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COMITE EXECUTIF
DU FONDS MULTILATERAL AUX FINS
D'APPLICATION DU PROTOCOLE DE MONTREAL
Quarante-huitième réunion
Montréal, 3 – 7 avril 2006

MISE A JOUR DU PROGRAMME DE PAYS: BANGLADESH

Ce document contient ce qui suit:

- Observations et recommandations du Secrétariat du Fonds multilatéral
- Mise à jour du programme de pays

DESCRIPTION

Programme de pays du Bangladesh

1. Le PNUD a présenté pour examen par la 48e Réunion du Comité exécutif la mise à jour du programme de pays du Bangladesh qui a été préparé en collaboration avec le Gouvernement du Bangladesh (mise à jour du programme de pays du Bangladesh).

2. Le programme de pays du Bangladesh a été approuvé à la 14e Réunion du Comité exécutif en septembre 1994. A la fin de l'année 2004, le Comité exécutif avait approuvé un financement total de 1,65 million de $US pour éliminer 172 tonnes PAO de CFC ; sur ce volume, 129 tonnes PAO ont déjà été éliminées et 1,2 million $US du montant approuvé a été décaissé. Lors de sa 36e Réunion, en mars 2002, le Comité exécutif avait approuvé la somme de 18 750 $US en faveur du PNUD pour qu'il puisse mener une étude et mettre à jour le programme de pays du Bangladesh.

3. Lors de la préparation de la mise à jour du programme de pays, le Gouvernement du Bangladesh et le PNUD avaient examiné dans le détail les progrès accomplis dans l'exécution du programme de pays initial. Les éléments saillants du programme de pays sont exposés ci-dessous.

Consommation de SAO

4. Le programme de pays du Bangladesh n'a signalé aucune consommation de CFC dans le secteur des mousses ou dans les applications de fumigation au bromure de méthyle. Le Bangladesh continuait à maintenir le statu quo concernant ces deux secteurs alors que la consommation de halons a été réduite depuis 1995. Les CFC, notamment le CFC-12, sont restées les substances les plus contrôlées qui sont consommées au Bangladesh en termes de volume d'utilisation durant la période d'exécution du programme de pays. Le tableau 1 ci-dessous compare la consommation de SAO au Bangladesh à la date d'approbation du programme de pays et la consommation de 2004.

Tableau 1: Comparaison de la consommation actuelle (2004) par secteur avec la consommation constatée lors de l'approbation du programme de pays du Bangladesh

Secteur	Consommation de 2004 (tonnes PAO)	Consommation de 1993 (tonnes PAO)	Type de SAO
Aérosols	62,22	86,6	CFC-11, CFC-12
Lutte contre l'incendie	0	7,5	Halon 1211
Mousses	0	0	CFC-11, CFC-12
Fumigènes	0	0	Bromure de méthyle
Réfrigération:	226,8	138,8	CFC-11, CFC-12
Fabrication	38,68	Non disponible	Non disponible
Entretien	188,12	Non disponible	CFC-11, CFC-12, CFC-115
Solvants	6,6**	0,9*	*CFC-113, **tétrachlorure de carbone, trichloroéthane
TOTAL	**295,62**	**233,80**	

5. Le CFC est utilisé principalement dans la fabrication de produits aérosols par la seule entreprise de fabrication d'aérosols et dans la réfrigération et la climatisation, y compris les appareils de climatisation portatifs, secteur qui a enregistré une modeste croissance pendant la période en question. Outre les CFC, l'autre SAO utilisée en grandes quantités, pendant la période 1995-2004, est le tétrachlorure de carbone (CTC) dans le secteur des solvants. Le CTC et, dans une moindre mesure, le 1,1,1-trichloroéthane sont utilisés par les industries textiles et du prêt-à-porter, soit un secteur incontournable de l'économie du Bangladesh. La croissance enregistrée dans les activités économiques semble avoir entraîné une augmentation de la consommation de SAO, notamment dans les secteurs du textile et des aérosols. Les schémas 1 et 2 ci-dessous illustrent les tendances de consommation du CFC et du CTC entre 1995 et 2004.

6. Au plus haut de sa consommation de CFC en 1997, le niveau de consommation de CFC du Bangladesh avait augmenté de 300% par rapport à sa consommation à la date de l'approbation du programme de pays. Quant au CTC, atteignant sa consommation maximum en 2002, la consommation est passée de zéro à près de 14 tonnes PAO. Ces tendances de consommation, notamment de CFC, ont été telles que le Bangladesh s'est trouvé confronté à de grandes difficultés pour respecter les mesures pertinentes de contrôle de la consommation de SAO au titre du Protocole de Montréal.

Schéma 1: Tendances de consommation de CFC au Bangladesh (1995-2004)

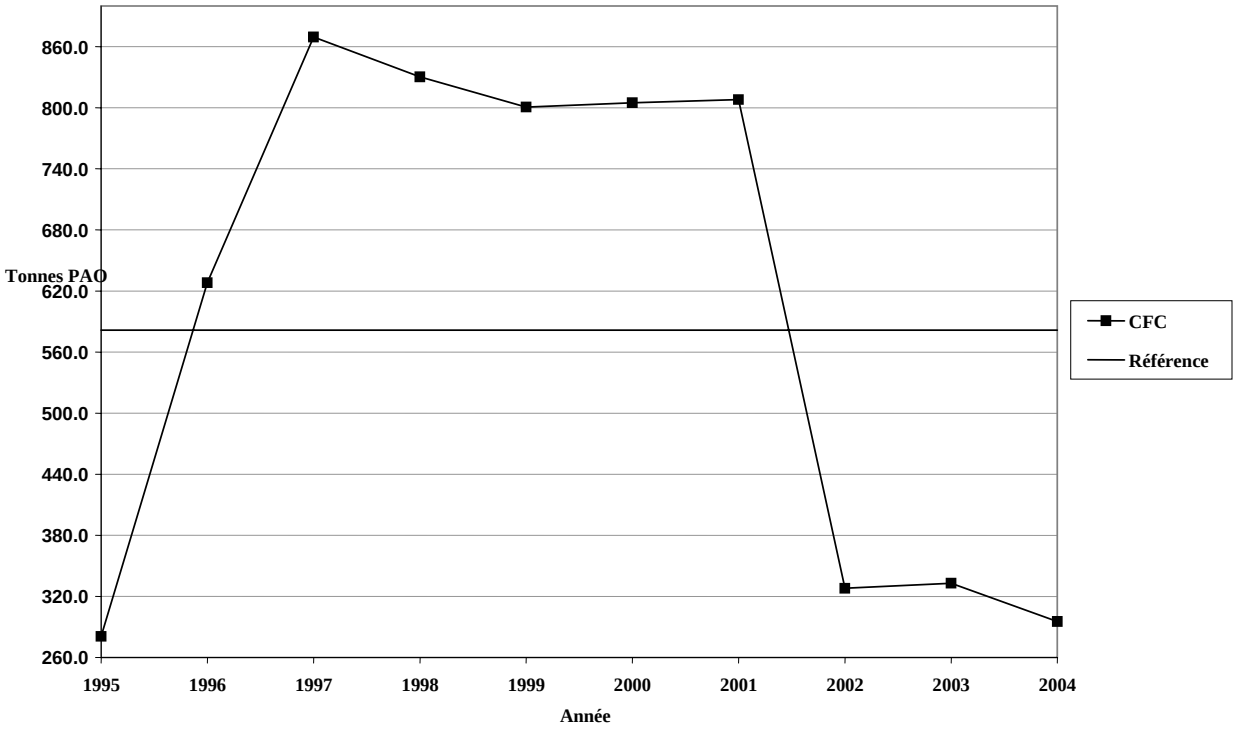
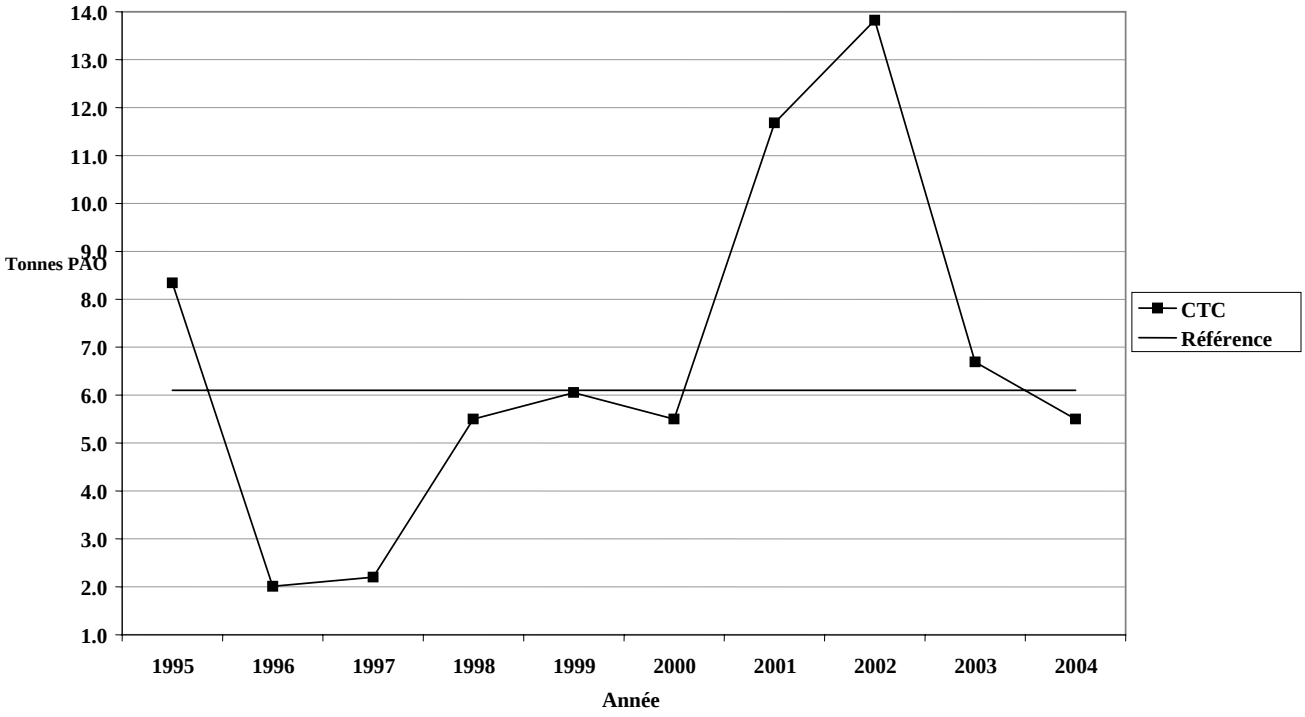


Schéma 2: Tendances de consommation du CTC au Bangladesh (1995-2004)



Projets et activités pour atteindre la conformité avec le Protocole de Montréal

7. Entre juin 1991 (4e Réunion) et décembre 2004 (44e Réunion), 22 activités ayant coûté au total 1 654 902 $US ont été approuvés pour le Bangladesh. L'activité la plus importante était le projet d'investissement, approuvé à la 17e Réunion en juillet 1995, qui ciblait la principale industrie consommatrice de CFC : l'unique fabricant d'aérosols dans le pays. Le projet de conversion, financé à hauteur de 322 577 $US, devait à sa date d'achèvement, en juillet 1996, permettre d'éliminer 123 tonnes PAO de CFC (40% de la consommation de 1995 qui était de 280,7 tonnes PAO). Le projet a été retardé de six ans et ne s'est achevé qu'en août 2002. Or, à cette date-là, le Bangladesh avait enregistré une hausse de sa consommation de CFC, soit 800 tonnes PAO, le pic de consommation étant enregistré entre 1997 et 2001. Cette évolution plaçait le Bangladesh en situation de non-respect du gel jusqu'en 2002.

8. L'autre activité d'élimination des CFC était le Plan de gestion des frigorigènes (PGF) qui a été approuvé en novembre 1999 (29th Réunion) au coût total de 424 225 $US. Le projet comprenait des activités de récupération et de recyclage – au montant de 298 270 $US – pour éliminer 12,6 tonnes PAO à l'échéance de décembre 2002. Le projet a ensuite été prorogé pour s'achever en juillet 2005 et éliminer 5 tonnes PAO à la fin de 2004.

9. Le Bangladesh a achevé, ou est censé avoir achevé, à fin 2004 toutes les activités hors-investissement du PGF, à savoir:

- L'introduction de la politique des licences d'importation/exportation;
- La formation de formateurs, puis de techniciens, aux bonnes pratiques de gestion des frigorigènes;
- La formation d'agents des douanes.

10. Le Bangladesh a également bénéficié d'un soutien important pour le renforcement de ses institutions avec 0,54 million $US en aide au bureau 'Ozone' pour la période allant de juillet 1994 à décembre 2004.

Mise à jour du programme de pays

11. Suite à l'achèvement, en 2001, de la conversion de l'usine d'aérosols d'une production à base de CFC à une production au LPG, qui représentait près de 60% de la consommation de CFC, le pays a estimé nécessaire de mettre à jour son programme de pays en se fondant sur les données réelles d'importation et de consommation par secteur, et ce afin de lui permettre de continuer à respecter les mesures de contrôle prévues au Protocole de Montréal. Le tableau ci-après énumère les mesures de contrôles applicables au Bangladesh pour ce qui concerne les SAO consommées actuellement dans le pays.

