Terminal Evaluation Review form, GEF Independent Evaluation Office, APR 2018

## 1. Project Data

Summary project data				
GEF project ID		5464		
GEF Agency project II	)	120621		
GEF Replenishment Phase		GEF-5		
Lead GEF Agency (include all for joint projects) UNIDO		UNIDO		
Project name		Reducing greenhouse gas and C transfer in industrial refrigeration	Reducing greenhouse gas and ODS Emissions through technology transfer in industrial refrigeration	
<b>Country/Countries</b>		Vietnam		
Region		Asia		
Focal area		Climate Change		
Operational Program Priorities/Objectives	or Strategic	CCM-1	CCM-1	
Executing agencies involved		Ministry of Natural Resources a Agriculture and Rural Developm Centre	Ministry of Natural Resources and Environment (MONRE), Ministry of Agriculture and Rural Development (MARD), Cleaner Production Centre	
NGOs/CBOs involven	nent	None		
Private sector involve	ement	Zanotti and Shecco		
CEO Endorsement (FSP) /Approval date (MSP)		11/20/2013		
Effectiveness date / project start		2/10/2014		
Expected date of pro	ect completion (at start)	9/13/2017		
Actual date of project completion		12/31/2017		
		Project Financing		
		At Endorsement (US \$M)	At Completion (US \$M)	
<b>Project Preparation</b>	GEF funding			
Grant	Co-financing			
GEF Project Grant		0.29	0.29	
	IA own	0.24		
		0.24	-	
	Government	1.1	-	
Co-financing	Government Other multi- /bi-laterals	1.1	-	
Co-financing	Government Other multi- /bi-laterals Private sector	0.24	- - 0.23	
Co-financing	Government Other multi- /bi-laterals Private sector NGOs/CSOs	0.24	0.23	
Co-financing Total GEF funding	Government Other multi- /bi-laterals Private sector NGOs/CSOs	0.24	- - 0.23 0.29	
Co-financing Total GEF funding Total Co-financing	Government Other multi- /bi-laterals Private sector NGOs/CSOs	0.24 1.1 0.51 0.29 1.86	- - 0.23 0.29 -	
Co-financing Total GEF funding Total Co-financing Total project funding (GEF grant(s) + co-fin	Government Other multi- /bi-laterals Private sector NGOs/CSOs	0.24 1.1 0.51 0.29 1.86 2.14	- - 0.23 0.29 - -	
Co-financing Total GEF funding Total Co-financing Total project funding (GEF grant(s) + co-fin	Government Other multi- /bi-laterals Private sector NGOs/CSOs ancing)	0.24 1.1 0.51 0.29 1.86 2.14 valuation/review information	- - 0.23 0.29 - -	
Co-financing Total GEF funding Total Co-financing Total project funding (GEF grant(s) + co-fin TE completion date	Government Other multi- /bi-laterals Private sector NGOs/CSOs ancing) Terminal ev	0.24 1.1 0.51 0.29 1.86 2.14 valuation/review information June 2018	- - 0.23 0.29 - - -	
Co-financing Total GEF funding Total Co-financing Total project funding (GEF grant(s) + co-fin TE completion date Author of TE	Government Other multi- /bi-laterals Private sector NGOs/CSOs ancing) Terminal ev	0.24   1.1   0.51   0.29   1.86   2.14   valuation/review information   June 2018   José de Bettencourt and Le Ha	- - 0.23 0.29 - - - Thanh	
Co-financing Total GEF funding Total Co-financing Total project funding (GEF grant(s) + co-fin TE completion date Author of TE TER completion date	Government Other multi- /bi-laterals Private sector NGOs/CSOs ancing) Terminal ev	0.24   1.1   0.51   0.29   1.86   2.14   /aluation/review information   June 2018   José de Bettencourt and Le Ha   January 2019	- - 0.23 0.29 - - - - Thanh	
Co-financing Total GEF funding Total Co-financing Total project funding (GEF grant(s) + co-fin TE completion date Author of TE TER completion date TER prepared by	Government Other multi- /bi-laterals Private sector NGOs/CSOs ancing) Terminal ev	0.24   1.1   0.51   0.29   1.86   2.14   /aluation/review information   June 2018   José de Bettencourt and Le Ha   January 2019   Ritu Kanotra	- - 0.23 0.29 - - - Thanh	

## 2. Summary of Project Ratings

Criteria	Final PIR	IA Terminal Evaluation	IA Evaluation Office Review	GEF IEO Review
Project Outcomes	NR	MS		MS
Sustainability of Outcomes		ML		MU
M&E Design		S		S
M&E Implementation		MS		MS
Quality of Implementation		S		MS
Quality of Execution		MS		MS
Quality of the Terminal Evaluation Report				MS

## **3. Project Objectives**

3.1 Global Environmental Objectives of the project:

As per the CEO Approval Document, the Global Environmental Objective of the project was the 'reduction of greenhouse gas emissions in the cold storage sector in Vietnam' (CEO Approval, Pg 38).

