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EXECUTIVE COMMITTEE OF
THE MULTILATERAL FUND FOR THE
IMPLEMENTATION OF THE MONTREAL PROTOCOL
Forty-ninth Meeting
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**OPTIONS FOR ADDRESSING THE SITUATION OF COUNTRIES REFERRED TO
IN DECISION XVII/14 OF THE SEVENTEENTH MEETING OF THE PARTIES
(FOLLOW-UP TO DECISION 48/36)**

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

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I. INTRODUCTION

1. At their 17th Meeting, the Parties to the Montreal Protocol discussed the difficulties faced by some Article 5 Parties with respect to the phase-out of CFCs used in the manufacture of metered-dose inhalers (MDIs). In decision XVII/14 (see Annex I for full text), the Parties expressed their concern that Article 5 Parties which manufacture CFC-based MDIs might find it difficult to phase out these substances without incurring economic losses to their countries, and that there is a serious risk that, for some Article 5 Parties consumption levels in 2007 of CFCs for MDIs may exceed the amounts allowed under the Protocol. Subsequently the Parties decided, among other things, to consider at their 18th Meeting a possible decision which would address the difficulties that some Article 5 Parties may face in relation to MDIs, and requested the Executive Committee to examine situations such as these and consider options that might assist this potential situation of non-compliance.

2. In response to decision XVII/14, the Executive Committee decided, at its 48th Meeting, to request the Fund Secretariat, in consultation with the implementing agencies, to prepare a paper for submission to the 49th Meeting, outlining options for addressing the situation of countries referred to in decision XVII/14 (decision 48/36).

Scope of the paper

3. The Secretariat has prepared this paper in response to the above-mentioned decisions taken by the Parties and the Executive Committee. Accordingly, it examines the specific circumstances of some Article 5 Parties with MDI manufacturing plants that might be at a serious risk of not meeting the control measures on CFC consumption in 2007. The paper does not address potential non-compliance issues in relation to the complete phase-out of CFCs in 2010.

Terms of reference

4. For the preparation of this paper, the Secretariat hired an industry expert (the expert) who has been actively involved in pharmaceutical and aerosol research and development of inhalation technology and has been a member of the UNEP Medical Technical Options Committee since 1996. The same expert assisted the Secretariat in the preparation of draft guidelines for MDI projects that were submitted for consideration by the Executive Committee at its 37th Meeting.

5. In order to collect relevant and current information on the MDI sub-sector at the country level, the Secretariat prepared specific questionnaires and sent them to 138 Article 5 Parties¹. Little information on the MDI sector could be extracted from the returned questionnaires since only 15 responses were received and, in many cases, the information was incomplete. Therefore, other sources of information were used to describe the MDI sub-sector in Article 5 Parties. These sources included: national phase-out plans under current implementation, reports submitted by Article 5 Parties to the Ozone Secretariat pursuant to decision XIV/5², the May 2006 Progress

¹ The following Article 5 countries that have agreed or were urged not to seek assistance from the Multilateral Fund have not been considered in this paper: Republic of Korea, Saudi Arabia, Singapore, South Africa and United Arab Emirates. South Africa manufactures MDIs.

² The 22 Article 5 Parties that have submitted data pursuant to decision XIV/5 are: Argentina, Belize, Bosnia and Herzegovina, Brazil, China, Croatia, Cuba, Eritrea, Georgia, Guyana, India, Indonesia, Jamaica, Macedonia, Malaysia, Mauritius, Moldova, Namibia, Oman, Romania, Sri Lanka, and Uruguay.

Report of the Technology and Economic Assessment Panel (TEAP), ODS data reported under the implementation of the country programme, and industry sources and databases provided by the expert.

Outline

6. This paper consists of the following sections:

Section I: Introduction

Section II: Relevant issues associated with the manufacturing of MDIs

Section III: An overview of the MDI sub-sector in Article 5 Parties

Section IV: Options for addressing difficulties that some Article 5 Parties may face in relation to MDIs

Section V: Conclusions and recommendations

Relevant decisions on MDIs

7. As early as their 8th Meeting (November 1996), the Parties to the Montreal Protocol began adopting decisions related to the MDI sub-sector. Annex I to the present report contains all the decisions on MDIs that have been adopted so far by the Parties and the Executive Committee.

II: RELEVANT ISSUES ASSOCIATED WITH THE MANUFACTURING OF MDIs

Manufacturing of MDIs

8. The MDI is a complex system designed to provide a fine mist of medication (the active ingredient), for inhalation directly into the airways to treat respiratory diseases such as asthma or chronic obstructive pulmonary disease (COPD), and to deliver drugs to the nasal passages. Historically the propellants used in MDIs are CFCs (CFC-12 and CFC-11, and sometimes CFC-114), and more recently HFC-134a and HFC-227ea (in the pharmaceutical sub-sector, HFC is referred to as HFA).

9. The CFC-MDI technology was first introduced in 1956 by Riker Laboratories in the United States. Since then, the use of MDIs in the treatment of asthma and COPD has been gaining acceptance. In March 1995, the first HFA-based MDI for salbutamol was introduced in the United Kingdom by one pharmaceutical company³. By the end of 1996, this HFA-MDI was available in several Article 5 and non-Article 5 Parties. A second pharmaceutical company introduced HFA-MDIs for salbutamol in Europe in 1997. In 2000, a nationally-owned MDI manufacturing company in an Article 5 country launched CFC-free inhalers⁴.

³ 3M.

⁴ The Chemical, Industrial and Pharmaceutical Laboratories, popularly known as Cipla established in India in 1935 (www.cipla.com).

10. Based on information reported by the International Pharmaceutical Aerosol Consortium (IPAC)⁵, today approximately 50 per cent of the MDIs used worldwide are based on CFC propellants. However, this situation is changing rapidly, and it is anticipated that there will be little need for CFC-MDIs in non-Article 5 Parties by the end of 2008. As of today, there is at least one HFA-MDI approved and marketed in more than 110 countries⁶.

Technology transfer

11. Based on a survey of formulation patents that have been prosecuted by multi-national companies in Article 5 Parties comprising the top ten users of MDIs by volume, TEAP has concluded that it does not appear that formulation patents will constitute a major barrier to the introduction of CFC-free MDIs⁷. Therefore, the most likely impediment to successful technology transfer in Article 5 Parties will be access to skilled technical consultants with the expertise to develop and implement HFA-MDI production and analysis.

12. One option for countries that do not yet have the HFA products widely available could be a license arrangement with a pharmaceutical company that has developed those products. These countries might be able to achieve access sooner and less expensively through the provision of a royalty payment rather than through *ab-initio* product development⁸.

13. In countries where no patent coverage exists or the patents are not enforceable, access to technology could be granted in exchange for a greater market presence (i.e. by establishing a joint venture in that country) that would provide a sufficient incentive to the pharmaceutical company with developed products to find such arrangements attractive. The magnitude of payments for this type of “enabling” technology is usually in the order of a small percentage of sales or it could come in the form of a share of revenue from sales of the already developed product. Relevant issues related to industrial processes involved in the manufacturing of MDIs, including technology transfers and costs, are discussed in greater detail in Annex II to the present paper

Availability of pharmaceutical-grade CFC propellant⁹

14. Between 2007 and 2009, CFC production will be limited to a few Article 5 Parties and certain non-Article 5 Parties to satisfy the basic domestic needs of Article 5 Parties and for any

⁵ The member companies of IPAC are: AstraZeneca, Boehringer Ingelheim, Chiesi Farmaceutici, GlaxoSmithKline, Inyx, Inc., and Sepracor.

⁶ More recently available HFA-MDIs include: beclomethasone, budesonide, fluticasone, di-sodium cromoglycate and nedocromil sodium. Table 1 in Annex II shows the availability of non-CFC based asthma and COPD medications worldwide.

⁷ May 2006 TEAP Progress Report.

⁸ Possible arrangements for access to these products could include: supply of the finished product; transfer of the technology to the Article 5 company for local production; and/or a joint venture established to produce the alternate products locally.

⁹ The availability of CFCs in Article 5 countries during the period 2004-2010 was considered by the Parties at their 17th Meeting, based on a report prepared by TEAP pursuant to their decision XV/2. In its report, the TEAP indicated that, on the basis of the analysis performed, it could not make definite recommendations for CFC basic domestic needs production volumes and concluded “that there seems no reason to make changes to the non-Article 5(1) basic domestic needs amounts, which are forecast to be produced. Next to precise monitoring, this will need further analysis in the near future”.

exempted uses in non-Article 5 countries (e.g., laboratory and analytical uses and MDIs¹⁰). Limitations on CFC production up to 2010 can be assessed as follows:

- (a) According to relevant agreements between Article 5 Parties with CFC production facilities and the Executive Committee, after 2006 CFC production will be limited to Argentina (annual production of 686 ODP tonnes between 2007 and 2009), China (production of 12,000 to 13,000 ODP tonnes in 2006 and cease production by July 2007, except for 800 ODP tonnes for MDI production), and India (annual production of 3,389 ODP tonnes between 2007 and 2009). There is no indication whether these CFCs could be used for production of MDIs;
- (b) Preliminary figures for total aggregated production levels of pharmaceutical-grade CFC by Spain are 3,250 metric tonnes for the period 2006-2009. These amounts are for MDI production facilities in both Article 5 and non-Article 5 Parties;
- (c) CFC production levels have been established by the Government of the United States to satisfy basic domestic needs of Article 5 Parties¹¹ as follows: a total of 172.817 metric tonnes of CFCs (CFC-11, CFC-113 and CFC-114) for 2006, and a total of 51.8451 metric tonnes of CFCs for each year in the period 2007-2009. The allowances for this production are tradable between CFCs. There is no indication whether these CFCs could be used for production of MDIs;
- (d) The overall supply situation for pharmaceutical-grade CFCs could become more critical depending upon what further action the Parties to the Montreal Protocol may take on the production of CFCs by non-Article 5 Parties for the basic domestic needs of Article 5 Parties.

