, underline the need for comprehensive and coordinated responses.

COPD is a significant health problem in India. Among the non-communicable diseases, bronchial asthma is considered to be one of the leading causes of hospital admissions in India. The economic and social cost of this disease is sizeable due to the disabling effect associated with frequent episodes of decompensation.

Given the size of the country and its population and given the geographic and socio-political diversity in India, collection of reliable national statistics on diagnosis and management of diseases is an enormously challenging and expensive proposition. However, some indicative statistics can be presented.

From a 1996 survey, COPD was prevalent in 7.7% of the population in India. The estimated number of adult patients of age 30 or more was 12.36 million. More recent studies estimate about 15 million persons affected by asthma in India.

Data from a few population-based studies in adults has recently become available. In a study conducted as part of the European Community Respiratory Health Survey in 2000, asthma prevalence in adults aged 20-44 years in India was reported to be 3.5% using 'clinician diagnoses' and 17% using a broader definition (which included a prior physician diagnosis and/or a positive bronchioprovocation test).

Studies on mortality and morbidity from Acute Respiratory Infections (ARI) in India indicate that ARI is the most significant cause of child mortality.

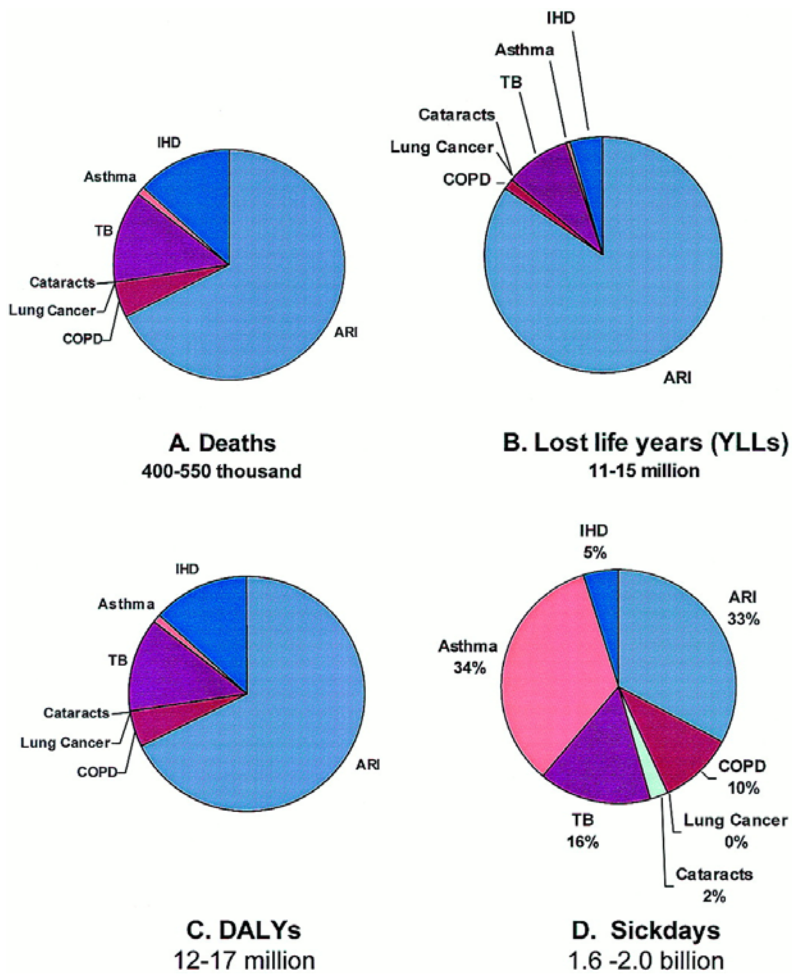


Figure-1: Annual Health Burden from Indoor Air Pollution in India
(Source: School of Public Health, University of California – Berkeley, 2000)

Figure-1 above indicates the incidence and contribution of respiratory disorders including Asthma, COPD, tuberculosis, ARI, etc. to the national health burden from Indoor Air Pollution in India.

2.1.3 Treatment

The most preferred route for therapeutic administration of drugs into lungs for respiratory disorders, on which there is international consensus by health authorities, is inhalation. Inhalation therapy with aerosols allows achieving high concentration of drugs such as corticosteroids, beta adrenergics and anticholinergics in airways, while diminishing their adverse side effects when used through other routes of administration. The treatment generally requires a regular administration of one or more drugs through metered dose inhalers (MDIs) or in some cases dry powder inhalers and less frequently through nebulizers. Inhalation treatment is administered by metered-dose inhalers that represent almost 70% of prescribed inhalers. The remaining 30% are dry powder inhalers and small quantity of nebulizers.

The most widely used propellants for metered dose pharmaceutical aerosols in India are CFCs. CFCs are non-toxic, non-reactive and non-flammable, with no odor, no flavor and excellent solvent action. Since CFCs will need to be phased out from 2010, alternative propellants, mainly HFAs, have been introduced in the past decade or more to replace CFCs and have already cleared clinical testing for several formulations.

The main categories of drugs used for treatment of Asthma and COPD are as below:

Category A: Short-acting beta-antagonist bronchodilators such as Salbutamol, Terbutaline and Fenoterol

Category B: Steroids such as Beclomethasone, Budesonide and Fluticasone

Category C: Non-steroid anti-inflammatory agents such as Disodium Cromoglycate and Nedochromil

Category D: Anti-cholinergic bronchodilators such as Ipratropium and Oxytropium

Category E: Long-acting beta-antagonist bronchodilators such as Salmeterol and Formoterol

Category F: Combination of products with two or more active ingredients.

MDI usage in India has seen a significant increase in the last decade. Initially, MDIs were prescribed by medical practitioners as a “last resort” solution possibly due to lack of awareness and limited availability of the product. With time and due to promotion efforts undertaken by the pharmaceutical industry and asthma associations, the adoption of MDIs as a treatment option for respiratory disorders has increased. As per industry estimates, asthma and COPD are prevalent in about 100 million people in India (about 10% of the population of the country). In addition, patients suffering from other diseases of the throat and other respiratory ailments, also use MDIs. Thus, cost effective availability of MDIs and/or similar solutions is critical for a country like India.

The MDI usage in India is predominantly in urban areas. However, the Ministry of Health and Family Welfare launched a National Rural Health Mission (2005-2012) which involves expansion of public expenditure on rural health care delivery for improved access to healthcare for rural populations particularly women, children and economically disadvantaged persons. Through the NHRM, medical drugs and devices are provided at subsidized costs or no costs to such patients, thus resulting in an increase in the number of patients gaining access to remedies such as MDIs particularly in the rural areas. This has contributed to the significant increase in MDI production over the past few years.

2.2 INSTITUTIONAL FRAMEWORK

2.2.1 Institutional Arrangements for the Montreal Protocol

Government of India has designated the Ministry of Environment & Forests as the national coordinating body for the Montreal Protocol in India. The functions and responsibilities of the Ministry of Environment & Forests as the designated national authority and nodal ministry include notification of regulations pertaining to the Montreal Protocol, issues related to international cooperation, maintaining and managing data on production, imports, exports and consumption of ODS, monitoring of implementation of Montreal Protocol activities, interacting with other line ministries on technical and financial matters pertaining to implementation of activities, liaising with scientific, technical and other public institutions for technical matters, representing India at various multilateral meetings and discussions, etc.

The Ministry of Environment & Forests has since 1991, established a special directorate (Ozone Cell) within the Ministry, which is the focal point for managing and coordinating the implementation of the Montreal Protocol activities in India.

The Ministry of Environment & Forests has also created an Empowered Steering Committee (ESC) with the approval of the Cabinet, which is an apex body mandated for formulation and review of policy actions for Montreal Protocol implementation. The ESC is assisted by three standing committees, for advice on Technology and Finance, Small-scale Industries and Monitoring/Evaluation.

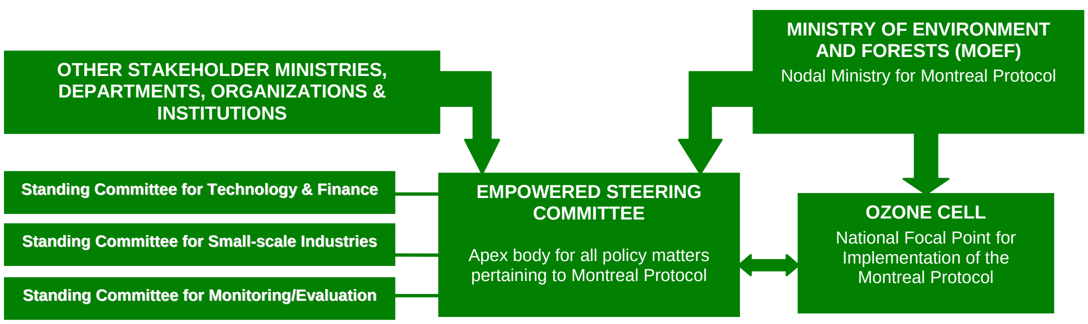


Figure-2: Institutional Arrangements for the Montreal Protocol in India

The Ozone Cell established a Project Management Unit (PMU) for implementation of the CFC Production Sector Phase-out Project in February 2002. The functions of the PMU include implementation and review of ODS phase out plans, assisting Ozone Cell in monitoring and implementation of ODS phase out activities, monitoring the production quota and export licensing systems, coordination of training, seminars and awareness activities for various stakeholders, etc. The governing body of the PMU consists of Additional Secretary (MOEF) as President, Joint Secretary (MOEF) as Vice-President, representatives from Department of Chemicals and Fertilizers, Ministry of Commerce and Industry, Confederation of Indian Industry (CII), Director-General Foreign Trade with Director–Ozone Cell and Joint Director-Ozone Cell as members.

Figure-2 above depicts the organizational and institutional structure of management of the Montreal Protocol in India.

2.2.2 Institutional Arrangements related to pharmaceutical MDIs

The Ministry of Health and Family Welfare is the nodal ministry designated by Government of India for all matters pertaining to health and family welfare, some of which are notification of regulations pertaining to health, monitoring and controlling drugs, policy matters pertaining to public health and prevention of food adulteration, formulating national health policies, designing and managing national health programmes, medical education and training, international cooperation, etc. The Ministry has administrative control over 29 autonomous/statutory bodies and three public sector undertakings. Figure-3 below shows the organizational arrangement.

The Directorate General of Health Services (DGHS) is an office which serves as a repository of technical knowledge attached to the Department of Health, Ministry of Health and Family Welfare. The DGHS renders technical advice on all medical and public health matters and in the implementation of various health programmes. In order to implement policies and programmes of the Ministry in an effective manner, DGHS is supported by three subordinate offices at various locations in the country.

The Central Drugs Standard Control Organization (CDSCO) functions under the DGHS and is responsible for the approval of licenses for specified category of drugs under the Drug and Cosmetics Act 1940 (updated until 2005). The CDSCO has the mandate to set standards for drugs, cosmetics, diagnostics and devices, approve new drugs and devices, review, approve and conduct clinical trials, regulate the standards of imported drugs, screen drug formulations, monitor adverse drug reactions, control quality of imported drugs, coordinate activities of state-level organizations and provide expert advice with a view to bring about uniformity in the enforcement of the Act. The CDSCO also provides guidance on technical matters, conducts training programmes for regulatory and enforcement officials and analysts and publishes the Indian Pharmacopeia.

The CDSCO is administered by the Drugs Controller General of India and is supported by four zonal offices, three sub-zonal offices and seven offices at ports of entry. In addition, CDSCO also operates six laboratories for quality control and testing of drugs.

