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Naciones Unidas  
para el Medio  
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COMITÉ EJECUTIVO DEL FONDO MULTILATERAL  
PARA LA APLICACIÓN DEL  
PROTOCOLO DE MONTREAL  
Nonagésima tercera reunión  
Montreal, 15-19 de diciembre de 2023  
Cuestión 9 c) y d) del orden del día provisional<sup>1</sup>

**ENMIENDAS AL PROGRAMA DE TRABAJO DEL BANCO  
MUNDIAL PARA EL EJERCICIO 2023**

<sup>1</sup> UNEP/OzL.Pro/ExCom/93/1.

## OBSERVACIONES Y RECOMENDACIONES DE LA SECRETARÍA

1. El Banco Mundial solicita al Comité Ejecutivo aprobar la suma de 550.000 \$EUA más gastos de apoyo de 38.500 \$EUA para las enmiendas al programa de trabajo del año 2023 que se indican en el Cuadro 1. La presentación hecha por el Banco Mundial se encuentra adjunta al presente documento.

**Cuadro 1. Enmiendas al programa de trabajo del Banco Mundial para el ejercicio 2023**

País	Actividad/Proyecto	Monto solicitado (\$EUA)	Monto recomendado (\$EUA)
<b>SECCIÓN A: ACTIVIDADES RECOMENDADAS PARA APROBACIÓN GENERAL</b>			
<b>A1: Preparación de planes de gestión para la eliminación de HCFC (PGEH)</b>			
Tailandia	Preparación de un PGEH (etapa III)	90.000	90.000
Tailandia	Preparación de un proyecto de inversión en el sector de refrigeración comercial	80.000	80.000
Subtotal A1		170.000	170.000
Gastos de apoyo		11.900	11.900
Total A1		181.900	181.900
<b>A2: Preparación de un catastro nacional de bancos de sustancias controladas agotadas o de desechos y de un plan para su acopio, transporte y eliminación<sup>2</sup></b>			
Viet Nam	Preparación de un catastro nacional de bancos de sustancias controladas agotadas o de desecho y del plan respectivo	100.000	100.000
Subtotal A2		100.000	100.000
Gastos de apoyo		7.000	7.000
Total A2		107.000	107.000
<b>A3: Preparación de un proyecto piloto destinado a mantener y/o potenciar la eficiencia energética de equipos y tecnologías sustitutivas durante la reducción de los HFC<sup>3</sup></b>			
Malasia	Preparación de un proyecto piloto destinado a mantener y/o potenciar la eficiencia energética de equipos autónomos de refrigeración comercial	30.000	30.000
Subtotal A3		30.000	30.000
Gastos de apoyo		2.100	2.100
Total A3		32.100	32.100
<b>SECCIÓN B: ACTIVIDADES RECOMENDADAS PARA CONSIDERACIÓN INDIVIDUAL</b>			
<b>B1: Preparación de planes de aplicación de la Enmienda de Kigali</b>			
Tailandia	Preparación de un plan de aplicación de la Enmienda de Kigali (etapa I)	220.000	*
Subtotal B1		220.000	*
Gastos de apoyo B1		15.400	*
Total B1		235.400	*
<b>B2: Preparación de un proyecto piloto destinado a mantener y/o potenciar la eficiencia energética de equipos y tecnologías sustitutivas durante la reducción de los HFC</b>			
Viet Nam	Preparación de un proyecto piloto destinado a mantener y/o potenciar la eficiencia energética en el sector climatización	30.000	*
Subtotal B2		30.000	*
Gastos de apoyo B2		2.100	*
Total B2		32.100	*
Total A1+A2+A3+B1+B2		550.000	300.000
Gastos de apoyo para A1, A2, A3, B1 y B2		38.500	21.000
Total general		588.500	321.100

\* Recomendado para consideración individual.

<sup>2</sup> En adelante, catastro nacional de bancos de sustancias controladas agotadas o de desecho y del plan respectivo.

<sup>3</sup> En adelante, proyecto piloto destinado a mantener y/o potenciar la eficiencia energética.

## SECCIÓN A: ACTIVIDADES RECOMENDADAS PARA APROBACIÓN GENERAL

### A1: Preparación de planes de gestión para la eliminación de HCFC (PGEH)

#### Descripción

2. El Banco Mundial, en calidad de organismo de ejecución designado, presenta una solicitud para la preparación de la etapa III del PGEH en el sector de refrigeración comercial de Tailandia, según se indica en la sección A1 del Cuadro 1.
3. El Banco adjunta la descripción de las actividades que respaldan la solicitud, entre ellas la justificación del financiamiento solicitado, un informe sobre los avances logrados durante la etapa II, el listado de las actividades que se llevarán a cabo y los correspondientes presupuestos.

#### Observaciones de la Secretaría

4. La Secretaría analizó la solicitud a la luz de las pautas para financiar la preparación de PGEH en países del artículo 5 contenidas en la decisión 71/42; de los avances logrados durante la etapa II, incluyendo el estado de ejecución de los tramos a la fecha del presente documento, y de lo contemplado en la decisión 84/46 e).<sup>4</sup> La Secretaría constató que los recursos solicitados se ajustan a lo dispuesto en la decisión 71/42 y que la solicitud concuerda con lo previsto en la decisión 82/45, según la cual las solicitudes para la etapa III podrán presentarse hasta dos años antes del término de la etapa II.<sup>5</sup>
5. La Secretaría constató que la ejecución de la etapa II del PGEH para Tailandia avanza tras haber sufrido algunos retrasos<sup>6</sup> y que en 2022 se aprobó el segundo tramo. La Secretaría tomó nota además de que el país se encuentra en situación de cumplimiento con las metas de control previstas en el Protocolo de Montreal; de que el consumo anual de HCFC informado no excede el máximo permitido en el Acuerdo con el Comité Ejecutivo y de que el Banco Mundial informa que a fines del año 2023 entrará en vigencia la prohibición de uso de HCFC-141b. El Banco confirmó que la etapa III del PGEH permitirá a Tailandia eliminar el 100 por ciento de la base de comparación de uso de HCFC al 1° de enero de 2030.
6. La solicitud de financiamiento dice relación con un plan sectorial destinado a convertir a fabricantes de refrigeradores comerciales a hidrocarburos, iniciativa que podría potencialmente abarcar a 12 Pymes que utilizan HCFC-22. El Banco confirmó que el proyecto de inversión se presentará como parte de la etapa III del PGEH.

#### Recomendación de la Secretaría

7. La Secretaría recomienda la aprobación general, al nivel de financiamiento que se indica en la sección A1 del Cuadro 1, de la solicitud relativa a la preparación del proyecto para la etapa III del PGEH y de un proyecto de inversión en el sector de refrigeración comercial de Tailandia.

<sup>4</sup> La inclusión en el plan administrativo de la etapa III de los PGEH se permite únicamente en el caso de países con una etapa II aprobada que contemple metas de reducción por debajo de las fijadas para el año 2025.

<sup>5</sup> El 2023 es el último año para el cual el Apéndice 2-A del Acuerdo entre el Gobierno de Tailandia y el Comité Ejecutivo para la etapa II del PGEH señala el consumo máximo permitido.

<sup>6</sup> La etapa II del PGEH para Tailandia para el período 2018-2023, destinada a reducir el consumo de HCFC en un 61,8 por ciento respecto de la base de comparación, se aprobó durante la 82ª reunión en la suma de 3.791.077 \$EUA más gastos de apoyo de 265.375 \$EUA para el Banco Mundial.