3.2 Development Objectives of the project:

As per the CEO Approval Document, the Development Objective of the project was to 'reduce greenhouse gas emissions by creating an enabling environment for the use of hydrocarbons, which have a very low Global Warming Potential (GWP), in cold storage facilities in Viet Nam that currently consume HCFC-22 for servicing and maintenance purposes' (CEO Approval Document, Pg 3). The project had three components with details below:

**Component 1: Policy and regulatory support** - Expected outputs included gap analysis carried out in the national policy, legal and regulatory frameworks and relevant recommendations drafted into the national laws/regulations/guidance.

**Component 2: Technology transfer and technical assistance** – Expected outputs included two pilot demonstration conversions are carried out with-two cold storage facilities converted from HCFC-22 use to hydrocarbon systems; the demonstration conversions are replicated in up to 10 facilities.

**Component 3: Awareness-raising** – Expected outputs included lessons learnt and information on technology solutions is disseminated to policy makers, companies and technicians

3.3 Were there any **changes** in the Global Environmental Objectives, Development Objectives, or other activities during implementation?

The TE does not report any changes in the Global Environmental and Development Objectives of the project.

## 4. GEF IEO assessment of Outcomes and Sustainability

Please refer to the GEF Terminal Evaluation Review Guidelines for detail on the criteria for ratings.

Relevance can receive either a Satisfactory or Unsatisfactory rating. For Effectiveness and Cost efficiency, a six point rating scale is used (Highly Satisfactory to Highly Unsatisfactory), or Unable to Assess. Sustainability ratings are assessed on a four-point scale: Likely=no or negligible risk; Moderately Likely=low risk; Moderately Unlikely=substantial risks; Unlikely=high risk. In assessing a Sustainability rating please note if, and to what degree, sustainability of project outcomes is threatened by financial, sociopolitical, institutional/governance, or environmental factors.

Please justify ratings in the space below each box.

4.1 Relevance	Rating: Satisfactory
---------------	----------------------

The TE assessed the rating of the relevance to be 'highly satisfactory', which was revised by the current TE to 'satisfactory'. The project was designed to add on to the Vietnam's Hydrochlorofluorocarbon Phase -out Management Plan (HPMP) that the country developed to comply with its Montreal Protocol phase-out obligations for hydrofluorocarbons (HCFCs). This project aimed to promote the use of HC gases with low Ozone Depleting Substances (ODS) and Global Warming Potential (GWP) and was designed at a time in which, due to lack of alternatives, obligations to reduce HCFC R-22 could favor the use of HFCs having very high global warming potentials thereby locking companies into these technologies for many years. The project was also in line with the national environmental policy as well as legislation and strategies developed in recent years such as Strategy for Cleaner production in Industry up to 2020, National Target Program, Action Plans (such as for responding to climate change) and others. It also aligned with the policies such as the Decree on Energy Saving and the National Energy Efficiency Program (VNEEP) for the period 2006-2015 for improving energy efficiency and conservation in all sectors of the economy.

The project was also consistent with GEF 5 Chemicals focal area 'to promote the sound management of chemicals throughout their lifecycle in ways that lead to the minimization of significant adverse effects on human health and the environment' and in particular Objective 2 to 'Phase out ODS and reduce ODS releases'. The project design was consistent with GEF strategy of building synergies across Conventions, namely by supporting the phase-out of hydrochlorofluorocarbons (HCFCs) used in industry and buildings such as chillers, air-conditioners, and refrigerators, and promote use of equipment that both operates more efficiently and uses chemicals with lower global warming potential.

