Terminal Evaluation Report

"Energy Efficiency Improvement in Commercial and High-Rise Residential Buildings (EECB)" Project, Viet Nam

(PIMS 5245)

Report Submitted to
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Disclaimer

The analysis and recommendations of this report do not necessarily reflect the views of the United Nations Development Programme, its Executive Board or the United Nations Member States. This publication reflects the views of its author.

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LIST OF ACRONYMS

AWP	Annual Work Plan
BAU	Business-as-usual
BRH	Bangkok Regional Hub of UNDP
CEEBs	Center for Energy Efficiency in Buildings
CDP	Country Development Program
CEO	Chief Executive Office
CO	Country Office
CO2	Carbon dioxide
COVID 19	Coronavirus Disease of 2019
DANIDA	Danish International Development Agency
DEA	Danish Energy Agency
DOC	Department of Construction
DOIT	Department of Industrial and Trade
DSM	Demand Side Management
DUPA	Departments of Urban Planning
EA	Executing Agency
EE	Energy Efficiency
EE&C/EEC	Energy Efficiency and Conservation
ECC	Energy Conservation Centers
EEBC	Energy Efficiency Building Code
EECB	Energy Efficiency Improvement in Commercial and High-Rise Residential Buildings in Viet Nam
EOP	End of Project
EPC	Energy Performance Contracting
ESCO	Energy Services Company
GDP	Gross Domestic Product
GHG	Greenhouse gas
GEF	Global Environment Facility
GIZ	Deutsche Gesellschaft fur Internationale Zusammenarbeit (German Development Agency)
GSO	General Statistics Office of Viet Nam
HCMC	Ho Chi Minh City
IA	Implementing Agency
IFC	International Finance Corporation
IMF	International Monetary Fund
IPMVP	International Performance Measurement and Verification Protocol
IRR	Internal Rate of Return
ISS	Implementation Support Services
KC	Knowledge Centre
MOC	Ministry of Construction
MOF	Ministry of Finance
MOIT	Ministry of Industry and Trade
MOST	Ministry of Science and Technology
MTR	Mid Term Review
M&V	Monitoring and Verification
NDC	Nationally Determined Contribution
NCE	Nature Climate Energy (Directorate)
NGO	Non-Governmental Organization
NIM	National Implementation Modality National Project Director
NTP	National Target Program

NPV	Net Present Value
OSP	One Strategic Plan
PIF	Project Identification Form
PIR	Project Implementation Review
PMU	Project Management Unit
ProDoc	Project Document
PPG	Project Preparation Grant
PCS	Project Steering Committee
PV	Photovoltaic (Solar)
RE	Renewable Energy
ROI	Return on Investment
RTA	Regional Technical Advisor
SDG	Sustainable Development Goal
SEC	Specific Energy Consumption
TAG	Technical Advisory Group
TE	Terminal Evaluation
TOT	Training of Trainers
tCO2e	Tons of Carbon Dioxide Equivalent
UN	United Nations
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
USAID	United States Agency for International Development
USD	United States Doller
VAA	Viet Nam Association of Architects
VACEE	Viet Nam Association of Civil Engineering Environment
VCEP	Viet Nam Clean Energy Program
VGBC	Viet Nam Green Building Council
VNEEP	Viet Nam National Energy Efficiency Program

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EXECUTIVE SUMMARY

Project summary table

Table 1: Project Summary

Project Title:	**Energy Efficiency Improvement in Commercial and High-Rise Residential Buildings in Viet Nam (EECB)**			
			at endorsement (million USD)	*Realized at completion (million USD)*
GEF Project ID:	5365	GEF financing:	3.198	3.198
UNDP Project ID:	5245	UNDP contribution:	2.220	2.220
Country:	Viet Nam	Government:	2.700	3.282
Region:	South-Est Asia	Other partners:	16.578	114.737
Focal Area:	Climate Change	Total co-financing	21.498	120.239
FA Objectives, (OP/SP):	CCM-2	TOTAL PROJECT COST	24.696	123.437
Executing Agency:	Ministry of Construction	GEF endorsement:	14.07.2015	
		ProDoc Signature (date project began)	05.04.2016	
Other Partners involved:		Closing date	05.04.2020	31.03.2021 (Expected)

Introduction and brief description of the project

The National Environment Protection Strategy for Vietnam[1] aimed to promote the application of clean technologies, cleaner production processes and the use of less polluting, more environmentally sound fuels and materials. Viet Nam had in December 2011 approved the National Climate Change Strategy in which energy saving and efficiency were highlighted as the key area for GHG emission reductions. Further, the Viet Nam Green Growth Strategy (September 2012) specified promulgation of compulsory application of green building measures in new and retrofitted building and green material technology in construction as solutions to achieve Green Growth and low carbon economy. With this background, the project "Energy Efficiency Improvement in Commercial and High-Rise Residential Buildings (EECB)" was implemented in Viet Nam, to contributing to GHG mitigation measures as highlighted in the 2nd National Communication report, in which promoting Energy Efficiency and Conservation (EE&C) in the commercial/institutional sector has been regarded as short and long term measures. The project was expected to make a significant contribution towards enforcement of Vietnam Energy Efficiency Building Code (EEBC) in the building sector, and also expected to lead to investments in building EE technologies. The objective of the GEF funded and UNDP executed Project was to reduce GHG emission intensity from the building sector in Viet Nam. The objective of the project were to be achieved through implementation of following three components of the project.

Component 1: Improvement and Enforcement of Energy Efficiency Building Code (EEBC)
Component 2: Building Market Development Support Initiatives
Component 3: Building EE Technology Applications and Replications.

[1] As per Project Document

Each of the above three components comprised of a number of complementary activities designed to remove barriers towards enforcement of the EEBC, and to the greater uptake of building energy efficiency technologies, systems, and practices in commercial and residential buildings.

By the 'End of the Project (EOP)', the project was to catalyze direct GHG emission reduction of about 37,680 tCO2e. The cumulative direct reduction in GHG emissions over the lifetime of the project was envisioned to be 236,382 tCO2e. Direct GHG emission reductions were to be achieved by improving the energy utilization performance of commercial and high-rise residential buildings in the cities of Ho Chi Minh and Hanoi.

The project has been implemented using National Implementation Modality (NIM) as per UNDP's procedures. The project's Implementing Partner is the 'Ministry of Construction'. Within the Ministry of Construction, the project implementation was carried out by Department of Science, Technology and Environment. The project implementation was started in April 2016 (signature on Project Document) with the project implementation period of 4 years the planned project closure was in April 2020. The actual project closure date is March 2021, after a 12 months extension request was approved by the UNDP-NCE Directorate.

With the project reaching its end, an 'Evaluation' has been carried out in order to ascertain the outcomes and impact of the programme, measured against its original purposed objectives, whilst in the process capturing the evaluative evidence of the relevance, effectiveness, efficiency, results/impacts and sustainability of this project, which will set the stage for future similar initiatives. The Terminal Evaluation has been carried out by a team of independent evaluators comprising of an 'International Consultant' (Dinesh Aggarwal, India) and a National Consultant (Dang Ngoc Dung, Vietnam).

Project Objectives and Logical Frame Work

The Project, "Energy Efficiency Improvement in Commercial and High-Rise Residential Building in Viet Nam" had the goal to reduce intensity of GHG emissions from the buildings in Viet Nam. The goal was to be achieved by improving energy utilization performance of commercial and high-rise residential buildings. The target buildings were those with gross floor areas exceeding 2,500 sq. meter. Table 2, below provides the Project Objectives along with the summary of the planned outcomes. It also shows the corresponding set of indicators for monitoring and verification of the achievements against the Objectives and the Outcomes.

Table 2: Project Results Framework[2]

Project Strategy	Indicator[3]	Comments/ Modifications/Changes at Inception/MTR[4]	Baseline	EOP[5] Target	Achievements at TE
GOAL: Reduced intensity of GHG emissions from the building sector	**Indicator 1:** Cumulative CO_2 emission reduction from the building sector by End-of-Project, tCO_{2e}		1,568	37,680	32,552
OBJECTIVE: Improved energy utilization performance of commercial and high-	**Indicator 2:** Cumulative energy savings from the commercial building by EOP MWh		2,528	61,137	52,817
	Indicator 3: % of new buildings that are fully compliant with the	• Assessment will be difficult	20	50	50

[2] Source: Project Document and Mid Term Review Report for the project. Numbering of the Indicators was done at the time of Mid Term Review, for the ease of reference and discussions in the MTR report.

[3] As per Project Document. Numbering of the indicators was done at the time of MTR

[4] The comments/modifications/changes were at the time of MTR unless specifically mentioned

[5] EOP = End of Project

Project Strategy	Indicator[3]	Comments/ Modifications/Changes at Inception/MTR[4]	Baseline	EOP[5] Target	Achievements at TE
rise residential buildings in Ho Chi Minh and Hanoi	revised Energy Efficiency Building Code by EOP	• Do not necessarily refer to specific outcomes stipulated by the project			
	Indicator 4: % of existing commercial and high-rise residential buildings that adopt EE technologies and practices and achieve at least 10% electricity savings by EOP		Less than 5%	20%	Unable to Assess As the detailed assessment by way of a survey to determine the achievement of this target, could not be completed
	Indicator 5: No. of people gainfully employed in the building sector in Viet Nam by EOP	• No. of people working in EE field of building sector in Viet Nam • During inception Baseline value changed from 4 to 20 • Assessment will be difficult • Indicators and targets are only partly addressed to the partners involved in realisation and thus not clear that they will be achievable by EOP • Do not necessarily refer to specific outcomes stipulated by the project	20	60	Unable to Assess People which can be included in this is very wide ranging from engineers, architects, service providers, system designers, utility services personals, building material suppliers, energy auditors etc.
COMPONENT 1: Improvement and enforcement of energy efficiency building code					
OUTCOME 1.1: Enforced, improved and comprehensive policy, legal, and regulatory frameworks on the energy efficient design, construction and operation of commercial and high-rise residential buildings	**Indicator 6:** % of DOCs nationwide that reference EEBC compliance toolkits and guideline developed by the baseline and the projects by EOP		30% of DOCs nation-wide	70% of DOCs nation-wide	70% of DOCs nation-wide
	Indicator 7: % of building practitioners nationwide that reference EEBC compliance toolkits and guideline developed by the baseline and the projects by EOP	• Assessment will be difficult	20% of building practitioners	50% of building practitioners	50% of building practitioners
	Indicator 8: % of applications for new commercial and high-rise residential building constructions submitted to DOCs		20%	50%	Unable to Assess Not monitored by PMU

Project Strategy	Indicator[3]	Comments/ Modifications/Changes at Inception/MTR[4]	Baseline	EOP[5] Target	Achievements at TE
	comply with EEBC-2013 by EOP				No data were available at TE
	Indicator 9: No. of national testing standards for energy performance of building construction materials promulgated by EOP	• No. of national standards for energy performance promulgated	0	5	5
	Indicator 10: No. of existing and new commercial buildings and high-rise residential buildings in Viet Nam certified as EE buildings by EOP	• No. of existing and new commercial buildings and high-rise residential buildings in Viet Nam certified as EE buildings under the pilot certification of EECB Project	0	20	0
OUTCOME 1.2: Strengthened compliance of the energy efficiency building code for commercial and high-rise residential buildings in Hanoi and HCMC	**Indicator 11:** % of building practitioners nationwide that reference the EE design guideline to achieve a higher level of EE than the EEBC requirements by EOP	• Assessment will be difficult • Do not necessarily refer to specific outcomes stipulated by the project	20%	50%	Unable to Assess. During the TE, existence of an EE design guideline could not be ascertained
	Indicator 12: % of commercial and high-rise residential buildings referencing M&V schemes in EE implementation by EOP	• Initial target in Project Document, was 70%, it was changed at inception to 25%	0%	25%	No Achievement As SEC norms for different buildings could be finalised only towards the end of the project
	Indicator 13: % of overall commercial and high-rise residential building stakeholders that are satisfied with availability and quality of energy benchmarking data by Year 4 ,	• **To be omitted as** Indicators and targets are only partly addressed to the partners involved in realisation and thus not clear that they will be achievable by EOP	20%	70% (at least)	This indicator was omitted at MTR Not Accessed at TE
COMPONENT 2: Building market development support initiatives					
OUTCOME 2: Increased local capacity in the EE design, construction, and operation of commercial and high-rise residential buildings	**Indicator 14:** No. of financial mechanisms and incentives for commercial and high-rise residential buildings approved and implemented by EOP.	• **Not appropriate, changed to:** No. of supporting mechanisms for commercial and high-rise residential buildings proposed by EECB Project. Supporting	0	1	The project supported revision of the cost norms, wherein the cost of consultancy services for design of an EE building is allowed to be considered as one of the component of the overall cost of the building. The

Project Strategy	Indicator[3]	Comments/ Modifications/Changes at Inception/MTR[4]	Baseline	EOP[5] Target	Achievements at TE
		mechanisms shall be referring to Financial (grants, tax incentives, reduced levies etc) and non-financial incentives			project also supported revision of the construction law to promote supporting mechanism for development of EE buildings. This was followed with Decree number 15, allowing the promulgation of energy certification systems. The project also supported Draft Decree on development of smart city. These measures supported by the project, help promotion of Green Buildings in Vietnam. Although, these are not supporting mechanisms (as per the text for this indicator), they help the overall objective of promotion of EE in buildings.
	Indicator 15: % of stakeholders in the building sector that are satisfied with services provided by CEEBs by EOP	• **To be omitted** as the indictor do not necessarily refer to specific outcomes stipulated by the project	0%	70% (at least)	This indicator was omitted at MTR Not Accessed at TE
	Indicator 16: % of CEEB trainees that are engaged in EE building designs, implementation and M&V by EOP	Split to two separate indicators • **Indictor 16.1:** % of trainees (building project developers, design & appraisal experts, appraisal officers of DOCs) that are trained on EE building designs and construction by EOP • **Indicator 16.2:** % of trainees	0%	50%	Due to issues with the measurability the achievement could not be ascertained in percent terms

Project Strategy	Indicator[3]	Comments/ Modifications/Changes at Inception/MTR[4]	Baseline	EOP[5] Target	Achievements at TE
		(relevant officers of DOCs, energy auditors, building operation managers) that are trained on building operation and M&V by EOP			
	Indicator 17: No. of commercial and high-rise residential buildings that implement EE projects using the ESCO models by EOP	• **To be omitted:** Recommended to be dropped as Indicators and targets are only partly address to the partners involved in realisation and thus not clear that they will be achievable by EOP	5	10	This indicator was omitted at MTR Not Accessed at TE
COMPONENT 3: Building EE technology applications and replications					
OUTCOME 3: Increased use of EE building materials and application of EE building technologies in Hanoi and HCMC	**Indicator 18:** % of new and retrofitted commercial and high-rise residential buildings that are partly or entirely based on EE building materials and applications being promoted and demonstrated by EOP	• **To be omitted**	5%	30%	This indicator was omitted at MTR Not Accessed at TE
	Indicator 19: No. of demonstration projects that adopted EE equipment, building materials and building energy monitoring and management/control systems promoted by the EEBC Project by EOP	• Number of demonstration projects were initially set to be 16. It was changed during inception to include 16 demonstration projects to be implemented by the EECB Project and 5 demonstration projects that have been implemented by IFC and DEA.	5	21	EE pilots were carried out in total 23 buildings of which 18 were the old buildings where EE retrofitting works were carried out, while 9 others were the new buildings
	Indicator 20: No. of completed M&V exercises in accordance with the guidelines proposed by the Project by EOP		0	16	The project prepared the guidelines for M&V activities and shared it across the demonstration projects. Post implementation of

Project Strategy	Indicator[3]	Comments/ Modifications/Changes at Inception/MTR[4]	Baseline	EOP[5] Target	Achievements at TE
					the EE measures, M & V systems were installed at three pilot projects. Apart from sharing the manual for M&V activities, the project supported the activities pertaining to guidance for implementation of the EE measures and for M&V activities at almost all the pilot projects.
	Indicator 21: No. of new EE building projects designed based on or influenced by, the results of the demonstration projects, by EOP	• **To be omitted**	5	50	This indicator was omitted at MTR Not Accessed at TE

Summary of assessment regarding attainment of the results and objectives of different components of the project and the project at an aggregate level is given in Table 3.

Table 3: Summary of Attainment of Outcomes and the Project Objectives

Project Objective / Outcome		Rating
Project Goal:	Reduced intensity of GHG emissions from the building sector	**MS**
Project Objective:	Improved energy utilization performance of commercial and high-rise residential buildings in Ho Chi Minh and Hanoi	**MS**
Component 1/Outcome 1.1:	Enforced, improved and comprehensive policy, legal, and regulatory frameworks on the energy efficient design, construction and operation of commercial and high-rise residential buildings	**MS**
Component 1/Outcome 1.2:	Strengthened compliance of the energy efficiency building code for commercial and high-rise residential buildings in Hanoi and HCMC	**MU**
Component 2/Outcome 2:	Increased local capacity in the EE design, construction, and operation of commercial and high-rise residential buildings	**MS**
Component 3/Outcome 3:	Increased use of EE building materials and application of EE building technologies in Hanoi and HCMC	**S**

Evaluation Ratings

As per the requirements of the TOR for Terminal Evaluations, Table 4 provides the ratings for relevance, effectiveness, efficiency, impacts and sustainability of the project. The Table also provides the ratings for Monitoring and Evaluation (M&E), Implementing Agency (IA) & Executing Agency (EA) Execution, and Assessment of Outcomes. Ratings have been provided using the obligatory GEF rating scale.

Table 4: Terminal Evaluation Ratings

1.Monitoring and Evaluation	Rating[6]		2. Implementing Agency (IA) & Executing Agency (EA) Execution	Rating
M&E design at entry	S		Quality of UNDP Implementation	S
M&E Plan Implementation	S		Quality of Execution - Executing Agency	S
Overall quality of M&E	S		Overall quality of Implementation / Execution	S
3. Assessment of Outcomes	**Rating[7]**		**4. Sustainability**	**Rating[8]**
Relevance	R		Financial resources	L
Effectiveness	S		Socio-political	L
Efficiency	S		Institutional framework and governance	L
Overall Project Outcome Rating	S		Environmental	L
			Overall likelihood of sustainability	L

Summary of Conclusions

The goal of the EECB project was promotion of EE measures in the building sector, so that the energy needs of the multi-story residential apartments and commercial buildings are met in an efficient manner, thereby reducing the GHG emissions from the buildings sector in Vietnam. There were following three specific interventions which were carried out to meet the goal of the project. These three interventions corresponds to the three outcomes of the project.

- Increasing the compliance with EE Buildings Code, by development of supporting tools and guidance as well as monitoring and verification mechanism and training and capacity building of the government officials and the building practitioners towards compliance with the building code
- Facilitating the development of the concept of EE labelling of the buildings by developing the norms of specific energy consumption for different types of buildings
- Facilitation of achievement of EE in the buildings beyond the levels mandated in the EE building code by training/capacity building of building practitioners and demonstration of EE technologies in the buildings (by way of pilot projects both new buildings and retrofitting in excising buildings). This was to lead to replication of EE technologies demonstrated by way of the demonstration projects.

When it comes to establishment of demonstration projects, the EECB project delivered successfully. However, as most of the demonstration projects could be completed only towards the end of the EECB project, the direct GHG emission reductions within the project implementation time lines (please see Indictor 1 in Table 2) for EECB project has fallen slightly short of the targets, in spite of over achievement for the number of pilot projects (please see Indictor 19 in Table 2). . The achievement of direct post-project GHG emission reduction is expected to meet the targets (post-project GHG emission reduction would be 251,226 tons CO2e against the target of 236,382 Tons CO2e.). Also, the replication due to demonstration projects is expected beyond the implementation timelines of the EECB project.
The idea of developing the SEC profile for different types of buildings was to use them subsequently for 'EE Certification of Buildings Scheme'. Under the project, SEC profiles and energy benchmarks for 6 different types of buildings in 3 climate zones was completed. Monitoring and verification systems were installed in two buildings to monitor the energy consumption by using the services of the 'Energy Conservation Centres'. However, as the task of preparation of SEC profiles could be competed only towards the end of the project, the activities of piloting of 'EE Labelling/ EE Certification of the building did not happen.

[6] Ratings for Outcomes, Effectiveness, Efficiency, M&E, I&E Execution: Highly Satisfactory (HS): no shortcomings; Satisfactory (S): minor shortcomings; Moderately Satisfactory (MS); Moderately Unsatisfactory (MU): significant shortcomings; Unsatisfactory (U): major problems; Highly Unsatisfactory (HU): severe problems

[7] Ratings for Relevance; Relevant (R)

[8] Ratings for Sustainability: Likely (L): negligible risks to sustainability; Moderately Likely (ML): moderates risks; Moderately Unlikely (MU); significant risks; Unlikely (U): severe risks

The project would also lead to reduction in the emission of GHG due to higher level of compliance with the EE Building Code. Although, during the TE such benefits could not be quantified, the benefits of training and capacity building of the government officials and building practitioners would definitely go a long way towards higher compliance with the EE Building Code.

It is expected that the demons tration of energy savings (and the consequent GHG emission reductions) due to the pilot projects would lead to replication of the EE measures in the buildings leading to energy savings in future.

Recommendations

#	Recommendation	Rational and Description	Responsibility	Timing/Dates for Action
	Corrective actions for the design, implementation, monitoring and evaluation of the project			
1	For the future projects of this nature, instead of 'Direct Reduction of the GHG emissions by EOP' the log-frame should use 'Direct Reduction in the GHG emissions over the lifetime of the investments made during the project implementation' as the indicator.	Considering that the process of building approval, detailed design, and actual construction involves time consuming sequential activities, any new building complying with the EE building code will at best get occupied towards the end of the implementation timelines of the GEF project. Thus, the benefits of the project in terms of reduced energy consumptions (and reduced GHG emissions) would get realized only after the project implementation timelines. In this regard it is important to note that as per the Revised Methodology for Calculating GHG mitigation benefits for the GEF Energy Efficiency Projects, for projects where building codes lead to building EE improvements prior to the project closure, the resulting emission reductions (over the lifetime of those improvements) are considered as direct project impacts. Building improvements that occur after project closure are considered to result in direct post-project impacts.	GEF agencies designing the future projects in the focal area of climate change (mitigation)	Future GEF projects in the focal area of climate change mitigation
	Actions to follow up or reinforce initial benefits from project			
2	Strengthen the mechanism for enforcement of EE building code.	Sustainability of the results of the project (in terms of improvement in the energy performance of the buildings due to EE building code) would depend upon the enforcement of the EE building code. The mechanism (Comprising of the overall process of application for approval of the building plans, monitoring of construction, approval of building etc.) for enforcement of the EE building code needs to be strengthened to ensure sustainability.	Government agencies responsible for enforcement of the EE building code	Beyond the implementation of EECB project
3	The software (s) procured by the project be transferred to one of the universities/ institutions so that it is put to good use for the remaining licence period of the software.	The 'Project Management Unit' (PMU) procured a building energy simulation software to support implementation of some of the activities (pertaining to determination of the baseline energy consumption for the pilot new buildings, where EE measures were implemented) of the project. The building energy simulation software and other such material available with the project, may be transferred to one of the universities/institutions, so that such material gets used, after implementation of the GEF project. A centre of excellence may also be created at the university/institution which can also host the	PMU/ UNDP CO	At the closing of EECB project

#	Recommendation	Rational and Description	Responsibility	Timing/Dates for Action
		knowledge products and data/information compiled under the project.		
4	It is recommended that a laboratory be created for testing the performance of the building materials. Along with creation of the test lab, possibilities may be explored for using the concept of EE labelling for the building materials.	The present version of the EE building code uses the prescriptive approach, wherein the EE performance of the materials and equipment to be used for construction is prescribed (specified). For successful enforcement of the code it is very important to have a lab for testing the building materials. It is gathered that technical standards have already been created in this regard. The test lab will become handy for implementation of the concept of EE labelling of building materials.	UNDP CO/ National Counterparts	After closure of the EECB project. As and when funds are available for creating the laboratory becomes available or there is an opportunity to include it in a externally funded project.
5	Any future revision of the code for energy efficiency in buildings may consider including the passive measures like orientation of the building, shading etc to reduce the cooling/heating load for the building.	Such provisions may be made which are specific to different climate zones of Vietnam. The revision may include the provision of the energy performance method for compliance with the building code, wherein, provision may be made to use a specified building energy simulation model to establish the compliance with the EE building code.	UNDP CO/ National Counterparts	After closure of the EECB project. As and when a revision of the present version of the EE building code is carried out.
6	Introduce a curriculum in the one of the Universities regarding the 'EE Building Code' and 'EE measures' in the buildings.	Apart from this a short module on Energy Efficiency in buildings, for skill upgradation and training of the practising professionals and government officials be introduced. This curriculum may later on be introduced in other institutions and universities.	PMU/ UNDP CO / National Counterparts	By the closure of the EECB project
	Proposals for future directions underlining main objectives			
7	Opportunities may be identified for promotion of ESCO models and financing of EE in Vietnam.	Apart from the building sector the ESCO model may take care of other large energy consuming sectors and Renewable Energy (RE) promotion through the ESCO route. In order to implement the ESCO models, there is a need to address the issues relating to the requirement of legal documents for paying for the energy savings in case of implementation of the EE measures through ESCO route for the government buildings and government owned enterprises. At the same time need to have guidelines on M & V system to verifying the ESCO energy savings achieved. Possibilities may be explored for creation of a super ESCO for EE in Vietnam.	UNDP CO / National Counterparts	Future GEF projects in the focal area of climate change mitigation
8	It is recommended that the possibilities of providing incentives for EE in the buildings may be examined afresh (particularly the non-fiscal incentives, as they will not have any financial	The project design has the provision of working out a scheme of financial incentives for promotion of EE in the building sector. However, considering the funds required for implementing such a scheme, this part of the project could not be implemented. The project has got a detailed assessment regarding the possibilities to provide incentives for promotion of EE in the building sector in Vietnam. The suggestions in this regard include both fiscal and non-fiscal measures (e.g. allowing higher ratio to land to floor area, Tax rebates etc.).	National counterparts	After the closure of the EECB project

#	Recommendation	Rational and Description	Responsibility	Timing/Dates for Action
	implications for the government).			
	Best/worst practices in addressing issues relating to relevance, performance and success			
9	It is recommended that in case of new buildings, the energy saving achieved should be computed based on the extent of projected energy savings in percent terms by running the baseline design and the design after the intervention in the 'Building Energy Simulation Model'. This percent savings should be applied to the actual monitored	To compute energy savings due to EE measures in new buildings, the project team has used building energy simulation software to determine the energy consumption in the baseline (normal building with no enhanced EE measures). In this regard it is important to note that the use of building energy simulation models is good for comparing different design options of a given building in terms of the energy performance. However, the use of software is not appropriate to accurately forecast the energy performance of the building. This is given the limited accuracy level of the building energy simulation models to forecast the energy consumption of the buildings due to a number of reasons (including the occupants behaviour). There is extensive evidence to suggest that buildings usually do not perform as predicted by energy simulation . Sufficient evidence[9] exists which show that 'Building Energy Models' predictions do not match up with actual energy use, with an average of 30% discrepancy being observed between the actual usage and predicted performance and in certain cases also have variations as high as 100%. consumption of energy to compute the savings achieved. It is recommended that in case of new buildings, the energy saving achieved should be computed based on the extent of projected energy savings in percent terms by running the baseline design and the design after the intervention in the 'Building Energy Simulation Model'. This percent savings should be applied to the actual monitored consumption of energy to compute the savings achieved.	GEF agencies	Future GEF projects in the area of Energy Efficiency in buildings

[9] Improving the Accuracy of Building Energy Simulation Using Real-Time Occupancy Schedule and Metered Electricity Consumption Data, Conference Paper · June 2017, Prashant Anand, Indian Institute of Technology Kharagpur; Junjing Yang, National University of Singapore; K.W.D Cheong, National University of Singapore; Chandra Sekhar National University of Singapore

1. INTRODUCTION

1.1 Context, purpose of the terminal evaluation and objectives

The project "Energy Efficiency Improvement in Commercial and High-Rise Residential Buildings (EECB)" was implemented in Viet Nam, to contribute to GHG mitigation measures in the building sector. The project was expected to make a significant contribution towards enforcement of 'Viet Nam Energy Efficiency Building Code (EEBC)' in the building sector, and also expected to lead to investments in building EE technologies and practices. The objective of the GEF funded and UNDP executed Project was to reduce GHG emission intensity from the building sector in Viet Nam. The objectives of the project were to be achieved through Improvement and Enforcement of Energy Efficiency Building Code (EEBC); Building Market Development Support Initiatives and piloting the Building EE Technology Applications and Replications.