Tableau 2: Consommation de référence et consommation autorisée de SAO au Bangladesh

	CFC	**CTC**	**Méthylchloroforme**
Consommation de référence	581,59	5,68	0,87
Année	**Consommation autorisée (tonnes PAO)**		
2005	290,80	0,852	0,609
2006	290,80	0,852	0,609
2007	87,24	0,852	0,609
2008	87,24	0,852	0,609
2009	87,24	0,852	0,609
2010	0	0	0,261
2015	0	0	0

12. Après l'achèvement de l'enquête dont le financement avait été approuvé lors de la 36^{e} Réunion, un plan national d'élimination (PNE) a été mis au point en mars 2002. Le PNE qui a été approuvé à la 42^{e} Réunion en avril 2004, avec un Accord entre le Gouvernement du Bangladesh et le Comité exécutif, prévoit d'accorder une enveloppe globale de 1 355 000 $US au Gouvernement du Bangladesh pour lui permettre d'éliminer définitivement sa consommation de CFC, CTC et 1,1,1-trichloroéthane au plus tard en 2010. Des activités pour éliminer les solvants à SAO, mettre sur pied une unité de gestion et de contrôle, appliquer un programme de contrôle et de certification, former des agents des douanes et fournir un programme d'assistance technique au secteur de l'entretien en vue d'éliminer 36 tonnes PAO de CFC, ont été approuvées en avril 2004, dans la première tranche du programme annuel d'exécution du PNE.

Autres utilisations de CFC: refroidisseurs et inhalateurs à doseurs

13. La mise à jour du programme de pays identifie l'utilisation de CFC dans les refroidisseurs et les aérosols à usage pharmaceutique (inhalateurs à doseurs). Dans le sous-secteur des refroidisseurs, il a été proposé de mener une étude exhaustive, plus tard en 2006, qui devrait conduire à la formulation d'une stratégie d'élimination et un projet de la Banque mondiale est envisagé. La mise à jour du programme de pays n'indique pas clairement si la consommation de CFC, dans le sous-secteur des refroidisseurs, est comprise dans les volumes de CFC consommés par le secteur de l'entretien des appareils de réfrigération dont parle la mise à jour du programme de pays.

14. Dans le sous-secteur des inhalateurs à doseurs, jusqu'à récemment le Gouvernement n'était pas au courant de l'utilisation de CFC dans la production locale d'inhalateurs à doseurs. La consommation de 21,74 tonnes PAO de CFC-11 et de CFC-12 a été identifiée en 2003. Le rapport sur les données 2004 signale une consommation totale de CFC au volume de 295,6 tonnes PAO, dont 62,2 tonnes PAO consommées par le secteur des aérosols. La mise à jour du programme de pays précise également que la consommation de CFC, dans le sous-secteur des inhalateurs à doseurs, à raison de 62,2 tonnes PAO était en corrélation avec les données signalées.

15. La mise à jour du programme de pays relève que le document de projet du Plan national d'élimination des SAO indique que le Bangladesh avait effectivement identifié l'utilisation de CFC dans les inhalateurs à doseurs. Or, l'Accord relatif au PNE ne traite ni ne mentionne la consommation de CFC, par le secteur pharmaceutique, pour fabriquer des inhalateurs à doseurs.

16. Le Gouvernement du Bangladesh souhaite qu'une attention particulière soit accordée au soutien technique et financier indispensable pour ce secteur national névralgique. Il a attiré l'attention sur le fait que pour la plupart des autres secteurs, des technologies de substitution étaient disponibles dès 1995 et que tel n'était pas le cas pour ce qui est des inhalateurs à doseurs. Ainsi, au regard des circonstances prévalant, il n'aurait pas été approprié pour le Gouvernement de conseiller aux entreprises pharmaceutiques de ne pas créer des capacités de production d'inhalateurs à base de CFC, surtout quand on sait que les besoins pour ce genre de matériel sont vitaux.

17. Les remarques et réflexions détaillées sur le sous-secteur des inhalateurs à doseurs sont exposées dans les observations du Secrétariat fournies ci-dessous.

OBSERVATIONS ET RECOMMANDATIONS DU SECRETARIAT

OBSERVATIONS

18. La mise à jour du programme de pays rend compte des progrès accomplis dans la mise en œuvre du programme de pays originel. Toutefois, le rapport d'étape sur le Plan de gestion des frigorigènes (PGF) ne fournit aucune information suffisamment précise pour apprécier les résultats concrets réalisés par les projets hors-investissement relevant du Plan. Les 5,0 tonnes

PAO de CFC éliminées sur le volet “récupération et recyclage” du PGF excédaient l’objectif des 3,0 tonnes PAO du PNE pour 2004.

19. La mise à jour du programme de pays devait être achevée en octobre 2003, mais elle n’a pu être terminée qu’à la fin de l'année 2005. Ce retard a eu pour conséquence la soumission du PNE avant la soumission de la mise à jour du programme de pays. Du coup, sa valeur et son utilité pour définir la stratégie à suivre et installer un cadre pour le PNE ont été réduites.

20. Quant à la performance du programme de pays, notamment pour ce qui concerne l’élimination de CFC du projet concernant le secteur des aérosols, le volume de consommation qui a été éliminé est bien supérieur à celui signalé conformément aux règles du Fonds multilatéral comme on peut le voir au schéma 1 ci-dessus. La mise à jour du programme de pays signale que près de 60% de la consommation annuelle avait été éliminée par le projet, soit l’équivalent d’environ 485 tonnes PAO (comparé au volume déclaré de 123 tonnes PAO). Ainsi, avec le coût de 322 577 $US, le projet aérosols a été réalisé avec un rapport coût – efficacité de 0,67 $US/kg.

Inhalateurs à doseurs

21. Le PNUD rapport que l’étude a permis de signaler que deux entreprises avaient commencé la production en 1996 et ont consommé au total 21,7 tonnes PAO de CFC 11 et 12 en 2004. En plus de la fabrication sous son nom propre, l’une de ces entreprises avait également fabriqué sous contrat pour Glaxo. L’étude n’a pas ventilé la consommation de l’entreprise et la consommation faite pour le produit Glaxo.

22. A l’issue de discussions entre le Secrétariat et le PNUD, ce dernier a ajouté une Annexe à la mise à jour du programme de pays contenant des informations supplémentaires sur le sous-secteur des inhalateurs à doseurs pour la période 2002-2005, y compris des niveaux de consommation de CFC pour les inhalateurs à doseurs trois fois supérieurs à ceux indiqués au document initial. Une troisième entreprise, plus petite, qui a commencé à produire des inhalateurs à doseurs en 2003 a été également identifiée. Les renseignements complémentaires ont permis également de clarifier que les quantités de CFC requises pour permettre à l’entreprise locale d’honorer son contrat Glaxo avaient été importées séparément par Glaxo et n’avaient pas été ajoutées aux chiffres de consommation de l’entreprise, contrairement à ce qui avait été induit au départ.

23. Les données de programme du pays, fournies par le Bangladesh, font état d’une consommation de 62.2 tonnes PAO en 2004 dans le secteur des aérosols. La consommation révisée des inhalateurs à doseurs, fournie dans les renseignements complémentaires émanant du PNUD, concorde avec les données du programme de pays pour 2004 et 2003 (36,3 tonnes PAO) mais pas avec celles de 2002 (28,7 tonnes PAO) ; le Bangladesh ayant signalé zéro consommation pour le secteur des aérosols. La source des renseignements complémentaires du PNUD n’a pas été fournie. En revanche, le PNUD avait précisé qu’il envisageait d’effectuer une mission pour contrôler la nouvelle entreprise et vérifier les niveaux, visiblement élevés, de la consommation. Si ces niveaux venaient à être vérifiés et se poursuivaient en 2007, le Bangladesh aurait des difficultés à s’en tenir à sa consommation maximale de CFC (87.2 tonnes PAO) pour 2007 aux termes du Protocole. En vertu des règles du Fonds (décision 17/7), aucune des

entreprises fabriquant des inhalateurs à doseurs n'était éligible à financement pour la conversion à une production d'inhalateurs sans SAO car elles ont toutes entamées leurs opérations après la date du 25 juillet 1995.

24. En outre, le paragraphe 2 de l'Accord passé entre la République populaire du Bangladesh et le Comité exécutif (UNEP/OzL.Pro/ExCom/42/54, Annexe VIII) stipule:

> "Le pays convient d'éliminer l'utilisation réglementée des Substances figurant aux Annexes A (Groupe I) et B (Groupes II et III) du Protocole de Montréal suivant les objectifs d'élimination annuelle indiqués aux rangées 2 et 7 de l'Appendice 2-A (les « Objectifs ») et conformément au présent Accord. Au minimum, les objectifs d'élimination annuelle correspondent aux calendriers de réduction prévus au Protocole de Montréal. Le pays reconnaît qu'en acceptant le présent Accord, et le Comité exécutif en s'engageant à honorer ses obligations de financement énoncés au paragraphe 3, il [le pays] s'abstiendra de demander ou de recevoir du Fonds multilatéral des fonds en rapport avec lesdites substances."

25. Cet Accord, conclu entre la République populaire du Bangladesh et le Comité exécutif, semble exclure toute aide financière supplémentaire pour éliminer des SAO comme il apparaît en filigrane dans la mise à jour du programme de pays pour les sous-secteurs des refroidisseurs et des inhalateurs à doseurs.

26. Conformément aux données 2004 que le Bangladesh avait fournies au Secrétariat de l'Ozone et au Secrétariat du Fonds, la consommation 2004 définie dans le PNE et destinée à être éliminée devrait inclure la consommation du sous-secteur des inhalateurs à doseurs. C'est pourquoi, toute considération de financement d'une consommation supplémentaire de CFC, attribuée aux applications des inhalateurs à doseurs, donnerait lieu à une situation de double comptage.

27. Au vu de ce qui précède, aux termes de la décision XVII/14, les Parties avaient relevé le risque grave que certaines Parties visées à l'Article 5 consomment, en 2007, des quantités de CFC pour les inhalateurs supérieurs aux seuils autorisés. Elles avaient alors décidé de demander au Comité exécutif d'étudier ce genre de situations et réfléchir à des options susceptibles d'aider dans ce scénario potentiel de non-respect. Elles avaient également décidé de demander au Comité exécutif d'envisager l'organisation d'ateliers de travail régionaux afin de sensibiliser davantage et mieux informer les parties prenantes, dont les médecins et les patients, sur des inhalateurs à doseurs de substitution et sur la nécessité d'éliminer les chlorofluorocarbones dans les utilisations des inhalateurs et fournir aux Parties visées à l'Article 5 une assistance technique leur permettant de mettre un termes à cette utilisation.

28. Quant à la deuxième demande, il est utile de rappeler aux membres du Comité que le PNUE avait inclus, dans son projet de plan d'activités 2006, une proposition visant à organiser une série d'ateliers de sensibilisation dans six régions (Afrique anglophone; Afrique francophone; Asie-Pacifique; Asie occidentale; Amérique latine et Caraïbes; Europe et Asie centrale) et l'élaboration de supports et de matériaux d'information/sensibilisation, si possible parallèlement à la tenue de conférences régionales de ministres de l'environnement et de la santé. Le PNUE a informé qu'une demande de financement pourrait être soumise à la 49^{e} Réunion.

29. Au sujet de la première demande, le Comité exécutif pourrait demander au Secrétariat d'élaborer un document à soumettre à la 49e Réunion. Ce document décrirait les options permettant de traiter les questions soulevées par les Parties dans la décision XVII/14(2). Des propositions d'actions visant à aider les pays, qui se trouvent dans des circonstances similaires à celles du Bangladesh, pourraient être examinées à la lumière des conclusions que le Comité exécutif présenterait sur le document cité plus haut.

30. Nonobstant les observations émises aux 27 à 29 ci-dessus, outre la question de l'éligibilité au financement, comme indiqué aux paragraphes 20 et 21, l'accord liant le Gouvernement du Bangladesh au Comité exécutif pourrait exclure l'inclusion des entreprises fabricant des inhalateurs à doseurs de tout arrangement de financement futur pour ce secteur.

31. A la date de la rédaction du présent document, le Secrétariat n'avait pas encore reçu de lettre de transmission du Gouvernement du Bangladesh. Le PNUD suit cette affaire avec le Gouvernement.

RECOMMANDATIONS

32. Le Secrétariat du Fonds recommande l'approbation de la mise à jour du programme de pays pour le Bangladesh sous réserve que le Gouvernement de ce pays fasse parvenir la lettre de transmission, notant que l'approbation du programme de pays ne signifie pas approbation des projets qui y sont identifiés ou des niveaux de financement demandés.

33. Le Comité exécutif pourrait également envisager de demander au Secrétariat, en consultation avec les agences d'exécution concernées, de préparer un document à soumettre à la 49e Réunion décrivant les options à explorer pour traiter la situation des pays visés à la décision XVII/14 de la XVIIe Réunion des Parties au Protocole de Montréal.

