



**United Nations  
Environment  
Programme**

Distr.  
GENERAL

UNEP/OzL.Pro/ExCom/92/39

8 May 2023

ORIGINAL: ENGLISH



EXECUTIVE COMMITTEE OF  
THE MULTILATERAL FUND FOR THE  
IMPLEMENTATION OF THE MONTREAL PROTOCOL  
Ninety-second Meeting  
Montreal, 29 May to 2 June 2023  
Item 9(c) of the provisional agenda<sup>1</sup>

**PROJECT PROPOSAL: THAILAND**

This document consists of the comments and recommendation of the Secretariat on the following project proposal:

Phase-out

- HCFC phase-out management plan (stage II, second tranche) World Bank

<sup>1</sup> UNEP/OzL.Pro/ExCom/92/1

Pre-session documents of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol are without prejudice to any decision that the Executive Committee might take following issuance of the document.

## PROJECT EVALUATION SHEET – MULTI-YEAR PROJECTS

## Thailand

(I) PROJECT TITLE	AGENCY	MEETING APPROVED	CONTROL MEASURE
HCFC phase-out plan (stage II)	IBRD	82 <sup>nd</sup>	61.8% by 2023

(II) LATEST ARTICLE-7 DATA (Annex C Group I)	Year: 2021	278.96 ODP tonnes
--	------------	-------------------

(III) LATEST COUNTRY PROGRAMME SECTORAL DATA (ODP tonnes)							Year: 2022		
Chemical	Aerosol	Foam	Fire-fighting	Refrigeration		Solvent	Process agent	Lab use	Total sector consumption
				Manufacturing	Servicing				
HCFC-22					225.53				225.53
HCFC-141b		23.10				44.58			67.68
HCFC-141b in imported pre-blended polyol		2.90							2.90
HCFC-123			0.26		1.79				2.05

(IV) CONSUMPTION DATA (ODP tonnes)			
2009-2010 baseline:	927.60	Starting point for sustained aggregate reductions:	943.30
CONSUMPTION ELIGIBLE FOR FUNDING			
Already approved:	533.20	Remaining:	410.10

(V) ENDORSED BUSINESS PLAN		2023	2024	2025	Total
IBRD	ODS phase-out (ODP tonnes)	28.77	2.37	0.00	31.14
	Funding (US \$)	2,264,689	186,763	0	2,451,452

(VI) PROJECT DATA			2018	2019	2020	2021	2022	2023	Total
Montreal Protocol consumption limits (ODP tonnes)			834.84	834.84	602.94	602.94	602.94	602.94	n/a
Maximum allowable consumption (ODP tonnes)			788.46	410.00	410.00	400.00	390.00	354.74	n/a
Funding agreed in principle (US \$)	World Bank	Project costs	1,500,000	0	2,116,532	0	174,545	0	3,791,077
		Support costs	105,000	0	148,157	0	12,218	0	265,375
Funds approved by ExCom (US \$)		Project costs	1,500,000	0	0	0	0	0	1,500,000
		Support costs	105,000	0	0	0	0	0	105,000
Total funds recommended for approval at this meeting (US \$)		Project costs	0	0	0	0	0	2,116,532*	2,116,532
		Support costs	0	0	0	0	0	148,157*	148,157

\* The second tranche should have been submitted in 2020.

<b>Secretariat's recommendation:</b>	Blanket approval
--------------------------------------	------------------

## PROJECT DESCRIPTION

1. On behalf of the Government of Thailand, the World Bank as the designated implementing agency has submitted a request for funding for the second tranche of stage II of the HCFC phase-out management plan (HPMP), in the amount of US \$2,116,532, plus agency support costs of US \$148,157. The submission includes a progress report on the implementation of the first tranche, the verification report on HCFC consumption for 2018 to 2021, and the tranche implementation plan for 2023 to 2024.

### Report on HCFC consumption

2. The Government of Thailand reported under country programme (CP) implementation report a consumption of 295.26 ODP tonnes of HCFC in 2022, which is 68.2 per cent below the HCFC baseline for compliance. The Article 7 data for 2022 has not been reported yet. The 2018-2022 HCFC consumption is shown in table 1.