The project implementation was started in April 2016 (signature on Project Document) with the project implementation period of 4 years the planned project closure was in April 2020. As the project has been granted a no-cost extension the actual project closure date is March 2021. The project has been implemented with funding from the Global Environment Facility (GEF) and the United Nations Development Programme (UNDP). With the project approaching its end, a terminal evaluation of the project has been carried out. This is as per the standard practice for all UNDP-GEF projects.

The UNDP CO invited a team (comprising of an International Consultant and a National Consultant) of consultants to carry out the Terminal Evaluation of the project as per the scope and terms of reference given in **Annex A**. The broader defined objectives of the terminal evaluation were as follows:

- To compare planned outputs of the project to actual outputs.
- Identify (if applicable) the causes and issues which contributed to non-achievement of the targets of the project.
- Draw lessons that can both improve the sustainability of benefits from the project, and aid in the overall enhancement of UNDP programming.

A team of consultants, comprising of an international consultant, Dinesh Aggarwal (India), and a national consultant Dang Ngoc Dung (Vietnam), was selected and contracted by the UNDP, Viet Nam country office (CO) to carry out the terminal evaluation.

1.2 Scope and methodology of the terminal evaluation

The evaluation has been carried out in accordance with the UNDP-GEF Guidance for Conducting Terminal Evaluations of UNDP-supported Projects, as provided in the 'Handbook on Planning, Monitoring and Evaluating for Development Results'. Prior to the start of the Terminal Evaluation, an inception report was prepared and shared with the UNDP CO in Viet Nam and the project team. The inception report provided the outlines of the approach and methodology to be followed while carrying out the evaluation. It also provided the proposed timelines for the evaluation. The inception report included a table providing the criteria for the evaluation and the list of main evaluation questions. The table of terminal evaluation criteria and the questions is given in **Annex B**. Accordingly, the methodology for carrying out the Terminal Evaluation was comprised of following activities:

- **Review of Documents:** Review of 'Project Design Document' and all relevant sources of information including documents prepared during the preparation phase. This included the review of information about the project on UNDP's website. The review of documents included a review of financial data, the mid-term evaluation report, a sample of back-to-office reports, samples of project communication material, Project Implementation Reviews, etc. Some of the related

secondary literature (e.g. Viet Nam EEBC, details of the projects implemented by other donor agencies in the building sector EE) were reviewed. **Annex C** provides the list of documents reviewed.

- **Mission to Viet Nam, interviews with stakeholders[10] and site visits**. A mission to Viet Nam was organised from the 18th of January 2021 until the 28th of January 2021. The mission started with a briefing by the UNDP CO and the project team. Towards the end of the mission a debriefing session was held with the PMU to get the feedback on the observations during the mission. The mission concluded on 28th January 2021with a presentation regarding the initial findings. During the mission, interviews with different stakeholders and project participants were carried out. The mission included discussions with the officials of the organisations where the pilot projects supported by the EECB project were implemented. **Annex D** provides the overall schedule of the missions and the stakeholders interviewed during the mission. The mission also served the purpose of collecting some of the missing documents to be reviewed.

The assessment of project performance has been carried out based upon the expectations set out in the Project Logical Framework/Results Framework which provides performance and impact indicators for project implementation along with their corresponding means of verification and the review of results that have been delivered by the project. For the purpose the Logical Framework as provided in the 'Project Document' was referred. While doing so, the suggested changes at the time of 'project inception' and at the time of 'mid-term review' of the project has also considered. While carrying out the evaluation, emphasis has been placed on evidence-based information that is credible, reliable and useful.

The review of documents provides the basic information regarding the activities carried out to attain the desired outcomes and outputs and the actual achievements. However, the mission was needed to verify the information, get missing data and to learn the opinion of stakeholders and project participants to interpret the information. During the mission, the interviews with the key stakeholders'/project participants were based on an open discussion to allow respondents to express what they feel are the main issues. This was followed by more specific questions on the issues mentioned. During the interviews, the evaluation criteria and the questions (Please see **Annex B**) were used as the check list to raise relevant questions and issues.

The limitations of the Terminal Evaluation include the time available for carrying out the field mission and the restrictions on travel for the International Consultant due to COVID 19 pandemic. Due to the travel restrictions the international consultant could not travel to Viet Nam for consultations with the stakeholders. However, meetings were held online using online meeting platforms. In persons meetings with the stakeholders were carried out by the national consultant. The evaluation team is of the view that the meetings and consultations carried out within the available time and the restrictions on travel were sufficient to provide the required level of clarity and information for the TE.

The evaluation has been conducted in accordance with the principles outlined in the United Nations Evaluation Group 'Ethical Guidelines for Evaluation' as given in **Annex E**.

1.3 Structure of the Terminal Evaluation Report

The structure of the report is as per the format suggested in the Terms of Reference for the terminal evaluation. However, the contents of the chapter on findings has been split into three separate chapters due to the size of the text.

[10] As the travel restriction were in force due to COVID 19, the international consultant did not physically join the field mission to Viet Nam, he carried out some of the stakeholder consultations remotely using online meeting platforms. Taking advantage of the presence of the National Consultant in Viet Nam, the stakeholder consultations by the National Consultant were carried out in person.

The report starts with a chapter providing an introduction which is followed by the chapters of project description, findings. The last chapter of the report provides the conclusions and the recommendations. Additional information is provided in the Annexes to the report. While the Executive Summary of the report is provided in the beginning of the report. The Findings have been organised in three chapters (instead of one single chapter as suggested in the TOR) due to the size of the text. With respect to the findings discussion, the report elaborates three general areas: project formulation, project implementation, and project results, in three different Chapters. The report is organised as follows;

Chapter 1: Introduction to the project
Chapter 2: Project description and development context. Most of the contents of this Chapter comes from the Project Document. This chapter provides information about the project, to a reader of the TE report at any point of time.
Chapter 3: Findings: Project design and formulation. This chapter provides an oversite of different 'design aspects' of the project. The aspects covered in this section of the report are termed as 'factors affecting performance'. The role of these aspects towards not that good performance (if applicable) is deliberated Chapter 5 of the TE report. This forms the basis to determine if any of the design aspects have impacted the results of the project (which are covered in Chapter 5 of the report).
Chapter 4: Findings: Project implementation. This chapter of the report provides information about planned provision in the project design regarding different aspects, like project implementation arrangements, M&V, stakeholder participation, roles of implementing partners and GEF agency etc. Most of this information comes from the project document.
Chapter 5: Findings: Project results. This Chapter deliberates upon the achievement of results and objectives of the projects. If applicable, an assessment regarding the reasons in the shortfall in the performance is carried out in terms of the 'Factors Affecting Performance'.
Chapter 6: Conclusions, recommendations and lessons. This Chapter provides the conclusions and a set of recommendations

Annex B shows where the main criteria and questions of the Terminal Evaluation can be located in different sections of the report.

2. PROJECT DESCRIPTION AND DEVELOPMENT CONTEXT

2.1 Project start and duration

Table 5 provides the details regarding the timelines for project approval and implementation

Table 5: Project Approval and Implementation Timelines

Event	Date
PIF Approval Date	Nov 15, 2013
CEO Endorsement Date	Jul 14, 2015
Project Document Signature Date (project start date):	Apr 22, 2016
Date of Inception Workshop	Aug 26, 2016
Expected Date of Mid-term Review	Apr 22, 2019
Actual Date of Mid-term Review	Jul 15, 2019
Expected Date of Terminal Evaluation	Dec 31, 2020
Actual Date of Terminal Evaluation	Mar 20, 2021
Original Planned Closing Date	Apr 22, 2020
Revised Planned Closing Date	Mar 31, 2021

The implementation timelines for the project were extended to 31 March 2021 as per the UNDP GEF Executive Coordinator and Director's approval of the extension request in January 2021. As the project's implementation is extended to 31st March 2021, the terminal evaluation of the project and project closure were rescheduled to first quarter of 2021.

2.2 Problems that the project sought to address[11]

Strong economic growth in Vietnam over a period of time has led to the growth in the building construction activity. As more and more people move to urban areas in search of economic opportunities, the number of buildings needed to house them and energy consumption in the building sector continues to rise. The growth in the number of buildings coupled with economic growth (leading to enhanced lifestyle and consumption of energy) is leading to growth in consumption of electricity. Buildings are one of the major consumers of electricity and the consequent adverse environmental impacts, which include emissions of greenhouse gases and other pollutants.

The Government of Viet Nam has realized the significance of the energy consumption and GHG emissions responsible by the building sector in the country, and to respond to the increasing energy consumption (and hence the GHG emissions) due to the buildings, considerable efforts have been undertaken by the government agencies to enhance EE in the building sector. At the time of the project formulation and design, one of the efforts in this direction was EE promotions in the building sector by approving Energy Efficiency and Conservation Law and the 'Energy efficiency Building Code' in 2013.

The EECB project addresses the barriers towards compliance with the EE building code and also increase the EE in the buildings beyond the leaves which can be achieved by EE Building Code, by demonstrating the EE technology application in the buildings (both the new buildings and retrofitting in the existing buildings). The three specific initiatives under the project towards increasing the energy performance of the buildings in Vietnam are increasing the compliance with the EE Building Code; increasing the use of EE technologies in the buildings; developing and promoting a scheme for EE labelling of the buildings.

[11] Based on Project Document

2.3 Immediate and development objectives of the project

The project while on one end will help reduce the energy consumption in the country leading to the reduction in the adverse local and global environmental impacts of the project, on the other hand the project will lead to increase in the provision of sustainable habitat for the households and commercial space for the businesses. At the national level the project will lead to reduction in the imports of fossil fuels by the country, thereby benefiting the economy of the country.

2.4 Baseline and expected results

The project baseline primarily consists of the activities, projects and programs on energy efficiency improvements in the buildings as well as ongoing initiatives aimed at creating an enabling environment to facilitate EE in the buildings sector. Following the approval of the revised EEBC 2013, several programs, projects and activities were implemented in Vietnam to strengthen its enforcement. Some of such initiatives in the past are as follows;

- The Ministry of Construction (MOC) has spearheaded a range of projects and activities focused at capacity development, awareness and piloting buildings to showcase EEBC compliance.
- Through the "Low Carbon Transition in Energy Efficiency Sector Project (project funded by DANUDA) " (2014-2016), the Ministry has specifically targeted building practitioners by (a) developing technical regulations, guidelines and standards for enforcement of EEBC; (b) conducting capacity building trainings for construction licensing officials at the central level and at the provincial level; (c) monitoring and inspecting compliance activities i.e. deployment of the building code; adjustment of policy, regulation and operating procedures; and, (d) demonstrating EEBC application in two buildings in northern and southern areas.
- Through the 'Vietnam Clean Energy Program (VCEP, 2014-2018)' implemented by the MOC there were efforts to reduce long-term emission in the building sector.
- MOC had coordinated with DOCs to fully implement the revised EEBC (QCVN09), and training programs to enhance awareness and knowledge of regulators (DOCs) and building practitioners on requirements and enforcement of the revised EEBC. An EEBC compliance checklist based on Excel spreadsheets aims at assisting regulators and designers in the compliance checking process was part of the training.

2.5 Results Framework

The results framework of the project providing the objectives, the expected outcomes and results along with corresponding indicators is presented as Table 6. During the inception of the project, there were minor adjustments in the indicators of the project. Significant changes in the indicators of the log-frame were carried out at the time of MTR. The Table 6 below, also highlights the changes carried out at the time of 'Project Inception and at the time of MTR.

Table 6: Results Framework of the project

Project Strategy	Indicator[12]	Comments/ Modifications/Changes at Inception/MTR[13]	Baseline	EOP[14] Target
GOAL: Reduced intensity of GHG emissions	**Indicator 1:** Cumulative CO_2 emission reduction		1,568	37,680

[12] As per Project Document. Numbering of the indicators was done at the time of MTR

[13] The comments/modifications/changes were at the time of MTR unless specifically mentioned

[14] EOP = End of Project

Project Strategy	Indicator[12]	Comments/ Modifications/Changes at Inception/MTR[13]	Baseline	EOP[14] Target
from the building sector	from the building sector by End-of-Project, tCO_{2e}			
OBJECTIVE: Improved energy utilization performance of commercial and high-rise residential buildings in Ho Chi Minh and Hanoi	**Indicator 2:** Cumulative energy savings from the commercial building by EOP MWh		2,528	61,137
	Indicator 3: % of new buildings that are fully compliant with the revised Energy Efficiency Building Code by EOP	• Assessment will be difficult • Do not necessarily refer to specific outcomes stipulated by the project	20	50
	Indicator 4: % of existing commercial and high-rise residential buildings that adopt EE technologies and practices and achieve at least 10% electricity savings by EOP		Less than 5%	20%
	Indicator 5: No. of people gainfully employed in the building sector in Viet Nam by EOP	• No. of people working in EE field of building sector in Viet Nam • During inception Baseline value changed from 4 to 20 • Assessment will be difficult • Indicators and targets are only partly addressed to the partners involved in realisation and thus not clear that they will be achievable by EOP • Do not necessarily refer to specific outcomes stipulated by the project	20	60
COMPONENT 1: Improvement and enforcement of energy efficiency building code				
OUTCOME 1.1: Enforced, improved and comprehensive policy, legal, and regulatory frameworks on the energy efficient design, construction and operation of commercial and high-rise residential buildings	**Indicator 6:** % of DOCs nationwide that reference EEBC compliance toolkits and guideline developed by the baseline and the projects by EOP		30% of DOCs nation-wide	70% of DOCs nation-wide
	Indicator 7: % of building practitioners nationwide that reference EEBC compliance toolkits and guideline developed by the baseline and the projects by EOP	• Assessment will be difficult	20% of building practitioners	50% of building practitioners
	Indicator 8: % of applications for new commercial and high-rise residential building constructions submitted to DOCs comply with EEBC-2013 by EOP		20%	50%

Project Strategy	Indicator[12]	Comments/ Modifications/Changes at Inception/MTR[13]	Baseline	EOP[14] Target
	Indicator 9: No. of national testing standards for energy performance of building construction materials promulgated by EOP	• No. of national standards for energy performance promulgated	0	5
	Indicator 10: No. of existing and new commercial buildings and high-rise residential buildings in Viet Nam certified as EE buildings by EOP	• No. of existing and new commercial buildings and high-rise residential buildings in Viet Nam certified as EE buildings under the pilot certification of EECB Project	0	20
OUTCOME 1.2: Strengthened compliance of the energy efficiency building code for commercial and high-rise residential buildings in Hanoi and HCMC	**Indicator 11:** % of building practitioners nationwide that reference the EE design guideline to achieve a higher level of EE than the EEBC requirements by EOP	• Assessment will be difficult • Do not necessarily refer to specific outcomes stipulated by the project	20%	50%
	Indicator 12: % of commercial and high-rise residential buildings referencing M&V schemes in EE implementation by EOP	• Initial target in Project Document, was 70%, it was changed at inception to 25%	0%	25%
	Indicator 13: % of overall commercial and high-rise residential building stakeholders that are satisfied with availability and quality of energy benchmarking data by Year 4 ,	• **To be omitted as** Indicators and targets are only partly addressed to the partners involved in realisation and thus not clear that they will be achievable by EOP	20%	70% (at least)
COMPONENT 2: Building market development support initiatives				
OUTCOME 2: Increased local capacity in the EE design, construction, and operation of commercial and high-rise residential buildings	**Indicator 14:** No. of financial mechanisms and incentives for commercial and high-rise residential buildings approved and implemented by EOP	• **Not appropriate, changed to:** No. of supporting mechanisms for commercial and high-rise residential buildings proposed by EECB Project. Supporting mechanisms shell be referring to Financial (grants, tax incentives, reduced levies etc) and non-financial incentives	0	1
	Indicator 15: % of stakeholders in the building sector that are satisfied with services provided by CEEBs by EOP	• **To be omitted** as the indictor do not necessarily refer to specific outcomes stipulated by the project	0%	70% (at least)
	Indicator 16: % of CEEB trainees that are engaged in EE building designs,	Split to two separate indicators • **Indictor 16.1:** % of trainees (building project developers,	0%	50%

Project Strategy	Indicator[12]	Comments/ Modifications/Changes at Inception/MTR[13]	Baseline	EOP[14] Target
	implementation and M&V by EOP	design & appraisal experts, appraisal officers of DOCs) that are trained on EE building designs and construction by EOP • **Indicator 16.2:** % of trainees (relevant officers of DOCs, energy auditors, building operation managers) that are trained on building operation and M&V by EOP		
	Indicator 17: No. of commercial and high-rise residential buildings that implement EE projects using the ESCO models by EOP	• **To be omitted:** Recommended to be dropped as Indicators and targets are only partly address to the partners involved in realisation and thus not clear that they will be achievable by EOP	5	10
COMPONENT 3: Building EE technology applications and replications				
OUTCOME 3: Increased use of EE building materials and application of EE building technologies in Hanoi and HCMC	**Indicator 18:** % of new and retrofitted commercial and high-rise residential buildings that are partly or entirely based on EE building materials and applications being promoted and demonstrated by EOP	• **To be omitted**	5%	30%
	Indicator 19: No. of demonstration projects that adopted EE equipment, building materials and building energy monitoring and management/control systems promoted by the EEBC Project by EOP	• Number of demonstration projects were initially set to be 16. It was changed during inception to include 16 demonstration projects to be implemented by the EECB Project and 5 demonstration projects that have been implemented by IFC and DEA.	5	21
	Indicator 20: No. of completed M&V exercises in accordance with the guidelines proposed by the Project by EOP		0	16
	Indicator 21: No. of new EE building projects designed based on or influenced by, the results of the demonstration projects, by EOP	• **To be omitted**	5	50

2.6 Main stakeholders

Table 7 provides the list of main stakeholders along with the details of their respective roles (as envisaged at the time of project design) in the project

Table 7: List of main stakeholders[15] involved in the EECB project

Stakeholders	Role
Ministry of Construction (MOC)	Implementing partner and key central government proponent for EE in buildings, including commercial and high-rise residential buildings. Responsible for managing and operating day-to-day project implementation.
Ministry of Industry and Trade (MOIT)	Responsible party involved in developing policies, standards and regulations for energy end-use equipment. MOIT was to also provide technical advice, co-develop and review activities related to training, certification system for energy auditors and energy managers in the building sector.
Ministry of Finance (MOF)	Responsible party involved in co-development of incentive/penalty scheme(s), mechanisms to support EE in the building sector.
Ministry of Science and Technology (MOST)	Participating agency involved in developing policies and providing technical advice on EE standards for energy intensive appliances and equipment in buildings, building construction materials and provision of technology transfer.
Local Governments and Local Authorities (Provincial and District Departments of Construction – DOC - and Departments of Urban Planning - DUPA)	Local agencies responsible for monitoring EE compliance during and after the construction phase and reviewing EE compliance against previously defined zone restrictions for new development, urban development plans, and environmental ordinances who will be involved in and benefit from capacity building on integration of EE in project design, energy auditing and certification of EE compliance.
Centre for Energy Efficiency in Buildings (CEEBs)	CEEBs under MOC will be involved in gathering relevant data, delivering technical training for energy managers, energy auditors, and conducting research and development on EE in buildings. CEEBs' capacity will also be enhanced through knowledge sharing during training and workshops.
Energy Conservation Centres (ECCs) in Hanoi and Ho Chi Minh	Local agencies responsible for provision of research, consultation and capacity building to government and private sector organizations to implement EE&C. ECCs has already been involved in development of energy database and energy benchmarking for buildings.
Academia (Hanoi University of Architecture, HCMC University of Architecture, National University of Civil Engineering, and other universities and institutes)	Universities and institutes will be involved in the development of capacity building for organizations and individuals involved in design, development and implementation of EE buildings.
Building Developers (Vietnam National Construction Consultants Corp., CONINCO., JSC, Housing and Urban Development Corporation)	Building developers will be involved in strengthening EEBC compliance during the design phase of new construction projects, and co-financing EE technologies and application in demonstration projects. Building developers will also benefit from capacity building, training, workshops and seminars.

[15] As per Project Document

Stakeholders	Role
Building Practitioners (Designers, Design Consultants, Building Sector Consultants, Contractors, Operators)	Building practitioners (organizations and individuals) play critical roles in delivering EE performance of buildings. They will be engaged in development and implementation of capacity building programs and development of demonstration projects. They will be identified and firmed up during project implementation.
Viet Nam Association of Civil Engineering Environment (VACEE), Viet Nam Association of Architects (VAA) and Viet Nam Green Building Council (VGBC)	Professional and industry association will play an active role in disseminating information and raising the awareness of different stakeholders on EE in buildings by using their current networks, and participate in development of demonstration projects.
Technology/Equipment Suppliers	These are partners for promoting EE and training/ workshops/ seminar activities. They will also support project activities with their expertise on technology and equipment through EE equipment exhibitions and by identifying demonstration opportunities.
Other stakeholders such as building owners, energy managers, groups of building technical managers (e.g. hotel chief engineers) tenants and occupants who directly pay for the energy consumed	These stakeholders will support investment (co-financing) in EE technologies, materials and products that can reduce their energy costs. Co-financing commitments have been provided by the following buildings which will participate as demonstrations: HITC Building, Hanoi Sheraton Hotel, Melia Hanoi Hotel, FPT telecom Building, JW Marriot Hanoi Hotel, Majestic Hotel, Cendeluxe Hotel, Michelia hotel, Vinpearl Resort, Somerset Service Apartment, Riverside Renaissance Hotel, Intercontinental Hotel, and Pedagogical University of HCMC.

3. FINDINGS: PROJECT DESIGN AND FORMULATION

The main questions for terminal evaluation are; (please see Annex B)

- **Were the project's objectives and components clear, practicable and feasible within its time frame?**
- **Were the capacities of the executing institution(s) and its counterparts properly considered when the project was designed?**
- **Were lessons from other relevant projects properly incorporated in the project design?**
- **Were the partnership arrangements properly identified and roles and responsibilities negotiated prior to project approval?**
- **Were counterpart resources (funding, staff, and facilities), enabling legislation, and adequate project management arrangements in place at project entry?**
- **Were the project assumptions and risks well-articulated in the PIF and project document?**
- **Whether the planned outcomes were "SMART"?**

3.1 Analysis of LFA/Results Framework

The log-frame of the project providing the objectives, the expected outcomes and results along with corresponding indicators was presented in an earlier section of this report (please see Table 6). During the inception of the project, there were minor adjustments in the indicators of the project. Significant changes in the indicators of the log-frame were carried out at the time of MTR.

During the MTR, it was pointed out (along with the recommendations for corrections), that there are problems with the indicators, as many of the indicators are not meeting the 'SMART[16]' criteria. The recommendations made at the time of MTR, were accepted by UNDP/Project Team. This improved the situation of the project design and the log-frame indictors to a large extent. However, some of the problems with the indicators, particularly the indicator regarding energy saving potential and the corresponding GHG emission reductions, still remained. Given below are some of the issues with the indicators of the log-frame.

