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COMITÉ EJECUTIVO DEL FONDO MULTILATERAL
PARA LA APLICACIÓN DEL
PROTOCOLO DE MONTREAL
Septuagésima segunda Reunión
Montreal, 12 – 16 de mayo de 2014

PROPUESTA DE PROYECTO: BRASIL

Este documento consta de las observaciones y la recomendación de la Secretaría del Fondo sobre la siguiente propuesta de proyecto:

Destrucción

• Proyecto piloto de demostración sobre gestión y eliminación de desechos de SAO	PNUD

HOJA DE EVALUACIÓN DE PROYECTO - PROYECTOS NO PLURIANUALES

BRASIL

TÍTULO DEL PROYECTO	**ORGANISMO DE EJECUCIÓN**
Proyecto piloto de demostración sobre gestión y eliminación de desechos de SAO	PNUD

ORGANISMO DE COORDINACIÓN NACIONAL: Ministerio de Medio Ambiente del Brasil

DATOS DE CONSUMO MÁS RECIENTE PARA SAO OBJETO DEL PROYECTO

A: DATOS DEL ARTÍCULO 7 (TONELADAS PAO en 2012)

Anexo I, CFC	0		

B: DATOS SECTORIALES DEL PROGRAMA DE PAÍS (TONELADAS PAO, 2011)

SAO	**Subsector/cantidad**	**Subsector/cantidad**	**Totales**
CFC			0

PLAN ADMINISTRATIVO DEL AÑO EN CURSO: Financiación total 672 253 $EUA Eliminación total 75 toneladas PAO

TÍTULO DEL PROYECTO

Uso de SAO en la empresa		n.c.
SAO a ser eliminadas		n.c.
Proyecto incluido en el plan administrativo en curso		Sí
Sector		Destrucción de SAO
Subsector		n.c.
Impacto del proyecto		120 toneladas métricas
Duración del proyecto		36 meses
Propiedad local		100%
Componente de exportación		0%
Suma original solicitada		1 578 000*
Donación del FML solicitada		
PNUD	$EUA	1 490 600
Gastos de apoyo del organismo de ejecución		
PNUD (7%)	$EUA	104 342
Costo total del proyecto para el Fondo Multilateral	**$EUA**	**1 594 942**
Relación de costo a eficacia	$EUA/kg	12,42 kg (métricos)
Hitos de supervisión del proyecto		Incluidos

* Excluye los gastos de apoyo al organismo

RECOMENDACIÓN DE LA SECRETARÍA:	Consideración individual

DESCRIPCIÓN DEL PROYECTO

1. El PNUD, en nombre del Gobierno del Brasil, presentó a la 72ª reunión una propuesta para un proyecto piloto de demostración sobre gestión y eliminación de desechos de las sustancias que agotan el ozono (SAO), por la suma de 1 578 000 $EUA, más gastos de apoyo al organismo de 110 460 $EUA, conforme a lo presentado originalmente[1].

Descripción del proyecto

2. La finalidad de este proyecto piloto es demostrar una gestión y eliminación de desechos de refrigerantes a base de SAO ambientalmente racional, eficiente y eficaz en función de los costos por medio del establecimiento de un sistema nacional complejo de gestión de desechos de SAO en el Brasil. Proporcionará oportunidades para integrar la gestión y destrucción de desechos de SAO en programas nacionales de gestión de desechos peligrosos e iniciativas de eficiencia energética más amplios. Estos esfuerzos se complementarán con actividades iniciadas durante la ejecución del plan nacional de eliminación de CFC, que promovió la creación de una estructura nacional para la recolección de CFC de equipos antiguos. Por medio del plan nacional de eliminación de CFC, se establecieron cinco centros de regeneración de gran escala y 120 centros de reciclaje descentralizados, con el apoyo de distribución de máquinas de recuperación a empresas y técnicos del país. El proyecto también buscará sinergias con las actividades de eliminación de los HCFC; en particular, las operaciones para el servicio y mantenimiento de los equipos de refrigeración existentes, que se espera que generen desechos de SAO que no se podrán reutilizar. Estos esfuerzos contarán además con el apoyo de una ley nacional sobre gestión de desechos sólidos en el Brasil que se aprobó en 2010. Por medio de esta ley, se aplicará un programa de responsabilidad ampliada del productor (EPR) que tiene posibilidades de generar grandes cantidades de desechos, incluidas SAO de desecho de equipos de refrigeración y aire acondicionado. Se adjunta a este documento una propuesta de proyecto detallada.