15. Depending upon operational parameters, the percentage of CFC production that does not meet the specifications required by MDI manufacturers is between 25 and 50 per cent of total production. Currently, CFCs that do not meet pharmaceutical specifications can be used for non-MDI basic domestic needs. However, this will not be possible after 2009, when non-pharmaceutical grade CFCs would need to be destroyed. Therefore, the economics of CFC production may make it impractical to continue producing pharmaceutical-grade CFCs for MDI production in Article 5 Parties on the assumption that CFC-MDI may be deemed as essential uses by the Parties for Article 5 Parties with manufacturing facilities.

16. The use of CFC stockpiles or recycled CFCs for manufacturing MDIs has major constraints. Some MDI manufacturing plants in non-Article 5 Parties have established storage facilities for strategic reserves of CFCs¹². The material from such stockpiles has generally met specifications and been suitable for use. However, there have been previous instances of substantial quantities of CFCs becoming contaminated during storage and not meeting specifications for use in pharmaceutical applications or encountering problems related to odour, particularly for CFC-12. A study carried out on behalf of IPAC in 1993¹³ concluded that because

¹⁰ In 2005, 2,699 tonnes of CFCs were used by non-Article 5 countries for the manufacture of MDIs under essential use exemptions. For 2006 and 2007, additional 2,050 and 1,778 metric tonnes of CFCs have already been requested respectively for MDI production (Source: May 2006 TEAP Progress Report).

¹¹ Rule 40 CFR Part 82 issued by the Environmental Protection Agency.

¹² 2002 ATOC Report.

¹³ 2002 ATOC Report.

of the very complex nature of the contaminants and their number present in recycled CFCs, it is impractical to develop commercial facilities to purify used CFCs to pharmaceutical standards (no further work has been reported on this issue).

III: OVERVIEW OF THE MDI SUB-SECTOR IN ARTICLE 5 PARTIES

Manufacturing of MDIs in Article 5 Parties

17. On the basis of the information analyzed by the Secretariat, MDIs are manufactured in 16 Article 5 Parties¹⁴, with a total consumption of 1,875 metric tonnes of CFCs (equivalent to a production of over 75 million MDIs). About 68 per cent of this consumption (1,285 ODP tonnes) is by nationally-owned manufacturing companies (equivalent to a production of some 51 million MDIs). It is assumed that any MDIs consumed in the other Article 5 Parties that receive assistance from the Multilateral Fund are imported.

18. Table 1 below provides relevant information on CFC consumption in these 16 countries. In order to address the specific requirements of decisions XVII/14 and 48/36, the Secretariat compared the allowable level of consumption in 2007 with the estimated level of CFC consumption used for the manufacturing of MDIs.

Table 1: Article 5 Parties with significant MDI manufacturing

No	Country	2007 allowable CFC consumption	CFC consumption for MDIs		Ratio CFC for MDI/CFC allowed	
			Total	Nationally-owned	Total ratio	Eligible ratio
	(a)	(b)	(c)	(d)	(e) = (c)/(b)	(f) = (d)/(b)
1	Argentina	704.59	187.69	130.85	26.64%	18.57%
2	Bangladesh	87.24	61.81	51.40	70.85%	58.92%
3	Brazil	1,578.87	153.25	1.53	9.71%	0.10%
4	China	8,672.81	431.50	369.00	4.98%	4.25%
5	Colombia	331.23	31.00	1.80	9.36%	0.54%
6	Cuba	93.77	109.00	109.00	116.24%	116.24%
7	Egypt	250.20	154.00	154.00	61.55%	61.55%
8	India	1,002.16	375.00	300.00	37.42%	29.94%
9	Indonesia	1,249.90	30.10	30.10	2.41%	2.41%
10	Iran	685.75	98.00	98.00	14.29%	14.29%
11	Jordan	100.99	5.00	5.00	4.95%	4.95%
12	Mexico	693.73	47.00	0.94	6.77%	0.14%
13	Pakistan	251.91	85.77	19.57	34.05%	7.77%
14	Philippines	458.38	30.00	1.80	6.54%	0.39%
15	Turkey	570.86	65.00	-	11.39%	0.00%
16	Uruguay	29.86	10.00	10.00	33.49%	33.49%
	Total		1,874.12	1,282.99		

(a) Article Parties with CFC-MDI manufacturing plants.

(b) CFC consumption allowable in 2007, equivalent to 15 per cent of the CFC baseline consumption as reported under Article 7 of the Montreal Protocol.

(c) Total amount of CFC used for the manufacturing of MDIs by national and multi-national companies. For several countries, this information has been extracted from the 2002 ATOC Report

(d) Amount of CFC used for the manufacturing of MDIs by nationally-owned companies (i.e., excluding consumption by multi-national companies).

¹⁴ MDIs are also manufactured in South Africa, with an estimated total CFC consumption of 71 metric tonnes (18 tonnes by nationally owned companies).

19. A detailed description of the MDI sub-sector in these countries is contained in Annex III to the present document.

Relevant observations

20. The following observations are relevant to the 16 countries where MDIs are locally produced:

- (a) In 9 countries (Brazil, China, Colombia, Indonesia, Iran, Jordan, Mexico, Philippines and Turkey) the total consumption of CFCs by national and multi-national companies for the manufacturing of MDIs is less than 15 per cent of the allowable CFC consumption in 2007. Except for Iran¹⁵, the CFC consumption used by national companies in these countries is lower than 5 per cent of the 2007 allowable CFC consumption;
- (b) In 4 countries (Argentina, India, Pakistan and Uruguay), the total consumption of CFCs for manufacturing MDIs is between 15 and 40 per cent of the 2007 allowable consumption;
- (c) In 2 countries (Egypt¹⁶ and Bangladesh), the total consumption of CFCs for manufacturing MDIs is between 60 and 80 per cent of the allowable consumption of CFCs in 2007;
- (d) Four countries (Argentina, China, Egypt and Indonesia) have approved national and/or sectoral plans for the complete phase-out of CFCs excluding additional amounts used for the manufacturing of MDIs. The amount of CFCs used by these countries for MDI production represents about 42 per cent of the total MDI-related CFC consumption in Article 5 Parties¹⁷;
- (e) Cuba and Uruguay have approved investment projects for the complete phase-out of CFCs used in the production of MDIs. The expected completion dates for these projects are March 2008 for Cuba and July 2007 for Uruguay. Cuba is the only country where the total CFC consumption used in the manufacturing of MDIs is above the eligible CFC consumption level for 2007. UNDP has reported that “in order to maintain compliance with the Montreal Protocol obligations on CFCs, Cuba and UNDP are working to have the MDI plant in operation before mid-2007. The engineering works are ongoing and the equipment is expected to be installed in December 2006. If the production of MDI can start in early 2007, there will be a substantive reduction in the need for CFC for 2007. Compliance in 2008 will be easier as the MDI plant will be fully operational and there will be no need for CFC (only at minimum levels, if any)”;

¹⁵ Funding for the preparation of a CFC phase-out project in the MDI sub-sector was approved by the Executive Committee at its 47th Meeting, on the understanding that the approval was an exception and should in no way set a precedent for opening agreements between the Executive Committee and a country regarding limits on further funding.

¹⁶ Funding for the preparation of a CFC phase-out project in the MDI sub-sector was approved by the Executive Committee at its 45th Meeting.

¹⁷ Funding for the phase-out of CFC used in these countries has been taken into account in the 2006-2008 replenishment of the Multilateral Fund.

- (f) Assistance for addressing the MDI sub-sector in Brazil, Colombia and the Philippines has been funded within the respective national CFC phase-out plans under current implementation. In its phase-out plan¹⁸ and its country programme update¹⁹ (submitted to the 49th Meeting of the Executive Committee) the Government of India has stated that it would not submit any MDI-related requests for funding to the Fund. Similarly, the Government of Mexico in its phase-out plan²⁰ stated that it will manage to phase-out the MDI usage of CFCs without any assistance from the Fund; and
- (g) Four countries (Bangladesh, Colombia, Iran and Jordan) with approved national and/or sectoral plans for the complete phase-out of CFCs have recently reported CFC consumption for the production of MDIs by national companies.

21. Additionally, the Secretariat discovered that:

- (a) The second-largest pharmaceutical company by market share in India launched CFC-free inhalers in 2000²¹. Currently, the company is selling both CFC and HFA-MDIs to several Article 5 and non-Article 5 Parties; and
- (b) The leading manufacturer of MDIs in Bangladesh (covering 75 per cent of the country's demand) has commenced conversion of its MDI plant to manufacture HFA-MDIs (with the technical collaboration of Bepak Europe). Conversion is scheduled to be completed during the third quarter of 2006²².

22. From the above analysis the Secretariat concluded that the only countries that might be at serious risk of not meeting the levels of CFC consumption allowed under the Protocol in 2007, because of the quantities of CFCs used in MDI manufacturing, are Bangladesh and Egypt.

IV: OPTIONS FOR ADDRESSING DIFFICULTIES THAT ARTICLE 5 PARTIES MAY FACE IN RELATION TO MDIs

2007 compliance-related issue

23. Despite widespread educational initiatives in non-Article 5 countries, transition to non-CFC-MDIs does not appear to have a high priority among many healthcare providers, who are generally the point of contact with patients who take these medicines. Thus, pharmaceutical companies' educational and marketing endeavours have, for the most part, been the driving force in the uptake of non-CFC alternatives. This is also likely to be the case in many Article 5 countries.