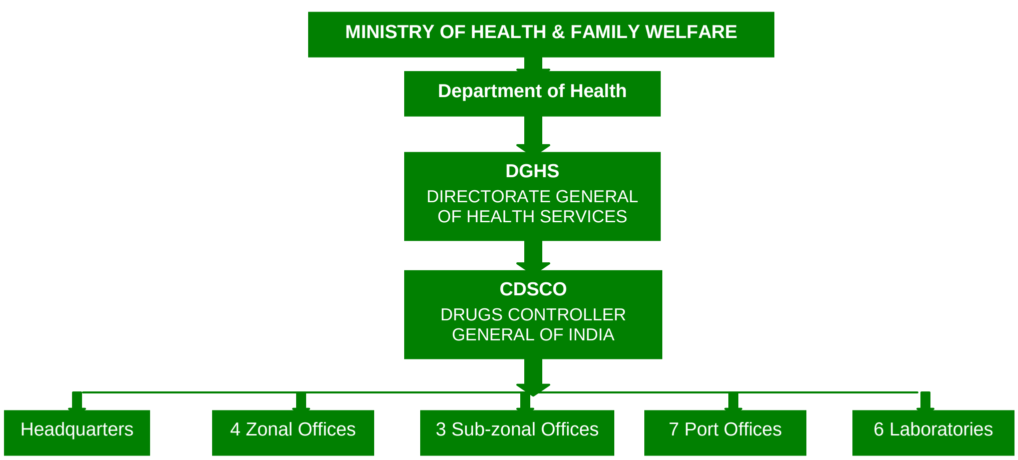


Figure-3: Institutional Arrangements for Drugs in India

2.2.3 Policies and Regulations

Policies and Regulations pertaining to Montreal Protocol

India's Country Programme for phasing out ODS, established the following guiding principles reflecting national priorities for formulating appropriate policy and regulatory instruments:

- To strengthen national institutions for monitoring and managing the ODS phase-out, and formulation and implementation of appropriate policies.
- To assist indigenous industries for conversion to non-ODS technologies through the Montreal Protocol financial mechanism, while ensuring that the SMEs and other unorganized tiny enterprises are fully compensated for conversions, including retraining
- To minimize economic dislocation either through closure of manufacturing units, loss of productive capacity, or through major capital expenditure that could become obsolete in future.
- To maximize indigenous production by encouraging technology transfer for and local production of non-ODS substitutes
- To give preference to one-time replacements
- To minimize obsolescence costs by promoting recycling, retrofitting and drop-in substitutes to prolong economic life of existing equipment, until new replacement technologies become mature, cost-effective and available
- To institute decentralized management of ODS phase-out activities and arrangements to facilitate feedback for smooth implementation.
- To facilitate development of new standards and certification systems for products and processes including those for safety
- To integrate the ODS phase-out activities closely with the growth in the various industrial sectors, economic reforms, etc.
- To evaluate alternatives to ODS and the available substitute technologies on a continuing basis, so as to lead to wider adaptation and dissemination.
- To periodically reassess and revise the Country Programme to reflect technological developments, progress in implementation of ODS phase-out activities and evolving trends in the growth of the various industrial sectors.

Recognizing the importance of establishing an effective regulatory framework for the successful implementation of the Montreal Protocol Programme and consistent with the guiding principles for developing policies, MOEF initiated actions to create one of the most comprehensive and forward-looking regulatory frameworks in the world, to support the various ODS phase out measures in India.

In exercise of the powers conferred by sections 6, 8 and 29 of the Environment Protection Act of 1986, Government of India notified the Ozone Depleting Substances (Regulation and Control) Rules 2000, which formally came in to effect from January 2000. The provisions of this comprehensive legislation are summarized as below:

General

- Every entity that produces, uses, imports, sells, stocks, reclaims or destroys ODS has to maintain records and file reports as specified.
- Every entity, which has received technical and/or financial assistance from any international agency or financial assistance from Government of India including duty exemptions, is required to maintain records and file reports as specified.
- Mandatory registration for reclamation and destruction of ODS. All registrations will be valid for specified periods, after which, they are required to be renewed.

ODS Production

- Mandatory registration with MOEF
- Restriction on production levels as per "base level" and specified time-bound reductions.
- Prohibition on creating new capacity or expansion of capacity

ODS Consumption

- Ban on new capacity or expansion of capacity for production of ODS-based equipment.
- Mandatory registration with designated authorities
- Declaration requirement in prescribed format at the time of procurement of ODS
- Restrictions on production of ODS-based products in various sectors from 2003

ODS Trade

- Mandatory registration for exporters & importers with designated authorities
- Import of ODS and ODS containing equipment only against license
- Export restricted to countries who are signatory to the Montreal Protocol against quota
- Trade in controlled substances with countries not party to the Montreal Protocol is prohibited.
- The export of Annex-A and Annex-B substances to Non-Article-5 Parties is prohibited.
- The import and export of all Annex-A and Annex-B substances are subject to licensing.
- Import of Equipment containing ODS was subjected to licensing

Fiscal Incentives

- Full exemption from Customs and Excise tariffs on capital goods required to implement ODS phase out projects. Duty exemptions also extended to capital goods required for establishing new capacity with non-ODS technology.
- Indian financial institutions were advised not to finance/refinance new ODS producing/consuming enterprises. The Tariff Advisory Committee (a statutory body under the Insurance Act, 1938) advised to grant suitable discounts on fire insurance premiums if alternative agents are used to replace Halons.

Policies and Regulations pertaining to pharmaceutical MDIs

The National Health Policy of 2002 (NHP) prioritizes key policy actions focusing on:

- Eradication measures for diseases such as polio, leprosy, black fever and filariasis, mortality reduction of 50% due to vector/water-borne diseases and achieve zero growth in HIV aids
- Establish an integrated network for health surveillance, national health accounts and health statistics
- Establish a comprehensive network of primary healthcare facilities linked to health education and encompassing a referral system
- Expand public health services and affordable and equitable access to drugs and devices through promotion of indigenous generic drugs and vaccines
- Establish uniform standards for deployment of healthcare personnel and extend continuing education and retraining facilities for healthcare personnel
- Intensify dissemination and awareness programmes for health-related information
- Promote medical research on therapeutic drugs and vaccines for tropical diseases
- Establish regulatory mechanism to ensure quality and standards in private sector healthcare
- Promote and increase involvement of civil society in disease control and healthcare
- Efficient regulation and enforcement of quality standards for drugs

At present the following laws and the regulations made thereunder, govern the manufacture, sale, import, export and clinical research of drugs and cosmetics in India.

- The Drugs and Cosmetics Act, 1940
- The Pharmacy Act, 1948
- The Drugs and Magic Remedies (Objectionable Advertisement) Act, 1954
- The Narcotic Drugs and Psychotropic Substances Act, 1985
- The Medicinal and Toilet Preparations (Excise Duties) Act, 1956
- The Drugs (Prices Control) Order 1995 (under the Essential Commodities Act)

In addition, there are some other laws which have a bearing on pharmaceutical manufacture, distribution and sale in India. The important ones are:

- The Industries (Development and Regulation) Act, 1951
- The Trade and Merchandise Marks Act, 1958
- The Indian Patent and Design Act, 1970
- The Factories Act

The primary law in India concerning pharmaceutical MDIs is the Drugs and Cosmetics Act 1940 (amended up to 2005). Some of the key features of the rules and regulations notified under this Act and pertaining to pharmaceutical MDIs are as below:

General

- The competent licensing authority is the Drugs Controller General of India (DCGI)
- Special committees comprising of subject experts and DCGI representatives will be set up for evaluation of the concerned devices and the committees are empowered to formulate their own benchmarks and procedures for such evaluation and for standards to which such devices should conform.

Imports

- Import is subject to licensing and no import shall take place prior to issuance of license

Manufacturing

- Manufacturing is subject to licensing and no manufacturing can take place prior to issuance of the license
- Applicants shall provide complete information on the details of the product and manufacturing to the licensing authority
- For new products or products without benchmark certification, Expert Committees will be set up for evaluation and assessment. The Committee(s) will submit their report and recommendation to the licensing authority
- In the event of approval, the state-level authorities will carry out a joint inspection and verification, after which the license may be issued

Registration for Manufacturing and Import

- A registration certificate in respect of the product and premises in which it is manufactured is required and the application for this certificate needs to be made to the competent authority by the manufacturer or importer along with required information and fees
- Registration is required separately for each medical device which has a different material, ingredient and/or a method of use
- Registration can be subject to such conditions as may be applied by the competent authority
- Registration is normally valid for five years and is renewable, unless canceled earlier.

Sale

- Sale of such medical devices requires a license and no sale shall be carried out prior to issuance of a license

2.3 MDI MANUFACTURING IN INDIA

2.3.1 CFC-based and HFA-based MDI manufacturing

There are currently five manufacturers of pharmaceutical MDIs in India. Table-7 below shows the MDI production levels in India from 2003 to 2007:

Table-7: MDI Manufacturing in India (2003-2007)

Manufacturer	Total Production (in million units)				
	2003	2004	2005	2006	2007
CFC-based MDIs					
Cadila Healthcare Ltd.	Blanked for reasons of confidentiality				
CIPLA Ltd.					
GlaxoSmithKline Pharmaceuticals Ltd.					
Midas-Care Pharmaceuticals Ltd.					
Sun Pharmaceutical Industries Ltd.					
Sub-total (CFC-based MDIs)	**28.83**	**35.69**	**31.77**	**39.16**	**31.19**
HFA-based MDIs					
CIPLA Ltd.	Blanked for reasons of confidentiality				
Midas-Care Pharmaceuticals Ltd.					
Sun Pharmaceutical Industries Ltd.					
Sub-total (HFA-based MDIs)	**0.47**	**1.23**	**4.06**	**11.19**	**24.32**
Grand Total	**29.30**	**36.92**	**35.84**	**50.35**	**55.51**

Figure-4 below depicts the production volumes of CFC and HFC-based MDIs in India during 2003 to 2007:

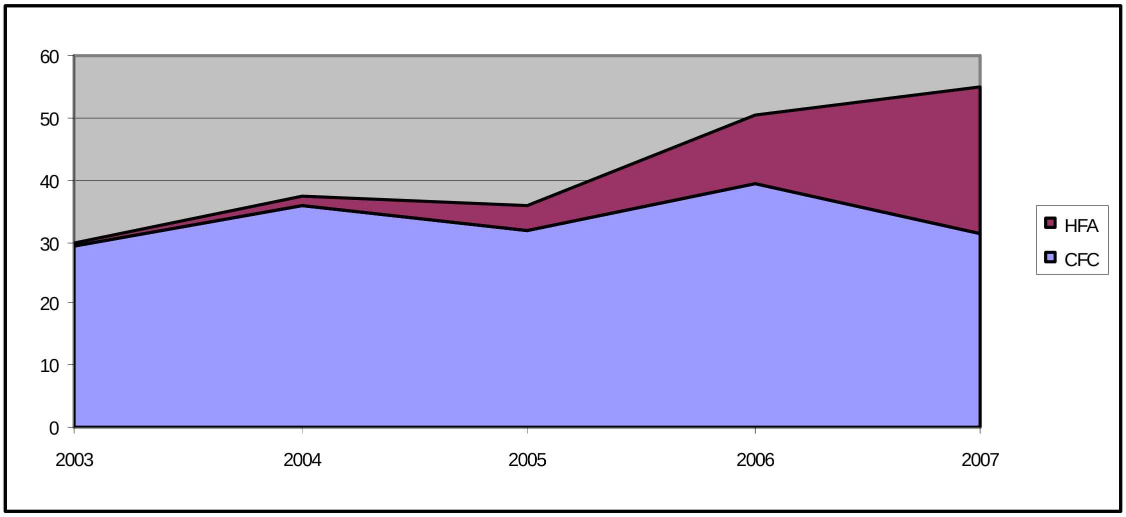


Figure-4: CFC-based and HFC-based MDI production in India (2003-2007)

As seen in the table and graphic above, there is a clear growth in demand for MDIs in India in the past few years. The growth is likely due to more widespread use of MDIs in the asthma and COPD patient population which is consistent with global trends. While the share of HFA products is growing in number of units produced, only two of the seven manufacturers have developed HFA formulations for a limited number of drugs. This implies that there is still a major work in formulation, development and registration of new HFA products for the coming years. Given the limitation on availability of CFCs in the near future, the majority of the companies are in the need to have these products commercially available as soon as possible.