3. El proyecto comprende los siguientes cuatro componentes:

a) Componente 1: establecimiento de un sistema de gestión de desechos de SAO abarcador, incluida creación de capacidad sobre manipulación, transporte y caracterización de desechos de SAO así como la mejora de la capacidad de almacenamiento de desechos de SAO;

b) Componente 2: realización de quemas de prueba en dos instalaciones de incineración a fin de preparar las capacidades nacionales para la eliminación de SAO conforme a las normas internacionales, y análisis de la logística y los costos correspondientes;

c) Componente 3: asistencia técnica y labor de desarrollo relacionada con la evaluación y normalización del proyecto de proyecto de demostración sobre gestión y eliminación de desechos de SAO; y

d) Componente 4: gestión de proyecto relacionada con la ejecución y supervisión del proyecto.

4. El sistema de gestión de desechos de SAO abarcador se desarrollará usando el sector nacional de servicio y mantenimiento de refrigeración del país operado por una red de técnicos y empresas del sector privado bien equipados de todo el país. Este programa es esencial para el proyecto de demostración, dado que el transporte, la consolidación y el almacenamiento plantean difíciles retos para el Brasil, dado que los desechos de SAO acopiados están situados en varias empresas y centros de regeneración, dispersos a

[1] En la 57ª reunión, el Comité Ejecutivo proporcionó fondos para que el PNUD preparase un proyecto piloto de demostración de destrucción de SAO.

lo largo de un amplio territorio de más de 3 800 km. El proyecto busca crear un mecanismo de coordinación integrado entre los centros de regeneración, los tenedores de los desechos de SAO, los consolidadores de desechos y los administradores de los centros, a fin de garantizar una manipulación, transporte y eliminación de desechos de SAO que pueda reproducirse en otros países.

5. La destrucción de desechos de SAO en el Brasil se realizará por medio de la destrucción a nivel nacional, usando dos de las siete instalaciones existentes de gestión de desechos peligrosos e industriales. El Brasil ha establecido una capacidad de gestión de desechos químicos peligrosos que está disponible a nivel comercial e incluye el tratamiento y destrucción de materiales clorados en forma líquida y sólida. A fin de cumplir las normas internacionales, se realizarán en estas dos instalaciones quemas de prueba de la corriente de desechos disponible en el país. Las dos instalaciones de incineración se determinarán por medio de un proceso de licitación pública conforme a lo requerido por las reglamentaciones gubernamentales.

6. Se seguirá un protocolo de supervisión que cubre las condiciones de funcionamiento (es decir, temperaturas de la cámara de combustión, tiempo de residencia estimativo, temperaturas de salida de chimenea), los requisitos normativos para las emisiones reguladas, incluidos dibenzoparadioxinas policloradas y dibenzofuranos policlorados (PCDD/PCDF), así como entradas de balance de masa de todos los trayectos de liberación residual (sólido, líquido y gaseoso) y análisis de contaminantes clave (incluidos PCDD/F en cenizas de fondo de horno sólidas, residuales de lavador de gases) y todas las corrientes residuales líquidas. La intención es determinar tanto la eficacia de la eliminación mediante destrucción (DRE) como la eficacia de destrucción (DE). Se prevé que el proyecto de demostración de destrucción de desechos de SAO se ejecutará en tres años.