24. For all Article 5 Parties that do not have an MDI manufacturing plant, or where MDIs are locally manufactured but predominantly by multi-national companies, national transition

¹⁸ UNEP/OzL.Pro/ExCom/42/33.

¹⁹ UNEP/OzL.Pro/ExCom/49/37.

²⁰ UNEP/OzL.Pro/ExCom/42/39.

²¹ Following the successful introduction of CFC-free salbutamol inhaler, Cipla also launched the world's first CFC-free budesonide inhaler (Source The Director's Sixty-Fourth Annual Report of the Company and Audited Accounts for the year ended 31st March 2000).

²² www.beximcopharma.com. Copy of the press release issued on 2 May 2006 is attached as Annex IV to this paper.

approaches may not have a large impact in the absence of support from the multi-national MDI manufacturers or importers²³. Multi-national pharmaceutical companies will switch their CFC products by introducing HFA-MDIs, quickly evaluating their acceptance in the marketplace and then ceasing the supply of the corresponding CFC product. In the absence of any government-driven legislation, this is a very effective approach for the adoption of non-CFC MDIs in Article 5 Parties that do not have MDI manufacturing plants. This transition will be driven by the desire of pharmaceutical companies to introduce products globally once they have been developed. Furthermore, as pharmaceutical-grade CFCs become less available, multi-national companies will rapidly introduce already-developed non-CFC alternatives in Article 5 Parties.

The case of Bangladesh and Egypt

25. As concluded from the previous section of the paper, Bangladesh and Egypt appeared to be the only two Article 5 Parties with CFC-MDI production that would appear to be at serious risk of not meeting the Protocol's CFC consumption controls in 2007.

26. It is important to note that:

- (a) CFCs will continue to be used in Bangladesh and Egypt up to 2009, mainly in the refrigeration servicing sector and for the production of MDIs;
- (b) Availability of MDIs will continue to be important, to protect patient's health;
- (c) Essential use exemptions will not be applicable to Article 5 Parties under the terms of decision IV/25 until the phase-out dates applicable to those Parties are reached (i.e., 2010 for CFCs); and
- (d) Due to the very limited time available prior to 2007, and on the basis that the average implementation time for conversion of MDI manufacturing plants to a non-CFC-based technology could be between 2 and 3 years, assistance provided by the end of 2006 or in 2007 would be too late to enable the two Parties to address their potential compliance difficulties with the 2007 CFC reduction target, irrespective of any conclusions on the eligibility of funding. In view of this situation, urgent activities to accelerate the phase-out of CFCs in sectors such as refrigeration servicing need to be considered (i.e., the introduction of non-CFC drop-in refrigerants for servicing refrigeration equipment and/or cost-effective equipment retrofits).

27. Therefore, the compliance-related risks faced by Bangladesh and Egypt may need to be referred to the Parties to the Montreal Protocol in the context of consideration of quantities of CFCs that may be reported by those countries in due course as having been consumed in 2007 above the control levels.

²³ Experience in non-Article 5 countries, where supply of CFC MDIs comes primarily from multi-national companies, is that CFC-free alternatives (MDIs or DPIs) can be introduced promptly within the regulatory framework of the country, and the corresponding CFC MDIs phased out.

Additional considerations

28. Any further actions that the Executive Committee may wish to undertake in relation to the phase out of CFCs used in the manufacture of MDIs in Article 5 Parties would be likely to affect compliance only in 2010, due to the relatively low levels of CFCs used in pharmaceutical applications in these countries (except for Bangladesh and Egypt). However, if the option of providing financial assistance for CFC phase-out in MDIs was to be considered more broadly for Article 5 Parties²⁴, the following would need to be taken into account:

Date of establishment of the production line

29. Through its decision 17/7 the Executive Committee decided, in the light of technological advances, not to consider any projects to convert any ODS-based capacity installed after 25 July 1995. Since the adoption of decision 17/7, no funding from the Multilateral Fund has been provided for the conversion of any new ODS-based manufacturing facility established after 25 July 1995.

30. In March 1995, the first HFA-MDI (salbutamol) manufactured by one pharmaceutical company was introduced in Europe; in 1997 another pharmaceutical company introduced HFA-MDIs onto the European market. However, it is unlikely that the technology was fully developed, commercially available and transferable to pharmaceutical companies owned by Article 5 Parties until the late 90s. In 2000, one pharmaceutical company wholly owned by an Article 5 Party launched an HFA-MDI.

31. There is currently very limited information available to the Secretariat on the dates of establishment of CFC-MDI production lines in companies owned by Article 5 Parties. However, it appears that, in the majority of the countries, CFC-MDI production lines have been established and/or increased production capacity after July 1995 (e.g., some production lines were established in Bangladesh in 2003, while in Pakistan some CFC-based lines were established as recently as 2005). Under these circumstances, the Executive Committee would need to consider whether or not the cut-off date of 25 July 1995 would apply to CFC-MDI production lines.

Equipment baseline and capacity increase

32. There is very little information available to the Secretariat on the baseline equipment of CFC-MDI production facilities, the capacity installed at the time the production line was first established, and whether or not the production lines have been expanded. In two cases, major increases in production levels of CFC-MDIs appear to be occurring on an annual basis (Argentina and Bangladesh). Therefore, the Executive Committee would need to consider the base year to be used for establishing the consumption of CFCs in the MDI sub-sector that would be eligible for funding.

Governments' agreements and other undertakings

33. All Article 5 Parties where CFC-MDIs are currently manufactured, have committed (either through specific agreements with the Executive Committee or through decisions by the

²⁴ Excluding Cuba and Uruguay since funding has been approved for the phase-out of CFCs used in production of MDIs and Turkey since CFC-MDIs are not produced by locally-owned companies. This could also be the case of Philippines.

Executive Committee) not to request any additional funding for any controlled uses of CFCs, except for Argentina, China, Egypt and Indonesia, which had excluded specific amounts of CFCs used for the manufacturing of MDIs from the national phase-out plans. Therefore, with the exception of these four countries, under the current rules of the Fund additional assistance could not be provided.

34. If additional assistance were to be considered on an equitable basis for these countries, the Executive Committee would need to consider a possible revision of the rules related to funding eligibility, as well as the direct assistance that has already been provided in some countries for addressing the MDI sector, and specific additional commitments made by some other countries (e.g., India and Mexico) not to seek any additional funding for the MDI sector.

Essential uses

35. Paragraph 7 of decision IV/25 states that “essential use controls will not be applicable to Parties operating under paragraph 1 of Article 5 of the Protocol until the phase-out dates applicable to those Parties”. However, the practicality of continuing to manufacture CFC-MDIs may be quite limited in view of the likely reduced availability of pharmaceutical-grade CFCs after 2009.

V: CONCLUSIONS AND RECOMMENDATIONS

Conclusions

36. In many Article 5 Parties where MDIs are supplied only through imports or are manufactured locally by multi-national companies, national transition approaches may not have a large impact in the absence of support from the multi-national MDI manufacturers or importers, multi-national pharmaceutical companies may switch their CFC products by introducing HFA-MDIs.

37. The greatest need in Article 5 Parties with locally-owned MDI manufacturing facilities is likely to be the development of national transition strategies to non-CFC technologies. In developing these strategies, it will be necessary for Article 5 Parties to ensure that the appropriate technical expertise is identified and that the management of implementation is supported. It will also be necessary for Governments to bear in mind that the amounts of pharmaceutical-grade CFCs available after 2009 may be very small, and therefore the practicality of requesting essential use controls in 2010 may be limited.

38. Based on the most recent information available to the Secretariat, it can be concluded that of the 16 Article 5 Parties with MDI production facilities, only Bangladesh and Egypt may be at a serious risk of not meeting the control measure for CFC consumption in 2007. Due to the very limited time available prior to 2007, the provision of financial assistance now (i.e. 2006 or 2007) to address CFC consumption in the MDI sub-sector in these countries would not solve potential compliance issues in 2007. Other measures may therefore be needed to achieve the required reduction in CFC consumption such as additional efforts to accelerate the phase-out of CFCs in the refrigeration servicing sector.

39. Finally, any further actions that the Executive Committee may wish to undertake in relation to the phase-out of CFCs used for the manufacturing of MDIs in Article 5 Parties would

generally be likely to affect compliance only in 2010, due to the relatively low levels of CFCs used in pharmaceutical applications in these countries.

Recommendations

40. In relation to Bangladesh and Egypt, as the two Article 5 Parties with production of CFC-MDIs that would appear to be at a serious risk of not meeting the 85 per cent reduction in CFC consumption in 2007, the Executive Committee might wish to:

- (a) Request the Governments of Bangladesh and Egypt, assisted by the relevant implementing agencies, to include the following in the 2007 and 2008 annual implementation programmes of their national CFC phase-out plans:
 - (i) Specific activities that are technically viable and economically feasible could be implemented in the shortest possible period of time to achieve the greatest reduction in consumption of CFCs, such as the introduction of non-CFC drop-in refrigerants for servicing refrigeration equipment and/or cost-effective equipment retrofits;
 - (ii) Assessment of the feasibility of importing recovered and recycled CFCs for servicing existing refrigeration equipment; and
 - (iii) Within the flexibility in reallocating the approved funds set out in the agreements between the Governments concerned and the Executive Committee, consider establishing stockpiles of pharmaceutical-grade CFC for use in MDI production facilities, if technically feasible and economically viable;
- (b) Request the Government of Bangladesh to submit to the 50th Meeting a proposal for the development of a transition strategy for the phase-out of CFC-based MDIs. In developing its strategy, Bangladesh is invited to consider, among other things:
 - (i) Accelerating the replacement of CFC-MDIs with HFA-MDIs and/or other non-CFC alternatives (i.e., DPIs) by multi-national companies that have already introduced those products in other Article 5 Parties;
 - (ii) Inviting multi-national companies that are manufacturing CFC-MDIs in Bangladesh to provide information demonstrating the steps being taken to assist the earliest possible changeover to the manufacture of non-CFC asthma and COPD treatments in Bangladesh; and
 - (iii) To facilitate the earliest possible completion by the leading nationally-owned manufacturer of MDIs in Bangladesh of the manufacturing facilities for non-CFC MDIs currently under implementation;
- (c) Request the Government of Egypt to finalize as soon as possible the preparation of a project for the phase-out of CFCs in the manufacture of MDIs that was

approved for UNIDO at the 45th Meeting of the Executive Committee, addressing any compliance-related issues; and

- (d) In relation to any broader action, including financial support for phasing out CFCs used for the manufacture of MDIs in Article 5 Parties that are not eligible for funding under the current rules of the Multilateral Fund, the Executive Committee might consider whether it wishes to request the Secretariat to undertake additional work and, if so, to provide specific guidance on the objectives and scope of the work in the light of any guidance the Parties to the Montreal Protocol may give at their 18th Meeting.