In response to the control measures established by the Montreal Protocol, MDI manufacturers in India have already initiated a process to identify alternatives to CFC-based MDIs. Some of them have been able to formulate some products based on HFA after significant investments on research and development. However, challenges to offer HFA-based MDIs exist, due to a combination of reasons which include higher costs of production, low availability of materials, higher cost of equipment, lost of production capacity and restrictions on the retail price of the products under the Drug Price Control Order, which makes it difficult for manufacturers to recover the additional costs. There are still many products being produced with CFCs and there will be need for CFCs in the next few years.

It takes between 9 months and two years to develop a new formulation that includes planning, formulation development, scale-up and stability testing. Based on the regulatory framework, the time needed for registering a new product can vary from 6 months to a year. Thus the overall timeframe for introducing new products in the market takes between 15 months and three years.

Considering the above background, it is possible to appreciate the constraints in context of demand growth, time, resources, regulatory framework and pricing maneuverability faced by MDI manufacturers in India in transitioning from CFC-based MDIs to non-CFC or HFC-based products.

2.3.2 Domestic Sales and Exports of CFC-based MDIs

A portion of the total CFC-based MDIs produced in India is exported to both non-Article-5 and Article-5 countries. Table-8 below shows the quantities of CFC-based MDIs for the domestic market and exports in recent years:

Table-8: Domestic Sales and Exports of CFC-based MDIs

Parameter	Total (in million units)				
	2003	2004	2005	2006	2007
Total Domestic Sales	14.90	15.72	16.21	18.27	10.33
Exports to non-Article-5 countries	0.42	0.05	0.42	0.47	1.53
Exports to Article-5 countries	13.52	19.93	15.16	20.43	19.30
Total Exports	13.94	19.98	15.57	20.90	20.82
Total Production	28.83	35.69	31.77	39.16	31.19
Exports to non-Article-5 countries (% of total)	1.5%	0.1%	1.3%	1.2%	4.9%

It is seen from the above that before 2007 exports of CFC-based MDIs to non-Article-5 countries were around 1% of the total production. Only in 2007 exports increased to a level that constituted 4.9% of the total production of CFC-based MDIs. Only one of the enterprises (CIPLA) is exporting to Non-Article 5 countries.

2.3.3 Breakdown of CFC Consumption in MDI manufacturing by enterprise

The CFCs required for the MDIs manufactured in India are sourced from domestic CFC producers as well as imported from other countries. Table-9 below shows the consumption of CFCs in MDI manufacturing in India in recent years for each manufacturer:

Table-9: Breakdown of CFC Consumption in MDI manufacturing by enterprise (2003-2007)

Manufacturer	CFC Consumption (ODP tonnes)				
	2003	2004	2005	2006	2007
Cadila Healthcare Ltd.	Blanked for reasons of confidentiality				
CIPLA Ltd.					
GlaxoSmithKline Pharmaceuticals Ltd.					
Midas-Care Pharmaceuticals Ltd.					
Sun Pharmaceutical Industries Ltd.					
Total	**578.91**	**742.81**	**740.41**	**763.62**	**608.07**

Figure-5 below depicts the relative CFC consumption of the five MDI manufacturers (2007):

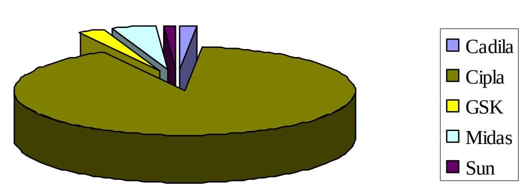


Figure-5: Relative CFC Consumption of the MDI manufacturers (2007)

2.3.4 Industry Structure

India caters to the needs of inhalation therapy for patients suffering from asthma, COPD and other respiratory ailments, through an established local MDI manufacturing capacity, which provides affordable MDI products to these patients. All MDIs consumed in India are locally manufactured.

The MDI manufacturing industry in India has experienced a growth of about 15-20% annually in the past decade. In 2007, over 50 million units of MDIs were sold in India, which has a population of about 1.1 billion and a patient base of about 15-20 million. Yet, the per capita use of MDIs in India is quite low, as compared to for instance UK, where over 60 million units of MDIs were sold for a population of 60 million and a patient base of about 6 million. This implies that that production of MDIs in India will continue to grow to provide affordable access to MDIs to the large number of asthma and COPD patients.

There were historically a total of seven MDI manufacturers in India. Of these, AstraZeneca Pharma India Ltd. has 100% non-Article-5 ownership and sub-contracts its products to one of the other manufacturers. Natco Pharma Ltd., an indigenously owned enterprise, has ceased production of MDIs as of 2007. Thus, currently five manufacturers of MDIs are operational in India. Table-10 below shows the MDI production breakdown by enterprise in India in 2007:

Table-10: MDI production breakdown by enterprise (2007)

Manufacturer	Total MDI production in 2007 (million units)	Share of total production
Cadila Healthcare Ltd.	Blanked for reasons of confidentiality	
CIPLA Ltd.		
GlaxoSmithKline Pharmaceuticals Ltd.		
Midas-Care Pharmaceuticals Ltd.		
Sun Pharmaceutical Industries Ltd.		
Total	55.51	100.0 %

Figure-6 below depicts the total production of MDIs and respective manufacturer shares pictorially:

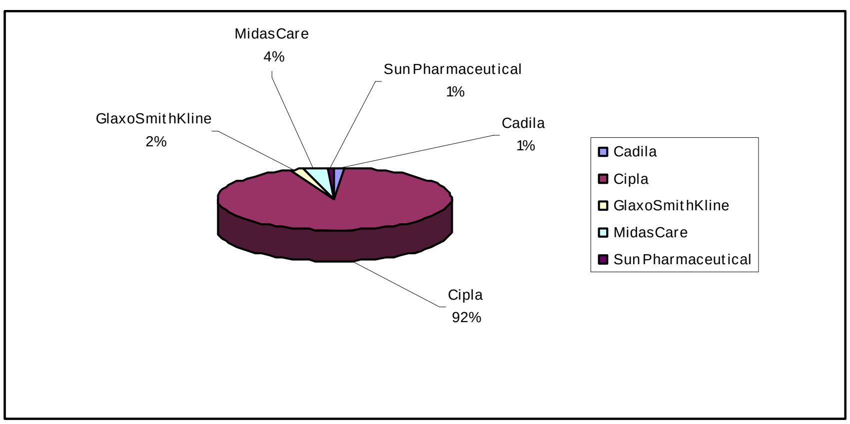


Figure-6: MDI Production breakdown by enterprise in 2007

Table-11 below shows the baseline information and products manufactured by these enterprises:

Table-11: Baseline Data for MDI manufacturers in India

PARAMETER	ENTERPRISE DATA				
	Cadila Healthcare Ltd.	**CIPLA Ltd.**	**GlaxoSmithKline Pharmaceuticals Ltd.**	**Midas-Care Pharmaceuticals P. Ltd.**	**Sun Pharmaceutical Industries Ltd.**
Indigenous Ownership (%)	100	100	49.33	100	100
Date of Establishment	1952	1935	1924	1986	1983
Number of MDI plants	1	3	1	1	1
Number of production lines for CFC-based MDIs	1	7	1	2	1
Date of establishment of CFC-based MDI capacity	2002	1995 -2002 - 2003	1989	1993-1994	1999-2000
Lines Output	25 – 28 can/min	455 can/min CFC + 160 can/min HFA	32 can/min	24 – 26 can/min	20 – 23 can/min
Annual capacity of CFC-based MDI production (based on single shift and 240 working days/year)	2.5 – 2.8 million	42 million CFC + 6 million HFA	3.3 million	3.38 million*	1.9 – 2.1 million
Products manufactured (strengths)	1 Salbutamol (1) 2 Budenoside (2) 3 Formoterol Fumarate (1) 4 Ipratropium Bromide (1) 5 Budenoside + Formoterol Fumarate (3) 6 Salbutamol+ Ipratropium Bromide (1) 7 Salmeterol + Fluticasone Propionate (3) 8 Tiotropium Bromide (1) 9 Tiotropium Bromide + Formoterol Fumarate (1) 10.Formoterol Fumarate + Fluticasone Proppionate(2)	1 Isoprenaline Sulphate (1) 2 Beclomethasone Nasal (1) 3 Sodium Cromoglicate (2) 4 Ipratropium Bromide (2) 5 Ipatropium + Salbutamol (1) 6 Tiotropium Bromide (1) 7 Tiotropium Bromide + Formoterol (1) 8 Levoalbuterol (1) 9 Levalbuterol + Ipatropium (1) 10 Belcomethasome + Formoterol (2) 11 Salbutamol (1) 12 Beclomethasone (4) 13 Salbutamol + Beclomethasone (1) 14 Budesonide(2) 15 Fluticasone Propionate (4) 16 Salmeterol Xinafoate (1) 17 Formoterol (1) 18 Fluticasone + Salmetrol (3) 19 Budesonide + Formoterol(3) 20 Troventol (1) Ciclesonid. HFA (2) 21 Ciclesonide + Formoterol HFA (2)	1 Salbutamol (1) 2 Beclomethasone (2)	1 Salbutamol (2) 2 Ipratropium Bromide (2) 3 Salbutamol + Beclomethasone(1) 4 Formeterol Fumurate (1) 5 Formoterol + Budesonide (3) 6 Beclometasone (4) 7 Budesonide (3) 8 Salmeterol + Fluticasone (3) 9 Ipratropium + Salbutamol (1) 10 Salmeterol (1) 11 Sodium Cromoglicate (2) 12 Terbutaline (1) 13 Tiotropium Bromide (1) 14 Tiotropium Bromide + Formoterol (1) 15 Levosalbutamol(1) 16 Levosalbutamol + Beclometasone (1) 17 Levosalbutamol + Ipatropium Bromide (1) 18 Ciclesonide (2) 19 Ciclesonide + Formeterol Fumurate (1) 20 Tiotropium + Formoterol + Budesonide (2) 21 Tiotropium +	1 Salmeterol + Fluticasone Propionate (3) 2 Fluticasone Propionate (3) 3 Budesonide (2) 4 Salbutamol (1) 5 Formoterol + Budenoside (3) 6 Tiotropium Bromide (1) 7 Tiotropium Bromide + Formoterol (1) 9 Ciclesonide HFA (2)

PARAMETER	ENTERPRISE DATA				
	Cadila Healthcare Ltd.	CIPLA Ltd.	GlaxoSmithKline Pharmaceuticals Ltd.	Midas-Care Pharmaceuticals P. Ltd.	Sun Pharmaceutical Industries Ltd.
		22 Budesonide Formoterol HFA (1) 23 Tiotropium + Formoterol + Ciclesonid. HFA (1)		Formoterol + Ciclesonide (2) 22 Fluticasone (3) 23 Fluticasone + Formoterol (3)	
Total CFC-based products (total strengths)	**10 (16)**	**23 (40)**	**2 (3)**	**23 (42)**	**8 (16)**
Non-Article-5 Exports (2007)	0%	5.6%	0%	0%	0%

* Six working days/week

3. Strategy for Transition to Non-CFC MDIs

3.1 Introduction

3.1.1 Objectives

The main objectives of India's strategy for transition to non-CFC MDIs are:

- To gradually reduce CFC consumption in the manufacture of pharmaceutical MDIs and achieve their complete elimination by 2012.
- To gradually assimilate non-CFC MDI technology into India, so that the required quantities of these products are cost-effectively and sustainably available

3.1.2 Principles

India's strategy to transition from CFC-based MDIs to non-CFC MDIs will be guided by the following key principles, as enunciated in the Country Programme for phasing out of ODS and the National Health Policy:

- The commitment and willingness of Government of India to eliminate substances that adversely affect the environment and ozone layer
- To prevent industrial dislocation and obsolescence, by supporting the indigenous industry to achieve transition through adequate technical and financial assistance
- Equity in health services and cost-effective and continuous availability of MDIs. Therefore, access to MDIs will be protected during the transition period by a gradual substitution that will involve simultaneous availability of CFC and non-CFC MDIs for a period of time under the control and supervision of the CDSCO.
- The transition strategy will be designed and implemented with the participation of a wide range of stakeholders including experts from the clinical sphere, pharmaceutical industry, and health education specialists, who will contribute to the viability and efficient implementation of this project at all the corresponding levels.
- Strengthening of national stakeholder institutions through adequate technical assistance, capacity-building and training
- To formulate and implement policies and regulations that would support the transition
- The acceptability of the CFC-free products and the reduction of the duration of gradual replacement will be encouraged by conducting clinical tests designed to train healthcare professionals and patients in the use of these new products, complemented by targeted awareness actions thus favoring their acceptability during the transition process.