Cálculo de las SAO que se destruirán

7. El proyecto piloto abordará inicialmente la destrucción de 120 toneladas de desechos de SAO para su destrucción. Estas cantidades provienen de un sistema de acopio nacional existe y están disponibles en centros de regeneración y reciclaje del Brasil, como se muestra en el Cuadro 1.

Cuadro 1: Cantidades estimadas de desechos de SAO que se usarán en el proyecto

Empresa		Perfil	Ciudad	SAO	kg
1	Capital Refrig	Centro de regeneración	Porto Alegre	CFC-11	11 250
				CFC-12 contaminado	4 900
2	Bandeirantes Refrig	Centro de regeneración	Sao Paulo	CFC-12 contaminado	4 419
3	Bom Clima Refrig	Centro de regeneración	Recife	CFC-11	1 190
				CFC-12 contaminado	1 057
4	Revert Brasil	Desfabricación	Careaçu	CFC-12 contaminado	5 000
				CFC-12 contaminado	4 000
5	Frigelar	Centro de regeneración	Sao Paulo	CFC-12 contaminado	300
6	Tecnitest	Usuario final	Río de Janeiro	CFC-12 contaminado	120
7	Ref. Marechal	Empresa de recuperación	Sao Paulo	CFC-11	4 000
8	Carrier do Brasil	Usuario final	Canoas	CFC-12 contaminado	11 500
9	ClimaSul	Centro de reciclaje	Curitiba	CFC-12 contaminado	500
10	Recigases	Centro de reciclaje	Río de Janeiro	CFC-12 contaminado	13 540
Total parcial de desechos de SAO acopiados y acumulados, que se consolidarán					**61 776**
Región norte 13	3 empresas	Centro de reciclaje	Provincia de Amazonas	CFC-12 contaminado	730
	1 empresa	Centro de reciclaje	Provincia de Acre	CFC-12 contaminado	100
	1 empresa	Centro de reciclaje	Provincia de Roraima	CFC-12 contaminado	150
	1 empresa	Centro de reciclaje	Provincia de Macapá	CFC-12 contaminado	170

Empresa		Perfil	Ciudad		SAO	kg
	2 empresas	Centro de reciclaje	Provincia de Rondônia		CFC-12 contaminado	200
	3 empresas	Centro de reciclaje	Provincia de Pará		CFC-12 contaminado	290
	2 empresas	Centro de reciclaje	Provincia de Tocantins		CFC-12 contaminado	120
Región centro 16	3 empresas	Centro de reciclaje	Provincia de Mato Grosso		CFC-12 contaminado	550
	4 empresas	Centro de reciclaje	Provincia de Mato Gr. do Sul		CFC-12 contaminado	1 100
	6 empresas	Centro de reciclaje	Provincia de Goiás		CFC-12 contaminado	2 500
	3 empresas	Centro de reciclaje	Distrito Federal (DF)		CFC-12 contaminado	900
Región noreste 30	3 empresas	Centro de reciclaje	Provincia de Maranhão		CFC-12 contaminado	500
	2 empresas	Centro de reciclaje	Provincia de Piauí		CFC-12 contaminado	90
	5 empresas	Centro de reciclaje	Provincia de Ceará		CFC-12 contaminado	2 900
	3 empresas	Centro de reciclaje	Provincia de Río Grande Nor.		CFC-12 contaminado	950
	3 empresas	Centro de reciclaje	Provincia de Paraíba		CFC-12 contaminado	1 350
	2 empresas	Centro de reciclaje	Provincia de Alagoas		CFC-12 contaminado	800
	2 empresas	Centro de reciclaje	Provincia de Pernambuco		CFC-12 contaminado	5 200
	2 empresas	Centro de reciclaje	Provincia de Sergipe		CFC-12 contaminado	320
	8 empresas	Centro de reciclaje	Provincia de Bahía		CFC-12 contaminado	6 480
Región sudeste 36	8 empresas	Centro de reciclaje	Provincia de São Paulo		CFC-12 contaminado	5 500
	3 empresas	Centro de reciclaje	Provincia de Río de Janeiro		CFC-12 contaminado	8 200
	19 empresas	Centro de reciclaje	Provincia de Minas Gerais		CFC-12 contaminado	7 034
	6 empresas	Centro de reciclaje	Provincia de Espirito Santo		CFC-12 contaminado	1 780
Región sur 25	4 empresas	Centro de reciclaje	Provincia de Río Grande Sul		CFC-12 contaminado	2 320
	14 empresas	Centro de reciclaje	Provincia de Paraná		CFC-12 contaminado	4 090
	7 empresas	Centro de reciclaje	Provincia de Sta. Catarina		CFC-12 contaminado	3 900
Total parcial de desechos de SAO acopiados, que se acumularán y consolidarán						**58 224**
Total de desechos de SAO que se destruirán en el proyecto						**120 000**
11	IBAMA	Entidad controladora	São Paulo	SP	se identificará*	734 400
Total parcial de desechos de SAO acopiados y acumulados, que se identificarán						**734 400**
Total de desechos de SAO inventariados en el Brasil						**854 400**