Annex I

RELEVANT DECISIONS ON THE METERED DOSE INHALERS SUB-SECTOR

This annex presents in chronological order all the decisions on the metered dose inhaler (MDI) sub-sector that have been taken by the Parties to the Montreal Protocol and the Executive Committee.

Eighth Meeting of the Parties (November 1996)

Decision VIII/10: Actions by Parties not operating under Article 5 to promote industry's participation in a smooth and efficient transition away from CFC-based MDIs

1. That Parties not operating under Article 5 will request companies applying for MDI essential-use exemptions to demonstrate ongoing research and development of alternatives to CFC MDIs with all due diligence and/or collaborate with other companies in such efforts and, with each future request, to report in confidence to the nominating Party whether and to what extent resources are deployed to this end and progress is being made on such research and development, and what licence applications if any have been submitted to health authorities for non-CFC alternatives;
2. That Parties not operating under Article 5 will request companies applying for MDI essential-use exemptions to demonstrate that they are undertaking individual or collaborative industry efforts, in consultation with the medical community, to educate health-care professionals and patients about other treatment options and the transition to non-CFC alternatives;
3. That Parties not operating under Article 5 will request companies applying for MDI essential-use exemptions to demonstrate that they, or companies distributing or selling their product, are differentiating the packaging of the company's non-CFC MDIs from its CFC MDIs and are applying other appropriate marketing strategies, in consultation with the medical community, to encourage doctor and patient acceptance of the company's non-CFC alternatives subject to health and product-safety considerations;
4. That Parties not operating under Article 5 will request companies manufacturing, distributing or selling CFC MDIs and non-CFC alternatives not to engage in false or misleading advertising targeted at non-CFC alternatives or CFC MDIs;
5. That Parties not operating under Article 5 will request companies applying for MDI essential-use exemptions to ensure that participation in regulatory proceedings is conducted with a view toward legitimate environmental, health and safety concerns;
6. That Parties not operating under Article 5 will request companies manufacturing CFC MDIs to take all economically feasible steps to minimize CFC emissions during the manufacture of MDIs;
7. That Parties not operating under Article 5 will request companies manufacturing, distributing or selling CFC MDIs to dispose of expired, defective, and returned MDIs containing CFCs in a manner that minimizes CFC emissions;

8. That Parties not operating under Article 5 will request companies manufacturing CFC MDIs to review annually CFC requirements and current MDI market forecasts, and notify national regulatory authorities if such forecasts will result in surplus CFCs obtained under essential-use exemptions;

9. That Parties not operating under Article 5 will request companies applying for MDI essential-use exemptions to provide information on the steps that are being taken to provide a continuity of supply of asthma and chronic obstructive pulmonary disease (COPD) treatments (including CFC MDIs) to importing countries;

10. That Parties not operating under Article 5 will request companies applying for MDI essential-use exemptions to provide information that demonstrates the steps being taken to assist the company's MDI manufacturing facilities in Parties operating under Article 5 and countries with economies in transition in upgrading the technology and capital equipment needed for manufacturing non-CFC asthma and chronic obstructive pulmonary disease (COPD) treatments;

11. To request the Technology and Economic Assessment Panel to reflect paragraphs 1 through 10 above in a revised version of the Handbook on Essential-Use Nominations.

Decision VIII/11: Measures to facilitate a transition by a Party not operating under Article 5 from CFC-based MDIs

The Parties note that a transition is occurring from the use of CFC based MDIs to non-CFC treatments for asthma and chronic obstructive pulmonary disease. In order to ensure a smooth and efficient transition, and protect the health and safety of patients, Parties not operating under Article 5 are encouraged:

1. To promote coordination between national environmental and health authorities on the environmental, health and safety implications of any proposed decisions on essential-use nominations and MDI transition policies;

2. To request their national authorities to expedite review of marketing/licensing/pricing applications of non-CFC treatments of asthma and chronic obstructive pulmonary disease, provided that such expedited review does not compromise patient health and safety;

3. To request their national authorities to review the terms for public MDI procurement and reimbursement, so that purchasing policies do not discriminate against non-CFC alternatives.

Decision VIII/12: Information gathering on a transition to non-CFC treatments for asthma and chronic obstructive pulmonary disease for Parties not operating under Article 5

1. To note with appreciation the work done by the Technology and Economic Assessment Panel and its Technical Options Committee pursuant to decision IV/25 of the Fourth Meeting of the Parties and decision VII/28 of the Seventh Meeting of the Parties;

2. To note with appreciation that one new non-CFC-based MDI for one active ingredient has now entered the market in some countries, and that others are anticipated over the next one to three years. Other non-CFC treatments and devices already provide a suitable alternative for many patients in some Parties not operating under Article 5;

3. To request Parties not operating under Article 5 that have developed a national transition strategy to report to the Panel and its relevant Technical Options Committee on the details of that national transition strategy for non-CFC treatments of asthma and chronic obstructive pulmonary disease in time for meetings of the Technical Options Committee, beginning in 1997;
4. To request the Technology and Economic Assessment Panel and its relevant Technical Options Committee to provide an interim report on progress in the development and implementation of national transition strategies in Parties not operating under Article 5 for non-CFC treatments of asthma and chronic obstructive pulmonary disease (COPD) and report to the Open-Ended Working Group in preparation for the Ninth Meeting of the Parties;
5. To request the Technology and Economic Assessment Panel to further examine and provide a progress report to the Ninth Meeting of the Parties and a final report to the Tenth Meeting of the Parties on issues surrounding a transition to non-CFC treatments of asthma and chronic obstructive pulmonary disease in Parties not operating under Article 5 that is fully protective of public health. In so doing, the Technology and Economic Assessment Panel should consult with international bodies, such as the World Health Organization and other institutions representing health-care professionals, patient-advocacy groups and private industry, and with national bodies and Governments. The Technology and Economic Assessment Panel should consider:
 - (a) In the context of a transition phase, how decisions taken within the Montreal Protocol framework and national strategies might complement each other;
 - (b) The impact on the right and ability of patients in Parties operating under Article 5, in countries with economies in transition, in Parties not operating under Article 5 with large disadvantaged communities and in importing countries to receive CFC-based MDIs where medically acceptable and affordable alternatives are not available due to reductions in essential-use exemptions in Parties not operating under Article 5 for CFC based MDIs;
 - (c) The influence of potential transferable essential use exemptions as well as existing and potential trade restrictions by individual countries on a smooth transition and access to affordable treatment options;
 - (d) The international markets and fluidity of trade in CFC-based MDIs as well as alternative treatments for asthma and chronic obstructive pulmonary disease;
 - (e) The implications for patient subgroups which may have continuing compelling medical needs after a virtual phase out;
 - (f) The range of regulatory and non-regulatory incentives for, and impediments to, research and development of alternative treatments for asthma and chronic obstructive pulmonary disease and market penetration of alternative treatments for asthma and chronic obstructive pulmonary disease;
 - (g) The degree to which dry powder inhalers (DPIs) and other treatment options may be considered medically acceptable and affordable alternatives for CFC-based

MDIs in consultation with the above bodies, and as a result, the factors which may influence their ability to act as substitutes in different countries;

- (h) The relative implications for the phase out of ozone-depleting substances of different policy options that facilitate the transition to non-CFC treatments;
- (i) Steps that could be taken to facilitate access to affordable non-CFC treatment options and technology.

Ninth Meeting of the Parties (September 1997)

Decision XI/20: Transfer of essential-use authorizations for CFCs for MDIs

1. That all transfers of essential-use authorizations for CFCs for MDIs be reviewed on a case-by-case basis at Meetings of the Parties for approval;

2. Notwithstanding paragraph 1 of the present decision, to allow the Secretariat, in consultation with the Technology and Economic Assessment Panel, to authorize a Party, in an emergency situation, to transfer some or all of its authorized levels of CFCs for essential uses in MDIs to another Party, provided that:

- (a) The transfer applies only up to the maximum level that has previously been authorized for the calendar year in which the next Meeting of the Parties is to be held;
- (b) Both Parties involved agree to the transfer;
- (c) The aggregate annual level of authorizations for all Parties for essential uses of MDIs does not increase as a result of the transfer;
- (d) The transfer or receipt is reported by each Party involved on the essential-use quantity-accounting format approved by the Eighth Meeting of the Parties by paragraph 9 of decision VIII/9.

