NATIONS UNIES

EP

Programme des Nations Unies pour l'environnement

Distr.
GÉNÉRAL

UNEP/OzL.Pro/ExCom/72/23
14 avril 2014

FRANÇAIS
ORIGINAL : ANGLAIS

COMITÉ EXÉCUTIF
DU FONDS MULTILATÉRAL AUX FINS
D'APPLICATION DU PROTOCOLE DE MONTRÉAL
Soixante-douzième réunion
Montréal, 12 – 16 mai 2014

PROPOSITION DE PROJET : BRÉSIL

Le présent document comporte les observations et la recommandation du Secrétariat du Fonds sur la proposition de projet suivante :

Destruction

• Projet pilote de démonstration de la gestion et de la disposition des résidus de SAO	PNUD

FICHE D'ÉVALUATION DE PROJET – PROJETS NON PLURIANNUELS
BRÉSIL

TITRE DU PROJET	AGENCE D'EXÉCUTION
Projet pilote de démonstration de la gestion et de la disposition des déchets de SAO	PNUD

AGENCE NATIONALE DE COORDINATION : Ministère de l'Environnement du Brésil

DERNIÈRES DONNÉES SUR LA CONSOMMATION DE SAO TRAITÉES DANS LE PROJET

A : DERNIÈRES DONNÉES DE L'ARTICLE 7 (TONNES PAO en 2012)

Annexe I, CFC	0		

B : DONNÉES SECTORIELLES DU PROGRAMME DE PAYS (tonnes PAO, 2011)

SAO	Sous-secteur/quantité	Sous-secteur/quantité	Quantité totale
CFC			0

PLAN D'ACTIVITÉS DE L'ANNÉE EN COURS : Financement total : 672 253 $US / Élimination totale : 75 tonnes PAO

TITRE DU PROJET		
Utilisation des SAO dans l'entreprise		s.o.
SAO à éliminer		s.o.
Projet dans le plan d'activités actuel		Oui
Secteur		Destruction des SAO
Sous-secteur		s.o.
Impact du projet		120 tonnes métriques
Durée du projet		36 mois
Propriété locale		100 %
Élément exportation		0 %
Montant initial demandé		1 578 000*
Subvention demandée au Fonds multilatéral		
PNUD	$US	1 490 600
Coûts d'appui à l'agence d'exécution		
PNUD (7 %)	$US	104 342
Coût total du projet pour le Fonds multilatéral	**$US**	**1 594 942**
Rapport coût-efficacité	$US/kg	12,42 kg (métrique)
Suivi des étapes du projet		Compris

*Sauf les coûts d'appui d'agence

RECOMMANDATION DU SECRÉTARIAT :	Pour examen individuel

DESCRIPTION DU PROJET

1. Au nom du gouvernement de la République fédérative du Brésil (le Brésil), le PNUD a présenté à la 72e réunion une proposition de projet pilote de démonstration de la gestion et de la disposition des déchets de substances appauvrissant la couche d'ozone (SAO), pour un montant de 1 578 000 $US plus des coûts d'appui d'agence de 110 460 $US tel qu'il avait été présenté initialement[1].

Description du projet

2. Le présent projet pilote vise à démontrer un plan respectueux de l'environnement, efficace et économique pour la gestion et la destruction des déchets de frigorigènes avec SAO, grâce à l'établissement d'un système national de gestion des déchets de SAO au Brésil. Il permettra d'intégrer la gestion et la destruction des déchets de SAO à des programmes nationaux plus vastes de gestion des déchets dangereux et à des initiatives en matière d'efficacité énergétique. Ces efforts seront appuyés par des activités entreprises lors de la mise en oeuvre du plan national d'élimination des CFC (PNE) qui ont favorisé la création d'une structure nationale pour la collecte des CFC des vieux équipements. Le plan national d'élimination a installé cinq grands centres de régénération et 120 centres de recyclage décentralisés avec le soutien de la distribution de machines de récupération à des entreprises et des techniciens au pays. Le projet déterminera aussi des synergies à appliquer aux activités d'élimination des HCFC, et en particulier aux activités de récupération lors de l'entretien des équipements de réfrigération existants, et l'on s'attend à ce que ces activités éliminent des déchets de SAO qui ne pourront plus être réutilisés. Ces efforts sont de plus soutenus par une loi nationale du Brésil sur la gestion des déchets solides approuvée en 2010. Cette loi mettra à exécution le programme de Responsabilité élargie des producteurs (REP) qui pourrait entraîner la génération de grandes quantités de déchets, y compris des déchets de SAO, des réfrigérateurs et des climatiseurs. Une proposition de projet détaillée est jointe au présent document.

3. Le projet comprenait les quatre éléments suivants :

(a) Élément 1 : Établir un système complet de gestion des déchets de SAO qui comprend notamment le renforcement de la capacité de manutention, le transport et la caractérisation des déchets de SAO, ainsi que l'amélioration de la capacité de stockage des déchets de SAO;

(b) Élément 2 : Procéder à des essais d'incinération dans deux installations d'incinération afin de caractériser les capacités nationales en matière de disposition des déchets de SAO en conformité avec les normes internationales, afin d'en analyser la logistique et le coût;

(c) Élément 3 : Assistance technique et travaux de développement associés à l'évaluation et à la normalisation du projet de démonstration de la gestion et de la disposition des déchets de SAO; et

(d) Élément 4 : Gestion de projet associée à la mise en oeuvre et au suivi du projet.

4. Le système complet de gestion des déchets de SAO sera élaboré en mettant à profit le secteur national de l'entretien en réfrigération du pays, exploité par un réseau de techniciens bien équipés et d'entreprises d'entretien du secteur privé au pays. Ce programme est essentiel au projet de démonstration, parce que le transport, le regroupement et le stockage posent de grands défis au Brésil, parce que les déchets de SAO récupérés sont conservés dans plusieurs entreprises et centres de régénération répartis sur un vaste territoire de plus de 3 800 km. Le projet vise à créer un mécanisme de coordination intégré entre les centres de régénération, les réserves de déchets de SAO, les consolidateurs de déchets et les

[1] À la 57e réunion, le Comité exécutif a fourni du financement au PNUD afin de préparer un projet pilote de démonstration pour la disposition des SAO au Brésil

gestionnaires de ces centres, afin de s'assurer que les activités de manutention, de transport et de disposition des déchets de SAO sont appropriées si elles sont dupliquées dans d'autres pays.

5. La destruction des déchets de SAO du Brésil sera effectuée au pays par deux des sept installations existantes de gestion des matières industrielles et dangereuses. Le Brésil a mis en place une capacité de gestion des déchets dangereux de produits chimiques disponibles sur le marché, y compris le traitement et la destruction des matières chlorées liquides et solides. Afin de se conformer aux normes internationales, deux de ces installations procéderont à des essais au four complets du circuit de déchets disponibles. Les deux installations d'incinération seront déterminées par un appel d'offres public, tel que l'exige les règlements du gouvernement.

6. Un protocole de suivi portera sur les conditions d'exploitation (température des chambres de combustion, temps estimatif de résidence, température de la sortie des cheminées), les exigences standard en ce qui a trait aux émissions réglementées, y compris les dibenzo-*p*-dioxines polychlorées (oxanthrènes) et les dibenzofuranes polychlorés (PCDD/PCFD) ainsi que des intrants sur un bilan massique couvrant l'ensemble des modes de rejets résiduels (solides, liquides et gazeux), et une analyse des principaux contaminants (notamment les PCDD-F dans les cendres résiduelles solides, les résidus des épurateurs) et les circuits résiduels liquides. L'exercice vise à déterminer à la fois le rendement de destruction et d'élimination (RDE) et l'efficacité de la destruction. On prévoit que le projet de démonstration de la destruction des déchets de SAO sera mis en oeuvre dans trois ans.

Estimation des SAO à détruire

7. Ce projet pilote portera initialement sur la destruction de 120 tonnes de déchets de SAO. Ces quantités proviennent d'un système national de collecte existant et elles sont disponibles dans des centres de régénération et de recyclage au Brésil (Tableau 1).

Tableau 1. Quantités estimatives de déchets de SAO qui seront utilisées dans le projet

Entreprise		Profil	Ville	SAO	kg
1	Capital Refrig	Centre de régénération	Porto Alegre	CFC-11	11 250
				CFC-12 contaminé	4 900
2	Bandeirantes Refrig	Centre de régénération	Sao Paulo	CFC-12 contaminé	4 419
3	Bom Clima Refrig	Centre de régénération	Recife	CFC-11	1 190
				CFC-12 contaminé	1 057
4	Revert Brasil	Retrait de la fabrication	Careaçu	CFC-12 contaminé	5 000
				CFC-12 contaminé	4 000
5	Frigelar	Centre de régénération	Sao Paulo	CFC-12 contaminé	300
6	Tecnitest	Utilisateur final	Rio de Janeiro	CFC-12 contaminé	120
7	Ref. Marechal	Entreprise de récupération	Sao Paulo	CFC-11	4 000
8	Carrier do Brasil	Utilisateur final	Canoas	CFC-12 contaminé	11 500
9	ClimaSul	Centre de recyclage	Curitiba	CFC-12 contaminé	500
10	Recigases	Centre de recyclage	Rio de Janeiro	CFC-12 contaminé	13 540
Sous-total des déchets de SAO recueillis et comptabilisés à être regroupés					**61 776**
Région Nord 13	3 entreprises	Centre de recyclage	Province Amazonas	CFC-12 contaminé	730
	1 entreprise	Centre de recyclage	Province Acre	CFC-12 contaminé	100
	1 entreprise	Centre de recyclage	Province Roraima	CFC-12 contaminé	150
	1 entreprise	Centre de recyclage	Province Macapá	CFC-12 contaminé	170
	2 entreprises	Centre de recyclage	Province Rondônia	CFC-12 contaminé	200
	3 entreprises	Centre de recyclage	Province Pará	CFC-12 contaminé	290
	2 entreprises	Centre de recyclage	Province Tocantins	CFC-12 contaminé	120
Région Centre	3 entreprises	Centre de recyclage	Province Mato Grosso	CFC-12 contaminé	550
	4 entreprises	Centre de recyclage	Province Mato Gr. do Sul	CFC-12 contaminé	1 100

Entreprise		Profil	Ville		SAO	kg
16	6 entreprises	Centre de recyclage	Province Goiás		CFC-12 contaminé	2 500
	3 entreprises	Centre de recyclage	District fédéral (DF)		CFC-12 contaminé	900
Région Nord-est 30	3 entreprises	Centre de recyclage	Province Maranhão		CFC-12 contaminé	500
	2 entreprises	Centre de recyclage	Province Piauí		CFC-12 contaminé	90
	5 entreprises	Centre de recyclage	Province Ceará		CFC-12 contaminé	2 900
	3 entreprises	Centre de recyclage	Province Rio Grande Nor.		CFC-12 contaminé	950
	3 entreprises	Centre de recyclage	Province Paraíba		CFC-12 contaminé	1 350
	2 entreprises	Centre de recyclage	Province Alagoas		CFC-12 contaminé	800
	2 entreprises	Centre de recyclage	Province Pernambuco		CFC-12 contaminé	5 200
	2 entreprises	Centre de recyclage	Province Sergipe		CFC-12 contaminé	320
	8 entreprises	Centre de recyclage	Province Bahia		CFC-12 contaminé	6 480
Région Sud-est 36	8 entreprises	Centre de recyclage	Province São Paulo		CFC-12 contaminé	5 500
	3 entreprises	Centre de recyclage	Province Rio de Janeiro		CFC-12 contaminé	8 200
	19 entreprises	Centre de recyclage	Province Minas Gerais		CFC-12 contaminé	7 034
	6 entreprises	Centre de recyclage	Province Espirito Santo		CFC-12 contaminé	1 780
Région Sud 25	4 entreprises	Centre de recyclage	Province Rio Grande Sul		CFC-12 contaminé	2 320
	14 entreprises	Centre de recyclage	Province Paraná		CFC-12 contaminé	4 090
	7 entreprises	Centre de recyclage	Province Sta Catarina		CFC-12 contaminé	3 900
Sous-total des déchets de SAO recueillis et comptabilisés à être regroupés						**58 224**
Total des déchets de SAO à détruire dans le cadre du projet						**120 000**
11	IBAMA	Organisme de réglementation	São Paulo	SP	À identifier *	734 400
Sous-total déchets de SAO recueillis et comptabilisés à être identifiés						**734 400**
Total des déchets de SAO en inventaire au Brésil						**854 400**

* L'Institut brésilien de l'environnement et des ressources naturelles renouvelables (IBAMA) a confisqué un gros conteneur contenant des SAO non encore identifiées. Une vérification est en cours.