3.2 STRATEGY COMPONENTS

Government of India recognizes that the strategy for transition to non-CFC MDIs in India is a critical step in ensuring compliance with its Montreal Protocol obligations and is therefore committed to take expedited actions to phase-out CFCs in MDI manufacturing in India. Government of India also recognizes the need to align such strategy with the preparedness of its healthcare sector to accept CFC-free alternatives and also the need to ensure adequate and cost-effective availability of MDIs to patients. Based on this the proposed strategy will need to include the following components:

- Technology conversions at MDI manufacturers
- Technical assistance
- Policy and regulatory actions
- Targeted awareness and capacity-building actions among stakeholders
- Efficient management of the transition and implementation of appropriate monitoring and verification protocols

3.2.1 Technology Conversions

This component would cover technology conversions at the five MDI manufacturers in India.

Selection of Technology

In considering options for developing appropriate alternatives to CFC-based MDIs in India, two factors need to be taken into account:

- Ease of use by the patient and applicability to the local context
- Ease of technology conversion
- The requirement to ensure that suitable therapies for all patient groups such as pediatric patients, adolescents and senior patients
- Maturity, effectiveness and commercial availability of the technology

Two main technology options, which qualify based on the above considerations, have been developed as alternatives to CFC-based MDIs. These are:

- HFA technology: This retains the drug delivery mechanism
- Dry Powder Inhalers (DPI): This involves a different delivery mechanism as well as administration of the drug in a different physical form (a powder as compared to an aerosol suspension)

In order to determine which of the above two options is more suited to the Indian context, the relative merits of the two technology options are evaluated.

DPIs

Two of the five MDI manufacturers in India (Cadila and CIPLA), have the facilities to produce single-dose DPIs covering ten drugs. The rationale for developing single-dose DPIs locally was to cover the needs of a specific group of elderly patients who have difficulties in coordination and dexterity to apply MDI products, but not with the intention to replace CFC MDIs as therapeutic treatment for asthma and COPD for all patients. These DPIs did not find acceptability among doctors and patients.
Various problems as reported by the Indian Chest Society and National College of Chest Physicians include:

- Throat irritation and coughing due to higher particle size than in MDIs.

- The tropical climatic conditions in India make it difficult to use the product effectively. At humidity levels of 70% to 80% the capsule absorbs moisture and this prevents the effective separation of the capsule by the device and the delivery of the drug.
- Difficulties in application of the drug include patients swallowing the capsule instead of introducing it in the device. Some of the side effects associated with swallowing the capsule are fatigue, headache, hypertension and growth retardation in children.

It has been very well-documented at the global level that DPIs do not represent a satisfactory therapeutic alternative to pressurized MDIs for all patients or for all drugs. DPI formulations either contain the active drug alone or have a carrier powder (e.g. lactose) mixed with the drug. The drug particles must be of sufficiently small diameter to for deposition on the airways. Young children (typically below 5 years old), patients with severe asthma and elderly COPD patients may not always be able to achieve adequate breathing flow to ensure optimal medication delivery from DPIs. A DPI-only based strategy would leave a significant portion of the patient population at high risk.

HFA-based MDIs

The HFA versions of CFC-based MDIs present an identical delivery mechanism. Therefore no adaptation is required on the part of the patient to use the drug. However, some challenges still exist:

- HFA-based MDIs require acceptance of slightly different physical characteristics with regard to taste.
- The technology of formulation of HFA-based MDIs differs significantly from that of CFC-based MDIs.

Selection of DPIs as an alternative technology will also necessitate providing for costs of access to suitable DPI technology and investments in new manufacturing and packaging infrastructures. Considering the development costs and costs of molds and tooling, the costs per therapeutic dose of DPIs will be significantly higher than those with HFA-based MDIs. Thus, DPI technology is not favorable as a cost-effective alternative.

In consultation with relevant stakeholders and considering the relative merits of the two technology options, it has been decided that HFA technology would be best suited for Indian conditions, considering ease of use for patients, availability of technology and technology providers and wider applicability in a humid climate.

Access to technology

Intellectual property issues are not foreseen, as India does not have to comply with WIPO requirements until 2016, which is beyond the timeframe of this project. Also by that time the patents for the drug molecules involved in this project will have expired. Furthermore, each of the five enterprises currently manufacturing CFC-based MDIs has in-house product development capability that has a record of developing products for the Indian market.

Product Development

Some of the existing CFC-based MDI drugs will need to be reformulated for HFA technology. Others (e.g. Salbutamol plus Ipratropium bromide), which do not have HFA alternative formulations approved will need to be developed. The reformulation and development is expected to be carried out by the enterprises themselves and would be subject to statutory approval. The entire process is expected to take between 9 and 15 months.

Conversions

All five MDI manufacturers utilize CFC pressure filling. They use both CFC-11 and CFC-12 in the manufacture of MDIs. CFC-11 is used for preparation of a “suspension slurry” of the active ingredient to facilitate filling the precise quantity into the open MDI container, after which the MDI container is closed with an aerosol metering valve, and thereafter CFC-12 that acts as the aerosol “propellant” is injected into the aerosol container under pressure through the metering valve. Replacement equipment to allow HFA-based MDI production can be installed alongside existing equipment.

The conversions would involve introduction of the necessary equipment for production lines, suitable for manufacturing the HFA-based MDIs.

More details of enterprise-level technology conversions are provided in Annex-1 and Annex-7.

3.2.2 Technical Assistance

In order to properly coordinate the technical implementation of the strategy, services of external technical expert(s) will be utilized. The tasks would include technical monitoring and supervision of enterprise-level conversions, technical advice on procurement, trouble-shooting issues between enterprises and suppliers, etc. More details are provided in Annex-2.

3.2.3 Policies and Regulations

In order to effectively support the transition to non-CFC MDIs, Government of India proposes to consider the following policy and regulatory interventions:

Control of supply of CFC-based MDIs

- Regulating CFC-based MDI manufacturing beyond 2009
- Regulating new formulations or products with CFC-based MDIs.
- Regulating import of new CFC-based MDIs. The timing of this measure needs to be aligned with the timing of phase-out of CFCs in MDI manufacturing by Ministry of Health and Family Welfare.

Promotion of CFC-free alternatives

- Fiscal incentives for adopting non-CFC alternatives
- Fast track procedures for approval of non-CFC MDIs

More details on this component are provided in Annex-3.

3.2.4 Awareness and Capacity Building Actions

Awareness and capacity-building actions are considered important and complementary to other initiatives to facilitate quicker adoption of HFA-based MDIs. Two critical factors would influence quicker market adoption of HFC-based MDIs:

- Prescription of HFC-based MDIs by doctors
- Wide availability of HFC-based MDIs in pharmacies

The following activities are proposed:

- Stakeholder sensitization workshops at national, regional and local levels
- Development of awareness materials for healthcare professionals, pharmacies, medical facilities treating respiratory diseases and organizations involved in disseminating knowledge on these diseases and treatments
- Public awareness through media publicity
- Color coding/labeling of CFC-based and HFA-based MDIs
- Information dissemination through dedicated website

More information on this component is provided in Annex-4.

3.2.5 Monitoring and Management

Following key activities would be carried out under this component:

a) Coordination of the strategy implementation with the various policy and awareness actions
b) Verification and certification of CFC phase-out
c) Status/progress reporting
d) Monitoring and evaluation of outputs

More details are provided in Annex-5.

Availability and management of Pharma-grade CFCs during the transition period

The consumption of CFCs in MDI manufacturing shows a decline from 2006 to 2007. However, as mentioned in Section 1.2 it still constitutes a significant portion of the agreed allowable total consumption and potentially in excess of the agreed consumption limits in 2008 and 2009. This situation poses a significant risk of non-compliance post-2007 and calls for urgent interventions to ensure timely and smooth transition to non-CFC MDIs and also effective management of CFCs during the transition period.

ExCom Decision 54/35 stipulates a limit on availability of CFCs for consumption in India, i.e., a maximum of 825 ODP tonnes would be available for consumption during 2008 and 2009.

Given these CFC consumption limits, while it is critical to accelerate phase-out of CFCs in pharmaceutical MDIs, it is also critical to ensure availability of adequate pharmaceutical-grade CFCs during the transition period.

In this regard, the following actions are proposed:

- Establishing the requirements of pharmaceutical-grade CFCs needed during the transition period, to ensure reliable availability of proven drugs to patients. This task will be a collaborative effort between the enterprises and government as part of the transition strategy. According to the information collected during the project preparation the quantity required between 2009 and 2012 may be above the 825 ODP tonnes available as per Decision 54/35, but it will need to be accurately defined. For the required quantities above the 825 ODP tonnes available, appropriate steps will need to be defined.

- India may need to apply for Essential Use Nomination for the amount of pharmaceutical-grade CFCs needed, which cannot be covered by the current limitations of availability. The exact amounts required would be calculated as part of the process described above.

3.3 MONITORING MILESTONES

	2008				2009				2010				2011				2012			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Annual CFC phase-out in MDIs (600 tonnes)	50				100				150				150				150			
Submission of proposal to MLF			■																	
Approval by MLF			■	■																
Project document signature by Government					■															
Implementation appraisal					■	■														
Equipment specifications and approval						■														
Equipment procurement and delivery							■	■	■	■	■	■								
Formulation development							■	■	■	■	■	■								
Stability testing and laboratory analysis										■	■	■	■	■						
Product registration													■	■	■	■	■			
Policy and regulatory actions									■	■	■	■	■	■	■	■				
Awareness actions							■	■	■	■	■	■	■	■	■	■	■	■		
Technical assistance						■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Equipment installation and commissioning												■	■	■	■	■	■			
Trial production																	■	■	■	
Commercial production of non-CFC MDIs																			■	■

3.4 IMPLEMENTATION

The overall management and coordination of the plan will be the responsibility of Ozone Cell, Ministry of Environment and Forests, with the assistance of UNDP as the lead implementing agency, UNEP as the cooperating implementing agency and Government of Italy as the bilateral cooperating agency.

3.5 FINANCING

The total cost of the plan is **US$ 61,701,934**. The requested MLF grant is **US$ 26,759,319**. The balance cost amounting to **US$ 34,942,615** will be co-financed by beneficiary enterprises.

3.6 RESULTS

The plan will result in a sustainable transition from CFC-based to HFA-based MDIs and in a phase-out of CFCs in the manufacture of MDIs in India by 2012.

ANNEX-1

PROJECT COMPONENT-I: TECHNOLOGY CONVERSIONS

ENTERPRISE LEVEL SUMMARIES

ATTACHMENT-1

SUMMARY: CADILA HEALTHCARE LTD.

1. BASIC DATA AT A GLANCE

Local Ownership: 100%
Exports to Non-Article 5 Countries: 0.00
Establishment of Production Line: 2002
Co-financing Commitment: 30%

2. CFC CONSUMPTION

Parameter	CFC-based MDI Manufacturing
	Baseline Year: 2003
CFC Consumed (in ODP Tonnes)	2.94

3. PROJECT COST SUMMARY

The table below shows the summary of the elements of the project and the proposed co-financing, at Cadila Healthcare Ltd (all amounts in US dollars)

Cost Head	Eligible Costs	Proposed Co-Financing	Proposed Project Funding
Incremental Development Costs	840,345	30%	588,242
Incremental Capital Costs	1,218,000	30%	852,600
Incremental Operating Costs	124,842	30%	87,389
TOTAL	**2,183,187**	**30%**	**1,528,231**

4. PROJECT COSTS

4.1 Product Development Costs

In reviewing the extensive listing of Cadila's products, not all of those listed are eligible for consideration. The following will not be eligible or appropriate for consideration.

a) Products which Cadila have decided they do not intend to make available as an HFA MDI and will be discontinued with the phase out of CFC

b) Products launched significantly after the 2003 baseline year. Having reviewed data, some products were under development and in the latter stages of registration in 2003, although are not recorded as formally launched until 2004. These products do represent eligible formulations/ products as significant volumes were manufactured prior to the baseline.