## **A2: Preparación de un catastro nacional de bancos de sustancias controladas agotadas o de desechos y de un plan para su acopio, transporte y eliminación**

### **Descripción**

8. El Banco Mundial, en calidad de organismo de ejecución designado, presenta una solicitud para la preparación de un catastro nacional de bancos de sustancias controladas agotadas o de desecho y del plan respectivo para Viet Nam, según se indica en la sección A2 del Cuadro 1.

### **Observaciones de la Secretaría**

9. La Secretaría analizó la solicitud a la luz de las pautas para financiar la preparación de planes y catastros nacionales de bancos de sustancias controladas agotadas o de desecho contenidas en la decisión 91/66 y de las actividades propuestas para la preparación del proyecto y de su nexo con los planes nacionales de eliminación o reducción (PGEH o plan de aplicación de Kigali). La Secretaría comprobó que la solicitud de financiamiento se ajusta a lo dispuesto en la decisión 91/66 y que, en calidad de organismo de ejecución designado, el Banco Mundial describió en los formularios dispuestos a tal efecto las actividades que demandará la preparación de dicho plan y catastro nacional.

10. Entre las actividades se destaca la elaboración de un plan de gestión de sustancias controladas que permita vigilar y manejar refrigerantes y agentes de extinción de incendios desde su importación hasta su recuperación, eliminación, destrucción e informe final; una recopilación de datos y consultas con las partes intervinientes; un análisis del volumen de equipos y sustancias controladas que deberá ser dado de baja; un estudio de opciones para reducir los costos del sistema de reciclaje, regeneración y eliminación, y consideraciones de género que incentiven la participación de la mujer y permitan acopiar datos desglosados por género cuando sea el caso.

### **Recomendación de la Secretaría**

11. La Secretaría recomienda la aprobación general, al nivel de financiamiento que se indica en la sección A2 del Cuadro 1, de la preparación del catastro nacional de bancos de sustancias controladas agotadas o de desechos y de un plan para su acopio, transporte y eliminación en Viet Nam.

## **A3: Preparación de un proyecto piloto destinado a mantener y/o potenciar la eficiencia energética de equipos y tecnologías sustitutivas durante la reducción de los HFC**

### **Descripción**

12. El Banco Mundial, en calidad de organismo de ejecución designado, presenta una solicitud para la preparación de un proyecto piloto destinado a mantener y/o potenciar la eficiencia energética en Malasia, según se indica en la sección A3 del Cuadro 1. La presentación se ajusta a lo dispuesto en la decisión 91/65.

13. Esta solicitud complementa el proyecto de conversión de dos pequeños y medianos fabricantes de equipos de refrigeración comercial desde HFC-134a y R-404A a R-290 y R-600a que se expone para la etapa I del plan de aplicación de la Enmienda de Kigali presentado a esta reunión. El proyecto piloto, conforme a lo previsto en la decisión 91/65, se orienta a potenciar la eficiencia energética durante la conversión de estas empresas. Esto comprende reemplazar los compresores de velocidad fija por compresores inversores de velocidad variable y ver la factibilidad de diseñar y ensamblar inversores libres de HFC a fin de no depender del mercado. El objetivo general es fortalecer las normas de eficiencia energética para equipos autónomos de refrigeración y aumentar la participación de las empresas nacionales en la fabricación de equipos ecoenergéticos. Se propone evaluar las necesidades y capacidades de las empresas y de los entes reguladores, la realización de consultas con oferentes regionales de

tecnología y el diseño y desarrollo de una propuesta final que designe a los proveedores de tecnologías y asesoría técnica.

### **Observaciones de la Secretaría**

14. La Secretaría analizó la solicitud a la luz de las pautas contenidas en la decisión 91/65, comprobando que la propuesta se encuadra en lo previsto en el párrafo b) i) a) sobre proyectos de conversión destinados a mantener y/o potenciar la eficiencia energética durante la conversión desde HFC en la fabricación de los equipos de refrigeración residencial, equipos autónomos de refrigeración comercial, climatizadores residenciales y comerciales y bombas de calor que se estiman prioritarios.

15. La Secretaría comprobó que la solicitud se entronca con la etapa I del plan de aplicación de la Enmienda de Kigali del país, iniciativa que se plantea la eliminación total de HFC-134a y R-404A en la fabricación de equipos autónomos de refrigeración comercial. El Banco Mundial confirmó que el proyecto fortalecerá la eficiencia energética de los equipos fabricados por estas empresas y facilitará el desarrollo de políticas y normas habilitantes en el país. La Secretaría solicitó aclarar si este proyecto piloto se iba a presentar a consideración antes del inicio de la conversión de las dos empresas a fin de garantizar la ejecución coordinada de las actividades, lo que el Banco confirmó. El Banco ratificó asimismo que el proyecto cumple con lo previsto en el párrafo b iv) de la decisión 91/65.

### **Recomendación de la Secretaría**

16. La Secretaría recomienda la aprobación general, al nivel de financiamiento que se indica en la sección A3 del Cuadro 1, de la solicitud para la preparación de un proyecto piloto destinado a potenciar la eficiencia energética en el sector de refrigeración comercial en Malasia durante la transición a refrigerantes alternativos de bajo PCA.

## **SECCIÓN B: ACTIVIDADES RECOMENDADAS PARA CONSIDERACIÓN INDIVIDUAL**

### **B1: Preparación de planes de aplicación de la Enmienda de Kigali**

#### **Descripción**

17. El Banco Mundial, en calidad de organismo de ejecución designado, presenta una solicitud para la preparación de la etapa I del plan de aplicación de la Enmienda de Kigali en Tailandia, según se indica en la sección B1 del Cuadro 1.

18. La solicitud informa sobre el consumo de HFC y sus mezclas para el año 2020 y describe las actividades que demandará la preparación de la estrategia transversal para la etapa I del plan de aplicación de la Enmienda de Kigali en el país. Se destacan la recopilación de datos y un estudio a nivel nacional sobre consumo de HFC; un análisis del uso de HFC y sus alternativas y de los equipos que los utilizan; un estudio de las políticas y normas legislativas de reducción de los HFC; un examen de las normas legislativas y regulatorias y el desarrollo de una estrategia transversal de reducción de los HFC.

19. El Banco Mundial presenta esta solicitud en conocimiento de que el Gobierno de Tailandia acordó ratificar la Enmienda de Kigali pero aún no deposita el instrumento de ratificación ante la ONU.

### **Observaciones de la Secretaría**

20. La Secretaría analizó la solicitud a la luz de las pautas para la preparación de planes de aplicación de la Enmienda de Kigali contenidas en la decisión 87/50, de las actividades propuestas y de su nexos con las actividades de apoyo y demás proyectos relativos a los HFC en el país.

21. El Banco Mundial, en calidad de organismo de ejecución designado, describió las actividades que demandará la preparación de la estrategia transversal en los formularios dispuestos a tal efecto. La Secretaría constató además que el país ha confirmado por escrito su intención de adoptar medidas para la reducción de los HFC y que los recursos solicitados se ajustan a lo previsto en la decisión 87/50 c).

22. La Secretaría tomó nota de que, si bien el Gobierno de Tailandia ha acordado ratificar la Enmienda de Kigali y se encuentra en proceso de aprobar el depósito del instrumento de ratificación ante Naciones Unidas, lo que debiese ocurrir antes o durante la reunión del Comité Ejecutivo, la ratificación es un prerrequisito para considerar el financiamiento de la preparación del plan de aplicación de la Enmienda. En consecuencia, la Secretaría advirtió al Banco Mundial que la solicitud se incluirá para consideración individual en el entendido de que la ratificación se deberá concretar antes de la reunión del Comité; de lo contrario, la solicitud será retirada y deberá presentarse en la próxima reunión. El Banco se mostró de acuerdo y dio seguridades de que para ese entonces el proceso de ratificación habrá concluido.

