



**REQUEST FOR CEO ENDORSEMENT**  
**PROJECT TYPE: Full-sized Project**  
**TYPE OF TRUST FUND: GEF Trust Fund**

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**PART I: PROJECT INFORMATION**

Project Title: Energy Efficiency Improvement in Commercial and High-Rise Residential Buildings in Viet Nam			
Country(ies):	Viet Nam	GEF Project ID:	5365
GEF Agency(ies):	UNDP	GEF Agency Project ID:	5245
Other Executing Partner(s):	Ministry of Construction	Submission Date:	6 May 2015
		Resubmission Date:	26 June 2015
GEF Focal Area (s):	Climate Change	Project Duration(Months)	48
Name of Parent Program (if applicable):	n/a	Project Agency Fee (\$):	303,810
<ul style="list-style-type: none"> <li>➤ For SFM/REDD+ <input type="checkbox"/></li> <li>➤ For SGP <input type="checkbox"/></li> <li>➤ For PPP <input type="checkbox"/></li> </ul>			

**A. FOCAL AREA STRATEGY FRAMEWORK**

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Grant Amount (\$)	Co-financing (\$)
CCM-2	2.1 Appropriate policy, legal and regulatory frameworks adopted and enforced 2.2 Sustainable financing and delivery mechanisms established and operational	2.1 Energy efficiency policy and regulation in place	GEF TF	785,500	2,426,026
		2.2 Investment mobilized	GEF TF	807,500	2,493,974
		2.3 Energy savings achieved	GEF TF	1,605,000	16,578,550
<b>Total project costs</b>				3,198,000	21,498,550

**B. PROJECT FRAMEWORK**

<b>Project Objective:</b> Improved energy utilization performance of commercial and high-rise residential buildings in Ho Chi Minh and Hanoi						
<b>Project Component</b>	<b>Grant Type</b>	<b>Expected Outcomes</b>	<b>Expected Outputs</b>	<b>Trust Fund</b>	<b>Grant Amount (\$)</b>	<b>Confirmed Co-financing (\$)</b>
1. Improvement and enforcement of energy efficiency building code	TA	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	1.1.1 Improved and enforced implementing policy framework and regulations on EE in buildings, including revised/improved EE Building Code (EEBC), with a full EEBC compliance guide 1.1.2 Established and operational EE certification scheme for buildings	GEF TF	269,000	830,810
	TA	1.2 Strengthened compliance of the energy efficiency building code for commercial and high-rise residential buildings in Hanoi and HCMC	1.2.1 Approved guidelines that support EE building initiatives and market 1.2.2 Established and implemented building measurement & verification (M&V) scheme 1.2.3 Established and implemented building energy benchmarking system that is linked to the certification scheme 1.2.4 Completed energy consumption survey of selected commercial and high-rise residential buildings	GEF TF	366,500	1,131,940
2. Buildings market development support initiatives	TA	2.Increased local capacity in the EE design, construction, and operation of commercial and high-rise residential buildings	2.1 Formulated, approved, funded and implemented financial mechanisms and incentives to support EE efforts in the buildings sector and cost norms for construction 2.2 Fully operational Centers for Energy Efficiency in Buildings (CEEBs) under MOC 2.3 Trained CEEB staff to implement awareness and training programs to promote EE in the building sector 2.4 Operational support program for ESCOs in the negotiation and	GEF TF	807,500	2,493,974

			implementation of building energy performance contracts			
3. Building EE technology applications and replications	TA	3 Increased use of EE building materials and application of EE building technologies in HCMC and Hanoi	3.1 Developed Five-year EE&C plans for 16 selected commercial and high-rise residential buildings 3.3 Documented and disseminated results and lessons from the demonstrations of implementing EEBC and EE&C in new and existing buildings	GEF TF	893,000	828,927
	INV		3.2 Completed demonstrations of the design, application and operation of EE equipment, building materials and building energy monitoring and management/control systems in the 16 selected commercial and high-rise residential buildings based on the EEBC	GEF TF	712,000	15,749,622
Subtotal					3,048,000	21,035,273
Project management Cost (PMC)				GEF TF	150,000 <sup>1</sup>	463,277 <sup>2</sup>
<b>Total Project Costs</b>					<b>3,198,000</b>	<b>21,498,550</b>