Further, consideration has been given to how products in multiple strengths are typically developed. Where three or four strengths of a product are commercialized, it is typical to develop only the highest and lowest strength in detail and to only undertake minimal confirmatory activities on the intermediate strengths.

Applying these criteria, only 10 formulations out of the 16 existing formulations are included in the calculation of development costs: Salbutamol. Budesonide 100, Budesonide 200, Formoterol Fumarate, Ipatropium Bromide, Budesonide+Formoterol 100, Budesonide+Formoterol 400, Salbutamol + Ipatropium, Formoterol + Fluticasone 125, Formoterol + Fluticasone 250.

Total Cadila Incremental Development Cost is estimated as US 840,345.

4.2 Incremental Capital Costs

Detailed description of the baseline equipment and proposed equipment for conversion can be found in Annex 7. The summary is tabulated below (all amounts in US dollars):

Item	Cost
1 Single Macromat filling line and associated pressure filling and preparation vessel	1,198.000
Modifications to existing area	20,000
Total	**1,218,000**

4.3 Incremental Operating costs

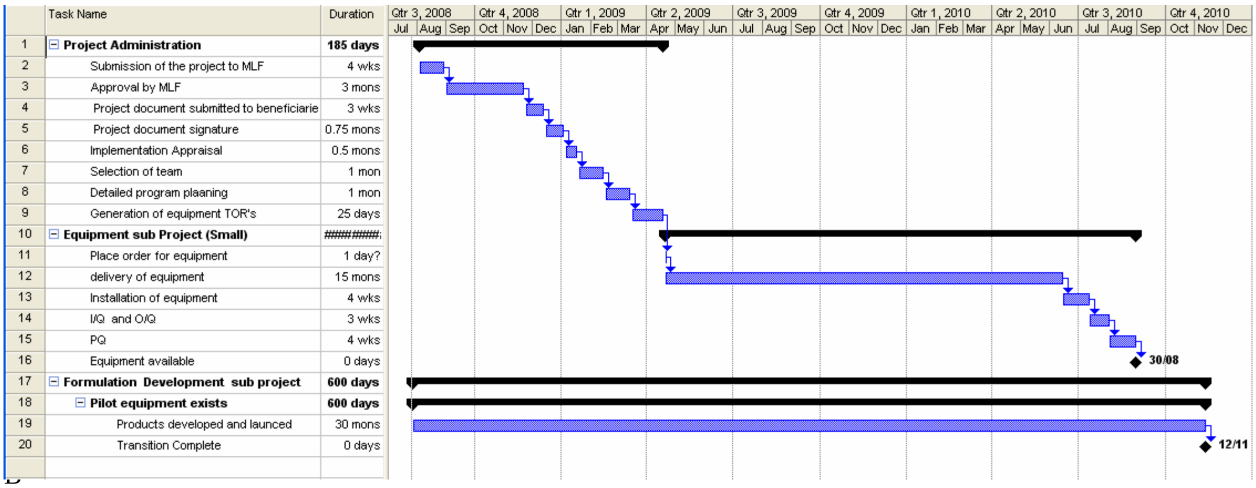
Incremental operating costs are calculated based on 2007 production of CFC-based MDIs. The production in 2007 was 713,387 units. No allowance for future growth in production has been factored. Incremental operating costs are calculated for one year duration.

Cadila could not provide a detailed analysis for differences in costs between equivalent CFC and HFA-based MDIs, as they only have CFC-based MDI manufacturing experience. In reviewing the cost quotations provided to Cadila, it is evident that costs and overheads are similar to other enterprises within the sector. It is reasonable therefore to assume that resulting cost differences will also be similar.

Therefore, based on a weighted average calculation, the incremental cost difference between an equivalent CFC and HFA MDI is approximately Indian Rupees 7.37. This is equivalent to US$ 0.175/unit of CFC-based MDI.

Based on the above, the incremental operating costs at Cadila are **US$ 124,842**

5. PROJECT SCHEDULE



Based on the above, the lead time for conversion at Cadila Healthcare Ltd will be about 24 to 26 months from the date of approval of the project. It will be essential to ensure that appropriate quantities of CFCs are made available, in line with the managed requirements during transition.

ATTACHMENT-2

SUMMARY: CIPLA LTD.

1. BASIC DATA AT A GLANCE

Local Ownership:	100%
Exports to Non-Article 5 Countries:	5.60% (2007)
Establishment of Production Line:	1995 (2), 2002 (2), 2003 (3)
Co-financing Commitment:	Minimum 30% (presently calculated 59.90%)

2. CFC CONSUMPTION

Parameter	CFC-based MDI Manufacturing
	Baseline Year: 2003
CFC Consumed (in ODP Tonnes)	526.60

3. PROJECT COST SUMMARY

The table below shows the summary of the elements of the project and the proposed co-financing, at CIPLA Ltd (all amounts in US dollars)

Cost Head	Eligible Costs	Proposed Co-Financing	Proposed Project Funding
Incremental Development Costs	37,890,000	70%	11,367,000
Incremental Capital Costs	11,175,600	35.5%	7,208,262
Incremental Operating Costs	4,411,716	35.5%	2,845,557
TOTAL	**53,477,316**	**59.9%**	**21,420,819**

4. PROJECT COSTS

4.1 Product Development Costs

CIPLA have already developed many of their CFC-based MDI products and relaunched them in HFA format. In addition some of the newer MDIs which have been developed by CIPLA have only been launched in an HFA presentation.

In reviewing the extensive listing of CIPLA's products not all of those listed are eligible for consideration. The following will not be eligible or appropriate for consideration.

a) Isoprenaline Sulphate is an older product being phased out in many countries as it is linked to abuse related issues.

b) Beclomethasone Nasal spray is a nasal delivery system which is adequately replaced with an aqueous spray system which CIPLA already manufactures.

c) Products launched significantly after the 2003/2004: Having reviewed data some products were developed and in the latter stages of registration in 2003, although are not recorded as formally launched until 2004.

Further, consideration has been given to how products in multiple strengths are typically developed. Where three or four strengths of a product are commercialized, it is typical to develop only the highest and lowest strength in detail and to only undertake minimal confirmatory activities on the intermediate strengths.

Applying the criteria above, the following products will be developed:

- Salbutamol (1 strength)
- Salbutamol + Beclomethasone (1 strength)
- Sodium Cromoglycate (1 strength)
- Beclomethasone (3 strengths)
- Budesonide (2 strengths)
- Ipratropium (2 strengths)
- Fluticasone (2 strengths)
- Salmeterol (1 strength)
- Formoterol (1 strength)
- Ipratropium + Salbutamol (1 strength)
- Salmeterol + Fluticasone (2 strengths)
- Sodium Cromoglycate (1 strength)
- Budesonide + Formoterol (1 strength)
- Troventol (1 strength)
- Tiotropium (1 strength)
- Tiotropium +Formoterol (1 strength)

Of these, CIPLA on their own initiative have already formulated 15 and currently 3 (some of which are the more problematic) still have to be formulated. The formulations above represent a minimum of 22 individual formulations (high and low strength for multiple strength products), which will need to be developed.

As a result of the extensive development activities already undertaken by CIPLA, they have developed a very good understanding of the costs associated with the development of an HFA MDI. The development cost estimates take in to consideration the following:

- Some products are far more problematic to reformulate than others

- In order to continue to provide the products internationally, CIPLA's development protocols need to be very demanding, so that the data will be acceptable to all potential reviewing health authorities. CIPLA have a global presence and it is necessary to develop all HFA products in a manner fully compliant with the demands of all regulatory bodies around the world. This avoids the need for unnecessary duplication of the development activities for each territory. The impact of this however is a far more intensive and comprehensive development programme than may be required for solely domestic registration.

Total Cipla Incremental Development Cost is estimated as **US$ 37,890,000.**

4.2 Incremental Capital Costs

Detailed description of the baseline equipment and details of conversion and equipment are provided in Annex-7. The summary is tabulated below (all amounts in US dollars):

Item	Cost
Replacement Line A	4,420,000
1,000 Litre mixing vessel	840,600
Modifications	25,000
Replacement Line B including 500 l vessel	2,080,000
Replacement Line C including 500 l vessel	2,080,000
Bulk storage and distribution modifications	1,730,000
Total	**11,175,600**

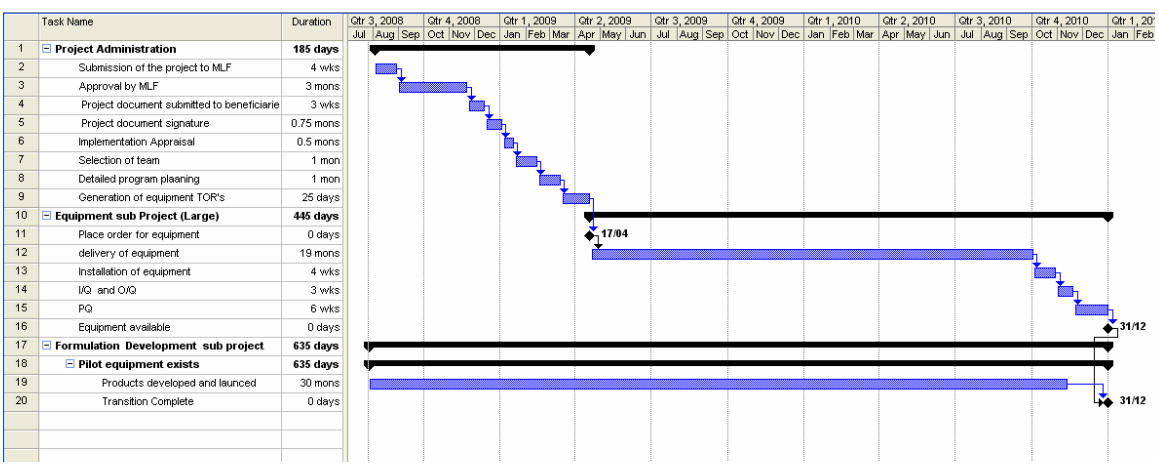
4.3 Incremental Operating costs

Incremental operating costs are calculated based on 2007 production of CFC-based MDIs. The production in 2007 was 27.35 million units. No allowance for future growth in production has been factored. Incremental operating costs are calculated for one year duration.

The incremental operational cost analysis shows that at US$ 0.1613 per unit, the incremental operating costs for one year duration for a production volume of 27.35 million units are calculated at **US$ 4,411,716.**

5. PROJECT SCHEDULE

CIPLA have some equipment suitable for commencing development of HFA MDI formulations, however complete transition to HFA MDIs and hence the elimination of use of CFCs, is dependant on the successful installation of new equipment required as described (in Annex-7) in this proposal. The schedule below takes into account the current equipment procurement lead time in to consideration.



Based on the above, the lead time for conversion at CIPLA Ltd will be about 25 to 27 months from the date of approval of the project. It will be essential to ensure that appropriate quantities of CFCs are made available, in line with the managed requirements during transition.

ATTACHMENT-3

SUMMARY: GLAXOSMITHKLINE PHARMACEUTICALS LTD.

1. BASIC DATA AT A GLANCE

Local Ownership:	49.33%
Exports to Non-Article 5 Countries:	0%
Establishment of Production Line:	1989
Co-financing Commitment:	Minimum 30% (presently calculated 81%)

2. CFC CONSUMPTION

Parameter	CFC-based MDI Manufacturing
	Baseline Year: 2003
CFC Consumed (in ODP Tonnes)	24.60

3. PROJECT COST SUMMARY

The table below shows the summary of the elements of the project and the proposed co-financing, at GlaxoSmithKline Pharmaceuticals Ltd (all amounts in US dollars)

Cost Head	Eligible Costs	Proposed Co-Financing	Proposed Project Funding
Incremental Development Costs	0	100%	0
Incremental Capital Costs	1,178,600	81%	223,934
Incremental Operating Costs	330,680	81%	62,829
TOTAL	**1,509,280**	**81%**	**286,763**

4. PROJECT COSTS

4.1 Product Development Costs

GSK have developed and launched many HFA products internationally. Development of the products required for GSK is completed and would be transferred internally. Therefore this cost will be absorbed within the GSK structure.