Indicators have been provided at Outcome level: The project design as presented in the 'Project Document' did specify the expected set of Outputs for each of the projected Outcome of the project. However, the expected outputs did not find their required place in the log-frame of the project. Indicators were provided at the outcome level. The monitoring (PIRs) of the progress of the project is being done as per the log-frame. As all the activities/Outputs do not get covered in the results framework, some of the important activities may get missed in the monitoring/PIRs.

The projected Global Environment Benefits (GHG Emission Reduction) are over ambitious: The targeted direct GHG emission reduction for the project by the EoP is 37,680 tCO2e. The targeted direct GHG emission reduction of 37,680 tCO2e, are to be achieved due to three different types of interventions; Building Code Implementation (27,633 tCO2e); Demonstration and Diffusion (8,473 tCO2e) ; Financing (1,574 tCO2e). The targeted GHG mission reductions are a bit ambitious as explained further in the following bullet points;

a. As mentioned in the project document, the computation of the targets for GHG emission reductions due to implementation of the building code is based on the following set of assumptions;

Length of Analysis Period (Years After Project Close)	*10*
Annual Construction Growth Rate (Commercial and High Rise Residential Buildings)	*14%*
Total Floor Area of Building Stock (m^2)	*6,722,000*
Floor Area (m^2) Subject to Code Built in Year 2016	*894,000*
Percent New Square Meters Built Compliant with Code	*20% (BAU, Baseline)* *25% (1^{st} year)*

[16] SMART = Specific, Measurable, Achievable, Relevant, Time-bound

	30% (2nd year) *40% (3rd year)* *50% (4th year)*

While computing the new built up area for the buildings which are required to comply with the EE Building Code, the 14% growth in construction has been applied to the total building stock. In this regard it needs to be appreciated that, the projected growth rate of 14% is the growth rate in the construction activity and not the annual rate of addition to the building stock. Further, the growth rate of 14% in the construction activity seems to be on a very high side. In this regard it may be noted that the project document itself mentions the growth in the construction in Vietnam is mentioned as 7.8% (please see para 9 of the project document)

b. The impacts of energy savings due to EECB project in terms of new buildings following the EEBC will get realised only, after the new buildings get completed and occupied. Further, measurements of energy consumption becomes relevant only during the second year of operations, since the first year suffers from lower occupancy and the tuning up of all equipment. Considering that the process of building approval, detailed design, and actual construction involves time consuming sequential activities, any new building complying with the EE building code will at best get occupied towards the end of the implementation timelines of the GEF project. Thus, the benefits of the project in terms of reduced energy consumptions (and reduced GHG emissions) would get realised only after the implementation timelines of the EECB project. For Indicator 1, instead of 'Direct Reduction of the GHG emissions by EOP' the log-frame should have used 'Direct Reduction in the GHG emissions over the lifetime of the investments made during the project implementation' as the indicator (please see recommendations 1). The project design has already provided the figures (in Annex A of Project Document) for the 'Direct Reduction in the emission of GHG over the lifetime of the investments leveraged during the project implementation'. In this regard it is important to note that as per the Revised Methodology for Calculating Greenhouse Gas Benefits for the GEF Energy Efficiency Projects, for projects where building codes lead to building EE improvements prior to the project closure, the resulting emission reductions (over the lifetime of those improvements) are considered as direct project impacts. Building improvements that occur after project closure are considered to result in direct post-project impacts.
c. There is no provision in the project design to provide fiscal incentives of financing support for implementation of EE measures in the buildings. Thus, the projected GHG emission reductions due to financial instruments will not be there.

Indicator 3 and Indicator 8: Indicator 3 and Indicator 8are essentially the same with only minor difference. It was pointed out during the MTR that for these indicators, assessment will be difficult. It is to be noted that in Vietnam, compliance with the EE building code is mandatory (and not voluntary). EE Building Code is mandatory for all the buildings with floor area of 2500 m2 and above. Thus, this indicator provides the information regarding the break-up of the number of construction of new buildings in two categories (those with floor area of less than 2500 m2 and those with floor area of 2500 m2 and above). In case it is assumed that in these Indicators 'new buildings' is being used for the buildings which are required to comply with the EE building code (as specified a bit in case of Indicator 8), the collection of this information from the government agencies, puts such agencies in a situation where they either admit compliance or non-compliance with the law. This kind of indicators works well in the situations/geographies where the EE building codes are newly introduced and in the initial stages the compliance may be voluntary . In this regard it is important to note that in Vietnam the EE building code was mandated at least since 2013 (much before the present GEF project). The 'Building Code Module' of the revised GEF methodology[17] for calculating GHG emissions reductions is applicable for either establishment of EE Building Code establishment or for ; enhanced enforcement of the Code. It is the latter situation for which such an indicator is applicable. However, in such case the project design

[17] Calculating GHG Benefits of GEF EE Projects: A Revised Methodology

(Project Document) should provide for a detailed assessment of the status of compliance with the EE code, the reasons/barriers due to which there is less compliance and the activities/outcomes targeted towards removal of such barriers.

Indicator 4: This indictor is not realistic. It needs to be appreciated that the existing base of the commercial buildings and high rise residential buildings in the country is very large. An intervention of this scale, though not impossible, is certainly difficult to achieve.

Indicator 5: This indicator suffers due to lack of definition of "people working in EE field of building sector'. In the absence of a definition, the persons which can be included in this is very wide ranging from engineers, architects, service providers, system designers, utility services personals, building material suppliers, energy auditors etc.

Indicator 7: Similar to Indicator 5, in this case also there is no definition of building practitioners. Partly due to the absence of precise definition and partly due to absence of a data base, it is difficult to ascertain the number of building practitioners in Vietnam on which the percentage is to be applied. The only way to determine achievement against this indicator would be a survey on the random and unbiased sample of building practitioners.

Indicator 11: As in the case of Indicator 7, there is a problem with this indicator, in terms of being 'measurable'. This is considering that it is not clear what is the absolute number of building practitioners in the country on which the percentage is to be applied.

Indicator 13: As in case of many other indicators, the absolute number on which % can be applied is not known. This problem can be partially solved by carrying not a comprehensive survey across different types of stakeholders. However, this is not a very cost effective solution.

Indicator 16: Based on the recommendation at MTR this indicator was split into 2 and the language was modified. There is a problem with the new indicator, in terms of being 'measurable'. This is considering that it is not clear what is the absolute number of stakeholders (building project developers, design & appraisal experts, appraisal officers of DOCs) on which the percentage is to be determined.

Except for the issues with the indicators, which were discussed in the above paragraphs, the project objectives and the three outcomes of the project were clear, predictable and feasible within the implementation timeframe of the project. The Outcomes were predictable meaning that at the time of project design, the activities and the corresponding Outputs specified in the 'Project Design' were leading to the desired Outcomes of the project.

3.2 Assumptions and Risks

During the project development stage, possible risks towards smooth implementation of the project were identified and the risk mitigation measures were proposed. Different risks that were identified during the project formulation and the recommended mitigation measures are provided in Table 8.

Table 8: Risk Analysis of EECB Project (as per Project Document)

Risk	Mitigating Measure	Level of Risk
Institutional and Operational Risk		
Lack of government commitment to EE	The government has taken significant steps to provide a policy and regulatory framework toward EE in the industrial and building sectors. In addition, by decision of the Prime Minister, it is mandatory to implement the National Target Program on Energy Efficiency and Conservation (20062010, 2011-2015), which	Low

Risk	Mitigating Measure	Level of Risk
	includes a specific component related to EE in the construction and buildings sector. The EE&C Law approved by the National Assembly in June 2010 has further demonstrated the government's commitment toward EE, and the building sector is clearly highlighted as the main target for EE improvements. MOC's roles and responsibilities are also clearly defined in relevant EE&C decrees. The EECB project involves MOC as the lead implementing agency and this assures the government commitment to EE promotions in the building sector.	
Lack of institutional capacity to implement and manage the project	MOC's institutional and technical capacity and experience in EE projects will ensure sound management and implementation of the project. MOC has dedicated management staff and a number of full-time staff responsible for EE. Besides, MOC's research and academic institutions such as the Construction Science and Technology Institution, Construction Materials Institution and Urban and Rural Planning Institute have been involved in a number of energy conservation projects ranging from development of standards and technical guidelines on EE, energy audits, research, surveys, recommendations and implementation of EE techniques in buildings, and EE monitoring and evaluation, etc. Since 2004, MOC has been involved in a number of key EE programs including a demand-side management (DSM) project with the deliverable of formulation and promulgation of the EE building code 2005. Within the framework of VNEEP 2, MOC takes the lead in implementation of Component 3 (Energy Efficiency and Conservation in Building, with two main projects of Improving capacity on EE&C and conducting EE&C activities in building design and management and Develop pilot models and disseminate EE&C management activities in building operation). Critically, it participated in the formulation of the Energy Efficiency and Conservation Law which was passed on June 2010. Although MOC has continuously strengthened its capacity in managing EE projects, the EECB project will further enhanced its institutional capacity in EE project implementation and management through establishment of two CEEBs in Hanoi and HCMC. The EECB project will also implement a comprehensive capacity building program for these two CEEBs to ensure that they can provide necessary supports to sustain the enforcement of the EEBC and EE implementations in the building sector as a whole.	Medium
Stakeholder coordination - Too many stakeholders may prevent efficient decision making	Identification of the appropriate lead agency and appropriate number of members for the National Steering Committee and the Technical Advisory Committee during the project design stage	Low
Climate Change Risk		
Over the past 50 years, the average temperature in Viet Nam has increased by 0.7°C and is expected to increase further, leading to increased demand for air conditioning, which could	In updating the EE building code, greater attention will be paid to expected climate change impacts, particularly higher temperatures. Measures such as advanced insulation techniques and passive solar design can reduce the expected increase in air conditioning loads. High efficiency electrical appliances, especially in commercial buildings, can also reduce the electricity demand for air conditioning. In addition to the revised EEBC issued in 2013, the EECB project will also layout a roadmap for	Medium

Risk	Mitigating Measure	Level of Risk
offset the energy savings achieved by the project.	upgrading the Vietnamese EEBC to respond available greater EE in building construction materials and electrical appliances. Furthermore, raising awareness among building occupants is important, as building users generally respond to a warmer climate by choosing options that increase cooling energy consumption rather than other means, such as insulation, shading or ventilation, which consume less energy. It is envisaged that there will be some public awareness activities under component 2 and that CEEB staff will engage in outreach and communications.	
Market Risk		
Low electricity tariffs could serve as a disincentive to EE	Viet Nam Electricity, the state-owned utility, raised average electricity prices by five percent in December 2012, the second increase in less than six months. Under a regulation that took effect in June 2011, the utility is allowed to raise power prices every three months based on changes in fuel costs or exchange rates. Input costs, including prices for coal and gas, have risen. Nonetheless, electricity prices remain low in comparison to other regional countries. MOC and the CEEBs will coordinate with the utility and relevant ministries[18] to set the electricity tariff at a level that reflects the true cost.	Medium
The market response of building owners, developers and end-users may not be as swift as anticipated. The desired behavioural change may not happen effectively within the project period due to unstable growth of the building sector in Viet Nam	As a result of the promulgation of the EE&C Law (2010), the implementation of the revised EEBC issued in 2013 is now strongly supported by a clear legal framework, not only by a decision of MOC as the previous EEBC in 2005. MOC, however, will accelerate the implementation of activities related to the enforcement of the incentive / penalty scheme, as well those pertaining to raising public awareness of such policy tools. At the beginning of the implementation schedule, the project will develop an effective communications plan and organize a set of relevant promotional activities targeting these stakeholders, so that long-term benefits of EE are well recognized. Successful case studies of EE implementation in the building sector will be drafted and the information will be shared with decision-makers.	Medium
Lack of support from building sector professionals	The project will involve of the professionals in all stages of the project so that the outcomes are in agreement with the consensus amongst such groups	Low
Failure to secure consumer interest may result into low demand for EE buildings and thereby slow rate of Market transformation. This will also result into reduced incentives for building designers/ owners to improve design.	EE in buildings have inherent economic benefits in addition to energy reduction and emissions reduction which is expected to attract the stakeholder response. The project activities have provision to create awareness, training and capacity building of the stakeholders.	Low
Technical/ Technological Risk		
Some technology suppliers may bring in very new technologies that may not	MOC will limit available technologies for demonstrations to those that have been tested in a similar market, especially technologies with actual energy savings performance data from building owners and developers. This is to ensure that the project will not	Low

Risk	Mitigating Measure	Level of Risk
be suitable to the local market.	be promoting "untested" technologies that may not be compatible with climatic conditions or demand-side energy utilization behaviour (and culture) in Viet Nam, or perhaps, may pose unforeseen safety and environmental hazards. This will be done through the demonstration projects and EE technologies inventory.	
Poor performance of demonstrated technologies, nonachievement of projected energy savings and increased investment or maintenance costs for energy efficient technologies.	The project will carry out detailed technical designs of EE measures and conduct review of available technologies to ensure that proper EE technologies will be selected and demonstrated. An implementation agreement with each project host will be established, and a focal point with authority will be appointed to facilitate effective implementation of the demonstration project. Adequate capacity building for project host personnel will also be undertaken to ensure operation, management and maintenance of EE measures will be carried out in an efficient manner.	Low
Overall		**Low**

3.3 Lessons from other relevant projects

In the past a number of projects pertaining to EE in the buildings has been implemented in Vietnam. These projects implemented in the past has been referred to in the project document. The lessons from these past projects were used while designing the EECB project.

3.4 Planned stakeholder participation[19]

In an earlier section of the report (please see section 2.5) the roles of the important stakeholders of the project was highlighted. There are provisions in the project design to implement the mechanisms to ensure an effective participation by the stakeholders. As per the plan the commencement of the Project was to happen with an inception meeting in which all the important stakeholders were to participate and contribute.

Apart from the inception meeting, the project had provision for conducting regular stakeholder meetings, issuing a regular project electronic newsletter, conducting feedback surveys, implementing strong project management practices, and having close involvement with UNDP Viet Nam as the GEF implementing agency. The principles of partnerships were to be adopted in the implementation of the project. MOC, as the Implementing Partner, was to enter into agreements with national government agencies, appropriate research and development institutes, consultants, NGOs, and universities in the implementation of selected outputs and activities. Key related implementing partners at the state management level, were to include Ministry of Industry and Trade (MOIT), Ministry of Finance (MOF), Ministry of Science and Technology (MOST). The key implementing partners at the local government level was to include Provincial and District Departments of Construction (DOC) and Departments of Urban Planning (DUPA).

The state enterprises, professional associations and/or private sector such as Viet Nam Electricity (EVN), Energy Conservation Centres (ECCs) in Hanoi and HCMC, Viet Nam Association of Civil Engineering Environment (VACEE), Viet Nam Association of Architects (VAA) and Viet Nam Green Building Council (VGBC) were to be engaged in the project implementation.

[19] As provided in the Project Document

Project design had the provision for establishment of a 'Technical Advisory Group (TAG)' to provide technical support to the PMU. TAG was to comprise of a flexible network of national and international experts on issues related to EE building policies, EE building designs, EE implementation and M&V, building operation and maintenance, etc. The project was to coordinate with ongoing EE promotion and implementations related to the other building sector projects.

3.5 Replication approach

As per the project design one of the components of the projects is focused on training, capacity building and creation of an enabling environment to increase the level of compliance with the EE building code. One of the components of the project (Component 3) is focused on achieving the level of EE in buildings beyond the levels achievable by the EE building code alone. This component has provision for implementation of pilot projects to demonstrate the EE technologies both for the new buildings and for the existing buildings by way of retrofitting. Replication is one of the focus areas for this component of the project, and the expected energy savings from the application of EE technologies in the building sector (and the corresponding GHG emission reductions) relies on the replication of the relevant pilot activities.

3.6 UNDP comparative advantage

Enhanced energy efficiency on one hand offers an opportunity to reconcile economic competitiveness with sustainable development, while on the other hand it reduces the cost of energy and increases productivity. Improvements in residential and commercial buildings delivers a wide range of social, environmental and economic benefits. Such benefits include energy security, job creation, poverty alleviation, improved health, and reduced greenhouse gas emission. In view of its development objectives UNDP encourages market demand for public and private investment in energy efficiency. For this purpose a combination of policy, financial de-risking and direct incentives are used.

UNDP services in the area of energy efficiency include policy and programme support to promote energy efficiency in different sectors, including residential and commercial buildings. UNDP also supports national and local governments for designing and adopting efficient policies and legislation, for promotion of energy efficiency.

UNDP's work on sustainable energy spans two decades. UNDP is an accredited multilateral development agency of the Global Environment Facility (GEF) and is recently accredited to the Green Climate Fund. In this capacity, UNDP offers countries specialized integrated technical services for eligibility assessment, programme formulation, mobilization of co-financing, implementation oversight, results management and evaluation, and knowledge management.

Over the past two decades, UNDP has supported more than 150 countries on sustainable energy[20], through a portfolio of $2 billion in grant financing for sustainable energy projects in addition to more than 4,000 community-level small grants projects, amounting to more than USD 130 million in grant financing. As of 2016, UNDP's active energy efficiency portfolio included 120 projects in 63 countries worldwide. For the Energy Efficiency in the building sector, in the past UNDP has supported the projects in many countries which includes India, China, Cape Verde, Armenia, Malaysia, Turkey, Croatia, Russia, Belarus, Kazakhstan, Turkmenistan and Uzbekistan.

[20] UNDP Support to the Implementation of Sustainable Development Goal 7, Affordable and Clean Energy, United Nations Development Programme

3.7 Linkages between project and other interventions within the sector

As was mentioned earlier (please see section 2.4) in Vietnam a number of interventions were carried out in the past for promotion of EE in the building sector. Such intervention in the past included promotion of EE building codes, energy consumption benchmarking (in terms of specific energy consumption kWh per m2) for different types of buildings, promotion of green buildings and other EE measure in the building sector. Some of these interventions were under implementation at the time of EECB project design. Linkages were drawn with the ongoing projects. In this regard some of the important initiatives which were either completed or were about to be completed at the time of start of implementation of EECB project are as follows;

- Implementation of the "Energy Efficiency Building Code" (EEBC) in Vietnam" by DANIDA/MOC (2013 – 2016)
- VN Building Energy Efficiency Code Demonstration, under the Vietnam Green Building Program by IFC/WB/MOC (2013 – 2015)
- Vietnam Clean Energy Program: Energy Efficiency Promotion in the Building Sector by The US AID / MOC (2014 – 2017)
- The Vietnam Green Building Program by IFC and MOC continues during September 2016 – June 2017

A new IFC project was under implementation to update the EE Building Code 2013 Building. This project also included development of training material on the Green Building Code for government officials and building consultants, and further development of the Building Code Compliance Tools. Finally, there will be an analysis of energy efficiency in buildings on a macro-economic basis for Vietnam. At the time of project inception, it was decided that UNDP and IFC will work closely together on promoting the new Building Code and improve Code Compliance towards the building industry and the local authorities.

At the time of Inception of the project it was decided that the EECB project will build upon the results of the US AID project regarding benchmarking energy efficiency in buildings based on the survey of 280 buildings. Furthermore, the EECB project was to build upon the survey of available architectural building materials for energy efficiency in Vietnam. It was also decided that the outcome of the USAID projects will be used actively and supplemented in the UNDP project.

3.8 Management arrangements

The project has been executed under National Implementation Modality (NIM) as per the NIM project management implementation guidelines agreed by UNDP and the Government of Viet Nam. The Project Implementing Partner (IP) was MOC, and UNDP was the GEF Implementing Agency (IA) for the project.

UNDP was to provide overall management and guidance from its Country Office in Hanoi and the Bangkok Regional Hub (BRH) in Bangkok, and was responsible for monitoring and evaluation of the project. MOC was to designate a senior official of the Department of Science, Technology and Environment as the National Project Director (NPD) for the project. The NPD was responsible for overall guidance to project management, including adherence to the Annual Work Plan (AWP) and achievement of planned results as outlined in the ProDoc, and for the use of GEF funds through effective management and well established project review and oversight mechanisms. The NPD was also to ensure coordination with various ministries and agencies, provide guidance to the project team to coordinate with UNDP, review reports and look after administrative arrangements as required by the Government of Viet Nam and UNDP.

The project was to establish a Project Steering Committee (PSC), which was to have oversight of the Project Management Unit (PMU). The primary functions of the PSC was to provide the necessary direction that allows the Project to function and achieve its policy and technical objectives, and to approve the annual Project plans and M&E reports. In addition, the PSC was to play a critical role in

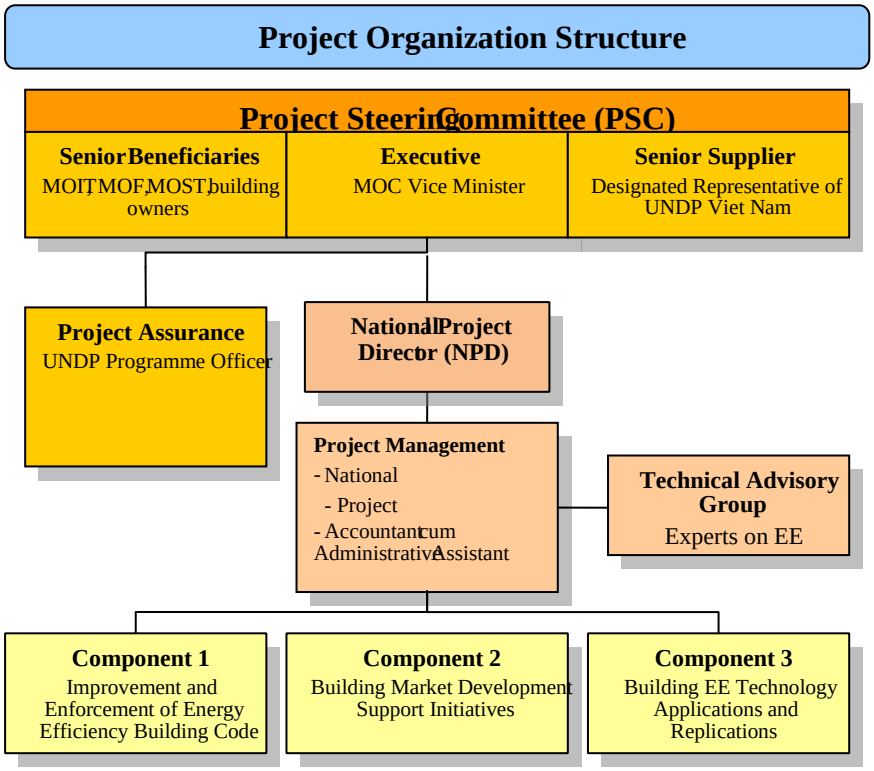

Figure : EECB Project Management Structure

project evaluations by quality assurance of the evaluation process and products, and using evaluations for performance improvement, accountability and learning.

Project Management Unit (PMU) was to report to the Director General of the Department of Science, Technology and Environment under MOC. As a GEF implementing agency, UNDP had a role of project assurance.

4. FINDINGS: PROJECT IMPLEMENTATION

4.1 Adaptive management and Feedback from M&E used for adaptive management

The main questions for terminal evaluation are; (please see B)

- **Did the project undergo significant changes as a result of recommendations from the mid-term review? Or as a result of other review procedures? Explain the process and implications.**
- **If the changes were extensive, did they materially change the expected project outcomes?**
- **Were the project changes articulated in writing and then considered and approved by the project steering committee?**
- **Whether feedback from M&E activities was used for adaptive management?**
- **Whether changes were made to project implementation as a result of the MTR recommendations?**

The Project's independent Mid-Term Review (MTR) was conducted between November 2018 and June 2019. The MTR recommends several actions to make better link between the project outcome and impact and to boost the delivery of project results. Table 9 provides the details of the recommendations at the time of MTR and the corresponding management response. Also given in the Table is the actions carried out by the project, in response to the recommendations/management response.