*** El Instituto Brasileño de Medio Ambiente y Recursos Naturales Renovables (IBAMA) ha confiscado un gran contenedor que contiene SAO que aún no se han identificado. Actualmente se está efectuando la verificación.**

Gestión financiera del proyecto

8. La financiación del Fondo Multilateral cubrirá los gastos requeridos para llevar a cabo las quemas de prueba en las instalaciones de incineración seleccionadas y certificar que estas cumplan con las normas internacionales requeridas para la destrucción de desechos de SAO. También cubrirá los gastos para establecer el sistema de gestión de desechos de SAO que supervisará el programa de EPR/Programa de equipos eléctricos y electrónicos de desecho, en el que se espera que otros materiales acopiados de equipos antiguos generarán ingresos suficientes para permitir la destrucción sostenida de futuros desechos de SAO. El proyecto también analizará la posibilidad de usar los mercados de carbono en el futuro; no obstante, esto no está previsto en el diseño actual del proyecto.

Selección de tecnología/enfoque de destrucción

9. Se consideraron tres opciones para la destrucción de desechos de SAO: i) exportación desechos de SAO a instalaciones de gestión de desechos peligrosos que cumplieran los requisitos, ii) desarrollo de instalaciones de destrucción nuevas usando tecnologías importadas y iii) utilización de una instalación

nacional existente de gestión de desechos peligrosos e industriales que podría actualizarse para cumplir las normas internacionales. La primera opción no resultaba viable debido al costo y la falta de experiencia con este tipo de transacciones en el país. La opción de desarrollar instalaciones especializadas para la destrucción de desechos de SAO no se consideró más a fondo ya que se habían realizado intentos de establecer instalaciones de desfabricación de refrigeradores que incluyeran instalaciones de destrucción que no habían resultado completamente exitosos.

10. La última opción requería examinar las posibilidades de usar las instalaciones nacionales de incineración existentes, con la condición de que cumplieran las normas internacionales, especialmente aquellas vinculadas con el Convenio de Basilea[2] y el Grupo Asesor Científico y Tecnológico (STAP) del Fondo para el Medio Ambiente Mundial (FMAM) [3]. Ambas entidades han publicado documentos de orientación sobre la selección de la tecnología de destrucción para los contaminantes orgánicos persistentes (COP) que también proporcionan información pertinente habida cuenta de las similitudes con los requisitos para la destrucción ambientalmente racional de desechos químicos clorados. También se tuvieron en cuenta los requisitos del Grupo de Evaluación Tecnológica y Económica (GETE) respecto a las normas de destrucción. Las siete instalaciones que se determinó que cuentan con capacidad potencial para destruir desechos de SAO se someterán a una validación técnica por medio de protocolos de prueba. El Gobierno del Brasil considera que la utilización de instalaciones nacionales de destrucción será más eficaz en función del costo que las restantes opciones propuestas. La propuesta presentada, por ende, se ha diseñado en base a esta opción.