The products below were all marketed significantly before 2003.

- Ventorlin Inhaler (Salbutamol)
- Becoride Inhaler (BDP)
- Becoride Forte Inhaler (BDP)

4.2 Incremental Capital Costs

Detailed description of the baseline equipment and proposed equipment for conversion can be found in Annex 7. The summary is tabulated below (all amounts in US dollars):

Item	Cost
1 Single Macromat filling line and associated pressure filling and preparation vessel	1,148,600
Modifications to existing area	30,000
Total	**1,178,600**

4.3 Incremental Operating costs

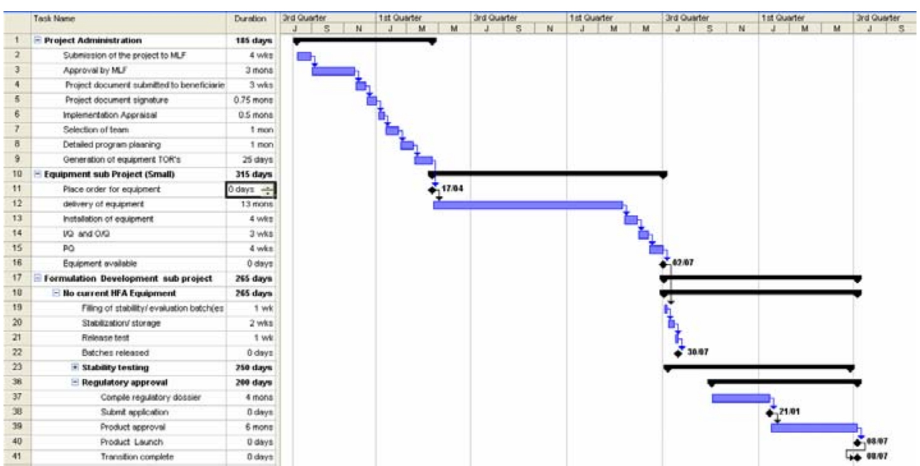
Incremental operating costs are calculated based on 2007 production of CFC-based MDIs. The production in 2007 was 944,801 million units (Ventorlin). No allowance for future growth in production has been factored. Incremental operating costs are calculated for one year duration.

GSK in India will potentially begin manufacture of HFA products as marketed by the international parent company. These are suspension formulations containing no surfactant. As a result they employ packaging components (metering valves and fluoropolymer-coated cans). These are considerably more expensive than the components currently used for the CFC MDI. Based on current costing the additional cost will be about US$ 0.35/unit CFC MDI.

Thus, at US$ 0.35 per unit, the incremental operating costs for one year duration for a production volume of 944,801 units are calculated at **US$ 330,680.**

5. PROJECT SCHEDULE

GSK currently have no equipment suitable to commence development of HFA MDI formulations, therefore complete transition to HFA MDIs and hence the elimination of use of CFCs is dependent on the successful installation and qualification of the equipment referenced in Annex-7 in this proposal. The schedule below takes into account the current equipment procurement lead time in to consideration:



Based on he above, the lead time for conversion at GSK will be about 30 to 32 months from the date of approval of the project. It will be essential to ensure that appropriate quantities of CFCs are made available, in line with the managed requirements during transition.

ATTACHMENT-4

SUMMARY: MIDAS-CARE PHARMACEUTICALS P. LTD.

1. BASIC DATA AT A GLANCE

Local Ownership:	100%
Exports to Non-Article 5 Countries:	0.00
Establishment of Production Line:	1993-1994
Co-financing Commitment:	30%

2. CFC CONSUMPTION

Parameter	CFC-based MDI Manufacturing
	Baseline Year: 2003
CFC Consumed (in ODP Tonnes)	18.78

3. PROJECT COST SUMMARY

The table below shows the summary of the elements of the project and the proposed co-financing, at Midas-Care Pharmaceuticals P. Ltd (all amounts in US dollars)

Cost Head	Eligible Costs	Proposed Co-Financing	Proposed Project Funding
Incremental Development Costs	765,000	30%	535,500
Incremental Capital Costs	780,000	30%	546,000
Incremental Operating Costs	308,850	30%	216,195
TOTAL	**1,853,850**	**30%**	**1,297,695**

4. PROJECT COSTS

4.1 Product Development Costs

In reviewing the extensive listing of products of Midas-Care Pharmaceuticals P. Ltd, not all of those listed are eligible for consideration. The following will not be eligible or appropriate for consideration.

a) Products which Midas-Care have decided they do not intend to make available as an HFA MDI and will be discontinued with the phase out of CFC

b) Products launched significantly after the 2003 baseline year. Having reviewed data, some products were under development and in the latter stages of registration in 2003, although are not recorded as formally launched until 2004. These products do represent eligible formulations/ products as significant volumes were manufactured prior to the baseline.

Further, consideration has been given to how products in multiple strengths are typically developed. Where three or four strengths of a product are commercialized, it is typical to develop only the highest and lowest strength in detail and to only undertake minimal confirmatory activities on the intermediate strengths.

Applying the criteria above, out of the 42 formulations produced by Midas-Care, only 17 formulations are included in the calculation of costs:

a) Salbutamol (1 strength)
b) Ipratropium Bromide (1 strength)
c) Salbutamol +Beclomethasone Dipropionate (1 strength)
d) Formeterol Fumarate (1 strength)
e) Budesonide + Formoterol Fumurate (2 strengths)
f) Beclomethasone Dipropionate (2 strengths)
g) Budesonide (2 strengths)
h) Fluticasone Propionate + Salmeterol (2 strengths)
i) Salbutamol + Ipratropium Bromide (1 strength)
j) Sodium Cromoglycate (1 strength)
k) Tiotropium Bromide (1 strength)
l) Fluticasone Propionate (2 strengths)

Total Midas Care Incremental Development Cost is estimated as **US$ 765,000**

4.2 Incremental Capital Costs

The costs below only cover one CFC MDI line. Detailed description of the baseline equipment and proposed equipment for conversion can be found in Annex 7. The summary is tabulated below (all amounts in US dollars):

Item	Cost
1.5 line manual filling installation	380,000
Pressure filling and preparation vessel	360,000
Custom fabricated table	20,000
Modifications to existing area	20,000
Total	**1,218,000**

4.3 Incremental Operating costs

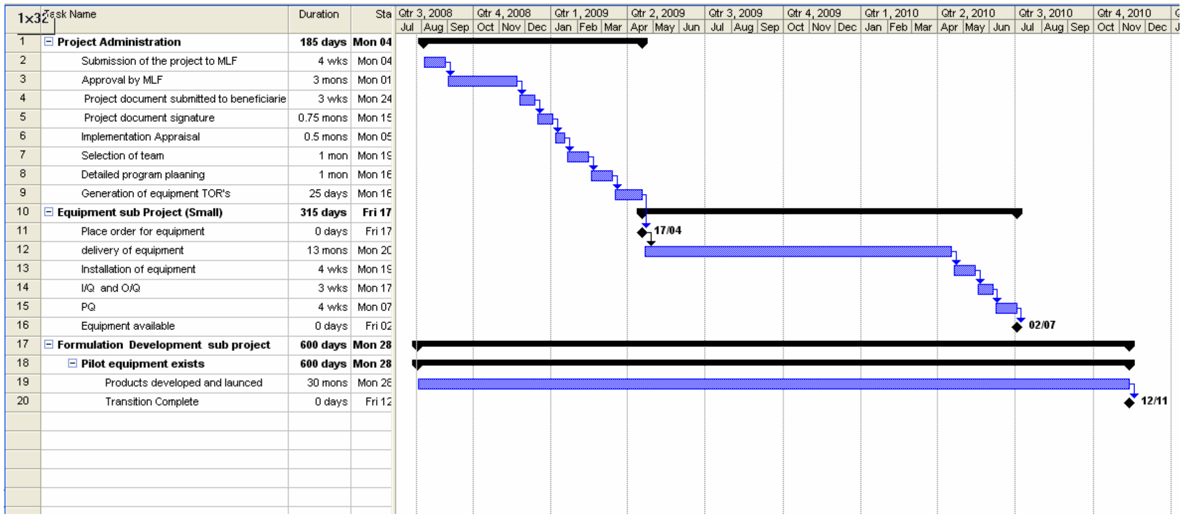
Incremental operating costs are calculated based on 2007 production of CFC-based MDIs. The production in 2007 was 713,387 units. No allowance for future growth in production has been factored. Incremental operating costs are calculated for one year duration.

Midas-Care provided a detailed cost analysis of the anticipated differences between equivalent CFC and HFA MDIs. The detailed analysis can be found in Annex-7. The result of this analysis the incremental cost difference between an equivalent CFC and HFA MDI is approximately Indian Rupees 7.37. This is equivalent to US$ 0.175/unit of CFC-based MDI.

Based on the above, the incremental operating costs at Midas-Care for 1,764,857 units work out to **US$ 308,850.**

5. PROJECT SCHEDULE

Midas-Care have some equipment suitable for commencing development of HFA MDI formulations, however complete transition to HFA MDIs and hence the elimination of use of CFCs, is dependant on the successful installation of new equipment required as described (in Annex-7) in this proposal. The schedule below takes into account the current equipment procurement lead time in to consideration:



a

Based on the above, the lead time for conversion at Midas-Care will be about 22 to 25 months from the date of approval of the project. It will be essential to ensure that appropriate quantities of CFCs are made available, in line with the managed requirements during transition.

ATTACHMENT-5

SUMMARY: SUN PHARMACEUTICAL INDUSTRIES LTD.

1. BASIC DATA AT A GLANCE

Local Ownership:	100%
Exports to Non-Article 5 Countries:	0.00
Establishment of Production Line:	1999-2000
Co-financing Commitment:	30%

2. CFC CONSUMPTION

Parameter	CFC-based MDI Manufacturing
	Baseline Year: 2003
CFC Consumed (in ODP Tonnes)	5.99

3. PROJECT COST SUMMARY

The table below shows the summary of the elements of the project and the proposed co-financing, at Sun Pharmaceutical Industries Ltd. (all amounts in US dollars)

Cost Head	Eligible Costs	Proposed Co-Financing	Proposed Project Funding
Incremental Development Costs	660,490	30%	462,343
Incremental Capital Costs	780,000	30%	546,000
Incremental Operating Costs	67,811	30%	47,468
TOTAL	**1,508,301**	**30%**	**1,055,811**

4. PROJECT COSTS

4.1 Product Development Costs

In reviewing the extensive listing of Sun Pharma's products, not all of those listed are eligible for consideration. The following will not be eligible or appropriate for consideration.

a) Products which Sun Pharma have decided they do not intend to make available as an HFA MDI and will be discontinued with the phase out of CFCs

b) Products launched significantly after the 2003 baseline year. Having reviewed data, some products were under development and in the latter stages of registration in 2003, although are not recorded as formally launched until 2004. These products do represent eligible formulations/ products as significant volumes were manufactured prior to the baseline.