### C. SOURCES OF CONFIRMED CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME (\$)

Sources of Co-financing	Name of Co-financier (source)	Type of Co-financing	Co-financing Amount (\$)
GEF Agency	UNDP	In-kind	2,070,000
GEF Agency	UNDP	Cash	150,000
National Government	Ministry of Construction (MOC)	In-kind	2,100,000
Local Government	Ministry of Industry and Trade (MOIT) through ECC Hanoi	In-kind	300,000
Local Government	ECC HCMC	In-kind	300,000
Private Sector	HITC Building	Equity	128,700
		In-kind	4,500
Private Sector	USSR – VN Friendship Culture Palace of Hanoi	Equity	595,750
		In-kind	4,250
Private Sector	Hanoi Sheraton Hotel	Equity	265,900
		In-kind	4,000
Private Sector	Melia Hanoi Hotel	Equity	77,700
		In-kind	3,750
Private Sector	N05 Building	Equity	32,500

<sup>1</sup> Includes US\$ 82,000 for M&E

<sup>2</sup> Includes US\$ 92,655 for M&E

		In-kind	3,500
Private Sector	FPT telecom Building	Equity	2,994,750
		In-kind	5,250
Private Sector	JW Marriott Hanoi Hotel	Equity	344,250
		In-kind	5,750
Private Sector	Hanoi energy management staff training center	Equity	665,000
		In-kind	35,000
Private Sector	Majestic Hotel	Equity	248,950
		In-kind	134,050
Private Sector	Cendeluxe Hotel	Equity	320,000
		In-kind	80,000
Private Sector	Michelia Hotel	Equity	100,000
		In-kind	25,000
Private Sector	Vinpearl Resort	Equity	176,000
		In-kind	44,000
Private Sector	Saigon Office & Service Apartment	Equity	320,000
		In-kind	80,000
Private Sector	Riverside Renaissance Hotel	Equity	180,000
		In-kind	20,000
Private Sector	Intercontinental Hotel	Equity	162,000
		In-kind	18,000
Private Sector	Pedagogical University of HCMC	Equity	6,650,000
		In-kind	2,850,000
<b>Total Co-financing</b>			<b>21,498,550</b>

**D. TRUST FUND RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY<sup>1</sup> N/A**

<sup>1</sup> In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table. PMC amount from Table B should be included proportionately to the focal area amount in this table.

**E. CONSULTANTS WORKING FOR TECHNICAL ASSISTANCE COMPONENTS:**

Component	Grant Amount (\$)	Co-financing (\$)	Project Total (\$)
International Consultants	630,000	-	630,000
National/Local Consultants	837,000	839,723	1,676,723

**F. DOES THE PROJECT INCLUDE A “NON-GRANT” INSTRUMENT? (Select)**

(If non-grant instruments are used, provide in Annex D an indicative calendar of expected reflows to your Agency and to the GEF/LDCF/SCCF/NPIF Trust Fund). **NO**

**PART II: PROJECT JUSTIFICATION**

**DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN OF THE ORIGINAL PIF<sup>3</sup>**

<sup>3</sup> For questions A.1 –A.7 in Part II, if there are no changes since PIF and if not specifically requested in the review sheet at PIF stage, then no need to respond, please enter “NA” after the respective question.

There are no changes to the Objective, Component and Outcome levels. Taking into account the changes to the baseline, some changes to outputs were identified during the PPG. These changes are reflected in the Project Result Framework presented from page 60-64 of the Project Document.

During preparation of the Project Document, it was evident that some aspects of the baseline project (s) require updating and that this involved some changes to the project design. The changes from the PIF outputs are as follows:

<b>PIF Output Affected</b>	<b>Changes &amp; Explanations</b>
1.2 Approved voluntary guidelines that support EE building initiatives and market	This output is now assigned as Output 1.2.1 to associate with Outcome 1.2 under Component 1 with a minor text revision to the Output title as “Approved guidelines that support EE building initiatives and market”
1.3 Established and operational EE certification scheme for buildings	This output is now assigned as Output 1.1.2 to associate with Outcome 1.1 under Component 1.
1.4 Established and enforced building energy monitoring and reporting system	This output is now assigned as Output 1.2.2 to associate with Outcome 1.2 under Component 1 and the “building energy monitoring and reporting system” was replaced by the “building measurement & verification (M&V) scheme” which better reflects MRV protocols and activities at the project level.
1.5 Established and enforced building energy benchmarking system that is linked to the certification scheme	This output is now assigned as Output 1.2.3 to associate with Outcome 1.2 under Component 1. Considering that the building energy benchmarking system is a set of guidelines and procedures to determine energy intensities for comparison and the system will be a component of a larger certification scheme, enforcement of the building energy benchmarking system is not considered as a pragmatic approach. Therefore, the Output title was slightly revised to “Established and implemented building energy benchmarking system that is linked to the certification scheme”.
2.2 Fully established, staffed, funded and operational Centers for Energy Efficiency in Buildings (CEEBs) under MoC	Minor text revisions to the Output title as “Fully operational Centers for Energy Efficiency in Buildings (CEEBs) under MOC”.
2.3 Trained CEEB staff to implement and become trainers on EEBC, serve as energy managers in designated buildings, energy auditors, and on the building M&R and benchmarking systems	Minor text revisions to the Output title as “Trained CEEB staff to implement awareness and training programs to promote EE in the building sector”.
2.5 Completed energy consumption survey of 100 commercial and high-rise residential buildings	This Output was incorporated to Outcome 1.2 under Component 1 to complement activities on development of M&V and benchmarking systems, and it is now assigned as Output 1.2.4. The Output

	<p>title was slightly revised to “Completed energy consumption survey of selected commercial and high-rise residential buildings”. The project aims to conduct the survey of at least 100 buildings, however it is anticipated that the final survey samples will be more than 100 buildings to ensure representation of different building types in Viet Nam.</p>
<p>3.1 Five-year EC plans for 20 selected commercial and high-rise residential buildings</p>	<p>The number of demonstration projects identified during the project design phase is 16 projects and these have already offered a good mix of different types of commercial and high-rise residential buildings in Viet Nam as well as EE technologies and practices to be implemented. Co-financing committed by the 16 project hosts for the EEBC project has already exceeded the initial amount of co-financing specified in the PIF. Fewer number of demonstration projects also offer a better focus for the project management team. The Output title was slightly revised to “Developed Five-year EE&amp;C plans for 16 selected commercial and high-rise residential buildings” to reflect the number of the confirmed demonstration projects (see Annex B and C in ProDoc).</p>
<p>3.2 Completed demonstrations of the design, application and operation of EE equipment, building materials and building energy monitoring and management/control systems in 20 selected commercial and high-rise residential buildings based on the EEBC.</p>	<p>The Output title was slightly revised to “Completed demonstrations of the design, application and operation of EE equipment, building materials and building energy monitoring and management/control systems in the 16 selected commercial and high-rise residential buildings based on the EEBC” to reflect the number of the confirmed demonstration projects (see Annex B and C in ProDoc).</p>
<p>3.3 Documented results and lessons from 20 demonstrations of implementing EEBC in new and existing buildings</p>	<p>The text of the Output title was slightly revised to “Documented and disseminated results and lessons from the demonstrations of implementing EEBC and EE&amp;C in new and existing buildings”.</p>
<p>3.2 Budget reorganized from INV to TA</p>	<p>A portion of GEF funds originally allocated for INV in Output 3.2 is now reorganized to be used for technical assistance. In discussions with demo project hosts during the PPG phase, demo project hosts are forthcoming to self-finance EE technologies, equipment and systems, instead they are requesting technical assistance to improve the preparations and planning for EE investments and operational capacities, as well as to install monitoring instruments and equipment for conduct of M&amp;V activities. Considering this, approximately 60% of the investment funds in the PIF were converted to technical assistance funds to</p>

	facilitate the preparation, implementation and reporting, while approximately 40% was retained as investments for M&V systems to produce credible and meaningful results of EE&C measures to improve the confidence of all stakeholders in EE investments.
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**A.1 National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAS, NAPs, NBSAPs, national communications, TNAs, NCSA, NIPs, PRSPs, NPFE, Biennial Update Reports, etc. NA**

**A.2. GEF focal area and/or fund(s) strategies, eligibility criteria and priorities. NA**

**A.3 The GEF Agency’s comparative advantage:** NA. There are no changes in UNDP’s comparative advantage from when the PIF was approved.

