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COMITÉ EJECUTIVO DEL FONDO MULTILATERAL
PARA LA APLICACIÓN DEL
PROTOCOLO DE MONTREAL
Cuadragésima Primera Reunión
Montreal, 17 al 19 de diciembre de 2003

PROPUESTA DE PROYECTO: REPÚBLICA POPULAR DEMOCRÁTICA DE COREA

Este documento contiene los comentarios y las recomendaciones de la Secretaría del Fondo en la propuesta de proyecto siguiente:

Solventes

- Plan para la eliminación definitiva de CTC (primera parte) ONUDI

HOJA DE EVALUACIÓN DE PROYECTO
R.P.D. DE COREA

SECTOR: CTC Uso de SAO en el sector (2002): 2.027,3 toneladas PAO

Umbrales de la relación de costo a eficacia del subsector: N/C

Título del proyecto

(a) Plan para la eliminación definitiva de CTC (primera parte)

Datos del proyecto	**Plan de eliminación**
Consumo de la empresa (toneladas PAO)	1.441,4
Impacto del proyecto (toneladas PAO)	700,0*
Duración del proyecto (meses)	48
Monto inicial solicitado ($EUA)	4.832.114
Costo final del proyecto ($EUA):	
Costo adicional de capital (a)	
Costo de imprevistos (b)	
Costo adicional de explotación (c)	
Costo total del proyecto (a+b+c)	5.684.840
Propiedad local (%)	100
Componente de exportación (%)	0
Monto solicitado ($EUA)	4.832.114
Relación de costo a eficacia ($EUA /kg.)	8,12**
¿Financiación de contraparte confirmada	
Organismo nacional de coordinación	Comité Nacional de Coordinación para el Medio Ambiente
Organismo de ejecución	ONUDI

Recomendaciones de la Secretaría	
Monto recomendado ($EUA)	
Impacto del proyecto (toneladas PAO)	
Relación de costo a eficacia ($EUA /kg)	
Costo de apoyo del organismo de ejecución ($EUA)	
Costo total al Fondo Multilateral ($EUA)	

* Las 700,0 toneladas PAO corresponden al consumo total financiable (impacto) del proyecto. Sin embargo, el impacto de la primera parte es de 526,6 toneladas PAO con una relación de costo a eficacia de $EUA 8,12/kg

** La relación de costo a eficacia de la primera parte es $EUA 9,18/kg

DESCRIPCIÓN DEL PROYECTO

Plan para la eliminación definitiva del consumo de CTC en la República Popular Democrática de Corea

1. La ONUDI presentó un plan de eliminación definitiva del consumo de CTC en la República Popular Democrática de Corea para ser considerado en la 41a. Reunión. Según la ONUDI el objetivo del plan terminal es facilitar la planificación, formulación y ejecución de los proyectos de inversión para sustituir el tetracloruro de carbono (CTC), en los sectores de limpieza con solventes, agentes de proceso y fumigación, por tecnologías alternativas, en su momento oportuno y con una buena relación de costo a eficacia.

Información sobre los antecedentes

2. La ONUDI presentó a la 40a Reunión un plan para la eliminación de CTC en el subsector de solventes de limpieza. El análisis de los datos de consumo de CTC hecho por la Secretaría demostró en ese momento que había discrepancias notables entre los datos del consumo de CTC proporcionados en el documento del proyecto y los datos verificados como parte de la auditoría de los datos de producción y consumo del país en relación con el acuerdo de cierre de producción de CFC y de CTC establecido con el Comité Ejecutivo. En vista de la dificultad de determinar el nivel del consumo de CTC admisible para financiamiento, la ONUDI retiró la solicitud de la 40a. Reunión para permitir que el gobierno abordara la cuestión más a fondo con el fin de facilitar la determinación del consumo de CTC admisible para financiamiento.

3. La R.P.D. de Corea informó los datos del consumo de CTC para 2001 y 2002 a la Secretaría del Ozono y a la Secretaría del Fondo, basados en la información de la actualización del programa del país, preparada por el PNUMA, que demostró el aumento de 100% aproximadamente con respecto a las cifras del año 2000. El consumo de CTC para los años 2000-2002 aparecen en la tabla siguiente.

Año	Consumo de CTC en toneladas PAO
2000	1.045,0
2001	2.077,9
2002	2.027,3
Base (promedio 1998-2000)	1.258,0

Plan sectorial de eliminación de CTC y consumo de CTC admisible para financiamiento

4. Dado la necesidad urgente de la R.P.D. de Corea de cumplir con sus obligaciones de 2005 para la reducción de CTC y las dificultades que encontradas en la determinación del consumo de CTC admisible para financiamiento, la Secretaría y la ONUDI en colaboración con el gobierno de la R.P.D. de Corea exploraron varias posibilidades para resolver las dificultades de los datos, de conformidad con las reglas del Fondo. En consecuencia, se acordó la propuesta siguiente para presentar a consideración del Comité Ejecutivo.

a) El consumo financiable remanente de CTC se calculará en función del consumo básico de CTC de la R.P.D. de Corea, de la cual se dedujo el consumo de todos los proyectos de CTC aprobados, pero no puestos en ejecución al año 2000. El consumo financiable remanente de CTC se calculó en 700 toneladas PAO;

b) La distribución del consumo financiable será como se indica a continuación:

- Limpieza con solventes: basado en el consumo real informado en los documentos del proyecto, presentados ya a la Secretaría del Fondo;
- Agentes de proceso y fumigación: basado en el consumo declarado en 2002 prorrateado sobre el consumo básico;

c) La relación de costo a eficacia para los proyectos en los tres sectores no debe exceder los niveles que aparecen más abajo. Los niveles de la relación de costo a eficacia se basaron en el promedio ponderado de la relación de costo a eficacia de proyectos similares aprobados para la R.P.D. de Corea, o en el caso de ningún proyecto aprobado para el país, el nivel de la relación de costo a eficacia se basó en el promedio ponderado de la relación de costo a eficacia de proyectos de una magnitud similar en el sector.