Gestion financière du projet

8. Le financement fourni par le Fonds multilatéral couvrira les coûts nécessaires à l'amorce des essais au four dans les installations d'incinération sélectionnées, ce qui leur permettra d'obtenir la certification nécessaire pour respecter les normes internationales de destruction des déchets de SAO. Il couvrira aussi les coûts de l'établissement du système de gestion des déchets de SAO qui supervisera le programme Responsabilité élargie des producteurs (EPR) / Déchets d'équipements électriques et électroniques, où l'on s'attend à ce que d'autres matières récupérées des vieux équipements génèrent assez de revenus pour permettre la destruction durable des déchets de SAO à l'avenir. Le projet analyse aussi la possibilité d'utiliser ultérieurement les marchés du carbone. Toutefois, cette possibilité ne fait pas partie de la conception actuelle du projet.

Sélection de la méthode ou de la technologie de destruction

9. Trois options ont été envisagées pour la destruction des déchets de SAO : i) exporter les déchets de SAO vers des installations accréditées de gestion des déchets dangereux; ii) développer de nouvelles installations de destruction à l'aide de technologies importées; et iii) utiliser une installation nationale existante de gestion des déchets industriels et dangereux qu'on pourrait potentiellement réaménager en fonction des normes internationales. La première option n'était pas réalisable en raison du coût et du manque d'expérience au pays pour ce type de transaction. L'option de développer des installations spécialisées pour la destruction des déchets de SAO n'a plus été envisagée, parce qu'on avait tenté d'établir au pays, sans succès, des installations de démontage de réfrigérateurs avec des installations de destruction.

10. La dernière option comprenait l'examen de la possibilité d'utiliser des installations d'incinération domestiques existantes pourvu qu'elles soient conformes aux normes internationales, et en particulier à celles qui faisaient partie à la fois de la Convention de Bâle[2] et du Groupe consultatif pour la science et la technologie (STAP)[3] du Fonds pour l'Environnement Mondial (FEM). Les deux entités ont émis des documents d'orientation sur la sélection des technologies de destruction des polluants organiques persistants (POP), lesquels fournissent aussi des renseignements pertinents étant donné les similarités en ce qui a trait aux exigences à ce qui a trait à la destruction de déchets chimiques chlorés respectueuse de l'environnement. On a aussi tenu compte des exigences du Groupe de l'évaluation technique et économique (GETE - *TEAP*) du PNUE en ce qui a trait aux normes de destruction. Les sept installations identifiées comme pouvant détruire les déchets de SAO feront l'objet d'une validation technique par le truchement de protocoles d'essai. Le gouvernement du Brésil est d'avis que l'utilisation d'installations de destruction domestiques sera plus économique que les autres options proposées. La proposition présentée est donc élaborée en fonction de cette dernière option.

Suivi et vérification de la destruction

11. Afin de s'assurer que tous les déchets de SAO ont été bien consignés, le processus de destruction sera étroitement suivi et les données seront enregistrées dans une base de données électronique qui sera établie à cette fin. L'origine de tous les déchets de SAO récupérés pour destruction est facile à déterminer, étant donné que les stocks actuellement disponibles sont détenus par les sources initiales et qu'ils sont récupérés lors d'activités bien définies (saisies douanières, activités d'entretien en réfrigération, et initiatives d'élimination). Dans le deux cas, le suivi de ces matières lors du regroupement, de la caractérisation, du stockage, du transport et de la destruction par la suite, fait l'objet de dispositions explicites dans le projet, entre autres par la documentation détaillée et l'utilisation d'un système électronique de suivi dans une base de données qui fait partie des activités du projet.

Coût du projet

12. Le coût total du projet, tel qu'il a été présenté initialement, a été évalué à 2 153 000 $US. Le financement demandé au Fonds multilatéral est de 1 578 000 $US (Tableau 2).

[2] http ://www.basel.int/Portals/4/Basel %20Convention/docs/pub/techguid/tg-POPs.pdf
[3] http ://www.unep.org/stap/Portals/61/pubs/POPs_Disposal_Final_low.pdf

Tableau 2. Coût proposé du projet

Éléments et activités		Financement du FML ($US)	Co-financement ($US)	TOTAL ($US)
Élément 1 : Gestion du système de projet pilote	Suivi de la collecte de CFC et de SAO avec CFC	25 000	-	25 000
	Consolidation et caractérisation des CFC	95 000	55 000	150 000
	Stockage temporaire des CFC	30 000	15 000	45 000
	Transport vers l'installation de destruction	20 000	10 000	30 000
	Structure du système pilote de gestion intégrée	400 000	120 000	520 000
	Documentation et présentation de rapports	10 000	-	10 000
	Sous-total - Élément 1	**580 000**	**200 000**	**780 000**
Élément 2 : Essai d'incinération et démonstration de la destruction	Essais d'incinération détaillés et sélection des installations	25 000	37 000	62 000
	Adaptation des infrastructures des installations pour l'incinération	35 000	20 000	55 000
	Réglementation des procédures et des produits d'alimentation	10 000	10 000	20 000
	Mélange d'alimentation de base pour les essais au four	55 000	25 000	80 000
	Démonstration des essais au four avec CFC-11 (5 tm)	75 000	45 000	120 000
	Démonstration des essais au four avec CFC-12 (5 tm)	75 000	45 000	120 000
	Destruction du CFC-11 et du CFC-12 (110 tm)*	418 000	-	418 000
	Supervision des essais au four	10 000	5 000	15 000
	Sous-total - Élément 2	**703 000**	**187 000**	**890 000**
Élément 3 : Assistance technique	Soutien des activités techniques d'appui	50 000	35 000	85 000
	Soutien de la sensibilisation du public et des intervenants	50 000	25 000	75 000
	Sous-total - Élément 3	**100 000**	**60 000**	**160 000**
Élément 4 : Suivi et évaluation	Spécialiste international	80 000	-	80 000
	Consultant national	60 000	60 000	120 000
	Frais de déplacement et de mission	45 000	45 000	90 000
	Bureau de l'administration	-	15 000	15 000
	Divers	10 000	8 000	18 000
	Sous-total - Élément 4	**195 000**	**128 000**	**323 000**
	Total ($US)	**1 578 000**	**575 000**	**2 153 000**

OBSERVATIONS ET RECOMMANDATION DU SECRÉTARIAT

OBSERVATIONS

13. Le Secrétariat a fourni au PNUD des commentaires et des observations en fonction de l'examen des critères établis dans la décision 58/19. Il a souligné que le Brésil est doté d'un système institutionnalisé de collecte des déchets de SAO appuyé par une loi nationale, et il semble qu'il y aura un circuit de déchets disponible pour les installations qui assurent la durabilité du projet.

14. En fournissant des explications sur les quantités de déchets de SAO actuellement disponibles au pays (Tableau 1), en particulier les quantités associées à IBAMA, le PNUD a indiqué que le gouvernement avait récemment saisi un important chargement de produits chimiques qui restent à identifier et qui contient probablement des SAO illégales (CFC). Le processus d'identification du contenu de ce chargement est en cours. Il est compris dans les quantités inventoriées afin de démontrer qu'il existe d'autres quantités potentielles à détruire.

15. Le Secrétariat a demandé des explications sur la situation des deux installations privées de retrait des frigorigènes d'usines établies au pays et qui ne fonctionnaient pas à plein rendement en raison d'un manque de déchets disponibles. Selon les renseignements recueillis par le PNUD, les études indiquent qu'il y a une grande quantité de stocks d'équipements EOL avec CFC au pays. Toutefois, la situation de ces deux installations et le coût élevé associé à leur exploitation semble être les raisons pour lesquelles elles n'ont pas été tout à fait productives. En outre, ceux qui procèdent au retrait mécanique et automatisé facturent aussi leurs services à l'encontre des opérateurs manuels (liés aux centres de récupération et de recyclage), qui arrivent à couvrir les coûts associés à la collecte des déchets de SAO en vendant d'autres matières recyclables de leurs équipements.

16. En ce qui a trait à la sélection des deux incinérateurs qui seront accrédités après les essais au four, le Secrétariat a été informé que le PNUD avait amorcé un vaste exercice afin de déterminer les exigences techniques et environnementales en matière de rendement qui sont applicables à la destruction des déchets de SAO. Ce faisant, il avait d'abord identifié dix installations qui utilisaient l'incinération à haute température à l'aide d'injections liquides ou d'une technologie employant un four rotatif, et une qui utilisait la combustion au plasma. Elles ont fait par la suite l'objet d'une autre évaluation, et leur nombre est passé a sept installations répondant aux critères établis par le PNUD, qui comprenaient entre autres la capacité, l'adaptation des installations à l'utilisation de gaz liquéfiés, le suivi des déchets et le processus de certification de la destruction, et la performance environnementale, en particulier l'efficacité de destruction (ED) et le rendement de destruction et d'élimination (RDE), ainsi que les niveaux d'émission de dibenzo-*p*-dioxines polychlorées (oxanthrènes) et de dibenzofuranes polychlorés (PCDD/PCFD). Les sept installations se sont dites intéressées à participer au projet. De ces dernières, deux seront sélectionnées après un processus public d'appel d'offres tel que l'exige tant le gouvernement du Brésil que le PNUD. Le PNUD a aussi insisté sur le fait qu'aucun investissement de capitaux par le Fonds multilatéral n'est recherché par ces installations dans ce projet pilote. Les modifications techniques seront effectuées à chaque installation à ses propres frais, en tant que partie du co-financement.

17. Lors de discussions subséquentes, le Secrétariat a proposé de modifier certains des éléments du projet, afin de regrouper les activités similaires et de rationaliser les coûts. Il a aussi suggéré des options pour les machines de récupération à haut débit pour le stock de déchets de SAO regroupés, afin d'en réduire le nombre et le coût. Le Secrétariat a confirmé auprès du PNUD qu'un des résultats du projet serait un rapport qui documentera les étapes et les résultats obtenus à partir du protocole d'essai, la façon dont les essais au four ont été effectués, la manière dont la validation technique a été entreprise, la façon dont les installations ont été réaménagées, ainsi que les coûts attenants. Ce rapport pourrait alors être utilisé pour des procédures d'essai similaires dans des installations d'incinération similaires, non seulement au Brésil mais aussi dans d'autres pays de l'Article 5, et qu'il deviendrait un extrant essentiel du projet de démonstration. Le PNUD s'est dit d'accord et a indiqué que le résultat global du projet et l'analyse des retombées (échange futur de crédits de carbone associé à cette activité) offrira à d'autres installations au pays un incitatif visant à investir dans une telle activité. Le PNUD était d'accord avec les changements précités et a procédé aux rajustements nécessaires à la proposition.

18. Le coût final du projet a été convenu pour un montant de 1 490 600 $US plus des coûts d'appui d'agence, calculés à 12,42 $US/kg, ce qui est inférieur au seuil (13,20 $US/kg) prévu dans la décision 58/19. Des modifications ont été apportées aux résultats et aux coûts afin d'inclure les suggestions du Secrétariat (Tableau 3).