THE PEOPLES REPUBLIC OF BANGLADESH

COUNTRY PROGRAMME UPDATE

DEPARTMENT OF ENVIRONMENT
MINISTRY OF ENVIRONMENT AND FORESTS

AND

UNITED NATIONS DEVELOPMENT PROGRAMME

February 2006

EXECUTIVE SUMMARY

The objective of the Country Programme Update was to evaluate the results of the original Country Programme, the present country situation with respect to ODS consumption, its related industry structure, and legal and institutional framework. This exercise was the basis for developing a National ODS Phase out Plan which was approved at the 42nd Meeting of the Multilateral Fund Executive Committee in March 2004. As such, this Country Programme Update is not requesting any additional funds for CFC phase out in the refrigeration sector and CTC and methyl chloroform phaseout in the solvent sector.

It should be noted that in the National ODS Phase Out Plan project document, Bangladesh did identify the use of CFCs in MDI. This consumption was not known earlier and had never been reported to the Multilateral Fund. As a result, no CFC consumption is allocated to MDI application. Bangladesh has been reporting this use since 2003. The pharmaceutical companies using CFCs for MDIs started up after the 1995 cut off date for MLF assistance, established by the Executive Committee.

The Executive Committee of the Multilateral Fund approved Bangladesh's Country Programme in 1994. Subsequently a Refrigerant Management Plan was approved in November 1999. Funding for CP update was approved in 2002 and funding for preparation of National Phase Out Plan was approved in 2003.

The consumption of CFCs reported by Bangladesh in 1999 was 801.33 MT or 800.61 ODP Tonnes. The consumption of Carbon Tetrachloride in 1999 was reported as 5.50 MT or 6.05 ODP Tonnes and the consumption of Methyl Chloroform was reported as 10.00 MT or 1.0 ODP Tonnes in 1999. According to Decision 35/57 of the Executive Committee of the Multilateral Fund, Bangladesh opted for Option 2 as the starting point based on its 1999 reported data. After accounting for all the projects funded by the Executive Committee till then and subsequently (123.6 ODP Tonnes for Aerosol and 11.6 ODP Tonnes for Recovery & Recycling component of RMP – Total 135.2 ODP Tonnes), there was an unfunded CFC consumption of 665.41 ODP Tonnes, unfunded CTC consumption of 6.05 ODP tonnes and unfunded methyl chloroform consumption of 1.00 ODP Tonnes.

Of the 665.41 ODP Tonnes of CFC that was unfunded in 1999, 595 ODP Tonnes was reported in the aerosol sector where the one company for which project had been approved, had increased its consumption from 123.6 ODP Tonnes to 595 ODP Tonnes. Thus, in 2002, an additional 471.4 ODP Tonnes (595-123.6) had been phased out leaving 194.01 ODP Tonnes of CFC consumption unfunded.

A detailed survey undertaken in 2003 in preparation of the Country Programme Update shows use of 13.115 ODP of CFC-11, 298.216 ODP Tonnes of CFC-12, and 3.563 ODP Tonnes (10.480 MT) of R-502 – total 314.894 ODP Tonnes of CFCs. This includes 8.840 ODP Tonnes of CFC-11 and 12.904 ODP Tonnes CFC-12 used for MDI applications. This consumption was not known earlier and had never been reported to the Multilateral Fund. As a result, no CFC consumption is allocated to MDI application.

Under the circumstances, while eligible tonnage of CFC in refrigeration sector for funding is 194.01 ODP Tonnes, it leaves 120.884 ODP Tonnes of CFC in the refrigeration sector unfunded yet requiring phase out.

Similarly, for the solvent sector, the survey shows use of 32.150 ODP Tonnes (29.226 MT) of CTC and 2.48 ODP Tonnes (24.80 MT) of methyl chloroform. 1999 reporting was 6.05 ODP Tonnes (5.5 MT) CTC and 1.0 ODP Tonnes (10.0 MT) methyl chloroform.

Thus eligible tonnage of solvent for funding is 7.05 ODP Tonnes leaving 27.58 ODP Tonnes unfunded yet requiring phase out.

On the basis of this data the National ODS Phase Out Plan was prepared and presented to the Executive Committee and approved at the 42nd Meeting of the ExCom for a total of $1,355,000 over a period of 7 years. UNDP is the lead implementing agency and UNEP is the co-implementing agency. The National ODS Phase-out Plan will phase-out the remaining eligible consumption of 194.010 ODP tons of Annex A, Group I CFCs, and 7.05 ODP Tonnes of Annex B Group II and III (CTC and methyl chloroform) over the period of 2003–2010. A series of investment, non-investment, technical assistance, and capacity building activities are proposed to achieve this target. The National ODS Phase-out Plan will enable the Government of Bangladesh to phase-out CFC, CTC and methyl chloroform consumption by January 01, 2010.

The current situation not addressed by the 2003 survey is presented in Annex I.

COUNTRY PROGRAMME UPDATE

BANGLADESH'S OBLIGATIONS & RESPONSES TO MONTREAL PROTOCOL

Bangladesh acceded to the Protocol on 2nd August, 1990 and ratified its London, Copenhagen and Montreal Amendments in March 1994, November 2000 and July 2001 respectively.. As a Signatory to the Montreal Protocol and the subsequent Amendments, Bangladesh has a commitment towards the global community to step-wise reduce and eventually ban, i.e. make a Terminal Phase-out of the use of Ozone Depleting Substances (ODS) in Bangladesh. As a Developing Country [Article 5 (1)] Signatory, Bangladesh enjoys, as mentioned above, a 10-Year Grace Period. As a Signatory to the Protocol, therefore Control Measures on Import and Use of ODS became effective for Bangladesh from 01 July 1999, as against 01 July 1989 as effective date for Non-Article 5(1) Parties. The Schedule of Phase-out applicable for Bangladesh as an Article 5 country is shown in the table above.

Bangladesh's Responses

Bangladesh responded to the Montreal Protocol through a series of Actions/Projects. In June 1991, UNDP received funding to assist Bangladesh carry out a reconnaissance survey of ODS use in Bangladesh. This survey information was used to prepare the Country Programme (CP) for Bangladesh which was approved by the Executive Committee of the Multilateral Fund in 1994. The CP identified projects and recommended action plans for the Government. Two projects, as recommended in the first Country Program of 1994, were implemented. These included, amongst others, the following:

- Institutional Strengthening Project : Creation & Strengthening of the Institutional Capability to implement Compliance Measures under the Montreal Protocol - Setting up of an Ozone Cell as "Focal Point" (1995) within Department of Environment (DOE) / Ministry of Environment & Forests (MOEF) - (Phase I) March 1996 - February 1999.

- Conversion to the CFC-free Technology for Production of Aerosol at ACI (Sept. 1998 - April 2000; Conversion Plant commissioned in May 2002).

Following the setting up of an Ozone Cell at DOE, subsequently other Phase-out related project activities were undertaken, which included:

- Institutional Strengthening Project : Phase-II / March'99 - March'02

- Institutional Strengthening Project : Phase-III/ March'02 - December'04

- Preparation of a Refrigerant Management Plan (RMP) with the assistance of UNDP which resulted in approval of the Plan in 1999 by the Executive Committee of the Multilateral Fund.

- Implementation of the Refrigerants Management Plan (RMP) : January '01 - Dec.'03 consisting of the following activities:

    - National Program for Recovery and Recycling of Refrigerants (UNDP): January '01 - Dec. '03. Eight Recycling and sixty two Electrical and Manual Recovery Machines and ancillary equipment were distributed throughout the country under the Recovery and Recycling Project and training in their use given.

    - Training Program on "Good Practices of Refrigeration" (UNEP): April '02 - Sept'03

    - Training Program of Custom Officers (UNEP): April '02 - March'03

- Monitoring of the Activities included under Refrigerants Management Plan (RMP) - Jan'01 - Dec'03 (UNDP)

- Preparation of Country Program Update with the assistance of UNDP. This resulted in the National ODS Phase-Out Plan for Bangladesh which was approved by the Executive Committee of the Multilateral Fund in April 2004. The Country Programme Update includes the following projects:

  - Public awareness and information dissemination to main stakeholders (UNEP)
  - Training and certification programme for refrigeration service technicians, including development of a code of good practices (UNEP)
  - Programme for custom officers (UNEP)
  - Recovery and Recycling Equipment (UNDP)
  - Domestic and Small Commercial Refrigerators to Hydrocarbon Blends
  - Retrofit of Car Air-Conditioning Equipment
  - Technical Assistance for Commercial Sector End Users to assist in decisions related to retrofitting or replacement
  - Technical Assistance for Solvent Sector End Users to assist in decisions related to alternatives to Carbon Tetrachloride and 1,1,1 Trichloroethane
  - Monitoring and Management of National ODS Phase Out Plan

Apart from above, the following ODS Phase-out related activities were performed under the Institutional Strengthening Project by the Ozone Cell:

- Formation of a National Technical Committee on ODS (NTCODS), headed by Secretary, Ministry of Environment & Forests
- ODS Data Update Surveys - 1995 to 2001 and 'Reconnaissance Survey' 2002
- Data reporting to Montreal Protocol (MP) Secretariat, MP Fund Secretariat, UNDP and other relevant offices and institutions
- Organization of Seminars in 2001 and 2002 on the eve of observance of the "International Ozone Day"
- GoB Initiative on Preparation of a Draft Legislation, in accordance with Powers conferred by the Environment Conservation Act 1995, to control Import of ODSs and ODS Equipment to strengthen Bangladesh regulations that would help phasing out of ODS Imports and Uses in the country
- Coordination with and Monitoring of Project activities-of ACI during Phase-out of their CFC uses by Conversion of their Aerosol Project (Public-Private Partnership arrangement)
- Awareness Campaign amongst Importers and End-Users of ODS on the adverse Impacts of Ozone depletion, during World Environment Day 2001, 2002 and 2003
- Public Awareness Creation through Media, including publishing Supplements in local Newspapers, Printing & Distribution of Posters, Stickers, initiating Essay and Painting Competitions,

Broadcasting Special Programs in Radio Bangladesh (Bangladesh Betar) and Bangladesh Television on the Eve of "International Ozone Day" - 2001, 2002 and 2003

- Two Training Workshops for motivating various tiers of Policy and Decision-makers on "Good Service Practices of Refrigeration & Air-conditioning' for Technicians and Personnel engaged in Servicing of various ODS based Equipment

In addition to the Draft Legislation, specifically on Ban on Production of ODS, ODS-using Equipment and also Controls imposed on Import and Export of ODS, as stated above, the following Government Initiatives have already been implemented as Bangladesh's Response to the Montreal Protocol and its subsequent Amendments:

- Increase in Tariff (or creation of a 'Tariff Barrier') on ODS

- Reduction in Tariff (or providing a 'Tariff Incentive') on Ozone friendly Substances (for example, the Import Duty on the major ODS Alternative - HFC 134a has been reduced to 7.5%, with effect from July, 2003).

COUNTRY PROGRAMME

As a first step to achieve the objectives of the Montreal Protocol, a Reconnaissance Study, on the use of ODS in Bangladesh was carried out in early 1993 by the Bangladesh Centre for Advanced Studies (BCAS) on behalf of the concerned agency of the Government of Bangladesh (GOB) – the Department of Environment (DOE). The study was sponsored by UNDP.

The study revealed that the per capita consumption of ODS in Bangladesh in 1991 was 2.02 gms per year. This is well below the 0.3 kg per capita per year for developing countries. Thus Bangladesh qualified under Article 5 para 1 of the Protocol to a 10 year delay in the phase out of ODS, and Bangladesh was eligible for seeking assistance from the Multilateral Fund.

UNDP, in consultation with the Department of Environment of the Government of Bangladesh contracted BCAS to prepare a Country Programme for ODS phase out. This was a requisite activity for seeking assistance from the Multilateral Fund. UNDP provided the financial support.

The Country Programme thus prepared, contained the essential information from the Reconnaissance Study on ODS use and import in Bangladesh during the period 1986-1991, the import figures for 1992 and 1993, analyses of phase-out scenarios, description of the recommended phase out strategy including an estimate of the cost of complete phase out, and an Action Plan for Government activities and project proposals for which the Bangladesh Government sought assistance from the Multilateral Fund.

ODS Import and Consumption in Bangladesh

It was established that no ODSs are manufactured in Bangladesh. These substances were imported by a limited number of importers and directly by end users. These were imported from nine countries of which 83% came from UK, Germany and USA. Since 1992, however, India became the major supplying country for Bangladesh.

Over the period 1986-91, on the average, 230.3 Metric ton (MT) of various ODS were imported. Of this CFC-11, CFC-12 and HCFC-22 accounted for 96.9%. Consumption of Me-chloroform, carbon tetrachloride and halons constituted the other 3%. No evidence was found regarding the import and use of methyl bromide as fumigation agent in Bangladesh. The 1992 and 1993 import figures for CFCs stood at 262.73 MT and 272.99 MT respectively. Figures for import of other ODS were not available. The share of CFCs in this figure was estimated to be the same as in 1986 – 1991 average.

