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COMITÉ EJECUTIVO DEL FONDO MULTILATERAL
PARA LA APLICACIÓN DEL
PROTOCOLO DE MONTREAL
Cuadragésima Segunda Reunión
Montreal, 29 de marzo al 2 de abril de 2004

PROPUESTA DE PROYECTO: INDONESIA

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

<u>Espumas</u>

- Eliminación del CFC residual en el sector de espumas — Banco Mundial

HOJA DE EVALUACIÓN DE PROYECTO
INDONESIA

SECTOR: Espuma — Uso de SAO en el sector (2002): 1 270,8 toneladas PAO

Umbrales de la relación de costo a eficacia del subsector: Revestimiento Integral 16,86 $EUA/kg
Rígidas 7,83 $EUA/kg

Título del proyecto

(a) Eliminación del CFC residual en el sector de espumas

Datos del proyecto	**Múltiple**
Consumo total (toneladas PAO)	352,0
Impacto del plan de eliminación (toneladas PAO)	333,1
Duración del proyecto (meses)	60
Costo total del plan ($EUA)	4 616 640
Monto total inicial solicitado para el plan ($EUA)	3 280 243
Costo final del plan ($EUA):	
a) Total de costo adicional de capital ($EUA)	1 369 000
b) Costo de imprevistos ($EUA)	136 900
c) Costo adicional de explotación ($EUA)	2 765 340
d) Costos administrativos	345 400
Costo total del proyecto (a+b+c)	4 616 640
Monto total solicitado para el plan ($EUA)	3 280 243
Relación de costo a eficacia ($EUA /kg.)	10,62
Costo total del organismo de ejecución	246 018
Costo total del plan al Fondo Multilateral	3 526 261
Total de desembolsos (partes)	4
Total (fase) de la parte actual	Primera
Monto de los fondos aprobados del plan, desembolsados previamente ($EUA)	0
Monto de los fondos aprobados del plan restantes ($EUA)	3 280 243
Monto solicitado para la parte actual ($EUA)	1 740 000
Impacto de la parte actual (toneladas PAO)	129,8
Costo a eficacia de la parte actual ($EUA/kg.)	13,41
Monto restante después de la aprobación de la parte actual ($EUA)	1 540 248
Organismo nacional de coordinación	Ministerio del Medio Ambiente
Organismo de ejecución	Banco Mundial

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)	

DESCRIPCIÓN DEL PROYECTO

Antecedentes del sector

Perfil de consumo y eliminación de CFC (Anexo A, Grupo I)

Conforme a la Decisión 35/57 Indonesia seleccionó la Opción 1 como punto de parte, lo que equivale a:	**3 951,4** toneladas PAO
- Cantidad de CFC aprobada para financiamiento antes de la 42ª Reunión	3 576,8 toneladas PAO
- Consumo restante de CFC admisible para financiamiento en la 42ª Reunión (conforme a la Decisión 35/57, proviso B)	374,5 toneladas PAO
- Consumo restante de CFC admisible para financiamiento en la 42ª Reunión, ajustado para consumo contabilizado por partida doble (véanse las Tablas 2 y 3 siguientes)	610,5 toneladas PAO
- Impacto de todos los proyectos de CFC propuestos para financiamiento en la 42ª Reunión (sectores de aerosoles y espumas)	592,3 toneladas PAO
- Consumo restante de CFC admisible para financiamiento, después de la aprobación de los proyectos propuestos a la 42ª Reunión	18,2 toneladas PAO

Eliminación de CFC residual en el sector indonesio de espumas

1. El Banco Mundial presentó, en nombre del Gobierno de Indonesia, un plan para la eliminación del consumo residual de CFC en los subsectores de revestimientos integrales de poliuretano y de espumas rígidas, en el sector indonesio de espumas.

2. El objetivo del plan es asegurar la eliminación completa de CFC en el sector de espumas para 2007, mediante la ejecución del plan de sector, conjuntamente con los proyectos individuales actualmente en curso. Esto permitiría a Indonesia cumplir con sus obligaciones presentes y futuras, conforme al Protocolo de Montreal.

3. El costo total del plan se calcula en 4 616 640 $EUA, de los cuales se solicitan al Fondo Multilateral 3 280 243 $EUA y 246 018 $EUA para costos de apoyo del organismo. Se informa que el consumo residual validado de CFC en el sector de espumas es 352 toneladas PAO, de las cuales 298 toneladas PAO son admisibles para financiamiento. Los fondos pedidos para el plan de sector son 207 900 $EUA para que el sistema de apoyo técnico asista en la eliminación de 54 toneladas PAO de consumo de CFC de las empresas no admisibles.

Identificación de empresas admisibles y consumo de CFC

4. El Banco Mundial llevó a cabo un sondeo del sector indonesio de espumas para identificar las empresas productoras de espumas, que explicaban el consumo residual de CFC en el sector. Se identificaron treinta empresas productoras de espumas: 20 de espumas rígidas y

10 de revestimiento integral, con un consumo total informado de 298,11 toneladas. Además, se estableció una lista de 85 empresas con un consumo total estimado de 705 toneladas PAO como no admisibles para financiamiento. Catorce de las 85 empresas no admisibles (3 de espumas de revestimiento integral y 11 de espumas rígidas) confirmaron, mediante el sondeo, su consumo total de CFC de 53,6 toneladas PAO. Las 71 empresas restantes ya no existían, no se podían localizar, rehusaron a participar en el sondeo o fueron consideradas potencialmente no admisibles para financiamiento, sobre la base de la documentación proporcionada por las empresas. Las empresas que potencialmente no eran admisibles para financiamiento fueron tres empresas que habían recibido financiamiento en reuniones anteriores mediante proyectos individuales. Esto explica el consumo de 145 toneladas PAO de CFC y un financiamiento de 715 550 $EUA. No obstante, las tres compañías, Ganesha Rattesko Prima (IDS/FOA/38/INV/150), Solindah Kita (IDS/FOA/36/INV/144) y Trias Rantaimas (IDS/FOA/31/INV/119) no participaron en los dos proyectos de grupo y su consumo de CFC no afectan el nivel de consumo residual de CFC. La lista de las empresas, cuyo consumo de CFC se ha validado y se incluyen en el plan de sector, aparece en la Tabla 1.

Tabla 1: Lista de las empresas indonesias productoras de espumas y sin financiamiento con el consumo validado de CFC

A. Empresas admisibles para financiamiento

N°	EMPRESA	APLICACIONES DE LA ESPUMA *	EQUIPO BÁSICO	USO DE CFC Toneladas PAO
1	Bintang Mas, UD	ERP – Termoplásticos	Manual	5,63
2	Cipta Karya, CV	ERP – Pulverización	Gusmer	3,79
3	Mayasari Utama, PT	ERP – Pulverización	H/P-Gusmer FF1600	3,08
4	Langgeng Makmur Industri Tbk, PT	ERP - Termoplásticos	Canon C 15 RF 2	15,00
5	Hadi Puteri Kartika Paqsi, PT	ERP – Tableros	Mezcla manual	9,00
6	Pangaji Mario Refconindo, PT	ERP – Tableros	H/P- KM 40/40 &L/P Canon C60	6,30
7	Bernadi Utama, PT	ERP - Termoplásticos	Gusmer H2000 & H II	2,60
8	Willich Isolasi Pratama, PT	ERP – Tubos	Gusmer H 2000	2,05
9	Sadana Ekapraya Amitra, PT	ERP – Tableros	Manual	0,79
10	Indomatic	ERP – Tableros	Manual	1,91
11	Citradinamika Interindo	ERP – Tableros	Manual	3,90
12	Sigma Engineering	ERP – Tableros	Manual	4,64
13	Harrison, UD	ERP – Tableros	Manual	0,53
14	Sengon Harpindo Sejati	ERP – Tableros	distribuidor de PL	41,60
15	Ditta Insulindo	ERP – Tableros	distribuidor de PL	35,67
16	Sinar Baja Walandra	ERP – Tableros	distribuidor de PL	29,00
17	Sumber Sejahtera Raya	ERP – Tableros	distribuidor de PL	27,61
18	Ero Fibre Glass	ERP – Tableros	distribuidor de PL	11,00
19	Shirabu	ERP – Tableros	distribuidor de PL	11,00
20	Belga Jaya Perkasa	ERP – Tableros	distribuidor de PL	0,00
21	Biru SCK, PT	ERI	H/P Canon C 30 & 40	4,00
22	Yamahato, CV	ERI	L/P Desma Klockner 583/24	3,60
23	Rizata Wijaya	ERI	L/P Canon 15 FL2	6,80
24	Osaga Mas Utama. PD	ERI	L/P Italy BGM Elite 60	10,00
25	Sinar Mulia, UD	ERI	Green 900 g/min	6,00
26	Kumala Indah Tata, PT	ERI	L/P Elastogran F70	13,50
27	SS Utama, PT	ERI	(3) L/P BGM	25,00
28	Restindo Dayatama, PT	ERI	Manual	0,79
29	Lion Metal Works TBK, PT	ERI	L/P Canon C15 FL2	1,62
30	Jaly Indonesia Utama, PT	ERI	LP BGM, MTB	11,70
	TOTAL			**298,11**

* ERP: Espuma rígida de poliuretano.
ERI: Espuma de revestimiento integral.

B. Empresas no admisibles para financiamiento

N°	EMPRESA	APLICACIONES DE LA ESPUMA	EQUIPO BÁSICO	USO DE CFC Toneladas PAO
1	Bertindomas Ciptasatya	Tableros	Manual	1,14
2	Cahaya Kencana Srikandi, PT	Tableros	H/P-Gusmer	1,00
3	Duta Eka Abadi, CV	Tableros	Manual	0,00
4	Framindex Indah Lestari (Yapindex)	Estructuras	KF – IS402	1,28
5	Mitra Niaga Kencana Lestari, PT	Tableros	SAIP K 60	7,43
6	Pungut Permai Perkasa PT	Estructuras	Manual	0,25
7	Restu Ibu, PT	Pulverización	n/k	0,00
8	Wika Intrade, PT	Termoplásticos	Pequeño	3,89
9	Yuriko Teknik	Tableros	Manual	1,36
10	Binder Indonesia, PT	Tubos	n/k	12,10
11	Megametal Perdana, PT	Tableros	L/P Li Peng (Taiwan)	11,99
12	Astra Otopart, Tbk, PT.	ERI	H/P KM & Rim Star	4,20
13	Jaya Mulya	ERI	Ex/Import	6,00
14	Yufo Sumber Mas	ERI	n/k	3,00
	TOTAL			**53,64**

Consumo restante de CFC admisible para financiamiento

5. Conforme a la Decisión 35/57, el consumo financiable restante de CFC en Indonesia, al final de la 41ª Reunión, era 374,5 toneladas PAO, como se indica en el perfil de consumo y eliminación de CFC antedichos. El Banco Mundial presentó a la Secretaría del Fondo, para ser considerados en la 42ª Reunión, dos proyectos en los sectores de espumas y aerosoles con un consumo total de 592 toneladas PAO, que requerían una evaluación del consumo restante financiable de CFC.

6. Para esta evaluación, el Banco Mundial proporcionó los datos basados en el sondeo descrito indicando que había una cierta contabilización por partida doble del consumo de CFC financiable en el sector de espumas de Indonesia. Esto resultó del hecho de que un número de empresas participantes en dos proyectos generales para 60 empresas de espumas flexibles para colchones y 26 de espumas moldeadas (IDS/FOA/23/INV/77 y 78), aprobados en la 23ª Reunión, para ser ejecutados por el Banco Mundial, recibieron posteriormente financiamiento mediante los proyectos individuales preparados por otros organismos.

7. El examen también demostró que debido a las dificultades socioeconómicas que desempeñaron una función en el retraso de la ejecución de los proyectos de grupo, algunas de las empresas iniciales que participaban en dos proyectos de grupo habían dejado de producir espumas o ya no podía localizarse. Sin embargo, en la 40ª Reunión, el Comité Ejecutivo decidió por Decision 40/13 no permitir la substitución de las empresas que habían salido de los proyectos de grupo por otras nuevas. Por lo tanto, si bien su consumo había sido considerado en los proyectos de grupo, también habían sido considerados en otros proyectos individuales, de allí la contabilización por partida doble de su eliminación de CFC financiado.

8. El análisis de la Secretaría de los datos proporcionados por el Banco Mundial aparece en la Tabla 2. El análisis demuestra que el consumo de CFC que se consideraría como admisible

para financiamiento, como resultado de la ejecución parcial de los dos proyectos de grupo asciende a 236 toneladas PAO, mientras que el consumo no admisible para financiamiento sería 237,5 toneladas PAO. Por lo tanto, el consumo total restante de CFC, admisible para financiamiento en Indonesia, sería 610,5 toneladas PAO (es decir 374,5 más 236,0 toneladas PAO), según lo indicado en la Tabla 3, en lugar de las 374,5 toneladas PAO indicadas en el perfil del consumo y eliminación de CFC.

Tabla 2: Impacto de los proyectos de grupo, aprobados por el Banco Mundial, sobre el consumo residual de CFC en el sector de espumas

	Total (a)	Cerrada/inexistente (b)	Rehusó participar (d)	Proyectos de ONUDI (d)	Proyectos de PNUD (e)	Proyectos de Japón (f)	Total financiable (g) c+d+e+f	Total no financiable (h) (b)	Total de empresas no participantes	Alcance final de los proyectos de grupo
Proyecto de espumas flexibles para colchones (IDS/FOA/23/INV/77)										
Total de empresas	60	10	2	2	1	--	5	10	15	45
Consumo de CFC	954	161,5	59	57	23	--	139	161,5	300,5	653,5
Proyecto de espumas moldeadas flexibles (IDS/FOA/23/INV/78)										
Total de empresas	26	5	1	2	3	1	7	5	12	14
Consumo de CFC	370	76	5	51	29	12	97	76	173	197
Total de empresas	86	15	3	4	4	1	12	15	27	59
Consumo total de CFC en proyectos del Banco Mundial	1.324	291,5	64	108	52	12	236	237,5	473,5	850,5

Tabla 3: Consumo residual de CFC en Indonesia

	Toneladas PAO
Consumo financiable restante, por Decisión 35/57	374,5
Consumo financiable de proyectos contabilizados por partida doble	236,0
Consumo total residual financiable	610,5
Consumo total de CFC restantes en el sector de espumas (298,1 + 53,6)	351,7
Consumo total de CFC restantes admisibles para financiamiento en el sector de espumas	298,1

<u>Antecedentes de las empresas</u>

9. Catorce de las veinte empresas de espumas rígidas producen tableros; el resto produce termoplásticos, tubos y espuma de pulverización. Siete de las empresas utilizan operaciones manuales mientras que el resto (excepto las productoras de espumas de pulverización) utilizan fundamentalmente las máquinas de espumas de baja presión. Nueve de las diez productoras de espumas de revestimiento integral funcionan con máquinas de espumas, principalmente máquinas de espumas de baja presión, mientras que una empresa trabaja manualmente.