### **Recomendación de la Secretaría**

23. El Comité Ejecutivo podrá estimar oportuno considerar la aprobación de la solicitud de preparación de un plan de aplicación de la Enmienda de Kigali en el monto de 220.000 \$EUA más gastos de apoyo de 15.400 \$EUA, a condición de que el instrumento oficial de ratificación de la Enmienda se deposite ante Naciones Unidas antes de la 93ª reunión del Comité Ejecutivo.

### **B2: Preparación de un proyecto piloto destinado a mantener y/o potenciar la eficiencia energética de equipos y tecnologías sustitutivas durante la reducción de los HFC**

#### **Descripción**

24. El Banco Mundial, en calidad de organismo de ejecución designado, presenta una solicitud para la preparación de un proyecto piloto destinado a mantener y/o potenciar la eficiencia energética en Viet Nam, según se indica en la sección B2 del Cuadro 1. La presentación se ajusta a lo dispuesto en la decisión 91/65.

25. La solicitud permitirá a un fabricante de climatizadores tipo split (Nakagawa) utilizar un diseño más ecoenergético y actualizar las normas mínimas de eficiencia energética para aparatos de aire acondicionado a base de inversores, vigentes desde el año 2011. El proyecto piloto comprende un estudio de mercado sobre la eficiencia energética promedio y los refrigerantes utilizados en los climatizadores que se comercializan en Viet Nam a fin de determinar los requisitos de diseño y servicio técnico para equipos de mayor eficiencia, en especial la factibilidad de reemplazar los modelos de velocidad fija a base de HFC-32 por otros a base de inversores. Se propone además evaluar las necesidades y capacidades de las empresas y de los entes reguladores, la realización de consultas con proveedores regionales de tecnología y el diseño y desarrollo de una propuesta final que designe a los proveedores de tecnologías y asesoría técnica.

#### **Observaciones de la Secretaría**

26. La Secretaría analizó la solicitud a la luz de las pautas contenidas en la decisión 91/65, comprobando que la propuesta se encuadra en lo previsto en el párrafo b) i) a) sobre proyectos de conversión destinados a mantener y/o potenciar la eficiencia energética durante la conversión desde HFC en la fabricación de los equipos de refrigeración residencial, equipos autónomos de refrigeración comercial, climatizadores residenciales y comerciales y bombas de calor que se estiman prioritarios.

27. La Secretaría tomó nota de que durante la etapa II del PGEH Nakagawa ya había recibido recursos para convertir climatizadores de velocidad fija de HCFC-22 a HFC-32. Aunque el reemplazo por alternativas de velocidad variable con tecnología de inversión permitiría mejorar la eficiencia energética

de los equipos a base de HFC-32, la Secretaría recordó que la decisión 91/65 específicamente entronca los proyectos piloto de eficiencia energética con la reducción de los HFC. La Secretaría, en consecuencia, expresó su preocupación en cuanto a que la empresa estuviese planificando aprovechar el proyecto para convertirse a alternativas distintas a los HFC, habida cuenta de que el HFC-32 es la tecnología de climatización que predomina en Viet Nam y en la región en general.

28. En respuesta a la inquietud de la Secretaría, el Banco Mundial explicó que la empresa no está en condiciones de cambiar a refrigerantes de bajo PCA libres de HFC dado que es un pequeño fabricante que necesita escoger una tecnología probada que sea técnica y económicamente viable y accesible. Dicho eso, la adopción de climatizadores a base de inversores sentaría sólidas bases para que la empresa nacional pueda empezar a fabricar productos de mayor eficiencia energética con vistas a una futura conversión a refrigerantes de bajo PCA. Se recordó además que el objetivo mayor del proyecto es actualizar las normas mínimas a fin de potenciar y fomentar la eficiencia energética de los climatizadores en general. En este contexto, el Banco fue enfático en señalar que la solicitud se ajusta a lo previsto en la decisión 91/65.

### **Recomendación de la Secretaría**

29. El Comité Ejecutivo podrá estimar oportuno considerar la aprobación de la solicitud de preparación de un proyecto piloto destinado a potenciar la eficiencia energética en el sector climatización de Viet Nam en la suma de 30.000 \$EUA más gastos de apoyo de 2.100 \$EUA.

2023 BUSINESS PLAN  
WORK PROGRAM



**WORLD BANK GROUP**

WORLD BANK IMPLEMENTED  
MONTREAL PROTOCOL OPERATIONS

Presented to the  
93<sup>rd</sup> Meeting of the Executive Committee  
of the Multilateral Fund

20 October 2023



## **WORK PROGRAM FOR WORLD-BANK IMPLEMENTED MONTREAL PROTOCOL OPERATIONS**

1. This proposed work program for Bank-Implemented Montreal Protocol Operations is prepared on the basis of the 2023-2025 World Bank Business Plan which was approved by the Executive Committee at its 91<sup>st</sup> meeting.
2. The 2023-2025 World Bank Business Plan consists of investment and non-investment activities to assist Article 5 partner countries to meet their HCFC reduction target, the 2020 35% reduction in both production and consumption sectors. The Business Plan includes, in addition to deliverables associated with previously approved and new investment activities, requests to extend support for implementation of existing institutional strengthening projects in 2 countries.
3. The 2023-2025 Business Plan also includes investment and non-investment activities for the World Bank client countries that either have ratified or in the process of ratifying the Kigali Amendment to phasedown HFCs. These activities will ensure their compliance with the 2024 freeze target and the 2029 10% reduction in the consumption sectors.

### **2023 Work Program – ExCom 93 Amendment**

4. The proposed 2023 Work Program being submitted for consideration at the 93<sup>rd</sup> Meeting of the Executive Committee, includes four (5) funding requests:
  - (i) One (1) for preparation of energy efficiency project in refrigeration sector for Malaysia
  - (ii) One (1) for preparation of Kigali Implementation Plan for Thailand
  - (iii) One (1) for preparation of Stage III HPMP for Thailand
  - (iv) One (1) for preparation of energy efficiency project in air-conditioning sector for Viet Nam
  - (v) One (1) for preparing life cycle management plan for controlled substances for Viet Nam
5. Brief description of the work program amendment activity requests are highlighted below.

**Table 1: Funding Requests Submitted for Consideration  
by the 93<sup>rd</sup> Meeting of the Executive Committee**

<b>Country</b>	<b>Request (US\$)</b>	<b>Support Costs (US\$)</b>	<b>Duration (months)</b>	<b>Description</b>	<b>Supporting document</b>
Malaysia	30,000	2,100	12-18	Preparation of energy efficiency project in refrigeration sector	Annex 1:
Thailand	220,000	15,400	12-18	Preparation of Kigali Implementation Plan Stage I	Annex 2-A
Thailand	90,000	6,300	12	Preparation of Stage III HPMP	Annex 2-B
Thailand	80,000	5,600	12	Preparation of Investment Projects in Commercial Refrigeration Sector Plan	Annex 2-C
Viet Nam	30,000	2,100	12-18	Preparation of energy efficiency project in air-conditioning sector	Annex 3-A
Viet Nam	100,000	7,000	24	Development of Lifecycle Management Plan for Controlled Substances	Annex 3-B
<b>Total</b>	<b>550,000</b>	<b>38,500</b>			

## **Annex 1: Request for project preparation of energy efficiency project for Malaysia**

**Title:** Project preparation for enhancing energy efficiency in Malaysia's commercial refrigeration sector while transitioning to low-GWP alternative refrigerants.

**Objective:** Improve energy efficiency by 20 to 40% in stand-alone commercial refrigeration in Malaysia in parallel with complete HFC phaseout in the subsector.