Table 9: Recommendations at MTR and the Management Response

MTR Recommendation	Management Response	Actions Carried Out
Recomendation1: Revise Strategic Results Framework The Project Log frame requires adaptations and rephrasing of some of the project indicators. The list of project indicators stipulated in the log-frame accordingly should be amended by reformulating some indicators while possibly omitting others to reduce the overall number	Based on the recommendation by the reviewers and in consultation with the project partners and the RTA, the project has revised the log-frame by omitting 6 indicators which are not relevant to the project's impacts or are hardly measurable without conducting large scale studies that the project cannot afford. Of the 15 remaining indicators, 5 indicators are reformulated to better link the project results with expected outcomes and objectives. The most updated log-frame was approved by the RTA	Revised the project results framework and updated the project annual targets
Recommendation 2: Strengthen project focus on enforcement of the new building code A mandatory building EE legislation and enforcement of the building code and other laws and regulations is crucial to ensure the long-term sustainability of the project results. Therefore, a main focus shall be on the finalization and delivery of outstanding activities considering the enforcement of the new building code requirements and capacity building among building professionals and public administration.	The Project has worked internally and then discussed at SC meeting and agreed with SC members on new activities that could better support the implementation of the building code and ensure the long-term sustainability of project results.	• Provide technical inputs to MOC and NA on EE provisions to be included into the revised law on construction • Provide technical inputs and conduct consultation workshops on EE buildings to the revision of the Decree 21 guiding the implementation of the Law on Energy Efficiency and Energy Conservation • Update the cost-norm to ensure the coverage of EE elements into the proforma cost for

MTR Recommendation	Management Response	Actions Carried Out
		construction of public buildings • Develop of guidelines for design of EE buildings
Recommendation 3: Ensure that institutional bodies take energy efficiency forward and market awareness is created in the longer term Enforcement of the new building code and other (by) laws and regulations will be required and thus public bodies to be created/assigned with specific tasks; although this development is at very early stage in Viet Nam so far and will need more time and efforts to create basic awareness among governmental and institutional stakeholders, building design and construction experts acting on the market, and the general public (mainly residents and users of buildings. The Project shall emphasize to build a country-wide "Knowledge Center (KC) for Energy Efficiency in Buildings" by providing all information, reports, tools, training materials, publications, guidelines developed by the Project and make them publicly available online. MOC should maintain to be the KC for EE topics in the future. Institutional building for developing a country building statistics and information base for building energy consumption in Viet Nam should be envisaged in the longer term, since it is understood that such institutions do not exist currently.	The recommendation is dully noted. To ensure the institutional bodies take energy efficiency forward and market awareness is created in the longer term the projects has built capacity of government official and building practitioners on EE and developed relevant tools to support the implementation and monitoring of EE in building. Additional training workshop targeting building retrofits, building energy audits and knowledge and experience sharing workshops will be further conducted in 2020 to further raise awareness and strengthen capacity among building practitioners. The project is also working with the University of construction to develop training manuals on EE in building for the university training curriculum. The project also discussed with MOC the possibility of establishment of knowledge center for energy efficiency in building under the MOC but this will not be feasible to set up a dedicated center for EE in building. MOC has the communication center who manage MOC website portal and responsible for communication outreach of the ministry and information related to the buildings including the information of energy efficiency in buildings Within the framework of the project, the project has been utilizing this network and website to update the project activities and maintain the data as resulted from the project (i.e. database on building materials and energy survey data) @ http://tietkiemnangluong.xaydung.gov.vn/project-c10.html. The project will further enhance the sharing of EE building practices and information through this website and other media channels.	• At least 3 training workshops on building energy audits and EE solutions targeting building retrofits • Training manual on EE developed for University of Construction • SEC profiles, energy consumption benchmark and M&V system, labelling scheme for EE buildings are finalized and submitted to MOC • 04 standards supporting definition, measurement and verification of energy performance in buildings (i.e. EE benchmarking methodology, energy performance of building, measurement, calculation and verification of energy saving) are developed and submitted to MOC
Recommendation 4: Introduce a higher level of public outreach and	From mid- 2019, project activities has started delivering concrete results and	• Conduct dialogues with building owners

MTR Recommendation	Management Response	Actions Carried Out
institutionalize public awareness measures in the frame of the country's policy framework. The Project must improve the current level of information dissemination and public awareness creation activities throughout the remaining project period. An update of the Project's communication strategy and plan is required. Co-operation should be sought with national media and it should be possible to share several substantial success stories and provide specific awareness measures throughout the remaining project period (e.g. among building developers, building users). This plan also will make the EECB project in Viet Nam more consistent with other projects throughout the region, which are already actively documenting their projects' successes via publications, internet, and mass media. In terms of networking and know-how exchange, the Project shall establish exchange of experience and information through the UNDP network and engage with other on-going international projects supporting building EE in the region	lesson learnt based on which the project will continue communication products and communication outreach activities. In addition, the project also keeps regular contact with other agencies and networks or initiatives for possible collaboration in promoting EE in building i.e. the green building week, the Viet Nam Energy Partnership Group and will explore the potentials to work with real estate companies to identify activities to promote green buildings among end-users.	• On-going mainstreaming and promoting EE in building design, construction and operation • Conduct workshops targeting building owners and operator to introduce and disseminate building energy benchmarks and labelling schemes • Continue to engage and promote EE in building through national green building week and energy partnership groups • Coordinate with the RTA to link the project UNDP CO, RTA with other international project on EE in the region to facilitate exchanges on relevant topics like EE policy options, financing and incentive mechanism on EE in buildings, etc.
Recommendation 5. Monitoring & evaluation of GHG mitigation levels and project impacts to be reviewed That relevant criteria will be considered for a GHG monitoring for the remaining duration of the Project and should thus be integrated into the overall monitoring activities under outcome 3. The PMU is doing well in monitoring the direct GHG impact of demonstration buildings that are receiving technical assistance through the Project; a weak point remains the monitoring of indirect GHG emission reductions, since required data (either from national energy statistics or specific building statistics, e.g. level of building construction, refurbishments, building energy consumption, etc.) is hardly available and requires high efforts for collection	The project has engaged an expert team to develop M&E scheme for the project and to collect corresponding required data tracking of project impacts. At the time when the MTR was undertaken (February 2019), the project just started the survey thus the data was not available for consolidation and reporting. Since July 2019 and based on the demonstration projects that are being implemented, survey of energy consumption of 165 buildings and the data collected from the provincial departments of construction, the project has been able to monitor both direct and indirect GHG emission reductions on annual basis. The project has resulted in a number of technical reports with good results and lessons learnt that would be documented and consolidated for publication, which will be further disseminated for awareness raising	Develop project lessons learnt report, exit strategy report, and lessons learned report for component 3.

MTR Recommendation	Management Response	Actions Carried Out
A "Lessons-learned report" shall be developed towards EOP summarizing the achievements and challenges the Project has overcome in regard to EE in buildings in Viet Nam, and outstanding support that is required for policies (enforcement), technologies and information sources to be replicated in the area of EE in buildings in future (follow-up projects)	and for conveying key messages to decision makers for strengthening EE building policy framework.	

The project did not undergo significant changes as a result of recommendations from the mid-term review. The only notable change was the change in the text of some of the indicators and dropping of some of the indicators from the results framework of the project. These changes in the results framework were carried out with the approval of the RTA and the SC. As a result of MTR, a couple of additional/supplementary activities were suggested in project implementation.

Monitoring and Evaluation activities for the project has been quite strong. Annual work plans and annual reports were prepared regularly. PIRs and other M&E periodic reports were prepared as per the requirements and provisions in the Project Document. The PIR were reviewed by the project steering committee and the feedback provided for adaptive management of the project.

4.2 Partnership arrangements

The main questions for terminal evaluation are; (please see Annex B)

- **Were there adequate provisions in the project design for consultation with stakeholder?**
- **Whether effective partnerships arrangements were established for implementation of the project with relevant stakeholders involved in the country/region, including the formation of a Project Board?**
- **Whether lessons from other relevant projects incorporated into project implementation**

In an earlier section of the report (please see section 3.4) details about the provisions made in the project design for consultation with the stakeholders were provided. Section 3.4 also provided details about the planned partnership arrangement with the stakeholders for implementation of the project and the formation of the project board. The project went ahead with the partnership arrangements as planned, except that the project didn't collaborate/support the CEEBs as there were no resources/plan for development of these centres. The 'Project Board' was dully constituted. There were a number of projects pertaining to the building EE (please see section 3.7 for details) which were either completed or were under implementation at the time of the start of the EECB project. These projects have been dully recognised in the 'Project Document'. EECB project reviewed relevant results of energy efficiency projects in the building sector implemented in the past by IFC/USAID and DANIDA. The lessons learnt from these projects were used by the EECB project, for example, for training contents learnt from DANIDA or the compliance checklist of IFC.

4.3 Project Finance

The main questions for terminal evaluation are; (please see Annex B)

- **Whether there was sufficient clarity in the reported co-financing to substantiate in-kind and cash co-financing from all listed sources?**
- **What are the reasons for differences in the level of expected and actual co-financing?**
- **To what extent project components supported by external funders were well integrated into the overall project?**
- **What is the effect on project outcomes and/or sustainability from the extent of materialization of co-**

financing?

- **Whether there is evidence of additional, leveraged resources that have been committed as a result of the project?**

The planned expenditure for the project and its distribution amongst different components of the project is given in Table 10

Table 10: Project Cost (as per project document) (figures in USD)

	Yr. 1	Yr. 2	Yr. 3	Yr. 4	Total
Component 1	282,500	273,000	52,000	28,000	635,500
Component 2	256,000	279,500	164,000	108,000	807,500
Component 3	295,000	464,000	457,000	389,000	1,605,000
Project Management	26,750	20,750	54,250	48,250	150,000
Total	**860,250**	**1,037,250**	**727,250**	**573,250**	**3,198,000**

Table 11 and Table 12 provides the details of the co-financing committed by different agencies at the project design and co-financing actually realised respectively

Table 11: Co-financing committed at the time of project design (figures in USD)

Co-financing (type)	UNDP own financing		Government		Partner Agencies		Total	
	Planned	Actual	Planned	Actual	Planned	Actual	Planned	Actual
Grants	150,000	150,000					150,000	150,000
In-kind support	2,070,000	2,070,000	2,700,000	3,281,956	3,317,050	58,968	8,087,050	5,410,924
Other (Equity)					13,261,500	114,677,759	13,261,500	114,677,759
Total	**2,220,000**	**2,220,000**	**2,700,000**	**3,281,956**	**16,578,550**	**114,736,727**	**21,498,550**	**120,238,683**

The project has successfully leveraged the co-financing much beyond the commitments made at the time of CEO endorsement. In particular, the Project has engaged with 18 new project developers with an investment commitment of about USD 112.7 million and making the total of 22 project developers are co-financing for the project with total investment commitment to nearly USD 115 million as mentioned above, achieved nearly 7 times higher than the project targets. Please see details of co-financing in Table 12 below.

Table 12: Detailed Planned and Actual Co-financing at project design and end[21] (figures in USD)

Name of co-financer	Classification	Type of co-financing	Amount committed at CEO Endorsement	Actual amount contributed at (EOP)
UNDP	GEF Agency	In-kind	2,070,000	2,070,000
		Cash	150,000	150,000
Ministry of Construction (MOC)	Government	In-kind	2,100,000	2,126,956
ECC Hanoi	Government	In-kind	300,000	850,000
ECC HCMC	Government	In-kind	300,000	305,000
Melia Hanoi Hotel	Private sector	Equity	77,700	177,000
		In-kind	3,750	200
Hanoi energy management staff training center	Private sector	Equity	665,000	960,000
		In-kind	35,000	20,000
Majestic Hotel	Private sector	Equity	248,950	7,529
		In-kind	134,050	2,630
Saigon office & service apartment (Somerset)	Private sector	Equity	320,000	833,798
		In-kind	80,000	7,028

[21] Prepared based on the information provided by PMU

Name of co-financer	Classification	Type of co-financing	Amount committed at CEO Endorsement	Actual amount contributed at (EOP)
HITC Building	Private Sector	Equity	128,700	0
		In-kind	4,500	0
USSR - VN Friendship Culture Palace of Hanoi	Private Sector	Equity	595,750	0
		In-kind	4,250	0
Hanoi Sheraton Hotel	Private Sector	Equity	265,900	0
		In-kind	4,000	0
N05 Building	Private Sector	Equity	32,500	0
		In-kind	3,500	0
FPT telecom Building	Private Sector	Equity	2,994,750	0
		In-kind	5,250	0
JW Marriott Hanoi Hotel	Private Sector	Equity	344,250	0
		In-kind	5,750	0
Cendeluxe Hotel	Private Sector	Equity	320,000	0
		In-kind	80,000	0
Michelia hotel	Private Sector	Equity	100,000	0
		In-kind	25,000	0
Vinpearl Resort	Private Sector	Equity	176,000	0
		In-kind	44,000	0
Riverside renaissance hotel	Private Sector	Equity	180,000	0
		In-kind	20,000	0
Intercontinental hotel	Private Sector	Equity	162,000	0
		In-kind	18,000	0
Pedagogical University of HCMC	Private Sector	Equity	6,650,000	0
		In-kind	2,850,000	0
CONINCO	Private Sector	Equity		17,308,524
		In-kind		3,000
Golden Lotus	Private Sector	Equity		103,851
		In-kind		0
Felix En Vista	Private Sector	Equity		22,543,920
		In-kind		1,500
Anland 2	Private Sector	Equity		11,899,611
		In-kind		2,000
CUWC	Public/state	Equity		5,000,000
		In-kind		2,000
Golden Lotus	Private Sector	Equity		103,851
		In-kind		0
DIC-Condotel & Hotel	Private Sector	Equity		54,829,078
		In-kind		3,500
CEO Building (CEO Tower)	Private Sector	Equity		6,000
		In-kind		1,000
DIC office	Private Sector	Equity		13,674
		In-kind		2,100
Ramana hotel	Private Sector	Equity		9,693
		In-kind		3,500
Sofitel Legend Metropole Hotel	Private Sector	Equity		150,222
		In-kind		2,500
Administration Building of District 8 People's Committee	Public/state	Equity		233,925
		In-kind		1,500
Administration Building of District 10 People's Committee	Public/state	Equity		29,598
		In-kind		1,500
Ho Chi Minh Television Building	Public/state	Equity		132,000
		In-kind		1,500
Ho Chi Minh University of Food Industry Building	Public/state	Equity		18,563
		In-kind		1,500

Name of co-financer	Classification	Type of co-financing	Amount committed at CEO Endorsement	Actual amount contributed at (EOP)
Equatorial Hotel	Private Sector	Equity		127,351
		In-kind		1,010
Kim Do hotel (Royal Hotel Saigon)	Private Sector	Equity		189,572
		In-kind		1,000
Total			**21,498,550**	**120,238,683**

Based on the funding by GEF and co-financing (planned and actual) by different agencies, the project expenditure is as given below:

- Project disbursement as of 31/12/2020 is USD 2,187,439. This is equivalent to 62% of total GEF funding
- Total disbursement and commitments as on 31/12/2020 was USD 2,550,836 (equivalent to 80% of total GEF funding).
- The remaining fund for annual budget 2021 is USD 647,164, which is equivalent to 20% of total GEF funding and is expected to utilised in the year 2021.

4.4 Monitoring and evaluation: design at entry

The main questions for terminal evaluation are; (please see Annex B)

- **Is the M&E plan well-conceived at the design stage?**
- **Is M&E plan articulated sufficient to monitor results and track progress toward achieving objectives?**
- **Was the M&E plan sufficiently budgeted and funded during project preparation and implementation?**
- **How effective are the monitoring indicators from the project document for measuring progress and performance?**

A monitoring and evaluation plan was put in place at the time of project design. There was a provision to review the plan at the time of project inception. As per the plan, the project was to be monitored through the periodic quarterly and annual monitoring. There were provisions for preparation of PPR/PIR. The APR/PIR combines both UNDP and GEF reporting requirements. Provisions were also made in the project design for an independent Mid-Term Review and the Terminal Evaluation. GEF Focal Area Tracking Tools were also to be prepared before the MTR and at the TE. As per the plan stipulated in the project document, the project team was to prepare a Project Terminal Report to summarize the results achieved (objectives, outcomes, outputs), lessons learnt, problems met and areas where results may not have been achieved. The set of indicators to be monitored and the corresponding targets were provided in the log-frame of the project. As mentioned earlier (please see section 3.1) there are issues with some of the indictors in terms of achievability and the measurability. The results of the monitoring and evaluations were to be provided to the project board.

The M&E plan at the design stage was well conceived. The plan was well articulated and was sufficient to monitor results and track the progress toward achieving the objectives, except for some issues with the indicators used (please see section 3.1). Adequate provisions were made in the budget for monitoring and evaluation activities. **The M&E design at entry has been rated[22] as Satisfactory**.

4.5 Monitoring and evaluation: implementation

The main questions for terminal evaluation are; (please see Annex B)

- **Whether the logical framework was used during implementation as a management and M&E tool?**
- **What has been the level of compliance with the progress and financial reporting requirements/ schedule, including quality and timeliness of reports?**

[22] Rating Scale Use: Highly Satisfactory (HS): no shortcomings; Satisfactory (S): minor shortcomings; Moderately Satisfactory (MS); Moderately Unsatisfactory (MU): significant shortcomings; Unsatisfactory (U): major problems; Highly Unsatisfactory (HU): severe problems; Not Applicable (N/A); Unable to Assess (U/A)

- **What has been the effectiveness of the monitoring reports and evidence that these were discussed with stakeholders and project staff?**
- **What is the extent to which follow-up actions, and/ or adaptive management, were taken in response to monitoring reports (APR/PIRs)?**
- **Whether APR/PIR self-evaluation ratings were consistent with the MTR. If not, were these discrepancies identified by the project steering committee and addressed?**

The quarterly monitoring reports were produced regularly. Annual PIRs were produced using the set of indicators provided in the log-frame. The PB did not meet as often as was needed to provide the project with the necessary oversight and direction. The Board could manage to meet only three times (once every year) during the entire duration of the project implementation. This includes the board meeting at the time of inception of the project. However, meetings between the project team and the focal points at the ministry were held regularly for quick decision making and to efficiently solve any difficulties or delays.

The project management accepted the recommendations of the MTR, and most of the recommendations were implemented (please see section 4.1). The MTR and the TE were conducted within the specified time period according to GEF guidance on MTR and TE.

M&E Plan Implementation has been rated as Satisfactory. Overall quality of M&E is rated as Satisfactory

4.6 UNDP and Implementing Partner implementation / execution coordination, and operational issues

The main questions for terminal evaluation are; (please see Annex B)

- **Whether there was an appropriate focus on results?**
- **Was there adequate UNDP support to the Implementing Partner and project team?**
- **Quality and timeliness of technical support to the Executing Agency and project team**
- **Were the management inputs and processes, including budgeting and procurement adequate?**

Ministry of Construction (MOC) is the implementing partner for the project. This was the first time that MOC acted as Implementing Partner. As per UNDP, in the beginning this was creating some delay because MOC still had to get the full understanding of operational principles for GEF projects.

The management arrangements as presented in the Project Document had been clearly described and were based on a common project management arrangement for UNDP, 'National Implementation Modality (NIM)'. The project has fully followed the management arrangements as described.

A Project Management Unit (PMU) was established. The PMU assisted the Ministry of Construction and other stakeholders in performing their respective roles as implementing partners. The Project Manager/Coordinator runs the project on a day-to-day basis on behalf of the Implementing Partners. PMU followed UNDP procedures on implementation of NIM projects

UNDP country office provided overall program, administrative, and financial oversight of the project progress in accordance with the common UNDP procedures and tracking tools available in the Atlas system. Considering the issues with the procurements using the national processes, UNDP helped with some of the procurements using its own procurement processes. The Project Board performed as a key decision-making body at a project strategic planning level. **Quality of UNDP Execution has been rated as Satisfactory.**

The project inception happened in a timely manner, and the project's implementation started in a timely manner. There were delays in implementing some of the activities, particularly those pertaining to the survey of energy consumption in buildings for the purpose of determining the bench mark specific

energy consumption for different type of buildings. These delays are largely attributable to the absence of arrangement with the Energy Efficiency Centers in the cities of Hanoi and HCM, which took time to materialize.

UNDP as GEF Executing Agency collaborated effectively with the Implementation Partners. Project management and administration have been satisfactory. **The quality of Implementation by the Implementation Agency is rated as Satisfactory.**

5. FINDINGS: PROJECT RESULTS

5.1 Overall results

The main questions for terminal evaluation are; (please see Annex B)

- **What has been the achievements of the objectives against the end of the project values of the log-frame indicators, with indicators for outcomes/outputs, indicating baseline situation and target levels, as well as position at the close of the project?**
- **What are the achievements /Results in terms of contribution to sustainable development benefits, as well as global environmental benefits (direct and indirect GHG emission reduction)?**
- **How does the GEF Tracking Tool at the Baseline and the one completed right before the Midterm Review compare with that, prepared at the time of Terminal Evaluation?**

A summary of the attainment of the overall project objectives is presented in this section of the report. Achievement of results against different Outcomes of the projects has been presented first, which is followed by the presentation regarding the achievement of the project goals and the project objectives. This is because the achievements of the project goals and the objectives has been assessed both, in terms of the indicators (for project goals and objectives as given in the log-frame) and in terms of the achievement of results for different Outcomes. As per the requirements, the evaluation regarding attainment of the results has been carried out for the three individual outcomes of the project. The attainment of results has been carried out in terms of the indicators of the log-frame, also taking into account the changes carried out in the indicators at the time of project inception and at the time of MTR. Wherever relevant, the reasons for non-attainment of the target values of the indicators have also been provided.

The mandatory ratings for the attainment of overall results has also been provided. Although, rating is not mandatory for achievement against each indicator, the rating has been provided. This has been done to facilitate the ratings for the individual Outcome and the project at an aggregate level. The evaluation of the attainment of overall results has been carried out keeping in mind the main questions for terminal evaluation, as given in the Box at the beginning of this section.

5.1.1 Attainment of results– Outcome 1.1

Table 13 provides the details of the level of attainment of the indicators (as per results framework) for Outcome 1.1. For reference, the baseline values of the indicators and those at the time of MTR and those self-assessed in PIR for the terminal year (2020) are also provided in the table.

Table 13: Attainment of results: Outcome 1.1: Enforced, improved and comprehensive policy, legal, and regulatory frameworks on the energy efficient design, construction and operation of commercial and high-rise residential buildings

Indicator	Baseline	EOP Target	Status at MTR	Status as per PIR 2020	Status at TE	TE Rating [23]
Indicator 6: % of DOCs nationwide that reference EEBC compliance toolkits and guideline developed by the baseline	30% of DOCs nation-wide	70% of DOCs nation-wide	Assessment of the indicator is ongoing at MTR stage	70% of DOCS: The guideline and toolkit have been shared with all 64 DOCs and with building practitioners through public media and/or trainings/ workshops nationwide. During the survey of 64 participants in the training organised by the project, officials of 45 DOCs (out of total 64) DOCs acknowledged their reference of these documents.	Based on the report of the survey on the MOC officials and building practitioners who participated in the project administered training, the targets for this indicator have been achieved. However, it needs to be appreciated that the sample on which the survey was administered may not be	MS

[23] Rating Scale Use: Highly Satisfactory (HS): no shortcomings; Satisfactory (S): minor shortcomings; Moderately Satisfactory (MS); Moderately Unsatisfactory (MU): significant shortcomings; Unsatisfactory (U): major problems; Highly Unsatisfactory (HU): severe problems; Not Applicable (N/A); Unable to Assess (U/A)

Indicator	Baseline	EOP Target	Status at MTR	Status as per PIR 2020	Status at TE	TE Rating [23]
and the projects by EOP					the true representative of population and may not be totally free from biases. This is because the survey was carried out just after the training was imparted and was not carried out in an independent manner. Further, the participants in the training may not be a true representative sample of the MOC officials in the country. Also, if the targeted % of participants in the training were already there, what was the need of the training. For achieving the targets against this indicator the project was to carry out activities like, 'development of compliance guidelines and toolkits'; 'implementation of advocacy and promotional programs for the EEBC compliance guide'. There is no evidence to suggest that such activities were undertaken under the project.	
Indicator 7: % of building practitioners nationwide that reference EEBC compliance toolkits and guideline developed by the baseline and the projects by EOP	20% of building practitioners	50% of building practitioners	Assessment of the indicator is ongoing at MTR stage	51% of building practitioners: The value is calculated based on the project's survey of 261 participants who attended the training provided by the project in 2019. Of the 261 interviewees, 133 indicated that they have referred to the EEBC compliance toolkits and guidelines for their work.	Same as for Indicator 6	MS
Indicator 8: % of applications for new commercial and high-rise residential building constructions submitted to DOCs comply with EEBC-2013 by EOP	20%	50%	Work in progress	No longer tracked as a result of Mid Term Review	There seems to be a bit of mix-up in the PIR, as the MTR report has not recommended dropping this indicator. However, as was mentioned earlier (please see section 3.1), there are significant problems with the measurability of this particular indicator. Also the other indicators being used for monitoring and reporting the achievement for Outcome 1.1 serves the purpose.	(U/A) Unable to Assess
Indicator 9: No. of national standards for energy performance promulgated[24]	0	5	Work in progress	05 standards on energy efficiency properties of building materials in Vietnam were approved by Ministry of Construction. The standards are being reviewed and expected to be approved by Ministry of Science and Technologies in Quarter 3 of year 2020. In addition, 04 standards on the establishment of specific energy consumption (SEC) profiles and energy	Although, the text for this indicator was changed at MTR, the PIR is still using the old text. Going by the project design, the idea was to develop the standards of SEC and EE performance of the buildings, which was to be subsequently used by the project for 'EE Certification Scheme' to EE certify the buildings (please see	MS

[24]The text of the Indicator was changed from 'No. of national testing standards for energy performance of building construction materials promulgated by EOP'

Indicator	Baseline	EOP Target	Status at MTR	Status as per PIR 2020	Status at TE	TE Rating [23]
				benchmarks have been drafted and approved at the project level. The draft standards are submitted to MOC and MOST for being reviewed and approved. These standards will work as a legal base for announcement of SEC and energy benchmarks results supported by EECB project	Indicator 10). Accordingly, the text of this indicator was changed at the time of MTR. Under the project comprehensive efforts were made to establish SEC profiles for different types of buildings in Vietnam. Energy consumption of a number of different buildings was monitored by using the services of the 'Energy Conservation Centres' in the cities of Hanoi and HCM. The past available data about the energy consumption by different types of buildings was also used. There were issues regarding the sampling of the monitored buildings, for different type of buildings. The data collected were not consistent for different categories of buildings, thus, adjustments were carried out using bench marking approach and regression modelling (as per the report on second phase of SEC study)results were also not very consistence. The report for SEC profile for different types of buildings in different climatic zones in Viet Nam was produced.	
Indicator 10: No. of existing and new commercial buildings and high-rise residential buildings in Viet Nam certified as EE buildings under the pilot certification of EECB Project[25]	0	20	Work in progress	The pilot certification of all 20 EE buildings will be undertaken in QIV of 2020 based on the established SEC profiles and energy benchmarks results. The draft SEC profile and benchmarks was available in late 2019. However, they need to be further tested and then finalized with additional surveys which can be produced in late QIV.2020. The certification therefore is expected to complete in the quarter IV 2020.	The task of certification of buildings as 'Energy Efficient Buildings' could not be completed as the work on SEC profile of the buildings could be completed only towards the end of the project.	MU
Rating for Outcome 1.1			**MS**			**MS**

Based on the achievement of the Indicators, the achievement of Outcome 1.1 of the project is rated as Moderately Satisfactory (MS).