Selección de tecnología

10. Se examinaron minuciosamente todas las tecnologías disponibles de los productos sucedáneos y se compararon con los antecedentes de las circunstancias socioeconómicas del país en general y, en particular, en el sector de espumas, y además se examinó el estado actual del desarrollo de las alternativas. Se seleccionó la tecnología de HCFC-141b como la más apropiada para las conversiones en las espumas rígidas. La tecnología seleccionada para las empresas productoras de espumas de revestimiento integral es el sistema a base de agua con el uso posible de sistemas de HCFC-141b, si no se puede tener acceso a sistemas a base de agua o si el producto final no es satisfactorio.

Cálculo del costo del proyecto

11. Sobre la base de las características de producción del subsector de espumas y la selección de la tecnología, se calcularon los costos de capital adicionales para cada empresa individual, usando componentes de costo normalizados y reglas para calcular los costos de proyectos de espumas. Así, para las conversiones de las espumas rígidas, se cambiarán los distribuidores existentes de baja presión por distribuidores de alta presión equivalentes; y para las conversiones de espumas de revestimiento integral, se adaptarán los distribuidores existentes de baja presión, según se considere apropiado. Donde no haya máquinas en los equipos básicos habrá una deducción del costo para una contribución de la contraparte, equivalente al 50% del costo de la nueva máquina de alta presión, y al 25% del costo de la nueva máquina de baja presión. De manera similar, se harán las deducciones que correspondan para las máquinas que sean demasiado viejas (más de 10 años).

Espumas rígidas

12. El costo de capital adicional de la tecnología de HCFC-141b se calculó sobre la base de los siguientes componentes de costos:

Distribuidor de alta presión	80 000 $EUA por máquina
Adaptación de FF1600	6 000 $EUA por máquina
Adaptación de H-2000	12 000 $EUA por máquina
Ensayos	5 000 $EUA por empresa

13. Sobre la base de los componentes antedichos, los costos de capital adicionales se calcularon sobre el reemplazo de 17 distribuidores de baja presión por otros de alta presión, incluyendo tres distribuidores básicos y viejos, el suministro de 7 distribuidores de alta presión para las operaciones de mezcla manual y la modificación de 4 máquinas de espumas de pulverización; todo esto resulta en un costo de capital adicional total de 1 334 300 $EUA, que incluye el 10% para gastos de imprevistos.

Espumas de revestimiento integral

14. El costo de capital adicional de la tecnología a base de agua se calculó sobre la base de los siguientes componentes de costos:

Distribuidor de baja presión	25 000 $EUA por máquina
Adaptación de distribuidores de baja presión	25 000 $EUA por máquina
Acondicionamiento de temperatura de moldeado	12 000 $EUA por máquina
Ensayos	5 000 $EUA por empresa

15. El costo de capital adicional implicó la modificación de tres distribuidores y el reemplazo de las mezclas manuales por un dispensador de baja presión, a un costo total de 171 600 $EUA, que incluye el 10% para gastos de imprevistos.

Costos de explotación adicionales

16. Se calcularon los costos de explotación adicionales para cada grupo de empresas sobre la base de reglas normalizadas y las diferencias entre los precios del mercado de los sistemas químicos con CFC y los de HCFC-141b, y los sistemas a base de agua, según lo indicado en la Tabla 4 siguiente:

Tabla 4: Precios de sistemas químicos

Subsector	Sistema de con CFC $EUA/kg	Sistema con sucedáneos $EUA/kg	Diferencia de precio $EUA/kg	Diferencia en porcentaje
Espuma rígida	2,50	2,80	0,30	12
Espuma de revestimiento integral	2,50	3,00	0,50	20

17. Basado en las diferencias de precio antedichas de los sistemas de espuma de la Tabla 4, los costos de explotación adicionales (Valor actual neto por dos años) para las cantidades requeridas de 1 811 toneladas y 1 142 toneladas de los sistemas de espumas para las empresas de espumas rígidas y las de revestimiento integral ascendieron a 1 319 400 $EUA y a 1 445 940 $EUA, respectivamente. El costo de explotación adicional del componente de espumas rígidas incluye la compensación para el aumento en la densidad de la espuma como consecuencia de la conversión.

Costo de inversión del plan

18. Los costos de explotación y capital adicionales totales que resultan de los cálculos antedichos aparecen en la Tabla 5.

Tabla 5: Costos de inversión del plan de sector

	Costo de capital adicional $EUA	Imprevistos $EUA	Costo de explotación adicionales $EUA	Total $EUA
Espumas de revestimiento integral	156 000	15 600	1 445 940	1 617 540
Espumas rígidas	1 213 000	121 300	1 319 400	2 653 700
Total	1 369 000	136 900	2 765 340	4 271 640

Costos de gestión y ayuda técnica

Oficina de ejecución y supervisión

19. Se propone establecer una oficina de ejecución y supervisión de proyectos, con personal a empleado tiempo completo, a un costo de 137 500 $EUA, para proveer al gobierno la ayuda necesaria para realizar todas las actividades propuestas en el plan. Se ha asignado a esta oficina una variedad de tareas relativas a la elaboración y aplicación de reglamentaciones, ejecución del proyecto, sensibilización, y supervisión. El costo de la oficina incluye 45 000 $EUA para la ayuda en cuestiones de criterios y sensibilización y 80 000 $EUA para gastos de explotación destinados a un experto.

Sistema técnico de ayuda

20. Además de la oficina de ejecución y supervisión, se propone el establecimiento de una oficina de ayuda técnica al costo de 207 900 $EUA. El propósito principal de esta oficina es asistir en la eliminación del consumo de CFC, descrito como no admisible para financiamiento. Los componentes principales del costo de la oficina de ayuda técnica son: para transferencia de tecnología y capacitación, 100 000 $EUA; costos de apoyo, 25 000 $EUA; y 64 000 $EUA para asistencia técnica a los usuarios de CFC muy pequeños e irregulares.

21. El costo total de la estructura de gestión propuesta sería 345 000 $EUA.

Costo total del plan

22. El costo total del plan de eliminación del consumo residual de CFC en el sector de espumas se resume a continuación.

Resumen de los costos del proyecto	$EUA
Costo de capital adicional	1 505 900
Costo de explotación adicional	2 765 340
Oficina de ejecución y supervisión de proyectos	137 500
Sistema de ayuda técnica	207 900
Total	4 616 640
Monto solicitado	3 280 243
Consumo total de CFC (298,1 + 53,6)	351,7 toneladas PAO
Impacto del plan (explica el uso de HCFC)	333,1 toneladas PAO
Relación de costo a eficacia del plan	9,85 $EUA/kg

Plan de acción

23. El Banco Mundial incluyó un plan de acción que proporciona el calendario de eliminación de CFC y desembolsos de fondos, basado en el consumo de 2 651 toneladas PAO de CFC, de 2001, y el monto pedido de 3 80 243 $EUA. Sin embargo, los datos informados por Indonesia a la Secretaría del Fondo demuestran que el consumo de CFC del sector de espumas fue 1 270,8 toneladas PAO, mucho más bajo que el consumo del año anterior, usado por el Banco Mundial para elaborar el calendario de reducción de CFC. Los programas anuales de ejecución para 2005-2009 también se elaboraron valiéndose de los mismos datos. A continuación se da el calendario de eliminación de CFC y de desembolsos de los fondos propuesto.

Línea		**Base (2001)**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**
Objetivos de eliminación e impactos de proyectos (TM)											
1.	Objetivo del consumo doméstico	2 651	2 583	2 515	2 046	1 270,2	688,4	232,7	[66,2*]	[66,2*]	0
2.	Impacto de PAO para los contratos	0	0	145	130	55	53	0	0	0	0
3.	Impacto real de proyectos en curso	--	68	469	775,8	452	300	100	0	0	0
4	Impacto de eliminación del plan de sector	0	0	0	0	129,8	155,7	66,5	0	0	0
Financiamiento solicitado (000 $EUA)											
5.	Proyectos de inversión	0	0		1 600	1 200	135	0	0	0	0
6	SPMCU nacional y actividades de apoyo	0	0		70	30	20	17,5	0	0	0
7.	Sistema de ayuda técnica	0	0		70	62	52	23,9	0	0	0
8.	Total	0	0		1 740	1 292	207	41,4	0	0	0

COMENTARIOS Y RECOMENDACIONES DE LA SECRETARÍA

COMENTARIOS

24. El análisis de los datos del sector indonesios de espumas parece confirmar que el consumo de CFC admisible para financiamiento sobrepasa el consumo restante registrado de 374,5 toneladas PAO. El mismo análisis demuestra que, basado en el nivel del consumo de CFC de los dos proyectos de grupo aprobados en la 23ª Reunión, que fue el 69% para las espumas de colchones y el 53% para espumas moldeadas flexibles, así como la relación correspondiente de costo a eficacia del proyecto, se espera que el Banco Mundial devuelva al Fondo Multilateral 1,28 $EUA millón aproximadamente de los 4 $EUA millones aprobados para el proyecto de grupo de espumas para colchones y 1,7 $EUA millón aproximadamente de los 3,5 millones $EUA aprobados para el proyecto de grupo de espumas moldeadas flexibles.

25. Con respecto a las cuestiones de la admisibilidad de financiamiento de algunos proyectos aprobados identificados por los resultados del sondeo del sector de espumas, se pidieron

aclaraciones a los organismos de ejecución pertinentes y el Comité Ejecutivo hará las recomendaciones que correspondan.

26. La Secretaría identificó algunas cuestiones relativas al cálculo de inversión y a los costos de gestión. Estas cuestiones están siendo tratadas por la Secretaría y el Banco Mundial.

27. En vista del hecho que los datos de consumo básico usados para la elaboración del calendario de reducción de CFC son obsoletos, se pidió al Banco Mundial que revise el plan de acción de eliminación de CFC para que refleje datos de consumo más actualizados. Por lo tanto, no ha sido posible preparar un proyecto de acuerdo en la propuesta. El proyecto de acuerdo se presentará al Comité Ejecutivo, concordando con la Decisión 41/80, después que se haya convenido el nivel de financiamiento del plan de sector y las revisiones necesarias al plan de acción.

RECOMENDACIONES

28. Pendiente.

PROJECT COVER SHEET

COUNTRY: Indonesia	**IMPLEMENTING AGENCY:** The World Bank
PROJECT TITLE:	**PHASEOUT OF RESIDUAL CFCs IN THE INDONESIAN FOAM SECTOR**
PROJECT IN CURRENT BUSINESS PLAN:	YES
SECTOR:	Foam
SUB-SECTORS COVERED:	Rigid (RPF), Flexible Molded/Integral Skin (FMF/ISF)
ODS USE IN SECTOR: (2001)	2,651 MT ODP
PROJECT IMPACT:	333.1 MT ODP (Remaining eligible consumption addressed in the project document).
PROJECT DURATION:	**5** years
PROJECT COSTS:	**Investment Costs:** **US$ 4,271,240** **Management Costs:** **US$ 345,400** **TOTAL:** **US$ 4,616,640**
LOCAL OWNERSHIP:	100 %
EXPORT COMPONENT:	0
REQUESTED GRANT:	**US$ 3,280,243 ($2,934,843 investment; $345,400 non-investment)**
IA SUPPORT COSTS:	**US$ 246,018**
TOTAL COST OF PROJECT TO MLF:	**US$ 3,526,261**
COST EFFECTIVENESS (weighted average):	US$ 10.52/kg ODP (composite threshold US$ 10.52/kg ODP)
STATUS OF COUNTERPART FUNDING:	N/A
PROJECT MONITORING MILESTONES:	**INCLUDED**
NATIONAL COORDINATING AGENCY:	Ministry of Environment of Indonesia

PROJECT SUMMARY

With the completion of this sector plan, all CFC-11 consumption in the foam sector in Indonesia will be eliminated. The funding request targets the remaining eligible consumption of CFC-11, and will be carried out through a series of annual programs. In conjunction with presently ongoing foam projects, this project will result in complete phaseout of CFC-11 use for foam applications in Indonesia by the end of 2007. Investment projects are included for 20 rigid foam and 10 integral skin foam enterprises. The plan proposes to replace present ODS-based technology with a combination of non-ODS and, where not feasible, low-ODS technologies (water-based (CO_2) and HCFC-141b). A Technical Service Support program includes workshops to effect conversion at enterprises too small for investment projects. Conversion projects will be accompanied by associated policy actions to ensure that the phaseout proceeds on schedule, and that ineligible enterprises are also compelled to stop use of CFC-11. An action plan indicating annualized phaseout targets is included in the proposal.

IMPACT ON THE COUNTRY'S MONTEAL PROTOCOL OBLIGATIONS

This project will allow Indonesia to complete its obligations for the foam sector with the Montreal Protocol, eliminating the use of CFCs in the production of polyurethane foam.

Prepared by: **Edrola/Rappa** **Date: December, 2002**
Reviewed by: **Dr. Mike Jeffs, OORG Technical Reviewer** **Date: February, 2003**

PHASEOUT OF RESIDUAL CFCs
IN
THE INDONESIAN FOAM SECTOR

February 4, 2003

(Revised January 29, 2004)

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1. ***Background:*** The Government of Indonesia started its Ozone Layer Protection Program in 1992 by ratifying the Vienna Convention, the Montreal Protocol and the Copenhagen Amendment through Presidential Decree No. 23/1992, and subsequently established a program for actions to phaseout the use of ODS. It has so far received US$ 35,607,902 to phaseout the annual use of 7,012 t ODS.

2. ***Project Objective:*** In conjunction with presently ongoing foam projects, this project will result in complete phaseout of the use of CFCs from the foam sector in Indonesia by the end of 2007. These actions will help Indonesia to meet its present and future obligations under the Montreal Protocol. The project has been developed by the Government of Indonesia's National Ozone Unit with assistance of the World Bank. The identified remaining un-addressed consumption in the sector amounts to 352 t CFCs from which 298 t is deemed eligible for financial assistance. The non-eligible consumption will be phased out through policy options.

3. ***Scope and Content***: The plan proposes to replace present ODS-based technology with a combination of alternative technologies, including HCFC-141b for rigid PU foam applications, and water-blown technologies for integral skin PU foam applications. Conversion projects will be accompanied by associated policy and management actions to ensure proper recipient verification, to keep the phaseout on schedule, and to assure that non-eligible enterprises are also compelled to stop use of CFC-11. A consolidated action plan is included.

4. ***Data:*** The foam sector has been surveyed through questionnaires and verification visits. The data have been cross-checked with the approved projects data base as well as existing preparation portfolio's of other Agencies. There are estimated to be more than 40 very small foam enterprises with unchecked CFC consumption in Indonesia whose CFC consumption is sporadic and low. The survey data were used to establish consolidated consumption data, to determine eligibility of enterprises for MLF support and to establish the required technical and economical assumptions for this project. Data analysis resulted in calculation of project costs based on 30 eligible enterprises – 20 rigid foam and 10 integral skin foam enterprises.

5. ***Costs calculations:*** Based on enterprise data and following MLF guidelines, actual conversion costs have been calculated for the 30 eligible enterprises. MLF-imposed thresholds were then applied to calculate fundable conversion costs. The proposed funding in the project has been based on the lower of those two calculations. Using this approach, the requested funding amounts to US$ **$2,934,843** for incremental investment costs. Management and technical Support Services costs of $345,400 are also requested to fund the activities required for implementation and monitoring, and technical support at the national level. As a sector phaseout plan, it is understood that the Government of Indonesia has flexibility in allocating the approved funding in order to efficiently achieve the objectives of total ODS phaseout in the foam industry in Indonesia.