The ODS consumption in Bangladesh was dominated by the Refrigeration and Air-conditioning Assembly and Maintenance (Service) Sector with a share of 46% of all ODS used in this country. The average consumption of the CFCs (CFC-11, CFC-12, HCFC-22) consumed in this sector from 1986-91 was about 95 MT/yr. The next largest consumer was a single Aerosol manufacturing unit, Advanced Chemical Industries (ACI), which consumed about 42% of the total ODS used for the manufacture of an insect spray. The average consumption of CFC-11 and CFC-12 by ACI was 86MT/yr. All other CFC consuming sector like Split and Central Air-conditioning sector, Cold storage, Fish-freezing plants, Ice Cream and Diary Processing Plants together consumed about 17.16 MT / yr. The use of non-CFC ODS amounted to an average of 8.14 MT/yr.

Phase-out Scenarios

Two basic phase-out scenarios were considered:

- Scenario A-1 — Phase-out as per permissible time limit of Copenhagen Amendment to the Montreal Protocol.
- Scenario A-11 — Accelerated phase-out at a pace set by availability of Technology including CFC alternatives at an earlier date

Scenario A-1 utilized the 10 year delay provision in the Protocol by considering a complete phase-out by the year 2006, whereas in Scenario A-11 a complete phase-out was envisaged by the year 2001 based on the assumption that substitute for CFCs would be available at reasonable price at an earlier date. However, both the scenarios were found to be in agreement with the phase-out schedule updated in Copenhagen Amendment of Montreal Protocol.

There were no basic differences in the two scenarios in terms of strategies, sequences and numbers of implementing measures, except the time scale for availability of the new technology and the Government policy imposition.

Although Scenarios A-11 was achievable, Scenario A-1 was considered to be the desirable and a more pragmatic phase-out schedule in the context of Bangladesh for the following reasons:

- ACI, the manufacturer of aerosol spray, was already considering switching over from CFCs to LPG as the propellant gas. If incentive was provided to ACI a 50% reduction in ODS use could effected when they stop use of CFC.
- Enactment of laws for imposing tariff barrier or banning import would need some time because of the bureaucratic complexities involved.
- Although ODS production in USA and Europe would stop in 1995-1996 with the bans on ODS in their home market, the production in India for their home market would continue till 2006. As share of imports from India into Bangladesh were increasing, illegal import of CFC from India would be encouraged if phase-out was scheduled earlier than production ban in India in 2006.

Recommended Phase-out Plan

The recommended phase-out schedule proposed a freeze on import and consumption at the 1986-1993 level (about 250 MT/Yr) by end of 1995. Thereafter a 50% reduction by 1996, 60% reduction by 2000, 80% reduction by 2003-2005 and 100% reduction by 2006. This seemed to be a more pragmatic schedule for Bangladesh on the grounds stated above.

The total cost of the recommended phase-out schedule was estimated at about US $ 8.05 Million. The benefit was a reduction of ODS consumption of about 7,500 MT ODS (low estimation being 5,500 MT) over a period of 1994-2006. The planned reduction in consumption was scheduled to be accomplished as follows:

- Conversion of the only existing Aerosol Plant from CFCs to LPG
- Conversion of large refrigeration units to ammonia
- Training and awareness programme for conservation of ODS use in Refrigeration and Air-conditioning Maintenance / Servicing industry
- Use of non-CFC refrigerant equipment in domestic sector
- Ban on import of CFC-based refrigeration and air-conditioning equipment as soon as new technologies become available.

Action Plan

In order to achieve the objective of ODS use phase-out in compliance with the requirements of the Copenhagen amendment to the Montreal Protocol an Action Plan was suggested in the Country Programme.

The plan required the introduction of Government initiatives to strengthen the institutional and policy framework, which would effectively regulate and monitor the import and use of ODS in the country and lead to implementation of a number of proposed projects in the ODS end user sector. These were prerequisites for bringing out the ODS phase-out.

Government Actions

The first step toward implementation of the Action Plan would be to establish the institutional framework. As the Government agency for implementation of different international conventions including Montreal Protocol the Department of Environment (DOE) would be the appropriate Government Institution to implement the Action Plan. DOE would be required to set up an Ozone Cell within the DOE for ODS phase-out and necessary rules and regulations were needed to be enacted. The Ozone Cell could be headed by the DG of DOE to be actively assisted by a full time director and his staff.

To oversee and support the functions of the Ozone Cell a National Technical Committee should be set up. Representatives from different Government agencies, who were conceivably directly or indirectly involved in the ODS phase-out programme, should be included in the Technical Committee. Representatives from Chambers of Commerce, Industry Associations, NGOs and forum of environmental journalists were also proposed to be included.

The National Technical Committee would advise the Government on import and export policy concerning ODS during the transition period. The committee would also advise the Government on the legal instruments/regulatory measures for ODS phase-out and prepare specific proposals for ODS phase-out to the Ministry of Environment and forest (MOEF) of which the DOE is an organ. The MOEF after inter-ministerial discussion and comments would submit specific proposals to the cabinet for approval and subsequent action by the Ozone Cell.

The Ozone Cell would act as the Secretarial of the National Technical Committee for ODS and co-ordinate and facilitate activities related to the phase-out of ODS.

A monitoring system for ODS use was to be introduced. This would be based on the requirement of obtaining permission from Ozone Cell to import before import process could be initiated and that the customs office would supply copies of all import declarations concerning ODS to the Ozone Cell, enabling the Cell to be in control of all legal imports of ODS in Bangladesh. Ministry of Industries, Ministry of Fisheries and the Ministry of Agriculture would inform the Ozone Cell of the setting up of any industry based on ODS as refrigerant.

To enable the Ozone Cell to act effectively the policy framework in the form of appropriate laws and regulations should be enacted by the Government.

Other proposed Government Actions were:

Introduction of Regulatory Measures

The regulatory measures proposed included a schedule of ban on the use of ODS for different purposes to be imposed at specifically given date; introduction of a special ODS tax on the import of all controlled substances and ODS using equipments. Since such a tax would, hopefully, encourage substitution of ODS in sectors where substitution may be easily accomplished, encourage import of ODS conserving technology. Tax exemptions for import of ODS recovering and recycling machines under a separate dedicated H.S. Code could be given. The services of a local legal consultant could be obtained to assist in preparing a schedule of regulatory measures and draft regulations for consideration by the Government through the National Committee on ODS. An economic consultant could be engaged to assess the cost of introducing the regulatory measures and the impact of these regulations.

The monitoring of regulatory measures would be the responsibility of the National Committee on ODS. Since this committee had no legislative and enforcement power it would act by making recommendations to other Ministries and Government agencies, especially the Ministry of Finance, Ministry of Commerce, Ministry of Industries, National Board of Revenue and the Factory inspectorate. The ODS taxes would be collected by the Customs and Excise wing of the National Board of Revenue.

Introduction of Certification of Refrigeration Technicians

In order to minimize operational losses and increase efficiency during servicing of refrigeration and air conditioning equipments in the maintenance and servicing workshops it was necessary to enhance efficiency of the workforce in those units. It was recommended that a certification arrangement be introduced for technicians, who had successfully completed the training programme, to be initiated for refrigeration technicians. A Technical Assistance programme involving expatriate and local consultants was developed.

Action Plan on Creating Awareness

Major importers and some of the users of ODS in Bangladesh were well informed about the Montreal Protocol and the efforts to substitute ODSs by new generation refrigerant. The majority of users, particularly the technicians in the service sector, owners of the fish freezing industries and the general public were unaware of the ozone depletion problem. Information dissemination to professional personnel/technicians as well as to the citizens of Bangladesh about the ODS was, therefore, essential for bringing about ODS use phase-out.

An information campaign would, therefore, be launched for creating general awareness about ODS through television spots, movie house (cinema) spots and newspapers.

The Ozone Cell would undertake distribution of international and national literature, posters etc. on ODS alternatives to the ODS using industries. Industry Associations in the respective sector would also support this activity.

Project Proposals

Four project proposals were submitted for funding from the Multilateral Fund – one project each for CFC substitution in the aerosol sector, conversion of large refrigeration units to ammonia, technical training and institutional strengthening.

The total incremental cost, which represented additional fund requirements in order to replace ODS-based technologies by ozone friendly technologies, was estimated at US $4,897,000. To facilitate complete phase-out of ODS use, an additional US $ 3,000,000 would be required in order to build-up of a strategic reserve of 1,000 MT of CFC. An additional US $ 150,000 would also be required to establish the proposed Ozone Cell within the DOE to facilitate implementation of the proposed Phase-out Action Plan.

IMPORTS OF ODS OVER THE YEARS

Bangladesh has been reporting consumption data every year to the Ozone Secretariat and Multilateral Fund Secretariat. The table below represents the consumption (or import) of the various ODSs since 1995. The Baseline is the average of 1995-1997 imports and forms the data for compliance.

Chemical	1995	1996	1997	BASE LINE	1998	1999	2000	2001	2002	2003
CFC (CFC-11, 12, 113, 115)	280.68	628.27	869.41	**581.59**	830.37	800.61	805.02	807.93	328.01	333.00
CTC	8.34	2.01	2.20	**5.68**	5.50	6.05	5.50	11.68	13.82	6.69
Halon (1211/1301)	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00	0.00
TCA	0.22	0.00	0.65	**0.87**	1.00	1.00	0.60	1.50	0.95	0.89
MBr	0.00	0.00	0.00	**0.00**	0.00	0.00	0.00	0.00	0.00	0.00

The Progress of Country Programme data submitted for 2001, 2002 and 2003 show the use of ODSs in different sectors. They are summarized in the table below.

Substance	Aerosol			Refrigeration			Solvent			Total		
	2001	2002	2003	2001	2002	2003	2001	2002	2003	2001	2002	2003
CFC-11	229.00	0.00	15.32	16.30	4.80	3.68				245.30	4.80	19.00
CFC-12	229.00	0.00	21.01	331.65	323.90	266.40				560.65	323.90	287.41
CFC-113				0.00	0.00	0.00				0.00	0.00	0.00
CFC-115				0.79	1.60	0.76				0.79	1.60	0.76
TOTAL	458.00	0.00	36.33	348.74	330.30	270.84					330.30	307.17
CTC							10.62	12.50	6.00	10.62	12.50	6.00
TCA							15.01	9.50	8.50	15.01	9.50	8.50

Note: Halon and MBr have not been shown above as their use was reported as "0" for all three years.

Aerosol:

In 2001, ACI was still consuming CFC-11 and CFC-12 for their pesticide product manufacturing. The conversion project undertaken with UNDP assistance was completed in May 2002. This resulted in "0" use being reported for Aerosol use in 2002.

During the Country Programme Update survey, it was found that Square Pharma and Beximco had been using CFC-11 and CFC-12 for their Metered Dose Inhalers. A third pharmaceutical company - Glaxo Smith Klein, which gets their MDI product manufactured under contract arrangement with BEXIMCO did not provide any data. It is believed that the plants came into production in 1996 and they had been using these products since then. Their use had never been reported to the National Ozone Unit and therefore not reported to the Multilateral Fund for previous years.

Refrigeration

The use of CFC-11 in this sector is very small and has been declining since 2001. It is used to recharge some chiller units and possibly for flushing of R&AC equipment.

The use of CFC-12 is substantial although a decline is noted between 2001 and 2003. One major area of use is in mobile air-conditioning and refrigeration, in addition to domestic and commercial refrigeration applications and central air-conditioning units.

Solvents

The use of CTC and TCA has reduced between 2001 and 2003. Most of the use is for "spot cleaning" in the garment industry followed by metal cleaning and electronic component cleaning. There is some use of TCA as an adhesive for joining plastic parts also.

ACTIVITIES UNDERTAKEN TO ACHIEVE COMPLIANCE AND PHASE OUT

Institutional Strengthening Project

Funding by the Multilateral Fund was approved in September 1994 for the Institutional Strengthening project. This allowed the National Ozone Unit to be set up in the Department of Environment to manage the phase out activities.

Two more tranches were approved in September 1999 and December 2001 for the National Ozone Unit to continue its activities.

Phase Out of CFCs at ACI Aerosol Plant

In July 1995, funding for equipment replacement and technical assistance at ACI was approved by the Multilateral Fund. The project was to convert the plant from using CFC-11 and CFC-12 to HAP as the propellant for insecticides. After some delays, the project was finally completed in August 2002.

Refrigerant Management Plan

As can be seen from the data reported on imports of ODS, after accounting for the consumption by ACI, the largest consumption was of CFC-12 for the refrigeration servicing sector. There was a need to address this important sector to ensure that refrigeration and air-conditioning (R&AC) equipment could operate till the end of useful life. It was also deemed necessary to train the technicians working in this sector to deal with the various alternatives as well as to be trained in conservation of CFCs through recovery and recycling. In addition, Bangladesh was moving towards implementation of legislation to meet the obligations of freezing and phasing-out as required by the Montreal Protocol and its relevant amendments. This required that Customs Officers be trained in recognizing Ozone Depleting Substances and equipment which worked on Ozone Depleting Substances.

A Refrigerant Management Plan (RMP) was prepared by UNDP in collaboration with the National Ozone Unit in 1999. The RMP was approved in December 1999. A summary of the project is given below.