Twelfth Meeting of the Parties (December 2000)

Decision XII/2: Transition to chlorofluorocarbon-free MDIs

1. For the purposes of this decision, "chlorofluorocarbon metered-dose inhaler product" means a chlorofluorocarbon-containing metered-dose inhaler of a particular brand name or company, active ingredient(s) and strength;

2. That any chlorofluorocarbon metered-dose inhaler product approved after 31 December 2000 for treatment of asthma and/or chronic obstructive pulmonary disease in a non-Article 5(1) Party is not an essential use unless the product meets the criteria set out in paragraph 1(a) of decision IV/25;

3. With respect to any chlorofluorocarbon metered-dose inhaler active ingredient or category of products that a Party has determined to be non-essential and thereby not authorized for domestic use, to request:
 - (a) The Party that has made the determination to notify the Secretariat;
 - (b) The Secretariat to maintain such a list on its Web site;
 - (c) Each nominating Party to reduce accordingly the volume of chlorofluorocarbons it requests and licenses;
4. To encourage each Party to urge each metered-dose inhaler company within its territory to diligently seek approval for the company's chlorofluorocarbon-free alternatives in its domestic and export markets, and to require each Party to provide a general report on such efforts to the Secretariat by 31 January 2002 and each year thereafter;
5. To agree that each non-Article 5 Party should, if it has not already done so:
 - (a) Develop a national or regional transition strategy based on economically and technically feasible alternatives or substitutes that it deems acceptable from the standpoint of environment and health and that includes effective criteria and measures for determining when chlorofluorocarbon metered-dose inhaler product(s) is/are no longer essential;
 - (b) Submit the text of any such strategy to the Secretariat by 31 January 2002;
 - (c) Report to the Secretariat by 31 January each year thereafter on progress made on its transition to chlorofluorocarbon-free metered-dose inhalers;
6. To encourage each Article 5(1) Party to:
 - (a) Develop a national or regional transition strategy based on economically and technically feasible alternatives or substitutes that it deems acceptable from the standpoint of environment and health and that includes effective criteria and measures for determining when chlorofluorocarbon metered-dose inhaler product(s) can be replaced with chlorofluorocarbon-free alternatives;
 - (b) Submit the text of any such a strategy to the Secretariat by 31 January 2005;
 - (c) Report to the Secretariat by 31 January each year thereafter on progress made on its transition to chlorofluorocarbon-free metered-dose inhalers;
7. To request the Executive Committee of the Multilateral Fund to consider providing technical, financial and other assistance to Article 5(1) Parties to facilitate the development of metered-dose inhaler transition strategies and the implementation of approved activities contained therein, and to invite the Global Environment Facility to consider providing the same assistance to those eligible countries with economies in transition;

8. To decide that, as a means of avoiding unnecessary production of new chlorofluorocarbons, and provided that the conditions set out in paragraphs (a) - (d) of decision IX/20 are met, a Party may allow a metered-dose inhaler company to transfer:

- (a) All or part of its essential use authorization to another existing metered-dose inhaler company; or
- (b) Chlorofluorocarbons to another metered-dose inhaler company provided that the transfer complies with national/regional license or other authorization requirements;

9. To request the Technology and Economic Assessment Panel to summarize and review by 15 May each year the information submitted to the Secretariat;

10. To modify as necessary the Handbook for Essential Use Nominations to take account of the requirements contained in this decision as they pertain to non-Article 5(1) Parties;

11. To request the Technology and Economic Assessment Panel to consider and report to the next Meeting of the Parties on issues related to the campaign production of chlorofluorocarbons for chlorofluorocarbon metered-dose inhalers.

Thirteenth Meeting of the Parties (October 2001)

Decision XIII/9: Metered-dose inhaler (MDI) production

To request the Executive Committee to prepare guidelines for the presentation of MDI projects involving the preparation of strategies and investment projects that would enable the move to CFC-free production of MDIs in Article 5 countries, and enable them to meet their obligations under the Montreal Protocol.

Decision XIII/10: Further study of campaign production of CFCs for MDIs

1. To note with appreciation the work of the Technology and Economic Assessment Panel and its Technical Options Committees in studying the issue of campaign production of CFCs for manufacturing CFC-based MDIs;

2. To request the Technology and Economic Assessment Panel and Technical Options Committees to analyze the current essential-use decisions and procedures to identify if changes are needed to facilitate expedient authorization for campaign production, including information needed for the review and authorization of nominations for campaign production quantities, the contingencies for under- and over-estimation of the quantities needed for a campaign production, the timing of the campaign production vis-à-vis export and import of those quantities, the oversight and reporting on the use of campaign production quantities, and the flexibility in ensuring that the campaign production is used only in the manufacture of MDIs for the treatment of asthma and chronic obstructive pulmonary disease or that any excess is destroyed;

3. To request the Technology and Economic Assessment Panel to present its findings to the Open-ended Working Group in 2002;

4. To request the Technology and Economic Assessment Panel to continue to monitor and report on the timing of the likely need for campaign production.

35th Meeting of the Executive Committee (December 2001)

Decision 35/4 (c): Developing projects for the CFC metered-dose inhaler

The Executive Committee decided to request the Secretariat, in co-operation with the Implementing Agencies, to prepare a paper for the Executive Committee's consideration on the issues associated with developing projects for the CFC metered-dose inhaler (MDI) sub-sector to give effect to decision XIII/9 of the 13th Meeting of the Parties.

36th Meeting of the Executive Committee (March 2002)

Decision 36/9 (e): Preparation of draft guidelines for metered dose inhaler (MDI) projects

The Executive Committee decided to request the Secretariat to prepare draft guidelines for metered dose inhaler (MDI) projects for consideration by the Executive Committee at its 37th Meeting.

37th Meeting of the Executive Committee (July 2002)

Decision 37/61: Draft guidelines for metered dose inhaler (MDI) projects

The Executive Committee decided:

- (a) To take note of the draft guidelines (UNEP/OzL.Pro/ExCom/37/58);
- (b) To request members of the Executive Committee to submit comments on the issue to the Secretariat in time for a further discussion at the 40th Meeting of the Executive Committee;
- (c) In the meantime, to allow consideration of some projects on a case-by-case basis, taking into account the relative need of the country to have an MDI project to ensure compliance, the relative cost-effectiveness of the project and the possibility that essential use applications for MDIs might be considered by the Parties as early as 2008.

Fourteenth Meeting of the Parties (November 2002)

Decision XIV/5: Global database and assessment to determine measures to complete the transition from CFC-MDIs

1. To request each Party or regional economic integration organization to submit available information to the Ozone Secretariat by 28 February 2003 and annual updates thereafter the following information concerning inhaler treatments for asthma and COPD that contain CFCs or that do not contain CFCs:

- (a) CFC and non-CFC metered-dose inhalers and dry-powder inhalers: sold or distributed within the Party, by active ingredient, brand/manufacturer, and source (import or domestic production);
- (b) CFC and non-CFC metered-dose inhalers and dry-powder inhalers: produced within the Party for export to other Parties, by active ingredient, brand/manufacturer, source and importing Party;
- (c) Non-CFC metered-dose inhalers and dry-powder inhalers: date approved, authorized for marketing, and/or launched in the territory of the Party;

2. To request the Technology and Economic Assessment Panel to take into account information submitted pursuant to paragraph 1 and other available information in its annual assessment, and to request the Parties to pay due consideration to this information when reviewing their national transition strategies.

Fifteenth Meeting of the Parties (November 2003)

Decision XV/5: Promoting the closure of essential-use nominations for metered-dose inhalers

1. That the present decision shall not affect the operation of paragraph 10 of Decision VIII/9 relating to the authorization of a quantity of CFCs in an emergency situation;
2. To request that Parties not operating under paragraph 1 of Article 5, when submitting their nominations for essential-use exemptions for CFCs for metered-dose inhalers, specify, for each nominated use, the active ingredients, the intended market for sale or distribution and the quantity of CFCs required;
3. To request the Technology and Economic Assessment Panel and its Technical Options Committee to make recommendations on nominations for essential-use exemptions for CFCs for metered-dose inhalers from Parties not operating under paragraph 1 of Article 5 with reference to the active ingredient of the metered-dose inhalers in which the CFCs will be used and the intended market for sale or distribution and any national transition strategy covering that intended market which has been submitted according to decision XII/2 or decision IX/19;
4. That no quantity of CFCs for essential uses shall be authorized after the commencement of the Seventeenth Meeting of the Parties if the nominating Party not operating under paragraph 1 of Article 5 has not submitted to the Ozone Secretariat, in time for consideration by the Parties at the twenty-fifth meeting of the Open-ended Working Group, a plan of action regarding the phase-out of the domestic use of CFC-containing metered-dose inhalers where the sole active ingredient is salbutamol;
5. That the plans of action referred to in paragraph 4 above must include:
 - (a) A specific date by which time the Party will cease making nominations for essential use exemptions for CFCs for metered-dose inhalers where the sole active ingredient is salbutamol and where the metered-dose inhalers are expected to be sold or distributed on the market of any Party not operating under paragraph 1 of Article 5;

- (b) The specific measures and actions sufficient to deliver the phase-out;
 - (c) Where appropriate, the actions or measures needed to ensure continuing access to or supply of CFC-containing metered-dose inhalers by Parties operating under paragraph 1 of Article 5;
6. To request each Party not operating under paragraph 1 of Article 5 to submit to the Ozone Secretariat as soon as practicable for that Party specific dates by which time it will cease making nominations for essential-use exemptions for CFCs for metered-dose inhalers where the active ingredient is not solely salbutamol and where the metered-dose inhalers are expected to be sold or distributed on the market of any Party not operating under paragraph 1 of Article 5;
7. To request the Technology and Economic Assessment Panel to report, in time for the twenty-fourth meeting of the Open-ended Working Group, on the potential impacts of the phase out of CFCs in Parties not operating under paragraph 1 of Article 5 on the availability of affordable inhaled therapy in Parties operating under paragraph 1 of Article 5;
8. To request the Ozone Secretariat to post on its web site all data submitted pursuant to decision XIV/5 that are designated non-confidential by the submitting Party;
9. To request the Technology and Economic Assessment Panel to modify the Handbook on Essential Use Nominations to reflect the present decision.