6. ***Adjustment for HCFC-141b consumption:*** The use of all water-based systems and of hydrocarbons has been considered in the conversion of rigid foam applications. However, all-water-based systems that can provide the insulation properties required in these applications are at this time not available in Indonesia. The economic threshold of ~50 t CFCs/y for hydrocarbon-based systems is approached by a few of the recipients, but due to the very large capital investment costs required for hydrocarbon conversions and the limited funding for the entire foam sector, the use of hydrocarbons has not been selected. Therefore, the replacement technology chosen for rigid foam is HCFC-141b. Adjustment has been made for the resulting residual ODP. It is estimated that the impact of HCFC-141b consumption will amount to approximately 19 t/y (at baseline conditions).

7. ***Annual Phaseout targets:*** it has been assumed that the first year of implementation will be needed for preparatory action and beginning signing contracts with enterprises. The eligible CFCs will after that be phased out over three years and the non-eligible consumption in the last year (or as otherwise required by the government):

Year Of Program	Total Consumption in Foam Sector	Estimated Ineligible & Not Identified Consumption	Impact Targeted In given Year	Estimated Actual Impact of On-going	Annual Reduction of CFC Demand	Accumulated Reduction of CFC's (baseline T)
2001	2,651.0	0.0	0.0	0.0	68.0	68.0
2002	2,583.0	66.2	0.0	68.0	68.0	136.0
2003	2,515.0	66.2	0.0	469.0	469.0	605.0
2004	2,046.0	66.2	0	775.8	775.8	1380.8
2005	1270.2	66.2	129.8	452.0	581.8	1962.6
2006	688.4	66.2	155.7	300.0	455.7	2418.3
2007	232.7	66.2	66.5	100.0	232.7	2,651.0
Sub-Total			**352**			
Adjustment for HCFC-141b Consumption			(18.9)	0.0	0.0	
Grand Total			**333.1**	**2164.8**	**2,651.0**	**2,651.0**

* plus consumption by not yet validated foam producers

8. ***Agency support costs:*** Agency support costs of 7.5% are included in the proposal.

9. ***OORG Review:*** The proposal has been reviewed and approved for submission by the Bank's OORG reviewer for the foam sector. His comments are attached at Annex I.

I. INTRODUCTION

A. BACKGROUND

1.1 Indonesia ratified the Montreal Protocol in June 1992 and was classified as an Article 5 country as the consumption per capita was less than 0.3 kg ODP/capita. Indonesia qualifies for a grace period of 10 years in the Protocol's implementation schedule and is eligible for financial support and technical assistance from the Multilateral Fund (MLF) of the Montreal Protocol to reduce the financial impact to the country caused by the ODS phaseout and introduction of substitutes. Indonesia's obligation under the Multilateral Fund is to reduce its CFC consumption to 4,166 tons by 2005, 1,250 tons by 2007 and 0 by 2010.

1.2 In 1994, Indonesia prepared a Country Programme (CP) incorporating a national strategy and action plan to phaseout ODS. The action plan proposed addressing each of the ODS consuming industry sectors, through institutional and regulatory measures, incentives and disincentives, awareness and information dissemination, financial and technical assistance and monitoring. Complete ODS phase-out was targeted ambitiously for 1998.

1.3 In 1998, the Government initiated preparation of a Country Programme Update (CPU) with assistance of the World Bank, UNDP and the industry. One of the planned activities was to re-survey the ODS consuming sectors. The CPU renewed and reinforced Indonesia's commitment, strategy and action plans to eliminate ODS and is intended to serve as a guideline for future activities to meet Indonesia's obligations under the Montreal Protocol. Realizing the needs of the industry and the economy, the CPU revised the target date for complete ODS phase-out to the end of 2007.

1.4 Activities to implement the Montreal Protocol are coordinated through the National Ozone Unit (NOU) in the Atmosphere and Climate Change Division of the Ministry of Environment (LH). The Government has taken the following initiatives and actions:

a) A licensing system for import of ODS was set up in 1998 where 22 substances of CFC were encoded, and one CFC registered importer and three registered methyl Bromide importers were appointed by the Government to handle CFC importation.
b) Ban on imports of goods containing ODS from 1998.
c) Amendment of licensing system for import of ODS on 2 December 2002 was issued where 5 substances of CFC are allowed to be imported through three CFC registered importers and three registered importers for methyl Bromide .
d) Amendment of ban on imports of goods containing ODS on 2 December 2002 where 5 substances of CFC namely CFC-11, CFC-12, CFC-113, CFC-114 and CFC-115 are allowed to be imported until 31 December 2007.
e) Monitoring the use and import of ODS to minimize illegal trade and capacity-building of customs officials in line with ASEAN agreements
f) Active monitoring of the progress of implementation of projects funded by MLF
g) Formulating guidelines and regulations as necessary for policy implementation
h) Supporting awareness initiatives promoting ozone layer protection at consumer level.
i) Interaction with other ministries, departments, industry representatives and implementing agencies for information dissemination related to impact of policies
j) Promoting research and use of ozone-friendly technologies
k) Developing incentives and rewards for the use of ozone-friendly technologies

1.5 Along with the progress of ODS phaseout activities in the Halon, RAC, MAC, Solvent, and Tobacco sectors, ODS phaseout in the Foam sector has become critical in Indonesia. This sector comprises many small and medium sized enterprises and poses a major challenge in paring limited funding with the management of geographically dispersed small CFC users.

1.6 The Plan aims at complete phaseout of CFC-11 in the foam sector. It will establish an efficient mechanism to promote phaseout activities, to reach out to small users, to promulgate and monitor suppliers, and to develop suitable reporting and auditing structures on phaseout activities and fund utilization. The plan is described in Chapter VII. With most ODS-producing countries gradually phasing out the production of CFC-11, the availability of CFC-11 will decline every year, and will stop completely in 2010. The schedule for consumption phaseout of CFC-11 will address this decline.

B. PREPARATION OF A CFC PHASEOUT PLAN FOR THE INDONESIAN FOAM SECTOR

1.7 This Foam Sector Project has been developed to satisfy the Government's obligations under the Montreal Protocol, and in line with Indonesia's Country Program Update, while taking into account the principles established in other sector plans approved by the ExCom and applicable MLF guidelines for the foam sector.

1.8 Main considerations in the preparation of the Plan were:

a) The Government's obligations under the London Amendment of the Montreal Protocol on Substances that Deplete the Ozone Layer;
b) Principles laid down in the CP from 1994 and the CPU from 2000;
c) The national strategy for economic and social development;
d) The need to ensure that the development of the foam sector itself will not be jeopardized by ODS phaseout;
e) The Government's commitment to comply with agreed-upon overall and annual phaseout targets—assuming that the MLF approves the Sector Plan and disburses funds according to the Annual Programs, and
f) Phaseout of the use of ODS in the foam sector in a cost-effective way.

1.9 The Foam Sector Plan avoids any double counting by deducting ODS phaseout amounts and costs from the baseline for foam projects already approved by the ExCom. Implementation of the PU foam Sector Plan will not affect implementation of projects already approved.

1.10 The Foam Sector CFC Phaseout Plan includes investment project for 30 individual enterprises, and a Technical Support Service component to provide technical support for those 30 enterprises, as well as to conduct workshops to effect ODS phaseout for enterprises too small to be considered for investment projects. Table 1.1 shows the breakdown of the investment projects included in the Plan.

Table 1.1 Investment Projects in the Foam Sector CFC Phaseout Plan

Sub-Sector	Eligible Enterprises	Identified Eligible Use(MT)	ODP Phased Out (MT)	MLF threshold (US$/kg)	Requested Funding (US$/kg)
RPF	20	215	196.1	7.83	1,535,463
FMF/ISF	10	83	83	16.86	1,399,380
TOTAL	30	298	279.1		**2,934,843**

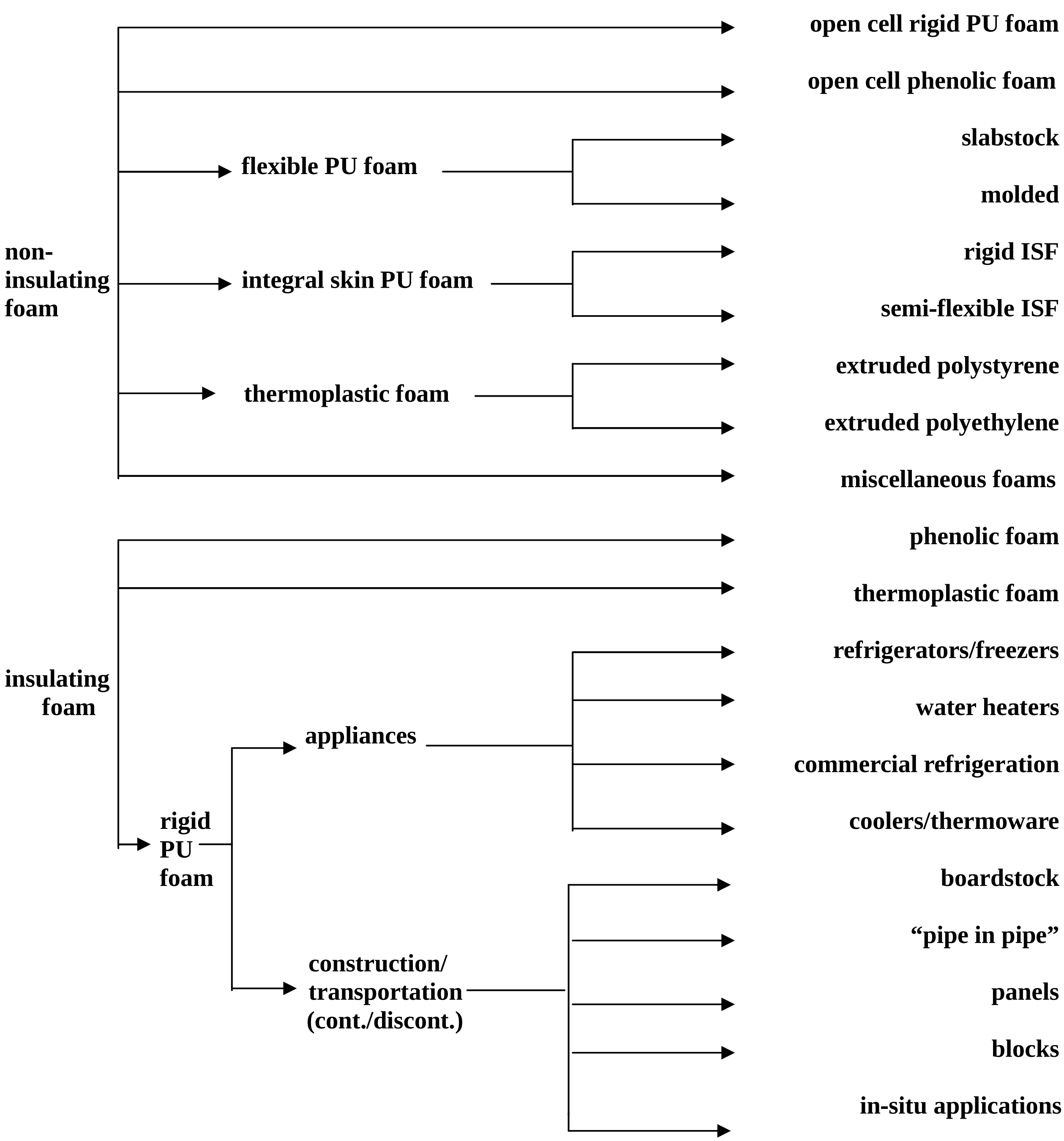
1.11 The total project impact is 333.1 ODP tons. From investment projects for phaseout of eligible consumption, the impact is 279.1 ODP tons, and from policy actions to phaseout identified ineligible consumption, the phaseout amount is 54 ODP tons.

1.12 Of the total project impact of 333.1 ODP tons, 75% (or 250.4 ODP tons) is accounted for by the reassignment of eligible tonnage from two previously approved projects -- IDS/FOA/INV/77 and 78. This tonnage is reassigned to remaining eligible consumption after the complete identification and verification process was finished for those projects. Decision 40/13 effectively prohibits substitution of enterprises into those projects; therefore the remaining tonnage is reallocated to this project. The impact of the remaining consumption for funding is 82.7 ODP tons.

II. THE FOAM SECTOR IN INDONESIA

A. GENERAL BACKGROUND

2.1 Foamed plastics can be classified on the basis of composition, chemical and physical characteristics, manufacturing process or application. These main categories can then be further divided and subdivided into functional groups as follows:



2.2 The most prevalent use of **open cell rigid PUR foam** is for packaging applications ("pour in place" foam), mostly when small lots are involves, such as in the return of repaired items. Another application is "back-foaming" of crash panels, such as automotive dashboards. **Open cell phenolic foam** is mainly used for flower arrangements. **Flexible PUR foam** constitutes the largest group of non-insulating foams. Comfort applications, such as bedding and furniture, dominate in the use of **slabstock—continuous or boxfoam—**followed by lining for textiles. **Molded** foam is used in the automotive industry and, in much smaller amounts, for office furniture. **Rigid integral skin foams** (ISFs) are used for recreational purposes, such as surf boards, and in imitation wood. **Semi-flexible ISFs** are used in the automotive industry for arm rests and steering wheels, in office furniture and in shoe soles (micro-cellular). **Extruded polystyrene foam sheet** is used for food service and food packing applications (meat trays, egg cartons, plates, cups, etc). **Extruded polyethylene foam sheet and plank** is mostly used for packaging purposes. Some examples of **miscellaneous foams** are floor mats for cars and one component foams, such as in spray canisters. Closed cell **phenolic foam** is used for building insulation. **Thermoplastic foams** for thermal insulation purposes consist mostly of **extruded polystyrene insulation board** in construction applications and of **extruded polyethylene tubing** for pipe insulation. **Rigid PUR foams** for thermal insulation is by far the most significant group of insulating foams. Its insulation value exceeds any other foam by a significant margin. There are numerous applications in appliances as well as construction. In appliances, refrigerators dominate, but specifically in commercial refrigeration and small appliances, there is a diverse and frequently unexpected large use of foam. Examples are:

- Thermos bottles
- Water containers, cool boxes (fish industry!)
- Boilers
- Milk containers
- Casseroles/hot pots
- Vendor carts (ice cream, drinks)
- Insulated trucks
- Mortuary coolers

Examples of applications in construction are:

- Sprayfoam (chicken/hog farms, commercial buildings, cold storage)
- Roof panels
- Cold storage structural panels
- Pipe insulation

Examples of miscellaneous applications are:

- Floatation devices (buoys, surf planks)
- Boat filling (floatation as well as insulation)
- Bus insulation (thermal, sound)

2.3 The most prevalent categories in Indonesia are flexible foams, integral skin foams, closed-cell rigid foams and thermoplastic foams. The sector has been sub-divided accordingly.