**Context:** Malaysia's Stage I Kigali Implementation Plan proposes total phaseout of HFC-134a and R-404A in the commercial refrigeration subsector of stand-alone units. Malaysia has put forward a request for MLF support to convert the two largest, eligible commercial refrigeration manufacturers, Berjaya Steel and Zun Utara and for TA to guide the remaining sector towards safe use of low-GWP alternatives and to inform the preparation of a sector ban of HFCs. Both of the refrigeration companies are considered small and medium size enterprises and have basic capacity in terms of technology. Although a number of their customers do prefer energy performing equipment, their products are largely based on fixed speed compressors which limits the extent to which companies can improve energy performance.

Additional climate benefits on top of the nearly 200,000 tCO<sub>2</sub> eq. in reductions that are targeted by the KIP are possible if manufacturers and importers market commercial refrigeration units with variable speed/inverter compressor technology. Because stand-alone refrigeration units such as freezers and display cases run 24 hours a day, there is large potential for significant energy savings and CO<sub>2</sub>.

HFC phaseout in the sector is also likely to be more sustainable if companies can design and assemble their own HFC-free, inverter products rather than rely on designs and technologies in the EE market that still is dominated by HFC-based compressors.

**Concept for Improving EE in Stand-alone Commercial Refrigeration:** The proposal intends to introduce a dual approach of strengthening energy performance policy on stand-alone refrigeration and technical and investment support to the Malaysian-owned manufacturers to increase their production share of energy efficient units (beyond the refrigerant).

The two companies will be supported to first select one of two pathways towards improving the energy performance in their products. The pathway chosen would dictate the type of technology transfer and capacity building needed. The technology support would allow the enterprises to design systems to effectively use and optimize inverter, hydrocarbon (R-290) based compressors, including how to program controls and install and repair the inverter box. The latter would reduce operating cost to consumers, which will make inverter commercial refrigeration equipment become more attractive. Expected project costs will be chiefly related to this technology transfer and capacity building. Only a small amount of investment would be likely required which will be confirmed during project preparation.

In order to quantify the CO<sub>2</sub> benefits accrued from the support to the two manufacturers, the project would cover the costs of testing the energy performance of the companies' existing products. This would become the baseline against which to measure the energy savings from the new equipment post-project.

To scale up climate benefits possible from the use of variable speed compressors, the proposed EE project would pursue the development and introduction of policy and standards that promote uptake of high energy efficient compressors in the subsector and create the enabling environment for uptake of more efficient, greener technology thereby supporting Malaysian-owned manufacturers. In order to understand how ambitious a minimum energy performance standard could be at the onset; the project would include a market assessment of the current average EE and refrigerant used of units (freezers and display cases) marketed in Malaysia. Moreover, the study would

assess other opportunities for EE improvement in the context of HFC phasedown, most notably in the MAC sector which is also targeted by the KIP in the form of a pilot project to phaseout HFC-134a.

**Project preparation support:** Preparation will determine what is required to help the companies design more efficient units and source requisite parts. Preparation work will also lead to an estimated amount of CO<sub>2</sub>eq. in additional benefits that can be accrued. The actual target would be confirmed in project implementation subsequent to 1) testing enterprise products and 2) assessing the average energy performance of stand-alone, plug-in units in the Malaysian market.

**Preparation Budget for EE Improvement in Stand-alone Commercial Refrigeration**

<b>Activity</b>	<b>Planned Budget (US\$)</b>
Capacity needs assessment of two enterprises and EE regulators (incl. travel)	10,000
Consultations with technology providers/suppliers in the Region (incl. travel)	5,000
Design and development of the proposal, including determination of source of technology and know-how	15,000
<b>Total</b>	<b>30,000</b>

## Annex 2-A: Request for project preparation of Kigali Implementation Plan for Thailand

### MULTILATERAL FUND FOR THE IMPLEMENTATION OF THE MONTREAL PROTOCOL KIGALI-HFC IMPLEMENTATION PLAN (KIP) PROJECT PREPARATION (PRP) KIP (OVERARCHING + INV)

#### Part I: Project information

<b>Project title:</b>	Thailand Kigali HFC Implementation Plan Preparation	
<b>Country:</b>	Thailand	
<b>Lead implementing agency:</b>	World Bank	
<b>Implementation period for stage I of the KIP:</b>	January 2024 – June 2025	
<b>Duration of PRP implementation (i.e., time (in months) from the approval of PRP to submission of the KIP (please specify):</b>	18	
<b>Funding requested:</b>		
<b>Agency</b>	<b>Sector</b>	<b>Funding requested (US \$)*</b>
World Bank	Overarching	220,000

#### Part II: Prerequisites for submission

Item	Yes	No
1. Official endorsement letter from Government, indicating the specifying roles of respective agencies (where more than one IA is involved)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2. Ratification of the Kigali Amendment by Thailand	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If NO, please provide explanation: <ul style="list-style-type: none"> <li>Thailand is in the final stage of ratification of the Kigali Amendment. The ratification process was delayed due to change in the government but is now back on track and expected by December.</li> </ul>		

#### A. Information required for PRP funding request for the overarching strategy of the KIP

<b>1. Montreal Protocol compliance target to be met in <input type="checkbox"/> stage I of the KIP</b>			
<b>Phase-out commitment (%)</b>	<b>Freeze 10% reduction</b>	<b>Year of commitment</b>	<b>2024 2029</b>
<input type="checkbox"/> Servicing only		<input type="checkbox"/> Manufacturing only	<input checked="" type="checkbox"/> Servicing and manufacturing
<b>2. Brief background/description/information on approved relevant projects and multi-year agreements as follows:</b>			
<ul style="list-style-type: none"> <li>The current progress in implementation of any funded HFC-related project (enabling activities or stand-alone HFC investment projects)</li> <li>The current progress in ongoing HCFC phase-out management plan (HPMPs)</li> <li>Consideration of integrating HFC phase-down activities with HPMP activities taking into account previously approved HFC-related projects, if this information is available.</li> </ul>			
<p>Thailand received MLF approval for its enabling activity funds in late 2017 to help guide it through the ratification of the KA, and initial monitoring and reporting obligations pertaining to HFCs. Also in 2017, it was awarded a Kigali-Cooling Efficiency Program (K-CEP) grant through the World Bank to develop a national cooling plan, but which integrated review, analysis and recommendations on alternatives to HCFCs and HFCs as refrigerant and on energy efficiency (EE) in the refrigeration and air-conditioning (RAC) sector. HFC Thailand enabling activities was completed in 2022. The recommendation package for Kigali Amendment ratification has already been submitted to Permanent Secretary of the Ministry of Industry for the consideration of the new Minister. The new Minister of Industry will assume her position after the new Government announces its policy to the parliament on September 8. With the approval of the Minister of Industry, the recommendation will be</p>			

forwarded for the consideration of the Cabinet. Thailand expects to deposit its ratification instrument by December 2023.