Limpieza con solventes:	$EUA 7,94/kg
Agente de proceso:	$EUA 6,07/kg
Fumigante:	$EUA 8,20/kg

d) Conforme al acuerdo de usar el consumo básico de CTC como la base para determinar el nivel de consumo financiable de CTC en la R.P.D. de Corea, se convino relacionar el nivel financiable del uso de CTC, todavía no clasificado como agentes de proceso, también con el consumo básico. Por lo tanto, tomando en consideración el consumo básico de CTC de 1.285,0 toneladas PAO, de las 229,9 toneladas PAO declaradas en uso actualmente (2002) en aplicaciones que todavía no se han clasificado como agentes de proceso, el consumo remanente potencialmente financiable no sobrepasará 146 toneladas PAO;

e) Si los usos actualmente no admisibles de agentes de proceso llegan a ser admisibles en el futuro para ser financiados bajo el Fondo Multilateral, la solicitud de la R.P.D. de Corea para el financiamiento de eliminación se debería calcular la misma manera que los costos de los proyectos presentados a la 41a. Reunión. Al respecto, la relación de costo a eficacia no debe exceder $EUA 6,07/kg.

5. Sobre la base de lo antedicho, la ONUDI preparó el plan de eliminación definitiva de CTC conforme a lo siguiente:

Subsector	**Consumo toneladas PAO**	**Costo a eficacia $EUA /kg**	**Donación calculada $EUA**
Limpieza con solventes	332	7,94	2.636.080
Agentes de proceso, excepto usos no aprobados	228	6,07	1.383.960
Fumigación	140	8,20	1.148.000
Subtotal	700	7,38	5.168.040
Gestión de políticas			516.800
Total	700	8,12	5.684.840

6. Puesto que para finales de 2004 con el plan se debería lograr la eliminación de más del 70% del consumo de CTC, se solicita alrededor del 85% del financiamiento acordado a la 41a. Reunión en diciembre de 2003. Por lo tanto, la ONUDI propone los siguientes objetivos de desempeño y el cronograma de desembolsos.

Objetivos de desempeño y programa de desembolsos

Año (al 1° de enero)	**Objetivo de eliminación de CTC (PAO en TM)**			**Consumo admisible remanente de CTC en el sector de solventes (PAO en MT)**	**Total $EUA**
	De los proyectos aprobados en curso	**Del plan de elimi-nación**	**Total**		
2003	0	0	0	1.365,8	4.832.114
2004	565,8	526,6	1.092,4	192,8	426.363
2005	0	92,8	92,8	92,8	213.182
2006	0	50	50	100	213.181
2007	0	50	50	50	0
TOTAL	**565,8**	**719,4**	**1.285,2**		**5.684.840**

7. Se adjunta al plan un proyecto de acuerdo al cual se le anexaron los objetivos de desempeño y los requisitos de financiamiento, así como los convenios institucionales para alcanzar los objetivos del plan de eliminación y el papel de la ONUDI en la ejecución de dicho plan.

Proyecto de acuerdo y programa de ejecución

8. El proyecto de acuerdo y el programa de ejecución de 2004 están siendo tratados con la ONUDI. Los proyectos definitivos se comunicarán al Subcomité de Examen de Proyectos.

COMENTARIOS Y RECOMENDACIONES DE LA SECRETARÍA

COMENTARIOS

9. Los resultados descritos en los párrafos precedentes se lograron después de extensas deliberaciones e influencia recíproca entre la Secretaría, la ONUDI y el gobierno de la R.P.D. de Corea y representan la posición convenida sobre la admisibilidad y los costos adicionales.

RECOMENDACIONES

10. Se invita al Comité Ejecutivo que:

a) Avale el enfoque adoptado por la Secretaría y la ONUDI para determinar el consumo admisible remanente de la R.P.D. de Corea, según lo descrito en el párrafo 4 anterior, y sobre esa base considere el plan de eliminación definitiva del consumo de CTC en dicho país;

b) Tome nota de que el gobierno de la R.P.D. de Corea asume el compromiso de no presentar ningún proyecto en el sector de consumo de CTC, a excepción de los usos de agentes de proceso actualmente no admisibles para financiamiento y que, en tal caso, la cantidad de CTC admisible para financiamiento bajo el Fondo Multilateral no sobrepasará 146 toneladas PAO y el nivel del financiamiento no excederá $EUA 6,07/kg.

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

PROJECT COVER SHEET

COUNTRY	D.P.R. of Korea	**IMPLEMENTING AGENCY**	UNIDO

PROJECT TITLE	Plan for Terminal Phase-out of CTC			
PROJECT IN CURRENT BUSINESS PLAN		Yes		
SECTOR		Solvent		
SUB-SECTORS		Cleaning, Process Agent, Fumigation		
ODS USE IN SECTOR	Baseline (Average of reported 1998-2000)		1,285.2	MT ODP
	Consumption in 2002		2,027.3	MT ODP
	From approved ongoing Cleaning projects		585.6	MT ODP
	From remaining Cleaning eligible projects		332	MT ODP
	From Process Agent eligible consumption		228	MT ODP
	From Process Agent ineligible consumption		316	MT ODP
	From Fumigation eligible consumption		140	MT ODP
	From Fumigation non-eligible consumption		195.5	MT ODP
	From as yet unapproved Process Agent uses		229.9	MT ODP
PROJECT IMPACT	Reflecting the net ODP value		700	MT ODP
	Including approved ongoing projects		1,285.6	MT ODP
PROJECT DURATION			4 years	
PROJECT COSTS				
	Incremental Capital Costs	US$	4,271,107	
	Contingencies	US$	427,111	
	Incremental Operating Costs	US$	469,822	
	Policy & Management Support	US$	516,800	
	Total Project Costs	US$	5,684,840	
LOCAL OWNERSHIP			100%	
EXPORT COMPONENT			0%	
REQUESTED GRANT		US$	**5,684,840**	
COST EFFECTIVENESS		US$/kg	8.12	
IMPLEMENTING AGENCY SUPPORT COSTS		US$	426,363	
TOTAL COST OF PROJECT TO MULTILATERAL FUND		US$	6,111,203	
STATUS OF COUNTERPART FUNDING			No required funding	
PROJECT MONITORING MILESTONES			Included	
NATIONAL COORDINATING BODY			NCCE, Ozone Cell	