4.2 Effectiveness	Rating: Moderately unsatisfactory
-------------------	-----------------------------------

The TE assesses the effectiveness of the project as 'moderately satisfactory'. However, based on the evidence in the TE, this TER assigns it a rating of 'moderately unsatisfactory'. Given the current challenges of bringing changes in the cold storage technologies used in the fishery sector in Vietnam, the project provided a good platform for the country to continue to expand its activities in environmental protection and phasing out Ozone Depleting Substance (ODS). The demonstration nature of the project was achieved with the installation of 25 HC-290 units in 4 companies, reported to be functional at the time of the TE. But other activities did not take place as planned as 'the reality did not evolve the way it was foreseen in the project document' (TE, Pg 20). The project design included the development by the Viet Nam Environmental Protection Fund (VEPF) of a soft loan scheme totaling \$900,000 to be used by about 10 facilities. However, this component was not developed and no companies showed interest on the soft loan, which further prevented the development of foreseen Business Support Centres and mobilization of local engineering companies supporting design of plants using non-ODS and very low global warming potential refrigerants. Although the project helped in raising awareness amongst technicians and entrepreneurs of the economic and environmental benefits of using HCs, the low demand of soft loans amongst entrepreneurs was partially due to the barriers (such as the availability of natural refrigerant in the country and high cost of conversion) beyond the control of the implementing agencies. But other factors such as uncertainty in the adoption by the government of the policy and regulatory measures recommended under component 1 and non-availability of trained technicians as trainings of the technicians in best refrigeration practices under component 3 were also not organized, which pose challenges to the adoption of demonstrated refrigeration technologies by the entrepreneurs.

#### Component 1: Policy and regulatory support

This TER agrees with the rating assigned to delivery of outputs under this component as 'satisfactory'. According to the TE, the gap analysis of Vietnamese policy and legislation pertinent to refrigeration in cold storage was completed. The project also organized a roundtable with stakeholders to collect recommendations regarding improvements to enforcement practices. However, as the TE notes, the recommendations were yet not adopted by the government. According to the Ministry of Natural Resources and Environment (MONROE), the recommendations would be incorporated once the legislation was revised taking into account the Kigali amendment to the Montreal Protocol. However, no definitive timeframe was provided for the same.

#### Component 2: Technology transfer and technical assistance

This TER agrees with the rating assigned to the delivery of outputs under this component as 'moderately satisfactory'. GEF funds were to be used to support the costs of equipment for the pilot projects (34 units) as well as the development of the financing scheme. The target of installation of 34 HC-290 units in two enterprises was partially met as the project installed 25 units in 4 enterprises.

The project also foresaw replication in 10 other companies, which was not achieved. The TE recognizes several barriers to the introduction of alternative to HCFC-22 with low global warming potential, including high cost of conversions to new equipment using low GWP refrigerants, lack of availability of local technicians and technology suppliers, and non-availability of natural refrigerant in the country. For these reasons, there was a lack of demand for the soft loans from the entrepreneurs and the co-

financing from the Vietnam Environmental Protection Fund (VEPF) did not materialize. One of the pilot facilities was also to be selected as a business support center that could serve as pilot demonstration of the improved technologies and model of replication by enterprises; this was also not achieved.

#### **Component 3: Awareness-raising**

This TER agrees with the rating assigned by the TE to the outcome under this component as 'moderately unsatisfactory'. The project organized a number of workshops targeting technicians and entrepreneurs and was able to develop widespread awareness amongst stakeholders of the benefits of adhering to energy-efficient and climate-friendly technologies. However, the other activities and sub- activities planned in the project document, such as design and implementation of annual competition to recognize the implementation of alternative refrigerants; trainings of the technicians in best refrigeration practices and lesson learned analysis from the project for scale up and replication in other countries through various awareness raising channels, was not carried out.

4.3 Efficiency	Rating: Unable to assess
----------------	--------------------------

The TE assesses efficiency of the project as 'moderately satisfactory'. The project was implemented without facing any significant delays. In particular, the demonstration activities were carried out on time. However, not all the project activities could be completed. The TE does not provide a component wise breakup of the actual cost and complete details on the actual co-financing from all the contributors are also not included in the report due to which this TER is unable to assess the efficiency with which the project was executed.