The Country Programme for Bangladesh identified 1993 consumption in the R&A/C sector as 112.16 MT of CFCs and HCFCs. For 1997, the corresponding reported figures were 344.260 MT. This consumption included the MAC sub sector. It should be noted here, that the Country Programme did not identify consumption of CFC-115 (as R-502), of which there is on going consumption. In addition, while chillers were identified in the RMP, no project proposal for retrofit was submitted in the RMP.

1997 ESTIMATED CONSUMPTION IN THE R&A/C SECTOR (ODP Tonnes)

CFC-11	CFC-12	CFC-115 (as R-502)	HCFC-22	HCFC-123
4.82	263.09	0.32	3.54	0.10

ESTIMATED CONSUMPTION OF REFRIGERANTS BY USE AND APPLICATION

Sector	Sub-Sector	ODS	Application	Consumption (MT)
Refrigeration and Air Conditioning	Freezer/Refrigerator and A/C service	CFC-11	Flushing	0.660
		CFC-12	Recharge	121.522
	Commercial			
	♦ Ice Cream and Ice Factory	CFC-12	Recharge	120.075
		HCFC-22	Recharge	0.220
	♦ Ice and Cold Storage	CFC-12	Recharge	3.262
	♦ Fish Freezing/Fish Processing Plants	CFC-12	Recharge	1.969
		HCFC-22	Recharge	1.688
	Mobile Air-Conditioning	CFC-12	Recharge	16.100
	Commercial Refrigeration	R-502	Recharge	1.054
	Domestic/Commercial Air-Conditioning	CFC-11	Recharge	4.160
		CFC-12	Recharge	0.100
		HCFC-22	Initial Charge & Recharge	68.331
		HCFC-123	Initial Charge & Recharge	5.055

The R&A/C equipment in use in the country are in the domestic, commercial and MAC (car and bus a/c) sectors. Bangladesh's economy is growing and this has led to an increase in "consumer" goods and personal comforts.

In addition fish exports contribute significantly to the foreign exchange earnings of the country. Use of refrigeration equipment in ice making, fish processing and storage is extensive. No data is currently available on refrigerated deep-sea trawlers and this information will be collected as and when the CP update is undertaken.

The Government is deeply concerned about the consequences of non-availability of refrigerants, particularly for the commercial/industrial and service sector. It will encourage recovery and recycling, particularly from commercial units during servicing, and certainly during

decommissioning, to ensure a stock of CFC-12 for the domestic and commercial refrigeration service sector, beyond 2010.

It is essential for ODS users to understand the implications of the country's obligations under the Montreal Protocol and be able to reduce and subsequently phase out their consumption in a coordinated, planned and cost effective manner. A combination of conversion projects, introduction of equipment using ozone friendly refrigerants, coupled with implementation of training in good maintenance practices, and an effective recovery and recycling program was expected to ease the economic consequences of the phase out. The expected Regulation banning import of ODS using equipment would limit the consumption to a finite service tail.

The RMP reflected the Government's commitment to comply with its obligations as a Party to the Montreal Protocol on Substances that Deplete the Ozone Layer. It also provided the catalyst to the R&A/C service sector in particular, to allow them to meet the conditions of the Montreal Protocol.

Sector Analysis

Bangladesh is divided into 6 Divisions – Dhaka, Chittagong, Rajshai, Khulna, Sylhet and Barisal. The major cities are Dhaka, Chittagong, Rajshahi, Khulna, Sylhet, Barisal, Cox's Bazar, Bogra, Dinajpur, Narayanganj, Munshiganj, Chandpur, Sunamganj, Comilla, Satkhira, Mymensingh, Jessore, Kushtiya, Noakhali, Pabna, Faridpur and Moulavibazar. The bulk of refrigerant consumption occurs in areas in and close to the above cities. Most imports come through Chittagong port and by road from India.

a) Manpower

It was estimated that Bangladesh had over 4,000 technicians working in the Refrigeration and Air - Conditioning sector. The Bangladesh Refrigeration & Air-Conditioning Banik Samity (an association of R&A/C traders, importers and service companies) put the number at 300,000, which included skilled, semi-skilled and unskilled workers. The skill level of service technicians in the country varies considerably. The industrial users and large service organisations generally do not have in-house technicians. Their service needs are met by the service organizations. In most cases, the user procures the refrigerant recurred from local sources. There are a large number of small and medium sized service workshops (over 4,000 according to the Association, of which approximately 400 are members of the Association) with semiskilled or untrained technicians, who service household refrigerators. The membership was expected to increase considerably within a short time as the government intended to circulate an order requiring any company seeking a Trade License to be a member of the appropriate trade association.

Bangladesh has 14 Polytechnics in some of which R&A/C is taught. The teachers for these institutions are taught at two Teachers Training Colleges in Dhaka and Bogra. Dhaka Polytechnic has two courses. The 4-month (360 hour) basic trade course prepares 50 students per batch. These students receive Certificates and generally go on to work in small R&A/C service companies.

The 3 year (six semesters) Diploma Course graduates 80 students a year. These students join as Sub Assistant Engineers in larger organizations and some go on to Teachers Training College.

In addition, there are several Vocational Training Institutes across the country some of which teach R&AC courses.

b) Domestic Refrigerators and Freezers

It was estimated that there were between 2.5 and 3 million refrigerators and freezers in Bangladesh. The average life being 20 plus years. All equipment was imported from Japan, Western Europe, Korea, and China. Discussions with service companies indicated that most refrigerators and freezers had their compressor changed at least 3 to 4 times during their lifetime, with two to three additional

recharges due to leakage. The practice was to use CFC-12 for flushing and pressure test before charging leading to an estimated consumption of 0.5 kg. per refrigerator serviced. CFC-11 was not used for flushing.

HFC-134a based refrigeration systems were being imported in substantial numbers into Bangladesh. The imports from Korea and China were CFC-12 based, while all others were HFC-134a based. R-600 (Hydrocarbon) based units were not yet known. The expected Regulation banning import of ODS using equipment would limit the service tail to equipment imported prior to 2000.

b) Commercial Refrigeration – Ice Cream and Ice factories

Bangladesh had around 2,500 ice and ice cream factories. There was an even split between CFC-12 and ammonia based refrigerant with a few units operating on HCFC-22.

c) Commercial Refrigeration – Cold Storage

The Bangladesh Cold Storage Association estimated that there were 175 cold storages in operation. Most of them were Ammonia based, with some being CFC-12 based.

d) Commercial Refrigeration – Fish Freezing/Fish Processing

The Bangladesh Frozen Foods Exporters Association had a membership of 90 units. Here too, most units were based on Ammonia with some being CFC-12 based, and some HCFC-22 based.

e) Air-Conditioning

Central air-conditioning systems were generally HCFC-22 based. There were two hotels and three other buildings that had CFC-11 based air conditioning systems. Two buildings were equipped with HCFC-123 based units, one of which was commissioned in 1997.

Mobile Air-conditioning and Refrigeration

Cars and Buses:

Bangladesh did not manufacture or assemble cars. In 1997 alone, 18,400 cars were registered in Bangladesh, 80% of which were air-conditioned. Very few new cars were imported and used/reconditioned vehicles upto 5 years old were allowed to be imported. All but a small percentage was imported from Japan. Since all Japanese cars were HFC-134a based from 1995, all cars entering Bangladesh from 2000 would be CFC free.

In 1997, there were 60,000 air-conditioned buses registered in Bangladesh. Travel across the country is generally by road, accounting for such a large number of busses. There were no estimates on how many were CFC-12 based, and how many had other refrigerants. It was expected that nearly all of them were CFC-12 based.

Refrigerated Trucks:

The Bangladesh Road Transport Authority had about 230 refrigerated trucks registered with them. These trucks were used for transport of frozen food, dairy products and ice cream. All of them were CFC-12 based.

Components of the Refrigerant Management Plan

The critical components of the phase out strategy considered in the RMP are given below.

Policy Framework

The Ozone Cell of Bangladesh would monitor implementation and control measures such as:

- Ban on new installations and equipment using ODS.
- Monitor imports of ODS to ensure freeze and phase-out conditions were being met. Implement and enforce caps or quotas if necessary.
- Study the possibility of import concessions and tax incentives to promote use of substitutes and alternative technologies. (A recommendation was be sent to the concerned Ministries to reduce taxes on ozone friendly substances and increase taxes on ODS.)

Emission Reduction

- Implement a national recovery and recycling project.
- Encourage industrial and commercial consumers to evaluate retrofitting of existing equipment to operate on ozone friendly refrigerants, and recover/recycle ODS from decommissioned equipment.

Training

- Training of refrigeration technicians in good refrigerant management practices.
- Training for Customs, aimed at Custom enforcement officers to better implement the licensing system, the ban on new and used ODS based equipment, increased taxation on ODS (as and when approved and put into effect) as well as identify imports of ODS and ODS containing equipment and products for accurate recording for the database..

The Ozone Cell would continue to be the main link with the users of ODS. The Ozone Cell did the reporting of data also. Continuation of Public Awareness programs, data collection of import/export and analysis of the same, monitoring of the recovery/recycling program (as and when implemented), and ensuring training programs reach the intended recipients would be a critical on-going task of the Ozone Cell till 2010.

Impact of the Refrigerant Management Plan

The successful implementation of the various components of the RMP (training, implementation and monitoring of 1999 regulation, and implementation of the National Recovery and Recycling Project) would lead to the effective phase out of ODS well within the requirements of the Montreal Protocol.

Component	Expected Impact
Institutional Strengthening and National Awareness Program (if extended beyond February 1999)	• Effective monitoring and coordination of all phase-out activities. • National Awareness of relevant regulations. • National awareness on Ozone issues, leading to increased demand for ozone friendly equipment.
Implementation of ban	• Ban on imports of ODS and ODS using equipment
Implementation of import/export licensing policy	• Ensure Montreal Protocol freeze and phase-out conditions are met. • Ensure phase-out completed by 2010.

Training of Trainers in Good Refrigerant Management Practices, followed by national training of technicians project	• Control of CFC-11 for flushing from 2000 - 2001. • Reduce CFC-12 from 2000 - 2001 (by preventing unnecessary emissions) • Make technicians familiar with drop in substitutes, retrofitting, and the different ozone friendly refrigerants
Training of Customs	• Effective implementation of ODS import/export licensing system and data collection. • Enforce ban on import of ODS using equipment. • Enforce economic incentives/disincentives.
National Recovery and Recycling Project	• Reduction in consumption of virgin CFC-12 • Collection of CFC-12 from equipment being decommissioned. • Availability of CFC-12 beyond 2010 to meet the service requirements of remaining equipment.

All the above activities have been completed or will be completed by end of 2004.

NEED FOR A COUNTRY PROGRAMME UPDATE

The Country Programme (CP) was prepared in 1994 and reported 1993 consumption data. It should be noted here, that all figures were based on statistical sampling and projections and did not reflect the true use, particularly of refrigerants. In addition, the CP was prepared under the premises that Article 5 countries had 10 years from 1995 (the phase out date for non Article 5 countries) to phase out. A series of important events and changes took place since the CP 1994 was prepared with the various Planning Strategies and Budgets for Phase-out and Recommendations for implementation of same. Three (3) additional Amendments of the Montreal Protocol were made, following the CP 1994 - at Montreal (1995), at Vienna (1997) and Beijing (1999) respectively. As per terms of the MP, the Control Measures on the Import and Use of ODS became effective for Bangladesh, as an Article 5 (1) Signatory country, from 1st July 1999.

The subsequent surveys by the Ozone Cell at DOE showed that the ODS consumption in Bangladesh has also increased substantially since the first Country Program - 1994 was prepared and its two major projects implemented. The CFC use in the Aerosol sector, which consumed over 60% of the total ODS use in Bangladesh in 2001, could be phased out through conversion of the CFC (11+12) based Aerosol Plant to a LPG-based Unit at ACI, which was commissioned in April/May 2002, following which Bangladesh went into full compliance of the MP. The "state-of-the-art of ODS substitution technologies in various sectors of ODS use have also progressed a lot in the International arena since the last Country Study.

A definite need was seen to update the Country Programme based on actual import and consumption data by sector to enable the country remain within compliance with the requirements of the Montreal Protocol. Although Bangladesh's base-level amounts (in ODP tonnes) for various ODS Consumption, as an Article 5 country, are predetermined by terms of the MP and Bangladesh's choice for Option 2 (1999 Reported Data), the survey became necessary not only to assess the present situation and the status of compliance of ODS Use in Bangladesh, but also the uses of such ODS in possible new / 'gap' areas, which could have been missed by past ODS Surveys.

UNDP received funding in March 2002 from the Multilateral Fund to assist Bangladesh carry out a survey and prepare the Country Programme Update. During the survey it was realized that additional funding was required to assist Bangladesh comply with the requirements of the Montreal Protocol. Additional funding was approved in April 2003 to prepare the National ODS Phase-Out Plan.

The National ODS Phase-Out Plan was submitted to the Executive Committee of the Multilateral Fund and funding was approved in April 2004. While it cannot provide full financial assistance to all the end users of Ozone Depleting Substances in Bangladesh, it will definitely allow for a informed

transition from ODS to non-ODS alternatives by all stakeholders, and hopefully minimize the economic impact of such a transition.

An ODS Update Survey to assess the current situation thus became necessary to provide a professional planning base for preparation of the Country Program Update and the National ODS Phase-out Plan for Bangladesh.