Plan summary

UNIDO will submit a Terminal CTC Phase-Out Plan to the December 2003 Executive Committee meeting. This Plan will eliminate the remaining eligible CTC consumption of 700 ODP MT in the D.P.R. Korea by the end of 2007. The Phase-out Plan will cover the technology conversions in the remaining eligible enterprises and ensure timely, sustainable and cost-effective phase-out through a combination of investment, technical support and policy/management support components. The total eligible incremental costs and the requested grant for the Terminal Phase-out Plan of CTC in the D.P.R. Korea amount to US$ 5,684,840. Should the as yet unapproved Process Agent applications be approved by the Technical and Economic Advisory Panel, an additional pro-rated 145.7 ODP MT CTC will become eligible for funding.

Impact of the project on the country's Montreal protocol obligations:

The approval of this project will help D.P.R. Korea meet its Montreal Protocol obligations, such as the phased reductions in CTC consumption according to the agreed schedules.

PREPARED BY	UNIDO	**DATE**	Nov. 2003
REVIEWED BY	Clinton Norris	**DATE**	Nov. 2003

PROJECT OF GOVERNMENT OF THE DEMOCDATIC PEOPLE'S REPUBLIC OF KOREA (D.P.R. Korea)

Plan for Terminal CTC phase-out in the D.P.R. Korea

1. PROJECT OBJECTIVES

UNIDO will submit a Terminal Phase-Out Plan to the December 2003 Executive Committee meeting.

The objectives of this project are:

(a) To achieve complete phase-out of carbon tetrachloride (CTC) in the D.P.R. Korea by 31 December 2007.
(b) To enable D.P.R. Korea to meet its obligations of CTC reduction and elimination in accordance with the control schedule of the Montreal Protocol.
(c) To ensure timely, sustainable and cost-effective CTC phase-out through appropriate investment, technical support and management support.

2. INSTITUTIONAL FRAMEWORK

The Democratic People's Republic of Korea ratified by accession the Vienna Convention and the Montreal Protocol on 24 January 1995. At the request of the Government of The Democratic People's Republic of Korea, the Ozone Cell of the National Coordinating Committee for the Environment (NCCE) submitted in December 1996 the Country Programme, a prerequisite activity for assistance from the Multilateral Fund for the Implementation of the Montreal Protocol (Multilateral Fund). The Secretariat of the Fund has certified that the D.P.R. Korea Country Programme conforms to the format of the approved guidelines. This 1996 Country Programme (CP) has been revised by the 2000 CP Amendment and now by an Update of March 2003. The data in this Update reflect the 2002 production and consumption data.

In 1974 National Coordinating Committee for Environment (NCCE) was set up and chaired by the vice-minister of the Ministry of Foreign Affairs. NCCE is composed of representatives from various ministries including Ministry of the Land and Environment Protection, Ministry of Chemical Industry, the State Planning Committee, Academy of Sciences and so on. NCCE is a leading body coordinating and consulting ozone issues. All the environment issues and draft policies including ozone issues are discussed and reviewed in NCCE and then NCCE makes recommendation to the Cabinet regarding environment issues. National Ozone Unit (NOU) was set up under NCCE in 1997, responsible for implementation of the country program. Currently NOU has 7 staff involved in the daily administration and management on MP implementation, data collection, regulatory actions, coordination, monitoring, and recommendations on the policy issues.

Ministry of Chemical Industry is responsible for management on production and consumption of ODS and monitor the production of ODS. State Planning Committee formulates the plan of ODS production. Ministry of Metal and Machinery Industry and Ministry of Electronics Industry are responsible for management on consumption of CTC, MCF and CFC-113 in metal and electronic parts cleaning. General Bureau of External Service is in charge of repairing refrigerant equipment. Ministry of Land and Environment Protection is in charge of environment legislation and control, research on substitutes to ODS and environment standards. All sales of ODS and goods containing ODS domestically

produced or imported are classified through the sales organisation of the Ministry of Chemical Industry who collects data on production and sales and then reports to the State Planning Commission and the Central Bureau of Statistics. All imports of ODS or goods containing ODS are monitored and recorded by the General Bureau of Customs. These are available to the NOU.

Relevant Regulations

D.P.R. Korea has a centralized and planned economic system. The production of ODS and products using ODS are approved in compliance with the plan and administrative requirements from the State Planning Committee. Therefore implementation of ODS phase-out measures, including reduction in the production, would be achieved within the existing framework.

D.P.R. Korea will implement licensing system with quota on ODS production, import and consumption. Several ministries are involved in the licensing process, such as NCCE, State Planning Committee, Ministry of Chemical Industry, Ministry of Foreign Trade, Ministry of Commerce and Ministry of Land and Environment Protection.

Table 1 lists the Regulations concerning ODS that have been issued to date in D.P.R. Korea.

Table 1: Regulations issued in D.P.R. Korea

No.	Regulation	Brief description	Promulgating Agency	Came into force
1	Regulation "Ban of import of cars with CFC-12 air conditioner	" All the institutions, which plan to import cars, should have permission from Ministry of Land Environment Protection, Ministry of Machine Industry and Ministry of Foreign Trade	Jointly promulgated by Ministry of Land Environment Protection, Ministry of Machine Industry and Ministry of Foreign Trade	January 2000
2	Regulation " Ban of import of refrigeration equipment using CFC-12"	Institutions or person, who plan to import any refrigeration equipment, should submit specification of the equipment and have permission identifying non-ODS using refrigeration.	Jointly promulgated by Ministry of Land Environment Protection, Ministry of Machine Industry and Ministry of Foreign Trade	1999
3	Ban of construction of new factories manufacturing CFC-11 and CFC-12 based equipment	All factories, in construction and planned to be constructed, should not have installations manufacturing CFC-11 and CFC-12 based equipment.	Jointly promulgated by Ministry of Land Environment Protection, Ministry of Machine Industry and State Planning Committee	1999

Table 2 lists the Regulations that will be issued in D.P.R. Korea.