Further, consideration has been given to how products in multiple strengths are typically developed. Where three or four strengths of a product are commercialized, it is typical to develop only the highest and lowest strength in detail and to only undertake minimal confirmatory activities on the intermediate strengths. Applying these criteria, only 10 formulations are included in the calculation of development costs, shown in the table below:

- Salbutamol (1 strength)
- Fluticasone (2 strengths)
- Salmeterol and Fluticasone Propionate (2 strengths)
- Budenoside (2 strengths)
- Formoterol and Budenoside (2 strengths)
- Triptropium (1 strength)

Total Sun Pharma incremental development cost is estimated as **US$ 660,490**

4.2 Incremental Capital Costs

Detailed description of the baseline equipment and proposed equipment for conversion can be found in Annex 7. The summary is tabulated below (all amounts in US dollars):

Item	Cost
1.5 line manual filling installation	380,000
Pressure filling and preparation vessel	360,000
Custom fabricated Table	20,000
Modifications to existing area	20,000
TOTAL	**780,000**

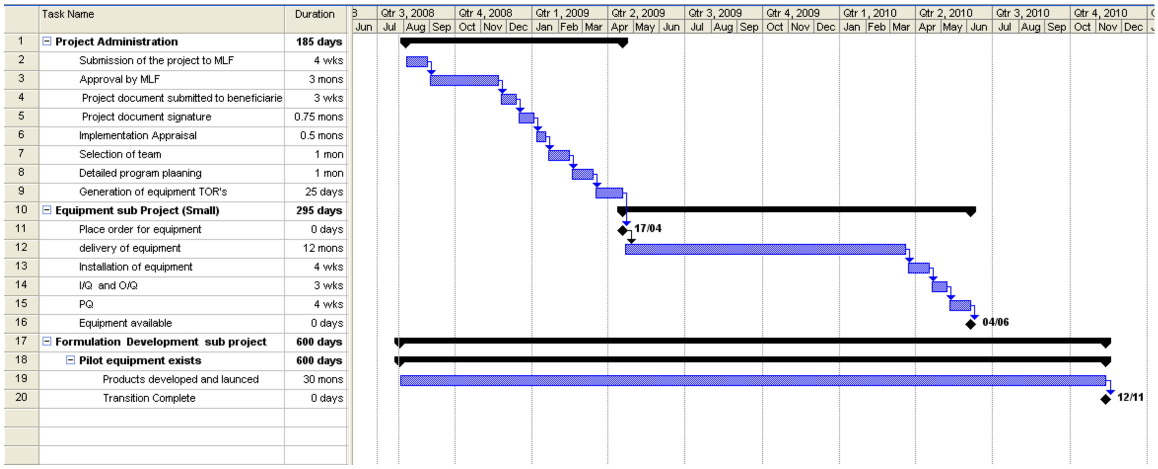
4.3 Incremental Operating costs

Incremental operating costs are calculated based on 2007 production of CFC-based MDIs. The production in 2007 was 387,492 units. No allowance for future growth in production has been factored. Incremental operating costs are calculated for one year duration.

Sun Pharma could not provide a detailed analysis for differences in costs between equivalent CFC and HFA-based MDIs, as they have only limited exposure HFA-based MDIs. In reviewing the cost quotations provided to Sun Pharma, it is evident that costs and overheads are similar to other enterprises within the sector. It is reasonable therefore to assume that resulting cost differences will also be similar. Therefore, based on a weighted average calculation, the incremental cost difference between an equivalent CFC and HFA MDI is approximately Indian Rupees 7.37. This is equivalent to US$ 0.175/unit of CFC-based MDI. Based on the above, the incremental operating costs at Sun Pharma are **US$ 67,811.**

5. PROJECT SCHEDULE

Sun Pharma currently has no equipment suitable to commence development of HFA MDI formulations, therefore complete transition to HFA MDIs and hence the elimination of use of CFCs is dependent on the successful installation and qualification of the equipment referenced in Annex-7 in this proposal. The schedule below takes into account the current equipment procurement lead time in to consideration:



Based on the above, the lead time for conversion at Sun Pharma will be about 24 to 26 months from the date of approval of the project. It will be essential to ensure that appropriate quantities of CFCs are made available, in line with the managed requirements during transition.

ANNEX-2

PROJECT COMPONENT –II: TECHNICAL ASSISTANCE

ANNEX-2

PROJECT COMPONENT-II: TECHNICAL ASSISTANCE

Title:	Technical assistance for implementation of the national strategy for transition to non-CFC MDIs
Implementing Agency:	UNDP
National Coordinating Agency:	Ozone Cell, Ministry of Environment and Forests
Requested Funding:	US$ 350,000
Implementation Timeframe:	January 2009 to December 2012
Impact:	Smooth transition to non-CFC MDIs

Proposed Activities

Technical assistance is proposed to be provided through international experts and, when available, national experts to ensure a smooth transition to the new replacement technology. The experts would need to be process specialists and their functions will include overall technical supervision of conversion projects and technical coordination between equipment/chemical suppliers, beneficiary enterprises and the implementing agency. Their specific responsibilities include:

- Technical assistance for preparing specifications of equipment to be procured in the sub-project
- Technical equipment bid evaluation from suppliers during the competitive bidding process
- Technical guidance to the beneficiary enterprises during start-up with the new equipment and process
- Resolving technical issues with the phase-in of the new equipment and processes
- Technical evaluation of the results of production and product quality trials jointly with the recipient enterprise
- Technical project commissioning including final technical inspection of equipment and process for establishing completion and compliance with project objectives such as the destruction of the baseline CFC-based equipment where applicable, verification of depletion of CFC stocks, and verifying that the non-CFC production process is in operation
- Technical evaluation of enterprise reimbursement claims on equipment, raw materials, local works and other items and certification of the same
- Technical clearance of project completion, so that the project assets can be handed over and the project closed.
- Technical assistance for completion and other reporting requirements.

Budget

Input	Cost (US$)
International Expert(s) Avg. 15 workdays/enterprise X 5 enterprises/year = 300 workdays over 4 years Total 300 workdays @ US$ 600/workday	180,000
National Expert(s) Avg. 15 workdays/enterprise X 5 enterprises = 300 workdays over 4 years Total 300 workdays @ US$ 200/workday	60,000
Expenses (travel, office and miscellaneous reimbursed expenses) over 4 years	110,000
Total:	**350,000**

ANNEX-3

PROJECT COMPONENT –III: SUPPORT FOR POLICY AND REGULATIONS

ANNEX-3

PROJECT COMPONENT-III: SUPPORT FOR POLICY & REGULATIONS

Title:	Support for policy and regulations
Implementing Agency:	UNDP
National Coordinating Agency:	Ozone Cell, Ministry of Environment and Forests
Requested Funding:	US$ 70,000
Implementation Timeframe:	July 2009 to December 2011
Impact:	Revisions to existing regulations for supporting the strategy for sustainable transition to non-CFC MDIs are notified

Proposed Activities

In order to effectively support the transition to non-CFC MDIs, Government of India proposes to consider the following policy and regulatory interventions:

Control of supply of CFC-based MDIs

- Partial licensing of CFC-based MDI manufacturing beyond 2009
- Ban on licensing of any new formulations or products with CFC-based MDIs.
- Ban on import of new CFC-based MDIs. The timing of this measure needs to be aligned with the timing of phase-out of CFCs in MDI manufacturing.

Promotion of CFC-free alternatives

- Fiscal incentives for adopting non-CFC alternatives
- Fast track procedures for approval of non-CFC MDIs

Appropriate amendments to the Ozone Depleting Substances (Regulation and Control) Rules 2000 may also need to be carried out, to align them with the requirements of the national strategy for transition to non-CFC MDIs.

The key stakeholders would be the Ozone Cell, Ministry of Environment & Forests, regulatory authorities from the Ministry of Health & Family Welfare, Ministry of Law, healthcare association and pharmaceutical industry.

The process/steps of implementing these measures would be as below:

- Desk review of existing regulations
- Interaction with stakeholders
- Draft regulations
- Review and consultation meetings of stakeholders
- Finalization and notification

It is expected that the entire process of revising regulations would take approximately 30 months.

Budget

Input	Cost (US$)
Legal advisor (about 120 workdays over 30 months @ US$ 200/workday	24,000
Stakeholder consultation meetings (5 meetings X US$ 5,000 per meeting)	25,000
National seminar on Policy and Regulations (1 seminar X US$ 15,000)	15,000
Documentation, finalization and notification	6,000
Total:	**70,000**

ANNEX-4

PROJECT COMPONENT –IV: SUPPORT FOR AWARENESS AND CAPACITY BUILDING

ANNEX-4

PROJECT COMPONENT-IV: SUPPORT FOR AWARENESS AND CAPACITY-BUILDING

Title:	Support for awareness and capacity building
Implementing Agency:	UNEP
National Coordinating Agency:	Ozone Cell, Ministry of Environment and Forests
Requested Funding:	US$ 350,000
Implementation Timeframe:	July 2009 to July 2012
Impact:	Expedited adoption of non-CFC MDIs for treatment of asthma, COPD and other respiratory ailments

Need Assessment

Awareness and capacity-building actions are considered important and complementary to other initiatives to facilitate quicker adoption of HFA-based MDIs as a reliable treatment for asthma, COPD and other respiratory ailments. Two critical factors would influence quicker market adoption of HFC-based MDIs:

- Prescription of HFC-based MDIs by doctors
- Wide availability of HFC-based MDIs in pharmacies

It is therefore considered necessary to sensitize and engage with stakeholders on the imminent transition to non-CFC MDIs in India, provide adequate information dissemination and training and ensure that non-CFC MDIs are regularly prescribed and widely available.

Stakeholders

Government: Ministry of Environment & Forests, Ministry of Health & Family Welfare and related regulatory authorities such as CDSCO and DCGI and including the Pharmacy Council of India, which regulates Pharmacy education in India.

Research Institutions: Indian Council of Medical Research, one of the oldest medical research bodies in the world, functions as an apex research and advisory body to Government for control and management of diseases.

Educational Institutions: The Vallabhbhai Patel Chest Institute in Delhi is a unique and preeminent medical institution dedicated to study and treatment of chest diseases, funded entirely by the Ministry of health and Family Welfare.

Medical Associations: The Indian Medical Association (IMA) is the only representative voluntary association of medical practitioners of modern medicine and has a membership of about 100,000 doctors with over 1,200 branches spread nationwide

Industry Associations: The Indian Pharmaceutical Association is the premier association of pharmacists in India, engaged in continuing education and training, good practices, and updating knowledge on technology, research and regulations.

	The Indian Drug Manufacturers Association (IDMA) is the premier representative association of the pharmaceutical manufacturers in India.
Other Organizations:	Such as the Indian Chest Society and National College of Chest Physicians are dedicated to disseminating knowledge and conducting training programs on management of Asthma and COPD.

Proposed Activities

The proposed activities for promoting awareness of the imminent transition to non-CFC MDIs would comprise of the following:

- Information dissemination and awareness through seminars and workshops
- Development and distribution of promotional materials
- Promoting public awareness

The activities would require an active engagement of all stakeholders described above for maximum effectiveness and outreach.

Budget

Input	Cost (US$)
Regional workshops for medical practitioners (5 X US$10,000)	50,000
Regional workshops for pharmacists (5 X 10,000)	50,000
Training and information materials on non-CFC MDIs and transition	50,000
Public awareness materials including advertisements	150,000
Sub-contract for design and development of awareness materials	50,000
Total:	**350,000**

ANNEX-5

PROJECT COMPONENT –V: SUPPORT FOR MANAGEMENT AND MONITORING

ANNEX-5

PROJECT COMPONENT-V: SUPPORT FOR MANAGEMENT AND MONITORING

Title:	Support for management and monitoring
Implementing Agency:	UNDP
National Coordinating Agency:	Ozone Cell, Ministry of Environment and Forests
Requested Funding:	US$ 400,000
Implementation Timeframe:	January 2009 to December 2012
Impact:	Timely project implementation, monitoring and reporting

Need Assessment

The implementation of the national strategy for transition to non-CFC MDIs will need to be closely aligned and coordinated with the various policy, regulatory, awareness and capacity-building actions the Government of India is taking and will need to take in future, in order to ensure that the implementation of the strategy is consistent with the Country Programme principles and with the National Health Policy. Further, in view of the time-bound targets needed to be achieved the implementation of the Plan will need to be closely and efficiently managed and will introduce additional coordinating, reporting and monitoring activities.