5.1.2 Attainment of results – Outcome 1.2

Table 14 provides the details of the level of attainment of the indicators (as per results framework) for Outcome 1.2. For reference, the baseline values of the indicators and those at the time of MTR and those self-assessed in PIR for the terminal year (2020) are also provided in the table.

[25]The text of the indicator was changed from 'No. of existing and new commercial buildings and high-rise residential buildings in Viet Nam certified as EE buildings by EOP'

Table 14: Attainment of results: Outcome 1.2: Strengthened compliance of the energy efficiency building code for commercial and high-rise residential buildings in Hanoi and HCMC

Indicator	Baseline	EOP Target	Rating and Status at MTR	Status as per PIR 2020	Status at TE	TE Rating
Indicator 11: % of building practitioners nationwide that reference the EE design guideline to achieve a higher level of EE than the EEBC requirements by EOP	20%	50%	Assessment is ongoing; requires proper enforcement tools and guidelines to be provided to DOCs and building practitioners as well as capacity building	69% EE design guidance was shared with 261 trainees nationwide during the training program on design, construction and acceptance of EE buildings in 2019. A survey with 261 trainees has indicated that 180 out of 261 referring to this guideline during their work performance.	This Indicator is more or less the same as Indicator 7. During the TE, existence of an EE design guideline could not be ascertained. As in the case of Indicator 7, the sample to which the survey was administered may not be the true representative of building practitioner population and may not be totally free from the biases. This is because the survey was carried out just after the training was imparted and was not carried out in an independent manner. Further, the participants in the training may not be a true representative sample of the building practitioners in the country. Also, if the targeted % of participants in the training were already there, what was the need of the training.	(U/A) Unable to Assess
Indicator 12: % of commercial and high-rise residential buildings referencing M&V schemes in EE implementation by EOP	0%	25%[26]	Assessment is ongoing; requires proper enforcement tools and guidelines to be provided to DOCs and building practitioners as well as capacity building	0% The M&V scheme recommended by the project will be piloted at all demonstration buildings in the Q IV, 2020 when the draft benchmark and SEC profiles are finalized. At the same time, the project is doing the survey of energy consumption and application of M&V schemes by building and data will be available by the end of 2020.	It is not clear if this indicator is for all the buildings or only for the new buildings. However, it is assumed to be for the new buildings. There is no achievement against this indicator as SEC norms for different buildings could be finalised only towards the end of the project,	U
Indicator 13: % of overall commercial and high-rise residential building stakeholders that are satisfied with availability and quality of energy benchmarking data by Year 4	20%	70% (at least)	This indicator was Omitted at MTR	Not assessed as this Indicator was omitted at MTR	This indicator was Omitted at MTR	N/A
Rating for Outcome 1.2			**MS**			**MU**

The achievement of results for Outcome 1.2 of the project is rated as MU (Moderately Unsatisfactory).

5.1.3 Attainment of results – Outcome 2

Table 15 provides the details of the level of attainment of the indicators (as per results framework) for Outcome 2. For reference, the baseline values of the indicators and those at the time of MTR and those self-assessed in PIR for the terminal year (2020) are also provided in the table.

[26]Initial target in Project Document, it was 70%, it was changed at inception to 25%

Table 15: Attainment of results: Outcome 2 : Increased local capacity in the EE design, construction, and operation of commercial and high-rise residential buildings

Indicator	Baseline	EOP Target	Rating and Status at MTR	Status as per PIR 2020	Status at TE	TE Rating
Indicator 14: No. of supporting mechanisms for commercial and high-rise residential buildings approved and implemented by EOP Supporting mechanisms shell be referring to Financial (grants, tax incentives, reduced levies etc) and non-financial incentives	0	1	**Not on Track** A national expert was contracted in late 2018 to support this task. The result is expected to be available in Q.IV 2019. However, EECB Project only develops (and proposes) the draft of support mechanisms for commercial and high-rise residential buildings. Questionable if this target will be achieved at all.	**02** 01 Revised Law on Construction: For the first time, the provisions of EE principles, incentive and EE building certification are included in the Law on Construction with support by the project. 01 circular by Ministry of Construction of guidance on the cost estimation of construction project management and consultant service, of which additional costs will be paid to EE consultants for EE integrated building design.	In the MTR, the text of this Indicator was changed to 'No. of supporting mechanisms and incentives for commercial and high-rise residential buildings approved and implemented'. It is important to note that as per the Project Design (Project Document) the objective of Component 2/ Outcome 2 of the project was to enhance the capacity of the building sector stakeholders to design, finance and implement EE measures, wherein different activities which were to be carried out included development of a suitable financial support mechanism together with toolkits for economic evaluations. The project has supported revision of the cost norms, wherein the cost of consultancy services for design of an EE building is allowed to be considered as one of the component of the overall cost of the building. The project also supported revision of the construction law to promote supporting mechanism for development of EE buildings. This was followed with Decree number 15, allowing the promulgation of energy certification systems. The project also supported Draft Decree on development of smart city (a new decree under development at MOC). These measures supported by the project, help promotion of Green Buildings in Vietnam. However, the idea of the project was promotion of EE labelling of the buildings. Although, these are not supporting mechanisms (as per the text for this indicator), they do help the overall objective of promotion of EE in buildings.	MS
Indicator 15: % of stakeholders in the building sector that are satisfied with services provided by CEEBs by EOP	0%	70% (at least)	This indicator was Omitted at MTR	Not assessed as this Indicator was omitted at MTR		N/A
Split to two separate indicators[27] **Indictor 16.1:** % of trainees (building project developers, design & appraisal experts, appraisal officers of DOCs) that are trained on EE building designs and construction by EOP **Indicator 16.2:** % of trainees (relevant officers of DOCs, energy auditors, building	0%	50%	**In progress** The MTR suggests the indicator to be revised and the focus on CEEBs being removed. The pilot of EE in new building has engaged experts in building sector and architects in all stages from design to implementation and M&V. Besides, there will be several technical courses launched in 2019.	**261** 261 trainees having participated in 05 training courses nationwide (02 before June 2019 and 03 after June 2019) on design, construction and acceptance of EE in buildings. 17 out of 261 were female.	The guideline and toolkit for EE design of the buildings have been shared with all 64 DOCs and with building practitioners through public media and/or trainings/ workshops nationwide. A total of 261 practitioners participated in the training provided by the project in the year 2019. Due to issues with the measurability the achievement could not be ascertained in percent terms	MS

[27] Indicator 16: % of CEEB trainees that are engaged in EE building designs, implementation and M&V by EOP was split into two at MTR

operation managers) that are trained on building operation and M&V by EOP						
Indicator 17: No. of commercial and high-rise residential buildings that implement EE projects using the ESCO models by EOP	5	10	**Not on target so far** The ESCO market in Viet Nam including that for the EE building is faced with a number of challenges including financial and legal constraints and limited human capacity. With the Project focussing on improved EEBC and new buildings, an ESCO model approach seems not viable for implementation. The MTR suggests the indicator to be removed.	**This indicator was Omitted at MTR**		N/A
Rating for Outcome 2			**MU**			**MS**

The achievement of results for Outcome 2 of the project is rated as MS (Moderately Satisfactory).

5.1.4 Attainment of results – Outcome 3

Table 16 provides the details of the level of attainment of the indicators (as per results framework) for Outcome 3. The values of the indicators at TE of the project are more or less as per PIR for the year 2020. For reference, the baseline values of the indicators and those at the time of MTR and those self-assessed in PIR for the terminal year (2020) are also provided in the table.

Table 16: Attainment of results: Outcome 3: Increased use of EE building materials and application of EE building technologies in Hanoi and HCMC

Indicator	Baseline	EOP Target	Rating and Status at MTR	Status as per PIR 2020	Status at TE	TE Rating
Indicator 18: % of new and retrofitted commercial and high-rise residential buildings that are partly or entirely based on EE building materials and applications being promoted and demonstrated by EOP	5%	30%	Work in progress, Data is not available yet; the Project is doing the survey and data will be available in 2019. The database EE building materials and appliances have been developed by the Project. In addition, key potential outcome of demonstration including energy saving and cost effectiveness	This indicator was Omitted at MTR	This indicator was Omitted at MTR	N/A

Indicator	Baseline	EOP Target	Rating and Status at MTR	Status as per PIR 2020	Status at TE	TE Rating
			have been documented for dissemination.			
Indicator 19: No. of demonstration projects that adopted EE equipment, building materials and building energy monitoring and management/control systems promoted by the EEBC Project by EOP	5	21[28]	18 projects so far; work in progress 13 projects directly supported by EECB Project so far, plus 5 demo buildings that have been implemented by IFC/WB and DEA. The construction of all foreseen pilot buildings might not be completed; however, all of related designs have been revised.	22 projects adopted EE measure. Of these 12 projects that have been fully adopted and implemented the technical recommendations of EECB project, 10 project that have partially implemented (since those projects are still under construction/ renovation). This excludes 05 demo buildings of which the owners have committed to implement recommended EE solutions as recommended by the project.	EE pilots were carried out in total 23 buildings of which 18 were the old buildings where EE retrofitting works were carried out, while 9 others were the new buildings. Given below as Table 17 is the list of buildings where pilot EE projects were implemented . For the old buildings the EE interventions at Nam Linh Office Building and CEO Tower could not be fully implemented.	S
Indicator 20: No. of completed M&V exercises in accordance with the guidelines proposed by the Project by EOP	0	16	Work in progress M&V systems have been developed and recommended as part of demonstration at 1 existing building and 3 new buildings. Installation of the systems for existing buildings will take place when the technical support completes in 2019/2020.	06 This includes M&V exercises done for 04 existing buildings after being renovated, 02 M&V systems being installed for demo buildings. The M&V results indicate that at this stage, the energy consumption of the renovated items have been significantly reduced, reflecting the reasonableness of recommended EE solutions by EECB project team. The EECB project will continue supporting 10 demo buildings in examining the actual energy consumption through either the installation and operation of M&V systems or energy audits.	As per the project design after implementation of the demonstration projects (Indicator 19 above), M&V of the energy consumption in the demonstration buildings was to be carried out. The project prepared the guidelines for M&V activities and shared it across all the demonstration projects. Post implementation of the EE measures, M&V equipment were installed for Somerset, CONINCO and CapitaLand buildings (please see details at Table 17). There were issues regarding provision of M&V equipment, in terms of procurement procedures and the availability of budget. Apart from sharing the manual for M&V activities, the project provided technical support like guidance for implementation of the EE measures and for M&V activities in the pilot projects as per details provided in Table 17	MS
Indicator 21: No. of new EE building projects designed based on or influenced by, the results of the demonstration projects, by EOP	5	50	Work in progress Data is not available yet; The Project is doing the survey and data will be available in 2019. Based on the initial results of demo projects,	This indicator was Omitted at MTR	This indicator was Omitted at MTR	N/A

[28] Number of demonstration projects were initially set to be 16. It was changed during inception to include 16 demonstration projects to be implemented by the EECB Project and 5 demonstration projects that have been implemented by IFC and DEA.

Indicator	Baseline	EOP Target	Rating and Status at MTR	Status as per PIR 2020	Status at TE	TE Rating
			documented best practice, benefits will be published and disseminated through workshops during 2019 and 2020. However, MTR suggests to omit the indicator on replication, since it shall be achieved after EOP only.			
Rating for Outcome 3			**S**			**S**

EE pilots were carried out in total 23 buildings of which 18 were existing buildings, where EE retrofitting work was carried out, while 9 others were new buildings. Given below is the list of buildings where pilot EE projects were implemented. For the existing buildings the EE interventions at Nam Linh Office Building and CEO Tower could not be fully implemented.

Table17: Demonstration projects for EE supported by the project and the M&V activities

	I. Existing buildings		
No.	**Name of buildings**	**Building Type**	**Technical Support for M&V, Technical Assistance and support for EEC plan provided by the project**
1	Somerset Grand Chancelor Building	Mixed use Building	Technical Support for implementation of EE measures, preparation of 5 year EEC plan, M&V system supply, Training on M&V System operations.
2	DIC Office	Office	Technical Support for implementation of EE measures including 5 year EEC plan
3	Nam Linh Office Building	Office	--
4	Administration Building of District 10 People's Committee	Office	Technical Support for implementation of EE measures including 5 year EEC plan
5	Administration Building of District 8 People's Committee	Office	Technical Support for implementation of EE measures including 5 year EEC plan
6	Cuu Long Majestic Hotel Building	Hotel	Technical Support for implementation of EE measures including 5 year EEC plan
7	Ramana Hotel	Hotel	Technical Support for implementation of EE measures including 5 year EEC plan
8	Ho Chi Minh Television Building	Office	Technical Support for implementation of EE measures including 5 year EEC plan
9	Ho Chi Minh University of Food Industry Building	Office	Technical Support for implementation of EE measures including 5 year EEC plan
10	Equatorial Hotel	Hotel	Technical Support for implementation of EE measures including 5 year EEC plan
11	Royal Hotel Saigon	Hotel	Technical Support for implementation of EE measures including 5 year EEC plan
12	Sofitel Legend Metropole Hotel	Hotel	Technical Support for implementation of EE measures including 5 year EEC plan
13	Melia Hotel	Hotel	--
14	CEO Tower	Office	Technical Support for implementation of EE measures including 5 year EEC plan
	Total		
	II. New buildings		
	Name of buildings	Building Type	**Measuring and Verification Activities**

1	New Admin and educational building, College of Urban Works Construction	Office/Educational	5 year EEC plan
2	Anland 2 New High rise Residential in Hanoi	Residential Bld.	5 year EEC plan
3	Golden Lotus Building	Office. Bld.	--
4	High-rise Residential and Commercial Building Y1 Capitaland - Felix En Vista	Residential Bld.	5 year EEC plan, M&V system supply, Training on M&V System operations.
5	CONINCO Building	Office	5 year EEC plan, M&V system supply, Training on M&V System operations.
6	Ha long Inn	Hotel	--
7	Headquarter building of Daikin Air Conditioning Vietnam JSC	Office	--
8	DIC Condotel of DIC CSJ	Hotel	--
9	DIC Hotel of DIC CSJ	Hotel	--

At the time of TE, for some of the buildings the EE measures suggested by the EECB project got implemented only partially, as some of the buildings were still under construction/renovation. More details about the EE interventions carried out under the pilot projects and the energy savings achieved are provided in Annex E.

The achievement of results for Outcome 3 of the project is rated as Satisfactory.

5.1.5 Attainment of project goals, project objectives

Table 18 provides the details of the level of attainment of the indicators (as per results framework) for project objectives and the project goals. The values of achievement of targets for most of the indicators at TE of the project are not in agreement with PIR for the year 2020. The reasons for the variation in the assessment of achievement between the PIR and TE are also provided in this section of the report. For reference, the baseline values of the indicators and those at the time of MTR and those self-assessed in PIR for the terminal year (2020) are also provided in the table.

Table 18: Attainment of results: Project Objective: Improved energy utilization performance of commercial and high-rise residential buildings in Ho Chi Minh and Hanoi; Project Goal: Reduced intensity of GHG emissions from the building sector

Indicator	Baseline	EOP Target	Rating and Status at MTR	Status as per PIR 2020	Status at TE	TE Rating
Indicator 1: Cumulative CO_2 emission reduction from the building sector by End-of-Project, tCO_{2e}	1,568	37,680	S Substantial progress on pilot activities is expected to result of savings target for demo component to be achieved at the end of the Project. So far, 4 new demo projects and 4 existing buildings have received TA by project. Estimated GHG savings are 11,207 t/a from demo activities (initial target: 8,473 t/a), which is highly satisfactory. However, GHG	*The PIR doesn't provide assessment regarding the achievement of this Indicator.* *However, when assessed based on the achievement for Indicator 2, the level of achievement for this Indicator works out to be about 8438 tCO2*	Against the target of 37,680 tCO2e of direct GHG emission reductions the project has achieved direct GHG emission reduction of 32,552 tCO2e over the implementation timelines of the project. For details please see Table 20.	S

			emission cuts from building code and financial components are not yet accountable (no monitoring results available so far), which takes time to materialize.			
Indicator 2: Cumulative energy savings from the commercial building by EOP MWh	2,528	61,137	13,769 MWh by EOP Analogous to the GHG emission cuts, substantial progress on pilot activities is expected to result in energy savings target to be achieved by EOP.	13,692 MWh as cumulative direct savings by 14 existing and 08 new demonstration buildings. 71.202 MWh as indirect savings as impacts from financial and building code components	Not assessed separately as this gets captured in Indicator 1	Not Assessed
Indicator 3: % of new buildings that are fully compliant with the revised Energy Efficiency Building Code by EOP	20	50	Assessment of the indicator is ongoing at MTR stage	13-20% The value is calculated based on the number of new certified green buildings and EE demo buildings supported by the projects during 2016 - 2020. Based on survey of EECB project on green buildings, there are 29 in 2016 and an additional of 37 green certified and EE buildings by mid-2019, and an additional 16 buildings by July 2020.	As was mentioned earlier (please see section 3.2), there are issues with the measurability of Indicator 3. Issues regarding measurability of this indicator were also highlighted during the MTR. In view of this the project team has based the achievement of this indicator in terms of the number of Green Buildings and in terms of the number of pilot projects being supported by the EECB project. It is true that all the green buildings are required to comply with the EE building code. However, in the view of the evaluators, considering a very small base number of the Green Buildings, it can't be considered as a proxy for the level of adoption of EE building code in the country . The evaluators are of the view that Indicator 7, better represents the level of adoption of EE building code in the country. Accordingly the achievement of this indictor at the EOP is assessed as 50%.	S
Indicator 4: % of existing commercial and high-rise residential buildings that adopt EE technologies and practices and achieve at least 10% electricity savings by EOP	Less than 5%	20%	Assessment of the indicator is ongoing at MTR stage; achievement of 20% target requires effective dissemination towards developers Adoption of E technologies/practices is a very general indicator. Achievement of 20% target is questionable, the 10% electricity savings seem achievable (average of demo retrofits is about 14%)	14% The updated data is not available since the surveys of consumed energy in buildings could not be done as planned during Jan - April . The surveys are on-going, and the results are expected to be available in late September	Unable to Assess As was mentioned earlier (please see section 3.2), this indicator and the corresponding target is not realistic. As the detailed assessment by way of a survey to determine the achievement of this target, could not be completed achievement against the targets for this indicator could not be ascertained during the TE	(U/A) Unable to Assess
Indicator 5: No. of people gainfully employed in the building sector in Viet Nam by EOP	20[29]	60	Work in progress The original indicator is too general and does not reflect the impact of EECB Project. Based on the footnote remark, considering no. of	117 The value is calculated as the number of EE technical staff working for demonstration buildings and certified green buildings.	Unable to Assess As was mentioned earlier (please see section 3.2), This indicator suffers due to lack of definition of "people working in EE field of building sector'. In the absence of a definition, the persons which can be included in	(U/A) Unable to Assess

[29]Baseline value changes from 4 to 20 at the time of project inception

			employments in pilots seems achievable	There are additional 05 EE technicians working for 05 demonstration buildings newly supported by the project during the reporting period. It is assumed that there are also at least 16 EE technicians working for 16 certified green buildings during this period. In summary, there are up to 117 people fully contributing to EE in buildings activities up to date.	this is very wide ranging from engineers, architects, service providers, system designers, utility services personals, building material suppliers, energy auditors etc. As was mentioned in the MTR report, this indicator is too general and does not reflect the impact of EECB Project	
Rating for Project Objective			**MS**			**MS**

Achievement of Project Objectives is Rated as Moderately Satisfactory (MS)

5.1.6 Global environmental benefits

The global environmental benefits of the project are the reduction in the emission of greenhouse gases (GHG) to help the global community address climate change. The project document stipulates the project objective as 'Reducing greenhouse gas emissions in the building sector. The GHG emission reduction from the building sector is to be achieved by increased compliance with the Building Code Implementation; Demonstration and Diffusion of EE technologies in new and retrofitting in existing buildings; Implementing financial incentives/mechanisms of EE buildings. Table 19 provides the targeted emission reductions (as per the Project Document)

Table 19: Targeted GHG Emission Reductions (as per project Document) (figures in Tons CO2e)

		2016-2019 By EOP	2020-2029	Total
Building Codes Components	Direct GHG Emission Savings	27,633	157,212	184,845
	Direct Post-project GHG Emission Savings		955,531	955,531
	Indirect Bottom-up Emission Savings			
Demonstration & Diffusion Components	Direct GHG Emission Savings	8,473	35,192	43,666
	Direct Post-project GHG Emission Savings			
	Indirect Bottom-up Emission Savings		105,577	105,577
Financial Components	Direct GHG Emission Savings	1,574	6,297	7,871
	Direct Post-project GHG Emission Savings		5,746	5,746
	Indirect Bottom-up Emission Savings		17,491	17,491
Total	Direct GHG Emission Savings	37,680	198,701	236,382
	Direct Post-project GHG Emission Savings		961,277	961,277
	Indirect Bottom-up Emission Savings		123,069	123,069
	Indirect Top-down Emission Savings		246,353	246,353

As was mentioned earlier (please see section 3.1), the targeted GHG emission reduction for the project are over ambitious. There are issues with the assumptions and computations of GHG emissions given in the project document. The computations of GHG emissions as given in the project document are based on the following parameters:

Table 20: Parameters of GHG Emission Reduction Computations

Notes	Inputs of GHG Emission Reduction Computation	Values as Used at project Design	Situation at TE (Please also see notes

			after the Table
1.	**A. For Building Code**		
2.	Length of Analysis Period (Years After Project Close)	10	10
3.	Annual Construction Growth Rate (Commercial and High Rise Residential Buildings)	14%	3.5%
4.	Total Floor Area of Building Stock (m^2) in 2015	6,722,000	
5.	Floor Area (m^2) added which is subject to Code Built in Year 2016	894,000	894,000
6.	Percent New Square Meters Built Compliant with Code	20% (BAU, Baseline) 25% (1st year) 30%(2nd year) 40% (3rd year) 50% (4th year)	20% (BAU, Baseline) 25% (1st year) 30%(2nd year) 40% (3rd year) 50% (4th year)
7.	**B. For Demonstration & Diffusion Component**		
8.	**B.1 Office Buildings EE Demonstration Projects**		
9.	Annual Electricity Savings due to Office building Demonstration Projects (MWh per building per Year)	424 MWh	743 MWh
10.	Number of Office Building EE Demonstration Projects	2	23
11.	Schedule of Implementation	2017-1 2018 – 1	2019 – 20
12.	Replication Factor	2	2
13.	Number of EE Office building projects due to replication	2	
14.	Total Number of Office Buildings EE projects	2*2=4	23*2=6
15.	**B.2 Hotel Buildings EE Demonstration Projects**		
16.	Annual Electricity Savings due to Hotel building Demonstration Projects (MWh per building per Year)	382 MWh	X
17.	Number of Hotel Building EE Demonstration Projects	9	X
18.	Schedule of Implementation	2016-1 2017-3 2018-3 2019-2	X
19.	Replication Factor	2	X
20.	Total Number of Hotel Buildings EE projects	9*2=18	X
21.	**B.3 School Buildings EE Demonstration Projects**		
22.	Annual Electricity Savings due to School building Demonstration Projects (MWh per building per Year)	92 MWh	X
23.	Number of School Building EE Demonstration Projects	1	X
24.	Schedule of Implementation	2017-1	X
25.	Replication Factor	2	X
26.	Total Number of School Buildings EE projects	1*2=2	X
27.	**B.4 High-Rise Residential Buildings EE Demonstration Projects**		
28.	Annual Electricity Savings due to High-Rise Residential building Demonstration Projects (MWh per building per Year)	666 MWh	X
29.	Number of High-Rise Residential Building EE Demonstration Projects	2	X
30.	Schedule of Implementation	2017-1 2018-1	X
31.	Replication Factor	2	X
32.	Total Number of High-Rise Residential Buildings EE projects	2*2=4	X
33.	**C. Financial Component**		

34.	**C.1 Financial Mechanisms to Support EE Investment**		NIL
35.	Investment Unit	$1000	
36.	Electricity Savings per $1000 (MWh)	0.268	
37.	Number of $1000 Implemented During Project Period	1,000	
38.	Investment Schedule (figures in thousand $)	2017= 333.3 2018= 333.3 2019= 333.3	
39.	Number of Replications Post-project as Spill over	2	
40.	Total	2,000	
41.	**C.2 ESCO to support EE Implementation**		NIL
42.	Investment Unit	$1000	
43.	Electricity Savings per $1000 (MWh)	1.15	

Notes Corresponding to Table 20 above:

Notes for row 3 of the Table:

The growth rate of 14% in the net stock of buildings as considered in the Project Document is quite high. In this regard it may be noted that at one place project document mentions the growth in the construction in Vietnam as 7.8% (please see para 9 of the project document). Based on a report published by IFC the following Table gives the details of the growth in construction of different types of buildings in Vietnam.

Growth in Building Stock Over Previous Year

Building Type	2019	2020	2021
Residential	1.84%	1.81%	1.78%
Office & Retail	3.85%	3.70%	3.57%
Other Commercial	0.00%	6.06%	2.86%
Aggregate	1.67%	2.59%	2.06%
Source: Worked out based on the Report: Green Buildings Market Intelligence Vietnam Profile, IFC.			

As can be seen the net addition in the net building stock on a year to year basis has been only of the order of 2 to 3% per annum. Here it is important to know that percent increase in the net stock and percent growth in the construction activity are two different things. For example, even if there is zero growth in the construction sector, still there will be growth in the net stock of the buildings. As can be seen from the above the growth in the addition of the building is higher when compared to the growth for other categories of buildings in the above Table. For computing the GHG emission reductions at TE the annual growth rate in the stock of buildings, which are required to comply with EE Building Code has been considered at 3.5%.