2.4 The Indonesian foam sector has developed rapidly over the past 20 years. Growth rates for extruded (PE/PS) foams have been less than for other foam sub-sectors, based on the 2reduction of plastics in packaging applications and adverse environmental publicity (landfill concerns). The total number of CFC-consuming foam enterprises is estimated to be 140.

2.5 Foam manufacturers are mostly relatively small and medium sized enterprises. Production technology is not very labor-intensive, capacity utilization is low and the technologies used generally not very sophisticated.

B. CFC CONSUMPTION

2.6 The foam sector initially accounted for nearly 50% of the country's CFC consumption but this has decreased rapidly in the last two years. Most of the larger-sized enterprises have in the mean time phased out or have approved phaseout projects. In addition, three group projects for smaller enterprises have been approved, from which one has been completed. For the remaining smaller enterprises, the adoption of a consolidated phaseout strategy is the only effective way to eliminate the entire CFC consumption in the sector.

2.7 Table 2.1 shows consumption patterns for the industry:

Table 2.1 CFC Consumption and Related Foam Production (2001)

Classification	Code	Main Products	Number of Enterprises	ODS Type	CFC use (t) *)	Production (t)
Continuous foam	FPF	Furniture, mattresses	1	CFC-11	200	3,700
Box foam	FPF	Furniture, mattresses	60	CFC-11	954	9,500
PU Rigid foam	RPF	Insulation materials, boards, pipes	46	CFC-11	773	4,355
Integral skin & Flexible molded	ISF FMF	Auto parts, furniture	46	CFC-11	689	800
Extruded PS/PE	XPE/ PS	Dishware, packaging	1	CFC-12	35	175
Total			**154**		**2,651**	**18,530**

*) CFCs Consumption based on on-going projects and sectoral plan funded by MLF

2.8 Table 2.2 below shows the CFC consuming enterprises by sub-sector:

Table 2.2: Number of foam enterprises and CFC consuming enterprises

	FPF	RPF	FMF/ISF	XPS/PE	Total
Total enterprises	121++	66++	55++	4++	246++1
Total CFC consuming enterprises[2]	61[3]	51	46	1	159
MLF funded enterprise	**121**	**32**	**42**	**4**	**199**
CFC consuming enterprises identified by SPP survey	0	34	13	0	47
Eligible enterprises identified by SPP survey	0	23	10	0	33
Non-eligible enterprises as identified by SPP survey	0	11	3	0	14

[1] Completed, on-going and sector plan funded by MLF

[2] Total CFC consuming enterprises comprises of on-going and sectoral plan funded by MLF

[3] Consisting of 60 boxfoam and 1 continuous producer

2.9 Table 2.3 shows shifts in consumption in the CFC-11 consuming sectors over the last years. Data was estimated based on best available information from the import control system at the time of the CP update. The import control system has not been reliable in the past, and in fact has received ExCom funding to improve its operation. Therefore, the figure of 2,625 tons remaining consumption as calculated in Table 2.1 above is considered a more accurate and reliable figure than the officially reported 1600 tons in the CP update, and is the figure upon which the Sector Phaseout Plan is based.

Table 2.3 CFC-11 Consumption (in t)

CFC- 11 Consumption	1995	21996	1997	1998	1999	2000	2001
PU foam sector	2,887	3,808	3,243	2,489	2172	1909	2625*
PU Refrigeration insulation foam	310	300	250	0	0	0	0
Tobacco sector	90	35	35	30	15	-	-
Commercial refrigeration sector	816	720	735	696	696	696	NA
Air conditioning	135	135	135	135	135	132	NA
National consumption CFC-11	**4238**	**4998**	**4398**	**3350**	**3018**	**2737**	*****

* The 2001 CFC-11 use is presently under review based on information collected during the sector project preparations

2.10 CFC-12 is consumed in foams, refrigeration and aerosols. Historic data of CFC-12 consumption is shown in Table 2.4 below.

Table 2.4: CFC-12 Consumption (in t)

CFC-12 Consumption	1995	1996	1997	1998	1999	2000	2001
National consumption CFC-12	**4,008**	**3,910**	**3,214**	**2,810**	2810	2652	2600
Foam sector (XPE/PS)	721	819	693	526	526	373	NA
Refrigeration sector	1,487	1,591	1721	1584	1584	1579	NA
Aerosol sector	1800	1500	800	700	700	700	NA

2.11 Table 2.5 show the identified remaining CFC use in the Foam Sector:

Table 2.5: 2001 Residual CFC Consumption in the Foam Sector (t)

	FPF		**RPF**		**ISF/FMF**		**XPE/PS**		**Total**	
	Total	**Eligible**	**Total**	**Eligible**	**Total**	**Eligible**	**Total**	**Eligible**	**Total**	**Eligible**
Identified enterprises	1,154	1,154	773	732	689	676	35	35	2,651	2,597
Residual CFC consumption in the PU foam sector to be phased out									**2,651**	**2,597**
CFC Consumption not covered by ongoing projects									352	298
CFC 11 & CFC 12 consumption to be phased out by ongoing MLF funded projects									2,299	2,299
Total 2001 CFC consumption									**2,651**	**2,597**

2.12 While at a later stage more CFC users in the foam industry may be found, the only way to quantify this would be through CFC import data. These data are not yet available for 2001 and may not be reliable as they do not reflect stockpiling. In the current situation this may occur. There are reports of as much as 800+ additional tons of non-eligible consumption that has not been verified.

2.13 The consumption of CFC-11 in the PU foam sector in the base year is shown below:

Table 2.6 Consumption of CFCs in the foam sector in the base year (2001)

	MT
Consumption by ongoing projects approved before 2002	2,051
Projects approved in 2002	248
Subtotal -- consumption by ongoing projects	**2,299***
Identified eligible consumption for the sector plan	298
Non-eligible consumption and consumption by not yet identified enterprises to be phased out under the sector plan	**54***
Total consumption of CFC 11 (base year 2001)	**2651**

* Based sector preparation information.

C. PREVIOUS PHASEOUT ACTIVITIES IN THE FOAM SECTOR

Policies and Regulations:

2.14 The Indonesian Government has issued the following regulations to help control ODS consumption:

- Establishment of a licensing system for import of ODS (1998)
- A ban on imports of goods containing ODS (1998)
- Amendment of licensing system for import of ODS on 2 December 2002 was issued where 5 substances of CFC are allowed to be imported through three CFC registered importers and three registered importers for methyl Bromide
- Amendment of ban on imports of goods containing ODS on 2 December 2002 where 5 substances of CFC namely CFC-11, CFC-12, CFC-113, CFC-114 and CFC-115 are allowed to be imported until 31 December 2007

The Government also trains customs officers and monitors ODS imports to minimize uncontrolled importation of these substances.

ODS Phaseout Activities:

2.15 As of November 2002, there were 69 MLF approved projects in the foam sector, accounting for 209 enterprises. Of these, 34 were rigid PU foam projects, 14 were flexible PU foam projects, 17 were PU integral skin foam projects and 4 were extruded polystyrene/polyethylene projects. The total ODP phaseout amount through these projects is 4,214 t ODP. More detailed information can be found in the following table:

Table 2.7: Approved MLF Projects in Foam Sector (end 2002)

Sub-sectors	No. Projects	Investment Projects (US$)	Non-Investment Projects (US$)	ODP to be Phased out (MT)	ODP already Phased out (MT)
CFC-11					
FPF	14	7,332,097	1,600,000[1]	2,107	593
ISF/FMF	17	8,234,830		913	271
RPF	34	**4,698,278**		824.8	355
CFC-12					
XPE/PS	4	1,480,000		369	369
Total	**69**	**21,745,205**	**1,600,000**	**4,214**	**1,588**

[1]a TA project for 50 boxfoam producers

2.16 There are two large ODS phaseout group projects for SMEs currently under implementation. Both are under execution by the Indonesian Foam Association (AFI) and were approved at the 23rd ExCom Meeting. One project covers flexible PU boxfoam (954 t ODP/60 participants) and is a terminal project, implying that no additional funding will be requested for this application. The other covers flexible molded PU foam (370t ODP/26 participants) and has no terminal character. Both projects include confirmation of the listed companies after approval. It was expected that some additional enterprises may be identified and added, specifically in the (terminal) boxfoam project.

2.17 The implementation of the projects was delayed due to a period of civil unrest and financial uncertainty in Indonesia which halted the certification process for an extended period.

2.18 When the certification process was resumed, it was found that that the financial and civil crisis had resulted in changes of ownership, relocations, temporary stop of production etc. This was affecting recipients' ability to provide the necessary documentation to prove their eligibility and stretched the certification process considerably. This, again, delayed the national phaseout process to an extent that the Government raised concerns regarding the impact on its ability to meet applicable ODS reduction targets.

2.19 It also raised concerns at the MLF in view of implementation time. The ExCom decided on its 40th meeting:

> **"To request the World Bank to implement the two SME foam projects in Indonesia (IDS/FOA/INV/77 and 78) as per the original project document and to return any funds and agency fees associated with the remaining enterprises that had been closed or did not provide required data in project IDS/FOA/23/INV/78" (Decision 40/13 (d)).**

2.20 The implementation status for **IDS/FOAM/23/INV/77 – FLEXIBLE PU BOX FOAM** at time of this decision was as follows:

60 Baseline units (companies) were included in the original project
2 companies refused cooperation
8 companies have been closed
3 companies have been double counted
47 Original units are leftover
11 Eligible enterprises have been found and verified in 2002, prior to Decision 40/13
58 Baseline units (= Companies) were identified and presented by AFI

2.21 Out of the 58 companies, 4 were unable to provide full documentation and have been taken from the list during the 2002/03 validation process. As no additional enterprises can be added anymore following decision 40/13, the project will be limited to 54 enterprises, 6 short of the original expectations. These enterprises represent a consumption of 95.4 t ODP which will now have to be added to the aggregate CFC consumption eligible for MLF funding as part of the sector phaseout plan.

2.22 To speed up implementation, AFI decided to purchase equipment in tranches. 30 units have been ordered July 2003 and a second batch of 24 will follow in March 2004.

2.23 The status for **IDS/FOAM/23/INV/78 – FLEXIBLE PU MOLDED FOAM** at time of decision 40/13 was as follows:

31 Baseline units (26 companies)
7 units (5 companies) have been closed or could not been found anymore
5 units (5 companies) double counted
19 Baseline units (17 companies) were identified and presented by AFI

2.24 Out of the 17 companies, one was unable to qualify and has been taken from the list during the 2002/03 validation process and the eligibility of two units is still under investigation. As no additional enterprises can be added anymore following decision 40/13, the project will be limited to 16 enterprises, 10 short of the original expectations. These enterprises represent a consumption of 155 t ODP which will now have to be added to the aggregate CFC consumption eligible for MLF funding as part of the sector phaseout plan.

2.25 The large amount of double counting concerns companies that received projects through other Agencies despite being previously approved under the SME projects.

2.26 The project was originally narrowly defined as FMF, although ISF applications are technically virtually identical to FMF and have the same financial threshold value. By mid-2002 it was clear that the project could not be filled with FMF recipients alone and the inclusion of FMF/ISF and ISF was started. However, decision 40/13 disallowed any reconsideration and limited therefore the participation to FMF only.

2.27 The 10 ISF recipients that are included in the sector phaseout plan would exactly fit the SME project that is 10 recipients short. Rather than cutting this project short and transferring the surplus ODP to the aggregate eligible consumption the MLF may consider reconsidering decision 40/13 and allowing inclusion of ISF recipients. This would accelerate implementation as all validation, procurement preparation and national/international technical support is already in place.

D. SURVEY OF REMAINING CFC CONSUMPTION

2.28 The World Bank, after consulting the Government of Indonesia, appointed a local consulting firm, Edrola, to conduct a comprehensive survey of the remaining CFC consumption in the foam sector. The consultant was directed to keep close contact with other Implementing Agencies to assure that any existing project pipelines, data banks and other information available from these Agencies would be included in the survey. The work was completed in November 2002 and the results have been forwarded to the NOU for validation.

The consultant was also directed to follow pertinent guidelines from the MLF ExCom on classification and determination of eligibility.

2.29 The average annual foam production of all PU foam producers in Indonesia is about 132 t/y, while the average for the 30 eligible enterprises under this Plan is approximately 146 t/y. This is relatively small by international standards. Indonesian foam producers generally produce for local and regional rather than national markets because of the difficulty and the high cost of transporting foam products over long distances within the Indonesian archipelago.

2.30 Tables 2.8 and 2.9 present information for the identified (not yet funded) rigid PU foam companies on baseline equipment, CFC-11 consumption and eligibility. Enterprise eligibility has been calculated based on ExCom decision *17/7 para.15*. Equipment eligibility has been based on capacity installed before July 25, 1995.

Table 2.8: Identified CFC-11 Consumption for PU Rigid Foam

	# of enterprises	Number of eqt	Number of eligible equipment		CFC-11 Consumption (MT)			Average size (MT)	Eligible consumption
			type I	type II	1999	2000	2001		
All enterprises	31	20	17	3	219.84	245.97	255.53	8.24	**256**
Eligible enterprise	20	14	13	1	195.13	212.98	215.09	10.75	**215**
Ineligible enterprises	11	6	4	2	24.71	32.99	40.44	3.68	**41**

2.31 Foam equipment has been categorized as follows:

a) Type I refers to equipment installed before July 1995. CFCs consumed by this equipment is eligible for compensation.

b) Type II refers to equipment installed after July 1995 but as replacement for retired equipment installed before July 1995, with no increase in capacity. CFC-11 consumed by this equipment is eligible for compensation.

c) Equipment installed after July 1995 is new production capacity. CFC-11 consumed by this equipment is not eligible for compensation.

Table 2.9 Distribution of Equipment Application in Rigid PU Foam

	Number of enterprises						Number of eligible spray equipment		Number of eligible dispenser equipment				ineligible eqt	total eqt
	Spray	Structural	Panel	Pipe	Thermoware	Total	H-P spray (import)	L-P spray (Import)	H-P dispenser import	H-P domestic dispenser	L-P import dispenser	L-P domestic dispenser		
All enterprises	3	2	20	2	4	34	1	1	4	0	11	0	3	20
Eligible enterprises	2	0	14	1	3	23	1	1	3	0	8	0	1	14
Ineligible enterprises	1	2	6	1	1	11	0	0	1	0	3	0	2	6

2.32 Of the 10 eligible integral skin foam producing enterprises, four produce shoesoles, and six produce automotive parts. Table 2.10 summarizes the findings related to eligibility and equipment for the integral skin foam group.

Table 2.10: Identified CFC-11 Consumption for Integral Skin Producers

Eligibility & Size of Enterprises	Number of enterprises	No. of equipment	No. of eligible equipment	Consumption (MT)			Average size (MT)
				1999	2000	2001	
All Enterprises	13	14	6	74.47	84.88	96.21	7.40
Eligible Enterprises	10	12	5	61.77	71.68	83.01	8.30
Ineligible Enterprises	3	2	1	12.70	13.20	13.20	4.40

2.33 The integral skin foam enterprises identified as eligible for inclusion in this project would fit extremely well within the AFI project for flexible molded foam. However, decision 40/17 would seem to preclude this substitution. From a technical standpoint, this would be the optimal solution, since there is no technical difference in implementation between the flexible molded and integral skin foam categories – identical technology and equipment.