Tableau 3. Coûts convenus du projet

Élément et Activités		Financement MLF ($US)	Co-financement ($US)	TOTAL ($US)
Élément 1 : Gestion du système de projet pilote	Suivi de la collecte des CFC et des SAO avec CFC	25 000	-	25 000
	Consolidation et caractérisation des CFC	95 000	55 000	150 000
	Stockage temporaire des CFC	150 000	67 000	217 000
	Transport aux installations de destruction	20 000	10 000	30 000
	Structure pilote intégrée au système de gestion	182 600	68 000	250 600
	Documentation et préparation de rapports	10 000	-	10 000
	Sous-total - Élément 1	**482 600**	**200 000**	**682 600**
Élément 2 : Essais d'incinération et démonstration de la destruction	Conception détaillée des essais au four et sélection des installations	25 000	37 000	62 000
	Adaptation des infrastructures d'incinération des installations	35 000	20 000	55 000
	Réglage des procédures et de l'alimentation de base	10 000	10 000	20 000
	Alimentation de base pour les essais au four	55 000	25 000	80 000
	Démonstration de l'alimentation pour les essais au four CFC-11 (5 tm)	75 000	45 000	120 000
	Démonstration de l'alimentation pour l'alimentation au four du CFC-12 (5 tm)	75 000	45 000	120 000
	Destruction des CFC-11 et CFC-12 (110 tm)*	418 000	-	418 000
	Supervision des essais au four	10 000	5 000	15 000
	Sous-total - Élément 2	**703 000**	**187 000**	**890 000**
Élément 3 : Assistance technique	Soutien aux activités techniques d'appui	50 000	35 000	85 000
	Soutien pour la sensibilisation du public et des intervenants	50 000	25 000	75 000
	Sous-total - Élément 3	**100 000**	**60 000**	**160 000**
Élément 4 : Suivi et évaluation	Spécialiste international	80 000	-	80 000
	Consultant national	60 000	60 000	120 000
	Frais de déplacement et de mission	45 000	45 000	90 000
	Bureau de l'administration	-	15 000	15 000
	Divers	20 000	8 000	28 000
	Sous-total - Élément 4	**205 000**	**128 000**	**333 000**
	Total global ($US)	**1 490 600**	**575 000**	**2 065 600**

RECOMMANDATION

19. Le Comité exécutif peut envisager :

(a) De prendre note avec satisfaction de la proposition du gouvernement du Brésil pour un projet pilote de gestion et de disposition des déchets de SAO afin de détruire 120 tonnes métriques de déchets de SAO; et

(b) D'approuver la mise en oeuvre d'un projet pilote de démonstration de la gestion et de la disposition de déchets de SAO au Brésil au montant de 1 490 600 $US plus un montant de soutien d'agence de 104 342 $US pour le PNUD, en étant entendu que le Brésil n'aura à l'avenir aucun droit à du financement supplémentaire pour des projets de disposition des SAO.

Project Document

PILOT DEMONSTRATION PROJECT ON ODS-WASTE MANAGEMENT AND DISPOSAL

FEDERATIVE REPUBLIC OF BRAZIL

Prepared by

MINISTRY OF ENVIRONMENT - MMA
National Coordinator

In Cooperation with

UNITED NATIONS DEVELOPMENT PROGRAMME - UNDP
Implementing Agency

Brasília - DF. Brazil. March, 2014

COUNTRY: Brazil **IMPLEMENTING AGENCY:** UNDP
PROJECT TITLE: Pilot Demonstration Project on ODS-Waste Management and Disposal

PROJECT IN CURRENT BUSINESS PLAN: Yes
SECTOR: ODS-Waste
Sub-Sector: Refrigeration Servicing Sector

PROJECT IMPACT (ODP targeted): 120 Metric Tons of CFC-11 and CFC-12

PROJECT DURATION: 24 months
PROJECT COSTS: US$ 1,490,600

LOCAL OWNERSHIP: 100 %
EXPORT COMPONENT: 0 %

REQUESTED MLF GRANT: US$ 1,490,600
IMPLEMENTING AGENCY SUPPORT COST: US$ 104,342 (7.0 %)
TOTAL COST OF PROJECT TO MLF: US$ 1,594,942

COST-EFFECTIVENESS: US$ **12.42** /kg ODS (metric) based on complete destruction of recovered ODS Waste in Brazil.

PROJECT MONITORING MILESTONES: Included
NATIONAL COORDINATING AGENCY: Ministry of Environment of Brazil

Brief Description.

The Ministry of Environment of Brazil, in collaboration with UNDP, has developed a project to demonstrate the environmentally sound, efficient and cost effective management and disposal of ODS waste refrigerants through the establishment of a complex nationwide ODS Waste Management System with MLF investment, as part of broader national programs related to energy efficiency and the sustainable management of hazardous wastes and WEEE.

The project utilizes an existing stocks of "end of life" ODS to qualify two domestic, modern, high temperature hazardous waste temperature incineration facilities to international standards. The project covers both the destruction of CFC-12 and CFC-11 refrigerants. Under the project, these facilities, as qualified, will destroy a more substantial quantity of ODS already generated as seized cargo resulted from illicit trade. The option of demonstrating destruction capability on such domestic facilities has been selected on the basis of it being the most cost effective route for Brazil relative other options available.

In terms of overall global demonstration value, the project offers an effective demonstration of what a middle income, industrializing Article 5 country can practically achieve in relation to EOL ODS waste management and destruction as integrating it into broader hazardous waste management programs and energy efficiency initiatives while capitalizing on emerging domestic environmental management capability.

It will also serves to demonstrate synergy with national stakeholders for the management of ODS stocks and wastes, and contributes to the knowledge base on current issues under discussion by TEAP. As result, it is expected that the lessons learnt under this project may be beneficial to other A5 countries.

Table of Contents

List of Annexes 3

List of Abbreviations 4

Executive Summary 5

A. Introduction and Background 7

B. Objective 8

C. Project Context & Justification 8

C.1. ODS Waste Management System 10

C.1.1. Collection 10

C.1.2. Transport Consolidation and Storage 11

C.2. ODS Disposal Strategy 15

D. Project Description 17

D.1. Synergies with other Chemical related Conventions 21

D.2. Financial Sustainability and expected Business Model 21

D.3. Budget & Related Costs 22

D.5. Monitoring, Implementation & Dissemination 22

E. Project Implementation Schedule & Milestones 23

Annex I – Transmittal Letter 24

Annex II – Reference Incinerator EPL Standards for Relevant Air Emissions 25

Annex III – Destruction Facilities Surveyed under the Preparation Project 26

Annex IV – Project Framework 30

LIST OF ANNEXES

Annex I Transmittal Letter

Annex II Reference Incinerator Environmental Performance Limit Standards for Relevant Air Emissions

Annex III Destruction Facilities Surveyed under the Preparation Project

Annex IV Project Framework

LIST OF ABBREVIATIONS

ABNT	National Association for Technical Standards
Alice-Web	System for Foreign Trade Data Analysis
CFC	Chlorofluorocarbon
CONAMA	National Council on Environment
CO_2 eq	Carbon Dioxide Equivalent
CTF	Federal Technical Registry
EE	Energy Efficiency
EPR	Extended Producer Responsibility
EOL	End of Life
ExCom	Executive Committee
GHG	Greenhouse Gas
GWP	Global Warming Potential
HCFC	Hydrochlorofluorocarbon
HC	Hydrocarbon
HFC	Hydrofluorocarbon
HPMP	HCFCs Phase Out Management Plan
HVAC-R	Refrigeration, Air Conditioners, Ventilation and Heating Sectors
IBAMA	National Institute of Environment and Natural Renewable Resources
MLF	Multilateral Fund for the Implementation of the Montreal Protocol
MMA	Ministry of Environment
MOP	Meeting of the Parties to the Montreal Protocol
N.A.	not available
NPP	National Phase-Out Management Plan
ODP	Ozone-Depletion Potential
ODS	Ozone-Depletion Substance
PBCO	National Program for the Protection of the Ozone Layer
PROZON	Inter-Ministries Executive Committee for Ozone Layer Protection
PU	Polyurethane Foam
RAC	Refrigerating and Air Conditioning
R&R	Recovery and Recycle
SMEs	Small and Medium Enterprises
UNDP	United Nations Development Programme
WEEE	Waste Electrical and Electronic Equipment

EXECUTIVE SUMMARY

1. UNDP, on behalf of The Government of Brazil, is submitting to the 72nd ExCom this request for funding for a pilot project that will evaluate and demonstrate the management and environmentally sound disposal and destruction of ODS waste, at a cost, as originally submitted, of US $1,490,600. This project is submitted in line with decision 58/19 and will address the destruction of 120 metric tonnes (mt) of waste ODS in the country.

2. At the 57th meeting, the Executive Committee approved the preparation project BRA/DES/57/PRP/288 for UNDP to prepare a pilot ODS demonstration project for Brazil. At that meeting, the decision was taken to look at pilot ODS disposal projects that would respond to decision XX/7 of the Twentieth Meeting of the Parties, which provided that pilot projects could cover the collection, transportation, storage and destruction of ODS, with a focus on assembled stocks with high net global warming potential (GWP), and in a representative sample of regionally diverse Article 5 countries. Members also stressed that ODS disposal demonstration projects should be feasible, and should include methods of leveraging co-funding. Brazil was one of the countries selected based on this criteria.

3. Brazil has already advanced significantly as regards of some aspects included in Decision 58/19, namely recollection and de-manufacturing of ODS. Transport and storage, and this final component of management of collected stocks, transport (logistics) and destruction would ensure that the full circle is completed. The project complies with the criteria established by Decision 58/19 including focus on specific aspects not addressed by other pilot projects.

4. The National CFC Phase-out Plan (NPP) promoted the creation a national structure for the recollection of CFCs from old equipment. Also, the national Council on Environment (CONAMA) has enacted the Resolution 267/2000 prohibiting the emissions of CFCs in the country. The Government of Brazil has approved, in 2010, the Law 12.305/10, that established the National Law on Solid Waste, which will enforce an Extender Producer Responsibility (EPR) programme, fact that will generate large quantities of waste of RAC equipment, including ODS.

5. In one hand, the establishment of regional energy-efficiency programmes promoted the early retirement of more than 500,000 units of domestic refrigerators. In the other hand, the country is implementing a project which seeks to transform the market by promoting the replacement of old and inefficient chillers, mainly CFC-based ones, through a complex nationwide finance-warranty scheme.

6. The above developments have resulted in the collection of ODS in an amount of 61,776 kg pure and contaminated CFCs (CFC-12, CFC-11), that has been accumulated mostly in the Reclaim Centers. Larger quantities might also been held in small scale de-centralized recycling centers that will needed to be inventoried and inserted in the ODS Waste Management System. Additionally, an estimated 734,400 kg of ODS materials is anticipated to become available from June, 2014 due to a large cargo seized by IBAMA.

7. It is anticipated that transportation, consolidation and storage will pose great challenges to the project, since the CFCs collected are located in several companies and reclamation centers, in tanks and cylinders of different sizes and shapes, are spread over a large territory that comprises more than 3,800 km. Besides the large distances to be covered in this ODS Waste Management System proposal, there is a need to strengthen the entities and transportation companies involved in such process.

8. The various strategic and technology options for destruction of waste ODS have been reviewed as a basis for developing the project design Overall the strategic options considered were: i) *export to qualified facilities in countries party to the Basel Convention*; ii) *the development of new national facilities using imported technologies*; and iii) *utilization of existing national hazardous and industrial waste management capacity that could potentially be qualified to international standards*. After careful evaluation the Government of Brazil has decided to pursue the path (iii).

9. In this sense, this project is design around 4 Components, as follows:

a. Component 1: Establish a comprehensive ODS Waste Management System including the ccapacity building on handling, transportation and characterization of ODS waste, as well as improve the ODS waste storage capacity;
b. Component 2: Undertake test burns at the two incineration facilities in order to qualify national capacities for ODS waste disposal as per international standards, analyzing its logistics and cost;
c. Component 3: Technical assistance and related development work associated with evaluation and standardization of the ODS waste Management & Disposal Demonstration Project;
d. Component 4: Project management associated with implementation and oversight of project

10. In order to ensure that all ODS waste is properly accounted for, the process will be closely monitored and data will be recorded through an electronic database system to be set up for this purpose. The origin of all EOL ODS recovered for destruction is easily determined given that the currently available stocks are held by the original sources and are collected from well-defined activities.

11. The total cost of the project, as originally submitted and including co-finance, has been estimated at US $2,065,600, the amount requested from the Multilateral Fund Secretariat is US $1,490,600.

12. As result, it is expected that this project will demonstrate the management and safe and environmentally sound management and disposal of “end of life” (EOL) ODS waste through an innovative approach that could be replied to other A5 countries.