Notes for row 6 of the Table:

The rate of compliance with the EE Building Code over the implementation period of the project has not been monitored. For the purpose of computing the GHG emission reductions due to the EECB project, Indicator 7 (% of building practitioners nationwide that reference EEBC compliance toolkits and guideline developed by the baseline and the project) has been used as a proxy for the level of compliance with the EE Building code.

Notes for row 8 to row 32 of the Table:

Under the EECB project 23 EE demonstration projects for different type of buildings have been executed. The details of the annual energy savings achieved from these buildings is given in Annex E. As can be seen from the Annex;

- A total of 23 EE pilot projects were implemented by the EECB project. Out of which 14 were retrofitting in the existing buildings and 9 were the EE initiatives in the new buildings,
- The annual savings achieved in case of retrofitting in the existing buildings is 10402 MWh per annum, which works out to about 743 MWh per building per year.
- In case of the new buildings the extent of actual achievement of annual energy savings could not be ascertained, as none of the new buildings has operated for one complete year at full load. . The EECB project has used 'building energy simulation model' to determine the baseline consumption of energy of new building. In this regard it is important to note that the use of building energy simulation models is more appropriate for comparing different design options of a given building in terms of the comparative energy performance . However, it is not appropriate to accurately forecast the actual energy performance of the building later on. This is given the limited accuracy[30] level of the building energy simulation models to forecast the energy consumption of the buildings. There is extensive evidence to suggest that buildings usually do not perform as well, as predicted by energy simulation . Sufficient evidence exists which show that 'Building Energy Models' predictions do not match up with actual energy use, with an average of 30% discrepancy being observed between the actual usage and predicted performance and certain cases also have variations as high as 100%. On an aggregate level there is no reason, for the energy saving to be less those achieved in case of retrofitting in the existing buildings. Thus, for the purpose of computing the achievement of the project in terms of energy savings due to EE interventions has been considered as 743 MWh per pilot project per year (same as for the existing buildings).
- Energy savings and hence the GHG mitigation due to the project at TE, has been worked out considering the energy savings of 743 MWh per year per pilot project, for 23 pilot project. The operational benefits of the EE has been considered for the years 2018, 2019, 2020 and for 10 years beyond 2020.

Notes for row 34 to 43 of the Table:

- There is no provision in the project design for providing financial support (grants, subsidies, connectional loan etc) for EE. Further, there is no budgetary provision for providing financial support. Thus, GHG emission reduction due to financial mechanisms should not have been considered at all at the time of project design
- In the project design the provision of using ESCO model is very week, the only proposal to develop an ESCO model for promoting EE in the buildings. There are no resources/funds allocated towards development and use of ESCO model. In any case this activity was dropped at the time of MTR
- At the TE no GHG emission reductions due to Financing has been considered.

Based on the situation and consideration at the time of TE as described in Table 20, the GHG emission reductions of the EECB project has been assessed as given in Table 21. For computing the GHG emission reduction the GEF tool "Calculating Greenhouse Gas Benefits of the Global Environment Facility Energy Efficiency Projects, Version 1.0, have been used.

Table 21: GHG Emission Reductions Achieved (assessed at TE) (Figures in Tons CO2e)

		2016-2020	2021-2030	Total
Building Codes Components	Direct GHG Emission Savings	23,393	127,088	150,481
	Direct Post-project GHG Emission Savings			
	Indirect Bottom-up Emission Savings			
	Direct GHG Emission Savings	9,149	91,587	10,0745
	Direct Post-project GHG Emission Savings			

[30] Improving the Accuracy of Building Energy Simulation Using Real-Time Occupancy Schedule and Metered Electricity Consumption Data, Conference Paper · June 2017, Prashant Anand, Indian Institute of Technology Kharagpur; Junjing Yang, National University of Singapore; K.W.D Cheong, National University of Singapore; Chandra Sekhar National University of Singapore

		2016-2020	2021-2030	Total
Demonstration & Diffusion Components	Indirect Bottom-up Emission Savings		61,017	61,017
Financial Components	Direct GHG Emission Savings	0	0	0
	Direct Post-project GHG Emission Savings	0	0	0
	Indirect Bottom-up Emission Savings	0	0	0
Total	Direct GHG Emission Savings	32,552	218,674	251,226
	Direct Post-project GHG Emission Savings			
	Indirect Bottom-up Emission Savings		315,974	315,974
	Indirect Top-down Emission Savings		246,353	246,353

In the project, GHG emission reductions from the building sector were to be achieved by increased compliance with the EE Building Code; Demonstration and Diffusion of EE technologies in new and retrofitting in existing buildings; Implementing financial incentives/mechanisms of EE buildings. As there were no financial incentives/mechanisms there was no emission reductions due to implementation of financial incentives. GHG emission reductions were achieved due to increased compliance with the EE Building Code and Demonstration and Diffusion of EE technologies in buildings (both retrofitting in the existing buildings as well as EE measures in new buildings). The GHG emission reductions are more or less comparable with the targets.

5.2 Relevance

The main questions for terminal evaluation are; (please see Annex B)

- **To what extent is the activity suited to local and national development priorities and organizational policies, including changes over time?**
- **To what extent is the project in line with UNDP Operational Programs or the strategic priorities under which the project has been funded?**

The EECB project and the activities planned within the project are highly relevant to the development needs of Vietnam. As mentioned in the project document the electricity tariff in Vietnam does not reflect the true generation, transmission and distribution costs. As per a study published by UNDP[31] in 2012, Viet Nam is capping electricity and fossil fuel prices, which amounts to very substantial indirect government subsidies to energy prices. As per a comparatively recent research paper[32], there is a significant cross-subsidy scheme for electricity in Vietnam and the average retail price of electricity in Vietnam is kept below the long-term marginal cost of production. This is considering that the project addresses the issue of availability of sustainable energy to all by way of energy savings at one end, while on the other hand, it addresses the issue of pressure on the economy due to the subsidies provided to the energy sector. The project is in line with the UNDP operational programs for Vietnam. This is explained further in the following paragraphs.

Strong economic growth in Vietnam over a period of time has led to the growth in the building construction activity. As more and more people move to urban areas in search of economic opportunities, the number of buildings needed to house them and energy consumption in the building sector continues to rise. The growth in the number of building coupled with economic growth (leading to enhanced lifestyle and consumption of energy) is leading to growth in consumption of electricity. Buildings are one of the major consumers of electricity and the consequent adverse environmental impacts, which include emissions of greenhouse gases and other pollutants.

The Government of Viet Nam has realized the significance of the energy consumption and GHG

[31] Fossil Fuel Fiscal Policies & GHG emissions in Viet Nam, 2012, UNDP

[32] Le Economic Structures (2019) 8:35

emissions responsible by the building sector in the country, and to respond to the increasing energy consumption (and hence the GHG emissions) due to the buildings, considerable efforts have been undertaken by the government agencies to enhance EE in the building sector. One of the comparatively recent effort in this direction is, EE promotions in the building sector by approving Energy Efficiency and Conservation Law and the 'Energy efficiency Building Code' in 2013.

The actions by the government for building energy efficiency are in line with its commitments towards reduction in the emissions of GHG. The government approved the National Climate Change Strategy in which energy saving and efficiency are clearly highlighted as the key area for GHG emission reduction. The Viet Nam Green Growth Strategy which was approved in September 2012, specifies promulgation of green building measures in new and retrofitted building and green material technology in construction. The National Environment Protection Strategy of the country aims to promote the application of clean technologies, cleaner production processes and the use of less polluting, more environmentally sound fuels and materials. The implementation plan for this strategy was approved by the Prime Minister in February 2014.

Under its 'Nationally Determined Contribution (NDC)', Vietnam has committed to reduce GHG emissions by nine percent compared to BAU scenario. As per NDC, the GHG emission reductions can be up to 27 percent with international support.

The project is also in accordance with UNDP Viet Nam Country Program Document (2012-2016) and the UN One Plan III (2012-2016) under the "Inclusive, Equitable and Sustainable Growth" focus area, specifically Outcome 1.3 on the climate change adaptation, mitigation and disaster risk management.

The relevance of the EECB project has been rated[33] as Relevant.

5.3 Effectiveness & Efficiency

The main questions for terminal evaluation are; (please see Annex B)

- **To what extent the objectives, expected outcomes and outputs have been achieved?**
- **To what extent the results have been delivered with the least costly resources possible?**
- **What are the positive and negative, foreseen and unforeseen changes to and effects produced by a development intervention?**

The goal of the EECB project was the reduction of the GHG emissions from the buildings sector in Vietnam by saving in the energy consumption due to EE measures.

The stated strategy, to reduce the energy consumption in the buildings as per the Project Document of the project, was;

- Increasing the compliance with EE Buildings Code, by training and capacity building of the government officials and the building practitioners
- Facilitating the development of the concept of EE labelling of the buildings by developing the norms of specific energy consumption for different types of buildings
- Facilitation of achievement of EE in the buildings beyond the levels mandated in the EE building code by training/capacity building of building practitioners and demonstration of EE technologies in the buildings (both new buildings and retrofitting in excising buildings). This was to lead to replication of EE technologies demonstrated by way of the demonstration projects.

The EECB project successfully delivered when it comes to the establishment of demonstration projects, however, as most of the demonstration projects could be completed only towards the end of the EECB

[33] Ratings for Relevance; Relevant (R), Not Relevant (NR)

project, the GHG emission reductions within the project implementation timeline for EECB project has not been that significant.

However, the achievement of GHG emission reductions beyond the project implementation timelines is expected, also the replication due to demonstration projects is expected beyond the implementation timelines of the EECB project. Benchmarking SEC (Specific Energy Consumption) profiles for different type of buildings, has have also been achieved. At the end of the project, the results towards the objective of higher compliance of the EE Building Code could not be clearly determined. It is expected that the demonstration of energy savings (and the consequent GHG emissions reduction) would lead to replication of the EE measures in buildings leading to energy savings in the future. **The Effectiveness of the project is rated as Satisfactory**.

The contribution of the EECB project in terms of direct GHG emission reductions within the lifetime of the interventions (As per GEF methodology for computation of GHG emissions the lifetime has been considered as 15 years.) is expected to be 251,226 tons of CO_2 equivalent. Considering the total GEF support provided to the project as USD 3.198 million, the cost of GHG mitigation works out to about USD 12.7 per ton of CO_2, which compared reasonably, with the median cost of USD 7.7 per ton of CO2 (median for 50 GEF projects) mitigation from other GEF projects[34] in the Building Sector. The project will also lead to indirect GHG emissions as was originally envisaged in the project. The, **efficiency of the project is rated as Satisfactory.**

5.4 Country ownership

The main questions for terminal evaluation are; (please see Annex B)

- **Was the project concept in line with development priorities and plans of Viet Nam?**
- **Were the relevant country representatives from government and civil society involved in project implementation, including as part of the project steering committee?**
- **Was an inter-governmental committee given responsibility to liaise with the project team, recognizing that more than one ministry should be involved?**
- **Have the government(s), enacted legislation, and/or developed policies and regulations in line with the project's objectives?**

As mentioned in section 5.2, the EECB project was in line with the development priorities and plans of the government in. Particularly, the project targeted to address the development priority to make availability of energy for the development needs.

The project design and the implementations were carried out in close coordination and consultation with different government agencies. A number of government agencies and institutions were involved for the execution of the project. The representative of the MOIT and MPI were part of the project steering committee. Outcome 1 of the project was targeted at training and capacity building of the government officials towards ensuring the compliance with the EE Building Code. There was active participation by different DOCs within the country, which clearly shows the country ownership. The country also approved the updated version of the EE Building Code (2017).

The project led to the Revised Law on Construction. The revised law has the provisions of EE principles, incentive and EE building certification. The Ministry of Construction issued a circular providing guidance on the cost estimation of construction project management and consultant service, of which additional costs will be paid to EE consultants for EE integrated building design.

[34] GEF Climate Change Mitigation GHG Analysis, OPS5, Technical Document #20, GEF Independent Evaluation Office

5.5 Mainstreaming

The main questions for terminal evaluation are; (please see Annex B)

- **How is the project successfully mainstreaming other UNDP priorities, including poverty alleviation, improved governance, the prevention and recovery from natural disasters, and women's empowerment?**
- **Whether it is possible to identify and define positive or negative effects of the project on local populations (e.g. income generation/job creation, improved natural resource management arrangements with local groups, improvement in policy frameworks for resource allocation and distribution, regeneration of natural resources for long term sustainability).**
- **If the project objectives conform to agreed priorities in the UNDP country programme document (CPD) and country programme action plan (CPAP) / One Strategic Plan (OSP).**
- **Whether there is evidence that the project outcomes have contributed to better preparations to cope with disasters.**
- **Whether gender issues have been taken into account in project design and implementation and in what way has the project contributed to greater consideration of gender aspects, (i.e. project team composition, gender-related aspects of pollution impacts, stakeholder outreach to women's groups, etc.)**

At the level of UNDP, although there is no direct contribution of this project towards mainstreaming its other priority areas of work like poverty alleviation, improved governance, prevention and recovery from disasters, gender equality, it has no negative impact on any of the other priority areas of the UNDP.

The project document mentions the intentions of strengthening and enhancing involvement of women in technical design and technology training for buildings in Viet Nam through its capacity building programs, in which the inclusion of women was to be emphasized in the training-of-trainers (TOT) objectives. The project document further mentions that through this approach, more women were to be trained to be skilled designers and operators by the project. However, the project team could not succeed to put this plan into action. One of the challenges faced by the project team in this regard is that as most of the technicians are male, it was difficult for the project team to manage higher participation by women in training and capacity building efforts.

There were significant effort by the project in encouraging female participants into the workshop and training. Project core teams consisting of 4 females. The project team was led by a female, further, the technical officer of the project team was also a female.

The project hired a gender consultant to evaluate the gender situation in this sector and find some solutions for improvement within and after the project. The findings of the consultant is that majority of the practitioners in the EE for buildings and most of the government staff relating to EE in building sector are males. This is one of the reasons due to which larger participation by women in the project activities (training, capacity building etc.) could not happen. As such there has not been any specific achievement by the project on the gender aspects (other than hiring female staff for the project).

The project supports Outcome 2 (Low-carbon, resilient and environmentally sustainable development) of the CPD for UNDP Viet Nam. The project directly contributed towards 'Country Program Output 2.1 (Reduced GHG emissions in key sectors and cities through low-emission and green development).

The One Strategic Plan 2017-2021for Vietnam is structured into four focus areas (Focus Area 1: Investing In People; Focus Area 2: Ensuring Climate Resilience And Environmental Sustainability; Focus Area 3: Fostering Prosperity And Partnership; Focus Area 4: Promoting Justice, Peace And Inclusive Governance). OSP has nine outcomes relating to these four focal areas. The EECB project pertains to Focal Area 2 of the OSP. Focal area 2 addresses following three Sustainable Development Goal (SDG).

- SDG 7: Affordable and Clean Energy
- SDG 11: Sustainable Cities and Communities

- SDG 13: Climate Action

The EECB project has contributed towards Outcome 2.1 (Low-carbon, climate and disaster resilient development) of the focal area 2 of the OSP 2017-2021 for Vietnam. The project has contributed towards Indicator 2.1.4 (Energy intensity measured in terms of GDP) of the OSP by reducing the energy consumption (as compared to the baseline) in the building sector. The project has also contributed towards Indicator 2.1.3 by promoting use of Solar PV in the buildings. The project contributed towards all the SDGs under focal area 2 of the OSP.

5.6 Sustainability

The main questions for terminal evaluation are; (please see Annex B)

- **Are there financial risks that may jeopardize the sustainability of project outcomes?**
- **What is the likelihood of financial and economic resources not being available once GEF grant assistance ends?**
- **Are there social or political risks that may threaten the sustainability of project outcomes?**
- **What is the risk for instance that the level of stakeholder ownership (including ownership by governments and other key stakeholders) will be insufficient to allow for the project outcomes/benefits to be sustained?**
- **Do the various key stakeholders see that it is in their interest that project benefits continue to flow?**
- **Is there sufficient public/stakeholder awareness in support of the project's long-term objectives?**
- **Do the legal frameworks, policies, and governance structures and processes within which the project operates pose risks that may jeopardize sustainability of project benefits?**
- **Are requisite systems for accountability and transparency, and required technical knowhow, in place?**
- **Are there ongoing activities that may pose an environmental threat to the sustainability of project outcomes?**

The project has successfully demonstrated application of EE technologies both in new buildings and existing buildings by retrofitting. The project also improved the compliance level with the EE building code by training and capacity building of the government officials and building practitioners. The other significant achievements of the project are establishment of SEC profiles for different types of buildings and the Revised Law on Construction.

To sustain the results of the project, beyond the GEF project implementation timelines would not require financial and economic resources. Even for the pilot projects, the investment in the EE measures was done by the building owners based on the conviction that the investment offers adequate return on investment. Discussion with the owners of some of the buildings, where pilot projects were implemented by the project, clearly revealed the wiliness of the building owners to implement EE measures in other buildings owned/managed by them. The other results of the project also don' require financial resources to sustain.

The results and impacts of the demonstration projects by way of replication would sustain over a longer period of time. In order to sustain the impacts of training to ensure compliance with the building code it would be necessary to institutionalise the education/training on EE measures in the buildings (please see recommendation 6).

The Social and Environmental screening of the project, done at the PPG stage did not identify any social or environmental risks. A review of the PIRs and MTR and the assessment done at the time of TE (through discussions with the stakeholders) did not identify any social or environmental risk for sustainability of the results of the project. From the social and political view point, there is not much threat to the sustainability of the results and outcomes of the project. There are practically no negative environmental impacts of the project. Thus, from the viewpoint of institutional framework and environmental sustainability, the outcomes of the project are likely to sustain.

There is a high level of ownership by the institutional and government stakeholders towards energy efficiency in buildings, which is evident by the consistent efforts in Viet Nam towards achieving higher level of energy efficiency in buildings. Thus, no risk is envisaged towards sustainability of the results of the project, due to lack of interest from the key stakeholders. As the stakeholders has seen the benefits

of EE in buildings, it is likely that implementation of the EE measures in the buildings will continue after the GEF project.

Due to implementation of a number of development projects, there has been consistent efforts since long in Viet Nam to raise the awareness level regarding the EE in the buildings. The EECB project has further raised the awareness levels. Discussions with the stakeholders during the mission confirmed adequate level of awareness amongst the stakeholders, regarding the benefits of EE in buildings.

The legal frameworks, policies, and governance structures and processes for implementation of EE measures in the buildings is already in place in Viet Nam. There are no risks to the results of the projects from these viewpoints. The implementation of the pilot projects has led to demonstration of the EE technologies and their cost effectiveness, which will help towards implementation of such technologies in other buildings.

The outcomes and results of the EECB project are Likely to Sustain. Sustainability of the results of the project are rated[35] as likely.

5.7 Impact

The main questions for terminal evaluation are; (please see Annex B)

- **Whether, the project has demonstrated verifiable improvements in ecological status?**
- **Whether, the project has demonstrated verifiable reductions in stress on ecological systems through specified process indicators, that progress is being made towards achievement of stress reduction and/or ecological improvement?**

The most direct impact of the project, in terms of GEF objectives, is the reduction in GHG emissions. The outcomes of the EECB project would lead to GHG emission reductions from the power sector in Vietnam on a long-term basis. This is considering that lesser generation of fossil fuel-based electricity would need to be generated for the same level of service delivery in the buildings. This will have the environmental and ecological co-benefits in terms of reduction in the emissions of particulate matter; lead, mercury and other heavy metals; acid gases like NO_x and SO_x. **The positive impacts of the project are rated[36] as significant**.

[35] Ratings for Sustainability: Likely (L): negligible risks to sustainability; Moderately Likely (ML): moderates risks; Moderately Unlikely (MU); significant risks; Unlikely (U): severe risks

[36] Rating for Impacts: Significant (S); Minimal (M); Negligible (N)

6. CONCLUSIONS, RECOMMENDATIONS & LESSONS

The main questions for terminal evaluation are; (please see Annex B)

- **Did the project provide cost-effective solutions in order to address barriers?**
- **Are these solutions provided in an efficient way?**
- **What are the best and worst practices in addressing issues relating to relevance, performance and success?**
- **Corrective actions for the design, implementation, monitoring and evaluation of the project**
- **Actions to follow up or reinforce initial benefits from the project**
- **Proposals for future directions underlining main objectives**

The goal of the EECB project was promotion of EE measures in the building sector, so that the energy needs of the multi-story residential apartments and commercial buildings are met in an efficient manner, thereby reducing the GHG emissions from the buildings sector in Vietnam. There were following three specific interventions which were carried out to meet the goal of the project.

- Increasing the compliance with EE Buildings Code, by development of supporting tools and guidance as well as monitoring and verification mechanism and training and capacity building of the government officials and the building practitioners towards compliance with the building code
- Facilitating the development of the concept of EE labelling of the buildings by developing the norms of specific energy consumption for different types of buildings
- Facilitation of achievement of EE in the buildings beyond the levels mandated in the EE building code by training/capacity building of building practitioners and demonstration of EE technologies in the buildings (by way of pilot projects both new buildings and retrofitting in excising buildings). This was to lead to replication of EE technologies demonstrated by way of the demonstration projects.

When it comes to establishment of demonstration projects, the EECB project delivered successfully. However, as most of the demonstration projects could be completed only towards the end of the EECB project, the direct GHG emission reductions within the project implementation time lines (please see Indictor 1 in Table 2) for EECB project has fallen slightly short of the targets, in spite of over achievement for the number of pilot projects (please see Indictor 19 in Table 2). The achievement of direct post-project GHG emission reduction is expected to meet the targets (post-project GHG emission reduction would be 251,226 tons CO2e against the target of 236,382 Tons CO2e.). Also, the replication due to demonstration projects is expected beyond the implementation timelines of the EECB project.
The idea of developing the SEC profile for different types of buildings was to use them subsequently for 'EE Certification of Buildings Scheme'. Under the project, SEC profiles and energy benchmarks for 6 different types of buildings in 3 climate zones was completed. Monitoring and verification systems were installed in two buildings to monitor the energy consumption by using the services of the 'Energy Conservation Centres'. However, as the task of preparation of SEC profiles could be competed only towards the end of the project, the activities of piloting of 'EE Labelling/ EE Certification of the building did not happen .

The project would also lead to reduction in the emission of GHG due to higher level of compliance with the EE Building Code. Although, during the TE such benefits could not be quantified, the benefits of training and capacity building of the government officials and building practitioners would definitely go a long way towards higher compliance with the EE Building Code.

It is expected that the demonstration of energy savings (and the consequent GHG emission reductions) due to the pilot projects would lead to replication of the EE measures in the buildings leading to energy savings in future.