Seventeenth Meeting of the Parties (December 2005)

Decision XVII/14: Difficulties faced by some Article 5 Parties with respect to CFCs used in the manufacture of MDIs

1. To consider at the Eighteenth Meeting of the Parties a possible decision which would address the difficulties that some Parties operating under paragraph 1 of Article 5 may face in relation to metered-dose inhalers;
2. To request the Executive Committee of the Multilateral Fund to examine situations such as these and consider options that might assist this potential situation of non-compliance;
3. To request the Executive Committee to consider appropriate regional workshops to create awareness and educate stakeholders, including doctors and patients, on alternative metered-dose inhalers and on the elimination of chlorofluorocarbons in metered-dose inhaler uses and technical assistance to Article 5 Parties to phase out this use;
4. To request the Open-ended Working Group at its twenty-sixth meeting to consider the issue.

48th Meeting of the Executive Committee (April 2006)

Decision 48/36 (c): Options for addressing the situation of countries referred to in decision XVII/14

The Executive Committee decided to request the Fund Secretariat in consultation with the implementing agencies, to prepare a paper for submission to the 49th Meeting, outlining options for addressing the situation of countries referred to in decision XVII/14 of the Seventeenth Meeting of the Parties.

Annex II

INDUSTRIAL PROCESSES INVOLVED IN THE MANUFACTURING OF MDIs

1. The MDI is a complex system designed to provide a fine mist of medication (the active ingredient) for inhalation directly to the airways to treat respiratory diseases such as asthma or COPD. The active ingredient may be either dissolved in the propellant or a co-solvent (e.g., ethanol) or suspended in the propellant.

Propellants

2. Historically the propellants used in MDIs are CFCs (CFC-12 and CFC-11, and sometimes CFC-114), and more recently HFC-134a and HFC-227ea. In addition, some preliminary work has been conducted using hydrocarbons as propellants. As the propellants in MDIs comprise the large majority of the formulation (often in excess of 98 per cent), and the patients using these drugs are particularly vulnerable to airway irritation or toxicity, extensive testing had to be conducted on these propellants. All these propellants have undergone the same toxicological testing as any new chemical drug substance and are widely approved as propellants suitable for MDI use.

Availability of non-CFC MDIs

3. A number of CFC-based MDI products have been replaced by not in-kind products, mainly dry powder inhalers (DPIs)¹, in several countries. Table 1 below shows the current availability of non-CFC based asthma and COPD medications worldwide.

Table 1: Worldwide available of HFA MDIs and DPIs²

Moiety	Device	All countries		Article 5 countries	
		Approved	Launched	Approved	Launched
Beclomethasone	DPI	45	39	24	20
	HFC MDI	77	61	38	29
Budesonide	DPI	83	76	43	39
	HFC MDI	17	15	0	0
Fenoterol	DPI	0	0	0	0
	HFC MDI	21	20	4	4
Fenoterol + Ipratropium	DPI	0	0	0	0
	HFC MDI	23	19	6	3
Fluticasone	DPI	94	77	55	40
	HFC MDI	145	111	88	60
Formoterol	DPI	61	52	27	21
	HFC MDI	12	11	0	0

¹ The first dry powder inhaler (DPI) became available in 1968. DPIs have been formulated successfully for most anti-asthma drugs and are now widely available. In the case of Japan, for example, a substantial proportion of the former CFC-MDI market has been changed to DPI alternatives. As reported in the May 2006 TEAP progress report, pharmaceutical companies are introducing new drugs directly in CFC-free devices (i.e., mometasone furoate in a multi-dose DPI; tiotropium bromide as a single-dose DPI; ciclesonide and levalbuterol, both as HFC MDIs). These products, introduced without a direct antecedent CFC-based counterpart, offer important new treatment options.

² May 2006 TEAP Progress Report.

Moiety	Device	All countries		Article 5 countries	
		Approved	Launched	Approved	Launched
Ipratropium	DPI	0	0	0	0
	HFC MDI	28	28	3	3
Nedocromil	DPI	0	0	0	0
	HFC MDI	9	9	0	0
Salbutamol	DPI	74	66	40	37
	HFC MDI	176	112	115	82
Salmeterol	DPI	84	65	43	37
	HFC MDI	3	1	0	0
Sodium cromoglycate	DPI	2	2	0	0
	HFC MDI	*14	*14	0	0
Terbutaline	DPI	74	51	36	23
	HFC MDI	0	0	0	0

*Includes one launch of sodium cromoglycate in combination with reproterol.

4. There are a limited number of CFC-MDIs produced today that do not yet have suitable alternatives developed. In these cases the volumes are usually small and the products do have medically suitable alternatives available. It should be noted, however, that some of these products cannot or will not be reformulated to an HFA-MDI; in these cases other alternatives (such as DPIs) are being developed.

Technology transfer and costs

5. There are essentially two ways to manufacture MDIs: pressure filled, where the propellant or the propellant plus the drug is driven in under pressure through the metering valve; and cold filled, where the formulation is chilled to a low temperature, filled as a liquid and then the valve is crimped on the canister.

6. All HFA-based MDIs contain the same physical components as the CFC-based MDI products. However, the very different physical properties of HFC propellants have meant that significant changes have had to be made to the technology for these components.

7. Locally-owned CFC-MDI manufacturing plants in Article 5 countries are likely to need to obtain support and guidance for the development of alternative formulations (including an evaluation of whether reformulation of a specific drug is technically feasible), for modification of the manufacturing plants and for the development of transition policies. The required level of technical assistance from appropriate pharmaceutical and technical experts will vary, depending on whether or not local manufacturing is undertaken independently, or under a licensing agreement with a multi-national company that has a product already developed.

8. The cost of access to the technology will depend on whether there are existing patents that cover the product being contemplated and whether these are enforceable in the particular Article 5 Party. However, on a preliminary evaluation³ based on a survey of formulation patents that have been prosecuted by multinational companies in those Article 5 countries comprising the top ten users of MDIs by volume, it does not appear that formulation patents will constitute a major barrier to the introduction of CFC-free MDIs in Article 5 countries. There are, however, some local exceptions to this situation that need to be noted:

³ May 2006 TEAP Progress Report.

- (a) This evaluation has not addressed process patents, such as those in India, or patents from domestic researchers and producers in individual countries, such as China; and
- (b) From a moiety perspective, formulation patents covering salbutamol, beclomethasone, fluticasone and salmeterol exist in several Article 5 Parties beyond 2010. While it may be possible to introduce different products containing the same moiety that are therefore not covered by the claims of these patents, the technical difficulty to redevelop them should not be underestimated.

9. Therefore, the more likely impediment to successful technology transfer in Article 5 countries will be access to skilled technical consultants with the expertise to develop and implement HFA MDI production and analysis. One alternative for countries that do not yet have the HFA products widely available could be a license arrangement with a pharmaceutical company that has developed those products. These countries might be able to achieve access sooner and less expensively through the provision of a royalty payment⁴. In countries where no patent coverage exists or the patents are not enforceable, access to technology could be granted in exchange for a greater market presence (i.e. by establishing a joint venture in that country). The magnitude of payments for this type of “enabling” technology is usually in the order of a few percent of sales or it could come in the form of a share of revenue from sales of the already developed product.

National transition strategies

10. Article 5 Parties, particularly those with locally-owned CFC-MDI manufacturing plants, will need to develop a national transition strategy to non-CFC-MDI alternatives⁵. The strategy should be prepared with the participation of major stakeholders (i.e., relevant authorities of the ministries of health and environment, physician and patient groups, MDI manufacturers, and CFC importers); it should ensure adequate supplies of inhaled therapy throughout the transitional period, including adequate supplies of pharmaceutical-grade CFCs where appropriate; and ensure adequate supplies of CFC-free alternatives.

⁴ Possible arrangements for access to these products could include: supply of the finished product; transfer of the technology to the Article 5 company for local production; and/or a joint venture established to produce the alternate products locally.

⁵ May 2006 TEAP Progress Report.

Annex III

**SUMMARY REPORT ON THE MDI SECTOR IN ARTICLE 5 PARTIES WITH
NATIONALLY OWNED MDI MANUFACTURING COMPANIES**

1. This Annex presents a summary report of the metered dose inhaler (MDI) sector in Article 5 Parties with nationally-owned companies manufacturing MDIs. Cuba and Uruguay are excluded from this summary since the Executive Committee has already approved investment projects for the complete phase-out of CFCs used in the manufacturing of MDIs in these two countries.
2. Information from this analysis is mainly extracted from documents that have been submitted for consideration by the Executive Committee (national or sectoral phase-out plans recently approved by the Executive Committee, country programme updates and case studies).
3. Additional information on the MDI sub-sector in several of these countries can be found in the May 2006 TEAP Progress Report.