4.4 Sustainability	Rating: Moderately unlikely
<i>v</i>	s , ,

The TE assessed the sustainability of risks as 'moderately likely'. But based on the evidence, this TER has revised the rating to 'moderately unlikely'. The sustainability of the project is at risk due to financial reasons such as lack of demand and confidence amongst the entrepreneurs to avail soft loans for conversion to low-GWP and higher efficiency equipment and lack of specific regulatory measures/guidance to support the conversions. Different aspects of sustainability are explored in detail below:

#### Financial risks – Moderately unlikely

The TE assessed the likelihood of sustainability due to financial risks as 'moderately unlikely'. This TER concurs with the rating assigned by the TE. As per the TE, the project was unable to increase the demand for the soft loan mechanism as entrepreneurs still had low acceptance (due to barriers such as lack of trained technicians; availability of natural refrigerants in the country, etc.,) and were not yet ready to invest in alternative HC refrigerants (as R-290) for industry. The TE notes that despite the offer to charge lower interest rates, companies in Vietnam were unwilling to borrow money from green funding institutions due to the complicated loan procedures. There was also a perception that that high capacity machines were effective only in large cool storages. The TE concludes that the project could be replicated if the new equipment was provided free of charge. But there could be less interest if co-funding was required from the companies, due to which this TER agrees with the rating assigned to the likelihood of sustainability due to financial reasons as 'moderately unlikely'.

#### Socio-political risks – Moderately unlikely

The TE assessed the rating as 'likely'. But based on the evidence in the available reports, this TER has revised the rating to 'moderately unlikely'. As per the TE, the government of Vietnam was committed to phasing out HCFCs prior to 2040. However, the current project had low ownership from the government as most of the activities that required government support were not completed. As part of the project, different stakeholders from industry associations and technical institutions were made aware of the benefits of using HC and their risk. However, the lack of demand for the soft loan by the industry/companies during the project indicates that the entrepreneurs had low acceptance for a number of reasons such as the loan process found cumbersome; perception that the technology was still at premature stage and lack of availability of natural refrigerants (HC-290) in the country, amongst others.

#### Institutional and governance risks – Moderately likely

The TE concurs with the rating assigned to the likelihood of sustainability due to institutional environment as 'moderately likely'. As per the TE, the project supported demonstration of new refrigerant technology at four companies. The project helped build the capacity of these companies' staff through training modules and guidelines. However, smaller companies shared concerns related to lack of technical assistance and experienced technicians in the country, as a barrier to adopting the new technology. The training to technicians supposed to be organized during the project was not completed. The policy, legal and regulatory measures recommended were still pending adoption at the time of the TE, reportedly to be incorporated by MONRE once Vietnam adapted its legislation to the Kigali Amendment to the Montreal Protocol (TE, Pg 13).

#### Environmental risks – Likely

The TE does not identify any risks to the project due to environmental factors.

### 5. Processes and factors affecting attainment of project outcomes

5.1 Co-financing. To what extent was the reported co-financing essential to the achievement of GEF objectives? If there was a difference in the level of expected co-financing and actual co-financing, then what were the reasons for it? Did the extent of materialization of co-financing affect project's outcomes and/or sustainability? If so, in what ways and through what causal linkages?

The project was supposed to mobilize a total of \$1,855,000 in co-financing. The TE does not provide a breakup of the co-financing from various sources but reports that more than half of the co-financing did not materialize. The private sector contribution through one of the technology suppliers -Zanotti, is reported as \$233,000 against original commitment of \$ 50,000 (TE, Pg 20). But the TE does not report on the contribution from other private sectors companies (Shecco - \$310,000 and other technology suppliers - \$150,000) mentioned in the original budget. A major part of the total co-financing from Vietnam Environmental Protection Fund (VEPF) in the form of soft loans of \$900,000 did not materialize. According to the TE, the VEPF agreed to provide loans at the preferential interest rates (TE, Pg 19), but the entrepreneurs/companies did not show interest in availing these loans. The TE does not comment or provide details on the co-financing contributions of \$2 million pledged by the national government, and as actual project costs are not reported, it is unclear whether this financing came through. Moreover, the exact contribution from UNIDO is also not clear from the evaluation report.

5.2 Project extensions and/or delays. If there were delays in project implementation and completion, then what were the reasons for it? Did the delay affect the project's outcomes and/or sustainability? If so, in what ways and through what causal linkages?

According to the TE, there were no significant delays in the implementation of the project.