**Table 1. HCFC consumption in Thailand (2018-2021 Article 7 data)**

HCFC	2018	2019	2020	2021	2022*	Baseline
<b>Metric tonnes (mt)</b>						
HCFC-22	5,035.28	5,469.20	5,327.70	4,344.30	4,100.55	13,028.60
HCFC-123	184.79	51.18	119.05	91.24	102.50	159.75
HCFC-124	0.00	0.00	0.00	0.00	0.00	3.41
HCFC-141b	673.45	543.96	542.16	347.29	615.28	1,865.93
HCFC-142b	0.00	0.00	0.00	0.00	0.00	1.81
HCFC-225**	30.61	38.18	8.00	0.00	0.00	54.60
<b>Subtotal (mt)</b>	<b>5,924.13</b>	<b>6,102.52</b>	<b>5,996.91</b>	<b>4,782.83</b>	<b>4,818.33</b>	<b>15,114.10</b>
HCFC-141b in imported pre-blended polyols*	26.18	42.24	20.13	20.13	26.40	142.50***
<b>ODP tonnes</b>						
HCFC-22	276.94	300.81	293.02	238.94	225.53	716.57
HCFC-123	3.70	1.02	2.38	1.82	2.05	3.19
HCFC-124	0.00	0.00	0.00	0.00	0.00	0.08
HCFC-141b	74.08	59.84	59.64	38.20	67.68	205.25
HCFC-142b	0.00	0.00	0.00	0.00	0.00	0.12
HCFC-225**	2.14	2.67	0.56	0.00	0.00	2.30
<b>Subtotal (ODP tonnes)</b>	<b>356.86</b>	<b>364.34</b>	<b>355.60</b>	<b>278.96</b>	<b>295.26</b>	<b>927.51</b>
HCFC-141b in imported pre-blended polyols*	2.88	4.65	2.21	2.21	2.90	15.67***

\* CP data.

\*\* These figures include consumption for HCFC-225, HCFC-225ca and HCFC-225cb.

\*\*\* Average consumption between 2007 and 2009.

3. In 2022, the consumption of HCFC-22 and HCFC-141b had decreased to 81 per cent and 91 per cent of their 2018 levels, respectively, mainly on account of the decrease in manufacturing and servicing of HCFC-22-based equipment and the phase-out of HCFC-141b in the foam manufacturing sector, which is expected to be fully completed by 31 December 2023. HCFC-141b continues to be consumed in solvent applications, mainly in servicing of refrigeration and air-conditioning (RAC) equipment, electronic cleaning and metal cleaning. HCFC-123 consumption in chillers and in fire-fighting applications is decreasing compared to 2018 levels. HCFC-225 consumption in solvent applications for 2021 and 2022 is nil due to lower levels of manufacturing as a result of challenges related to the COVID-19 pandemic and the use of HCFC-225 stockpiled from previous years.

*Country programme implementation report*

4. The Government of Thailand reported HCFC sector consumption data under the 2021 country programme (CP) implementation report that is consistent with the data reported under Article 7 of the Montreal Protocol.

*Verification report*

5. The verification report confirmed that the Government is implementing a licensing and quota system for HCFC imports and exports and that the total consumption of HCFCs reported under Article 7 of the Montreal Protocol for 2019 and 2021 was correct (as shown in table 1 above), and that for 2018 and 2020, the consumption, in accordance with import declaration registered in Department of Industrial Works (DIW) records, should be 362.73 ODP tonnes and 356.15 ODP tonnes, respectively, instead of 356.86 ODP tonnes and 355.60 ODP tonnes reported under Article 7 and CP data including possible cancellation of the import. The revised data reports were submitted to the Ozone and Fund Secretariats at the end of March 2023. The verification concluded that the consumption for all four years is below the maximum allowable consumption in the country's Agreement with the Executive Committee.

6. The World Bank indicated that the recruitment of a consultant to undertake the verification of HCFC consumption for 2022 is ongoing, and the verification report would be prepared and submitted by September 2023.

Status of implementation of stage I of the HCFC phase-out management plan

7. Stage I of the HPMP was completed in December 2018 and the project completion report was submitted on 8 April 2019.

Progress report on the implementation of the first tranche of stage II of the HCFC phase-out management plan

*Legal framework*

8. In January 2013, the DIW established an import quota system for HCFCs. On 1 July 2017, it issued a ban on the use of HCFC-22 for manufacturing air conditioners with a cooling capacity below 50,000 BTU/hour and on 31 March 2018, the Ministry of Commerce issued a ban on the import of such equipment.