Thailand embarked on Stage I HCFC Phaseout Management Plan (HPMP) in 2013 that focused on enterprises in the foam sector (except spray foam) consuming bulk HCFC-141b and Thailand's important air-conditioning manufacturing sector, HCFC-22. Through the Stage I HPMP, Thailand committed to reduce its consumption of HCFCs within the baseline level by 2013 and reduce its consumption further to the level not exceeding 90% of the baseline level by 2015, and 85% of the baseline level by 2018. Implementation of the Stage I HPMP was completed in 2018 and all the commitments were achieved. The Stage II HPMP addressing the remaining consumption of HCFC-141b in the spray foam sub-sector and consumption in the refrigeration and air-conditioning sectors, was submitted and approved by the MLF ExCom. Implementation of the Stage II HPMP started in 2020 and still on-going. The objectives of the Stage II HPMP is to sustain the consumption level achieved by the Stage I HPMP and further reduce the consumption to not more than 355 ODP tons by 2023. Thailand has submitted project preparation for the Stage III HPMP to the 93<sup>rd</sup> ExCom to enable Thailand to completely phase-out HCFCs by 2030, except for those allowed for a servicing tail between 2030 and 2040, where required, consistent with the provisions of the Montreal Protocol/

### 3. Overview of current HFC consumption in metric tonnes by substance (last three years)

Substance/blend	Sector	2020	2021	2022
HFC-23	Fire suppression	3.89		
HFC-32	RAC manufacturing and/or servicing	7,877.80		
HFC-43-10mee	Solvent	4.63		
HFC-125	Fire suppression	39.32		
HFC-134a	RAC manufacturing and servicing	6,067.43		
HFC-152a	Others	3.60		
HFC-227ea	Fire suppression	17.50		
HFC-236fa	Fire suppression	6.60		
HFC-245fa	Foam	392.08		
HFC-365mfc	Foam	0.92		
R-404A	RAC manufacturing and/or servicing	568.49		
R-407C	RAC manufacturing and/or servicing	147.80		
R-407F	RAC manufacturing and/or servicing	12.17		
R-407H	RAC manufacturing and/or servicing	2.21		
R-410A	RAC manufacturing and/or servicing	6,853.40		
R-415B	RAC manufacturing and/or servicing	225.65		
R-448A	RAC manufacturing and/or servicing	36.16		
R-452A	RAC manufacturing and/or servicing	6.91		
R-454A	RAC manufacturing and/or servicing	0.33		
R-454B	RAC manufacturing and/or servicing	0.48		
R-454C	RAC manufacturing and/or servicing	0.32		
R-507A	RAC manufacturing and/or servicing	18.42		
R-508B	RAC manufacturing and/or servicing			
R-513A	RAC manufacturing and/or servicing	0.76		

### 4. Based on the consumption data given above, please provide a description of the sector/sub-sector that use HFCs in the country, including a short analysis and explanation of the consumption trends (i.e., increasing or decreasing)

HFC consumption in Thailand is mainly in the AC and refrigeration sectors including residential AC, building chiller, mobile AC, commercial and domestic refrigeration sectors. Only small quantities are consumed in the foam, solvent, aerosol, and fire protection industries.

- Thailand is a major manufacturing hub for residential ACs. These manufacturers are multinational and national companies. The main HFCs used in residential ACs are HFC-32 and R-410A with increasing preference to HFC-32. This is a significant shift from R-410A which was the main alternative to HCFC-22 till 2015.
- The total production of domestic refrigerators in Thailand is estimated at 7-8 million units per annum of which about 2-3 million is sold to meet the domestic demand with remaining sold in the export market. HC-600a is fast replacing HFC-134a as preferred refrigerant for domestic refrigerators and freezers.

- Thailand is also a major hub of automobile manufacturing to serve the domestic and export markets. Cars, vans and buses, pick-up trucks, and large trucks, are manufactured and exported from the country. The annual production of vehicles is more than two million of which, cars and small pick-up trucks make up a major share.
- The commercial refrigeration sector comprises many type of equipment and refrigeration system for various applications such as retail market, cold chain, food and industrial processing. The major manufacturers are mainly local players providing design, engineering, installation and servicing support.
- PU foam sector has converted from HCFC-141b mainly to cyclopentane with some opting for HFC-245fa, HFC- 365mfc/HFC-227ea blend, HFOs, and water blown technology in certain applications.
- Fire protection systems are either fixed or portable type. Fixed fire protection systems installed in Thailand use HFC-227ea (FM-200) along with CO2. Besides, HFC-236fa, HFC-125 and HFC-134a are used as fire suppression agents in portable type fire protection equipment.

<b>5. Description of information that needs to be gathered during project preparation. Explain how this data will be gathered</b>		
<b>Information needed</b>	<b>Description</b>	<b>Agency</b>
Data on HFC consumption in manufacturing/servicing sector	Update Thailand HFC survey – inclusion of actual 2021 – 2023 HFC consumption and sectoral consumption. Analyze the impact of COVID-19 pandemic that may depress the demand of HFCs and HFC-based equipment during the baseline years (2020 – 2022), resulting in a lower HCFC baseline than the previous estimate. Update HFC consumption projections for the immediate period (2024 – 2029) to assess potential compliance risk once demand returns to normal post COVID-19 pandemic.	World Bank
HFC sectoral consumption information		
Analysis of types of equipmentt using HFCs		
New information on ODS regulations		

<b>6. Activities to be undertaken for project preparation and funding (decision 87/xx(b))</b>		
<b>Activity</b>	<b>Indicative funding (US \$)</b>	<b>Agency</b>
<b>1. Import and export control</b>		
1.1 Review of the national licensing and quota system to monitor and control the consumption of HFCs and HFC blends. Development of options in alignment with the preparation of the HFC phasedown strategy.	20,000	World Bank
1.2 Capacity building activities related to import/export licensing system including Customs and importers/exporters. Assistance in the development of options as necessary.	10,000	World Bank
<b>2. Data collection and analysis</b>		
2.1 Data collection by sector/sub-sector/HFC substance (2019-23)	50,000	World Bank
2.2 Stakeholder consultation: conducting interviews, organizing workshops and stakeholders’ consultations on ODS alternatives and for the integration of national regulations and procedures for KA implementation and coordination of technical capacities in the institutions involved in HFC control	25,000	World Bank
2.3 Data analysis and development of BAU and growth modeling scenarios, sensitivity analysis, review of feasible options along with preparation of a related technology roadmap reflecting current and future HFC alternatives	25,000	World Bank
<b>3. Development of overarching strategy</b>		
3.1 Review and development of implementing policies and approaches as relevant and in the context of Vietnam’s forthcoming national plan on the management and disposal of controlled ODS and GHGs, including inter-ministerial/agency and institutional arrangements for HFC phasedown.	10,000	World Bank
3.2 Development of the overarching strategy for the phase-down of HFCs and plan of action for stage I of the KIP to address the freeze and 10 per cent reduction in HFC consumption. HFC phase-down strategy development: Technical and legal experts to prepare all legal and technical documents; and if necessary, recommendations for update of institutional arrangements; consult all key stakeholders and develop detailed strategy.	50,000	World Bank

3.3 Development of and integration of the strategy for the phase-down of HFCs focusing on refrigeration servicing sector into the overarching strategy.	20,000	World Bank
<b>4. Outreach and communication</b>		
4.1 Preparation of a comprehensive communication and outreach plan in consultation with key stakeholders.	5,000	World Bank
4.2 Consultation with relevant stakeholders to identify challenges and conduct need assessment for development of outreach and communication methodology for the servicing sector.	5,000	World Bank
<b>TOTAL</b>	<b>220,000</b>	
<b>7. How will activities related to preparing the KIP be linked to the current stages of the HPMP being implemented in the country? (OPTIONAL)</b>		
<p>It is expected that there will be opportunities for synergies between the HPMP and the KIP, particularly in refrigeration and air-conditioning sectors that use both HCFCs and HFCs. Previous measures from the HPMPs in these sectors such as capacity building for technicians, can be integrated to a certain extent. However, there are other sectors that only use HFCs such as in the mobile air-conditioning and domestic refrigeration that were not addressed in the HPMPs. Moreover, integration of best practices in installed equipment maintenance related to energy performance was also not covered. Thus, the Kigali Implementation Plan will be broader and more complex undertaking than HCFC phase-out.</p>		
<b>8. How will the Multilateral Fund gender policy be considered during project preparation?</b>		
<p>The Royal Thailand Government is aware of the Multilateral Fund gender policy contained in ExCom document 84/73, and the related Executive Committee decision 84/92. The project preparation will aim to advocate the importance of gender-responsive actions and provisions in developing the Kigali Implementation Plan. Relevant stakeholders will be sensitized on the gender policy and efforts will be made to encourage female stakeholders to contribute to the project preparation. To the extent possible, a gender-disaggregated data will be collected.</p>		