A. Introduction and Background

13. In recent years it has become generally recognized that a significant bank of ODS remains in use, mainly as refrigerant fluids and as blowing agent for PU foams, and it is likely that this ODS will be subject to atmospheric release at some point at the end of its useful life. As a consequence, the Parties to the Montreal Protocol have directed attention to the issue, particularly in developing countries where the major remaining banks of high ODP ODS (i.e. CFCs) remain. Under Decision XX/7[1], the Parties requested ExCom to consider supporting demonstration initiatives in Article 5 countries as well as requesting TEAP to update its earlier guidance on ODS destruction[2] as adopted by the Parties[3].

14. In recognition of this, ExCom Decision 58/19[4] approved a set of interim guidelines for the funding of demonstration projects for the disposal of ODS and agreed that the Multi-lateral Fund (MLF) will fund demonstration projects. Preparation funding for a number of such projects, including the current project proposed in Brazil were subsequently approved at ExCom 59. TEAP has also updated its guidance on destruction requirements and approved technologies for ODS destruction with inclusion of a current Task Force Report in its most recent Progress Report[5].

15. In this sense, a number of ODS Waste & Disposal demonstration projects funded by the Multilateral Fund are being implemented worldwide based on the most varied premises. Overall it is apparent that experience gathered through those projects with a variety of ODS destruction technologies, programs and business models will be accumulated over the next years that can serve as a basis for future decision making and action on the issue by both countries and collectively by the Parties.

16. In the national context, although the production and consumption of CFCs in Brazil have been successfully phased-out under the Montreal Protocol, there is a significant residual amount of CFCs still found in equipment currently in operation, such as domestic refrigerators and Chillers. Due to their high Global Warming Potential, the CFCs contained in such equipment threaten to leak into the atmosphere if appropriate management and disposal measures are not taken into consideration.

17. Also, there is an evident need for an environmentally sound management and disposal of ODS that are being accumulated in the country originated at its operational recovery, recycling and reclaim system, also due to regional programmes on early retirement of Chillers and Domestic Refrigerators under the energy efficiency targeted initiatives and expected to be expanded to national levels due to the approval of the National Law on Solid Waste (Política Nacional de Resíduos Sólidos).

[1] Montreal Protocol Handbook (8th Edition, 2009), Page 90 - http://ozone.unep.org/Publications/MP_Handbook/MP-Handbook-2009.pdf
[2] TEAP Task Force on Destruction Technologies Report – 2002 (Volume 3b of 2002 TEAP Report) - http://ozone.unep.org/Assessment_Panels/TEAP/Reports/Other_Task_Force/TEAP02V3b.pdf
[3] Montreal Protocol Handbook (8th Edition, 2009), Page 457-464 - http://ozone.unep.org/Publications/MP_Handbook/MP-Handbook-2009.pdf
[4] http://www.multilateralfund.org/sites/58th/Document%20Library2/1/5853.pdf
[5] May 2011 TEAP Progress Report – P65, http://ozone.unep.org/Assessment_Panels/TEAP/Reports/TEAP_Reports/TEAP_Progress_Report_May_2011.pdf

B. Objective

18. In this proposal, the Government of Brazil is requesting funding for a project to demonstrate and evaluate the management and safe and environmentally sound disposal of "end of life" (EOL) ODS. The country's aggressive legislation and efforts to prevent the release of this material resulted in the accumulation of stocks of CFCs and CFCs-contaminated materials. Such stocks are also in significant risk of dramatic growth due the anticipation - in the mid to long term - of the impacts of national programs related to energy efficiency and the Extended Producer´s Responsibility under the National Law on Solid Waste. The absence of cost effective demonstrated destruction scheme represents a significant gap in that process and a barrier to its implementation.

19. From the perspective of the MLF, ExCom and the Parties generally, the proposed project provides an opportunity within the overall global ODS destruction demonstration program to support the practical implementation of ODS destruction using existing domestic capacity as an integrated part of broader national environmental and sustainable development programs utilizing various instruments such as energy efficiency incentives and potentially carbon financing. The project will also serve to address several technical issues that have been raised in recent TEAP discussions and add to the technical knowledge base related to environmental performance requirements applied to ODS destruction.

C. Project Context and Justification

20. Brazil has ratified and implemented the Vienna Convention and Montreal Protocol by Decree no. 99.280 of June the 6th in 1990. All amendments of the Protocol were ratified and implemented by Brazil, according to the following table, and since 1988 Brazil has been implementing activities addressed to comply with the targets set by the Montreal Protocol through legislative measures, public policies and through investment and non-investment projects.

Table 1. Vienna Convention, Montreal Protocol and respective Amendments

Convention, Protocol &Amendments	Ratification	Date
Vienna Convention – 1985	19 March 1990	Decree 99.280 – 06 June 1990
Montreal Protocol – 1987	19 March 1990	Decree 99.280 – 06 June 1990
London Amendment – 1990	1 October 1992	Decree 181 – 24 July 1991
Copenhagen Amendment – 1992	25 June 1997	Decree 2.679 – 17 July 1998
Montreal Amendment – 1997	30 June 2004	Decree 5.280 – 22 November 2004
Beijing Amendment – 1999	30 June 2004	Decree 5.280 – 22 November 2004

21. To support the coordination of activities and to mainframe the actions under the Montreal Protocol, the Ozone Layer Protection Coordination (CPCO) was created, which is subordinated to the Climate Change Department of the Ministry of Environment. The CPCO works on policies related to the phase out of the Ozone-Depleting Substances and acts as National Ozone Unit for the MP, also coordinating the formulation and implementation of all projects funded by the MLF, and acts as executive secretariat for the Inter-Ministries Executive Committee for Ozone Layer Protection (Prozon).

22. In 2002, the MLF approved for Brazil the National CFC Phase out Plan (NPP) aiming to phase out the consumption of 9,276 ODP tonnes of ODS from the Annex A, Group I (CFCs), during the period of 2002-2010. In this sense several investment, non-investment, technical assistance and training activities have been carried out, specifically the ones related to Recovery & Recycling structure.

23. The NPP promoted the creation of 5 large scale Reclaim Centers and 120 de-centralized Recycling Centers, supported by the distribution of 5,000 recovery bags and machines to companies and technicians in the country, which created a unique environment for the recovery of CFCs from old equipment in the country through operations of maintenance and/or disposal. Also, CONAMA has enacted the Resolution 267/2000 prohibiting the emissions of CFCs in the country.

24. The Government of Brazil has approved, in 2010, the Law 12.305/10, that established the National Law on Solid Waste. This regulation has come to establish national and subnational Directives on solid waste matters (including WEEE). Between such Directives, there is the creation of a sector Extender Producer Responsibility (EPR) programmes, setting obligations for the establishment of a wide reverse manufacturing system to recover, dismantle, recycle and disposal equipment, including RAC ones.

25. In this sense, the subsector regulation of National Law on Solid Waste is being discussed and is expected to be enforced in the next couple of years, fact that will generate large quantities of waste of RAC equipment, including ODS, that will need to be recovered and disposed properly, in line with the CONAMA Resolution.

26. In one hand, as advanced programme, public and private sectors in Brazil joined forces through the establishment of regional energy-efficiency programmes that promoted the early retirement of more than 500,000 units of domestic refrigerators.

27. In the other hand, the country is implementing the project BRA/REF/47/DEM/275 - co-funded by the MLF, the GEF and the IADB – which seeks to transform the market by promoting the replacement of old and inefficient chillers, mainly CFC-based ones, through a complex nationwide finance-warranty scheme.

28. The above developments have resulted in the collection of ODS in an amount of 61,776 kg pure and contaminated CFCs (CFC-12, CFC-11), that has been accumulated mostly in the Reclaim Centers, and was verified as being available for destruction as listed in Table 2 below. Larger quantities might also been held in small scale de-centralized recycling centers that will need to be inventoried and inserted in the ODS Waste Management System. Additionally, estimated 734,400 kg of ODS materials is anticipated to become available from June, 2014 due to a large cargo seized by IBAMA.

29. Finally, larger quantities of CFC-contained waste will be generated in the mid to long term, result of the enforcement of the National Law on Solid Waste and its related EPR programme. The universe of those stocks must still need to be inventoried.

Table 2. ODS Inventory Brazil, as of 28th February 2013

Company		Profile	City	Prov.	ODS	Kg
1	Capital Refrig	Reclaim Center	Porto Alegre	RS	CFC-11	11,250
					CFC-12 Contaminated	4,900
2	Bandeirantes Refrig	Reclaim Center	Sao Paulo	SP	CFC-12 Contaminated	4,419
3	Bom Clima Refrig	Reclaim Center	Recife	PE	CFC-11	1,190
					CFC-12 Contaminated	1,057
4	Revert Brasil	De-manufacturer	Careaçu	MG	CFC-12 Contaminated	5,000
					CFC-12 Contaminated	4,000
5	Frigelar	Reclaim Center	Sao Paulo	SP	CFC-12 Contaminated	300
6	Tecnitest	End-user	Rio de Janeiro	RJ	CFC-12 Contaminated	120
7	Ref. Marechal	Recovery company	Sao Paulo	SP	CFC-11	4,000
8	Carrier do Brasil	End-user	Canoas	RS	CFC-12 Contaminated	11,500
9	ClimaSul	Recycle Center	Curitiba	PR	CFC-12 Contaminated	500
10	Recigases	Recycle Center	Rio de Janeiro	RJ	CFC-12 Contaminated	13,540
SUBTOTAL ODS WASTE COLLETED AND AGGREGATED, to be consolidated						**61,776**
North Reg. 13	3 companies	Recycle Center	Amazonas Province		CFC-12 Contaminated	730
	1 company	Recycle Center	Acre Province		CFC-12 Contaminated	100
	1 company	Recycle Center	Roraima Province		CFC-12 Contaminated	150
	1 company	Recycle Center	Macapá Province		CFC-12 Contaminated	170
	2 companies	Recycle Center	Rondônia Province		CFC-12 Contaminated	200
	3 companies	Recycle Center	Pará Province		CFC-12 Contaminated	290
	2 companies	Recycle Center	Tocantins Province		CFC-12 Contaminated	120
Center Rg. 16	3 companies	Recycle Center	Mato Grosso Province		CFC-12 Contaminated	550
	4 companies	Recycle Center	Mato Gr. do Sul Province		CFC-12 Contaminated	1,100
	6 companies	Recycle Center	Goiás Province		CFC-12 Contaminated	2,500
	3 companies	Recycle Center	Federal District (DF)		CFC-12 Contaminated	900
North East Reg. 30	3 companies	Recycle Center	Maranhão Province		CFC-12 Contaminated	500
	2 companies	Recycle Center	Piauí Province		CFC-12 Contaminated	90
	5 companies	Recycle Center	Ceará Province		CFC-12 Contaminated	2,900
	3 companies	Recycle Center	Rio Grande Nor. Province		CFC-12 Contaminated	950
	3 companies	Recycle Center	Paraíba Province		CFC-12 Contaminated	1,350
	2 companies	Recycle Center	Alagoas Province		CFC-12 Contaminated	800
	2 companies	Recycle Center	Pernambuco Province		CFC-12 Contaminated	5,200
	2 companies	Recycle Center	Sergipe Province		CFC-12 Contaminated	320
	8 companies	Recycle Center	Bahia Province		CFC-12 Contaminated	6,480
South East Reg. 36	8 companies	Recycle Center	São Paulo Province		CFC-12 Contaminated	5,500
	3 companies	Recycle Center	Rio de Janeiro Province		CFC-12 Contaminated	8,200
	19 companies	Recycle Center	Minas Gerais Province		CFC-12 Contaminated	7,034
	6 companies	Recycle Center	Espirito Santo Province		CFC-12 Contaminated	1,780
South Reg. 25	4 companies	Recycle Center	Rio Grande Sul Province		CFC-12 Contaminated	2,320
	14 companies	Recycle Center	Paraná Province		CFC-12 Contaminated	4,090
	7 companies	Recycle Center	Sta Catarina Province		CFC-12 Contaminated	3,900
SUBTOTAL ODS WASTE COLLETED, TO BE AGGREGATED and to be consolidate**						**58,224**
TOTAL ODS WASTE TO BE ELIMINATED UNDER THE PROJECT						**120,000**
11	IBAMA	Controlling Entity	São Paulo	SP	to be identified*	734,400
SUBTOTAL ODS WASTE COLLETED AND AGGREGATED, to be characterized						**734,400**
TOTAL UNVERSE OF ODS WASTE inventoried in Brazil						**854,400**

**ODS originated from a large cargo seized by IBAMA*
***indicative inventory.*

C.1. ODS Waste Management System

30. As can be seen in the above, the quantities of CFCs recollected are located in several companies and reclamation centers in tanks and cylinders of diverse sizes and shapes and spread over a large territory that comprises the states of São Paulo (SP), Rio de Janeiro (RJ), Minas Gerais (MG), Pernambuco (PE), Rio Grande do Sul (RS) and Paraná (PR).