5.3 Country ownership. Assess the extent to which country ownership has affected project outcomes and sustainability? Describe the ways in which it affected outcomes and sustainability, highlighting the causal links:

As per the TE, the project received insufficient support from the government. Despite the fact that the project was relevant and the involvement of National Ozone Unit (NOU) satisfactory, it was still considered a small project by Ministry of Natural Resources and Environment (MONRE), given its budget of USD290,000. The TE mentions that 'the project did not attract much political support per se' (TE pg, 23). The project coordinator worked towards generating synergies with other ongoing projects, but activities dependent on national ownership were not implemented, indicating that the project was not backed by strong support from the government.

## 6. Assessment of project's Monitoring and Evaluation system

Ratings are assessed on a six point scale: Highly Satisfactory=no shortcomings in this M&E component; Satisfactory=minor shortcomings in this M&E component; Moderately Satisfactory=moderate shortcomings in this M&E component; Moderately Unsatisfactory=significant shortcomings in this M&E component; Unsatisfactory=major shortcomings in this M&E component; Highly Unsatisfactory=there were no project M&E systems.

Please justify ratings in the space below each box.

6.1 M&E Design at entry	Rating: Satisfactory
-------------------------	----------------------

This TER concurs with the rating assigned by the TE to M&E design at entry as 'satisfactory'. The project document included a comprehensive Project Results Framework including indicators, timelines, sources of verification to monitor progress against the project development objective, outputs and outcomes. Most of the proposed indicators were 'SMART' and could be easily verified and budget earmarked for various reports and meetings assigned for review, monitoring and evaluation of the project.

6.2 M&E Implementation	Rating: Moderately satisfactory
------------------------	---------------------------------

This TER concurs with the rating assigned to the M&E implementation as 'moderately satisfactory'. The project document recommended the constitution of Project Steering Committee (PSC), with representatives from the government and UNIDO, responsible for reviewing the progress, providing guidance and solutions to ensure that the project objectives were met. However, the PSC was not constituted and there was no formal apex body to ensure an overall supervision and review of the progress of the project. The TE confirms the timely submission of PIR and annual progress reports and a national technical consultant hired for monitoring the performance of equipment after its installation. Energy efficiency gains were recorded with the last available report till May 2016. But the results related

to information dissemination-related interventions (corresponding to component 3) were not captured in a systematic manner, which makes it difficult to assess if the lessons learnt from the project were effectively disseminated amongst the policy makers, companies and technicians.

## 7. Assessment of project implementation and execution

Quality of Implementation includes the quality of project design, as well as the quality of supervision and assistance provided by implementing agency(s) to execution agencies throughout project implementation. Quality of Execution covers the effectiveness of the executing agency(s) in performing its roles and responsibilities. In both instances, the focus is upon factors that are largely within the control of the respective implementing and executing agency(s). A six point rating scale is used (Highly Satisfactory to Highly Unsatisfactory), or Unable to Assess.

Please justify ratings in the space below each box.

7.1 Quality of Project Implementation	Rating: Moderately satisfactory
7.1 Quality of Project Implementation	Rating: Moderately satisfactory

The TE rates the quality project implementation as 'satisfactory'. But based on the evidence in the TE, this TER assesses the quality of implementation as 'moderately satisfactory'. The TE notes that UNIDO project management was adequate and timely, with technical supervision and backstopping to project implementation. UNIDO HQ contracted national and international consultants directly and worked closely with the project management unit. But the evaluation report also highlights some of issues that impacted project achievements and were not dealt with at the design stage or reviewed during implementation. Some of the project activities, although critical and with potential to have significant impact, were not adequately budgeted taking into account the scale of the operation and size of the country. For instance, activity related to training of technicians from 50% of the cold stores in the fisheries sector in Vietnam, couldn't be undertaken as it would have required significant budget (TE, Pg 15). The TE notes that future projects need to factor in issues such as lack of availability of refrigerant with low global warming potential and technical assistance within the country, which were not dealt with adequately in the design of the current project.

7.2 Quality of Project Execution	Rating: Moderately satisfactory
7.2 Quality of Project Execution	Rating: Moderately satisfactory

The TE rates quality of project execution as 'moderately satisfactory'. The project was implemented by Ministry of Natural Resources and Environment (MONRE) with the support of Cleaner Production Center of the Hanoi University of Technology (technical expert). The head of Vietnam's National Ozone Unit (NOU) under MONRE served as Project Director, responsible for day-to-day management, monitoring and evaluation of project activities as per the approved Annual Work Plan (AWP), agreed with UNIDO-HQ. However, the project didn't constitute the Project Steering Committee as envisaged in the project document, as an informal set-up for the technical coordination and inter-ministerial communication was considered sufficient for projects of this budget. But not only could the formal constitution of the PSC have improved the regular monitoring and review of the progress, the project could also have benefitted from 'the communication means and procedures of projects with similar focus taking place in parallel (e.g., the project Hydrofluorocarbons Phase out Management Plan- Institutional Strengthening for Montreal Protocol) and through various ministries' (TE, Pg 20).