**Annex 2-B: Request for project preparation of Stage III HPMP for Thailand**

**MULTILATERAL FUND FOR THE  
IMPLEMENTATION OF THE MONTREAL PROTOCOL  
HPMP PROJECT PREPARATION REQUEST FORM  
HCFC PHASE-OUT MANAGEMENT PLAN (OVERARCHING STRATEGY)**

**Part I: Project Information**

<b>Project title:</b>	<b>Project Preparation Request: Thailand HCFC Phase-out Management Plan Stage III (HPMP III)</b>	
<b>Country:</b>	<b>Thailand</b>	
<b>Lead implementing agency:</b>	<b>World Bank</b>	
<b>Implementation period:</b>	<b>12 months</b>	
<b>Funding requested:</b>		
<b>Agency</b>	<b>Sector</b>	<b>Funding requested (US \$)*</b>
<b>World Bank</b>	<b>Overarching</b>	<b>90,000</b>

**Part II: Prerequisites for submission**

Item	Yes	No
3. Official endorsement letter from Government specifying roles of respective agencies (where more than one IA is involved)	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4. Written confirmation – balances from previous PRP funding approved for stage I HPMP had been returned / will be returned ( <b>decision 71/42(i)</b> )	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<ul style="list-style-type: none"> <li>Specify meeting at which PRP funding balance had been returned/will be returned</li> </ul>	Not Applicable	

**Information required to support PRP funding (Overarching strategy)**

<b>Montreal Protocol compliance target to be met in <input type="checkbox"/> stage II / <input checked="" type="checkbox"/> stage III of the HPMP</b>			
<b>Phase-out commitment (%)</b>	<b>100%</b> (with a servicing tail in line with the MP)	<b>Year of commitment</b>	2030
<input checked="" type="checkbox"/> <b>Servicing only</b>		<input type="checkbox"/> <b>Manufacturing only</b>	<input type="checkbox"/> <b>Servicing and manufacturing</b>
<b>Brief background on previous stage of the HPMP</b> (i.e., when the HPMP was approved; a description of the progress in implementation of the previous stage of the HPMP to demonstrate that substantial progress had been made.)			
Thailand embarked on its Stage I HCFC Phaseout Management Plan (HPMP) in 2013. It focused on enterprises in the foam sector (except spray foam) consuming bulk HCFC-141b and Thailand’s important air-conditioning manufacturing sector consuming HCFC-22. Through the Stage I HPMP, Thailand committed to reduce its consumption of HCFCs to within the baseline level by 2013 and reduce its consumption further to a level not exceeding 90% of the baseline by 2015, and not exceeding 85% of the baseline by 2018. Implementation of the Stage I HPMP was completed in 2018 and all the commitments were achieved. The Stage II HPMP addressing the remaining consumption of HCFC-141b in the spray foam subsector and consumption in the refrigeration and air-conditioning sectors, was submitted and approved by the MLF Executive Committee (ExCom). Implementation of the Stage II HPMP started in 2020 and is ongoing.			
<b>Current progress in implementation of previous stage of the HPMP</b>			
<b>Activity</b>	<b>Description</b>		<b>Implementing agency</b>

Manufacturing-Foam PU	Conversions in the manufacturing sector are exclusively in the spray foam sector as planned in the Stage II HPMP. Larger enterprises with HCFC-141b consumption of more than 10 MT will have subprojects to change or retrofit foaming machines: five subgrant agreements have been signed and one more is in the works, planned for an estimated US\$1.3 million. Smaller enterprises with limited HCFC-141b consumption and capacity are receiving technical support through a workshop on the comparison of each alternative for the spray foam industries, technical know-how on self-blended HFOs and others. Hands-on training on reduced-HFO formulation via the cooperation of the Bank and the main system houses also provided.	World Bank
Refrigeration servicing sector	In the refrigeration and air-conditioning (AC) servicing sector, equipment procurement for training has started after some COVID-19-related delays. Delivery of 72 sets of training equipment for AC service technicians for the 12 selected training centers was completed by June 2022. Two partner training institutes have been engaged in delivering the training to technicians, DSD and OVEC (six centers each). One-hundred two (102) out of 229 training sessions were completed by the 12 training centers. A total of 1,860 technicians received training from the DSD and OVEC training centers.	World Bank
Legal/regulatory framework	Preparation of the notification to ban HCFC-141b is ongoing and planned to be enacted by the end of 2023, as per ExCom Decision 82/60(b)(ii) to prevent diversion and zero consumption of HCFC-141b in all applications.	World Bank

**Overview of current HCFC consumption in metric tonnes by substance (last three years)**

Substance	Sector	2019	2020	2021
HCFC-22	Manufacturing-REF	120.36	34.18	34.18
HCFC-22	RAC servicing	5,013.64	5,348.91	5,308.55
HCFC-123	Manufacturing-AC	16.50	6.50	6.50
HCFC-123	RAC servicing	120.00	35.00	112.50
HCFC-141b	Manufacturing-Foam PU	115.00	153.27	153.27
HCFC-141b	Solvent	429.00	388.91	194.00
HCFC-227	Solvent	38.14	4.00	-

**Based on the consumption data given above, please provide a description of the sector/sub-sector that use HCFCs in the country, including a short analysis and explanation of the consumption trends (i.e., increasing or decreasing)**

HCFC consumption for manufacturing has dropped significantly after completion of Stage I which focused on the foam sector (except spray foam) consuming bulk HCFC-141b and the air-conditioning manufacturing sector. Remaining HCFC consumption for manufacturing is in the refrigeration sector and is expected to further drop as the sector started moving to HFCs, although it is believed that several companies using R-22 remain. Consumption of HCFC-141b in foam and solvent sectors have been on a decline with ongoing activities in spray foam and in part due to the signals received by the industry on the inevitable bans in 2023. The bulk of remaining HCFC consumption is HCFC-22 for the servicing sector as well as possibly up to the 12 small commercial refrigeration manufacturers identified in Stage II preparation.