31. Due to the large distances of Brazil, it is foreseen that a major administrative/operational challenge in a sustainable solution to accumulating ODS will lay in the logistics of management system, mainly those related to the consolidation, transport and storage capacity in the country.

32. In this sense, to meet the requirements of the interim guidelines for the funding of demonstration projects for the disposal of ODS , as approved by Executive Committee, at its 58th Meeting, in accordance with paragraph 2 of decision XX/7 of the Meeting of the Parties. This project proposes to comply with all of the requirements as set out by the above mentioned Decision 58/19, as follows:

C.1.1. Collection

33. In recent years, through a series of activities driven by the MLF funded projects, Brazil has established a nationwide Recovery, Recycling and Reclaiming (RRR) System composed by 5 (five) Reclaim Centers and 120 (one hundred and twenty) de-centralized Recycling Centers, backed up by the distribution of 5,000 (five thousand) tools, recovery bags and recovery machines, reaching all states in the country.

34. Also, Brazil has successfully created a stable energy efficiency program, driven by the Law 9991/00, that by working in close cooperation with Utilities, have promoted a wide equipment replacement programme. Since 2005, this programme successfully retired and replaced more than 500,000 inefficient domestic refrigerators, mostly owned by low income families.

35. In the same spirit, Brazil is implementing the project BRA/REF/47/DEM/275, which is co-funded by the MLF, the GEF and the IADB. This project overlooks the chillers owners and tries to create a new market, mostly driven by ESCOs and Utilities energy efficient programmes, by creating technical and financial mechanisms which companies can accede to accelerate the replacement of old and inefficient chillers. Indeed, replacement of high impact CFC-based chillers is a priority under the programme that, directly or indirectly, is promoting such replacements.

36. Supported by the National Resolution CONAMA 267/2000 – that prohibited CFC emissions in the country – great efforts were made to strengthen the collection system in the country, grouping all these sources of ODS contained equipment. As owners of state-of-

art recovery equipment, Reclaim and Recycling Centers had become the priority consolidation centers for these ODS, generating a real demand for the environmentally sound disposal.

37. However, selecting and consolidating such ODS (at the end-user level) is not a straightforward activity, since those Centers deal with a large and diverse source of equipment (and ODS), this situation generated a large quantity of CFC-based contaminated ODS collected. Also, it was identified that pure CFC-11 has virtually no commercial value due to the extreme low demand of this refrigerant for Chillers (that are being replaced), resulting in the inventory collected and surveyed in the Table 2 of this document that has no market value or technical condition to be recycled and reused.

38. In this sense, a major objective of this project is monitor the source of the collected ODS held by those Centers and strength their capacities in receiving, separating transferring and temporarily store it (in small quantities) with proper equipment to accomplish the further steps of the logistic process, avoiding, in this ways, the risk of venting and the loss of materials.

39. Private companies (Reclaim and Recycle Centers) will finance the cost of personnel and daily operational costs involved in the collection process. Therefore, no funds are being requested to collection of ODS waste.

C.1.2. Transport, Consolidation and Storage

40. It is anticipated that transportation and consolidation will pose great challenges to the project, since the CFCs collected are located in several companies and reclamation centers, in tanks and cylinders of different sizes and shapes, are spread over a large territory that comprises the states of São Paulo (SP), Rio de Janeiro (RJ), Minas Gerais (MG), Pernambuco (PE), Rio Grande do Sul (RS) and Paraná (PR), needing to overcome distances of more than 3,800 km (From Porto Alegre to Recife). The Figure 1, below, indicate the map of distribution of the ODS collected through the partial inventory.

41. The inventory in Table 2 is based on collected ODS originated from a limited number of Recycling Centers and from all Reclaim Centers, including additional independent owners of CFCs. Due to the large basis of the country it is expected that more quantities of CFCs and contaminated CFCs collected may be inventoried during the implementation of the project.

42. Besides the large distances to be covered in this ODS Waste Management System proposal, there is a need to strengthen the entities and transportation companies involved in such process. It was identified that transportation of virgin/new ODS is quite a simple process due to the large normative basis and due to the fact that great part of consumption is through labelled non-refillable cylinders. However, managing the transport of collected (included recycled/reclaimed) ODS is still a challenge for these actors.

Fig. 1 – Map of the partial inventory of ODS Collected

43. In this sense, transport of ODS waste in Brazil has been done in an *ad hoc* manner and with no structured approach so far. The gaps already identified are:

a. Lack of a hegemonic understanding (voluntary standardization) on how to treat and categorize ODS waste (subnational permit systems and documentation), it means: which class of waste/hazardous waste ODS should be marked and labelled, as well its issued documents at state environmental agencies. Such categorization is being done *ad hoc* by state governments. Different interpretation of class of the materials is given, meaning that each time that a ODS waste cargo cross a state border new regulations must be obeyed, resulting in more time and cost in the process.

b. Lack of proper vehicles for transport of ODS waste, and lack of refillable cylinders for transport of collected ODS waste, since great part of the refrigerant market in Brazil is supplied by non-refillable cylinders;

c. Lack of expertize on handling and labelling refillable cylinders/tanks containing ODS waste;

d. Lack of technical standards for handling, labelling and transporting ODS waste; and

e. Lack of consolidation of ODS waste coming from different owners and recycling centers that could allow economies of scale, improve efficiency and minimize venting.

44. This proposal includes a component that will create a tangible and coordinated structure for transport of collected ODS waste at all levels in Brazil. This includes capacity building activities for state governments and private companies involved in the licensing and transport operations of ODS waste from the recollection centers to storage and destruction facilities. Private companies (Reclaim Centers) will co-finance the cost of personnel involved in transport of ODS waste in the country.

45. Brazil is also using its Reclaim and Recycle centers as advanced locals for consolidation and storage facilities, taking advantage of the very limited capacity storage with proper tanks and cylinders.

46. Since the main area of business of such centers is recovering, recycling/reclaiming and re-using ODS, it was also identified that there is a certain lack of expertize of handling, transferring and lack proper storage equipment at the Centers.

47. It was identified the current system has its limitations, since ODS waste use the same tanks and cylinders that are to be used for tradable recycled/reclaimed ODS. It is urgent the need to undertake improvements in order to have a fully operational system that would complement the general ODS Waste Management System.

48. The proposal includes that recycle centers become advanced points of receipt of ODS waste and that the Reclaim Centers become also Regional Storage Centers to facilitate the consolidation and the transport of the waste to the destruction facility, taking advantage of the physical structure and capacities already in place.

49. In this sense, as part of the collection process, Recycling Centers placed at 120 cities in Brazil will be responsible to act as advanced collections centers for ODS waste and will be able to support ODS waste owners on how to collect and direct their waste. As determined by ExCom decision, this **collection** activity **will not** be funded by this proposed project.

50. As further step, Reclaim Centers placed at the 4 main cities of Brazil (*Refrigeração Bandeirantes and Sudeste Refrigeracao, in São Paulo; Frigorio Climatizacão, in Rio de Janeiro; Bom Clima Refrigeracão, in Recife; and Refrigeracão Capital, in Porto Alegre*) will be the main responsible (and co-funders) partners in the consolidations of ODS Waste . Their activities will include: receipt collected ODS waste; identification and characterization of the ODS waste streams and tonnage; transfer to high capacity cylinders and tanks and labeling of the consolidated ODS waste cargo.

51. Ultimately, this proposal intends to create a coordination mechanism between the Reclaim Centers, ODS waste holders, consolidators and managers to assure proper handling, transportation and disposal of ODS waste through an integrated Management System that could be replicated to other countries.

52. Therefore, the government of Brazil is requesting funds to cover the costs of procuring recovery equipment and associated multi-refrigerant ODS identifiers, materials/large

capacity storage cylinders and ancillary equipment that would allow transfer of ODS waste from smaller to larger cylinders in a higher rate.

53. The proposal includes the procurement of 5 high rate recovery machines that can be moved in the units at the advanced receipt points. It would be important to note that the recovery machines would need to have a high capacity in order to be able to transfer ODS waste between cylinders of different sizes.

54. It is also foreseen the procurement of 15 large capacity tanks (1,000kg each) to each Reclaim & Storage Center, increasing the storage capacity of the country from current from 4.4 metric tonnes to 20 metric tonnes, facilitating the handling and disposal of waste (since current inventory is being stored in private owned cylinders, and the centers are being demanded to return the empty cylinders to end users, creating a negative incentive for the system).

55. This also includes capacity building activities for the private companies involved in the handling and storing operations of ODS waste from the recollection centers to storage and destruction facilities, as well as further quantification of stocks (associated costs for gas-chromatographic analysis, labelling, issuance of documents and certificates for final disposal, supervision and monitoring).

56. This proposal will co-finance a consolidation pilot project in each Reclaim Center. These Storage Centers will co-finance the cost of personnel and day-to-day operational costs involved in consolidation, transfer and storage of ODS waste in the country.

C.2. ODS Disposal Strategy

57. The various strategic and technology options for destruction of waste ODS have been reviewed as a basis for developing the project design and its detailed scope. In general, the menu of available technological options that would meet the destruction performance requirements set out by the Montreal Protocol is well known.

58. These have been reviewed in the previous referenced TEAP documentation adopted by the Parties, including the most recent update in 2010 where a number of new innovative but as yet fully commercialized technologies were considered. Similarly, both the Basel Convention[6] and the GEF Scientific and Technical Assessment Panel (STAP)[7] have issued guidance documents on the selection of destruction technology for POPs which also provide relevant information given the similarities in requirements for environmentally sound destruction of chlorinated chemical wastes, including differential between so-called combustion and non-combustion technologies.

59. Overall the strategic options considered were: i) export to qualified facilities in countries party to the Basel Convention; ii) the development of new national facilities

[6] http://www.basel.int/Portals/4/Basel%20Convention/docs/pub/techguid/tg-POPs.pdf
[7] http://www.unep.org/stap/Portals/61/pubs/POPs_Disposal_Final_low.pdf

using imported technologies; and iii) utilization of existing national hazardous and industrial waste management capacity that could potentially be qualified to international standards. Each of these is discussed below:

60. *Export to qualified hazardous waste management facilities:* This option would essentially be applicable to the actual chemicals under the assumption that the cost of bulk export of any significant quantities of CFC-11 and contaminated CFC. The export options considered available to Brazil are North America and Europe, noting that the United States status as a non-party to the Basel convention limits consideration of that destination directly. Facilities qualified and experienced in destroying EOL ODS exist in Mexico, the United States and Canada. These primarily employ high temperature incineration (HTI) although commercial plasma arc facilities employing PLASCON technology were to start operation in Mexico and the United States. In Europe, to date HTI is the main available commercial option with a number of facilities existing that have destroyed EOL ODS. In general, facility gate market prices for EOL ODS destruction with HTI in North America range from approximately US$1.5/kg to US$3.0/kg and essentially mirror the market pricing for non-flammable halogenated waste. Destruction with plasma arc technology is reported to be somewhat higher, An overall unit cost range of US$10.3-18.5/kg is estimated for this technology, noting that a cost of US$6.5/kg in Australia would apply at an operating commercial facility there. The European market has recently become similar in pricing to that in North America for chlorinated waste streams. Current pricing for POPs shipped from Eastern Europe is in the range of US$1.5-2.0/kg. It should be noted that all of these costs exclude Basel Convention transaction, local administration/supervision, local handling and sea container transportation. Based on quotations from the UNDP demonstration project in Ghana (overall destruction cost of US$12.3/kg) , reasonable estimates of these would be US$6/kg including US$3/kg for transportation and US$1/kg transaction costs for Basel documentation into the EU. There is no recent previous experience for export of ODS from Brazil that could be used as reference to calculate such costs.