Table 2: Regulations to be issued in D.P.R. Korea

No.	Regulation	Brief Description	Promulgating Agency	Planned date
1	Ban the installation of freon-based air-conditioners on all newly manufactured vehicles.	Conversion from freon to substitute refrigerant in air-conditioners to be completed before 01/01/2004. Use only substitute refrigerant as of 1/1/2005. Installation of freon-based air-conditioner on any newly manufactured vehicles will be banned	Jointly promulgated by Ministry of Land Environment Protection and Ministry of Machine Industry.	First half of 2003, effective on 1/1/2005.
2	Ban the import of industrial refrigerating equipment using ODS	Import of industrial refrigerating equipment using ODS to be banned as of 01/07/2004	Jointly promulgated by Ministry of Land Environment Protection and Ministry of Foreign Trade.	First half of 2003, effective on 01/07/2004.
3	Ban the manufacture of refrigeration equipment using ODS (domestic & public service refrigerator)	Use of ODS as refrigerant to be banned in newly manufactured domestic and public service refrigerators.	Jointly promulgated by Ministry of Land Environment Protection, Ministry of Machine Industry and Ministry of Electronic Industry	First half of 2004, effective on 01/01/2005
4	Ban the manufacture of industrial refrigerating equipment using ODS	Substitute refrigerants to be used in newly manufactured industrial refrigerating equipment as of 1/1/2004	Jointly promulgated by Ministry of Land Environment Protection and Ministry of Machine Industry	First half of 2003, effective on 01/01/2004
5	Ban import of CFC-11/12/113, MCF, CTC, Halons and MBr; Ban export of CFC-11/12/CTC	Bans on import and export of ODS	Jointly promulgated by Ministry of Land and Environment Protection and Ministry of Foreign Trade	2007

3 Background of the Solvent Sector

The 1996 Country Programme (CP) and the 2000 CP Amendment reported the use of three solvents in the Solvent Sector, namely carbon tetrachloride (CTC), methyl chloroform (MCF) and CFC-113. Only the Cleaning Solvent Sub-Sector was covered.

The Update of 2003 now includes the Process Agent and Fumigation Sub-Sectors. Methyl chloroform (MCF) and CFC-113 are no longer used in the Solvent Sector.

3.1 Production Phase-Out

The Multilateral Fund (MLF) had a Techno-economic Audit of Production of Ozone Depleting Substances (ODS) in the Democratic People's Republic of Korea (D.P.R. Korea) conducted in 2001. The Final Report was issued on 8 November 2001.

D.P.R. Korea and the Executive Committee of Multilateral Fund (ExCom) agreed at the 36th Meeting of Executive Committee on the terms of timing and compensation for the complete closure of all ODS production facilities.

D.P.R. Korea shut down both the Methyl Chloroform (MCF) and CFC-113 production in May 2001 and dismantled them. The CFC-11/CFC-12 facilities will be closed in 2003 and the CTC facility will be closed in 2005. These are the only ODS production plants in the D.P.R. Korea and they are located in the February 8th Vinalon Complex.

The schedule of closures and disbursement is listed in Exhibit 1:

Exhibit 1

Facility	Closure	Verification	Disbursement, US$
CFC-113	May 2001	August 2001 (Wakim), July 2002 (UNIDO)	687,700
Methyl chloroform	May 2001	August 2001 (Wakim), July 2002 (UNIDO)	656,650
CFC-11/12	2003	2003	733,700
CTC	2005	2005	488,750
Total			**2,566,800**

3.2 Consumption of CTC in the Solvent Sector

Carbon tetrachloride (CTC) is the only ODS solvent still in use in the Solvent Sector. Consumption of CTC reported by D.P.R. Korea to UNEP for the years 1998 to 2002 is given in Exhibit 2:

Exhibit 2

Year	1998	1999	2000	2001	2002
ODP MT	1,424.5	1,386.0	1,045.0	2,077.9	2,027.3

3.2.1 Baseline

The baseline for CTC consumption is set by the average of the reported data for the years 1998 to 2000, as published in UNEP/Ozl.Pro/ExCom/38/58. The baseline is 1,285.2 ODP MT CTC and this is the maximum quantity that can be funded under the rules of the Multilateral Fund.

3.2.2 Determination of quantities of CTC eligible for funding

The jump in consumption that can be seen in Exhibit 2 between 2000 and 2001 is not due to a real increase in consumption. It arises from the fact that 2001 was the first year in which D.P.R. Korea started to include Process Agent quantities in the reported consumption, as noted in the 2003 CPU. A current consumption of 2,027.3 ODP MT versus a fundable baseline of 1,285.2 ODP MT represents a considerable challenge in the process of a complete phase-out of CTC in the D.P.R. Korea.

Extensive discussions between the Government of D.P.R. Korea, UNIDO and the Secretariat of the Multilateral Fund came to the conclusion that the way forward lay in applying agreed cost-effectiveness factors to the quantities in each of the three sub-sectors that were deemed to be eligible. The results are expressed in Exhibit 3a.

Exhibit 3a

Sub-sector	Cost-Effectiveness, US $/kg	Submitted Consumption (ODP Tonnes)	Eligible Consumption (ODP Tonnes)	Calculated Grant (US $)
Solvent cleaning	7.94	917.4	332	2,636,080
Process agent, excluding unapproved uses	6.07	544	228	1,383,960
Fumigation	8.2	335.5	140	1,148,000
Total		1,796.9	700	**5,168,040**

The breakdown of Investment Cost (Grant) is taken for the purpose of the Plan as 90% Increased Capital Cost (ICC) and 10% Increased Operating Cost (IOC).