<b>Description of information that needs to be gathered and updated. Explain why this has not been undertaken during preparation for the previous stage of the HPMP.</b>		
<b>Information needed</b>	<b>Description</b>	<b>Agency</b>
Updated data on HCFC consumption in manufacturing/servicing sector	To better assess the type/size of typical providers, nature of work and options/readiness for introduction of climate-friendly, potentially flammable replacements. To revisit the commercial refrigeration manufacturing sector where some remaining HCFC consumption may exist.	World Bank
Analysis of the types of equipment using HCFCs	To estimate needs for servicing tail after 2030	World Bank
Updated sectoral consumption information	The Stage III HPMP will review and address the use of HCFCs in the solvents sector	World Bank
New information on ODS regulations	A review of existing rules, any updates and any need for updates or modifications	World Bank
Explore the need for continuity and further capacity strengthening for functional agencies in controlled substances management	To better manage the controlled substances by competent and functional agencies like customs, import-export management agencies and other relevant stakeholders	World Bank
<b>Activities to be undertaken for project preparation and funding</b>		
<b>Activity</b>	<b>Indicative funding (US \$)</b>	<b>Agency</b>
Data updates, reconciliation, and analysis	45,000	World Bank
Technology and servicing needs assessment	20,000	World Bank
Stakeholder workshops (2) and consultations and associated travel	15,000	World Bank
Policy and institutional framework review, including aspects related to gender, and actions needed if any	10,000	World Bank
<b>TOTAL</b>	<b>90,000</b>	
<b>How will activities related to implementation of the Kigali Amendment to phase down HFCs be considered during project preparation for stage III of the HPMP?</b>		
Efforts will be undertaken to coordinate activities in servicing subsectors such as air-conditioning and commercial refrigeration that may use both HCFCs and HFCs. During preparation, survey data from the KIP preparation will be compared to that collected/updated under the HPMP to better identify consumption and use patterns in the servicing sector of the different types of refrigerants as well as to assess and understand supply and distribution channels beginning with imports to end-users and service shops. Efforts will be made in training and awareness workshops and other events to provide consistent messaging on phaseout and phasedown requirements.		
<b>How will the Multilateral Fund gender policy be considered during project preparation?</b>		
In Stage III preparation, first an assessment will be made of how gender was addressed in Stage II, lessons learned and results if any given that the MLF policy was adopted after the Stage II project was prepared and launched. The data update and collection period will be an opportunity to establish the starting point for measuring progress in integrating gender considerations. A WB gender specialist will be included in the preparation team to determine how to integrate gender into the project in accordance with the WBG gender policy and that of the MLF and to work with the government on incorporating practicable measures and indicators into the project design.		

**Annex 2-C: Request for project preparation for investment projects in commercial refrigeration sector for Thailand**

**A. PRP funding request for investment projects in commercial refrigeration**

<b>1. Agency:</b>		World Bank			
<b>2. Sector:</b>		Refrigeration			
<b>3. HCFC consumption in item #2 reported under country programme data?</b>		<input type="checkbox"/> Yes, please specify reported amount and year: _____ <input checked="" type="checkbox"/> No The enterprises' HCFC consumption to be phased out will be determined during the preparation of the investment project. The country has been reporting HCFC consumption as servicing consumption absent of a detailed survey (to be done under the HPMP III overarching preparation support)			
<b>4. Does the enterprise commit to phase out the HCFC consumption associated with the proposed investment project, if approved by the Executive Committee?</b>		<input checked="" type="checkbox"/> Yes, please provide support letter _____ <input type="checkbox"/> No			
<b>5. If the project preparation is requested in advance of the HPMP, did the Government provide a written commitment that the consumption associated with these investment projects, once approved, will be deducted from the country's starting point, once established?</b>		<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Investment project/sector plan will be submitted as part of the final Stage III HPMP.			
<b>6. Please explain briefly how the investment project would relate to the overarching strategy for the country, and when the final HPMP will be submitted</b>		Complete conversion of remaining manufacturing will allow Thailand to permanently ban all manufacturing and imports of HCFC-based products and assist it to slow demand for HCFC in servicing as it moves to complete phaseout.			
<b>7. Information on sector consumption (specify previous year HFC consumption)</b>					
<b>Substance</b>			<b>Consumption (metric tonnes)</b>		
Others, specify.			HCFC-22 TOTAL CONSUMPTION IN 2022: 4,100.55 MT		
<b>8. Information on enterprise(s) for which funding is being sought</b>					
Enterprise	Year established	HCFC consumption (metric tonnes) (last three years)			HCFC phase-out to be achieved (metric tonnes and CO <sub>2</sub> -eq. tonnes)
		2020	2021	2022	
Up to 12 SMEs* The combined R-22 consumption is expected to be low due to the size of these companies.	Prior to Sep. 2007	TBD	TBD	TBD	TBD

<b>9. Activities to be undertaken for preparation of the investment project and funding requested</b>		
Activity	Indicative funding (US \$)	Bilateral/implementing agency
Prepare investment group conversion project for up to 12 enterprises manufacturing commercial refrigeration equipment to convert from HCFC-22 refrigerant to hydrocarbons	80,000	World Bank
<b>TOTAL</b>	<b>80,000</b>	

\*In the event that a lower number of enterprises are identified, preparation funding will be returned in accordance with Decision 56/16(f) on the funding scale for the number of enterprises in manufacturing.

### **Annex 3-A: Request for project preparation of energy efficiency project for Viet Nam**

**Title:** Project preparation for enhancing energy efficiency in Viet Nam’s air-conditioning sector while transitioning to low-GWP alternative refrigerants.

**Objective:** Improve energy efficiency by 10 to 20% in split-type air-conditioning equipment in Viet Nam in parallel with complete HFC phaseout in the subsector.

**Context:** Room AC is also the top energy consuming equipment in the residential sector in Vietnam. Room AC, with an estimated stock of 16 million units in 2020, accounted for 30%. While energy consumption for ACs is high in the residential sector, it is even higher in the commercial and industrial sectors. AC systems consume 45% of total electricity used in office buildings, 41% of total electricity used in supermarkets, and 42% in hotels.

There are currently three air-conditioner manufacturers in Vietnam, including two multinational companies and one locally owned manufacturer. The local company, Nagakawa, restarts AC production in 2023 after a few years pause to modernize its factory to comply with new safety regulations. Nagakawa, however, can only make fixed speed R-32 models as it currently lacks capacity to make inverter units. Fixed-speed room AC is simple to design and manufacture because the marketplace is highly commoditized with components that are easy to obtain and integrate into an operational AC system. For inverter-based room AC systems it is necessary to integrate sensors, signal conditioning, analog-to-digital converters and computational programming into the electronic controllers for each model. In addition, the local companies cannot fix the inverter circuit board and can only replace with new one leading to growing problems of electronic waste. These barriers have entrenched local manufacturing in fixed speed AC production and further exacerbates competitiveness of local manufacturing, as witnessed particularly in Vietnam.

In Vietnam, the MEPS and labeling scheme are in place since 2011 and are mandatory for a range of products, including air conditioners. They include the comparative label (up to five stars) and endorsement label (which is recognition that the equipment has an EE level that reaches or exceeds the highest energy performance standard). Vietnam’s approach is considered “technology neutral,” in that it does not provide two sets of MEPS for fixed-speed and more efficient inverter AC. The MEPS for AC have been revised only once in 2015 though market data however shows that its current MEPS levels are low and not reflective of the actual market. The MEPS levels have not been updated in eight years and there is no strong legal basis for a continuous review and improvement, meaning there is no obligation nor resources for regulators to update MEPS levels.

**Concept for Improving EE in Split-type Air-Conditioner:** The proposal intends to introduce a dual approach of strengthening energy performance policy on split-type AC and technical and investment support to the Viet Nam-owned manufacturer to increase their production share of energy efficient units.

To scale up climate benefits possible, the proposed EE project would pursue the development and introduction of policy and standards to increase MEPS that promote uptake of inverter-based room AC and create the enabling environment for uptake of more efficient, greener technology thereby supporting Viet Nam-owned manufacturers. In order to understand how ambitious a minimum energy performance standard could be at the onset; the project would include a market assessment of the current average EE and refrigerant used of room AC marketed in Viet Nam. Moreover, the study would assess other opportunities for EE improvement in the context of HFC phasedown.

**Project preparation support:** Preparation will determine what is required to help Nagakawa design and service more efficient units while reducing electronic waste. Preparation work will also lead to an estimated amount of CO<sub>2</sub>eq. in additional benefits that can be accrued. The actual target would be confirmed in

project implementation subsequent to 1) testing enterprise products and 2) assessing the average energy performance of split-type AC units in the Viet Nam market.