## 8. Assessment of Project Impacts

Note - In instances where information on any impact related topic is not provided in the terminal evaluations, the reviewer should indicate in the relevant sections below that this is indeed the case and identify the information gaps. When providing information on topics related to impact, please cite the page number of the terminal evaluation from where the information is sourced.

8.1 Environmental Change. Describe the changes in environmental stress and environmental status that occurred by the end of the project. Include both quantitative and qualitative changes documented, sources of information for these changes, and how project activities contributed to or hindered these changes. Also include how contextual factors have contributed to or hindered these changes.

According to the TE, the project's target for direct emission reduction, 9,000 tonnes of CO2 equivalent, was not met as it would have required companies/entrepreneurs to avail the soft loans for installation of roughly 18 small cooling units in 10 facilities, which did not take place. The companies were not interested in availing loans due to various barriers such as non-availability of alternative refrigerant HC-290 in the market, high cost of conversions to new equipment using low global warming potential refrigerants, lack of policy and regulatory environment as well as technical assistance to facilitate the conversions. The project facilitated conversions into low global warming potentials by delivering 25 HC290 refrigeration units in four pilot facilities. Reportedly, with the installation of 25 units of HC-290, the project was able to phase-out 25 kg of HCGC-22, reduce 450 tonnes of CO2 equivalent and achieve energy efficiency gains, as monitored during 2015 and 2016, from 10% to 42% - average 28% (according to the technical document referenced by the TE)<sup>1</sup> (TE, Pg 19).

8.2 Socioeconomic change. Describe any changes in human well-being (income, education, health, community relationships, etc.) that occurred by the end of the project. Include both quantitative and qualitative changes documented, sources of information for these changes, and how project activities contributed to or hindered these changes. Also include how contextual factors have contributed to or hindered.

The TE does not report on any socioeconomic changes brought about by the project.

8.3 Capacity and governance changes. Describe notable changes in capacities and governance that can lead to large-scale action (both mass and legislative) bringing about positive environmental change. "Capacities" include awareness, knowledge, skills, infrastructure, and environmental monitoring systems, among others. "Governance" refers to decision-making processes, structures and systems, including access to and use of information, and thus would include laws, administrative bodies, trust-building and conflict resolution processes, information-sharing systems, etc. Indicate how project

<sup>&</sup>lt;sup>1</sup> The 23 years Journey of Viet Nam's Ratification and Implementation of the Montreal Protocol on Substances that Deplete the Ozone Layer, MONRE, 2017

activities contributed to/ hindered these changes, as well as how contextual factors have influenced these changes.

a) Capacities

The activity under component 3 related to the training of technicians from 50% of cold stores in the fisheries sector in Vietnam, which could have potentially made a significant impact on capacity-building, was not performed.

b) Governance

The TE does not report any changes in the governance bought about by the project.

8.4 Unintended impacts. Describe any impacts not targeted by the project, whether positive or negative, affecting either ecological or social aspects. Indicate the factors that contributed to these unintended impacts occurring.

The TE does not report any positive or negative unintended impacts brought about by the project.

8.5 Adoption of GEF initiatives at scale. Identify any initiatives (e.g. technologies, approaches, financing instruments, implementing bodies, legal frameworks, information systems) that have been mainstreamed, replicated and/or scaled up by government and other stakeholders by project end. Include the extent to which this broader adoption has taken place, e.g. if plans and resources have been established but no actual adoption has taken place, or if market change and large-scale environmental benefits have begun to occur. Indicate how project activities and other contextual factors contributed to these taking place. If broader adoption has not taken place as expected, indicate which factors (both project-related and contextual) have hindered this from happening.