When 565.8 ODP MT are added to the eligible unfunded 700 ODP MT, a total of 1,265.8 ODP MT is reached. In addition 19.8 ODP MT were eliminated in 2001 when the Ceramic Tools Factory project was completed. The total is then 1,285.6 ODP MT, i.e. the fundable baseline quantity.

The Process Agent uses of CTC in the manufacture of Ciprofloxacin, Norfloxacin, Dichloroisocyanurate and Vitamin C are not yet listed as approved by the Technical and Economic Advisory Panel (TEAP) of UNEP.

If and when these processes are approved by TEAP, applications to the Executive Committee for funding will be made on a pro-rated basis. The CTC consumption in 2002 due to the unapproved process agent uses will be adjusted by the ratio of the baseline CTC consumption to the CTC consumption in 2002, as shown in Exhibit 3b. In this event, the resulting quantity, up to 145.7 ODP MT, will be eligible for funding at the C/E appropriate to Process Agent applications.

Exhibit 3b

Baseline CTC consumption	1,285.2
CTC consumption in 2002	2,027.3
CTC consumption in 2002 due to the unapproved process agent uses	229.9
Remaining consumption for unapproved process agent uses corrected to the baseline consumption	145.7

3.2.3 Non-funded quantities

The difference between the quantity of CTC eligible for funding (700 ODP MT plus 565.8 ODP MT already approved) and the current (2002) CTC consumption of 2,027.3 presents a challenge to find ways and means to eliminate the difference of some 762 ODP MT of CTC.

This will be accomplished by such measures as:

- Further rationalisation of the cleaning operations in the four enterprises of the Cleaning Solvent Sub-Sector, by merging cleaning lines of Workshops where possible.
- Workshops will be merged where possible; the local costs to be borne by the enterprises.
- Enterprises will assume responsibility for other expenses involving local currency.
- The Process Agent projects include three new production units for paints; these will be merged to give two or even one new unit.
- The Fumigation projects will need to be rationalised, for example by reducing the financing of new pesticide plants.
- Projects will be carefully scrutinised for equipment designated for destruction that could be salvaged and renovated for re-use in the same or in another project.

The Management Committee (**5.3.1** below) will address these points as a priority.

3.2.4 Fumigation Sub-Sector

The fumigation project will completely phase out the use of carbon tetrachloride (CTC), 305 ODS MT (335.5 ODP MT) at 2002 levels, in soil and grain storage fumigation.

Grafting technology, Cadusafos and Hymexazol, combined with soil solarization and biofumigation, has been selected as CTC alternative in protected horticulture sector and seedbeds (Seedling production).

Chloropyriphos Methyl (contact insecticide) has been selected as the most suitable alternatives for grain storage fumigation in the D.P.R. of Korea.

The Fumigation Phase-Out Plan (Attachment III) foresees a two year program for the phase-out of the current (2002) consumption of 335.3 ODP MT, taking into account the upgrading of the chemical plant for Carbosulfan, Hymexazol and Chlorpyriphos methyl production, installation of grafting equipment and the implementation of the training program.

The reduction would be 323 ODP MT in 2004 and the remaining 12.5 ODP MT in 2005.

3.2.5 Cleaning Solvent Sub-Sector; progress to date

The consumption of CTC in the Cleaning Solvent Sub-Sector reported by the 2000 CP Amendment is detailed in Exhibit 4.

Exhibit 4 Consumption of CTC by enterprise in 1996-1999 (MT)

Enterprise/Year	1996	1997	1998	1999
Unsan Tools Factory	218	250	256	153
Pyongyang September 18 Bearing Factory	94	116	110	122
Ceramics Tools Factory	16	21	19	17
Sungri Truck Factory	224	165	210	176
Huichon Parts for Trucks	68	56	84	95
Illuminating Fixtures Factory	48	30	25	46
Gumsong Tractor Factory	100	116	62	128
Others (small users)	27	61	16	83

Nine Projects to eliminate CTC in the Cleaning Solvent Sub-Sector have been approved, of which four have been completed and five are being implemented. These are listed in Exhibit 5.

Exhibit 5 CTC Projects approved

Beneficiary	ODP MT	Approved	Completed
Unsan Tools Factory, Phase 1		11/1997	06/1999
Unsan Tools Factory, Phase 2		11/1998	06/2000
September 8 Bearings Factory		11/1998	06/2000
Ceramic Tools Factory	19.8	07/1999	12/2001
Gumsong Tractor Factory	198	03/2002	
Huichon Parts for Trucks Factory	209	07/2002	
Taedong-gang TV Factory	59.8	11/2002	
October 5 Automation Instrument Complex	69.3	11/2002	
Illuminating Light Fixtures Factory	29.7	11/2002	
Total ODP MT CTC, 2001-2003	**585.6**		

3.2.6 Remaining CTC Users in Cleaning and Process Agent Sub-Sectors

The remaining users of CTC in the Solvent Sector (Cleaning and Process Agent Sub-Sectors) are listed in Exhibit 6, which includes those that have been identified recently. After the intensive market research by NCCE, Ozone Cell and UNIDO, it is most unlikely that further users remain to be identified.

Exhibit 6 CTC Users in Cleaning and Process Agent Sub-Sectors

Enterprise	2002 MT CTC	2002 ODP MT	SUB-SECTOR	COMMENTS
Sungri 58 Factory (Trucks)	197	216.7	Cleaning Solvent	Surface cleaning
Moranbong Instruments Factory	52	57.2	Cleaning Solvent	Surface cleaning
Integrated Circuit Factory	19	20.9	Cleaning Solvent	Surface cleaning
Seanal Electrical Factory	34	37.4	Cleaning Solvent	Surface cleaning
Heungnam Pharmaceutical Factory	75	82.5	Process Solvent	Ciprofloxacin, Norfloxacin
Heungnam Pharmaceutical Factory	62	68.2	Process Solvent	Dichloroisocyanurate
Lanam Pharmaceutical Factory	72	79.2	Process Solvent	Vitamin C
2.8 Vinalon Factory Complex	157	172.7	Process Solvent	Chlorinated and chloro-sulphonated polyethylenes
Sinuiju Chemical Fibre Complex	99	108.9	Process Solvent	Chlorinated rubber
Wonsan Chemical Company	145	159.5	Process Solvent	Asbestos products
Hungnam Fertiliser Complex	94	103.4	Process Solvent	Anticorrosion paints
Total	**1,006**	**1,107**		

Status: 12 March 2003

The Process Agent uses of CTC in the manufacture of Ciprofloxacin, Norfloxacin, Dichloroisocyanurate and Vitamin C are not yet listed as recognised applications by the Technical and Economic Advisory Panel (TEAP) of UNEP. Applications to the Executive Committee for funding will follow their official listing.