6.1 Corrective actions for design, implementation, monitoring and evaluation of project

#	Recommendation	Rational and Description	Responsibility	Timing/Dates for Action
	Corrective actions for the design, implementation, monitoring and evaluation of the project			
1	For the future projects of this nature, instead of 'Direct Reduction of the GHG emissions by EOP' the log-frame should use 'Direct Reduction in the GHG emissions over the lifetime of the investments made during the project implementation' as the indicator.	Considering that the process of building approval, detailed design, and actual construction involves time consuming sequential activities, any new building complying with the EE building code will at best get occupied towards the end of the implementation timelines of the GEF project. Thus, the benefits of the project in terms of reduced energy consumptions (and reduced GHG emissions) would get realized only after the project implementation timelines. In this regard it is important to note that as per the Revised Methodology for Calculating GHG mitigation benefits for the GEF Energy Efficiency Projects, for projects where building codes lead to building EE improvements prior to the project closure, the resulting emission reductions (over the lifetime of those improvements) are considered as direct project impacts. Building improvements that occur after project closure are considered to result in direct post-project impacts.	GEF agencies designing the future projects in the focal area of climate change (mitigation)	Future GEF projects in the focal area of climate change mitigation

6.2 Actions to follow up or reinforce initial benefits from project

#	Recommendation	Rational and Description	Responsibility	Timing/Dates for Action
2	Strengthen the mechanism for enforcement of EE building code.	Sustainability of the results of the project (in terms of improvement in the energy performance of the buildings due to EE building code) would depend upon the enforcement of the EE building code. The mechanism (Comprising of the overall process of application for approval of the building plans, monitoring of construction, approval of building etc.) for enforcement of the EE building code needs to be strengthened to ensure sustainability.	Government agencies responsible for enforcement of the EE building code	Beyond the implementation of EECB project
3	The software (s) procured by the project be transferred to one of the universities/ institutions so that it is put to good use for the remaining licence period of the software.	The 'Project Management Unit' (PMU) procured a building energy simulation software to support implementation of some of the activities (pertaining to determination of the baseline energy consumption for the pilot new buildings, where EE measures were implemented) of the project. The building energy simulation software and other such material available with the project, may be transferred to one of the universities/institutions, so that such material gets used, after implementation of the GEF project. A centre of excellence may also be created at the university/institution which can also host the knowledge products and data/information compiled under the project.	PMU/ UNDP CO	At the closing of EECB project
4	It is recommended that a laboratory be created for testing the performance of the building materials. Along	The present version of the EE building code uses the prescriptive approach, wherein the EE performance of the materials and equipment to be used for construction is prescribed (specified). For successful enforcement of the code it is very important to have a lab for testing the building materials. It is gathered	UNDP CO/ National Counterparts	After closure of the EECB project. As and when funds are available for creating the

	with creation of the test lab, possibilities may be explored for using the concept of EE labelling for the building materials.	that technical standards have already been created in this regard. The test lab will become handy for implementation of the concept of EE labelling of building materials.		laboratory becomes available or there is an opportunity to include it in a externally funded project.
5	Any future revision of the code for energy efficiency in buildings may consider including the passive measures like orientation of the building, shading etc to reduce the cooling/heating load for the building.	Such provisions may be made which are specific to different climate zones of Vietnam. The revision may include the provision of the energy performance method for compliance with the building code, wherein, provision may be made to use a specified building energy simulation model to establish the compliance with the EE building code.	UNDP CO/ National Counterparts	After closure of the EECB project. As and when a revision of the present version of the EE building code is carried out.
6	Introduce a curriculum in the one of the Universities regarding the 'EE Building Code' and 'EE measures' in the buildings.	Apart from this a short module on Energy Efficiency in buildings, for skill upgradation and training of the practising professionals and government officials be introduced. This curriculum may later on be introduced in other institutions and universities.	PMU/ UNDP CO / National Counterparts	By the closure of the EECB project

6.3 Proposals for future directions underlining main objectives

#	Recommendation	Rational and Description	Responsibility	Timing/Dates for Action
7	Opportunities may be identified for promotion of ESCO models and financing of EE in Vietnam.	Apart from the building sector the ESCO model may take care of other large energy consuming sectors and Renewable Energy (RE) promotion through the ESCO route. In order to implement the ESCO models, there is a need to address the issues relating to the requirement of legal documents for paying for the energy savings in case of implementation of the EE measures through ESCO route for the government buildings and government owned enterprises. At the same time need to have guidelines on M & V system to verifying the ESCO energy savings achieved. Possibilities may be explored for creation of a super ESCO for EE in Vietnam.	UNDP CO / National Counterparts	Future GEF projects in the focal area of climate change mitigation
8	It is recommended that the possibilities of providing incentives for EE in the buildings may be examined afresh (particularly the non-fiscal incentives, as they will not have any financial implications for the government).	The project design has the provision of working out a scheme of financial incentives for promotion of EE in the building sector. However, considering the funds required for implementing such a scheme, this part of the project could not be implemented. The project has got a detailed assessment regarding the possibilities to provide incentives for promotion of EE in the building sector in Vietnam. The suggestions in this regard include both fiscal and non-fiscal measures (e.g. allowing higher ratio to land to floor area, Tax rebates etc.).	National counterparts	After the closure of the EECB project

6.4 Best/worst practices in addressing issues relating to relevance, performance and success

#	Recommendation	Rational and Description	Responsibility	Timing/Dates for Action
9	It is recommended that in case of new buildings, the energy saving achieved should be computed based on the extent of projected energy savings in percent terms by running the baseline design and the design after the intervention in the 'Building Energy Simulation Model'. This percent savings should be applied to the actual monitored	To compute energy savings due to EE measures in new buildings, the project team has used building energy simulation software to determine the energy consumption in the baseline (normal building with no enhanced EE measures). In this regard it is important to note that the use of building energy simulation models is good for comparing different design options of a given building in terms of the energy performance. However, the use of software is not appropriate to accurately forecast the energy performance of the building. This is given the limited accuracy level of the building energy simulation models to forecast the energy consumption of the buildings due to a number of reasons (including the occupants behaviour). There is extensive evidence to suggest that buildings usually do not perform as predicted by energy simulation . Sufficient evidence[37] exists which show that 'Building Energy Models' predictions do not match up with actual energy use, with an average of 30% discrepancy being observed between the actual usage and predicted performance and in certain cases also have variations as high as 100%. consumption of energy to compute the savings achieved. It is recommended that in case of new buildings, the energy saving achieved should be computed based on the extent of projected energy savings in percent terms by running the baseline design and the design after the intervention in the 'Building Energy Simulation Model'. This percent savings should be applied to the actual monitored consumption of energy to compute the savings achieved.	GEF agencies	Future GEF projects in the area of Energy Efficiency in buildings

[37] Improving the Accuracy of Building Energy Simulation Using Real-Time Occupancy Schedule and Metered Electricity Consumption Data, Conference Paper · June 2017, Prashant Anand, Indian Institute of Technology Kharagpur; Junjing Yang, National University of Singapore; K.W.D Cheong, National University of Singapore; Chandra Sekhar National University of Singapore

ANNEX A: TERMS OF REFERENCE

Position:	01 international consultant and 1 national consultant to conduct a terminal evaluation of the project **Energy Efficiency Improvement in Commercial and High-Rise Residential Buildings in Viet Nam**
Duty Station:	Home base, Hanoi and travel to provinces
Type of appointment:	Individual contract
Duration:	From October 2020 to September 2021

PROJECT SUMMARY TABLE

Project Title:	Energy Efficiency Improvement in Commercial and High-Rise Residential Buildings in Viet Nam			
GEF Project ID:	5245		*At Endorsement (Million US$)*	*At completion (Million US$)*
UNDP Project ID:	00092225	GEF financing:	$3,198,000	To be completed during the TE
Country:	Viet Nam	IA/EA own:	$2,220,000	"
Region:	Country wide	Government:	$ 2,700,000	"
Focal Area:	Climate Change	Private Sector:	$16,578,550	"
FA Objectives, (OP/SP):	CCM1_2.1 Appropriate policy, legal and regulatory frameworks adopted and enforced CCM1_2.2 Sustainable financing and delivery mechanisms established and operational	Total co-financing:	$21,498.550	"
Executing Agency:	Ministry of Construction	Total Project Cost:	$24,696,550	"
Other Partners involved:	Ministry of Industry and Trade (MoIT), Ministry of Science and Technology	ProDoc Signature (date project began):		April 5th, 2016
		(Operational) Closing Date:	Proposed: 30 March 2021	Actual:

INTRODUCTION

In accordance with UNDP and GEF M&E policies and procedures, all full and medium-sized UNDP-supported GEF-financed projects are required to undergo a Terminal Evaluation (TE) upon completion of implementation. These terms of reference (TOR) set out the expectations for a TE of the project **Energy Efficiency Improvement in Commercial and High Rise Residential Buildings in Viet Nam (PIMS #:5245)**. The TE process must follow the guidance outlined in the document *Guidance for Conducting Terminal Evaluation of UNDP-Supported, GEF-Financed Projects*. The essentials of the project to be evaluated are as follows:

PROJECT BACKGROUND INFORMATION

Although the building construction market went through a long period of volatility after the crisis in 2008, the total construction activities outputs (including both building and infrastructure works) still grew by 9% in 2019 compare to 2018, likewise it already achieved what it did during the 2015 -2018 period. The Government of Viet Nam has realized the significance of the energy consumption and GHG emissions responsible by the building sector in the country, and to respond to this alarming trend, considerable efforts have been undertaken by responsible government agencies to enhance EE in the building sector

The Project was designed to reduce intensity of GHG emissions from the building sector in Viet Nam. The project objective is to improve the energy utilization performance of commercial and high-rise residential buildings in Ho Chi Minh and Hanoi. Realization of this objective will be achieved through implementation of three components.

(1) Improvement and Enforcement of Energy Efficiency Building Code;
(2) Building Market Development Support Initiatives, and
(3) Building EE Technology Applications and Replications.

Each component comprises a number of complementary activities designed to remove barriers to the stringent enforcement of the revised EEBC, and to the greater uptake of building energy efficiency technologies, systems, and practices in commercial and residential buildings. By EOP, the GEF investment will have catalyzed direct GHG emission reduction of about 37,680 tCO2e. The cumulative direct reduction in GHG emissions over the lifetime of the project is envisioned to be 236,382 tCO2e.

The Project was designed for 4-year period from 2016 – 2020 and was extended until Mar 31, 2021. The TE will be conducted according to the guidance, rules and procedures established by UNDP and GEF as reflected in the UNDP Evaluation Guidance for GEF Financed Projects

Since the start of the novel coronavirus (COVID-19) outbreak, Vietnam has closely monitored the situation and installed a series of proactive, comprehensive measures to combat the spread of the virus within the country and prepare its public health facilities. The first confirmed cases of COVID-19 appeared in Vietnam on January 23, 2020. As of September 11, Viet Nam had confirmed 1,059 cases of COVID-19 with 893 of the affected patients recovered and 35 deaths. Vietnam has reported no cases of community spread since September 2. In light of the recent COVID-19 outbreak, Vietnam has imposed several travel restrictions on those entering the country. Flights, public transportation, inter-provincial transportation, hotels, monuments, tourism attractions, and government offices have reopened with safety measures in place. Viet Nam has lifted the mandatory 14-day quarantine for foreign experts, investors, managers, and diplomats on short business trips of less than 14 days. However, they must comply with all other health measures and must follow their scheduled itinerary. If after 14 days they wish to stay in Viet Nam, they can do so without quarantining, provided they test negative for the virus.

OBJECTIVE AND SCOPE

The TE will be conducted according to the guidance, rules and procedures established by UNDP and GEF as reflected in the *Guidance For Conducting Terminal Evaluation of UNDP-Supported, GEF-Financed Projects*.

The objectives of the evaluation are (1) to assess the achievement of project results based on the project set targets and linkages of the actual results with UNDP country programme (relevant strategy/outcomes/outputs) and One Strategic Plan 2017-2021 (OSP), and (2) to draw lessons that can both improve the sustainability of benefits from this project and aid in the overall enhancement of UNDP country programme 2017 – 2021 (CPD), One Strategic Plan 2017-2021 (OSP), and recommendations for the new Programming Period.

EVALUATION APPROACH AND METHOD

An overall approach and method for conducting project terminal evaluations for UNDP-supported, GEF-financed projects has developed over time. The evaluator is expected to fame the evaluation effort using the criteria of **relevance, effectiveness, efficiency, sustainability, and impact,** as defined and explained in the *UNDP Guidance for Conducting Terminal Evaluations of UNDP-Supported, GEF-Financed Projects.* A set of questions covering each of these criteria has been drafted and is included with this TOR (see **Annex C**). The evaluator is expected to amend, complete, and submit this matrix as part of an evaluation inception report, and shall include it as an annex to the final report.

The evaluation must provide evidence-based information that is credible, reliable and useful. The TE team is expected to follow a collaborative and participatory approach ensuring close engagement with the Project Team, government counterparts including Ministry of Construction, Ministry of Science and Technology, Ministry of Industry and Trade, the UNDP Country Office(s), UNDP-GEF Regional Technical Advisers, and other key stakeholders including demonstration site owners, etc. Depending on the travel restriction due to the COVID, the evaluators might be expected to conduct a field mission to Viet Nam including the project sites in Hanoi and Ho Chi Minh city.

The evaluators will review all relevant sources of information (refer to Annex B) , such as the project document, the project inception report, project reports (including Annual APR/PIR, project budget revisions, midterm review, progress reports, GEF focal area tracking tools, project files, and national strategic and legal documents),

and any other materials that the evaluators consider useful for this evidence-based assessment. A list of documents that the project team will provide to the evaluators for review is included in **Annex B** of this Terms of Reference.

Depending on COVID situation, if it is not possible to travel to or within the country for the TE mission then the TE team should develop a methodology that takes this into account the conduct of the TE virtually and remotely, including the use of remote interview methods and extended desk reviews, data analysis, surveys and evaluation questionnaires. This should be detailed in the TE Inception Report and agreed with the Commissioning Unit.

If all or part of the TE is to be carried out virtually then consideration should be taken for stakeholder availability, ability or willingness to be interviewed remotely. In addition, their accessibility to the internet/computer may be an issue as many government and national counterparts may be working from home. These limitations must be reflected in the final TE report.

If a data collection/field mission is not possible then remote interviews may be undertaken through telephone or online (skype, zoom etc.). International consultants can work remotely with national evaluator support in the field if it is safe for them to operate and travel. No stakeholders, consultants or UNDP staff should be put in harm's way and safety is the key priority.

A short validation mission may be considered if it is confirmed to be safe for staff, consultants, stakeholders and if such a mission is possible within the TE schedule. Equally, qualified and independent national consultant can be hired to undertake the TE and interviews in country as long as it is safe to do so.

EVALUATION CRITERIA & RATINGS

An assessment of project performance will be carried out, based against expectations set out in the Project Logical Framework/Results Framework (see **Annex A**), which provides performance and impact indicators for project implementation along with their corresponding means of verification. The evaluation will at a minimum cover the criteria of **relevance, effectiveness, efficiency, sustainability,** and **impact.** Ratings must be provided on the following performance criteria. The completed table must be included in the evaluation executive summary. The obligatory rating scales are included in **Annex D**.

EVALUATION RATINGS			
1. Monitoring and Evaluation	***Rating***	**2. IA & EA Execution**	***Rating***
M&E design at entry		Quality of UNDP implementation	
M&E plan implementation		Quality of execution – Executing Agency	
Overall quality of M&E		Overall quality of implementation / execution	
3. Assessment of Outcomes	***Rating***	**4. Sustainability**	***Rating***
Relevance		Financial resources:	
Effectiveness		Socio-political:	
Efficiency		Institutional framework and governance:	
Overall Project Outcome Rating		Environmental:	
		Overall likelihood of sustainability:	

PROJECT FINANCE / CO-FINANCE

The evaluation will assess the key financial aspects of the project, including the extent of co-financing planned and realized. Project cost and funding data will be required, including annual expenditures. Variances between planned and actual expenditures will need to be assessed and explained. Results from recent financial audits, as available, should be taken into consideration. The evaluators will receive assistance from the Country Office (CO) and Project Team to obtain financial data in order to complete the co-financing table below, which will be included in the terminal evaluation report.

Co-financing (type/source)	**UNDP's own financing (mill. US$)**		**Government (mill. US$)**		**Partner Agency (mill. US$)**		**Total (mill. US$)**	
	Planned	**Actual**	**Planned**	**Actual**	**Planned**	**Actual**	**Actual**	**Actual**
Grants								
Loans/Concessions								
In-kind support								
Other								

Totals								

MAINSTREAMING

UNDP-supported GEF financed projects are key components in UNDP country programming on promotion of sustainable low-carbon development while strengthening resilience of targeted groups, as well as regional and global programme. The evaluation will assess the extent to which the project was successfully mainstreamed with other UNDP priorities, including poverty alleviation, improved governance, the prevention and recovery from natural disasters and gender equality.

IMPACT

The evaluators will assess the extent to which the project is achieving impacts or progressing towards the achievement of impacts. Key findings that should be brought out in the evaluations include whether the project has demonstrated:

a) verifiable improvements in energy savings,
b) verifiable reductions in greenhouse gas emissions, and/or
c) demonstrated progress towards these impact achievements and contribution to CPD's strategy/ outcomes/ outputs

CONCLUSIONS, RECOMMENDATIONS & LESSONS

The evaluation report must include a chapter providing a set of **conclusions**, **recommendations,** and **lessons**. Conclusions should build on findings and be based in evidence. Recommendations should be prioritized, specific, relevant, and targeted, with suggested implementers of the recommendations. Lessons should have wider applicability to other initiatives across the region, the area of intervention, and for the future.

IMPLEMENTATION ARRANGEMENTS

The principal responsibility for managing this evaluation resides with the UNDP CO in Viet Nam. The UNDP CO will contract the evaluators and ensure the timely provision of per diems while travel arrangements within the country for the evaluation team will be made by the PMU. The Project Team will be responsible for liaising with the Evaluator Team to set up stakeholder interviews, arrange field visits, coordinate with the Government, etc.

EVALUATION TIMEFRAME, DUTY STATION AND EXPECTED PLACES OF TRAVEL

Duty station: Home based and Hanoi with in-country travel as required. The international consultant is expected to have 5 working day mission to Hanoi, Viet Nam. In case of in-country travel (if required) for both IC and NC, local travel cost shall be covered by the project management unit or UNDP based on UNDP policy or UN-EU - norm.

Duration and Timing: Estimated 30 working days for an international consultant and 25 working days for one national consultant during October 2020 – September 2021. The tentative schedule is according to the following plan:

Reviewing documents and Preparation of inception report	10 working days	10 working days	15 December 2020
Evaluation Mission, stakeholder meetings, interviews, field visits, etc	5 working days (tentatively during 11 – 22 January 2021)	5 working days	18 – 22 January 2021
Draft Evaluation Report	10 working days	8 working days	15 February 2021
Final Evaluation Report that incorporate comments on draft TE report into Audit Trail & finalization of TE report	5 working days	2 working days	15 March 2021

EVALUATION DELIVERABLES

The evaluation team is expected to deliver the following:

#	Deliverable	Description	Timing	Responsibilities
1	TTR Inception Report	TR team clarifies timing, objectives and methods of Terminal Review	No later than 2 weeks before the TE mission: (15 December 2020)	TE team submits to the UNDP CO and project team the Inception Report
2	Presentation	Initial Findings	End of TE mission: (22, January 2021)	TE team presents to UNDP and PMU
3	Draft TE Report	Full draft report (using guidelines on report content in ToR Annex C) with annexes	Within 3 weeks of the TE mission: (15 February 2021)	TE team submits to PMU and UNDP; reviewed by GEF RTA
5	Final TE Report* + Audit Trail	Revised final report and TE Audit trail in which the TE details how all received comments have (and have not) been addressed in the final TE report (See template in ToR Annex H)	Within 2 weeks of receiving UNDP comments on draft: (15 March 2021)	TE team submits both documents to UNDP

TEAM COMPOSITION

The evaluation team will be composed of 01 international evaluator and 1 national evaluator (the international evaluator will be the team leader and will be responsible for finalizing the report). The consultants shall have prior experience in evaluating similar projects. Experience with GEF-financed projects is an advantage. The evaluators selected should not have participated in the project preparation and/or implementation and should not have conflict of interest with project-related activities.

QUALIFICATIONS

The team members must present the following qualifications:

For International Consultant (Team Leader)

- Master's degree in project management, energy efficiency, construction or relevant fields.
- At least ten (10) years of international experience in the areas of project development, project implementation, and project evaluation for donor-funded development projects in developing countries.
- Recent experience in leading results-based management evaluation management evaluation for international donor supported projects in climate change mitigation, energy efficiency
- Experience working with the GEF or GEF-evaluations; Project evaluation/review experiences within United Nations system will be an asset;
- Work experience in climate change mitigation, energy efficiency in building projects in developing countries in Asia is an advantage;
- Good interpersonal and analytical skills and ability to work under diverse/varied cultural environments;
- Demonstrated command over writing professional reports in English.

Specifically, the international consultant (team leader) will perform the following tasks:

- Lead and manage the evaluation mission; Guide the national expert in collecting data and information and preparation of relevant sections in the report
- Design the detailed evaluation scope and methodology (including the methods for data collection and analysis);
- Conduct an analysis of the outcome, outputs and partnership strategy (as per the scope of the evaluation described above);
- Draft related parts of the evaluation report; and
- Finalize the entire evaluation report.

For National Consultant (Team member)

- Graduate degree in degree in project management, energy efficiency, construction or relevant fields
- At least five (5) years of experience in the areas of project development, project implementation, and project evaluation for donor-funded development projects in Viet Nam;
- Familiarity and past experience with evaluation of international donor supported projects, especially energy efficiency (in buildings), climate change mitigation projects;
- Work experience in climate change mitigation for donor-supported projects is an advantage
- Experience with evaluation of GEF supported projects is an asset
- Good interpersonal and analytical skills and ability to work under diverse/varied cultural environments;
- Excellent English skills with evidence through practical experience.

Specifically, the national consultant will perform the following tasks:

- Documentation of evaluation and data gathering and consultation meetings;
- Contributing to the development of evaluation plan and methodology;
- Conducting specific elements of the evaluation determined by the International Lead Consultant;
- Contributing to presentation of the evaluation findings and recommendations at the evaluation wrap-up meeting;
- Contributing to the drafting and finalization of the TR reports, notes of the meetings and other related documents prepared by the international consultant
- Performing translation for the international consultants during meetings with various stakeholders and necessary documents discussed during the international consultant's mission.

EVALUATOR ETHICS

Evaluation consultants will be held to the highest ethical standards and are required to sign a Code of Conduct (**Annex E**) upon acceptance of the assignment. UNDP evaluations are conducted in accordance with the principles outlined in the *UNEG Ethical Guidelines for Evaluations*.

PAYMENT MODALITIES AND SPECIFICATIONS

%	Milestone
20%	Payment upon satisfactory delivery of the final TE Inception Report and approval by UNDP
40%	Payment upon satisfactory delivery of the draft TE report to UNDP
40%	Following submission and approval (UNDP-CO and UNDP RTA) of the final terminal evaluation report

In line with the UNDP's financial regulations, when determined by the Commissioning Unit and/or the consultant that a deliverable or service cannot be satisfactorily completed due to the impact of COVID-19 and limitations to the TE, that deliverable or service will not be paid.

Due to the current COVID-19 situation and its implications, a partial payment may be considered if the consultant invested time towards the deliverable but was unable to complete to circumstances beyond his/her control.

ANNEX B: TERMINAL EVALUATION CRITERIA AND THE QUESTIONS

Before undertaking the Terminal Evaluation, an Inception Report was presented, including the proposed tasks, activities and deliverables, as well as a table of main evaluation questions that need to be answered to determine and assess project results. The evaluation/review criteria and questions are presented in the Table below.

Contents	Main questions and Terminal Evaluation Scope
• Title page with basic report information • Table of contents • Acronyms and abbreviations	
Executive Summary • Project Summary Table • Project Description (brief) • Evaluation Rating Table • Summary of conclusions, recommendations and lesson	
1. Introduction • Context; purpose of the Terminal Evaluation and objectives • Scope and methodology of the Terminal Evaluation • Structure of the Terminal Evaluation Report	
2. Project description and development context • Project description and development context (objectives, project participants, objectives and main outcomes; Project duration and timing) • Problems that the project sought to address • Immediate and development objectives of the project • Baseline indicators established • Main stakeholders • Expected Results	
3. Findings: Project Design and Formulation	
• Analysis of LFA/Results Framework • Assumptions and Risks • Lessons from other relevant projects • Planned stakeholder participation • Replication approach • UNDP comparative advantage • Linkages between project and other interventions within the sector • Management arrangements	• Were the project's objectives and components clear, practicable and feasible within its time frame? • Were the capacities of the executing institution(s) and its counterparts properly considered when the project was designed? • Were lessons from other relevant projects properly incorporated in the project design? • Were the partnership arrangements properly identified and roles and responsibilities negotiated prior to project approval? • Were counterpart resources (funding, staff, and facilities), enabling legislation, and adequate project management arrangements in place at project entry? • Were the project assumptions and risks well articulated in the PIF and project document? • Whether the planned outcomes were "SMART"?
4. Findings: Project Implementation	
4.1 Adaptive management	***ADAPTIVE MANAGEMENT*** • Did the project undergo significant changes as a result of recommendations from the mid-term review? Or as a result of other review procedures? Explain the process and implications. • If the changes were extensive, did they materially change the expected project outcomes?

Contents	Main questions and Terminal Evaluation Scope
	• Were the project changes articulated in writing and then considered and approved by the project steering committee? • Whether feedback from M&E activities was used for adaptive management? • Whether changes were made to project implementation as a result of the MTR recommendations?
4.2 Partnership arrangements	***PARTNERSHIP ARRANGEMENT*** • Were there adequate provisions in the project design for consultation with stakeholder. • Whether effective partnerships arrangements were established for implementation of the project with relevant stakeholders involved in the country/region, including the formation of a Project Board? • Whether lessons from other relevant projects incorporated into project implementation?
4.3 Project Finance	***PROJECT FINANCE / CO-FINANCE*** • Whether there was sufficient clarity in the reported co-financing to substantiate in-kind and cash co-financing from all listed sources. • What are the reasons for differences in the level of expected and actual co-financing? • To what extent project components supported by external funders were well integrated into the overall project? • What is the effect on project outcomes and/or sustainability from the extent of materialization of co-financing? • Whether there is evidence of additional, leveraged resources that have been committed as a result of the project?
4.4 Monitoring and evaluation: design at entry	***PROJECT MONITORING & EVALUATION (AT DESING)*** • Is the M&E plan well-conceived at the design stage? • Is M&E plan articulated sufficient to monitor results and track progress toward achieving objectives? • Was the M&E plan sufficiently budgeted and funded during project preparation and implementation? • How effective are the monitoring indicators from the project document for measuring progress and performance;
4.5 monitoring and evaluation: implementation	***MONITORING & EVALUATION (IMPLEMENTATION)*** • Whether the logical framework was used during implementation as a management and M&E tool? • What has been the level of compliance with the progress and financial reporting requirements/ schedule, including quality and timeliness of reports; • What has been effectiveness of the monitoring reports and evidence that these were discussed with stakeholders and project staff; • What is the extent to which follow-up actions, and/ or adaptive management, were taken in response to monitoring reports (APR/PIRs); • Whether APR/PIR self-evaluation ratings were consistent with the MTR and TE findings. If not, were these discrepancies identified by the project steering committee and addressed?
4.6 UNDP and Implementing Partner implementation / execution coordination, and operational issues	***GEF IMPLEMENTING AGENCY EXECUTION - UNDP*** • Whether there was an appropriate focus on results • Was there adequate UNDP support to the Implementing Partner and project team • Quality and timeliness of technical support to the Executing Agency

Contents	Main questions and Terminal Evaluation Scope
	and project team • Were the management inputs and processes, including budgeting and procurement adequate
5. Findings: Project Results	
5.1 Overall results	***OVERALL RESULS*** • What is the achievement of the objectives against the end of the project values of the log-frame indicators for project objectives, outcomes, outputs, indicating baseline situation and target levels, as well as position at the close of the project? • What is the achievements /Results in terms of contribution to sustainable development benefits, as well as global environmental benefits (direct and indirect GHG emission reduction)? • How does the GEF Tracking Tool at the Baseline and the one completed right before the Midterm Review with that Prepared at the time of Terminal Evaluation compare?
5.2 Relevance	***RELAVENCE*** • To what extent the activity is suited to local and national development priorities and organizational policies, including changes over time.? • To what extent the project is in line with UNDP Operational Programs or the strategic priorities under which the project was funded?
5.3 Effectiveness & Efficiency	***EFFECTIVENESS*** • To what extent the objectives, expected outcomes and outputs have been achieved? • To what extent the results have been delivered with the least costly resources possible? • What are the positive and negative, foreseen and unforeseen changes to and effects produced by a development intervention?
5.4 Country ownership	***COUNTRY OWNERSHIP*** • Was the project concept in line with development priorities and plans of Viet Nam? • Were the relevant country representatives from government and civil society involved in project implementation, including as part of the project steering committee? • Was an inter-governmental committee given responsibility to liaise with the project team, recognizing that more than one ministry should be involved? • Have the government(s), enacted legislation, and/or developed policies and regulations in line with the project's objectives?
5.5 Mainstreaming	***MAINSTREAMING*** • How the project is successfully mainstreaming other UNDP priorities, including poverty alleviation, improved governance, the prevention and recovery from natural disasters, and women's empowerment. • Whether it is possible to identify and define positive or negative effects of the project on local populations (e.g. income generation/job creation, improved natural resource management arrangements with local groups, improvement in policy frameworks for resource allocation and distribution, regeneration of natural resources for long term sustainability). • Do the project objectives conform to agreed priorities in the UNDP country programme document (CPD) and country programme action plan (CPAP)?