The project supported the demonstration of new refrigeration technology at four companies. As per the TE, two out of four companies were satisfied with results but were concerned about the local availability of the alternate refrigerant HC-290. The companies were willing to invest in new equipment if some of the conditions were met such easy availability of spare parts in Vietnamese markets and access to operations and maintenance services. There was also a perception that that high capacity machines were effective only in large cool storages. The TE concludes that the project could be replicated if the new equipment was provided free of charge. But there could be less interest if co-funding was required from the companies. Besides, the conversions were also discouraged by the decisions/guidelines of the Executive Committee of the Multilateral Fund for the Implementation of the Montreal Protocol in 2016, which lays emphasis on leakage reduction and energy efficiency of systems rather than on conversions. However, the difficulties encountered by the project may function as lessons for the design of new projects.

## 9. Lessons and recommendations

9.1 Briefly describe the key lessons, good practices, or approaches mentioned in the terminal evaluation report that could have application for other GEF projects.

The main lessons listed in the TE are given below:

1. The evaluation was affected by the very ambitious objective and goals set in the project document, namely regarding companies' adherence to the conversions and use of Viet Nam Environmental Fund, as well as establishment of Business Support Centers and private sector development of viable project pipelines. When designing future projects, it is preferable to set quantitative objectives and goals on issues the project can control to a certain extent, instead defining them on issues that depend solely/mostly on external factors.

2. Implementation partners/institutions to avoid taking up responsibilities that are out of reach given their capacities (for example existence of required staff) or mandate, unless the project itself has provisions to satisfy the requirements. Responsibilities of each participating institution should be fully owned through formal institutional commitment.

4. To change behavior in the refrigeration and AC industry it is an excellent idea to mobilize beneficiaries/stakeholders from industry and strengthen awareness to achieve stakeholder commitment. However, it is equally important to train refrigeration/AC technicians (service providers) as they are at the forefront to sensitize the end-user.

When introducing new technology, it is important to make sure that entrepreneurs have easy access to the consumable goods and technical assistance required for operation. Besides, the proposed solutions need to be perceived as being within reach of the targeted sectors (technologically and financially), useful (namely regarding competitiveness and compliance), and relevant (return of investment, added value).

9.2 Briefly describe the recommendations given in the terminal evaluation.

The main recommendations listed in the TE are given below:

1. The Ministry of Natural Resources and Environment (MONRE) should take quick action to sensitize policy makers on the alternatives to hydrofluorocarbons (HCFC) and implement the policy/legal/institutional recommendations and guidance (produced by component 1). This includes sensitization to policy makers and decision-makers of several departments of the government and the national assembly. In particular, MONRE should seek increased communication and synergies with Ministry of Industry and Trade (MOIT) and the energy efficiency project supported by the World Bank, which includes HCFC phase out in industry.

2. MONRE should continue the process of mobilizing interest of enterprises for the use of HC in the refrigeration industry. This could be done by mainstreaming training and certification of refrigeration technicians on HC technology, and by improving conditions for the availability in the country of alternative refrigerants as well as of technical assistance to HC systems.

## **10. Quality of the Terminal Evaluation Report**

A six point rating scale is used for each sub-criteria and overall rating of the terminal evaluation report (Highly Satisfactory to Highly Unsatisfactory)

Criteria	GEF IEO comments	Rating
To what extent does the report contain an assessment of relevant outcomes and impacts of the project and the achievement of the objectives?	The TE contains assessment of relevant outcomes and impacts of the projects and its achievements in adequate details.	S
To what extent is the report internally consistent, the evidence presented complete and convincing, and ratings well substantiated?	The report was more or less internally consistent. However, convincing evidence on some of the aspects, like 'quality of project implementation' was lacking. For instance, the TE recognized that the coordination and management as perceived in the original project document was 'moderately unsatisfactory' (TE, Pg 22) but doesn't provide the reasons to back up this statement, which also contradicts the ratings assigned to quality of implementation as 'satisfactory' and execution as 'moderately satisfactory' (TE, Pg 25).	MS
To what extent does the report properly assess project sustainability and/or project exit strategy?	The TE assessed the sustainability of the project in adequate detail	S
To what extent are the lessons learned supported by the evidence presented and are they comprehensive?	Lessons learned are supported by the evidence in the main body of the report	S
Does the report include the actual project costs (total and per activity) and actual co-financing used?	The details on co-financing are not complete as the TE does not provide a component wise exact breakup of actual cost as well as co-financing realization from all the sources	MU
Assess the quality of the report's evaluation of project M&E systems:	The assessment was adequate with sufficient details	S
Overall TE Rating		MS

# 11. Note any additional sources of information used in the preparation of the terminal evaluation report (excluding PIRs, TEs, and PADs).

No additional sources were used in the preparation of this TER.