**A.4. The baseline project and the problem that it seeks to address:**

During PPG exercise several additional baseline projects were identified. These include several programs, projects and activities initiated to strengthen the enforcement of the revised EEBC. As for those ongoing and planned activities, projects and programmes that complement the Project, relevant activities from these have been considered as baselines activities, including:

- The revised Vietnamese EEBC (QCVN 09:2013/BXD)-prepared by the Department of Science, Technology and Environment, under MOC, together with the Viet Nam Association of Civil Engineering and Environment, has been approved and enacted by MOC in late 2013 (under Circular No. 15/2013/TT-BXD) after the approval of the PIF. The associated activities related to the implementation and enforcement of the revised EEBC have been identified as the baseline activities. The revised EEBC provides mandatory technical standards to achieve energy efficiency in the design and construction or retrofit of buildings (office buildings, hotels, hospitals, schools, retails, department stores, residential buildings, among others), with gross floor area of 2,500 m<sup>2</sup> or larger.
- Promotion of Energy Efficiency in Vietnam Building Sector Project (2013-2017) - MOC is implementing awareness and capacity building activities for DOCs to strengthen enforcement of the revised EEBC and to formulate the National Green Building Strategy.
- Low Carbon Transition in Energy Efficiency Sector Project (2014-2016) – Under this project, MOC is specifically targeting building practitioners and developing technical regulations, guidelines and standards to support enforcement of the revised EEBC.
- Viet Nam Clean Energy Program (VCEP) (2014-2018) – MOC implements this program to support the National Green Growth Strategy to reduce long-term emission in the building sector. Relevant activities include formulation of building energy performance database as well as development of energy efficiency benchmark for types of typical buildings in different climate zones.
- Strengthening Capacity and Institutional Reform for Green Growth and Sustainable Development in Viet Nam (CIGG) (2015-2018) – This project is being implemented by the Ministry of Planning and Investment (MPI) in collaboration with UNDP Viet Nam. The project supports activities such as design and implementation of MRV for tracking and reporting of mitigation actions and GHG emission targets; design training of trainers program on climate change and green growth with pilot training in one province. The baseline project will undertake policy analyses in energy intensive end use sector as inputs for policy discourse.

- Capacity Building for Implementation of National Climate Change Strategy Project (CBICS) (2014-2017) – This project is being implemented under the flagship of MONRE & MARD with technical and financial supported from UNDP Viet Nam. The project aims to (1) build capacity in planning, implementation and monitoring of the National Strategies on Climate Change; (2) strengthen the management, coordination and information sharing within the framework of the National Strategy on Climate Change; (3) formulate and implement training courses on major energy intensive sectors for target groups (e.g., local officials, managers and technicians).

There have been minor omissions to the project baseline presented in the PIF although these have not resulted in changes to the proposed project outcomes. During PPG, the following projects were identified to have more appropriate linkages and complementarity with the Local Development and Promotion of LED Technologies for Advanced General Lighting Project (also known as UNDP-GEF LED Project) and hence subsumed as its baselines:

- VNEEP Phase 2 (2011-2015) – This project comprises activities aiming at promoting energy efficiency and energy conservation in industry, building, transportation and households. Phase 2 (2011-15). The program does not have any activities on strengthening compliance with the EEBC.
- Strengthening capacity on climate change initiatives in the Industry and Trade sectors (CCIT) 2013 - 2016 - The CCIT project aims to: (1) review policies, prepare Marginal Abatement Cost Curves (MACC) and undertake MRV assessment in industry sector including those relating to building materials such as steel and design NAMA for steel sector; (2) develop and deliver training programs to integrate climate change initiatives into process for strategy formulation and industry planning; (3) review and develop policies and mechanism and promote market reform to involve private sector and service providers into industry development towards low-carbon; (4) review and suggest banking policies and financial mechanisms and products to promote GHG emissions/low-carbon development. The project does not have specific activities responding to energy efficiency in the buildings and EEBC compliance.

The baseline activities are described in detail in the Project Document, section 1.5

**A.5. Incremental /Additional cost reasoning: describe the incremental (GEF Trust Fund/NPIF) or additional (LDCF/SCCF) activities requested for GEF/LDCF/SCCF/NPIF financing and the associated global environmental benefits (GEF Trust Fund) or associated adaptation benefits (LDCF/SCCF) to be delivered by the project: NA**

**A.6 Risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and measures that address these risks:**

There were no changes in the risks identified in the PIF. The PPG exercise anticipated other operational risks and proposes countermeasures and management responses as detailed in the Project Document: Annex E. The overall risk rating is unchanged and is low.