61. *Development of new national facilities using imported technologies:* The option of developing specialized facilities for destruction of EOL ODS has not been further considered noting that two attempts to establish refrigerator de-manufacturing facilities inclusive of destruction facilities have not been completely successful. In any event it was determined through a preliminary qualification process that permit national commercial HTI incineration facilities have the required capability subject to demonstration. Additionally, a pilot Plasma Arc facility exists in the country and could be considered subject to economic viability.. In general it is felt that development of any new technology in Brazil exclusively for EOL ODS destruction would not be viable due to the relatively high initial cost and oversized for the national requirement. This generally mirrors the experience of other more advanced MLF projects, notably that approved and now being implemented in Colombia[8]

[8] http://www.multilateralfund.org/66/English/1/6633.pdf

62. *Utilization of existing national hazardous and industrial waste management capacity:* This option involved examining the potential for existing domestic incineration facilities to be qualified to international standards, specifically those that could potentially be qualified to international standards as reference to both the Basel Convention[9] and the GEF Scientific and Technical Assessment Panel (STAP)[10] have issued guidance documents on the selection of destruction technology for POPs which also provide relevant information given the similarities in requirements for environmentally sound destruction of chlorinated chemical wastes, including differential between so-called combustion and non-combustion technologies. This involved review of the present permitting and qualification protocols and standards in force in Brazil as applied to hazardous waste thermal treatment/incineration facilities as well as identify these facilities subject to this legislation and permitting process, as can be found in the Annex III.

63. In summary, Brazil has a well-established mature legal and regulatory system for the management of hazardous waste. The requirements and procedures in place and enforced by institutions and technical capability are generally aligned with those in developed countries. Similarly, the country has a rapidly developing and capable waste management service provider base that is investing in modern capability, both in the collection and handling of hazardous waste and in its environmental sound processing, treatment and disposal. In particular, it now has several thermal treatment and destruction facilities that should be capable of undertaking the destruction of waste ODS. Subject to demonstration of this capability in accordance with international standards, utilization of domestic destruction capability should be more cost effective than alternatives of export to qualified facilities elsewhere, or developing new purpose built facilities with alternative technologies.

Table 3 – Summary table of surveyed hazardous and industrial waste management facilities

Company	City	State	Technology	Remarks
Cetrel	Salvador	BA	Liquid Injection	Solid waste
HazTec-Tribel	Belford Roxo	RJ	Rotary and Static Kilns	Hazardous waste
Essencis	Taboão da Serra	SP	Rotary Kiln	De-manufacturing ref.
BASF	Guaratinguetá	SP	Rotary Kiln	Chemicals waste
ABL	Cosmópolis	SP	Rotary Kiln	Pharmaceutical waste
Ecochamas	Rezende	RJ	Plasma Arc	Industrial waste class II
Fox Reciclagem	Cabreúva	SP	Chemical-Thermal Treat.	Refrigerator de-manufacturer

64. In this sense, Brazil has decided to implement its disposal project based on the destruction strategy described in the paragraph 43 above, namely to "*Use the existing national hazardous and industrial waste management capacity".*

65. The rationale behind qualifying destruction capability for both for CFC-11 and contaminated CFC-12 is so that options are covered given the overall incremental approach adopted for developing waste ODS destruction capability. The pre-qualification of CFCserves to remove a possible barrier to the eventual investment in such high efficiency capability when economies of scale and financing mechanisms are

[9] http://www.basel.int/Portals/4/Basel%20Convention/docs/pub/techguid/tg-POPs.pdf
[10] http://www.unep.org/stap/Portals/61/pubs/POPs_Disposal_Final_low.pdf

in place. This incremental project design strategy should serve as useful and practical demonstration for broader replication elsewhere.

66. The qualification of the existing domestic incineration facilities will be accomplished through undertaking test burns of these waste streams at least in one facility (preferred two due to the geographic distribution of Storage Centers in the country, to be determined during the implementation). This will involve the destruction of an estimated 120 metric tonnes of CFC contaminated refrigerant, being 61,776 kg of collected CFC-11 and 12 and additional 58,224 kg to be consolidated from diverse sources at Recycling Centers and from the seized stock from IBAMA . The project will also support the incremental development of key institutional and technical capacity through technical assistance related to regulatory measures and appropriate economies of scale.

67. The project complies with the criteria established by Decision 58/19 and involves aspects that are not necessarily addressed by other pilot projects approved by ExCom.

D. Project Description

68. The proposed project described below has been structured into four components: *Component 1* (ODS Waste Management System through Transport, Consolidation and Storage coordination and structure enhancement); *Component 2* (Test Burn/Destruction Demonstration); *Component 3* (Technical Assistance); and *Component 4* (Monitoring and Evaluation). The activities to be undertaken in each component are summarized in the Table 4. The following provides a detailed project description by Component:

Component 1:

69. The activities in this component cover the oversight/monitoring of collected CFC and the proper consolidating the material into larger containers (for compatibility with onward transport and incineration feed infrastructure) at the Regional Storage Centers, and transportation to the destruction facility, its characterization as to CFC content and contaminants, secure storage, and ultimately transportation to the test burn sites. **The initial collection stage up** to the consolidation and storage sites **will not be MLF funded**, but paid for by the current holders.

70. MLF grant funding is proposed for 5 sets of high speed refrigerant recover equipment (inclusive of tools, accessories and portable analyzers) and a quantity of larger multiple use cylinders with appropriate vapour locks and purging capability. Capacity building on handling, transportation and characterization is also envisaged with MLF funds. Finally, a specific activity is identified to document and report on the origin, tracking, and verification of all the waste ODS in accordance with procedures suitable for use under an international carbon crediting system if that were to apply and to enhance the coordination system through the creation of an Integrated Management System as pilot activity. The detailed activities include:

- Consolidate collected ODS waste into centralized storage sites, consolidating the material into larger containers (sizing anticipated to be at least 500 kg containers, preferably 1,000kg ones, selected for compatibility with onward transport and incineration feed infrastructure);
- Proper characterization (identification) of large containers as to CFC content and contaminants though gas chromatograph analysis;
- Establish a secure storage at 5 strategically located places (cities São Paulo, Osasco, Rio de Janeiro, Porto Alegre and Recife), with proper stocks control;
- Transportation to the test burn sites and the transport documentation/licensing.
- A specific activity is to document and report on the origin (collection sites, profile of equipment, etc), tracking (labelling), and verification of all the EOL ODS in accordance with procedures suitable for use under an international carbon crediting system if that were to apply;
- Review of Licensing demands for all operations;

Component 2:

71. It is proposed to undertake test burns at the two incineration facilities that will be further selected under a public process – taking as reference the short list provided in Table 3 above. The test burn process will be utilize the national regulatory requirements and protocols described above, supplemented by an international standard, likely as issued by USEPA[11, 12].
72. The initial activity will be technical assessment work undertaken jointly by an MLF funded consultant and the incinerator operator that will include a base line environmental audit of the facilities and current environmental management plan required under national regulations, development of a detailed test burn protocol and specification, and design for any modifications required for the test burn. A key part of this will be determination of an appropriate ODS feed rate (allowable chlorine content) and the waste stream to be co-disposed with ODS along with its compositional characterization.

73. In terms of modifications required, these are anticipated to be relatively minor. It will involve installation of a new feed port in the front end of the kiln and setting up the feeding cylinder system with appropriate metering and automated record tabulation as well as a switching and purging capability for cylinders. For CFC-11, modifications may involve either a dedicated feed system but more likely simply a connection into the existing liquid feed system and burner nozzle, although for purposes of the test burn and integrity of input measurement a dedicated feed tank, pump, metering system and flow controls will likely be required.

74. On each facility/ODS chemical combination, there will be a baseline test burn with the normal waste stream to be co-disposed, and then a test burn with the ODS. In each case, the monitoring protocol will be followed covering operating conditions (i.e. combustion chamber temperatures, estimated resident times, stack outlet temperatures),

[11] http://www.epa.gov/osw/hazard/testmethods/sw846/pdfs/chap13.pdf
[12] http://www.epa.gov/osw/hazard/tsd/td/combust/pdfs/burn.pdf

the standard menu of regulated emissions including PCDD/F as well as mass balance inputs covering all residual release paths (solid, liquid and gaseous), analysis for key contaminants (including PCDD/F) in solid bottom ash, scrubber residuals) and any liquid residual streams. The intention is to determine both Destruction Removal Efficiency (DRE) and Destruction Efficiency (DE). This would serve to inform current discussions reflected in the most recent TEAP ODS Destruction Task Force report referenced above regarding the equivalency of these two parameters used in assessing environmental performance of organic waste destruction facilities generally. DE is generally considered more comprehensive since it covers all releases though DRE which only assesses releases to air is more generally used including in the TEAP guidelines. It is generally felt that gaseous or high vapor pressure CFCs would only be subject to air release but this should be validated. Likewise, analysis for PCDD/F and any recombinant CFC residuals in all release medium would likewise be useful contributions to the technical knowledge base.

Component 3:

75. This component covers technical assistance and related development work associated with evaluation, regulation and implementation of the ODS disposal demonstration project and in ensuring the legal, regulatory, technical and public acceptance tools are in place to sustain capacity so qualified. This sub-component provides limited MLF support, co-financed by the MMA for regulatory enabling measures. This would include:

    i) legislation/regulation guidance in support of collection, storage, analysis, tracking, certified destruction and reporting requirements applicable to the management of waste ODS;

    ii) Standardization of the technical criteria and specifications for the facilities managing waste ODS; and

    ii) legislation/regulation guidance for the ODS waste management under the EPR system regulation under the National Policy on Solid Waste.

Component 4:

76. This component covers the project management costs associated with this kind of project. MLF funding would be associated with partial funding of incremental staffing costs in the form of a full time project manager, project documentation printing/translation costs and local project related travel. This component also provides for normal M&E costs also on a cost shared basis between the MLF and the Government.

77. Formal Monitoring and Evaluation activities responsible to gather all documents at all level, establishment of digital archives, tables and controls. Systematization of storage data (quantity of cylinders, composition of ODS contained in it and labelling). Transportation system related to profile of transport company and insurance. Systematization of transport and handling Licensing protocols with the various state agencies involved in the process. Monitoring and evaluation of test Burn protocols.

D.1. Synergies with other Chemical related Conventions

75. In principle, there are no direct synergies related to this project proposal that can be implemented *vis-à-vis* with other chemicals projects. However, it was identified that the destruction qualification for ODS waste (particularly the upgrade of incineration facilities and the establishment of protocols and verification of efficiency of destruction) that can be beneficial for the disposal of other types of hazardous waste like PCBs, since Brazil is implemented, under the GEF-V, a "Integrated Project on PCBs Management". In this sense, some institutional cooperation might the promoted between the Ozone National Unit and other Chemicals Directories, in order to exchange good practices on the overall waste management principles (although the stakeholders involved in each project are different, but general lessons learned can be exchanged).

D.2. Financial Sustainability and expected Business Model

78. Initially, the project will analyze the possibility of using carbon finance scheme for the short term; In the medium to long term, the Extended Producer´s Responsibility (EPR) programme will fund the ODS waste system through the establishment of a financial mechanism (or fund), funded by RAC equipment producers, that will be responsible for the disposal of ODS contained equipment (cradle-to-grave / life cycle approach).