Findings of the Survey

The survey was conducted as a sampling survey. It was understood that it would not be possible to undertake a 100% census survey in view of the limited availability of time and resources. However, it would provide a close 'Base-line' estimate of the ODS use by applying professionally designed methods for conducting the Survey and evaluating the Data.

In some cases, such as the refrigeration servicing sector survey, because of the large number of servicing shops dispersed all over the country, the best possible estimates and information from Associations were taken. Hence, such limitations of a sampling survey should be kept in mind, although close estimates are possible.

A total sample size of over 837 ODS and Non-ODS user units were covered in the survey in 3 main Sectors and 16 sub-sectors.

ODS Use was found in the following sector and sub-sector units surveyed:

▪ R & AC Maintenance Shops ('Fixed')	-	292 units (Users of CFC-12, HCFC-22 and R-502
▪ R & AC Maintenance Shops ('Mobile)	-	197 units (CFC-12, HCFC-22 and R-502 Users)
▪ Commercial/Industrial Refriger. Units	-	88 units (CFC-11,CFC-12, HCFC-22 and R-502)
▪ Solvent Sector	-	7 units (CTC and MCF)
▪ Pharmaceutical (MDI) Sector	-	3 units (CFC-11, CFC-12)
Sub-total of units found using ODS	-	**587 Units**
▪ Other units, using non-ODS Refrigerants (A cross-section of Ice Plants, Cold Storages and Fish Freezing Plants)	-	250 units (Uses Ammonia - Non-ODS)
Total units covered by survey	-	837 units

Summary of Survey Findings

This section presents a summary of the results / final outputs of the ODS update survey (2003) in terms of imports and uses of the various types of ODS (CFC-11, CFC-12, R-502, HCFC-22, Carbon Tetrachloride and Methyl Chloroform), as evaluated from the survey data, collected through import information and sampling surveys of various ODS users.

ODS Imports

Bangladesh imported a total quantity of 636.55 MT of all ODS types over the total fiscal year 2002, which, apart from CFC-11, CFC-12 and R-502, also includes HCFC-22 and the ODS solvents - Carbon Tetrachloride (CTC) and Methyl Chloroform (MCF) used in Bangladesh. Import data obtained up to June 2003 is indicative of a lower quantity of total imports - about 490 MT this year, if extrapolated for the entire fiscal year. The Importers have reported a stagnation of overall business and production activities in the country as the reason for lower imports in 2003.

Imports of CFC-11, CFC-12 and R-502 - Total imports into Bangladesh during the fiscal year – 2002 were 13.67 MT CFC-11, 382.67 MT CFC-12 and 7.76 MT R-502.

Imports of ODS Solvents - Carbon Tetrachloride (CTC) and Methyl Chloroform (MCF) were found to be 14.4 and 8.6 MT respectively in 2002. This makes the total Imports of ODS in Bangladesh 427.121 MT, excluding HCFC-22 (the CFC which is controlled substance with a long term Phase-out Schedule (up to 2040).

The imports of ODS **Solvents** - CTC and MCF, amounted to only about 3.6% of total Imports all ODS, including HCFC-22 and about 5.38% excluding HCFC-22

The share of CFC-12 imports at 60% of total ODS (including HCFC-22) is found to be the highest, as expected due to its widespread use. With the import figures for HCFC-22 taken out, CFC-12 imports for 2002 amount to about 90 % of total ODS imports, which meant that the National Phase-Out Plan would need to focus on the import and use of CFC-12 and its replacement by appropriate Alternatives, like HFC-134a.

ODS Prices (C & F)

The mid 2003 average C& F Prices of the various CFCs and Other ODSs, as reported by the major Importers are in the following range :

- CFC-11 : US$ 1.62
- CFC-12 : US$ 2.10
- HCFC-22 : US$ 2.20
- HFC-134a : US$ 4.10
- CTC : US$ 2.35
- MCF : US$ 2.36

The Custom Duties on the ODSs are : 15% + 15% VAT (on add val)., other landed costs, including ILC being 6.5&, the average multiplying factor to reach landed costs being 1.3875 on C & F Prices.

Share of Origin Countries (from where Imported)

An interesting aspect of ODS imports is that in 2002, while India had the largest share as origin country for CFC imports into Bangladesh, the scenario has shifted now (2003) totally in favour of China, which now has a 77.5% share as an origin country, the reason being cost-effectiveness of CFCs imported from China, compared to India. This price-gradient has reportedly initiated a temporary border 'market force' and an 'illegal border trade' of CFCs with India.

Share of various Importers

There are currently 15 major importers of ODS. Delco Engineering is currently the largest CFC importer of Bangladesh (about 34% share in 2002 and 51% share of all ODSs imported up to 2003), followed by Syed Gas and Chemicals (24% in 2002 and 12% up to June 2003). The market share of other importers was found to be varying.

ODS Uses

The uses of ODS were derived from the comprehensive sample survey, using the specific user-level questionnaires. The uses of ODS, as evaluated from the survey results are summarized below - by 3 broad sectors, both in MT and ODP Tonnes, which, together with quantities of reported of ODS in 1999 (Option 2 for Bangladesh) will form the basis to calculate the starting point of ODS use.

ODS USES BY BROAD SECTORS AND GROUPS OF CONTROL SUBSTANCES

CFC Use in R&AC	CFC-11		CFC-12		R-502	
	MT	ODP	MT	ODP	MT	ODP
Refrigeration & Air-Conditioning. Servicing Sector	-	-	251.071	251.071	1.568	0.533
Commercial / Manufacturing Refrigeration Sector	4.275	4.275	34.240	34.240	10.312	3.506
Sub-total CFC Use - R & AC Sectors	**4.275**	**4.275**	**285.311**	**285.311**	**11.880**	**4.039**
Total CFCs in R & AC Sector	**293.625 ODP Tonnes**					

ODS SOLVENT USE	CTC		MCF	
	MT	ODP	MT	ODP
In Readymade Garment Industry	29.226	32.148		
Electrical/Electronics Sun-sector Degreasing			24.48	2.45
Sub-total ODS Solvent Use	**29.226**	**32.148**	**24.48**	**2.45**
Total ODS Solvent Use	**34.62 ODP Tonnes**			

PHARMACEUTICAL USE - MDI APPLICATIONS	CFC-11		CFC-12	
	MT	ODP	MT	ODP
In Metered Dose Inhaler	8.840	8.840	12.904	12.904
Sub-total CFC Use in MDI	8.840	8.840	12.904	12.904
Total MDI Use (CFC-11+CFC-12)	**21.744 ODP Tonnes**			

New Uses not Covered or Inadequately Covered by Projects in the Past

Solvent Use of CTC & MCF

- **CTC Use**

The users of CTC and MCF were identified through the update survey and their amounts quantified in the readymade garments (RMG) sectors and in the electrical/electronics assembly industries/establishments respectively. CTC was found to be used in five RMG Industries for 'spot cleaning', the usual cleaning method being either by using spray guns or mechanized inspection table, equipped with spraying facility and a suction system. However, considering the small quantity of solvent use, no recovery system is being used.

Stakeholders in this sector reported that about 15 nos. of such RMGs, especially those who have integrated garment manufacturing (from yarn), are using CTC for the above purpose. BEXIMCO Textiles Ltd., Padma Textiles Ltd. are two of the largest users of CTC.

The total use of CTC, as found through the Update Survey is estimated as 29.226 MT (32.148 ODP Tonnes).

- **MCF Use**

MCF was found in the import records of Customs and also reported by Chemical Importers (Chemicon and Azad Chemicals). Square Pharma has also reported both import and use (laboratory)

The major use of MCF is in the degreasing of electrical and electronic components (PC boards, parts). Bangladesh Biman, GMG Airlines are using MCF. Bangladesh Army is also reportedly using MCF in their Machine Tools Factory and Ordance Factory at Joydevpur, near Dhaka. However, the defence services were not covered by the survey.

Plastic industries are also using MCF in small quantities for joining plastic parts etc, as it has a similar property as Chloroform to dissolve certain 'Plexiglas' type plastics.

The total Use of MCF as surveyed is 24. 8 MT (2.48 ODP Tonnes).

Mobile Refrigeration

There has been a significant growth in the population of automobiles (cars/jeeps) in the country, over the last seven (7) years, i.e. from 1995-96. All cars imported from Japan after 1996 are equipped with the CFC alternative - HFC 134a based air-conditioners. However, the problem is that when they are coming for recharge, most of them are being refilled with CFC-12.

The update survey comprehensively covered the CFC use by air-conditioned bus operators. 13 A/C bus companies were identified and all of them surveyed (100%). They reported that a fleet of 144 A/C buses are currently operating in the country. These A/C buses are maintained in their own workshops, including the recharge of CFC refrigerants. Their workshops interestingly, reported quite high use of CFC-12 (about 12.96 MT/Year). As reasons they mentioned:

(i) frequent occurrence of slow leakages at critical joints due to very bad road conditions and
(ii) 'topping up' of remaining refrigerants with more CFC-12 quantities.

However, this requires a further detailed investigation, as the high consumption could also be a result of 'pilferage' of CFCs (possible outside sale of CFC by concerned workshop personnel for personal gains).

MDI Application (CFC-11 and CFC-12 as Propellant Gases)

Past surveys missed finding and reporting the MDI use of CFC-11 and CFC-12. Two private sector companies have production lines to manufacture the above CFC-based MDIs - BEXIMCO Pharmaceuticals Ltd. and SQUARE Pharmaceuticals Ltd. A third pharmaceutical company - Glaxo Smith Klein, which gets their MDI product manufactured under contract arrangement with BEXIMCO did not provide any data. The data provided by the two companies during the survey amounted to 21.744 Tonnes (CFC-11 – 8.840 T and CFC-12 – 12.904 T). The total CFC-11 and CFC-12 Use in the MDI Sector was found through the update survey to be **21.744 MT (21.44 ODP tonnes).**

Use of CFC Pre-mixes in Polyols used in Foam Industries

Although earlier reports, starting from 'Recon' Study in 1993 till 2001 did not report any use of CFCs/Other ODS in the foam industry, a re-check was done directly with the production and import departments of all local foam industries, as well as the suppliers of Polyols (e.g. BASF), who reported that no use CFC-11 or other CFCs pre-mix in Polyols were being used.

CFC Use in Razor Blade Industry

Two Razor Blade Industries, operating in Bangladesh, were surveyed. No CFC Use was found.

CFC Use in Disposable Syringe (Needle production) Manufacture

CFC is not being used in manufacture of Injection Needles in Bangladesh.

Use of Halons (for Fire-fighting)

Use of Halons was reported in surveys up to 1993 - '94. The Fire Fighting (Civil Defence) Department, when contacted reported that the import of Halon was banned since 1995. Contacts with Petrobangla, Bangladesh Gas Fields Ltd., Bangladesh Petroleum Exploration and Production Company Ltd., Electrical Sub-stations of Dhaka Electric Supply Authority (DESA), Bangladesh Power Development Board (BPDB) revealed that they are not using Halons for Petroleum, Oil and

Gas and Electrical fires. A number of RMG Industries, who have frequent incidents of electrical fires, were approached, who also reported that no Halon is used. Carbon Dioxide fire-extinguishers are most frequently used.

Use of Methyl Bromide

The Pest Control / Pesticides Department of the Government Agricultural Department, when contacted reported no use of Methyl Bromide (for Pest Control / Quarantine use), the import of the said ODS having been banned in Bangladesh by a Government order.

THE NATIONAL ODS PHASE-OUT PLAN

The National ODS Phase-Out Plan, which was approved by the Multilateral Fund in March 2004, outlines a proposal to phase out all ODS in Bangladesh. The Plan includes strategies for the refrigeration servicing sector and the solvent sector. The strategy calls for complete phase-out of all ODS by January 1, 2010 while complying with the Montreal Protocol phase-out requirements.

The consumption of CFCs reported by Bangladesh in 1999 was 801.33 MT or 800.61 ODP Tonnes. The consumption of Carbon Tetrachloride in 1999 was reported as 5.50 MT or 6.05 ODP Tonnes and the consumption of Methyl Chloroform was reported as 10.00 MT or 1.0 ODP Tonnes in 1999. According to Decision 35/57 of the Executive Committee of the Multilateral Fund, Bangladesh has opted for Option 2 as the starting point based on its 1999 reported data. After accounting for all the projects funded by the Executive Committee till then and subsequently (123.6 ODP Tonnes for Aerosol and 11.6 ODP Tonnes for Recovery & Recycling component of RMP – Total 135.2 ODP Tonnes), there is an unfunded CFC consumption of 665.41 ODP Tonnes, unfunded CTC consumption of 6.05 ODP tonnes and unfunded MCF consumption of 1.00 ODP Tonnes.

Of the 665.41 ODP Tonnes of CFC that was unfunded in 1999, 595 ODP Tonnes was reported in the aerosol sector where the one company for which project had been approved, had increased its consumption from 123.6 ODP Tonnes to 595 ODP Tonnes. Thus, in 2002, an additional 471.4 ODP Tonnes (595-123.6) has been phased out leaving 194.01 ODP Tonnes of CFC consumption unfunded.