Contents	Main questions and Terminal Evaluation Scope
5.6 Sustainability 5.7 Impact	• Whether there is evidence that the project outcomes have contributed to better preparations to cope with natural disasters. • Whether gender issues had been taken into account in project design and implementation and in what way has the project contributed to greater consideration of gender aspects, (i.e. project team composition, gender-related aspects of pollution impacts, stakeholder outreach to women's groups, etc.) ***SUSTAINABILITY*** ***Financial risks:*** • Are there financial risks that may jeopardize the sustainability of project outcomes? • What is the likelihood of financial and economic resources not being available once GEF grant assistance ends? ***Socio-economic risks:*** • Are there social or political risks that may threaten the sustainability of project outcomes? • What is the risk for instance that the level of stakeholder ownership (including ownership by governments and other key stakeholders) will be insufficient to allow for the project outcomes/benefits to be sustained? • Do the various key stakeholders see that it is in their interest that project benefits continue to flow? • Is there sufficient public/stakeholder awareness in support of the project's long-term objectives? ***Institutional framework and governance risks:*** • Do the legal frameworks, policies, and governance structures and processes within which the project operates pose risks that may jeopardize sustainability of project benefits? • Are requisite systems for accountability and transparency, and required technical knowhow, in place? ***Environmental risks:*** • Are there ongoing activities that may pose an environmental threat to the sustainability of project outcomes? ***IMPACT*** • Whether, the project has demonstrated verifiable improvements in ecological status? • Whether, the project has demonstrated verifiable reductions in stress on ecological systems through specified process indicators, that progress is being made towards achievement of stress reduction and/or ecological improvement?
6. Conclusions, Recommendations and Lessons	
	• Did the project provide cost-effective solutions in order to address barriers? • Are these solutions provided in an efficient way? • What are the best and worst practices in addressing issues relating to relevance, performance and success? • Corrective actions for the design, implementation, monitoring and evaluation of the project • Actions to follow up or reinforce initial benefits from the project • Proposals for future directions underlining main objectives
Annexes • TOR • List of people interviewed • Documents reviewed and bibliography	

Contents	Main questions and Terminal Evaluation Scope
• Terminal Evaluation evaluative matric (criteria, questions, indicators) • Signed UNEG code of conduct forms • Other information, as needed	

ANNEX C: DOCUMENTS REVIEWED

Project Design	
	Project Document
	Project PIF (Downloaded from Net)
	Project Inception Report
	GEF EE Tool for GHG Mitigation Ver 1.0, 2015
Mid Term Review (MTR)	
	MTR Report
	Management Response to MTR (Downloaded from Net)
Work Plans	
	Annual Work Plan 2016
	Annual Work Plan 2017
	Annual Work Plan 2018
	Annual Work Plan 2019
	Annual Work Plan 2020
	EECB Five year Implementation Plan
Project Implementation Report (PIR)	
	PIR 2017
	PIR 2018
	PIR 2019
	PIR 2020
	Updated PIR Calculations Jan 2021
Audit Reports	
	Audit 2017
	Audit 2018
	Audit 2020
Project Steering Meeting Report	
	Project Board Meeting Report 2016
	Project Board Meeting Report 2018
	Project Board Meeting Report 2019
	Project Board Meeting Report 2020
Combined Delivery Reports (CDR)	
	CDR 2016
	CDR 2017
	CDR 2018
	CER Q1 2019
	CDR Q2 2019
	CDR Q3 2019
	CDR Q4 2019
Technical Reports / Consultancy Reports	
	Specific Energy Consumption Study Phase 1
	Specific Energy Consumption Studies Phase 2
	New Buildings EE Design Course

	Post training reports
	Gender in Building Sector Study
	Documents for revised Construction Law
	Under Construction Law for DOCs
	Action Plans
	EE Material Circulars
	Specific Energy Consumption Methods Circular
	Report of Incentive Mechanism
	Support to New Buildings
	Support to Retrofitting buildings
	Leaflet for New Buildings
	Leaflet for Existing Buildings
	Publicity Material (Standees)
	Green Building Week Related Material
	Standards Decision 1
	Standards Decision 2
	Financial Data of the Project (Compiled by the Project Team)
	Revised Construction Law
	Documents for Decree 15
	Documents for Decree on Development of Smart Cities
	Documents pertaining to Decision 1677 on Long term plan to promote EE buildings
	M&V Guide for energy consumption in buildings
	Reports on Technical Support for Implementation of EEC in Demonstration projects (16 reports)
	Reports for training on M&V of energy consumption in demonstration projects (3 reports)
Other Documents - External to the EECB project	
	QCVA 09: 2017/BXD, National Technical Regulations on Energy Efficiency Buildings 2017
	Viet Energy Consultant and Investment Corporation - Viet ESCO - PPT
	Viet Nam CPD 2017-2021
	One Strategic Plan Between Government of Viet Nam and United Nations in Vietnam
	Conference Paper 2017: Improving the Accuracy of Building Energy Simulation Using Real-Time Occupancy Schedule and Metered Electricity Consumption Data Prashant Anand, Junjing Yang, David Cheong, Chandra Sekhar
	Assessing the accuracy of a simplified building energy simulation model using BESTEST: The case study of Brazilian regulation; A.P. Meloa, D. Cóstolab, R. Lambertsa, J.L.M. Hensenb
	MTR Report: Review of GEF Project: Promoting Energy Efficiency in Commercial Buildings in Thailand (PEECB), UNDP PIMS no. 3937
	QCVN 09:2013/BXD, National Technical Regulation on Energy Efficiency Buildings
	Green Buildings Market Intelligence Vietnam Profile - IFC
	A Review on Green Building in Vietnam, Hong-Trang Nguyen, Matthew Gray
	Vietnam Affordable Housing, A Way Forward, October 2015, World Bank Group
	PBBE: Program on Energy Efficiency in Buildings: Building Sector Brief: Vietnam, April 2019
	Energy Efficiency in Building, October 2018, Vietnam, Copenhagen Centre for Energy Efficiency

ANNEX D: FIELD VISITS AND LIST OF PEOPLE INTERVIEWED

No	Time	Organization	Name	Position	Meeting contents	Venue
Monday, 18 January 2021						
1	9:00 - 12:00	PMU	Ms. Luong Ngọc Huyen Hoang Thi Kim Cuc Mr. Hoang Anh	M&E consultant Project Manager Technical consultant, component 3	- M & E at designing and implementation - The effectiveness and quality of M & E - Measurement and verification of project achievements	37 Lê Đại Hành, Hai Bà Trưng, Hà Nội & Online
2	13:30 – 15:45	Ministry of Construction (MOC)/ Department of Science Technology and Environment (DOSTE) - PMU	Mr. Vũ Ngọc Anh Mr. Nguyễn Công Thịnh Mr. Đinh Chính Lợi Ms. Hoàng Thị Kim Cúc Mr. Yannick Millet Mr. Hoang Anh	Director General of DOSTE, Director of EECB Project Vice Director-DOSTE & EECB PMU Official DOSTE-National Coordinator of EECB PMU EECB Project Manager ITA Technical consultant	- Briefing meeting with project team and update of mission agenda (if needed) - Project design and relevance - Project overall results and main achievements (project objective results and main achievements in log-frame) - Project Implementation and Adaptive Management - Country ownership and mainstreaming - Project sustainability and impact - Lessons learned and recommendations	37 Lê Đại Hành, Hai Bà Trưng, Hà Nội & Online
3	17:00 – 18:00	UNDP CO	Mr. Dao Xuan Lai Ms. Vu Thi Thu Hang Ms. Hoàng Thị Kim Cúc Mr. Yannick Millet	Head of Climate Change and Environment UNDP Programme officer EECB Project Manager ITA	- Briefing with UNDP - Overview of the TE, specific questions from UNDP, issues observed - UNDP view on project, and some highlights	304 Kim Mã, Ba Đình, Hà Nội. & Online
Tuesday, 19 January 2021					-	
4	10:45 – 12:00	Sofitel Legend Metropole Hà Nội (a refurbishment building)	Mr. Nguyen Anh Tuan Mobile phone: 0906872572	Technical Director	- Outcomes of demonstration project and co-finance disbursement - Any difficulties in applying EE technologies in building - Involvement and results in capacity building, training, workshops and seminars - Sustainability: any plan for innovation of other buildings which replicates EE,	15 Ngô Quyền, phường Tràng Tiền, quận Hoàn kiếm, Hà Nội

No	Time	Organization	Name	Position	Meeting contents	Venue
					application of EECB methods in other buildings	
5	13:30 - 15:00	IFC	Mrs. Do Ngoc Diep Mr. Vu Hong Phong	Green Building Specialist, VN Green Buildings Program Green Building Specialist	- EE/Green building programme/ projects in Vietnam - Orientation of future program/ project development (ESCO model)	IFC Ha Noi, 63 Ly Thai To, HN
6	15:30 – 17:00	GIZ	Ms Vu Thi Kim Thoa	Senior Project Officer	- GIZ EE/Green building programme/ projects in Vietnam - Orientation of future program/ project development (ESCO model)	GIZ office in Hanoi, 14 Thuy Khue, HN
Wednesday, 20 January 2021					-	
7	8:30 – 10:00	National University of Civil Engineering	Mr. Nguyen Tien Dung Mr. Nguyen Cao Lanh Ms. Pham Thi Hai Ha Mr. Tran Ngoc Quang Mr. Tran Minh Tu	Vice Dean, Department of International Affairs Vice Dean, Faculty of Architecture and Planning Head – Department of Environmental Architecture, Head- Department of Building Services and Built Environment Vice Dean of Building and Industrial Construction Faculty	- Involvement and achievements of University in EECB - Difficulties during implementation of project activities and ways to overcome (design, development and implementation of EE buildings education/trainings) - Changes and impact in capacity building and performing the education/trainings on EE buildings - Sustainability, lessons learned and recommendations	55 Giải Phóng, Đồng Tâm, Hai Bà Trưng
8	10:30 - 12:00	CONINCO (designers, building consultants, demo consultants; a new building)	Mr. Minh Mr. Ta Duc Hoang Mobile phone: 0983375588 Mr. Tran Duc Tai Mr. Dinh Tien Duong	CEO Vice head, Division of Technical Management, Focal point Chief Engineer of Project Management Unit MEP officer of Project Management Unit	- Outcomes of demonstration project and co-finance disbursement - Any difficulties in applying EE technologies in building - Involvement and results in capacity building, training, workshops and seminars - Sustainability: any plan for innovation of other buildings which replicates EE, application of EECB methods in other buildings	No. 4, Ton That Tung Str., Dong Da Distr., Hà Nội
9	13:30– 15:00	Energy Conservation	Mr. Tran Anh Thinh	Official, Energy Conservation Division, Industrial	- Outcomes of research and consultation	37 Lê Đại Hành, Hai

No	Time	Organization	Name	Position	Meeting contents	Venue
		Center (ECC) in HN	Mr. Do Van Sang	Promotion and Development Consultancy Centre	provided to EECB Project - Results of energy database and benchmarking of buildings	Bà Trưng, Hà Nội
10	15:30 – 17:00	UNDP Regional Office	Ms. Milou Beerepoot	RTA	- Measure of objective indicators - ESCO model - Project achievements and results - Sustainability and recommendations	Online meeting
Thursday, 21 January 2021						
11	08:30 – 10:00	Somerset Chancellor Court (a refurbishment building)	Mr. Doan Nhat Ho Mobile phone: 0906388200 Ms. Doan Thi Ngoc Dieu	Chief Engineer Building operation manager	- Outcomes of demonstration project and co-finance disbursement - Any difficulties in applying EE technologies in building - Involvement and results in capacity building, training, workshops and seminars - Sustainability: any plan for innovation of other buildings which replicates EE, application of EECB methods in other buildings	21-23 Nguyễn Thị Minh Khai, Phường Bến Nghé, Quận 1, TP.HCM
12	10:30 – 12:00	Energy Conservation Center (ECC) in HCM	Mr. Hoang Anh Tri Mr. Ngo Dinh Cuong Mr. Nguyen Van Hung	Deputy Head of Division Energy solutions and Renewable Energy Department Startup and Innovation Hub of HCMC (SIHUB) Technical Offiicer	- Outcomes of research and consultation provided to EECB Project - Results of energy database and benchmarking of buildings - ESCO model	273 Điện Biên Phủ, Phường 7, Quận 3, Hồ Chí Minh
13	13:30 – 15:00	HCM DOC	Mr. Nguyen Thanh Xuyen Ms. Nguyen Thi Huong	Head, Division of Construction Quality Management Department of Construction	- Application of standards and code on energy efficiency and saving in buildings - Outcomes of development of EE incentive policies/measures in buildings - Monitoring EE compliance during and after the construction phase and reviewing EE compliance. Specific tasks on energy auditing and certification of EE in buildings	60 Trương Định, Phường 7, Quận 3, Hồ Chí Minh

No	Time	Organization	Name	Position	Meeting contents	Venue
					- ESCO model	
14	15:30 – 17:00	Artelia Vietnam (SEC/Energy Benchmarks Team)	Mr. Nicolas Jallade Mr. Khanh	Project Director/ Renewable Energy and Energy Efficiency Technical Specialist in EE survey database	- Involvement and outcomes of team in EECB (SEC/energy benchmark) - Difficulties during implementation and ways to overcome - Lessons learned and recommendations (if any)	06 Phùng Khắc Khoan, Phường Đa Kao, Quận 1, Thành phố Hồ Chí Minh
Friday, 22 January 2021					-	
15	8:30 – 10:00	Feliz en Vista, Capitaland (a new building)	Mr. Nguyen Ba Thanh Mobile phone: 0971062943 Mr. Huynh Nam Anh - Andy	Project Manager Property Manager	- Outcomes of demonstration project and co-finance disbursement - Any difficulties in applying EE technologies in building - Involvement and results in capacity building, training, workshops and seminars - Sustainability: any plan for innovation of other buildings which replicates EE, application of EECB methods in other buildings	Tầng 8, Toà nhà Vista, Lô Y1, đường Đồng Văn Cống, Quận 2, TP. Hồ Chí Minh
16	10:30 – 12:00	UNDP CO/PMU	Mr. Nguyễn Trung Hòa	EECB Project National Technical Advisor	- Project achievements and difficulties in technical aspects during implementation of EECB - Sustainability of project results and benefits - Lessons learned and recommendations for other and future projects	196 Pasteur, Phường 6, Quận 3, Hồ Chí Minh
17	13:30 – 15:00	Energy Conservation Center (ECC) in HCM	Mr. Cuong	Startup and Innovation Hub of HCMC (SIHUB)	- ESCO model	273 Điện Biên Phủ, Phường 7, Quận 3, Hồ Chí Minh
Monday, 25 Jan 2020					-	
18	9:00 – 12:00		Ms. Hoang Thi Kim Cuc Ms. Bui Bach Yen	EECB Project Manager Project Finance and Accountant	- Adaptive management (outcomes in project planning, procurement, implementation, M & E, communication, coordination)	37 Lê Đại Hành, Hai Bà Trưng, Hà Nội

No	Time	Organization	Name	Position	Meeting contents	Venue
					- Results in financial management, disbursement, co-finance contribution of stakeholders	
19	9:00 – 10:30	Department of Energy Efficiency and Sustainable Development, Ministry of Industry and Trade (MOIT)	Mr. Le Ba Viet Bach	Department of Energy Efficiency and Sustainable Development,	- Involvement and responsibility of Ministry in EECB project and achievements (Revision of Decree 21) - Vietnam strategy, policy, plan, programme on energy efficiency (especially energy efficiency in buildings) and relevance of EECB - National programme on energy efficiency - ESCO model	54 Hai Bà Trưng, Hoàn Kiếm, Hà Nội
Tuesday, 26 Jan 2020					-	
20	14:00 – 15:00	UNDP CO/PMU	Mr. Nguyen Cong Thinh Mr. Dinh Chinh Loi Ms. Hoang Thị Kim Cuc Mr. Yannick Millet Ms. Luong Thi Thu Huyen	PMU Vice Director PMU Coordinator EECB Project Manager ITA PMU member	- De-briefing - Mission conclusions - Next steps	37 Lê Đại Hành, Hai Bà Trưng, Hà Nội & Online
Thursday, 28 Jan 2020					-	
21	10:30 – 12:00	UNDP CO	Ms. Milou Beerepoot Mr. Dao Xuan Lai Ms. Vu Thi Thu Hang Ms. Hoang Thị Kim Cuc Mr. Yannick Millet	RTA UNDP head of CC Unit UNDP Programme officer Project Manager ITA	- De-briefing and highlights - Next steps	Online meeting
Monday, 08 Feb 2020					-	
22	9:00 – 9:45	ADB	Ms Vu Quang Dang	Project Officer	- ADB EE/Green building programme/ projects in Vietnam - Challenges of ESCO model application in Vietnam and progress of ADB TA to MOIT and MOF - Recommendations	GIZ office in Hanoi, 14 Thuy Khue, HN

ANNEX E: ENERGY SAVINGS DUE TO PILOT PROJECTS

I. Existing buildings

(Figures in MWh/Yr.)

No.	Name of buildings	Building Type	Building Floor Area (Sq. M)	Actual Energy Consumption 2015	Actual Energy Consumption 2016	Actual Energy Consumption 2017	Actual Energy Consumption 2018	Actual Energy consumption 2019	Actual Energy consumption 2020	Yr. of start of EE measures Implementation	Yr. of end of EE implementation	Type of EE implemented
1	Somerset Grand Chancelor Building	**Hotel**	**37,930**	**3,094**	**3,156**	**3,251**	**2,693**	**2,679**	**2,330**	**2018**	**2018**	Replace lamps, chillers, air-conditioners
2	DIC Office	**Office**	**2,600**	N/a	**227**	**229**	**232**	**194**	**190**	**2019**	**2019**	Replace lamps, Air-conditioners (split unit)
3	Nam Linh Office Building	**Office**	**3,084**	N/a	**114**	**117**	**124**	**131**	**116**	N/a	N/a	
4	Administration Building of District 10 People's Committee	**Office**	**7,200**	N/a	**495**	**364**	**326**	**251**	**246**	**2019**	**2019**	Replace air-conditioners; Install solar power, LED lighting
5	Administration Building of District 8 People's Committee	**Office**	**13,543**	N/a	**557**	**559**	**614**	**319**	**314**	**2019**	**2019**	Install solar power, Replace lamps, Air-conditioners (split unit)
6	Cuu Long Majestic Hotel Building	**Hotel**	**16,603**	N/a	**4,218**	**4,219**	**4,265**	**4,101**	**2,812**	**2019**	**2019**	Replace lamps, Air-conditioners (split unit)
7	Ramana Hotel	**Hotel**	**26,800**	N/a	**3,943**	**3,876**	**3,648**	**3,578**	**2,355**	**2019**	**2019**	Replace lamps
8	Ho Chi Minh Television Building	**Office**	**19,667**	N/a	**7,613**	**6,932**	**7,191**	**6,510**	**5,947**	**2019**	**2019**	Replace lamps, VSD and BMS
9	Ho Chi Minh University of Food Industry Building	**Office**	**15,200**	N/a	**821**	**859**	**1,076**	**988**	**839**	**2019**	**2019**	Replace lamps
10	Equatorial Hotel	**Hotel**	**39,308**	N/a	**6,222**	**6,201**	**6,231**	**6,055**	**4,035**	**2019**	**2019**	Replace lamps, thermal

No.	Name of buildings	Building Type	Building Floor Area (Sq. M)	Actual Energy Consumption 2015	Actual Energy Consumption 2016	Actual Energy Consumption 2017	Actual Energy Consumption 2018	Actual Energy consumption 2019	Actual Energy consumption 2020	Yr. of start of EE measures Implementation	Yr. of end of EE implementation	Type of EE implemented
												isolation glasses
11	Royal Hotel Saigon	**Hotel**	**14,861**	N/a	**2,225**	**2,277**	**2,252**	**1,972**	**1,267**	**2019**	**2019**	Replace lamps, Air-conditioners (split unit)
12	Sofitel Legend Metropole Hotel	**Hotel**	**27,300**	N/a	**11,028**	**10,935**	**10,850**	**9,927**	**7,494**	**2019**	**2019**	Install heat pump, LED lighting
13	Melia Hotel	**Hotel**	**33,000**	N/a	N/a	**7,616**	**7,797**	**7,697**	**6,257**	**2020**	**2021**	Chiller replacement
14	CEO Tower	**Office**	**20,000**	N/a	N/a	N/a	**1,976**	**2,049**	**1,844**	N/a	N/a	

Saving Per Building 743 MWh/Year
Percent Saving 22.40%

II. New buildings

(Figures in MWh/Yr.)

	Name of buildings	Building Type	Building Floor Area (Sq. M)	Estimated Energy Consumption-Baseline	Method used to determine baseline energy consumption	Actual Energy consumption 2017	Actual Energy consumption 2018	Actual Energy consumption 2019	Actual Energy consumption 2020	Yr. of start of EE measures Implementation	Yr. of end of EE implementation	Type of EE implemented
1	New Admin and educational building, College of Urban Works Construction	**Office**	**3,338**	**256**	**Simulation**	0	0	0	119	2017	N/a	PV system, LED lighting, ground thermal system
2	Anland 2 New High rise Residential in Hanoi	**Resi. Bld.**	**56,500**	**4,030**	**Simulation**	0	0	0	3,084	2018		PV system, LED lighting, thermal isolation glasses
3	Golden Lotus Building	**Resi. Bld.**	**5,564**	**1,338**	**Simulation**	0	0	0	887	2018	N/a	VRF system, LED lighting, thermal isolation glasses

	Name of buildings	Building Type	Building Floor Area (Sq. M)	Estimated Energy Consumption-Baseline	Method used to determine baseline energy consumption	Actual Energy consumption 2017	Actual Energy consumption 2018	Actual Energy consumption 2019	Actual Energy consumption 2020	Yr. of start of EE measures Implementation	Yr. of end of EE implementation	Type of EE implemented
4	High-rise Residential and Commercial Building Y1 Capitaland - Felix En Vista	**Resi. Bld.**	**66,500**	**6,715**	**Simulation**	0	0	0	4,325	2017	2020	High COP AC, LED lighting
5	CONINCO Building	**Office**	**20,279**	**2,726**	**Simulation**	0	0	0	1,685	2017	2020	VRF system, LED lighting, CHP
6	Ha long Inn	**Hotel**	**27,507**	**8,652**	**Simulation**	0	0	0	5,357	2020	N/a	building envelop, LED lighting, CHP
7	Headquarter building of Daikin Air Conditioning Vietnam JSC	**Office**	**15,108**	**4,746**	**Simulation**	0	0	0	3,794	2020	N/a	VRF system, High COP AC, LED lighting, thermal isolation glasses
8	DIC Condotel of DIC CSJ	**Hotel**	**37,077**	**6,821**	**Simulation**	0	0	0	2,484	2018	2020	VRF system, High COP AC, LED lighting, thermal isolation glasses
9	DIC Hotel of DIC CSJ	**Hotel**	**32,110**	**7,396**	**Simulation**	0	0	0	5,733	2018	2020	VRF system, High COP AC, LED lighting, thermal isolation glasses

Note
1. For the cells highlighted data is either not available or is not collected
2. None of new demo building operated full load for one year, thus annual energy consumption is not recorded

ANNEX F: SIGNED UNEG CODE OF CONDUCT FORMS

Evaluators/reviewers:

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimise demands on time, and respect people's right not to engage. Evaluators must respect people's right to provide information in confidence, and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals, and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrong doing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study limitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

Evaluation/reviewer Consultant Agreement Form

Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: Dinesh Aggarwal

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

(Dinesh Aggarwal)

16 August 2021

ANNEX G: TE REPORT AUDIT TRAIL

In accordance with the guidelines the audit trail is being submitted as a separate file

ANNEX H: EVALUATION REPORT CLEARANCE FORM

Terminal Evaluation Report for "Energy Efficiency Improvement in Commercial and High High-Rise Residential Buildings (EECB)" Project, Viet Nam

Reviewed and Cleared by:

Commissioning Unit (M&E Focal Point)

Name: Nguyen Thi Ngoc Han

Signature: 

Date: 16 August 2021

Regional Technical Advisor

Name: Milou Beerepoot

Signature:

Date: 18 August 2021

Approved by:

Evaluation Commissioner/Deputy Resident Representative

Name: Patrick Haverman

Signature:

Date: 23 August 2021