E. Issues

2.34 The main issues for CFC phaseout in foam sector include:

a) **Identification of all CFC users**. Not only potential recipients should be identified but also non-eligible enterprises, as they need to be briefed as well.

b) **Need for an efficient phaseout approach**. Most remaining foam enterprises are very small, privately owned and widely distributed over the country. Phaseout of the residual CFCs through a project-by-project approach is too time-consuming to meet the Montreal Protocol requirements. A group mechanism based on common applications or regional locations will be faster and more cost-effective.

c) **Suitable alternative technologies.** Following criteria for the selection of alternative technologies apply:

- Proven and reasonably mature
- Cost effective in conversion
- Locally available
- Acceptable priced
- Support available from the local suppliers
- Critical properties to be maintained in the end product
- Meeting established standards on health, safety and environment
- Zero ODP technology should be chosen whenever feasible.

d) **Awareness.** Enterprises, especially small users, do not have sufficient knowledge about CFC phaseout policies, technical options and costs, and they also do not have sufficient knowledge about their obligations and rights in the ODS phaseout process.

e) **Market competition** Since the production costs for CFC technology and alternative technology are different, the differentials in production costs would result in challenges for converted enterprises, etc.

III. PHASEOUT STRATEGY

C. Introduction

3.1 The foam sector phaseout strategy has been established based on the historical development and the present structure of the foam industry in Indonesia, including the present status of ODS phaseout, as well as forecasts of production and consumption of CFCs and their substitutes, with the objective of developing and implementing the most efficient and cost-effective phaseout program possible. It is very important that the strategy is designed to minimize any adverse impact on the development of the foam sector.

3.2 The PU foam sector plan phaseout targets are as follows:

a) All eligible CFC-11 consumption will be phased out by the end of 2007;
b) All ineligible CFC-11 consumption in ineligible enterprises will be phased out by controlling CFC-11 supply; and
c) total phaseout of CFC-11 consumption will be achieved by the end of 2007.

D. Approach to Phaseout CFC-11 in PU Foam Sector

3.3 The overall approach to the phaseout of CFC-11 under this sector plan will include multiple approaches to reflect the diverse structure of the industry, such as the size and number of enterprises, and the characteristics of the sub-sector. The phaseout targets in the plan will be achieved by a series of annual programs. The main operating mechanisms to implement the sector plan include:

- Selection of enterprises for participation according to existing MLF policies
- Inclusion of a technical support system to assist small enterprises
- Policy initiatives to effect elimination of CFC use in ineligible enterprises

3.4 Schedule: According to the Indonesian targets for CFC phaseout in the country, the CFC phaseout for the foam sector must be complete by the end of 2007. This plan aims to achieve the phaseout within that timeframe. The plan is presented as a sector phaseout plan based on a performance agreement.

3.5 Selection of enterprises: As described in Section IID, an extensive survey was conducted identifying remaining foam producing enterprises in Indonesia. Selection of enterprises for participation in this sector phaseout strategy was made according to established MLF criteria, including:

- Enterprise establishment prior to 25 July 1995
- Verified CFC-11 consumption, corrected if based on equipment installation dates
- Corrections for foreign ownership and exports, as necessary

3.6 Technical Support System (TSS): Because of limitations in technology, information collection and management expertise, small enterprises may face difficulties in selecting and using the most appropriate substitute technology. A technical support system will be set up to provide substitute technologies, formulation and technical consultation to such enterprises, etc. In addition, this Technical Support System will provide for conduction of a series of workshops to inform and train very low-consuming foam enterprises (who are not eligible for investment projects) on ODS phaseout requirements.

3.7 Policy initiatives for addressing Ineligible enterprises: Ineligible enterprises will not be funded under the sector plan. The CFC-11 consumption phaseout of these enterprises will be realized via the following policy initiatives and measures: (1) ban on new production facilities which use ODS, (2) quota systems for CFCs, etc.

E. SELECTION OF SUBSTITUTE TECHNOLOGY

3.8 The following factors are to be considered when selecting substitutes and substitute technology. The chosen technology should :

a) be benign to the Ozone Layer and the environment;
b) ensure worker safety and health;
c) discourage replacement with low ODP substance or high GWP substance;
d) provide equal capacity as former substances and technologies used; and
e) be cost effective.

3.9 Rigid Foam: The three currently prevailing phaseout technologies for PU rigid foam products are pentanes, water and HCFC-141b technologies. Other technologies such as HCFC-22/142b and HFC-134a can also be used but these technologies always require extensive adjustment of the current production process.

a) *Pentane* technology is commercially proven and extensively used. It has zero ODP and GWP, but is flammable and needs careful review of manufacturing operations. Because of the related safety costs, it is not cost-effective to use pentanes in smaller enterprises. In the foam sector, no enterprise in Indonesia has implemented pentanes. Cyclopentane has been implemented in domestic refrigeration conversions in Indonesia.

b) *Water blown (CO2)* technology is another zero ODP technology and is commercialized in Indonesia for the application of non-insulation foam. The disadvantage of water blown technology is that it requires changes of foaming machines and formulations. It is not applicable for insulating rigid foams, as it does not provide the insulation properties required in the final products. Water-based formulations tend therefore to be most applicable in relatively less critical applications, such as acoustical application and floatation devices

c) *HCFC-141b* has an ODP of 0.11. Its application is proven, mature, relatively cost-effective and it is locally available. HCFC-141b can, however, be destabilizing in higher concentrations, being a strong solvent, which would lead to the need to increase the foam density. As an interim option, its application would only be recommended if permanent options do not provide acceptable solutions. Most rigid foam conversion in MLF projects in Indonesia have been made using HCFC-141b.

d) *HCFC-22* has an ODP of 0.05 and is under ambient conditions a gas. It is not offered as a premixed system and would require an on-site premixer. It has at times been promoted as a co-blowing agent with HCFC-141b to increase the cell-pressure and thus to decrease potential shrinkage. However, this technology never has gained significant market recognition, mostly because of the general presumption against HCFCs in this area.

e) *HFC-134a* is under ambient conditions a gas. It is not offered in the applicable regional area as a premixed system and would require an on-site premixer. It is also less energy efficient, and expensive compared to most other technologies.

3.10 Integral Skin Foam: The presently available substitute technologies for integral skin foams are hydrocarbons, water blown and HCFC-141b.

a) *Hydrocarbons* are zero ODP solutions that have been used by some European companies, and is used in many shoesole applications. The drawback is the inherent flammability of these systems, requiring process exhaust as well as a gas sensing/alarm system. It is generally applicable only with enterprises that are large enough to warrant it from a cost and safety standpoint.

b) *Water-blown* systems have no ODP, making water blown a favorable final solution. However, the skin formed is much thinner and there is an increased friability. In-mold coating is frequently required, which increases cost and production time. The durability of the product is less than with CFCs, HCFCs or hydrocarbons. Water-blown polyester polyol formulations do provide the required physical properties, but are more expensive and require equipment that can handle the higher viscosity.

c) *HCFC-141b* is an interim solution. The process conditions of HCFC-141b is very similar to that of CFC-11. The safety issue is minor and the quality of the final product will be very close to that of CFC-11. The disadvantage of this option is that HCFC-141b still has an ODP of 0.11.

d) *HFC-134a based systems* are generally offered by suppliers from the USA. The resulting product approximates the old CFC-11 blown products but the skin is thinner. The shrinkage rates are approximately the same as for CFC-11 systems. Handling of HFC-134a can be problematic. It is a gas at room temperature, and must be dissolved into the polyol system. Special equipment is required, including pressurized tanks and a gas handling system for dissolving the gas in the polyol component. It can be supplied pre-mixed, and when handled properly, can be kept dissolved in the polyol. However, the user should have facilities available to re-dissolve the material in the polyol. Storing the pre-mix under a blanket of HFC-134a helps to keep the gas in solution. In tropical climates, handling may become quite difficult.

e) *LIQUID HFCs* (HFC-245fa, HFC-365mfc) are not yet commercially available but suitable systems are already technically developed. They are expected to commercially emerge in 2002/2003 and their application will certainly focus on those countries limiting the use of HCFCs. The systems are much like HCFC-141b but will be significantly more expensive. They will not be considered in this project as they do not meet the requirement of commercial availability.

3.11 Selection of Alternative Technologies

a) For the <u>rigid foam applications</u>, the conversion technology selected is HCFC-141b, based on the size of the enterprises involved (small) and the products produced (generally having insulation requirements). HCFC-141b is an interim technology with residual ODP of 0.11, and enterprises are required to convert to a non-ODS solution at their own expense by 2040.

Cyclopentane is limited to larger operations, which will qualify for enough funding to cover the expense of a pentane installation with all of its required safety features. Three of the panel manufacturers approach this threshold, but due to the very large capital investments required, the funding limitations for the remaining foam sector phaseout, and the fact that hydrocarbon technology has not been implemented in any foam project in Indonesia to date, this technology option is not selected, even for the larger enterprises.

Water-based systems do not provide the required physical properties in the end product.

With HCFC-141b, enterprises that already have high pressure foaming machines will need to retrofit their baseline equipment to apply new HCFC-141b systems. Enterprises with low pressure foaming machines will in most cases need to purchase high pressure foaming machines in order to use HCFC-141b.

b) The technology choice for the <u>integral skin foam</u> enterprises is water-based formulations for most enterprises, based on the types of products produced and the requirements for skin formation. In exceptional situations (for instance, when skin formation is vital and appropriate coatings are not available or are too expensive) HCFC-141b may be used as an interim solution. Exceptional circumstances can include availability of water-based systems, and final product performance of water-based systems.

Information on Equipment and Chemical Suppliers

3.12 Foam equipment in Indonesia is supplied by both domestic and international suppliers.

3.13 **Foam Dispensers:** The major international suppliers for high-pressure foam dispensers are:

Cannon	Hennecke
Krauss-Maffei	OMS
SAIP	GMA

3.14 A typical standard high pressure dispenser consists of a pair of chemical tanks (polyol, isocyanate) with auto-refill system from chemical storage drums. The tanks most often include thermal control for temperature conditioning of the chemical components. Chemicals are recirculated to a three-way valve at the mixing head. The mixing head is generally a self-cleaning impingement mixer, which can be mounted on a boom, or on a movable beam, to allow it to reach all required dispensing points. The entire dispenser could also be mounted on a lorry and rail system if plant layout requires such an arrangement. These are generally PLC controlled dispensers, and include ancillary equipment such as chillers and driers. Some of these suppliers have also developed compact versions of a high pressure dispenser which offer almost the same foam quality with fewer of the sophisticated options, and at generally lower prices.

3.15 Suppliers for small, mobile machines tend to include:

GFT	Glas-Craft/Glas-Mate
Gusmer	Graco
Intergun	TecMac

3.16 Dispensers in this category are generally small mobile high pressure dispensers with output from 7 to 20 kg/min, although there are some mobile dispensers on the market with higher outputs to 25-30 kg/min. Piston pumps are typical with no chemical recirculation, and mixheads may be either pneumatically or hydraulically actuated. Mixheads are generally hand-held guns that can be configured in a variety of ways. A wide variety of options is available within this general category of small, mobile dispensers. This category includes sprayfoam dispensers, pour-in-place dispensers and mobile high pressure dispensers.

3.17 Other dispensers that may be required could include standard low pressure dispensers, or boxfoam dispensers geared either to flexible or rigid boxfoam production.

3.18 Chemical Suppliers: The chemical suppliers in Indonesia are as follows:

a) Bayer
b) BASF
c) Dow Chemical
d) Huntsman
e) Small regional/domestic suppliers

3.19 Survey to major chemical suppliers provides the estimated polyol demands as per 2002 for domestic consumption as described below:

CHEMICAL SUPPLIER	POLYOL CONSUMPTION OF 2002 (MT)		
	Rigid Foam	MOLDED	Integral Skin
Huntsman (principal)	900	100	50
BASF (principal)	100	N/A	60
Vecto (principal)	100	N/A	N/A
Dow (principal)	50	300	N/A
Bayer (principal)	N/a	300	N/A
Tansri Gani (Distributor)	150	40	60
Jaya Abadi (Distributor)	250	250	40
Others; unidentified demands	150	100	50
TOTAL	1600	1190	260

3.20 Most regional/domestic suppliers are local and much smaller than these large international corporations. All chemical suppliers can provide CFC-11 and HCFC-141b systems, while only international suppliers and leading domestic suppliers can provide hydrocarbon and water blown systems.

IV. POLICIES

F. INTRODUCTION

4.1 Enterprises in the foam sector face several operating challenges which limit their willingness to phase out CFC on a voluntary basis: lack of readily available and low cost substitute technologies, limited capital resources, and the need to maintain quality, market share and profitability. Even though they can receive some financial assistance from the MLF, many enterprises are still reluctant, or lack motivation, to phase out CFCs because they prefer the familiar existing techniques, and would be averse to the uncertainties and disadvantages of changing technological processes (with potentially higher operating costs, lower product quality, or higher safety and health concerns).

4.2 The Government will therefore establish a policy structure to complement MLF funding to ensure CFC phaseout in the sector, and will promote the transfer and dissemination of suitable substitute technologies, and to provide training for workers. Only by establishing and enforcing policies and regulations, can it influence the activities of enterprises and consumers to participate actively and quickly in PU foam conversion. While the key policy instrument for CFC-11 phaseout in the foam sector will focus on the supply side, by controlling and monitoring the production and import of CFC-11 to ensure that consumption targets are reached, it is also necessary to meet the demand for blowing agent and maintain growth in the foam sector by ensuring supply of alternative technology and substitutes.

G. POLICY OBJECTIVES

4.3 The objectives of the phaseout policies are to achieve the following:

a) Ensure that the consumption of CFC-11 in the foam sector is reduced as scheduled;

b) Provide incentives for enterprises to phaseout CFC-11 and adopt environmentally benign substitute technologies;

c) Ensure the phaseout target of CFC-11 consumption in the foam sector is achieved according to schedule;

d) Encourage the propagation of low cost, technically suitable substitutes to replace CFC-11 blowing agent;

e) Promote the development and dissemination of substitute technology;

f) Encourage consolidation and regrouping of enterprises; and

g) Ensure that the growth of the foam sector is not affected by meeting the phaseout targets.

H. POLICY DESIGN INPUTS

4.4 The following factors are relevant for a policy framework for the foam sector:

a) Description of existing regulations;
b) The specific Indonesian situation, taking into account the characteristics of the foam sector, such as large numbers of geographically scattered enterprises, demands for foam production, etc.;
c) The framework of policies for ODS phaseout in the Country Program;
d) The need to maintain continuity and consistency of these policies with the existing policy and regulation system;
e) Ensuring feasibility of the policies, as also continued supervision and management; and
f) Economic efficiency and fairness.

I. DESCRIPTION OF POLICY INSTRUMENTS

Table 4.1:Policy Framework for ODS Foam Sector

OBJECTIVES	POLICY
Control supply of CFC	To be covered by the overall control import system
Control consumption of CFC	To be covered by the overall control import system
Encourage phaseout activities on a voluntary basis	Public awareness
Guarantee safety and health with substitute technology	Technical support system
Encourage complete phaseout in the specific regions	Public awareness
Encourage selection of environmentally friendly substitute technology	Technical support system

4.5 Import license system : The Government of Indonesia currently operates a CFC import licensing system. Importation, while controlled, is allowed until 2007. After completion of an ODS phaseout project, a company will not anymore be eligible for an import license.