A detailed survey undertaken in 2003 in preparation of the Country Programme Update shows use of 13.115 ODP of CFC-11, 298.216 ODP Tonnes of CFC-12, and 3.563 ODP Tonnes (10.480 MT) of R-502 – total 314.894 ODP Tonnes of CFCs. This includes 8.840 ODP Tonnes of CFC-11 and 12.904 ODP Tonnes CFC-12 used for MDI applications. This consumption was not known earlier and had never been reported to the Multilateral Fund. As a result, no CFC consumption is allocated to MDI application.

Under the circumstances, while eligible tonnage of CFC in refrigeration sector for funding is 194.01 ODP Tonnes, it leaves 120.884 ODP Tonnes of CFC in the refrigeration sector unfunded yet requiring phase out.

Similarly, for the solvent sector, the survey shows use of 32.150 ODP Tonnes (29.226 MT) of CTC and 2.48 ODP Tonnes (24.80 MT) of MCF. 1999 reporting was 6.05 ODP Tonnes (5.5 MT) CTC and 1.0 ODP Tonnes (10.0 MT) MCF.

Thus eligible tonnage of solvent for funding is 7.05 ODP Tonnes leaving 27.58 ODP Tonnes unfunded yet requiring phase out.

The Government of Bangladesh wishes to distribute the eligible unfunded consumption as follows:

Sector	ODP Tonnes
Refrigeration Servicing Sector and Technical Assistance	194.01
Solvent Sector	7.05
Total	**201.06**

Current Situation

For various reasons, implementation of the RMP could not effectively start till early 2003. The Training of Trainers in Good Refrigerant Management Practices has been completed and the second phase of Training of Technicians is going on start shortly. The Recycling Centres have been set up and Recovery machines have been distributed to eligible service shops. Monitoring of the Recovery and Recycling project is also ongoing.

The Refrigeration and Air-Conditioning Sector use was reasonably well covered in the Refrigerant Management Plan, with some gap areas remaining. The estimated 1997 consumption of refrigerants by use and application, as well as the results of the 2003 CP Update survey (presenting 2002 data) is reproduced in the table below:

Sub Sector	Sub-Sub Sector	ODS	APPLICATION	1997 Estimated Use (MT)	2002 Extrapolated Survey Data (MT)
Dom. & Small Comm. Freezer/ Refrigerator and A/C	R&AC Service Shops (domestic & Small commercial)	CFC-11	Flushing	0.660	0.00
		CFC-12	Recharge	121.522	157.710
		HCFC-22	Initial Charge and Recharge	N/a	46.202
Commercial/ Industrial	• Ice Cream/ Dairy/Food	CFC-12	Recharge	120.075	19.691
		HCFC-22	Recharge	0.220	1.080
		R-502	Recharge	1.054	10.480
	• Ice and Cold Storage	CFC-12	Recharge	3.262	7.500
		HCFC-22	Recharge	N/a	47.143
	• Fish Freezing/ Processing	CFC-12	Recharge	1.969	0.00
		HCFC-22	Recharge	1.688	17.500
	1. Soft Drink	CFC-12	Recharge	N/a	0.780
		HCFC-22	Recharge	N/a	1.360
	2. Assembly	CFC-12	Init. Charge	N/a	1.305
		HCFC-22	Init. Charge	N/a	35.820
	Commercial Air-Conditioning	CFC-11	Flushing/ Chiller Recharge	4.160	4.275
		CFC-12	Recharge	0.100	4.964
		HCFC-22	Init. Charge	68.331	5.089
		HCFC-123	Initial Charge & Recharge	5.055	0.00
Mobile Air-Conditioning	Car/Jeep	CFC-12	Recharge	16.100	76.634
	Air-Con Bus	CFC-12	Recharge	N/a	12.960
	BD-Railway	CFC-12	Recharge	N/a	3.468
	Ref. Van	CFC-12	Recharge	N/a	0.300
		R-502	Recharge	N/a	1.400
	Fishing Trawler	HCFC-22	Recharge	N/a	70.416

When comparing the RMP data with the 2002 survey data it can be seen that:

- CFC-11 use for flushing by small shops has reduced from 0.66 MT to negligible amounts.
- CFC-12 use for domestic refrigeration and small commercial refrigeration has gone from 121.522 MT to 157.710 MT

- CFC-12 use in the Commercial sub-sector has gone down from estimated 125.306 MT to 29.276 MT. In 1997 most shops did not differentiate between applications, and possibly a lot of mobile applications, which were simply top ups, got clubbed into commercial applications.
- R-502 consumption in Commercial Refrigeration has increased from 1.054 MT to 10.480 MT
- CFC-11 use for commercial air-conditioning servicing has remained constant.
- CFC-12 use in commercial air-conditioning has increased from 0.100 MT to 4.964 MT.
- CFC-12 consumption for mobile applications has increased from 16.1 MT to 93.362 MT. As explained earlier, part of this is because of allocation of this consumption to the commercial sector. Also, since 1997 there has been import of a large number of automobiles and busses with CFC-12 based air-conditioning systems. Bangladesh allows up to 4-year-old cars to be imported. With the majority of imports being from Japan, all cars imported till 1999 operated on CFC-12. Another reason for the high consumption is that service technicians are charging CFC-12 into HFC-134a systems – either unknowingly or because the price is much less.

It is noted that there is increasing use of HCFC-22 in the R&AC sector. While we are noting this consumption for dealing with in future, at present it does not come within the current freeze and phase out requirements of the Montreal Protocol.

While the RMP will contribute to the CFC phase out through the remaining training and monitoring, the National ODS Phase Out Plan stresses the need for strengthening the capabilities of the service companies to meet the demands of the various new technologies being introduced. In addition to the current RMP activities, it is essential for Bangladesh to pursue the retrofit and other additional activities to ensure the reduction in the need for CFCs.

Funding requested in the National ODS Phase Out Plan is essential for Bangladesh to meet its 2005 and, more importantly its 2007 phase out requirements. The proposed activities will start in 2004 and will ensure meeting of all obligations.

2.3 Government Initiatives

Bangladesh has regulations for imports and exports and ODS and ODS using products are also included. In order to strengthen these regulations specifically for ODS and ODS using equipment a Legislation under the Bangladesh Environment Protection Act 1995 has been enacted and implemented in 2004. It includes, amongst others, the following controls:

- Ban on Production of ODS.
- Controls on ODS Import and Export
- Controls on Sales and Purchase of ODS
- Ban on Production of Compressors using ODS
- Mandatory Reporting of Import, Export and Sales of ODS

In addition the following has already been implemented:

- Increase in tariff of ODS
- Reduction in tariff of ozone friendly substances

With the regulations in place, Bangladesh will be able to closely control and reduce the imports of ODS to ensure compliance. However, the consumption in the R&AC service sector is a matter of great concern. While recovery and recycling will reduce the demand for new CFCs to some extent, the demand for new CFC-12 for recharge of systems from which refrigerant has leaked or where the compressor has burnt out will always be there. This is estimated at 289.627 ODP Tonnes, primarily for servicing of domestic and commercial equipment as well as servicing of MAC systems including cars, a/c busses, trawlers and railway carriages.

2.4 Project Descriptions under the National ODS Phase Out Plan

Of all the sectors covered under the Montreal Protocol the R&AC sector, particularly the service and end-use sector faces the biggest challenge in phasing out the use of ODS, particularly CFC-12. Every domestic, commercial and industrial refrigeration or air-conditioning system is affected. Unlike in developed countries, Bangladesh does not have the economic capability to replace equipment every 5 – 10 years. The tendency is to continue to repair and use until there is catastrophic failure. This leads to, for example, use of domestic refrigerator for 20 to 40 years!!

At the same time, an important finding is that most refrigeration equipment comes in for servicing after leakage has occurred. This means that while a certain quantity of refrigerant is being used to recharge/top up, not all of that quantity is recoverable, since refrigerant has leaked out. This creates a continuing demand for CFC imports.

The option to seek funding from the Multilateral Fund to replace all refrigerators in the country is not practical or feasible. Yet the demand for new CFCs for servicing has to be addressed. In addition the emergence of several technologies requires that a planned effort be made to keep technicians abreast of new developments, while consumers need to be protected and made aware. This is proposed through extension of existing RMP activities, in addition to some retrofitting activities, and strengthening and empowering of the Association. Brief descriptions and budgetary costs are outlined below.

2.4.1 **National ODS phase-out plan: public awareness and information dissemination to main stakeholders**

With 2005 reductions in imports coming up very quickly, the NOU proposes to mount an intensive campaign with advertisements in National newspapers and TV spots to sensitise it's citizens of the impact of CFC-12 phase out and what alternative options are available.

With the approved budget, the following activities are proposed with the indicative deadlines and the budget, and shall of course be changed as implementation is to be done.

Sl. No.	Proposed Activity	Description	Time frame
1.	Baseline survey of level of communication awareness in the country, by sector, and preparation of a national communication strategy	Following the regional awareness strategy, countries in the region are encouraged to develop their own national communication strategies which will outline specific activities that need to be done to support compliance. Bangladesh will benefit from doing this so that each sector can be covered and activities identified. It is also essential that a baseline survey of the level of awareness be done in the country, so that interventions will be more targeted to the needs expressed. Both the activities are to be done engaging a competed national professional agency.	2004-2005
2.	Development of communication materials	May interalia include poster, leaflet, pocketbook, calendar, slides, TV ad, radio ad, newspaper ad, video documentary etc. in the light of communication strategy to be developed.	2004-2005
3.	Dissemination	In appropriate mode including public awareness campaign in conjunction with the technician training workshop.	2004 - 2005

2.4.2 **Training and certification programme for refrigeration service technicians, including development of a code of good practices (UNEP)**

With the emergence of several new technologies, particularly for domestic refrigeration and MAC applications, in the span of a few years, the Government and the Bangladesh Refrigeration and Air-Conditioning Merchants Association (BRAMA) are concerned that the technicians in Bangladesh do

not have the opportunity to get information disseminated and training provided in these technologies. Technicians in the unorganized sector are the worst affected as they end up being the last to know.

BRAMA is a recognised Association in this sector in Bangladesh. It has a membership of over 400 with representation from the Import, Retail and Servicing sectors of the industry. BRAMA is participating actively in the implementation of the RMP and many of its members have attended the Training of Trainers workshop.

The Training of Technicians component of the RMP has started and is going. The RMP training project is expected to train approximately 1,000 technicians by the end of 2004. It is estimated that there are nearly 25,000 technicians in the country, mostly in the unorganised sector. With additional training funding sought in the National Phase Out Plan, it is proposed to train another 7,500 technicians, who could be then transfer the skill, knowledge through daily on-job learning to other technicians in Bangladesh.

The technician training would be organized by the PMU under the supervision of DOE/NOU in cooperation with local government (head of the administration), local DOE and local branch of BRAMA. The local BRAMA will be responsible for the selection of the technicians and submit the list to PMU/NOU to finalize. The PMU/NOU would coordinate the organization of the workshop with development of the agenda, training material and the other logistic arrangement. The local consultant to be hired under the monitoring project would act as the Lead trainer, and 2 or 3 local trainers from participants of the train-the-trainer workshop would be recruited to assist the lead trainer. The local vocational schools or any suitable venue should be used for the delivery of the training. To facilitate the delivery of the training workshop, the equipment/tools such as refrigeration board, compressor cut out, manometer, vacuum pump, gauges, manual recovery machine, cylinder etc will be procured from the local market.

The training workshop will be lasted for 2/3 days. The number of the technicians to be trained in each year would be:

2004	2005	2006	2007	2008	2009
1,000	2,500	1,000	1,000	1,000	1,000

NOU will also to develop and disseminate a Code of Good Practice for R&AC technicians through training workshop and retail chains. In total, 15,000 copies of the manual of Code of Good Practice will be produced with 1,000 copies to be produced in t he year 2004.

A certification system will be established to issue the certificate to the trained technicians though the formally organized training workshops or on-job training, which has been verified by DOE or its authorized organizations. The certificate will be issued by DOE and will be used in the future to assess whether the workshop could do the recovery/recycling and or retrofitting under the NOPP. About 25,000 copies of certificate are scheduled to be printed for both the whole project implementation period and past project period.

2.4.3 National ODS phase-out plan: training programme for custom officers (UNEP)

As part of the RMP 35 Customs trainers have been trained. Another 100 will be trained under Phase-II of the Customs Training 13 Refrigerant Identifier Kit have been collected and distributed under a regional project. More customs officer of different check-posts are required to be trained. Additional quantities of 10 Refrigerant Identifiers are required to cover all of the customs entry points. A process of continuous training of another 500 staff from the customs and other enforcement authorities under National ODS Phase-out Plan is proposed to combat illegal trade and smuggling.

The training workshop will be organized by NOU/PMU in close cooperation with the National Board of Revenue (NBR), the customs authority of Bangladesh. A long term strategy concerning how to deliver the customs training, i.e. prioritize the region to be trained, sustain the customs training, select the port offices to receive the identifiers, update the customs training curriculum, etc will be jointly worked out by NOU and the relevant government offices.

The possibility to have the custom training workshop to be organized in conjunction with the normal training workshop organized by the custom office will be explored to sustain the training activities. Also during the customs training, public awareness activities will also be organized.