Proposed Activities

The implementation of the strategy will be managed by a dedicated management team, comprising of a coordinator to be designated by the Ozone Cell and supported by representatives and experts from the implementing/executing agencies and the necessary support infrastructure. The management component of the strategy will include the following activities, for the duration of the Plan:

- Establishment and operation of the management unit
- Coordination of the implementation of various components of the strategy, with the required Government policy and regulatory actions
- Progress/status reporting including management of databases
- Coordination of enterprise-level implementation and phase-out activities
- Establishment and operation of a decentralized mechanism for monitoring and evaluation of Plan outputs, in association with the relevant regulatory bodies
- Verification and certification of CFC phase-out at the enterprise level

Budget

Input	Cost (US$)
Personnel costs including two support staff (4 years)	200,000
Infrastructure costs	20,000
Operational costs	100,000
Independent verification and reporting (US$ 15,000/year for 4 years)	80,000
Total:	**400,000**

ANNEX-6

LETTERS OF COMMITMENT FROM BENEFICIARY ENTERPRISES

Zydus
dedicated to life

Cadila
Healthcare Limited

Sarkhej-Bavla N. H. No. 8A,
Moraiya. Tal. : Sanand,
Dist. : Ahmedabad 382 210. India.
Phone : +91-2717-250331/32/36/37
Fax : +91-2717-250319
www.zyduscadila.com

LETTER OF COMMITMENT

I, Shirsh G. Belapure – President Manufacturing, on behalf of *Cadila Healthcare Limited, Ahmedabad, India* do hereby declare and affirm as below:

THAT we have read and reviewed the project proposal prepared by UNDP, for conversion of our CFC-based MDI manufacturing facilities to non-CFC-based technology at *Cadila Healthcare Limited Ahmedabad, India*;

THAT we have been briefed on and understood the various rules and criteria of the Multilateral Fund for the Implementation of the Montreal Protocol, governing costs, technology, eligibility, funding and counterpart financing;

THAT we are in agreement with the proposed technology conversions, the estimated costs, the proposed funding levels and implementation schedules;

THAT we undertake to implement the conversion to non-CFC-based MDI products and to phase-out the use of CFCs in manufacturing MDIs in accordance with the transition schedule as proposed and also undertake not to revert to use of CFCs in future in any of our MDI manufacturing facilities;

THAT we understand that the proposal will be submitted to the next meeting of the Executive Committee of the Multilateral Fund for its consideration, that the proposal may be subject to funding negotiations between the Executive Committee and Government of India and the net funding that would be actually provided could be lesser than that indicated in the proposal;

THAT we agree to abide by the rules and regulations that may be promulgated by Government of India in context of this project and in context of MDIs in India;

THAT we would abide by the UNDP and Government of India rules and regulations pertaining to finance/accounting, procurement, project management, monitoring and reporting during the implementation stage of the project.

Place: Ahmedabad
Date: 29/07/2008

For and on behalf of *Cadila Healthcare Limited*

Shirsh G. Belapure – President Manufacturing
Authorized Signatory

Cipla

Cipla Ltd.
C-1 Pooja Apts, 17 Hariyali Estate,
Vikhroli (West), Mumbai 400 083.
Tel. : (91-22) 25786604, 25786605,
25784195, 25783843
Fax : (91-22) 25795025

LETTER OF COMMITMENT

I, **R.M. Nikam, Director Supply Chain**, on behalf of **Cipla Ltd, Mumbai (India)**, do hereby declare and affirm as below:

THAT we have been briefed on and understood the various rules and criteria of the Multilateral Fund for the Implementation of the Montreal Protocol, governing costs, technology, eligibility, funding and counterpart financing;

THAT we are in agreement with the proposed technology conversions, the estimated costs, the proposed funding levels and implementation schedules;

THAT we undertake to implement the conversion to non-CFC-based MDI products and to phase–out the use of CFCs in manufacturing MDIs.

THAT we hereby, commit to phase-out the usage of CFC in MDIs by December, 2012. However, till then, the quantities which have been projected year-wise as contained in our project report will be used.

NOTWITHSTANDING what is stated in above paragraphs, we will do our best to phase-out CFC at the earliest possible.

THAT we understand that the proposal will be submitted to the next meeting of the Executive Committee of the Multilateral Fund for its consideration, that the proposal may be subject to funding negotiations between the Executive Committee and Government of India and the net funding that would be actually provided could be lesser than that indicated in the proposal;

THAT we agree to abide by the rules and regulations that may be promulgated by Government of India in context of this project and in context of MDIs in India;

THAT we would abide by the UNDP and Government of India rules and regulations pertaining to finance/accounting, procurement, project management, monitoring and reporting during the implementation stage of the project.

Place: Mumbai

Date: 12.08.2008

For and on behalf of **CIPLA LIMITED**

Rmnikam

R M NIKAM
DIRECTOR – SUPPLY CHAIN

GlaxoSmithKline

GlaxoSmithKline
Pharmaceuticals Limited
A - 10, M.I.D.C.
Ambad-Pathardi Block,
Nashik-422 010. INDIA.

Tel. : 0253-2300346 / 2300404
Fax : 0253 - 2381274

LETTER OF COMMITMENT

I, ***Bhanwar Singh Yadav, Vice President, Nashik factory***, on behalf of ***M/s GlaxoSmithkline Pharmaceuticals Ltd.,*** do hereby declare and affirm as below:

THAT we have read and reviewed the project proposal prepared by UNDP, for conversion of our CFC-based MDI manufacturing facilities to non-CFC-based technology at ***GlaxoSmithkline Pharmaceuticals Ltd. ;***

THAT we have been briefed on and understood the various rules and criteria of the Multilateral Fund for the Implementation of the Montreal Protocol, governing costs, technology, eligibility, funding and counterpart financing;

THAT we are in agreement with the proposed technology conversions, the estimated costs, the proposed funding levels and implementation schedules;

THAT we undertake to implement the conversion to non-CFC-based MDI products wherever applicable and to phase-out the use of CFCs in manufacturing MDIs in accordance with the transition schedule as proposed and also undertake not to revert to use of CFCs in future in any of our MDI manufacturing facilities;

THAT we understand that the proposal will be submitted to the next meeting of the Executive Committee of the Multilateral Fund for its consideration, that the proposal may be subject to funding negotiations between the Executive Committee and Government of India and the net funding that would be actually provided could be lesser than that indicated in the proposal;

THAT we agree to abide by the rules and regulations that may be promulgated by Government of India in context of this project and in context of MDIs in India;

THAT we would abide by the UNDP and Government of India rules and regulations pertaining to finance/accounting, procurement, project management, monitoring and reporting during the implementation stage of the project.

Place: Nashik
Date: 7th August 2008

For and on behalf of GlaxoSmithkline Pharmaceuticals Ltd.

Byadav

Bhanwar Singh Yadav
Vice President, Nashik factory
Authorized Signatory

भारत सरकार
पर्यावरण एवं वन मंत्रालय
ओज़ोन सेल
Government of India
Ministry of Environment and Forests
Ozone Cell

सत्यमेव जयते

DR. A. DURAISAMY
Director, Ozone Cell

D. O. No. 38/1/2008-OC

Dated : 1st October, 2008

Dear Mr. Chirmulay,

This is to acknowledge receipt of India's proposal for the National Strategy for Transition to non-CFC MDIs and Plan for phase-out of CFCs in pharmaceutical MDIs in India. The document was reviewed by us and subject to our comments as indicated in our message dated 25th September 2008, our concurrence to the contents is confirmed. I hereby request UNDP for its assistance in submission of this proposal to the 56th meeting of the Executive Committee.

With Kind regards,

Yours sincerely,

(A. DURAISAMY)

Mr. Nandan Chirmulay
Regional Coordinator
Montreal Protocol/Chemicals Unit
Environment and Energy Group
UNDP-Thailand
Regional Center in Bangkok, UN Services
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ज़ोन चार बी, द्वितीय मंजिल, इंडिया हैबिटाट् सैंटर,
लोदी रोड़, नई दिल्ली-110003
Core-4B, 2nd Floor, India Habitat Centre,
Lodhi Road. New Delhi - 110 003

SAVE OUR OZONE LAYER

Phone : 24642176, 24602601, 24601533
Fax : 91-11-24642175
e-mail : ozone@del3.vsnl.net.in
web : ozonecell.com

Midas-Care
We Care

MIDAS-Care
PHARMACEUTICALS PVT LTD
Papa Industrial Estate, 40 Suren Road
Andheri (East), Mumbai 400 093
Tel : 2683 5678, 2683 3409
Fax : 91 22 2683 7947
E-mail : aerosol@vsnl.com

LETTER OF COMMITMENT

I, **Ms Sangithaa Gupta**, **Managing Director**, on behalf of **Midas-Care Pharmaceuticals Pvt. Ltd.** do hereby declare and affirm as below:

THAT we have read and reviewed the project proposal prepared by UNDP, for conversion of our CFC-based MDI manufacturing facilities to non-CFC-based technology at **Midas-Care Pharmaceuticals Pvt.Ltd. ;**

THAT we have been briefed on and understood the various rules and criteria of the Multilateral Fund for the Implementation of the Montreal Protocol, governing costs, technology, eligibility, funding and counterpart financing;

THAT we are in agreement with the proposed technology conversions, the estimated costs, the proposed funding levels and implementation schedules;

THAT we undertake to implement the conversion to non-CFC-based MDI products and to phase-out the use of CFCs in manufacturing MDIs in accordance with the transition schedule as proposed and also undertake not to revert to use of CFCs in future in any of our MDI manufacturing facilities;

THAT we understand that the proposal will be submitted to the next meeting of the Executive Committee of the Multilateral Fund for its consideration, that the proposal may be subject to funding negotiations between the Executive Committee and Government of India and the net funding that would be actually provided could be lesser than that indicated in the proposal;

THAT we agree to abide by the rules and regulations that may be promulgated by Government of India in context of this project and in context of MDIs in India;

THAT we would abide by the UNDP and Government of India rules and regulations pertaining to finance/accounting, procurement, project management, monitoring and reporting during the implementation stage of the project.

Place: Mumbai
Date: July 26, 2008

For and on behalf of Midas-Care Pharmaceuticals Pvt Ltd.

Sangithaa

Ms Sangithaa Gupta, Managing Director
Authorized Signatory

MIDAS CARE PHARMACEUTICALS PVT. LTD.
MUMBAI

17-B, Mahal Industrial Estate,
Mahakali Caves Road, Andheri (E),
Mumbai - 400 093. India.
Tel. : (91-22) 6645 5645
Fax : (91-22) 6645 5685

SUN PHARMACEUTICAL INDUSTRIES LTD.

LETTER OF COMMITMENT

I, Mr. Kirti Ganorkar, Vice President (Business Development) , on behalf of Sun Pharmaceutical Industries Limited do hereby declare and affirm as below:

THAT we have read and reviewed the project proposal prepared by UNDP, for conversion of our CFC-based MDI manufacturing facilities to non-CFC-based technology at Sun Pharmaceutical Industries Limited

THAT we have been briefed on and understood the various rules and criteria of the Multilateral Fund for the Implementation of the Montreal Protocol, governing costs, technology, eligibility, funding and counterpart financing;

THAT we are in agreement with the proposed technology conversions, the estimated costs, the proposed funding levels and implementation schedules;

THAT we undertake to implement the conversion to non-CFC-based MDI products and to phase-out the use of CFCs in manufacturing MDIs in accordance with the transition schedule as proposed and also undertake not to revert to use of CFCs in future in any of our MDI manufacturing facilities;

THAT we understand that the proposal will be submitted to the next meeting of the Executive Committee of the Multilateral Fund for its consideration, that the proposal may be subject to funding negotiations between the Executive Committee and Government of India and the net funding that would be actually provided could be lesser than that indicated in the proposal;

THAT we agree to abide by the rules and regulations that may be promulgated by Government of India in context of this project and in context of MDIs in India;

THAT we would abide by the UNDP and Government of India rules and regulations pertaining to finance/accounting, procurement, project management, monitoring and reporting during the implementation stage of the project.

Place: Mumbai
Date: 29th July, 2008

For and on behalf of Sun Pharmaceutical Industries Ltd.,

Kirti Ganorkar
(Vice President -Business Development)