4. PHASE-OUT STRATEGY

The Government of the Democratic Peoples' Republic of Korea has set the goal to achieve the phase-out of 85% of CTC by 1 January 2005. This target will be achieved by investment, non-investment, technical assistance and capacity building activities.

As a major contribution to this goal, UNIDO will implement the Terminal CTC Phase-out Plan, to be submitted to the 41st meeting of the Executive Committee. The purpose is to speed the implementation process and ensure that D.P.R. Korea meets its commitment to eliminate 85% of CTC use by the end of 2004.

5. IMPLEMENTATION

5.1 Management and Execution

The overall management of the Plan will be carried out by UNIDO with the assistance of Government of the Democratic Peoples' Republic of Korea.

NCCE, Ozone Cell, will be responsible for monitoring the implementation of the Terminal CTC Phase-out Plan. The Ozone Cell will be responsible for tracking the promulgation and enforcement of policy and legislation and will assist UNIDO with the preparation of the implementation plan and progress report to the Executive Committee of Multilateral Fund.

5.2 Performance and Disbursement Schedule

Exhibit 7 gives an overview of the annual phase-out targets for the Terminal CTC Phase-out Management Plan. The first tranche of US$ 4,832,114 should be available by the end of 2003 to start project activities in 2004.

Exhibit 7

Year (as of 1 Jan.)	CTC phase-out target (ODP MT)			Remaining eligible CTC consumption in Solvent Sector (ODP MT)	Total US$
	From approved ongoing projects	From Phase-out Plan	Total		
2003	0	0	0	1,365.8	4,832,114
2004	565.8	526.6	1,092.4	192.8	426,363
2005	0	92.8	92.8	92.8	213,182
2006	0	50	50	100	213,181
2007	0	50	50	50	0
TOTAL	**565.8**	**719.4**	**1,285.2**		**5,684,840**

5.3 Funding Arrangements

5.3.1 Work Plan for 2004

5.3.1.1 Establishment of mechanism

Upon approval by Multilateral Fund of the Terminal CTC Phase-out Plan, the Government of the Democratic Peoples' Republic of Korea, through UNIDO, requests the Executive Committee to authorise disbursement of the first tranche in 2003. The implementation plan for 2004 is:

a) Establishment of operational mechanism for management and monitoring of the Phase-out Plan. This could take the form of a Management Committee and a Monitoring Committee.
b) Formulation of detailed terms of reference and work plans for various activities under the Technical Support and Policy & Management Support components
c) Establishment of an operational mechanism for participation in the Phase-out Plan and for obtaining phase-out commitments from enterprises
d) One workshop under the Technical Support component for technology assistance to participant enterprises in the sector.
e) One workshop under the Policy & Management Support component for public awareness and information dissemination in the Cleaning Solvent and Process Agent Sub-Sectors.
f) Two workshops under the Policy & Management Support component for public awareness and information dissemination in the Fumigation Sub-Sector. This Sub-Sector covers the whole country and addresses a different audience, so two workshops are required for a comprehensive coverage.

Since the average duration for completion of a sub-project is expected to be about 12 months, the phase-out activities initiated at the beginning of 2004 will not be produce results until the end of 2004, contributing to the reduction of consumption starting 2005. Therefore, the Government of the Democratic Peoples' Republic of Korea through UNIDO, will request the disbursement of the 2004 funding not later than the last Meeting of the Executive Committee in 2003.

As noted in **3.2.3** above, the difference between the quantity of CTC eligible for funding and the current (2002) CTC consumption presents a challenge to find ways and means to eliminate the difference of some 762 ODP MT of CTC.

This will be accomplished by such measures as:

- Further rationalisation of the cleaning operations in the four enterprises of the Cleaning Solvent Sub-Sector, by merging cleaning lines of Workshops where possible.
- Workshops will be merged where possible; the local costs to be borne by the enterprises.
- Enterprises will assume responsibility for other expenses involving local currency.
- The Process Agent projects include three new production units for paints; these will be merged to give two or even one new unit.
- Projects will be carefully scrutinised for equipment designated for destruction that could be salvaged and renovated for re-use in the same or in another project.
- For the Fumigation project, all equipment and materials locally available will be (tentatively) provided by the enterprises, unless the supply proposed does not meet the specifications requested.

The Management Committee will need to address these points as a priority.

5.3.1.2 Actions for 2004

Specific actions needed at the beginning of 2004 are:

- Initiate bid procedures and procurement of equipment for the four Cleaning projects.
- Initiate bid procedures and procurement of equipment for the approved Process Agent projects.
- Initiate bid procedures and procurement of equipment for the Fumigation projects.
- Establish health and safety training projects for operators of the new open-top cleaners.
- Organize a survey of small enterprises (provincial factories) re-using discarded CTC for cleaning purposes.

5.4 Investment Component

The investment component of the plan will focus on enabling the participant enterprises to physically eliminate CTC from their production activities and consists of the following elements:

- Assessment of the technical requirements of conversion
- Determining the scope of international and local procurement
- Development of technical specifications and terms of reference for procurement
- Pre-qualification and short-listing of vendors
- International/local competitive bidding
- Procurement contracts
- Site preparation
- Customs clearance and delivery
- Installation and start-up
- Product and process trials
- Operator training
- Commissioning and phase-in of CTC-free production
- Destruction of baseline equipment

This approach draws on previous implementation experience and has been designed based on the size, level of organization, location and customer base of enterprises concerned and also

based on ease and convenience for execution and management. Given the medium to large size of the remaining enterprises in the sub-sector, the need for adequate investments for plant and process changes, supported by investments on adequate technical assistance, trials and training, is critical and will involve significant inputs. It is foreseen that the duration for the project would be set in such a way as to ensure that the verifiable performance targets would be quantifiable and achievable. CTC phase-out in ineligible enterprises will not be funded under the umbrella plan and is expected to take place through Government policy and regulatory actions. Any unaccounted or unidentified eligible enterprises will be identified and accommodated within the resources approved for this phase-out plan.