Supervisión y verificación de la destrucción

11. A fin de garantizar que todos los desechos de SAO estén adecuadamente contabilizados, el proceso de destrucción se supervisará de cerca y los datos se registrarán por medio de un sistema electrónico de base de datos que se configurará a estos efectos. El origen de todos los desechos de SAO recuperados para destrucción se puede determinar fácilmente, dado que las reservas actualmente disponibles están en posesión de las fuentes originales y se acopian por medio de actividades bien definidas (es decir, decomisos en las aduanas, actividades de servicio y mantenimiento de refrigeración e iniciativas de eliminación). En ambos casos, se prevé explícitamente en el proyecto un seguimiento de estos materiales por medio de la consolidación, caracterización, almacenamiento, transporte y destrucción posteriores, con inclusión de documentación detallada y uso de un sistema de supervisión electrónico con base de datos, que será parte de los resultados esperados del proyecto.

Costo del proyecto

12. Se ha calculado que el costo total del proyecto, conforme a la presentación original, asciende a 2 153 000 $EUA. La suma que se solicita al Fondo Multilateral es de 1 578 000 $EUA y se muestra en el Cuadro 2 a continuación:

[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

Cuadro 2: Costo del proyecto propuesto

Componente y actividades		Financia-ción del FML ($EUA)	Cofinan-ciación ($EUA)	TOTAL ($EUA)
Componente 1: Proyecto piloto de sistema de gestión	Supervisión de acopio de CFC y SAO a base de CFC	25 000	-	25 000
	Consolidación y caracterización de los CFC	95 000	55 000	150 000
	Almacenamiento provisional de CFC	30 000	15 000	45 000
	Transporte a la instalación de destrucción	20 000	10 000	30 000
	Estructura piloto de sistema de gestión integrada	400 000	120 000	520 000
	Documentación y presentación de informes	10 000	-	10 000
	Total parcial Componente 1	**580 000**	**200 000**	**780 000**
Componente 2: Quema de prueba/Demostración de destrucción	Diseño detallado de quema de prueba y selección de instalaciones	25 000	37 000	62 000
	Adaptación de las instalaciones para la infraestructura de incineración	35 000	20 000	55 000
	Establecimiento de procedimientos y alimentación de base	10 000	10 000	20 000
	Mezcla de entrada de prueba de base	55 000	25 000	80 000
	Alimentación para quema de prueba de demostración para CFC-11 (5 tm)	75 000	45 000	120 000
	Alimentación para quema de prueba de demostración para CFC-12 (5 tm)	75 000	45 000	120 000
	Destrucción de CFC-11 y CFC-12 (110 tm)*	418 000	-	418 000
	Supervisión de quema de prueba	10 000	5 000	15 000
	Total parcial Componente 2	**703 000**	**187 000**	**890 000**
Componente 3: Asistencia técnica	Apoyo para actividades de facilitación técnica	50 000	35 000	85 000
	Apoyo para concienciación de los interesados y del público	50 000	25 000	75 000
	Total parcial Componente 3	**100 000**	**60 000**	**160 000**
Componente 4: Supervisión y evaluación	Experto internacional	80 000	-	80 000
	Consultor nacional	60 000	60 000	120 000
	Gastos de viajes/visitas en misión	45 000	45 000	90 000
	Oficina administrativa	-	15 000	15 000
	Gastos varios	10 000	8 000	18 000
	Total parcial Componente 4	**195 000**	**128 000**	**323 000**
	Total ($EUA)	**1 578 000**	**575 000**	**2 153 000**

OBSERVACIONES Y RECOMENDACIÓN DE LA SECRETARÍA

OBSERVACIONES

13. La Secretaría presentó al PNUD varios comentarios y observaciones basados en el examen realizado siguiendo los criterios establecidos en la decisión 58/19, y señaló que el Brasil cuenta con un sistema de acopio de desechos de SAO bien institucionalizado, apoyado por la legislación nacional, y que aparentemente habrá una corriente de desechos disponibles para las instalaciones, lo que garantizará la sostenibilidad del proyecto.