It is foreseen to more aggressively pursue this license system to limit CFC consumption and to counter unlicensed importation. To this purpose, the MLF has separately approved a study of CFC imports that will develop the necessary policy instruments and technical assistance programs to prevent unauthorized import of CFCs

4.6 Safety regulations for using flammable substitutes as blowing agent: As some substitutes are flammable, safety regulations will be promulgated to prevent fire accidents and guarantee the safety of workers.

4.7 Promotion of environmentally friendly substitute technology: Indonesia will promote the selection of environmentally-friendly, safe and cost-effective substitute technologies, considering not only ozone depletion but other environmental effects as well.

4.8 Regional policies: Each region will be encouraged to promulgate its own ban on CFC-11 consumption in the foam sector ahead of phaseout schedule based on its own situation. Regrouping and consolidation of enterprises in the region will be encouraged.

4.9 Ban on consumption of CFC-11: A ban on CFC-11 consumption will be promulgated by January 2007, and CFC-11 use in the foam sector will be banned from January 1, 2010.

J. POLICY ACTIONS

4.10 Policy actions related to ODS phaseout in the foam sector will include the following:

a) Control supply of CFC-11 by aggressively enforcing the existing ODS import license system and the issuance of quotas;
b) Ban CFC-11 consumption in the PU foam sector by the end of 2007;
c) Decrease consumption by implementing phaseout projects;
d) Formulate and promulgate policies to ensure the implementation of the sector plan;
e) Conduct training and public awareness campaigns to promote substitute technologies and encourage enterprises to actively participate in phaseout activities;
f) Provide technical assistance to enterprises for selection of substitute chemicals, formulation and substitute technology; and
g) Formulate technical norms and safety standards of substitute and alternative technologies.

4.11 The Foam Sector Plan is expected to be executed with all Phaseout actions starting after approval and completed by end of 2007 as described in the Action Plan (Chapter VIII)

V. INCREMENTAL COSTS ANALYSIS

K. GENERAL PRINCIPLES

5.1 The incremental costs for the PU foam sector have been calculated using the following approach:

a) Calculate the remaining eligible consumption of CFC-11 in the sector;
b) using MLF guidelines, calculate the incremental conversion costs of the 30 eligible enterprises identified in the survey, according to the sub-sectors (rigid and integral skin (ISF/FMF));
c) calculate the phaseout costs ($) of each sub-sector;
d) compare these costs with the sub-sector thresholds under MLF guidelines, and use the lower of the two costs in each case to establish the eligible grant amount for the sector as a whole;

5.2 The costs calculation is based on information on the total number of eligible CFC consuming PU foam enterprises for which detailed baseline information has been collected. Actual conversion costs have been calculated based on baseline information.

5.3 Chemical Prices used for IOC Calculation. The chemical prices used for calculating IOC were derived from the following:

a) The prices used in the latest projects approved by ExCom;
b) Price information in completed projects; and
c) Current prices obtained from the market.

Table 5.1 Chemical Prices used in the Sector Plan

Chemical Systems (US$/Kg)			
Application	CFC-11-based systems	HCFC-141b-based systems	Water-based systems
Price	2.50	2.80	3.00

Rigid Foam Sub-sector

5.4 Rigid foam is produced by a large number of companies of various sizes spread all over Indonesia. Thirty five rigid foam projects have so far been funded by the MLF. The main products include pipe, panels, refrigeration equipment, cold storage, construction insulation, and packing materials. The various products set specific requirements for the foaming equipment. In general, low pressure equipment can be used for products without insulation performance requirements. High pressure equipment must be used for products where insulation performance is essential.

5.5 The survey has identified 31 remaining CFC consuming enterprises in the rigid foam sub-sector, of which 20 are eligible for funding. The remainder were established after July 25, 1995 and are thus not eligible for funding.

5.6 The survey also revealed many rigid foam enterprises with a very low and irregular blowing agent consumption. Identifications of these enterprises led to conclusion that these enterprises have not been in PU business as core business, they procured chemical systems from second and third tier suppliers without sufficient knowledge on what blowing agent was used in the polyol. These enterprises are too small to be eligible for investment projects, and will receive training on ODS phaseout through a series of 8 technical workshops (corresponding to regions in Indonesia) under the Technical Support Service part of the plan.

5.7 The replacement technology selected by Indonesia for the remaining rigid foam enterprises is HCFC-141b. During implementation, commitment letters from the enterprises will be collected. Part of this process includes informing the enterprises fully on the implications of choosing HCFC-141b as an alternative technology, as well as presentation of the costs and consequences of other technology choices.

5.8 Of the 20 eligible enterprises, analysis of the baseline equipment reveals the following with the related required actions:

Table 5.2 Equipment related actions

Handmix (7)		Replace by high-pressure dispenser
Low pressure Dispensers (10)		Replace by high-pressure dispenser
High Pressure dispensers	Standard HPDs (1)	Use as is
	Gusmer (FF1600 and H-2000)	Retrofit

5.9 The incremental capital costs for HCFC 141b technology are calculated based on:

High pressure dispenser	$80,000/machine
Retrofit of FF1600	$ 6,000/machine
Retrofit of H-2000	$12,000/machine
Trials	$ 5,000/enterprise
Contingency	10% of net ICC
Deductions	handmix – 50%
	Age of baseline as needed

5.10 The calculation of the Incremental Capital Costs for the Rigid foam sub sector is as follows:

Table 5.3 Calculation of Incremental capital Costs for Rigid Foam

Item	Unit Cost	Quantity	Total Cost
High Pressure dispenser	80,000	17	1,360,000
Deductions (handmix)	(40,000)	7	(280,000)
Deductions (age of baseline dispenser)	(3,000)	1	(3,000)
Retrofit of FF1600	6,000	2	12,000
Retrofit of H2000	12,000	2	24,000
Trials	5,000	20	100,000
Sub-Total			**1,213,000**
Contingency (10%)			121,300
TOTAL			**1,334,300**

5.11 Density increase. The OORG report on density increase, (UNEP/Ozl.Pro/ExCom/31/61 read with Decision 31/44) is used for determining the density increases necessary to maintain product quality. The density increase does not address insulation performance. Based on weighted core density of baseline foam products and OORG density report, the following percentages in density increase are used:

	Panel	Pipe	Spray foam
Baseline foam density (kg/m3)	41-44	33-35	32-35
Density increase in 1st year	4%	6%	6 %
Density increase in 2nd year	0%	3%	3%

For costing purposes in this project, a 5% density increased has been applied for simplicity.

5.12 The incremental operating costs are based on current chemical systems prices. IOCs are calculated based on chemical systems usage, applying a 5% density increase as shown below:

Table 5.4 Incremental operating costs for HCFC-141b blown foam

	CFC blown foam			**HCFC-141b blown foam**		
Chemicals	Tons	$/kg	Unit costs	Tons	$/kg	Unit costs
Systems	1,725	2.50	$4,312,500	1,811	2.80	$5,070,800

5.13 Based on these assumptions, the incremental operating costs in converting to HCFC 141b for the 20 identified eligible enterprises is $ 758,300/year. The net present value (NPV) at 10% for 2 years is:

$ 758,300 x 1.74 = $1,319,400.

5.14 Based on the above figures, the incremental costs for the rigid foam sub-sector conversion are:

Table 5.5: HCFC-141b Conversion Costs for Identified Enterprises

	No of enterprises	Net Incremental equipment Costs	Trials	Contingency	IOCs	Total Costs
Total	**20**	**$ 1,113,000**	**$ 100,000**	**$ 121,300**	**$ 1,319,400**	**$ 2,653,700**

5.15 The maximum allowable grant based on the rigid foam sub-sector threshold is:

196.1 ODP tons x US$7.83/kg ODP = **US$ 1,535,463**

L. INTEGRAL SKIN FOAM SUB-SECTOR

5.16 There are 13 identified CFC consuming enterprises in the Integral Skin Foam sub-sector, of which 10 are eligible for funding. The other three were established after July 25, 1995 and are therefore ineligible. Of the 10 eligible enterprises, 4 manufacture shoesoles, and the other six manufacture foam for automotive and/or furniture (arm rests) applications.

5.17 The replacement technology selected by Indonesia for the remaining integral skin foam enterprises is water-based systems to the extent possible, with use of HCFC-141b if water-based systems are unavailable or final product performance is unsatisfactory.

5.18 Of the 10 eligible enterprises, analysis of the baseline equipment reveals the following with the related required actions:

Table 5.6 Equipment related actions, ISF

Handmix (1)	Replace by low pressure dispenser
Low pressure Dispensers (10)	3 eligible for retrofit for thermal control and new polyol pumps; remaining 7 not eligible for action
High Pressure dispensers (2)	Use as is

5.19 The incremental capital costs for water-based (CO_2) technology are calculated based on:

Low Pressure dispenser	$ 25,000/machine
Retrofit of low pressure dispensers	$25,000/machine
Mold Temperature conditioning	$ 2,000/enterprise (non-shoe)
Trials	$ 5,000/machine
Contingency	10% of net ICC

5.20 The calculation of the Incremental Capital Costs for the Integral Skin foam sub-sector is as follows:

Table 5.7 Calculation of Incremental capital Costs for Integral Skin Foam

Item	**Unit Cost**	**Quantity**	**Total Cost**
Low Pressure Dispenser	25,000	1	25,000
Retrofit of low pressure dispenser	25,000	3	75,000
Mold Conditioning (thermal control)	2,000	3	6,000
Trials	5,000	10	50,000
Sub-Total			**156,000**
Contingency (10%)			15,600
TOTAL			**171,600**

5.21 The incremental operating costs are based on current chemical systems prices. IOCs are calculated based on chemical systems usage, applying a 10% density increase as shown below. For shoesoles, a density increase is probably not going to be experienced, although for the automotive and furniture applications, an increase up to 15% may be experienced. This density increase is required to replicate the thick skin achieved by CFC-11 blowing. With water-based foam, this skin must be achieved by packing; hence increased density.

Table 5.8 Incremental operating costs for water blown ISF

	CFC blown foam			**Water blown ISF**		
Chemicals	Tons	$/kg	Unit costs	Tons	$/kg	Unit costs
Systems	1,038	2.50	$2,595,000	1,142	3.00	$3,426,000.

5.22 Based on these assumptions, the incremental operating costs in converting to water-based ISF systems for the 10 identified eligible enterprises is $831,000/year. The net present value (NPV) at 10% for 2 years is:

$831,000 x 1.74 = $1,445,940

5.23 Based on the above figures, the incremental costs for the ISF sub-sector conversion are:

Table 5.9: Water-based Conversion Costs for Identified Enterprises, ISF

	No of enterprises	**Net Incremental equipment Costs**	**Trials, technology transfer, training**	**Contingency**	**IOCs**	**Total Costs**
Total	**10**	**106,000**	**$50,000**	**15,600**	**$1,445,940**	**1,617,500**

5.24 The maximum allowable grant based on the integral skin foam sub-sector threshold is:

83 ODP tons x US$16.86/kg ODP = $1,399,380

M. CALCULATION METHODOLOGY

5.25 **Incremental costs calculation.** Incremental costs (IC) for CFC-11 phaseout in the foam sector are based on actual costs to the extent possible. Incremental operating costs are calculated based on systems usage and factor in average density increases as appropriate.

5.26 **Incremental Costs for technical assistance** activities may include some or all of the following activities:

a) technical assistance for preparing equipment specifications;
b) technical equipment bid evaluation from suppliers during the competitive bidding process;
c) technical guidance to the recipient enterprise during start-up with the new equipment or process, including instruction on the safe use of substitute technologies;
d) technical evaluation with the enterprise on the results of product and process trials;
e) resolution of problems with new equipment or processes (which in difficult cases can result in significant inputs of time, money and effort to achieve satisfactory conclusions);
f) technical project commissioning including final technical inspection of equipment and process for establishing completion and compliance with project objectives such as the destruction of the existing ODS equipment where applicable, verifying that no ODS stocks remain, and verifying that the non-ODS production process was in operation;
g) technical evaluation of enterprise reimbursement claims on equipment, raw materials, local works and other items and technical certification of the same;
h) technical clearance so that the Hand-over Protocol can be signed and the project closed;
i) collection during the Hand-over Protocol of enterprise data on use of IOCs and other production/consumption data as required under new format project completion reports.

N. TOTAL INCREMENTAL COSTS

Table 5.10: Summary of Incremental Costs of Eligible Consumption by Sub-Sectors

	Identified Eligible Consumption (MT)	ODP Phased Out (MT)	Incremental Capital costs (US$)	Incremental Operating costs (US$)	Total Incremental costs (US$)	MLF threshold (US$/kg)	Requested Funding (US$/kg)
Rigid foam	215	196.1	1,334,300	1,319,400	2,653,700	7.83	1,535,463
Integral skin foam	83	83	171,600	1,445,940	1,617,540	16.86	1,399,380
TOTAL	298	279.1	1,505,900	2,765,340	4,271,240		**2,934,843**

5.27 A schedule for phasing out CFC-11 is presented in Chapter VII. The real incremental phaseout cost to Indonesia is US$4,271,240, and is calculated based on relevant ExCom guidelines (summarized above). Considering the MLF thresholds, the funding request for phaseout of CFC-11 in the entire PU foam sector is adjusted to account for maximum allowable grants. The adjusted total funding request for investment costs is US$ **2,934,843**.

O. MANAGEMENT COSTS AND TECHNICAL SUPPORT

5.28 It is proposed that a project implementation and monitoring unit be established to provide the Government with necessary support to carry out all activities proposed under this plan. This foam sector phaseout plan entails CFC phase out activities in the foam manufacturing sector. In total, this plan will involve CFC phase out activities in 25-30 private enterprises, in addition to a series of activities to establish a policy and regulatory framework to support sustainable CFC phase out in the foam sector. Implementation of this proposed plan will involve a significant amount of administrative work to facilitate the development of the policy and regulatory framework, identification of additional end-users, development of enterprise-level project proposals, resource allocation for investment activities, public awareness activities, and other activities including necessary audit works. Implementation of this plan requires a project implementation and monitoring unit with full-time staff.