5.4.1 Plant and process investments

UNIDO will ensure the installation of modern technologies that are best adapted to the needs of the enterprises. Equipment will continue to be specified for solvent cleaning so as to ensure protection of workers, together with measures to recycle solvent where economically practical.

Aqueous cleaning techniques will continue to be preferred and applied where they are best suited, with provision for protection of the environment from discharges of untreated wastes.

5.4.2 Product and Process Trials

Trials will be required to validate the new equipment as well as the production process using the new technology, specifically to establish their performance and suitability for the conversion in accordance with specifications and project objectives. Trials will also be needed to evaluate and establish satisfactory end product properties. Trial costs will cover the cost of chemicals, raw materials, components, consumables and utilities required during site preparation and commissioning. These costs are normally provided by the enterprise and some may be included in the supplier budget.

5.5 Technical Support Component

Since the Terminal CTC Phase-out Plan will address the entire Sub-Sector, the industry as a whole will need to be supported through provision of a technical support component for ensuring that their phase-out actions and initiatives are not only technically sound but also sustainable. They should be consistent with the important priorities of the Government, which are to prevent industrial dislocation and obsolescence.

5.5.1 Technical Support Component Actions

The Technical Support Component will:

(a) Establish quality and performance standards for the CTC-free products and applications within the sector.
(b) Interact with the user industry to provide technology assistance for sustainability of CTC-free applications, through technical workshops and meetings.
(c) Establish a training, certification and licensing program for production operators and technicians, to sustain the CTC-free technologies.
(d) Conduct one workshop to ensure a high level of professional technical assistance in the fields of health and safety and for protection of the environment.

(e) Conduct one workshop for technology assistance to participant enterprises in the sector
(f) Conduct one training workshop for small enterprises re-using spent CTC solvent
(g) Conduct three training workshops in 2004 and one in 2005 for the Fumigation Sub-Sector. This Sub-Sector covers the whole country and addresses a different audience, so four workshops are required for a comprehensive coverage.

The workshop to ensure a high level of assistance in the fields of health and safety and for protection of the environment is necessary because closed equipment for chlorinated solvent cleaning has so far been supplied to D.P.R. Korea factories. The projects in this phase-out plan include open-top cleaners for use with perchloroethylene. While they are of modern design, considerably more attention is needed in their operation than is the case with closed equipment, in order to ensure optimum protection for health and safety and for the environment.

5.6 Policy & Management Support Component

The implementation of the Terminal CTC Phase-out Plan will need to be closely aligned and co-ordinated with the various policy, regulatory, fiscal, awareness and capacity-building actions the Government of the Democratic Peoples' Republic of Korea is taking to ensure that the implementation of the Phase-out Plan is consistent with the Government priorities. Further, in view of the performance-based targets needed to be achieved under the terms of the Phase-out Plan, the implementation of the Plan will need to be closely and efficiently managed and will introduce additional co-ordinating, reporting and monitoring activities.

The Terminal CTC Phase-out Plan will be managed by a dedicated Management Committee, consisting of a co-ordinator to be designated by the Government and supported by representatives and experts from the implementing/executing agency and the necessary support infrastructure. The Management Support component of the Phase-out Plan will include the following activities for the duration of the Plan:

(a) Management and co-ordination of the Plan implementation with the various Government policy actions pertaining to the Solvent Sector
(b) Establishment of a policy development and enforcement program, covering various legislative, regulatory, incentive, disincentive and punitive actions to enable the Government to acquire and exercise the required mandates in order to ensure compliance by the industry with the phase-out obligations
(c) Development and implementation of training, awareness and capacity-building activities for key government departments, legislators, decision-makers and other institutional stakeholders, to ensure a high-level commitment to the Plan objectives and obligations
(d) Awareness creation of the Phase-out Plan and the Government initiatives in the Sector among consumers and public, through workshops, media publicity and other information dissemination measures
(e) Development of a programme and procedures to address the impact of CTC phase-out on the large number of small scale enterprises (SSE) in D.P.R. Korea re-using spent CTC, in view of the hardship that CTC elimination will cause them
(f) Preparation of implementation plan including determining the sequence of enterprise participation in planned sub-projects

(g) Verification and certification of CTC phase-out in completed projects within the Plan through plant visits and performance auditing
(h) Establishment and operation of a reporting system for use of CTC substitutes by enterprises
(i) Establishment and operation of a decentralised mechanism for monitoring and evaluation of Plan outputs, in association with provincial regulatory environmental bodies to ensure sustainability.

It may be desirable to establish a separate Monitoring Committee.

6. SELECTION OF TECHNOLOGIES

The selection of approved alternative technologies for conversion is governed by the following:

(a) Proven and reasonably mature technology
(b) Cost-effective conversion
(c) Availability of the systems at favourable pricing
(d) Critical properties that have to obtained in the end product
(e) Compliance with established (local and international) standards on safety and environment.

The technology selected would also need to be easily adaptable at the recipient enterprises, which would be participating in this project. The selection of the technology would also need to be consistent with the priorities of the Government and industry and to ensure sustainability of the technology in the long-term.

Details are to be found in the three original Phase-Out Plans, Attachments I-III.

1: INCREMENTAL CAPITAL COSTS

A. Investment Component

The breakdown of Investment Component (**Exhibit 3a**) is taken for the purpose of the Plan as 90% Increased Capital Cost (ICC) and 10% Increased Operating Cost (IOC).