9. The regulations implemented in July 2017 also included a ban on the use of HCFC-141b pure and contained in imported pre-blended polyol for manufacturing all polyurethane foam products except spray foam; on 31 December 2023, the ban will be extended to cover all polyurethane foam manufacturing applications in line with decision 82/60(b)(ii). The Government is working closely with the systems houses and distributors to ensure effective implementation of the ban; and would also continue to monitor its implementation through random checks and confirmation from importers on the users.

10. Currently, no air-conditioning units using hydrocarbon refrigerants can be installed in buildings in Thailand due to safety standards.

*Spray foam manufacturing sector*

11. In stage II of the HPMP, total funding in the amount of US \$1,732,597 was approved to convert 71 enterprises from HCFC-141b used as a foam blowing agent to reduced-HFO-based formulations. The Government of Thailand initiated activities relating to the implementation arrangements in 2019 (e.g., preparation of sub-grant agreements and development of an environmental management framework for

beneficiaries) and conducted a launch workshop for the implementation of stage II of the HPMP after the relevant administrative processes in November 2020. Sub-grant agreements for two enterprises, PU Foam Insulation and Trading Co. and Lohr Trade and Consulting Ltd., consuming 14.84 mt and 14.08 mt, respectively, were concluded by January 2023 for conversion to HFO-based formulations; the total amount of funding for the sub-grant agreement at each of the enterprises is US \$103,370 and US \$77,330, respectively. These projects are expected to be completed by September 2023.

#### *Refrigeration servicing sector*

12. The following activities were undertaken:

- (a) Provision of 72 sets of training equipment (e.g., vacuum pump, manifold gauges, weighing scales, servicing tools) for air-conditioning service technicians to the 12 selected training centres (six each to the Office of the Vocational Education Commission (OVEC) and to the Department of Skill Development (DSD)); and
- (b) Training, by the DSD and OVEC training centres, of 980 air-conditioning service technicians on good service practices and safe installation, maintenance and servicing of equipment; a training tool would be provided to the technicians who have completed training in one of the 12 centres.

#### *Project implementation and monitoring*

13. The Global Saving Bank (GSB) staff is responsible for implementing conversion activities in the manufacturing sector and technical assistance activities. The DIW's project management unit (PMU) is responsible for facilitating DIW's approval of sub-project eligibility and disposal plans. It also plays a vital role in monitoring implementation of disposal plans and sustainable phase-out of HCFCs at the enterprise level. Moreover, the DIW-PMU oversees the implementation of technical assistance activities related to training institutes and non-governmental organizations; it assisted DIW in allocating annual HCFC import quotas for 2021, 2022 and 2023 and facilitated the work of the independent consultant to carry out the verification of the annual HCFC consumption.

14. The total expenditure of PMU in the amount of US \$110,494 includes expenditures incurred by DIW-PMU (US \$11,232) and GSB-PMU (US \$99,262).

#### Level of fund disbursement

15. As of March 2023, of the US \$1,500,000 approved so far, US \$501,793 (33.5 per cent) had been disbursed. The balance of US \$998,207 will be disbursed in 2023.

#### Implementation plan for the second tranche of stage II of the HCFC phase-out management plan

16. The following activities will be implemented during the second tranche of stage II of the HPMP between July 2023 and December 2024.

#### *Spray foam manufacturing sector (US \$1,047,067)*

17. By mid-2023, additional sub-grant agreements will have been signed with four large spray foam manufacturing enterprises that have already confirmed their interest in participating in the project and the conversion will be completed by the end of 2023. The table below provides information on the four enterprises.

**Table 2. Spray foam manufacturing enterprises with sub-grant agreements to be signed in 2023**

<b>Enterprise</b>	<b>HCFC-141b to be phased out (mt)</b>	<b>Estimated value (US \$)</b>
New Tech & J Service	56.46	299,775
Narongrit Insulate	24.87	153,520
Beam Chem	29.02	174,255
Dabco Intertrade	101.59	537,100

18. To avoid any diversion of the remaining consumption of HCFC-141b to the polyurethane foam sector, DIW and the Polyurethane Industry Group will be conducting workshops in June 2023 to provide technical support to smaller enterprises with consumption of HCFC-141b below 2 mt and educate them on the proper and cost-effective use of new non-ODS blowing agents without significantly compromising product quality.

19. In addition, those enterprises will receive a hands-on training in June 2023 on reduced HFO-based formulations through cooperation of the World Bank and the main system houses in the country (South City, Bangkok Integrated Trading (BIT), P.U. Foam Insulation and Trading, Huntsman, Integrated Refinery and Petrochemical Complex (IRPC), and Thai Mitsui).