The following activities, but not limited to, will be managed or carried out by the Project Implementation and Monitoring Unit:

5.29 Regulations

The project management team will assist the NOU to undertake the following:

- To develop sector specific phase-out schedules for CFC imports.
- To enforce existing prohibition on the use of CFC-11 in the foam production from 2007 onwards;
- To attach a condition prohibiting the sales of CFC-11 for the use as a blowing agent, to all import licenses issued from 2005 onwards;
- To ban the use of CFC-11 in the production of pre-mixed CFC-11 polyol;
- To include pre-mixed CFC-11 polyol in the list of restricted products whose imports require review and approvals, from 2007 onwards;

5.30 Project Implementation

The project management team will undertake the following activities under supervision of the NOU:

- Prepare standard implementation procedures for eligible enterprises that would like to seek funding from the resources provided by the Multilateral Fund;
- Assist eligible CFC consuming enterprises prepare proposals to obtain financial support from the funds provided by the Multilateral Fund to phase out their use of CFCs;
- Arrange technical support, on a need basis, to assist enterprises to identify appropriate non-ODS technology;

- Review and approve proposals submitted by eligible enterprises;
- Prepare an annual progress report of the overall implementation of the Foam Sector CFC phase out plan in accordance with any ExCom procedures for this task;

5.31 PUBLIC AWARENESS

The project management team will undertake the following tasks under supervision of the NOU:

- Disseminate information related to the Government's policy to phase out CFCs in the foam sector in 2007;
- Inform the industry of the availability of funds provided by the Multilateral Fund to support CFC phase out in the foam sector in Indonesia;
- Raise public awareness of the environmental and economic impact of ozone layer depletion to the public via newsletters, news articles, seminars, radio spots;

5.32 MONITORING

The project management team will assist NOU to carry out the following tasks:

- Update the information on the actual amount of imported CFCs with the Custom Department on a quarterly basis;
- Monitor import of HCFC-141b;
- Train Ministry of Environment officers to identify and monitor CFC use at the enterprise level;
- Inspect warehouse of CFCs and HCFCs importers;
- Report any incidents of illegal import of CFCs in the foam sector;
- Carry out safety and technical audits of all projects undertaken under this plan as needed;
- Update the consumption data at the end-user level once every two years and prepare a revised strategy, if necessary;
- Prepare progress reports and annual work plans for submission to the ExCom;
- Maintain good account of all the expenditures incurred by this project.

5.33 Table 5.11 shows the requested for the costs of one additional technical specialist to be added to the Sector Project Management Coordination Unit (SPMCU) and consultancy services to cover the operation of the Implementation and Monitoring Unit in Indonesia during the implementation of this sector phaseout plan. One time costs are US$ 45,000 for Policy support and Public Awareness and US$ 80,000 is operational expenses for one expert for four years (US$20,000/year).

Table 5.11 Project Implementation and Monitoring Unit (2003 – 2007)*

Description	US $
Regulatory and Policy Support	15,000
Project Implementation and Management	50,000
Public Awareness	30,000
Monitoring Activities	30,000
Sub-total	125,000
Contingency 10%	12,500
Total	137,500

*After 2007, the remaining tasks will be carried out by the National Ozone Unit

5.34 Table 5.12 shows the requested funds for operation of the Technical Support System in Indonesia during the implementation of the Sector Phaseout Plan. This system will provide for technical support to small enterprises as described in the project document, as well as providing workshops and training for very small and irregular users who may not be eligible for investment projects due to their size and the nature of their business.

Table 5.12 Technical Support System (2003 – 2007)

Description	US $
Support System for Small Enterprises	
Technical Transfer	50,000
Training	50,000
Support cost	25,000
Technical Assistance for Very Small/Irregular Users	64,000
Sub-total	189,000
Contingency	18,900
Total	207,900

P. PROJECT IMPACT

5.35 The project costs and impact are summarized in Table 5.13 below.

Table 5.13 Project Summary

Description	ODP Phaseout Amount	Project Costs (US$)	Grant Request (US$)
Investment Component	279.1	4,271,240	2,934,843
Management Costs	0	137,500	137,500
Technical Support	54	207,900	207,900
Total	**333.1**	**4,616,640**	**3,280,243**

5.36 The grant effectiveness of the entire project is US$9.85/kg ODP. For the investment portion, the grant effectiveness is $10.52/kg ODP.

5.37 Of the ODP phaseout attributed to the project (333.1 ODP tons), a large portion of that is accounted for by the reallocation of remaining tonnage from two previously approved projects for AFI, leaving only 82.7 ODP tons to be accounted for from remaining consumption.

ODP phaseout from sector phaseout project:	333.1 ODP t
Reassigned from IDS/FOA/INV/77:	95.4 ODP t
Reassigned from IDS/FOA/INV/78:	155 ODP t
Remainder:	82.7 ODP t

VI. OPERATING MECHANISMS

Q. INTRODUCTION

6.1 Upon approval of this project, the Government of Indonesia will introduce additional policy measures and take other actions, as described in chapter IV, to achieve a rapid cost-effective CFC-11 phaseout in the foam sector. This chapter explains the funding arrangements, operating mechanisms, and the responsibilities of major institutions involved in implementation of this sector plan.

R. UMBRELLA GRANT AGREEMENT

6.2 Indonesia and the World Bank have signed an Umbrella Grant Agreement which sets forth the terms and conditions under which grant resources approved by the ExCom in sector approaches in Indonesia would be carried out. The existing umbrella grant agreements between the Bank and Indonesia under which project-by-project activities are carried out will also be used for this project.

S. FUNDING ARRANGEMENTS

6.3 **MLF Approval**.

It is understood that funding could either be provide as a one time funding at the 42nd meeting or in tranches over a four year period. It both cases, Indonesia would agree to a ceiling of import of CFC-11 for the foam sector as given in the table in the Executive Summary and in table under Action Plan. If the total amount is released at the 42nd meeting, the Bank would report consistent with progress reporting requirements. If released in tranches, the existing agreement for the refrigeration sector could be amended to include the foam sector. Funding would be released in tranches as described in the following and reporting would be through annual programs.

a) Firstly, the Government, through the World Bank, requests that the ExCom consider this overall sector plan and agree to fund the Foam Sector CFC-11 Phaseout with annual advances provided that Indonesia meets the annual phaseout target. Indonesia will also request ExCom to fund the first Annual Program.

b) From 2004 onwards, the Government would submit an annual program at the last ExCom meeting each year with a funding request. The amount of annual funding request would be consistent with the funding amounts indicated in the overall sector plan. For example, The World Bank, on behalf of the Government, would submit the 2005 annual plan to the ExCom in time to allow for funding approval by November 2004. The ExCom would be asked to release funds by December 2004 at the levels agreed to in this sector plan based on achievement of previous phaseout targets, so that the annual program could start in January 2005. In general, approval of funds would be based on achievement of CFC-11 phaseout targets in the foam sector.

c) Annual plan program funding requests would be based on achievement of CFC-11 phaseout targets for the previous years and the semi-annual progress report for the current year. For example, 2004 funds would be approved based on 2002 phaseout results and the 2003 semi-annual progress report, and so on.

6.4 In the unlikely event that Indonesia were to fail to achieve phaseout targets for a given year (that is CFC-11 consumption in the foam sector exceeds the target, or contracts signed less than the phaseout target for the year), the Bank and Indonesia would agree on remedial actions. New funding requests to the ExCom would go forward only after phaseout targets had been met.

6.5 By the time any over-consumption for a previous year is confirmed, the current year's Annual Program would be most likely having already been started and be underway. Thus, the proposed approach to remedial action is to bring the program back on track by the end of the current year. For example, if over-consumption occurred in 2002, remedial actions would ensure that, by the end of 2003, cumulative CFC-11 consumption for the two years, 2002 and 2003 would not exceed the combined targets for the two years. The remedial actions taken to assure this result would be submitted along with the next year's funding request (refer to 2004 in the above-mentioned example). The ExCom would therefore be in a position to decide either to release funds or condition release funds for the next year's Annual Program upon accepted evidence showing that the remedial actions were successful and the cumulative consumption of the previous two years did not exceed the combined targets. This approach to remedial action allows the program to maintain momentum and keeps the phaseout schedule on track even if difficulties arise in a particular year.

6.6 If the program is still not back on track within two years, continued funding of the program could be based on a reduced level of compensation. Under this plan, grant funds would be released for Annual Programs and disbursed through the World Bank to Indonesia to achieve specific phaseout targets. Therefore, even if delays are expected in any given year, the Bank, on behalf of the Government will still submit request for funding approval for the next calendar year for phaseout targets in the following year. However, if it is proved that a delay is persistent and the phaseout targets could not be achieved within the schedule set in the approved Foam Sector Plan , funds proportional to phaseout shortfall would be returned to the Multilateral Fund.

6.7 Annual Program would contain the following sections:

a) sector phaseout schedule;

b) status of all activities of previous year(s) and any agreed remedial actions for the current year (not required for the first implementation program covering July 2003 to December 2004).
c) objectives of following year's Annual Program – phaseout targets and funding requirements for activities in the following year[2];
d) description of activities in the following year – enterprise level activities, policies to be implemented and technical assistance activities; and
e) performance indicators of the annual program.

6.8 The World Bank would approve the technical assistance consistent with the Annual Program based on the agreed TOR of TA (including the funding level of TA) in that year's Annual Program. Procurement of consultant services and equipment will be based on agreed Bank procurement procedures for all TA activities.

T. DISBURSEMENT MECHANISM

6.9 Multilateral Fund (MLF) disbursement to the World Bank --The MLF will deposit the agreed annual funding to World Bank shortly after ExCom approval of the Annual Program.

6.10 World Bank disbursement to Indonesia – Method of disbursement of funds from World Bank to the government of Indonesia are established in the umbrella grant agreement between the World Bank and Indonesia. All such disbursements will follow the procedures as outlined in said agreement. Funds will be deposited in the ODS Phaseout Account for release to or for the benefit of eligible enterprises in the course of project implementation. All funding disbursements are conditional upon meeting the established phaseout targets and activities as planned for in the annual plans.

6.11 Disbursement mechanism.

a. Financial administration mechanism including disbursement modality of the project shall continue to apply the existing procedures by retaining existing Financial Administration Agent.

b. Incremental cost components (investment part of grant fund) would be disbursed directly from the ODS phaseout account to recipients through the Financial Administration Agent based on terms and conditions in the "Sub-grant Agreement" for enterprise activities, and

[2] Total grant funding for each year would be agreed along with this sector plan proposal. However, Indonesia would have flexibility in each Annual Program to allocate funds within enterprise-level or TA activities to achieve phaseout targets.

c. Non-investment components including training contracts for technical assistance activities will be administered and disbursed through Project Management Team with supervision from NOU.

U. MANAGEMENT AND COORDINATION

6.12 This Sector Plan for CFC-11 Phaseout in Foam Sector will be executed by the National Ozone Unit. The National Ozone Unit will maintain responsibility for:

- Verification of eligibility of participating enterprises
- Monitoring procurement of equipment
- Coordinating technical assistance for phaseout projects at individual enterprises
- Verifying destruction of baseline equipment as applicable
- Verifying depletion of ODS inventory at participating enterprises
- Disbursement of funds to eligible enterprises as required
- Providing data for annual reports to the World Bank in a timely manner
- Resolving issues that might result in project delays

V. MONITORING AND EVALUATION

6.13 **NOU's role** - core organization for monitoring implementation of Annual Programs for CFC-11 consumption phaseout in the foam PU sector and reporting to the World Bank.

6.14 **Role of World Bank** - independent annual verification as required by ExCom to verify CFC-11 consumption level. The Bank will supervise the implementation of Annual Programs including spot checks of the records of on-going projects and random factory visits.

6.15 **Audit.** There will an annual financial audit of the ODS Phaseout Account, conducted by an independent audit agency acceptable to the Bank.

6.16 **CFC-11 consumption verification.** Will be undertaken annually by an independent organization acceptable to the Bank and the report will be provided to the ExCom as part of the annual program reporting.

VII. ACTION PLAN

Line		Baseline (2001)	2002	2003	2004	2005	2006	2007	2008	2009	2010
Phaseout targets and project impacts (MT)											
1.	Domestic consumption target	2651	2583	2515	2046	1270.2	688.4	232.7	[66.2*]	[66.2*]	0
2.	ODP impact targeted for contracts	0	0	145	130	55	53	0	0	0	0
3.	Actual impact of ongoing projects	--	68	469	775.8	452	300	100	0	0	0
4	Phaseout impact of sector plan	0	0	0	0	129.8	155.7	66.5	0	0	0
Funding Request (000 US$)											
5.	Investment Projects	0	0		1,600	1,200	135	0	0	0	0
6	National SPMCU and supporting activities	0	0		70	30	20	17.5	0	0	0
7.	Technical support system	0	0		70	62	52	23.9	0	0	0
8.	Total	0	0		1,740	1,292	207	41.4	0	0	0

Explanations: This is a rolling plan where the impact of an annual program is spread over subsequent years. Every annual program will provide detailed progress of all program activities of previous years, including policy implementation, enterprise activities, and technical assistance activities. The following explains lines 1 to 4 in the above table, as well as the composition of each Implementation/Annual program.

1. Line 1 – the domestic consumption target in the foam sector is derived from the following formula:

Consumption target in foam sector = total available consumption of CFC-11 in the country, minus CFC-11 consumption in all other CFC-11 consumption sectors.

2. Line 3 - Estimated actual impact of ongoing projects taking into account already achieved impact and actual consumption in 2001.

3. Indonesian Country Program requires that all consumption stops in 2007 and the consumption is zero in 2008. However, as this will be the Indonesian responsibility at its own costs, the agreement with ExCom should allow for 66.2 tons for 2008 and 2009.

4. **First Implementation Program** (for 2004): the following activities are 'captured' under this program:

    a. Line 2-Phaseout targets for the sector plan: new investment project contracts with enterprises for phasing out 275 MT of CFC-11 to be signed up to end of 2004.

    b. Line 3 -- Phaseout amount of previously approved projects: the phaseout of 68 MT in 2002, 469 MT in 2003 and 775.8 MT in 2004 from projects approved prior to the Sector plan (in 2002 and earlier), will be completed during this program.

    c. Line 4 -- Phaseout amount in sector plan: the impact will be 0 t in 2004.

    d. Verification of the disposal certification of equipment (and, where available, PCRs) accounting for CFC phaseout of 469 MT (phase out impact of previously approved projects in 2002 from line 3) to be carried out in 2004 as part of this annual program.

    e. Agreement with the World Bank a TOR on the preparation of verification of the disposal certification of equipment and PCR for the entire foam sector.

5. **2005 Annual Program**: This will be prepared in mid-2004. It will consist of the following:

    a. Line 2 -- Phaseout targets for the sector plan: new investment project contracts with enterprises for phasing out 55 MT of CFC-11 to be signed up to end of 2005

    b. Line 3 -- Phaseout amount of previously approved projects: the phaseout of 452 MT from projects approved prior to the Sector Plan (in 2002 and earlier), will be completed during the year.

    c. Line 4 -- Phaseout amount in sector plan: the impact will be 129.8 in 2005.

    d. Verification of the disposal certification of equipment (and, where available, PCRs) accounting for CFC phaseout of 775.8 MT (phase out impact of previously approved projects in 2002 from line 3) to be carried out in 2005 as part of this annual program.

6. **2006 Annual Program**: This will be prepared in mid-2005. It will consist of the following:

    a. Line 2 -- Phaseout targets for the sector plan: new investment project contracts with enterprises for phasing out 53 MT of CFC-11 to be signed up to end of year 2006.

    b. Line 3 -- Phaseout amount of previously approved projects: the phaseout of 300 MT from projects approved prior to the Sector Plan (in 2002 and earlier), will be completed during the year.

    c. Line 4 -- Phaseout amount in sector plan: the impact will be 155.7 MT in 2006

d. Verification of the disposal certification of equipment (and, where available, PCRs) accounting for CFC phaseout of 452 MT (phase out impact of previously approved projects in 2002 from line 3) to be carried out in 2006 as part of this annual program.

e. Verification of the disposal certification of equipment (and , where available, PCRs) accounting for CFC phaseout of 129.8 MT (phase out impact of sector plan) to be carried out in 2006 as part of this annual program.