**A.7. Coordination with other relevant GEF financed initiatives**

There was no change required to the coordination requirements of GEF financed initiatives identified in the PIF. However, note that the UNDP/GEF regional project, Barrier Removal to the Cost-Effective Development and Implementation of Energy Efficiency Standards and Labelling (BRESL) has recently undertaken Terminal Evaluation and is wrapping up in 2015, and the UNEP/GEF Phasing out Incandescent Lamps through Lighting Market Transformation in Vietnam will also be concluded in 2015. Relevant results on testing and energy performance standards for electrical appliances, equipment and lighting products as well as database will be incorporated into the project. In addition, the PPG exercise also



identified additional opportunities to build synergies and complementarities with on-going projects related to buildings energy efficiency in Vietnam that are financed by the GEF, in particular the following:

- **Local Development and Promotion of LED Technologies for Advanced General Lighting Project –** This project that was approved on 4 February 2015, is implemented by VAST. The objective of the Project is to mitigate GHG emissions through transformation of the lighting market towards greater usage of locally produced LED lighting products in Viet Nam. This will be achieved by removing barriers to increased production and utilization of locally produced LED lighting products in Viet Nam through two components: i) the transfer of skills, knowledge and technology for the manufacturing of LED lamps in Viet Nam; and ii) the demonstration of cost-effective local commercial production of LED lighting devices. Considering that the UNDP-GEF LED Project will focus on the supply side of quality LED lighting in Viet Nam, it will complement well with the proposed project which aims at promotions and adoptions of more efficient lighting technologies for the building sector in Viet Nam. Qualified locally produced LED lighting can be part of the demonstrations under Component 3 of this project. The project implementing partner will coordinate with the LED project activities related to the promotion and application of LED lighting demonstrations to avoid duplication of efforts and also to explore and enhance possible synergies in the implementation of activities.

To ensure effective coordination of activities the Project staff will interact and consult with the PMU of the UNDP-GEF LED project including inviting participation of LED project staff in the Project Technical Advisory Committee. Specifically, sharing of information of LED lighting product technical data and trends in product developments and applications will greatly benefit development of EE product database under Output 1.1.1, as well as communication and capacity building activities under Outputs 1.2.1, 2.3 and 2.4.

## **B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE:**

### **B.1 Describe how the stakeholders will be engaged in project implementation.**

The two primary government agencies at the state management level with mandates to promote EE in the building sector are the Ministry of Construction (MOC) and the Ministry of Industry and Trade (MOIT) who will be engaged and serve as lead agencies in project implementation. In addition, the project will involve other ministries, academic institutions, private sector, notably constructors, building designers, practitioners, building owners, professional associations, groups of building managers and operators, and equipment suppliers, which will play an important role in improving the energy performance of new and existing buildings and transforming the buildings market. Relevant and specific stakeholders engaged in project implementation are identified and detailed in the Project Document pp. 9-11.

### **B.2 Describe the socioeconomic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global environment benefits (GEF Trust Fund/NPIF) or adaptation benefits (LDCE/SCCF):**

There are socio-economic benefits of the proposed shift to carbon displacement approach that will reduce emission from energy efficiency measures and transform to a more sustainable livelihood at the global and national level. These include:

- Savings of electricity in the buildings sector consequently leading to reduced electricity costs and increased savings for facility owners;
- Reduced electricity usage contributes to lesser demand on the national grid and improved grid reliability;

- Reduced CO2 emissions thereby reducing the long term risk of climate change;
- Significant capacity built, whereby 70% of building practitioners and professionals are enabled to design EE buildings on a large scale;
- Improved access to financing for EE in buildings, including implementation of at least one new and improved financing tool/model for commercial building EE investments;
- More stringent implementation of mandatory policy instruments to promote EE in buildings, specifically the revised EEBC;
- Greater potential for EE investments in the building sector as a result of demonstration projects.
- Ensures improved comfort of building occupants.
- Gender equity benefits - The project will strengthen and enhance 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 will be emphasize in the training-of-trainers (TOT) objectives. With this approach, more women will be trained to be skilled designers and operators by the project. The project will also ensure that gender considerations are embedded to equally engage men and women in the decision making process during project implementation. The project will also support MOC to include policies, strategies, or action plans that promote gender equality.