Argentina

4. The national CFC phase-out plan for the complete phase-out of all remaining consumption of CFCs in Argentina was approved by the Executive Committee at its 42nd Meeting (UNEP/OzL.Pro/ExCom/42/24) (decision 42/25).
5. The phase-out plan specifically stated that the Government of Argentina will completely phase out its CFC consumption by 1 January 2010, except consumption in the MDI sector, for which funding may be requested separately in the future. In the Plan, it has been estimated that about 85 ODP tonnes of CFCs are used by national companies and the remaining 75 ODP tonnes by multi-national companies.
6. The Government of Argentina submitted to the Secretariat a detailed description of the MDI sector in Argentina using the questionnaire prepared by the Secretariat for the preparation of this document. According to this report, total CFC consumption for the production of MDIs increased from 86 metric tonnes to 188 metric tonnes between 2003 and 2005, as shown in the table below:

Company	2003		2004		2005	
	CFC tonnes	MDIs	CFC tonnes	MDIs	CFC tonnes	MDIs
Nationally-owned	49.09	1,963,760	108.28	4,331,120	130.85	5,234,160
Multi-nationals	36.97	1,478,840	32.69	1,307,720	56.84	2,273,480
Total	86.07	3,442,600	140.97	5,638,840	187.69	7,507,640

7. Additional information provided by the Government of Argentina indicates that in 2003 the level of CFC consumption used for the production of MDIs was much lower than in previous years (i.e., 128,5 metric tonnes in 2000, 135,1 metric tonnes in 2001 and 141 metric tonnes in 2002).
8. HFA MDIs have been produced in Argentina from 2005.

Bangladesh

9. The national ODS phase-out plan for the complete phase-out of CFCs in Bangladesh was approved by the Executive Committee at its 42nd Meeting (UNEP/OzL.Pro/ExCom/42/25) (decision 42/19).

10. Based on a survey conducted in 2003 during the preparation of the Bangladesh country programme update, it was found that 31.7 ODP tonnes of CFCs were used for MDI applications. The plan did not allocate any CFC consumption to MDI applications, since this consumption has never been reported to the Multilateral Fund.

11. At its 48th Meeting, the Executive Committee considered the Bangladesh country programme update submitted by UNDP on behalf of the Government of Bangladesh (UNEP/OzL.Pro/ExCom/48/41). The country programme update indicated that, until recently, the Government of Bangladesh had been unaware of CFC use in the local production of MDIs. CFC use in the MDI sub-sector is estimated at 62.2 ODP tonnes for 2004. Additional information received from UNDP indicates that two national companies commenced production of MDIs in 1996, with a total consumption of 21.7 ODP tonnes of CFCs in 2004. In addition to manufacturing under its own name, one of the enterprises also manufactures under contract for one multi-national company (GlaxoSmithKline).

12. The Government of Bangladesh submitted to the Secretariat a description of the MDI sector in Bangladesh using the questionnaire prepared by the Secretariat. According to this report, total CFC consumption for the production of MDIs increased from 39 metric tonnes to 62 metric tonnes between 2003 and 2005. It has been estimated that consumption will increase to 76 metric tonnes in 2006, as shown in the table below. The Government also reported that there are 4 companies manufacturing CFC-MDIs in Bangladesh (ACME, Beximco, GSK and Square). All companies are locally owned except for one company (GSK) which has 18 per cent local ownership (the data in the table below has been consolidated for confidentiality purposes).

Moiety	2003		2004		2005		2006 (estimated)	
	MDIs	CFC tonnes	MDIs	CFC tonnes	MDIs	CFC tonnes	MDIs	CFC tonnes
Beclomethasone Dipropionate	178,412	4.77	236,591	6.59	269,873	7.32	352,738	9.22
Budisonide		-	17,846	0.41		-	25,000	0.57
Ciclesonide		-		-		-	24,000	0.87
Ipratropium Bromide	36,425	0.83	38,700	0.88	48,145	1.10	63,500	1.45
Levosambutamol		-		-		-	96,000	1.37
Salbutamol	1,359,777	31.66	2,244,259	51.62	2,057,259	47.65	2,244,273	51.71
Salbutamol, Ipratropium Bromide		-		-	83,224	1.79	212,800	4.67
Salmeterol Xinafoate	83,545	1.89	100,323	2.17	97,233	2.19	139,334	3.08
Salmeterol Xinafoate, Fluticasone Propionate		-	46,614	0.65	99,505	1.48	161,926	2.38
Triotropium Bromide		-		-	21,000	0.29	28,600	0.40
Total	1,658,159	39.15	2,684,333	62.31	2,676,239	61.81	3,348,171	75.71

Brazil

13. The national CFC phase-out plan for Brazil was approved by the Executive Committee at its 37th Meeting (UNEP/OzL.Pro/ExCom/37/30) (decisions 37/33 and 37/54). The phase-out plan proposed that, for reducing CFC consumption, funding would be requested for the complete phase-out in all manufacturing sectors, including two national MDI manufacturers with a total production of some 80,000 MDIs and a CFC consumption of about 2 ODP tonnes. A total of US \$960,000 was requested for the conversion of the two MDI companies, with a cost-effectiveness of US \$480/kg. In addition to these national companies, there are several multi-national companies manufacturing CFC MDIs in Brazil. The plan also proposed a request for technical assistance for the MDI sector at a cost of US \$487,500.

14. The agreement between the Government of Brazil and the Executive Committee indicated the approval in principle of a total of US \$26.7 million in funding for the phased reduction and complete phase-out of consumption of Annex A Group I substances in Brazil by 2010. This represented the total funding that will be available to Brazil from the Fund for the total elimination of CFC use in the refrigeration sector in Brazil as well as for all other sectors using these substances, (e.g., foams, aerosols, solvents, sterilants, MDIs).

China

15. The refrigeration servicing sector CFC phase-out plan for China was approved by the Executive Committee at its 44th Meeting (UNEP/OzL.Pro/ExCom/44/33) (decisions 44/49). This is the latest sectoral plan approved by the Executive Committee. While no detailed description of the MDI sector was included in this sectoral plan, the following levels of CFC consumption for the manufacturing of pharmaceutical aerosols and MDIs were reported.

Year	CFC consumption in pharmaceutical aerosols and MDIs (ODP tonnes)				
	2005	2006	2007	2008	2009
Pharmaceutical (external use)	784	901	800	400	334
MDI	418	481	553	553	553
Total	1,202	1,382	1,353	953	887

16. Additional information on the MDI sector in China, as reported in the May 2006 TEAP Progress Report, is presented below:

- (a) More than 40 million people in China have asthma or COPD;
- (b) Approximately 15 million CFC MDIs are locally manufactured, about 2.5 million MDIs are sold each year by multi-national companies, and a small quantity of HFC MDIs has been imported since 2004; and
- (c) Some local companies have developed and patented new technology for CFC-free MDIs; clinical trials are ongoing. Adequate bulk pharmaceutical-grade HFC is readily available from three multi-national producers and likely will be from one local producer.

Colombia

17. The national phase-out plan for Annex A substances for Colombia was approved by the Executive Committee at its 41st Meeting (UNEP/OzL.Pro/ExCom/41/29) (decision 41/52). It was reported in the phase-out plan that all CFC MDIs in the country were imported into the country (no CFC-based MDIs were manufactured in Colombia). Although CFC consumption for MDIs was nil, the Government of Colombia and the health authorities were concerned about the MDI sub-sector and requested funding for the development of an MDI transition strategy that will establish a clear schedule for import substitution of CFC MDIs, regulations that will promote and support the phase-out of these products, and a programme that will raise physician awareness and patient acceptance of alternatives to CFC-based MDIs.

Egypt

18. The national CFC phase-out plan for Egypt was approved by the Executive Committee at its 46th Meeting (UNEP/OzL.Pro/ExCom/46/32) (decision 46/31). The implementation of the plan will lead to the phase-out of the remaining consumption of CFCs, except for consumption in the MDI sector, estimated at 154 ODP tonnes. The phase-out strategy in the MDI sector will be developed at a later stage.

19. Information provided by the Secretariat's expert from industry sources indicates that MDIs in Egypt are manufactured by two companies: Arab Drug Company, founded in 1964 and with an annual MDI production of about 5 million MDIs (self-manufactured and manufactured under licence), and Egyptian International Pharmaceutical Industries Co., the largest local producer of pharmaceuticals in the country, with a total annual MDI production of 1.5 million MDIs.

India

20. The national CFC consumption phase-out plan focusing on the refrigeration servicing sector for India was approved by the Executive Committee at its 42nd Meeting (UNEP/OzL.Pro/ExCom/42/33) (decision 42/37). The phase-out plan reported a consumption of 120 ODP tonnes of CFC-12 in the manufacturing of MDIs in India. As stated in the plan "the consumption in the MDI sector will be phased out under the plan according to decision 41/31 which inter alia indicates that India had allocated its total remaining CFC consumption eligible for funding to the refrigeration servicing sector and would not be submitting an investment project for MDI aerosols".

21. On behalf of the Government of India, UNDP has submitted the country programme update for India for consideration by the Executive Committee at its 49th Meeting (UNEP/OzL.Pro/ExCom/49/37). In its country programme update, the Government of India has once again stated that it would not submit any MDI-related requests for funding.

Indonesia

22. The national CFC phase-out plan for Indonesia was approved by the Executive Committee at its 44th Meeting (UNEP/OzL.Pro/ExCom/44/40) (decision 44/39). Information in the phase-out plan indicated that MDIs and other aerosol pharmaceutical products were produced in the country by several multi-national companies (Astra Zeneca, Boehringer Ingelheim,

GlaxoSmithKline) and by national companies (Otsuka, Daya Varia and Konimex), with an estimated annual consumption of 30 ODP tonnes of CFCs. It was also reported that “one or two of the companies might import MDIs and do not have CFC filling operations in Indonesia. Based on import records, it seems that the consumption by 3 of the companies is around 1.6 tonnes per year and one is much higher”

23. Pursuant to decision XV/5, the Government of Indonesia reported a CFC consumption of 8.386 metric tonnes of CFCs for the manufacture of MDIs in 2002. However, the CFC consumption reported in its national phase-out plan for this purpose is 30 tonnes (it would appear that a large portion is used for the manufacturing of pharmaceutical aerosols).