The training workshops will be organized for 50 participants each. During 2004 and 2008, each year there will be two workshops to train 100 staff.

2.4.4 Recovery and Recycling Equipment (UNDP)

The Recovery and Recycling project of the RMP started in March 2003, when the equipment was distributed following training of the beneficiaries. It maybe that eventually the concept of Recycling Centres will have to be rethought and the equipment redistributed to the few service shops that service large commercial equipment for better utilisation. The project, however, is in its early stages and needs to be evaluated after a year before decisions are taken. However, the need for manual recovery units and small vacuum pumps has already emerged from discussions with the domestic and small commercial service shops.

In addition there continues to be a need for MAC recovery/recycle/recharge equipment. While Japan may have started production of cars with HFC-134a MAC's in 1993, the export of those newer models to countries like Bangladesh will have commenced many years later. Currently Bangladesh may have been importing such vehicles, but it is not possible to provide an estimate of the amount of CFC used for servicing non-CFC based equipment. As a matter of fact, since CFC-12 can be used in HFC134a systems, once it is introduced, the system becomes a CFC based system and is treated as such.

The National Ozone Officer further reports that the age of the car fleet in Bangladesh is rather old. As such most of the CFC-12 in the MAC sector is used for servicing CFC-12 based MAC's and only exceptionally will it be otherwise.

2.4.5 Retrofit of Domestic and Small Commercial Refrigerators to Hydrocarbon Blends

As can be seen from the table at 2.2, the use of CFC-12 for servicing of domestic and small commercial equipment was 157.710 MT in 2002. This consumption is due to leakage and compressor burn out and is at the moment new CFCs. While Recovery and Recycling, particularly from commercial systems being decommissioned, will provide some refrigerant to reduce the demand, the impact will not be sufficient to meet the entire demand. The option of replacing the entire refrigerator because CFC-12 is not available is not an acceptable one for the Government and the citizens of the country. A refrigerator ranks amongst the top 5 most expensive items in a household. In addition many small businesses derive their livelihood from selling refrigerated products including soft drinks.

With the successful completion of the project on establishing criteria and techniques of retrofitting domestic and small commercial refrigeration equipment to hydrocarbon blends in India, Bangladesh Government is keen to implement the technology. As and when refrigerators need refrigerant due to leakage or compressor burn out, they will be retrofitted to hydrocarbon blends thereby ensuring continued use of the refrigerator and reducing the demand for new CFCs. An awareness campaign will also be undertaken under the project detailed in 3.3.1.

Bangladesh Government proposes to have a pilot project to retrofit refrigerators. The project requests initial equipment for retrofit of approximately 9,600 refrigerators for start up. It will be on a cost recovery basis, and the funds generated will be used to make the project self-sufficient. The funding is being requested as seed money. For CFC phase out to be truly successful, end users have to be convinced and facilities have to be available. The import of kits has to be in substantial numbers to have any impact. The service companies do not have the financial strength to be able to do that. Once the "seed" kits are imported and distributed across the country, and the conversion projects pick up, the service companies will be able to import the next sets themselves. It is vital for the project to have the initial kits funded by the Multilateral Fund.

2.4.6 Retrofit of Car Air-Conditioning Equipment

The Table at 2.2 shows that car and jeep air-conditioning service alone used 76.634 MT CFC-12 in 2002. As for domestic and small commercial refrigeration, this use is also for new CFC-12 since the servicing is done when refrigerant has leaked out. The majority of the vehicles are of Japanese make and retrofit kits are available to convert these systems to HFC-134a.

It is proposed to have a pilot retrofit project in Bangladesh, through some organised MAC repair shops. The project requests funding for the initial start up of retrofitting 250 vehicles. It will be on a cost recovery basis, and the funds generated will be used to make the project self-sufficient. The funding is being requested as seed money. For CFC phase out to be truly successful, end users have to be convinced and facilities have to be available. The import of kits has to be in substantial numbers to have any impact. The service companies do not have the financial strength to be able to do that. Once the "seed" kits are imported and distributed across the country, and the conversion projects pick up, the service companies will be able to import the next sets themselves. It is vital for the project to have the initial kits funded by the Multilateral Fund.

2.4.7 Technical Assistance for Commercial Sector End Users to assist in decisions related to retrofitting or replacement

During the National Consultative workshop on CP Update, several large commercial end users expressed the need for awareness on current technologies, how to make decisions on whether to retrofit or replace equipment, and cost issues.

The Bangladesh Government would like to address this need through a technical workshop, with presentations from a few international equipment manufacturers and a neutral international expert to help this end user sector evaluate their needs. Several end users have been identified during the survey. These users and any other users of commercial/industrial R&AC equipment will be invited to participate.

3. SOLVENT SECTOR PHASE-OUT PLAN

29.226 M.T of Carbon Tetrachloride and 24.800 MT of Methyl Chloroform is the estimated usage in the Solvent sector as per the 2003 survey.

CTC is used by the Ready Made Garment (RMG) industry for spot cleaning. The RMG industry is a major foreign exchange earner for Bangladesh. The cleaning operations vary from use of a spray gun to spot clean to the use of a mechanized inspection table with spot spraying facility and a suction system to remove the solvent.

The electrical and electronics industry and end users use MCF for degreasing and cleaning. Use of MCF has also been found in the plastics industry as a solvent adhesive.

No full-fledged projects are being proposed for the solvent sector where there is an increasing consumption of CTC and MCA. Through the component being suggested, UNDP plans to provide Technical Assistance (TAS) to address the urgent needs of the sector. International expert(s) will suggest alternative solvents for each of the applications where CTC and MCA are used today. This will be imparted through the relevant industry associations and the relevant chemical distributors.

4. Monitoring and Management of National ODS Phase Out Plan

In order to ensure that all activities are taking place as planned in the National ODS Phase Out Plan, it is necessary to have a Bangladesh Ozone Project Implementation and Monitoring Unit (BOPIMU) in place to work with the Institutional Strengthening project. The BOPIMU will carry out the day-to-day implementation and monitoring activities and advise the NOU, UNDP and UNEP to take corrective action wherever necessary. Since the strategy is a country driven approach and Bangladesh has the flexibility to reallocate the approved funding if so required, regular monitoring and evaluation will also assist the NOU, UNDP and UNEP to decide whether reallocation is required at any stage of the implementation of the strategy. BOPIMU's activities will be quite intensive throughout the project - from inception in 2004 to 2010 when there will be no more ODS available for use.

WHAT REMAINS TO BE DONE

The National ODS Phase Out Plan provides funding for activities to cover most of the uses. However, there are some uses that are not covered, either because the users are reluctant to disclose their use or because the applications are not eligible under the Montreal Protocol.

Training of Technicians

The National ODS Phase Out Plan covers training of 7,500 technicians, in addition to the technicians trained under the Refrigerant Management Plan. It is expected that those that will be difficult to identify and train are the "practitioners" who are one man outfits primarily repairing domestic refrigerators. These practitioners have most likely learned there trade by being apprenticed to another technician or practitioner and have little or no theoretical knowledge of refrigeration. Short training courses must be designed for them to understand the different refrigerants that are no in use and how to identify them and how to repair the systems.

Recovery and Recycling

Close monitoring must be maintained to ensure that the equipment are being used.

Retrofit

It is not feasible to provide for retrofit kits for all refrigerators and mobile air conditioners. In order to encourage retrofitting, "seed" kits and funding is provided in the National Phase Out Plan. Close monitoring must be maintained to ensure that the funds recovered from end users are rolled over again to buy more kits to ensure sustainability of the projects.

Support to Refrigerator Assembly

The Update Survey tracked down Assembly of Refrigerators and Air-conditioners, which is primarily being done at present in the unorganized sector and by Assemblers, who do not want it known.

The modus operandi of the Assemblers in the unorganized sector is to import all components like Evaporators, Condensers, Piping and others and source cost-effective Compressors from China. They

assemble the imported components together and charge the system with CFCs and market them, often in cooperation with good marketing establishments in this business.

These assemblers have to be encouraged to move to HFC-134a or other alternative refrigerants. They should be invited to participate in training workshops.

Large Commercial Refrigeration and Air Conditioning End Users

The only support that can be provided to these end users is a technical assistance workshop where options of retrofit and/or replacement will be discussed. No funding is available for their change over. These end users will need to plan their strategy and ensure private funding is available for them to continue to use their equipment.

Solvent

Most solvent applications were found to be in small quantities and manually used. The support for these users is being provided through a Technical Assistance workshop. Monitoring has to be closely done to ensure that the alternatives are put into use immediately. Legislation should also be enforced to ensure that reduction in imports happen as otherwise Bangladesh will be cited for non compliance in solvent use.

Metered Dose Inhalers (MDI)

It should be noted that in the National ODS Phase Out Plan project document, Bangladesh did identify the use of CFCs in MDI. The CFC consumption as informed by the two companies during the survey amounted to 8.840 ODP Tonnes of CFC-11 and 12.904 ODP Tonnes of CFC-12 for 2002. Glaxo did not provide any data. This consumption was not known earlier and had never been reported to the Multilateral Fund. As a result, no CFC consumption is allocated to MDI application. Bangladesh has been reporting this use since 2003. The pharmaceutical companies using CFCs for MDIs started up after the 1995 cut off date. Bangladesh would like to take this opportunity to request special consideration for financial and technical support for this nationally critical sector. For most other sectors, alternative technologies were available by 1995, but this was not the case for MDIs. Under the circumstances it would not have been appropriate for the Government to advise pharmaceutical companies not to create CFC based MDI capacity, particularly when there was a critical need for this application.

ANNEX I

CURRENT SITUATION NOT ADDRESSED BY THE 2003 SURVEY

The CP Update was based on the survey conducted in 2003 on the basis of which the National Phase Out Plan for Bangladesh was prepared and approved. The 2004 data (in Metric Tonnes) that was reported to the Ozone Secretariat is as follows:

CFC-11	CFC-12	CFC-113	CFC115	Carbon Tetrachloride	Methyl Chloroform	HCFC-22
25.60	268.74	0.00	0.96	5.00	5.50	165.00

The Progress on Implementation of Country Programme Data for 2004 (in Metric Tonnes) submitted to the Multilateral Fund Secretariat is as follows:

	Aerosol	Foam	Refrigeration		Solvent	Total	Import
			Manufacturing	Servicing			
CFC-11	20.874			4.25		25.124	25.60
CFC-12	41.352		38.68	183.29		263.322	268.74
CFC-113	0.00						
CFC-115				0.96		0.96	0.96
Carbon Tetrachloride					5.00	5.00	5.00
Methyl Chloroform					5.50	5.50	5.50
HCFC-22			44.34	116.25		160.59	165.00

Refrigeration: Chillers

Bangladesh has several centrally air-conditioned buildings using CFC-11, CFC-12, R-502, HCFC-22, R-123 and HFC-134a refrigerants. A detailed survey is proposed to be undertaken later in 2006 and a strategy to phase out the use of ODS for this application will be developed. A project with the World Bank is envisaged.

Pharmaceutical Aerosols: MDIs

It should be noted that in the National ODS Phase Out Plan project document, Bangladesh did identify the use of CFCs in MDI. During the survey for the Country Programme Update in 2003, the use of CFCs in MDI production in Bangladesh was identified for the first time. This consumption was not known earlier and had never been reported to the Ozone Secretariat nor to the Multilateral Fund. The pharmaceutical companies using CFCs for MDIs started up after the 1995 cut off date

In early 2003, when the survey was done, the data provided by two pharmaceutical companies manufacturing MDIs showed consumption of 21.74 ODP tonnes of CFCs (CFC-11 – 8.84 ODP T + CFC-12 – 12.90 ODP T). A third company, Glaxo Smith-Klein, imported its raw materials and had their MDI produced under a contract arrangement with Beximco. They did not provide any data at that time. A fourth company, Acme Laboratories, started production of MDIs in 2003.

The consumption reported for MDIs in 2004 is 62.2 ODP tones. Based on preliminary estimates, consumption for 2005 is 68.3 MT. In the coming years, Bangladesh is considering limiting ODS consumption in this sector to 75.00 ODP Tonnes through the licensing system. Discussions are planned with the stakeholders later this quarter. The breakdown of consumption by the 4 MDI manufactures mentioned from 2003 to 2004 can be found below. Article 7 data for 2005 data is still to

be reported officially. UNDP will coordinating with Bangladesh a mission as early as possible to verify in loco actual consumption at the 4 companies.

Enterprise	2002 (in kg)			2003 (in kg)			2004 (in kg)			2005 (in kg)		
	CFC-11	CFC-12	Total	CFC-11	CFC-12	Total	CFC-11	CFC-12	Total	CFC-11	CFC-12	Total
Acme	0	0	0	161	1,257	1,418	302	2,119	2,421	2,950	3,463	6413
Beximco	5,220	8,160	13,380	4,800	10,599	15,399	11,545	22,060	33,605	15,100	17,563	32,663
Glaxo	3,040	5,700	8,740	4,320	8,100	12,420	5,120	9,600	14,720	3,960	7,561	11,521
Square	1,846	4,769	6,615	2,538	4,555	7,093	3,907	7,573	11,480	5,800	11,968	17,768
TOTAL			28,735			36,330			62,226			68,365