14. Al explicar las cantidades de desechos de SAO disponibles actualmente en el país, conforme a lo presentado en forma resumida en el Cuadro 1, especialmente las cantidades relacionadas con el IBAMA, el PNUD aclaró que el gobierno ha decomisado recientemente un gran envío de sustancias químicas aún no identificadas que, según afirman, contienen SAO ilegales (es decir, CFC). Se está llevando a cabo el proceso para identificar el contenido de este envío. Se incluye en las cantidades inventariadas para demostrar que existen posibles volúmenes adicionales para la destrucción.

15. La Secretaría pidió aclaraciones sobre la situación de las dos entidades privadas que desfabrican refrigerantes establecidas en el país, que no están operando a capacidad plena debido a la falta de material

de desecho disponible. Según la información recogida por el PNUD, los estudios indican que en el país hay una gran cantidad de equipos a base de CFC que han llegado al fin de su vida útil; no obstante, la ubicación de estas dos instalaciones y el alto costo relacionado con su operación parecen ser los motivos por los que no han resultado totalmente exitosas. Además, los operadores procesos de desfabricación mecanizados y automatizados también cobran por sus servicios, a diferencia de los operadores de procesos manuales (vinculados con los centros de recuperación y reciclaje) que pueden cubrir sus gastos de acopio de desechos de SAO por medio de la venta de otros materiales reciclables que se extraen de los equipos.

16. Con respecto a la selección de los dos incineradores que se certificarán por medio de la realización de quemas de prueba, se informó a la Secretaría de que el PNUD ha llevado a cabo un ejercicio amplio para identificar los requisitos técnicos y de desempeño ambiental que se aplican a la destrucción de desechos de SAO. En dicho ejercicio, había identificado inicialmente diez instalaciones que usan incineración a alta temperatura por medio de tecnología de inyección líquida o de horno giratorio, entre la que una usaba combustión de arco de plasma. Las instalaciones se examinaron más detalladamente y se redujeron a una lista de siete instalaciones que cumplían los criterios establecidos por el PNUD; estos incluían, entre otros, capacidad para adaptar las instalaciones para manejar gases licuados, proceso de seguimiento de desechos y certificación de destrucción y desempeño ambiental, especialmente en cuanto a la DE y la DRE, así como niveles de emisiones de PCDD/PCDF. Estas siete instalaciones han indicado su interés en participar en el proyecto. Entre estas, se seleccionarán dos sobre la base de un proceso de licitación pública, requerido tanto por el Gobierno del Brasil como por el PNUD. El PNUD también puso de relieve que no se está solicitando al Fondo Multilateral en el proyecto piloto ninguna inversión de capital para estas instalaciones. Las modificaciones técnicas serán realizada por cada una de las instalaciones a su propia costa, como parte de la cofinanciación.

17. En otras discusiones, la Secretaría propuso cambios en algunos de los componentes del proyecto, a fin de agrupar las actividades similares y racionalizar los gastos. También sugirió opciones para las máquinas de alta tasa de recuperación para acumular las reservas de desechos de SAO a fin de reducir su número y costo. La Secretaría también confirmó con el PNUD que uno de los resultados esperados del proyecto sería un informe que documentaría los pasos y resultados logrados con el protocolo de prueba, cómo se habían llevado a cabo las quemas de prueba, cómo se había realizado la validación y cómo se habían actualizado las instalaciones, así como los costos incurridos. Este informe luego se usaría para procedimientos de prueba similares en instalaciones de incineración similares no solo en el Brasil sino en otros países que operan al amparo del Artículo 5, y se convertiría en uno de los resultados esenciales del proyecto de demostración. El PNUD estuvo de acuerdo e indicó además que los resultados globales del proyecto y el análisis de amortización (es decir, futuro comercio de carbono asociado) proporcionarán un incentivo para que otras instalaciones del país puedan decidir si invierten en tal actividad. El PNUD aceptó los cambios indicados e hizo los ajustes necesarios en la propuesta.