The following table summarises the basis and considerations for calculating the incremental capital costs, for the remaining unfunded eligible enterprises in the Terminal Phase-out Plan:

Sub-sector	Incremental Capital Costs (US$)		Total (US$)
	Equipment	Contingencies, (US$)	
Cleaning solvent	2,178,578	217,858	2,396,436
Process Agent	1,143,769	114,377	1,258,146
Fumigation	948,760	94,876	1,043,636
Total	4,271,107	427,111	**4,698,218**

B. Policy & Management Support Component; Cleaning Solvent and Process Agent Sub-Sectors

Activity	Cost (US$)
*Management, coordination and monitoring, communications and transportation (detailed breakdown below)	102,000
Verification and certification, 50 days each in 2004 and 2005, 5 days each in 2006 and 2007 @ US$ 200/day	22,000
*One Workshop in 2004 for training and capacity-building activities for government/industry stakeholders and decision makers, Cleaning Solvents and Process Agents	30,000
*Two Workshops in 2004 for training and capacity-building activities for government./industry stakeholders and decision makers; Fumigation	60,000
Survey to identify small factories re-using spent CTC solvent	15,818
Contingency @ 10%	22,982
Total	**252,800**

* Management, coordination and monitoring is by NCCE, Ozone Cell of D.P.R. Korea and requires:

Personnel, estimated 400 days in 2004, 100 days in 2005 and 50 days each in 2006-7, at US $60/day; total US $36,000
Communications, estimated US $2,000 in 2004 and US $1,000 per year in 2005-7; total US $7,000
Transport, estimated US $6,000 in 2004 and US $2,000 per year in 2005-7; total US $12,000
Miscellaneous expenses estimated at US$ 22,000 in 2004, US$ 15,000 in 2005 and US $5,000 in 2006 and in 2007 (local experts, advertisement, leaflets preparation, room renting, etc.); total US $ 47,000
Sub-total: US $ 36,000 + 7,000 + 12,000 + 47,000 = US $ 102,000.

*Each Workshop requires the participation of one UNIDO staff member with associated costs, for transport and one week subsistence, of US$ 5,000, and one consultant, with associated costs for compensation, transport and one week subsistence, of US $10,000. Miscellaneous expenses totalling US $ 15,000 for conduction of Workshop (accommodation of local participants in a hotel, one dinner, secretary services, printing of reports, room renting, etc) are also required. Total US $ 30,000 per workshop.

The Phase-out Plan will be managed by a dedicated management team, comprising of a coordinator from the Ozone Cell, to be designated by the Government and supported by representatives and experts from the implementing/executing Ministries and the necessary support infrastructure. The Policy & Management Support component of the Phase-out Plan will include the following activities, for the duration of the Plan:

1. Management and coordination of the Plan implementation with the various Government policy actions pertaining to the Sub-Sector
2. Establishment of a policy development and enforcement program, covering various legislative, regulatory, incentive, disincentive and punitive actions to enable the Government to acquire and exercise the required mandates in order to ensure compliance by the industry with the phase-out obligations.
3. Development and implementation of training, awareness and capacity-building activities for key government departments, legislators, decision-makers and other institutional stakeholders, to ensure a high-level commitment to the Plan objectives and obligations.
4. Preparation of the implementation plan including determining the sequence of enterprise participation in the planned projects.
5. Verification and certification of CTC phase-out in completed projects within the Plan through plant visits and performance auditing.
6. Establishment and operation of a reporting system of use of substitutes by enterprises.

These require the investment of significant resources by NCCE and the responsible Ministries, which are covered in the table above.

C. Technical component

Activity	Cost (US$)
*Health, safety and environmental protection training technical workshop, with international expert	30,000
*Training workshop for small enterprises re-using spent CTC solvent	30,000
One workshop for technology assistance to participant enterprises	30,000
One training workshop for small enterprises re-using spent CTC solvent	30,000
Three technical training workshops in 2004 and one in 2005 for the Fumigation area	120,000
10% contingency	24,000
Total	**264,000**

* Each Workshop requires the participation of one UNIDO staff member with associated costs, for transport and one week subsistence, of US$ 5,000, and one consultant, with associated costs for compensation, transport and one week subsistence, of US$ 10,000. Miscellaneous expenses totalling US$ 15,000 for conduction of Workshop (accommodation of local participants in a hotel, one dinner, secretary services, printing of reports, room renting, etc) are also required. Total US$ 30,000 per workshop.

D. SUMMARY

Activity	Cost (US$)
Investment Component	4,698,218
Policy & Management Support Component	252,800
Technical Support Component	264,000
TOTAL	**5,215,018**

2: COST EFFECTIVENESS

A. ODP Impact of the Project

SUBSTANCE	ODP	CONSUMPTION (ODS KG)	NET ODP KG
CTC	1.10	636,364	700,000
Remaining ODP Consumption in the Sub-Sector			**0**

B. Cost-effectiveness Calculation

PARAMETER/COST HEAD	UNIT	TOTAL
Total Project Costs		
A. Incremental Capital Costs	US$	4,271,107
B. Contingencies (10% of A)	US$	427,111
C. Policy & Management and Technical Support Components	US$	516,800
D. Incremental Operating Costs	US$	469,822
E. Total Project Costs (A + B + C + D)	US$	5,684,840
Adjustments to Project Costs		
F. Adjustment for non-Article-5 ownership	US$	0
G. Adjustment for export to non-Article-5	US$	0
Net Project Costs		
H. Net Project Costs (E – [F + G])	US$	5,684,840
ODS Phase-out		
I. Total ODS phase-out	kg	636,364
J. Net ODP phase-out	ODP kg	700,000
Cost-effectiveness		
K. Cost-effectiveness (H/J)	US$/kg/y	8.12
Eligible Multilateral Fund Funding	**US$**	**5,684,840**

3: ENVIRONMENTAL ASSESSMENT

Details are to be found in the three original Phase-Out Plans, Attachments I-III.

4: PROJECT DOCUMENTS

Details are to be found in the three original Phase-Out Plans, Attachments I-III.