#### *Refrigeration servicing sector*

20. Activities in the refrigeration servicing sector will include:

- (a) Training of about 3,600 technicians through 183 workshops on good service practices and adoption of low-global-warming-potential (GWP) alternatives in the 12 training centres (US \$912,757);
- (b) One workshop for users of HCFC-141b as a solvent, to identify potential alternatives to HCFC-141b in different applications including in the refrigeration servicing sector, and identify interested parties to develop projects to assess efficacy and performance of alternatives in future (balance from previous tranche); and
- (c) Project management and monitoring through the two PMUs (GSB and DIW) for ensuring proper planning and timely implementation of phase-out projects in the spray foam sector and in the service sector (US \$156,708).

## **SECRETARIAT'S COMMENTS AND RECOMMENDATION**

### **COMMENTS**

#### Report on HCFC consumption

##### *Verification report*

21. The World Bank submitted a verification report which covered 2018 to 2021. The World Bank indicated that the consultant to undertake the verification report for 2022 is being hired and the Government of Thailand is committed to resubmitting in September 2023 a revised verification report pursuant to decision 72/19(a)<sup>2</sup> to include data for 2022. Accordingly, the Secretariat recommends approval of this

<sup>2</sup> Encourages lead bilateral and implementing agencies submitting HPMP tranche requests to the first meeting of the year to include a verification report of national consumption targets for the year immediately preceding the year during which the tranche was submitted.

funding tranche request on the understanding that in the unlikely event of non-compliance by the Government of Thailand with its Agreement with the Executive Committee, relevant actions will be taken by the Executive Committee.

Progress report on the implementation of the first tranche of stage II of the HCFC phase-out management plan

*Reasons for delays in the submission of the second tranche of stage II*

22. The World Bank explained that the delays in the submission of the second tranche of stage II of the HPMP were mainly due to delays in consultations with the beneficiaries in spray foam applications and relevant stakeholders in the service sector due to restrictions related to the COVID-19 pandemic; these issues have been addressed and the implementation is progressing satisfactorily.

*Legal framework*

23. The Government of Thailand has already issued HCFC import quotas for 2023 at 300.64 ODP tonnes, which is lower than the Montreal Protocol control targets and the targets set in the Agreement with the Executive Committee.

*Spray foam manufacturing sector*

24. The World Bank indicated that as of the end of April 2023, the Government of Thailand had confirmed that none of the 71 foam enterprises identified during the submission of stage II of the HPMP were found to be ineligible,<sup>3</sup> and that six enterprises with a consumption of greater than 10 mt have been identified for support under stage II. As of January 2023, sub-grant agreements have been signed with two of the six enterprises, and the other four enterprises are expected to sign their sub-grant agreements by June 2023. The Government of Thailand is working closely with the systems houses and foam systems distributors for assessing the eligibility of and providing technical support to the eligible enterprises that are consuming less than 2 mt; those enterprises will receive support in adopting reduced HFO-based formulations through the hands-on training planned in June 2023. The World Bank also confirmed that, in line with decision 82/60(b)(ii), the Government would implement a ban on imports of HCFC-141b in bulk and contained in pre-blended polyols in all foam applications by 31 December 2023; implementation of this legislation and assistance to the eligible spray foam enterprises during 2023 would facilitate the phase-out of HCFC-141b in all foam applications. Ineligible enterprises, if any, identified during the implementation would be tracked and a report covering details of the enterprises and their consumption would be submitted to the Executive Committee along with the country's third tranche request.

*Refrigeration servicing sector*

25. The World Bank reported a reduction in the number of technicians proposed to be trained from 5,500 to 4,500, which is primarily due to the reallocation of funds for providing equipment support to technicians, implementation of capacity building for certification programmes and other capacity building and outreach activities for RAC technicians. This would result in effective implementation of service sector activities and facilitate the adoption of lower-GWP alternatives in the country.

26. The World Bank reported that DSD and the Electricity Generating Authority of Thailand have developed and launched, with their internal resources, a mobile phone application for promoting air-conditioning service technicians. Funds for this activity, originally budgeted in the first tranche of stage II of the HPMP, have been reallocated to the activities related to training of service technicians.

---

<sup>3</sup> Decision 82/60(c)

27. The Secretariat requested additional information on what activities are planned to be undertaken during the workshop on the use of HCFC-141b in solvent applications noting that the conversion project in the solvent sector was planned to be submitted under stage III of the HPMP.<sup>4</sup> The World Bank explained that this activity mainly relates to gaining a better understanding of the use of HCFC-141b in solvent applications mainly in RAC servicing and other metal cleaning applications and would contribute to understanding of future project needs in the solvent sector.