D.3. Budget & Related Costs

Component and Activities			MLF Funding USD	Co-funding USD	TOTAL USD
1.1	**Component 1: Management System Pilot Project:** Transport, Consolidation and Storage	Collection oversight of CFCs and CFC-based ODS	25,000	-	25,000
1.2		Consolidation and Characterization of CFCs	95,000	55,000	150,000
1.3		Temporary storage of CFCs	150,000	67,000	217,000
1.4		Transportation to destruction facility	20,000	10,000	30,000
1.5		Integrated Management System Pilot Structure	182,600	68,000	199,600
1.6		Documentation and Reporting	10,000	-	10,000
1		**Subtotal Component 1**	**482,600**	**200,000**	**682,600**
2.1	**Component 2: Test Burn / Destruction Demonstration**	Detailed test burn design and selection of facilities	25,000	37,000	62,000
2.2		Incineration infrastructure adaptation of facilities	35,000	20,000	55,000
2.3		Settlement of procedures and baseline feed	10,000	10,000	20,000
2.4		Baseline test burn feed mix	55,000	25,000	80,000
2.5		Demonstration test burn feed CFC-11 (5mt)	75,000	45,000	120,000
2.6		Demonstration test burn feed CFC-12 (5mt)	75,000	45,000	120,000
2.7		Destruction of CFCs 11&12 (110mt)*	418,000	-	418,000
2.8		Test burn supervisión	10,000	5,000	15,000
2		**Subtotal Component 2**	**703,000**	**187,000**	**890,000**
3.1	**Component 3: Technical Assistance**	Support for technical enabling activities	50,000	35,000	85,000
3.2		Support for stakeholder and public awareness	50,000	25,000	75,000
3		**Subtotal Component 3**	**100,000**	**60,000**	**160,000**
4.1	**Component 4: Monitoring and Evaluation**	International Expert	80,000	-	80,000
4.2		National Consultant	60,000	60,000	120,000
4.3		Travel / Mission Costs	45,000	45,000	90,000
4.4		Administrative Office	-	15,000	30,000
4.5		Sundry	20,000	8,000	22,000
4		**Subtotal Component 4**	**205,000**	**128,000**	**333,000**
		Total USD	**1,490,600**	**575,000**	**2,065,600**

**remaining 676,176 kg of ODS contaminated materials seized by IBAMA shall be destructed by own costs, as co-financed provided by the Government/fined company responsible for the illegal trade. Destruction is dependent on positive results of the burns undertaken under this demonstration project.*

D.4. Monitoring, Implementation & Dissemination

76. A national team of experts will be set up to implement and monitor project implementation and progress under the direct coordination of MMA and UNDP. This includes the monitoring of transport, storage and final disposal of ODS, as per ExCom Guidelines 58/19 and other national/international legislation.

77. Lessons learned will be documented and shared nationally as well as internationally. The project will generate valuable information about how to develop a full system of ODS Disposal Management System covering collection, transport, storage and destruction in place. A Closure Seminar is intended to be promoted to share the experiences learned.

E. Implementation Schedule & Milestones

Activity	2014			2015				2016				2017	
	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Project Start-up													
Excom Project Approval													
Receipt of Funds													
Project/Grant Signature													
Management activities													
Progress Reports to Excom													
Project Implementation													
Component 1: Collection/Transport/Consolidation/Storage													
Component 2: ODS Destruction Demonstration													
Selection Process of Incineration Facility													
Test burn design													
Adaptation of feeding mechanism, baseline feed mix pre-determination process, settlement of test burn evaluation													
Test burn of 10mt of CFC													
Effective incineration of 110mt of ODS waste recollected													
Supervisory/audit and data analysis													
Component 3: Technical Assistance													
Component 4: Management/Monitoring/Evaluation													
Project Closure													
Final Report													
Certificate of Technical Completion													
Operational and Financial Closure													

ANNEX I

Transmittal Letter

MINISTÉRIO DO MEIO AMBIENTE
SECRETARIA DE MUDANÇAS CLIMÁTICAS E QUALIDADE AMBIENTAL
DEPARTAMENTO DE MUDANÇAS CLIMÁTICAS
SEPN 505 - Lote 02 - Bloco B - Edifício Marie Prendi Cruz - Sala 307. CEP: 70.730-542. Brasília DF
Tel.: (61) 2028-2272 -e Fax.: (61) 2028-2272

Ofício nº 16/2014/SMCQ/DEMC

Brasília, March 18 2014.

Mr. JACQUES VAN ENGELS
Officer-in-Charge, Montreal Protocol Unit/Chemicals
UNDP
New York, NY
USA

Subject: Pilot Demonstration Project on ODS-Waste Management and Disposal.

Dear Mr. Jacques Van Engels,

Please find enclosed original copy of the Pilot Demonstration Project on ODS-Waste Management and Disposal to be submitted for the consideration of the 72nd Executive Committee Meeting of the Multilateral Fund.

Yours sincerely,

ADRIANO SANTHIAGO DE OLIVEIRA
Director of the Department of Climate Change

ANNEX II

Reference Incinerator Environmental Performance Limit Standards for Relevant Air Emissions[13]

Performance Parameter	Brazil CONAMA 316 de 2002[14]	TEAP Task Force Report (2002)[15] Decision XV/9[16]	Basel Convention G/L (POPs)[17]	EC Incineration Directive[18]	EC IPPC BREF[19]
Particulates (mg/Nm^3)	70	50	NR	10	0.1 – 2
SO_x (mg/Nm^3)	280	n/a	NR	50	0.1 – 50
HCl (mg/Nm^3)	80	100	NR	60	0.1 – 10
HF (mg/Nm^3)	5	5	NR	1	0.04 – 1
HBr/Br_2 (mg/Nm^3)	n/a	5	NR	n/a	n/a
NO_x (mg/Nm^3)	560	n/a	NR	200	40 – 200
CO (mg/Nm^3)	100	100	NR	n/a	5 -50
Dioxin/Furan ($ng\text{-}ITEQ/Nm^3$)	0.5	0.2 0.5 (Foam)	0.1	0.1	0.002 – 0.1
Total Organic Carbon	n/a	n/a	NR	10	0.1 – 10
DE (%)	n/a	n/a	99.99	n/a	n/a
DRE (%)	99.99 (POPs) 99.9999(PCB)	99.99	99.9999	99.9999	n/a

NR – National Regulations
n/a – not applied

[13] Limits are also applied to other pollutants, particularly heavy metals but are not listed.
[14] CONAMA Resolution no. 316 from 2002 - http://www.mma.gov.br/port/conama/legiabre.cfm?codlegi=338
[15] TEAP Task Force Report on ODS Destruction Technologies (2002) - http://ozone.unep.org/Assessment_Panels/TEAP/Reports/Other_Task_Force/TEAP02V3b.pdf
[16] Handbook of the Montreal Protocol, 8th Edition (2009), Section 3.1,Page 457, http://www.unep.ch/ozone/Publications/MP_Handbook/MP-Handbook-2009.pdf
[17] http://www.basel.int/pub/techguid/tg-POPs.pdf
[18] Directive 2000/76/EC on Incineration of Waste – Hazardous waste incineration daily averages: http://www.central2013.eu/fileadmin/user_upload/Downloads/Document_Centre/OP_Resources/Incineration_Directive_2000_76.pdf
[19] EC IPPC BREF, August 2006- – Hazardous waste incineration daily averages:, ftp://ftp.jrc.es/pub/eippcb/doc/wi_bref_0806.pdf

ANNEX III

Destruction Facilities Surveyed under the Preparation Project

Comparative Factors	Cetrel	HazTec-Tribel	Essencis	BASF	Serviatis	ABL	Ecochamas
Location	Salvador, BA	Belford Roxo, R.J.	Taboao da Serra, SP	Guaratinqueta, SP	Resende/RJ	Cosmopolis, SP	Resende, RJ
General Business Scope	Operating environmental services – Waste Mgt., WWT, monitoring	Hazardous/ Industrial WM. services	Waste Mgt. Reverse manufacturing Consulting	Major international chemicals producer	Formulating agrochemicals and waste management	Pharmaceutical manufacture	Industrial waste destruction
Ownership/Financial Depth	100% national. State (20%) and large industrial firm (80%)	100% national ownership involving two banks. Recent merger with larger firm.	100% national ownership.	10% foreign (German)	100% national ownership (workers and ex-workers)	100% foreign (Italian, US)	100% national, local entrenpeneur, state research institute technical support
Waste Management Business Scope	Incineration, landfill, land farm, biological treatment	Integrated Organic/Inorganic Hazardous/ Industrial waste	Solid, industrial and Haz. Waste, plus resource recovery	Accepts third party hazardous waste for incineration in captive facility	Liquid industrial and Haz. Waste	High temperature incineration	Galvanic waste, with plan to process domestic, agrochemicals and pharmaceutical waste
Destruction Technology Proposed	Liquid injection & rotary kiln incineration	Rotary kiln Static kiln	Rotary kiln	Rotary kiln	Vertical static kiln	Rotary Kiln	Plasma Arc combustion
Age/History of Facility	Liquid injection - 1992, Rotary kiln- 1998	Initially 1992 WWTP/Phys-Chem - 2000 Upgrade, capacity increase, add static kiln – 2001 Relocating – 2010	Operation since 1993 Operational upgrades 2003-2010 including bag filters in 2009	Constructed 1994 Upgraded 2007.2008	Constructed 1977	Constructed 1996	Funded in 1999. Licence from 2006. Upgrade operation in process
Nominal Annual Capacity (t/year unless noted)	Liquid injection - 10,000 t/year (5.6 Gcal/hr) Rotary kiln- 5,000 t/year (4.4 Gcal/hr)	7,000 t/year (2.2 Gcal/hr)	7,000 t/year (6.5 Gcal/hr)	3,600 t/yr	20,000 t/year (6.0 Gcal/hr)	8,000 t/year	300 kg/hour

Comparative Factors	Cetrel	HazTec-Tribel	Essencis	BASF	Serviatis	ABL	Ecochamas
Capacity Availability (t/year)	Operating at 85% capacity	Operating at full capacity	Operating at full capacity	N/A	N/A	Approximately 4,000 t/yr	N/A - full capacity not in use
Waste Currently Processed	Wide range of chlorinated wastes	Wide range of industrial wastes (solids liquids gasses)	Limited chlorinated wastes but wide range of other HW, primarily pesticide containers and solids	Wide range of chlorinated by products, principally from agro-chemical production	Organic solvents, waste water	Wide range of chlorinated and non-chlorinated solids and liquids.	Galvanic residues, with Fe, Zn, Cr, Cd, Ni
Other Waste Qualified For	PCBs	PCBs	No PCBs	No PCBs	No PCBs	No PCBs	No PCBs, due to rules of the condominium
Technical/ Environmental Waste Type Limitations	800 kg/hr. Chlorinated waste	Not Significant	Potential limitations on Cl and F feed. Fluorine impact monitored. Not qualified for PCBs	Potential limitations on Cl and F feed.	No chlorinated/ fluorinated waste	Subject to feed rate restrictions on chlorinated solid and liquids generally, as well as chlorine and fluorine content	None declared except PCBs and declared that are able to process waste with Cl and F
Combustion Chamber Temperature Range	Liquid Injection - >1,000^{o}C(1,200 +/- ^{o}C 100 ^{o}C) Rotary Kiln –>800 ^{o}C Secondary - >900 ^{o}C 1,100 +/- ^{o}C 100 ^{o}C)	Rotary Kiln –800 to 1100 ^{o}C Secondary – 1100-1250 ^{o}C	Rotary Kiln – 900 ^{o}C Secondary –1,160 ^{o}C	Rotary Kiln – 686 ^{o}C Secondary –1,200 ^{o}C	950-1,100 ^{o}C	Kiln temperature 1,100 ^{o}C	Average temperature: 1500°C Temperature inside the torch: 5000 to15 000°C Combustion chamber 1000 to 1800°C
Residence Time (liquid)	Liquid Injection – 2.5 sec. Rotary Kiln - 2 Sec.	Rotary kiln 2-3 sec Secondary 2-3 sec	Rotary kiln N/A Secondary >2 sec	N/A	N/A	45-60 min. for solids 2-3 sec for liquids	N/A