24. The phase-out of CFCs used in the manufacturing of pharmaceuticals and MDIs was not included in the phase-out plan; therefore, the Government of Indonesia will request assistance from the Fund for phasing out CFC consumption in these sub-sectors.

Iran

25. The national CFC phase-out plan for Iran was approved by the Executive Committee at its 41st Meeting (UNEP/OzL.Pro/ExCom/41/38) (decisions 41/20 and 41/55). In the phase-out plan it was reported that some 50 tonnes of CFCs were used for the manufacturing of MDIs. The phase-out of MDIs was not included in the phase-out plan and the Government of Iran will submit, in the future, a project proposal for the phase-out of CFCs in the manufacturing of MDIs.

26. In reviewing the national plan, the Secretariat observed that the project proposal submitted to the 41st Meeting by the Government of Germany on behalf of the Government of Iran was presented as a plan for the total phase-out of CFCs in Iran. The draft agreement included the provision that “this is the total funding that would be available to the Islamic Republic of Iran from the Multilateral Fund for the total elimination of CFC use in the country”. The Secretariat indicated that, on this basis, the additional project for addressing CFC consumption in the MDI sector for possible future submission would not be eligible for funding. The Government of Germany responded that the Government of Iran agreed to exclude funding requests for MDI projects from the phase-out plan. However, the Government of Germany maintained the MDI component in the phase-out plan as a basis for discussion of potential funding requests in the future.

Jordan

27. The World Bank, on behalf of the Government of Jordan, submitted a country programme update for Jordan (UNEP/OzL.Pro/ExCom/38/63) for consideration by the Executive Committee at its 38th Meeting. The country programme update also included a national phase-out plan to address remaining CFC consumption in the refrigeration sector (including commercial, servicing and chiller sub-sectors), solvent (CTC) sector, foam sector, and remaining CFCs in the aerosol (pharmaceutical) sector. At that Meeting, the Executive Committee took note of the Jordan country programme update and approved the phase-out plan in Jordan on the understanding that, *inter alia*, the Government of Jordan agrees that no additional resources will be requested from the Fund or bilateral agencies for activities related to the phase-out of ODSs. The Committee also agreed to provide Jordan with flexibility in using the agreed funds consistent with operational procedures as agreed between Jordan and the agencies (UNIDO and the World Bank) in the phase-out plan (decision 38/72).

28. At its 48th Meeting, the Executive Committee considered a final report on the evaluation of RMPs in non-LVCs and of national phase-out plans (UNEP/OzL.Pro/ExCom/48/12). This report was based on case studies including one for Jordan. According to the information reported in the Jordan case study, there is one company manufacturing a wide range of pharmaceutical products including MDIs (Arab Centre for Pharmaceutical Products), under current conversion with assistance from the Fund. After conversion, the company will still be allowed to manufacture CFC-based MDIs with an estimated consumption of 5 metric tonnes of CFCs. The manufacturing of ODS products (other than MDIs) is expected to cease by March 2006. The Government of Jordan has stated that there will be no imports allowed for MDIs or for servicing MAC units after 2009.

Mexico

29. The national CFC phase-out plan for Mexico was approved by the Executive Committee at its 42nd Meeting (UNEP/OzL.Pro/ExCom/42/39) (decision 42/32). In the phase-out plan it was reported a consumption of 5.0 ODP tonnes of CFCs for the manufacturing of MDIs. It was also stated in the phase-out plan that “the Government of Mexico will manage to phase-out the MDI usage of CFCs without any assistance from the Multilateral Fund”.

Pakistan

30. At its 41st Meeting, on behalf of the Government of Pakistan, the World Bank submitted for consideration by the Executive Committee its country programme update (UNEP/OzL.Pro/ExCom/41/75). According to data presented in the country programme update, in 2002 the Government of Pakistan reported under Article 7 of the Montreal Protocol a total CFC consumption of 1,646.7 ODP tonnes, including 69.4 ODP tonnes used for the manufacturing of MDIs by one multi-national company (with 22 per cent local ownership). At the same meeting, the Government of Pakistan submitted three project proposals in the foam and refrigeration sectors to phase out 1,063.6 ODP tonnes of CFCs (UNEP/OzL.Pro/ExCom/41/51). The letter of submission of the Pakistan country programme update indicated the sectoral distribution of the remaining CFC consumption eligible for funding among the three projects that were submitted to the 41st Meeting.

31. The Government of Pakistan submitted to the Secretariat a detailed description of the MDI sector in Pakistan using the questionnaire prepared by the Secretariat. According to this report, the number of MDIs imported into the country increased from 460,192 units in 2003 to 998,838 units in 2005 (no complete information was provided on the propellant contained in all the MDIs). Of the total MDIs imported in 2005, about 487,000 units were imported, for the first time, from one MDI manufacturing company in China (Shandong Jewim Pharmaceutical Co. Ltd.).

32. There are also two MDI manufacturing companies in Pakistan. One is a joint venture between a multi-national company (GlaxoSmithKline) and a local company (with 21 per cent ownership), which started production of MDIs in 1983; the other company (Zafa Pharmaceutical), established since 1973, started production of CFC MDIS in 2005. Production figures are presented in the table below:

Ownership	2003		2004		2005	
	MDIs	CFC tonnes	MDIs	CFC tonnes	MDIs	CFC tonnes
Joint venture	2,957,682	59.92	2,922,143	59.13	4,139,209	83.81
National owned					95,197	1.97
Total	2,957,682	59.92	2,922,143	59.13	4,234,406	85.77

Philippines

33. The national CFC phase-out plan for Philippines was approved by the Executive Committee at its 38th Meeting (UNEP/OzL.Pro/ExCom/38/47) (decisions 38/20 and 38/49). To reduce demand of CFCs, the phase-out plan proposed, among other activities, funding of technical assistance for the MDI sector. It was also reported that Philippines does not manufacture MDIs, but imported about 1.2 million MDIs in 2001 from several multi-national companies. It was also reported that some of the companies have already introduced non-CFC MDIs, including DPIs, since 1999 (the main driving force for the introduction of non-CFC alternatives is the corporate policy of the MDI manufacturers).

Turkey

34. Preliminary information on the MDI sector in Turkey provided by the Secretariat's expert indicates that 2.5 million MDIs are used annually in Turkey, with an estimated consumption of about 65 ODP tonnes of CFCs. These products are mainly imported and in response to the request by the Secretariat sent to Article 5 Parties for the preparation of this paper, the Government of Turkey indicated that there have not been requests submitted by companies for production of MDIs in the last two years.

Annex IV

BEXIMCO PHARMACEUTICALS LTD.

2nd May, 2006

Results for the year ended 31 December 2005

Beximco Pharmaceuticals Limited (AIM Symbol: BXP) today announces its results for the year ended 31 December 2005.

Highlights

Products

- 49 products launched across a range of therapeutic classes
- 55 new product registrations in export markets
- Sri Lanka has become a new export market

Corporate

- Successfully integrated Beximco Infusions Limited
- Successfully placed £12 million and admitted GDRs to trading on AIM in October 2005
- Completed construction of new Oral Solid Dosage (OSD) plant built to USFDA standards and two out of five new OSD lines are currently being installed
- Commenced conversion of Metered Dose Inhaler (MDI) plant to manufacture HFA inhalers with the technical collaboration of Bepak Europe. Conversion is scheduled to be completed during Q3 2006

Financial*

- Net Sales increased by 38% to over Tk.3,327.0m (£26.5m) (20% increase on a pro-forma basis)
- Profit before tax** increased by 37.9% to Tk.509.6m (£4.1m) (21.4% increase on a pro-forma basis)
- EPS increased by 35% to Tk. 6.36 (5.1p)
- Cash dividend of 15% (gross) of par value (representing Tk.1.5, or 1.2p per share) declared with record date of 1 June 2006, and payment date on or before 21 August 2006.

Post year end highlights

- Introduced Oseflu® (Oseltamivir) to the Bangladesh market which aims to combat the growing threat of Bird Flu
- Launched 14 new products in the first quarter of 2006
- Signed agreement with a leading Indian API manufacturer to set up an API plant for Ranitidine, Ciprofloxacin & Omeprazole
- Commenced manufacturing of Penicillin API

The AGM will be held on 22 June 2006 at 10.30 a.m. at 1 Shahbag C/A, Dhaka, Bangladesh

Nazmul Hassan, CEO of Beximco pharmaceuticals, commented:

“Beximco Pharmaceuticals has had an extremely good year, and the successful flotation on AIM has enabled us to progress our strategic plans.

“We have continued our growth into 2006, and have already successfully launched 14 new products, most significantly the introduction of our generic bird flu drug, Oseflu™ into the Bangladeshi market. We believe that Beximco Pharma has a strong platform to continue to grow profitably in both the domestic and international markets.”

The full audited accounts are available from the Company's website: www.beximcopharma.com

* Financial figures on a pro-forma basis include the result of BPL and Beximco Infusions Limited which was effectively integrated into BPL from 1 July 2005

** Profit before tax and contribution to Workers' Profit Participation Fund

Exchange rate used: £1=Tk. 125.35

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Notes to Editors

About Beximco Pharmaceuticals Limited

Founded in 1976 and based in Dhaka, Bangladesh, BPL manufactures and sells generic pharmaceutical formulation products, active pharmaceutical ingredients and intravenous fluids. The Company also undertakes contract manufacturing for GlaxoSmithKline and is about to commence manufacturing for Novartis. The Company operates from a 20 acre site in Dhaka and currently employs over 1800 staff.

The Company's products are sold to retail outlets, medical institutions and other pharmaceutical manufacturers in Bangladesh, in regional markets such as Pakistan, Nepal and Myanmar and in other markets overseas, principally in East Africa (including Kenya) and South East Asia (including Singapore).

END