18. El costo final del proyecto se acordó por la suma de 1 490 600 $EUA más gastos de apoyo al organismo, que se calcularon a un valor de 12,42 $EUA/kg, cifra inferior al umbral (13,2 $EUA/kg) establecido en la decisión 58/19. Se realizaron modificaciones en los resultados previstos y los costos a fin de incluir las sugerencias formuladas por la Secretaría como se resume en el Cuadro 3 a continuación:

Cuadro 3: Costos acordados del proyecto

Componente y actividades		Financiación del FML ($EUA)	Cofinan-ciación ($EUA)	TOTAL ($EUA)
Componente 1: Proyecto piloto de sistema de gestión	Supervisión de acopio de CFC y SAO a base de CFC	25 000	-	25 000
	Consolidación y caracterización de los CFC	95 000	55 000	150 000
	Almacenamiento provisional de CFC	150 000	67 000	217 000
	Transporte a la instalación de destrucción	20 000	10 000	30 000
	Estructura piloto de sistema de gestión integrada	182 600	68 000	250 600
	Documentación y presentación de informes	10 000	-	10 000
	Total parcial Componente 1	**482 600**	**200 000**	**682 600**
Componente 2: Quema de prueba/Demostración de destrucción	Diseño detallado de quema de prueba y selección de instalaciones	25 000	37 000	62 000
	Adaptación de las instalaciones para la infraestructura de incineración	35 000	20 000	55 000
	Establecimiento de procedimientos y alimentación de base	10 000	10 000	20 000
	Mezcla de entrada de prueba de base	55 000	25 000	80 000
	Alimentación para quema de prueba de demostración para CFC-11 (5 tm)	75 000	45 000	120 000
	Alimentación para quema de prueba de demostración para CFC-12 (5 tm)	75 000	45 000	120 000
	Destrucción de CFC 11 y 12 (110 tm)*	418 000	-	418 000
	Supervisión de quema de prueba	10 000	5 000	15 000
	Total parcial Componente 2	**703 000**	**187 000**	**890 000**
Componente 3: Asistencia técnica	Apoyo para actividades de facilitación técnica	50 000	35 000	85 000
	Apoyo para concienciación de los interesados y del público	50 000	25 000	75 000
	Total parcial Componente 3	**100 000**	**60 000**	**160 000**
Componente 4: Supervisión y evaluación	Experto internacional	80 000	-	80 000
	Consultor nacional	60 000	60 000	120 000
	Gastos de viajes/visitas en misión	45 000	45 000	90 000
	Oficina administrativa	-	15 000	15 000
	Gastos varios	20 000	8 000	28 000
	Total parcial Componente 4	**205 000**	**128 000**	**333 000**
	Total ($EUA)	**1 490 600**	**575 000**	**2 065 600**

RECOMENDACIÓN

19. El Comité Ejecutivo tal vez desee considerar:

a) Tomar nota con agradecimiento de la presentación del Gobierno del Brasil para un proyecto piloto para la gestión y destrucción de desechos de SAO para destruir un total de 120 toneladas métricas de desechos de SAO; y

b) Aprobar la ejecución de un proyecto piloto de demostración sobre la gestión y destrucción de desechos de SAO en el Brasil por una suma de 1 490 600 $EUA, más gastos de apoyo al organismo de 104 342 $EUA para el PNUD, en la inteligencia de que en el futuro no habría fondos adicionales disponibles para el Brasil para otros proyectos de destrucción de 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**	