**Preparation Budget for EE Improvement in Split-type AC**

<b>Activity</b>	<b>Planned Budget (US\$)</b>
Capacity needs assessment of Nagakawa and EE regulators (incl. travel)	10,000
Consultations with technology providers/suppliers in the Region (incl. travel)	5,000
Design and development of the proposal, including determination of source of technology and know-how	15,000
<b>Total</b>	<b>30,000</b>

**Annex 3-B: Request for the Development of Lifecycle Management Plan for Controlled Substances for Viet Nam**

**MULTILATERAL FUND FOR THE  
IMPLEMENTATION OF THE MONTREAL PROTOCOL**

**FUNDING REQUEST FOR THE PREPARATION OF NATIONAL INVENTORIES OF BANKS OF USED OR UNWANTED CONTROLLED SUBSTANCES AND A PLAN FOR THE COLLECTION, TRANSPORT AND DISPOSAL OF SUCH SUBSTANCES, INCLUDING CONSIDERATION OF RECYCLING, RECLAMATION AND COST-EFFECTIVE DESTRUCTION**

**Part I: Project information**

<b>Project title:</b>	<b>Development of Lifecycle Management Plan for Controlled Substances</b>
<b>Country:</b>	<b>Viet Nam</b>
<b>Lead implementing agency:</b>	<b>World Bank</b>
<b>Meeting where request is being submitted</b>	<b>93<sup>rd</sup> Meeting</b>
<b>Implementation period</b>	<b>2025-2027</b>
<b>Duration of implementation (i.e., time (in months)) from the approval of PRP to submission of the national inventory and action plan (please specify): 24</b>	
<b>Funding requested:</b>	
<b>Agency</b>	<b>Funding requested (US \$)*</b>
<b>World Bank</b>	<b>107,000</b>

\*Details should be consistent with information provided in the relevant sections below. Agency support costs included.

**Part II: Prerequisites for submission**

<b>Item</b>	<b>Yes</b>	<b>No</b>
Official endorsement letter from Government, indicating roles of respective agencies (where more than one IA is involved), and that the national inventory/action plan will be completed within 24 months from the date of project approval	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Project included in the bilateral/IA business plan?	<input type="checkbox"/>	<input checked="" type="checkbox"/>
If <b>NO</b> , please provide explanation:		
<ul style="list-style-type: none"> <li>• Endorsement letter will be provided by the week of October 30<sup>th</sup> (due to DCC travel for MP meetings)</li> <li>• The activity was not included in the 2024-2026 Business Plan as the KIP survey was just starting and it was not certain whether the activity was needed at that time (September 2022).</li> </ul>		

**Information required for PRP funding request for the national inventories of banks of used or unwanted controlled substances and a plan for the collection, transport and disposal of such substances, including consideration of recycling, reclamation and cost-effective destruction**

<b>Brief overview of the the concept, methodology and approach to be taken for the preparation of the national inventory and / or action plan and how it is linked to other activities in the country (i.e., national plans like the KIP), in particular those activities in the refrigeration servicing sector such as recovery, recycling, and reclamation programmes.</b>
The project objective is to develop a life-cycle management plan for reducing demand for and emissions of Montreal Protocol controlled substances and which is financially self-sustaining over time. In order to understand the feasibility of such a plan, the following is needed: i) the amount and type of currently installed controlled substances (i.e. “banks”); ii) the existing flow of and market for refrigerants and fire suppression agents and available infrastructure for tracking, monitoring, recovering and storing these chemicals; iii) the existing regulatory framework and system related to trade in chemicals and to waste management as well as



recovery and recycling of MP controlled substances; iv) models and lessons learned from other countries that have a life-cycle management approach, or elements of an approach in place; v) technical capacity to analyze content and quality of reclaimed materials and purity standards of reclaimed materials required/expected by the market and how to ensure these are achieved; and vi) demand for recovered, recycled controlled substances within Viet Nam and the Region.

After understanding the current situation, the proposed activity will analyze the information and data collected, including estimating future streams (amounts and types of substances) for recovery, reuse or destruction. One of the main objectives will be in fact, to quantify real and sustained reductions in CO<sub>2</sub>eq. emissions that Viet Nam can claim in its NDC and other climate related strategies and carbon market objectives. Financial analysis, most critically the break-even cost for a viable, self-sustained scheme will be conducted. Design of a scheme, or business model, and required regulation, infrastructure and other investments to make it viable will be done in close consultation with the various stakeholders in the country as well as external players that have already some ideas and experience in the field. In the consultation process, business partnerships and public-private sector cooperation will be promoted. For the latter, linkages to implementation of related activities in the servicing sector under Viet Nam's Stage I KIP and HPMP III will be made as well as to build on/scale-up bilateral work with Japan on recovery and disposal. Recommendations will be formulated to assist the country and stakeholders to institute and implement the proposed life-cycle management plan, building on the country's current import/export/destruction system, and to scale-up recovery, recycling and reuse of controlled substances across MP sectors and possibly across countries.

**Description of activities that will be implemented during the preparation of the national inventories/action plans of banks for used and/or unwanted controlled substances and an indication of the estimated costs for the activities described broken down per agency**

Activity	Description	Agency
Data collection	Data collection will determine the installed stock of refrigeration and cooling equipment, including estimates on the amount and types of refrigerant used. The focus will be on larger units. Part of data collection will entail research of bankable management models in non-A5 and other A5 countries, and Viet Nam's existing regulatory framework and including the new regulation on ODS and GHG and rules to fulfil obligations under the chemicals conventions (Basel, etc.). The study will also investigate current in-country capacity to analyze quality of recovered and reclaimed materials.	World Bank
Stakeholder consultations	Consultations with importers of controlled substances, major equipment suppliers, associations, waste management and disposal operators, larger servicing shops and authorized dealers and regulators from ministries of industry, environment, energy and finance (Customs). Consultations with companies active in the Region that specialize in recovery, reclamation, disposal and tracing refrigerants and to the extent possible companies engaging in carbon market trading, will also be consulted.	World Bank
Analysis of data collected	Analysis of collected data and modelling of quantities of equipment and controlled substances that will be decommissioned, available for collection over time by type of substance. The focus will also be given to collection options to minimize transaction costs of the R&R and disposal scheme. The break-even cost of R&R and destruction will be	World Bank

	calculated. Assessment of Viet Nam’s existing infrastructure and regulatory framework for lifecycle management of controlled substances will be undertaken, including any need for implementation rules of its new Decree No. 06/2022/ND-CP and other provisions of the Law on Environmental Protection.	
Preparation of inventory report/national plan	A lifecycle management plan for controlled substances will be developed to track and manage refrigerants and fire suppression agents from first import through recovery and disposal (including destruction). The starting point for the plan, namely the existing inventory of controlled substances will be described as well as the results of the analysis, financing scheme and additional requirements if any, and recommendations for implementation, including needed infrastructure, facilities and equipment, will be included.	World Bank
<b>Funding for the activities described in 2 above</b>		
<b>Activity</b>	<b>Indicative funding (US \$)</b>	<b>Agency</b>
Data collection consulting firm	45,000	World Bank
In country stakeholder consultation	15,000	World Bank
Expert time for data analysis	15,000	World Bank
Expert time for designing a viable lifecycle management plan and sustainable business model	20,000	World Bank
Report preparation	5,000	World Bank
<b>TOTAL</b>	<b>100,000</b>	
<b>How will the Multilateral Fund gender policy be considered during project preparation?</b>		
Relevant stakeholders will be sensitized on gender policy including that of the Multilateral Fund to the degree possible and as relevant. Efforts will be made to encourage female stakeholders to contribute to the inventory and design of the proposed scheme/action plan for managing refrigerants and fire suppression agents and other related controlled substances. To the extent relevant, gender-disaggregated data will be collected (in the consultations and discussions with waste operators for example).		