#### Gender policy implementation<sup>5</sup>

28. The World Bank reported that during stages I and II of the HPMP, gender mainstreaming is under implementation. The Bank's gender policy ensures that there is no discrimination against women during project formulation and implementation process; gender mainstreaming is an integral part of the Bank's operational manual for implementation of investment and training activities, which explicitly requires equal treatment and provision of equal opportunities to female workers for training and other technical assistance activities; gender indicators are a part of the project indicators which the Bank uses for internal evaluation when a project is completed. Furthermore, the training institutes have established a system to monitor the number of female applicants and those attending the air-conditioning servicing training and certification. The World Bank also mentioned that while implementing activities under the second tranche of stage II of the HPMP, it would continue to implement measures in line with the gender policy approved by the Executive Committee to the extent practicable.

#### Sustainability of the HCFC phase-out and assessment of risks

29. To ensure the sustainability of the HPMP activities over time, the Government of Thailand has implemented regulations for reducing the use of HCFC-22 in air-conditioner manufacturing and HCFC-141b in foam applications; furthermore, the Government would strengthen these regulations and implement additional measures in future to reduce HCFC consumption in remaining uses and this would reduce the risks of use of HCFCs in applications/sectors where their use is prohibited. The Government is also implementing activities to provide technical support to the service sector to promote the adoption of low-/lower-GWP refrigerants in a safe manner; this would reduce the risks related to safe and sustainable use of flammable refrigerants. The PMU would continue to facilitate the project implementation process and undertake measures for timely completion of projects to reduce consumption of HCFCs in line with the HPMP targets.

#### Conclusion

30. The HCFC consumption reported in CP data for 2022 was 68.2 per cent below the HCFC baseline for compliance and 24 per cent below the country's maximum eligible consumption under its Agreement with the Executive Committee. The verification report confirmed the effective implementation of the ODS licensing system, and the Government of Thailand has committed to submitting an updated verification report to include 2022 consumption data by September 2023. The Government is implementing HPMP activities in a systematic manner to meet the Montreal Protocol Agreement targets. Though the pace of project implementation was affected due to constraints related to the COVID-19 pandemic, the Government continued to undertake activities that facilitated expeditious project completion in spray foam manufacturing applications and service sector, resulting in consumption reduction. The Government is expected to implement regulations by 31 December 2023 to prohibit import of HCFC-141b, pure and contained in imported pre-blended polyols, for use in all polyurethane foam applications. Furthermore, the Government, in close coordination with relevant industry representatives, is working on ensuring

---

<sup>4</sup> Paragraph 61 of document UNEP/OzL.Pro/ExCom/82/59

<sup>5</sup> In line with decision 84/92(d), decision 90/48(c) encouraged bilateral and implementing agencies to continue ensuring that the operational gender mainstreaming policy was applied to all projects, taking into consideration the specific activities presented in table 2 of document UNEP/OzL.Pro/ExCom/90/37.



HCFC-141b phase-out project implementation is well aligned with the implementation of regulations. The Government is continuing to take steps for building capacity of the service sector to adopt good practices and use low-/lower-GWP alternatives in a safe manner. The disbursement rate of funds approved from the first tranche is 33.5 per cent and the balance is expected to be disbursed by the end of 2023. The activities planned in the second tranche of stage II would help in completing activities relating to phase-out of HCFC-141b in spray foam manufacturing applications and continue supporting capacity building of the service sector.

## RECOMMENDATION

31. The Fund Secretariat recommends that the Executive Committee note the progress report on the implementation of the first tranche of stage II of the HCFC phase-out management plan (HPMP) for Thailand, and further recommends blanket approval of the second tranche of stage II of the HPMP and the corresponding 2023-2024 tranche implementation plan for Thailand at the funding level shown in the table below on the understanding that:

- (a) The World Bank has committed to submit an updated verification report to include 2022 consumption data by September 2023; and
- (b) In the unlikely event of non-compliance by the Government of Thailand with its Agreement with the Executive Committee, relevant actions will be taken by the Executive Committee.

	<b>Project title</b>	<b>Project funding (US \$)</b>	<b>Support costs (US \$)</b>	<b>Implementing agency</b>
(a)	HCFC phase-out management plan (stage II, second tranche)	2,116,532	148,157	World Bank