Comparative Factors	Cetrel	HazTec-Tribel	Essencis	BASF	Serviatis	ABL	Ecochamas
Overall Environmental Performance Parameters	DRE >99.99 on general waste, >99.9999 on PCBs. PCDD/PCDF-<0.1 Ng/Nm^3 Generally meet international air emissions/significantly better than national standards.	DRE >99.99 on general waste, >99.9999 on PCBs. PCDD?PCDF <0.5 Ng/Nm^3 Air emissions to national regulations.	DRE >99.99 on PCDD?PCDF <0.5 Ng/Nm^3 Air emissions to national regulations.	DRE >99.99 on PCDD?PCDF <0.5 Ng/Nm^3 Actual 0.35-0.40 Ng/Nm^3 Air emissions to national regulations.	N/A	DRE.99,9999 DE>99.9999 PCDD/PCDF 0.06 NG/Nm^3 on test burns. Other air parameters substantially better than nation regulations and meet international	N/A
Residuals Handling/Disposal	No pre-treatment of solid residuals, sent to on-site landfill. Liquids residuals to on site WWTP	No pre-treatment of solid residuals. Liquids residuals to on site WWTP Solid residuals sent to off-site LF	No pre-treatment of solid residuals. Liquids residuals to on-site WWTP Solid residuals sent to on-site LF	No pre-treatment of solid residuals. Liquids residuals to on-site WWTP Solid residuals sent to off-site LF (SASSA landfill)	No pre-treatment of solid residuals. Liquids residuals to on-site WWTP Solid residuals sent to off-site LF	Solid residuals immobilized in cement production Liquid effluents to WWTP and reuse on- site	Residues sent to the condominium landfill
Waste Tracking/ Destruction Documentation	Reception analysis/formal tracking thru to destruction certificate	N/A	N/A	N/A	N/A	Reception analysis/formal tracking thru to destruction certificate	Reception analysis/formal tracking thru to destruction certificate
Facility Land Use Setting	Located adjacent to the ocean with main industrial complex providing buffer with other land uses.	Located in an industrial park, immediately adjacent to a small river. Residential development on river's opposite bank	Relatively good separation from other development but surround by urban development	Excellent location with substantial buffer under enterprise control.	Located in Dutra Via, in industrial area, without adjacent population	Location remote from residential or conflicting land use.	Inside Clariant's condominium, about 1 km from a urban center
Environmental Monitoring	Continious – O_2,CO,CO_2,SO_X, NO_X	Continuous stack monitoring of basic parameters – CO, O_2). Well equipped on-site lab Compliance stack monitoring quarterly. PCDD/PCDF – 2y.	Continuous stack monitoring of CO, NO_x, SO_x, MP and O_2 Ground water monitoring	Continuous stack monitoring of basic parameters - CO, NO_x, SO_x,O_2.	Continuous stack monitoring of CO, NO_x, SO_2, and O_2	Continuous stack monitoring of CO, NO_x and SO_2	CO and CO_2. New equipments, in instalation will monitor SO_X, NO_X

Comparative Factors	Cetrel	HazTec-Tribel	Essencis	BASF	Serviatis	ABL	Ecochamas
Public Consultation Program	N/A	N/A	No formal program. Publications	Active public consultation and information program	N/A	Active public consultation and information program	None
Laboratory/QA/ EMS Standards Certification	ISO 14.001:2004 ISO 9.001:2000 OHSAS 18.001:2007 SA 8.000:2001	ISO 14001	ISO17025 ISO14001	N/A	None	ISO14001	None
Required Facility Modifications for ODS	Minor if liquid injection unit used	Addition of kiln injection port.	$1 million upgrade investment planned (proposed)	Addition of kiln and/or secondary chamber injection port.	N/A	Minor Addition of kiln injection port or off gas return piping	Minor modifications anticipate by enterprise
Feasibility of Onsite ODS Bulk Storage	Yes	Yes	Yes	Yes	N/A	Yes	Area available to expand for storage
Feasibility of ODS Specific Tracking/ Monitoring Protocols	Yes	Yes	Yes	Yes	N/A	Yes	Yes upon evaluation
Provision of Collection/ Transportation Services	Yes, although capacity limited	Yes	Yes	No	No	No	No
Raw Estimate Pricing Range for ODS (FOB Site), not included collection, transport, consolidation and storage	R$5-16/kg	R$2 – 15/kg	R$9/kg	N/A	N/A	R$1-12/kg	R$3-13,50/kg
Confirmation of Interest in Pursuing ODS Destruction	Yes	Yes, subject to availability of facility after relocation	Yes, but may be constrained by 18 months to upgrade facility.	Yes	No	Yes	Yes

N/A – Information not provided

ANNEX IV

Project Framework

Activity		Product	Funding - USD			Remarks on Co-funders
			MLF	Co-finance	Total	
1	**Component 1: Collection oversight, Transport, Consolidation and Storage Management System**		**482,600**	**200,000**	**682,600**	
1.1	Technical assistance on collection oversight of CFCs and CFC-contaminated ODS	Bulk quantities of CFC/CFC-contaminated ODS already collectedt Storage Center / Incineration Facility level, are verified and monitored, in order to check if best available practices were undertaken to avoid leakages and environmental contamination.	25,000	0	**25,000**	No co-financing
1.2	Technical assistance on consolidation and characterization of CFCs	Bulk quantities of CFC/CFC-contaminated ODS screened, consolidated into optimized cylinders for destruction and monitored.	95,000	65,000	**150,000**	Co-funded by Recycling Centers and ODS Waster owners/holders as operational costs (staff, energy, cleaning of tanks, licensing costs)
1.3	Technical assistance on Temporary storage of CFCs	Bulk quantities of CFC/CFC-contaminated ODS securely storage at the project sites.	150,000	67,000	**217,000**	Co-funded by Reclaim Centers (staff, energy, licensing costs)
1.4	Technical assistance on transportation to destruction facility	Bulk quantities of CFC/CFC-contaminated ODS, transported from Storage Center to Incineration Facilities as required by test burn/burning schedules.	20,000	10,000	**30,000**	Co-funded by Reclaim Centers (staff, licensing costs, insurance)
1.5	Integrated Management System Pilot Structure	Integrated consolidation and ODS waste management system in place at each of the 5 Regional Storage Centers, included staff capacitated and logistic system developed	100,000	50,000	**150,000**	Co-funded by Reclaim Centers as operational costs (staff, energy, water, handling, inspection and cleaning of tanks, licensing costs)
1.5.1	5 (five) High capacity transfer machinery for recovered ODS waste	Bulk quantities of CFC/CFC-contaminated ODS collected by 120 companies transferred to larger size cylinders.	10,000	50,000	**60,000**	
1.5.2	15 (fifteen) High capacity storage cylinders	High capacity cylinders, that match incineration facilities feeding systems, made available to 5 Storage Centers for temporary storage of waste.	22,100	0	**22,100**	
1.5.3	5 (five) Multi-refrigerant identifiers	Refrigerant blends identifier delivered to Storage Centers and characterization costs minimized over the medium to long term.	22,500	0	**22,500**	

Activity		Product	Funding - USD			Remarks on Co-funders
			MLF	Co-finance	Total	
1.5.4	Revision of Processes, Documents and Lessons Learnt	Internal revision of ODS waste aggregation process and consolidation of lessons learnt focused on compliance with national regulations on waste.	10,000	0	**10,000**	
1.5.5	Integrate System Coordinator	Part time Coordinator financed for 6 months by the project in order to start-up the Integrated System hired.	18,000	18,000	**36,000**	6 additional months to be co-financed by the Storage Centers = total period 12 months
1.6	Documentation and Reporting	Auditable documentation on the origin, tracking and certified analysis of EOL ODS for test burns stocks assembled in suitable format for accreditation under an international carbon crediting mechanism model.	10,000	0	**10,000**	No co-financing
2	**Component 2: Test Burn / Destruction Demonstration**		**703,000**	**187,000**	**890,000**	
2.1	Detailed test burn design and selection of facilities	Detailed test burn design, specification and proposal documents delivered with baseline environmental audit for each test burn facility	25,000	37,000	**62,000**	Co-funded by Incineration Operator: staff, opportunity cost for not incineration other streams, internal auditing costs)
2.2	Incineration infrastructure adaptation of facilities	Material feed, control and measurement infrastructure at HW incineration facility improved, included but not limited to: - Primary combustion chamber port modifications for high vapor pressure liquid and/or compressed gas feed; - Dedicated liquid feed from barrels or containers inclusive of weight scale, pump, fugitive emission containment, flow controls and flow metering; - Dedicated gaseous feed from pressurized containers inclusive of weight scale, pump, fugitive emission containment, flow controls and flow metering; - Container purging capability.	35,000	20,000	**55,000**	Co-funded by Incineration Operator: staff, opportunity cost for not incineration other streams while civil and retrofit works are being done, equipment adaptation, licensing costs)
2.3	Settlement of procedures and baseline feed	Representative baseline feed to be co-disposed with ODS selected and implemented	10,000	10,000	**20,000**	Co-funded by Incineration Operator: staff, internal auditing costs)

Activity		Product	Funding - USD			Remarks on Co-funders
			MLF	Co-finance	Total	
2.4	Baseline test burn feed mix	General baseline test burn on representative normal feed mix established: - Incineration facility operating conditions; - Stack analysis for regulated emissions including HF and PCCD/F; - Bottom ash analysis; - Scrubber waste water (as applicable) analysis.	55,000	25,000	**80,000**	Co-funded by Incineration Operator: staff, equipment review protocols, licensing costs)
2.5	Demonstration test burn feed CFC-11 (5 metric tonnes)	Continuous metered injection of 5 metric tonnes of CFC-11, at pre determined rates, with monitoring and documentation of items 2.3 and 2.4 above	75,000	45,000	**120,000**	Co-funded by Incineration Operator: staff, opportunity cost for not incineration other streams while test burns are running).
2.6	Demonstration test burn feed CFC-12 (5 metric tonnes)	Continuous metered injection of 5metric tonnes of CFC-12, at pre determined rates, with monitoring and documentation of items 2.3 and 2.4 above.	75,000	45,000	**120,000**	
2.7	Destruction of of CFC (11&12) (110 metric tonnes)	110 mt of CFC-11 and CFC-12 destructed at commercial rate of USD 3.80/kg, established after the test burns.	418,000	0	**418,000**	No co-financing
2.9	Test burn supervision	Independent supervisory/audit consultant(s) undertaken for the test burn oversight, data analysis and reporting	10,000	5,000	**15,000**	Co-funded by Incineration Operator: staff, internal auditing and Env. Licensing costs)
3	**Technical Assistance**		**100,000**	**60,000**	**160,000**	
3.1	Support for technical enabling activities	Support for enabling measures delivered for the facilitation development and implementation of the ODS Management System - Verification/Update of Environmental Performance Limit Standards for Relevant Air Emissions. - Technical guidance in support of collection, storage, analysis, tracking, certified destruction and reporting requirements applicable to the management of EOL ODS. - Regulation of the technical criteria and specifications for the selection of facilities to incinerate ODS. - Technical guidance for the regulamentation of EPR system	50,000	35,000	**85,000**	Co-funded by Ministry of Environment of Brazil: staff, legal advisory of the Ministry, mission and day to day operational costs.

Activity		Product	Funding - USD			Remarks on Co-funders
			MLF	Co-finance	Total	
3.2	Support for stakeholder and public awareness	Stakeholder and public consultations effective support and awareness developed and delivered related to the national ODS Waste Management System: - Information products/public promotion; - Stakeholder workshops; - Consultation meetings; - Capacitation/Information Materials.	50,000	25,000	**75,000**	Co-funded by Ministry of Environment of Brazil: staff, legal advisory of the Ministry, mission and day to day operational costs.
4	**Monitoring and Evaluation**		**205,000**	**128,000**	**333,000**	
4.1	International Expert	International expert (part-time) on hazardous waste management/incineration that delivered high level advisory, guidance and oversight to National Expert, to NOU and UNDP on the project implementation cycle	80,000	0	**80,000**	Co-funded by Ministry of Environment of Brazil: staff, mission and day to day operational costs.
4.2	National Consultant	National expert on ODS, hazardous waste and WEEE management (full time) delivered overall project coordination, reporting to NOU/UNDP, and provided close cooperation with private sector	60,000	60,000	**120,000**	
4.3	Travel / Mission Costs	Projected related travel/mission costs.	45,000	45,000	**90,000**	
4.4	Administrative Office	Projected related day-to-day operational issues.	0	15,000	**15,000**	
4.5	Sundry	Not foreseen extraordinary costs contingences.	20,000	8,000	**28,000**	
GRAND TOTAL			**1,490,600**	**575,000**	**2,065,600**	