7. **2007 Annual Program**: This will be prepared in mid-2006. It will consist of the following:

   a. Line 3 -- Phaseout amount of previously approved projects: the phaseout of 100 MT from projects approved prior to the Sector Plan (in 2002 and earlier), will be completed during the year.

   b. Line 4 -- Phaseout amount in sector plan: the impact will be 66.5 MT in 2006

   c. Verification of the disposal certification of equipment (and, where available, PCRs) accounting for CFC phaseout of 300 MT (phase out impact of previously approved projects in 2002 from line 3) to be carried out in 2007 as part of this annual program.

   d. Verification of the disposal certification of equipment (and, where available, PCRs) accounting for CFC phaseout of 155.7 MT (phase out impact of sector plan) to be carried out in 2007 as part of this annual program.

8. **2008 Annual Program**: This will be prepared in mid-2007. It will consist of the following:

   a. Verification of the disposal certification of equipment (and, where available, PCRs) accounting for CFC phaseout of 100 MT (phase out impact of previously approved projects in 2002 from line 3) to be carried out in 2008 as part of this annual program.

   b. Verification of the disposal certification of equipment (and, where available, PCRs) accounting for CFC phaseout of 66.5 MT (phase out impact of sector plan) to be carried out in 2008 as part of this annual program.

9. **2009 Annual Program**: This will be prepared in mid-2008. It will consist of the following:

   a. PCR will be prepared covering all sector plan activities and be submitted to the ExCom during the year.

ANNEX-1

INVENTORY OF FOAM ENTERPRISES
NOT YET ADDRESSED UNDER THE CFC PHASEOUT PROGRAM

A. Eligible Enterprises

#	COMPANY	SUB-SECTOR	BASELINE EQUIPMENT	CFC USE
1	Bintang Mas, UD	RPF - Thermoware	Manual	5.63
2	Cipta Karya, CV	RPF – Spray	Gusmer	3.79
3	Mayasari Utama, PT	RPF – Spray	H/P-Gusmer FF1600	3.08
4	Langgeng Makmur Industri Tbk, PT	RPF - Thermoware	Canon C 15 RF 2	15.00
5	Hadi Puteri Kartika Paqsi, PT	RPF – Panel	Hand Mix	9.00
6	Pangaji Mario Refconindo, PT	RPF – Panel	H/P- KM 40/40 &L/P Canon C60	6.30
7	Bernadi Utama, PT	RPF - Thermoware	Gusmer H2000 & H II	2.60
8	Willich Isolasi Pratama, PT	RPF – Pipe	Gusmer H 2000	2.05
9	Sadana Ekapraya Amitra, PT	RPF – Panel	Manual	0.79
10	Indomatic	RPF – Panel	Manual	1.91
11	Citradinamika Interindo	RPF – Panel	Manual	3.90
12	Sigma Engineering	RPF – Panel	Manual	4.64
13	Harrison, UD	RPF – Panel	Manual	0.53
14	Sengon Harpindo Sejati	RPF – Panel	LP Dispenser	41.60
15	Ditta Insulindo	RPF – Panel	LP Dispenser	35.67
16	Sinar Baja Walandra	RPF – Panel	LP Dispenser	29.00
17	Sumber Sejahtera Raya	RPF – Panel	LP Dispenser	27.61
18	Ero Fibre Glass	RPF – Panel	LP Dispenser	11.00
19	Shirabu	RPF – Panel	LP Dispenser	11.00
20	Belga Jaya Perkasa	RPF – Panel	LP Dispenser	0.00
21	Biru SCK, PT	ISF	H/P Canon C 30 & 40	4.00
22	Yamahato, CV	ISF	L/P Desma Klockner 583/24	3.60
23	Rizata Wijaya	ISF	L/P Canon 15 FL2	6.80
24	Osaga Mas Utama. PD	ISF	L/P Italy BGM Elite 60	10.00
25	Sinar Mulia, UD	ISF	Green 900 g/min	6.00
26	Kumala Indah Tata, PT	ISF	L/P Elastogran F70	13.50
27	SS Utama, PT	ISF	(3) L/P BGM	25.00
28	Restindo Dayatama, PT	ISF	Manual	0.79
29	Lion Metal Works TBK, PT	ISF	L/P Canon C15 FL2	1.62
30	Jaly Indonesia Utama, PT	ISF	LP BGM, MTB	11.70
	TOTAL			**298.11**

B. Ineligible Enterprises

#	COMPANY	SUB-SECTOR	BASELINE EQUIPMENT	CFC USE
1	Bertindomas Ciptasatya	Panel	Manual	1.14
2	Cahaya Kencana Srikandi, PT	Panel	H/P-Gusmer	1.00
3	Duta Eka Abadi, CV	Panel	Manual	0.00
4	Framindex Indah Lestari (Yapindex)	Structure	KF – IS402	1.28
5	Mitra Niaga Kencana Lestari, PT	Panel	SAIP K 60	7.43
6	Pungut Permai Perkasa PT	Structure	Manual	0.25
7	Restu Ibu, PT	Spray	n/k	0.00
8	Wika Intrade, PT	Thermoware	Small	3.89
9	Yuriko Teknik	Panel	Manual	1.36
10	Binder Indonesia, PT	Pipe	n/k	12.10
11	Megametal Perdana, PT	Panel	L/P Li Peng (Taiwan)	11.99
12	Astra Otopart, Tbk, PT.	ISF	H/P KM & Rim Star	4.20
13	Jaya Mulya	ISF	Ex Import	6.00
14	Yufo Sumber Mas	ISF	n/k	3.00
	TOTAL			**53.64**

C. Other Identified Ineligible Enterprises*

#	COMPANY	SUB-SECTOR	BASELINE EQUIPMENT	CFC USE
15	IRC Inoac	FMF	n.k	105
16	Karya Bahana Utama	FMF	n.k	n.k
17	Sana Triputra Dinamika	FMF	n.k	30
18	Tunas Samudera Kurnia	FMF	n.k	35
19	Pramata Sentosa	FMF	n.k	n.k
20	Tunas Samudera	FMF	n.k	n.k
21	Dwisata Foam	FMF	n.k	n.k
22	Meta Prsindo Utama	FMF	n.k	n.k
23	Nusa Pima	FMF	n.k	n.k
24	Astanatha Buna Mandiri	FMF/ISF	n.k	30
25	Citra Christopher Mulia	FMF/ISF	n.k	30
26	Lawang Teknik	FMF/ISF	n.k	25
27	Surya Ahdi Kencana	FMF/ISF	n.k	n.k
28	Anugrah Foam	FMF/RPF Block	n.k	50
29	Putra Alam	ISF	n.k	n.k
30	Bogorindo	ISF	n.k	n.k
31	Indorevsco	ISF	n.k	n.k
32	Krekot Jaya	ISF Shoesole	n.k	95
33	Solindah Kita	ISF Shoesole	1 Elastogran	90
34	Trias Rantai Mas	ISF Shoesole	n.k	40
35	Tikari Perdana	ISF Shoesole	n.k	n.k
36	Nikomas	ISF Shoesole	n.k	n.k
37	Ganesha Rattesko Prima	RPF	n.k	15
38	Albisia Jaya Industri	RPF	Home Made	45
39	Wijaya Karya	RPF	n.k	15
40	Lenteng Agung	RPF	n.k	n.k
41	Sami Jaya Perkasa	RPF	n.k	n.k
42	Sarana Fiberindo	RPF	n.k	n.k

43	Aman Multi Mandiri	RPF	n.k	n.k
44	Besar Indah Gemilang	RPF	n.k	n.k
45	Cisang Garung Putra	RPF	n.k	n.k
46	Dansas Pan Suksesa	RPF	n.k	n.k
47	Daya Dumas Lestari	RPF	n.k	n.k
48	Ganesha RP	RPF	n.k	n.k
49	Gema Istana Arta	RPF	n.k	n.k
50	Inka Sakti	RPF	n.k	n.k
51	Inpaga Aman Sentosa	RPF	n.k	n.k
52	Jadi Sejati Perkasa	RPF	n.k	n.k
53	Kharisa Bayu Mandala	RPF	n.k	n.k
54	Kragu Nusanatara	RPF	n.k	n.k
55	Mahkota Agung Pratama	RPF	n.k	n.k
56	Multibrata Anugrah Utama	RPF	n.k	n.k
57	Cahaya Kencana	RPF Spray	n.k	15
58	Thermacelindo	RPF Spray	n.k	30
59	Perkasa Raya Laowomaru	RPF Spray	n.k	n.k
60	Tentram	RPF Spray	n.k	n.k
61	Cahaya Kencana Srikandi	RPF Spray	n.k	n.k
62	Sansenindo Makmur	RPF Panels	n.k	n.k
63	Tehnik Fajar	RPF Panels	n.k	n.k
64	Parliha Indonesia	RPF Panels	n.k	n.k
65	Refconindo	RPF Panels	n.k	n.k
66	Riatirta Nirwana Mas	n.k	n.k	n.k
67	Surya Ankasa	n.k	n.k	n.k
68	Alam Dinamika	n.k	n.k	n.k
69	Alfa Fumi Megah Indah	n.k	n.k	n.k
70	Busofa Karindo	n.k	n.k	n.k
71	Cahaya Indoniaga	n.k	n.k	n.k
72	Cahaya Ultra Poly	n.k	n.k	n.k
73	Elastic Foam	n.k	n.k	n.k
74	Fortuna	n.k	n.k	n.k
75	Garuda	n.k	n.k	n.k
76	Gesalunda Indah	n.k	n.k	n.k
77	Indoluhur	n.k	n.k	n.k
78	Karya Pluit	n.k	n.k	n.k
79	MusimasSejahtera Abadi	FPF Slabstock	Manual	55.00
80	Citra Sarana Makmur	FPF Boxfoam	Manual	n.k
81	Dakar Foam	FPF Boxfoam	Manual	n.k
82	Sumber Indah	FPF Boxfoam	Manual	n.k
83	Surya Cahaya Sakdi	FPF Boxfoam	Manual	n.k
84	PT Dayak Lestari Ekalaga	FPF Boxfoam	Manual	n.k
85	PT Rentang Buana Niaga Makmur	FPF Boxfoam	Manual	n.k
	TOTAL			**705++**

*Most of these companies originate from the old (before the civil unrest) pipeline inventory from UNDP. The ones that could be located are included in list A and B. The ones in list C could not be located or were deemed ineligible from documentation provided. In addition, the list contains companies with canceled projects, companies that refused to cooperate, companies that were deemed ineligible under the SMS projects, etc. The listed consumption is based on self-reporting and not audited. LH will address them as part of its policy enforcement program.

ANNEX II

INDONESIA FOAM CFC PHASE-OUT PLAN – OORG REVIEW

GENERAL AND MARKET INFORMATION

The plan covers the phase-out of a total of 329.3 ODP tons of CFC 11 use in foams in Indonesia in the polyurethane integral skin and rigid insulating foam sub-sectors. The ODS phase-out is net of the residual ODP of HCFC 141b used in some projects to phase out CFC 11.

There are obvious challenges in identifying the remaining CFC users in the foam sector and the consultants, Edrola have assisted in the task. Details have been obtained on 39 of these enterprises and a further 40, at least, have unchecked CFC consumption (Executive Summary item 4). There should be a list could be include, perhaps in an appendix, of all the enterprises by name, their sub-sectors, sizes and baseline equipment. An analysis of the uncertainties in the market description and a sensitivity analysis of the impact of there se uncertainties on project cost effectiveness would be useful. In addition, a plan to subsequently improve the information should be included. It is noted that more information may be obtained at a later stage via import data (section 2.12, page 8) but there is no indication of how this may be utilised.

In table 2.1 (page 8) there is an informative overview of the foam sector. There are a total of 18 eligible rigid foam enterprises and 11 which are not eligible for funding. From table 2.9 the rigid foam sub-sectors are spray, non-insulating, panel, pipe and thermoware. There are three “large” enterprises with average CFC consumptions of approximately 47 tons and are all in the panel sector.
There are 7 eligible integral skin enterprises all classified as medium or small producers. In addition, there are 3 ineligible enterprises. Of the eligible enterprises, three produce shoesoles and four produce automotive parts.

There are experienced and major suppliers of foam systems active in the Indonesian market. However, there does not appear to be a stated role for these companies to participate in the phase-out implementation strategy.

TECHNOLOGY

The rigid foam applications in this project are all insulating applications. Three technology options are discussed – “all water” which is normally referred to as CO2(water), hydrocarbon/cyclopentane and HCFC 141b. However, it is not basically suitable for the insulating foam market because the insulation value is poor and deteriorates rapidly with time. Some enterprises approach the consumption level where the use of pentane technology can be considered but the capital outlay would still be very high and significant infrastructural and equipment changes and procedures have to be put in place to operate this technology. It should also be recorded that hydrocarbon technology is not yet proven for the spray foam application irrespective of the size of the enterprise. The of HCFC 141b is supported by the reviewer

There is little discussion of HFC technologies for rigid foams and this is an omission to be corrected. Neither is there a discussion on the eventual replacement of transitional technologies such as HCFC 141b. See “SAFETY AND ENVIRONMENTAL ISSUES” for further comments.

The equipment considerations are explained and are supported. Decision 31/44 regarding density is applied in an effective manner.

For integral skin foams a wide range of options is considered. There is support for interim use of HCFC 141b for automotive applications. Polyester polyols and CO2(water) technology is normally only used in footwear applications. CO2(water) is normally fully suitable in furniture applications and the choice of a physical blowing agent can normally only be supported in some automotive applications. HFC 134a technology has been in use in the South East Asia region for the production of high quality automotive mouldings for a number of years but, as indicated, there have to be equipment changes.

SAFETY AND ENVIRONMENTAL ISSUES

There is no clear statement given as to whether the Indonesian government supports the use of HCFC 141b as now required by the ExCom. That is, unless Section 5.8 on page 26 implies this point. The transitional status of HCFC will require its phase-out by 2040. The enterprises should be informed of this and that subsequent conversion to a zero ODP technology should be at their own cost.

It is noted that technical assistance includes safe operation of flammable blowing agents and this is should include the safe use of HCFC141b-based systems.

PROJECT COSTS

The proposed grant is pegged at a weighted average of the thresholds for the rigid foam and integral skin sub-sectors.

The equipment cost proposals follow acceptable procedure with respect to replacement based on the type baseline equipment and its age.

In the incremental operating cost calculations it is noted that the same chemical prices are used for both rigid and integral skin applications. In the reviewer’s opinion the chemical costs are higher in the integral skin than in the rigid foam sector but this is not reflected here. The averaged prices may well reflect reality. For the integral skin calculation a density increases of 10% is used. This is supported.

IMPLEMENTATION TIMEFRAME

At this stage of the project the timetable seems to be realistic.

RECOMMENDATION

This project is supported.

Several points to follow during the implementation phase are listed

M Jeffs

06/02/2003