### **B.3. Explain how cost-effectiveness is reflected in the project design:**

The proposed project is extremely cost-effective as it will utilize \$3,198,000 of GEF funds to leverage approximately \$22 million of co-financing. In the absence of the Project, although other baseline projects will lead to reduced emissions, these are likely to be carried out at a slower pace and resulting in diffused and uncoordinated rollout. In particular, the identified baseline investment projects will either not realize their expected maximum emission reductions or will not be implemented.

The estimated direct CO2 emission reductions of 37,680 tonnes CO<sub>2</sub>eq until the End-of-Project (EOP), and the projected cumulative Direct CO2 emissions avoided over the lifetime of 236,382 tonnes CO<sub>2</sub>eq that can collectively be attributed to the Project, translate to an approximate Unit Abatement Cost (UAC) of US\$13.5 per tonne of CO<sub>2</sub>eq (i.e. GEF\$ per ton CO<sub>2</sub>). The estimated UAC of the project is based on a very conservative estimation approach that has been applied to determine direct GHG reductions and does not consider either post-project direct emissions reductions that will be accomplished through financial mechanism or indirect emissions reductions achieved through replication of technology investments and additional demonstration projects.

When comparing the estimated UAC of this project against alternative EE lighting projects in Viet Nam that deliver GHG reduction benefits through electricity savings, it is found that this project is more cost effective than the Local Development and Promotion of LED Technologies for Advanced General Lighting Project, which focuses on the supply side of quality LED lighting in Viet Nam and offers a UAC of US\$21.7/tCO<sub>2</sub>eq. This project is also more cost effective than the average value of UACs delivered by similar GEF funded building energy efficiency projects in other countries with UACs ranging from US\$4.3 to US\$37.3 per tonne of CO<sub>2</sub>eq<sup>4</sup>. The estimated UAC of this project is also in accord with the findings from the GEF/UNDP's publication, entitled "Promoting Energy Efficiency in Buildings: Lessons Learned from International Experience", which illustrates (Figure 1) that there is a large potential for GHG emission reduction activities that cost below US\$20/tCO<sub>2</sub>eq in non-OECD countries.

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<sup>4</sup> Malaysia: Buildings Sector Energy Efficiency Project (BSEEP), UAC estimated at US\$4.3/t CO<sub>2</sub>eq; Promoting Energy Efficiency in Commercial Buildings in Thailand (PEECB), UAC estimated at US\$37.3/t CO<sub>2</sub>eq; India: IND Energy Efficiency Improvements in Commercial Buildings, UAC estimated at US\$5.7/t CO<sub>2</sub>eq; the Improving Energy Efficiency in the Residential Buildings Sector of Turkmenistan project estimated the UAC at US\$15.8/tCO<sub>2</sub>eq.

Moreover, the Project will facilitate the realization of the expected outcomes through barrier removal and complementary capacity development and technical assistance activities. Consequently, facilitating removal of barriers to the stringent enforcement of the revised EEBC, and to the greater uptake of building energy efficiency technologies, systems, and practices. This will provide vital support to MOC in effectively enforcing the EE&C regulations with regard to EE in the building sector, while helping to set up fiscal incentives and facilitate access to commercial financing, and greatly enhancing the level of awareness of building professionals on the benefits of EE. Such enabling activities are cost effective as they will lead to market transformation at the national level which will generate significant emission reductions, than supporting direct investments in standalone EE building projects or providing subsidies to stimulate greater uptake of EE designs and EE technologies in the building sector. In particular, this will also improve the energy utilization performance of commercial and high-rise residential buildings in Hanoi and Ho Chi Minh City.

### **C. DESCRIBE THE BUDGETED M & E PLAN:**

Project monitoring and evaluation will be in accordance with the standard approach of UNDP and GEF and the following table summarizes the budget for the various monitoring & evaluation (M&E) activities that will be carried out to manage and gauge the effectiveness of the project implementation. The table also shows the parties responsible for each M&E activity and the time frame for each activity.

#### **M&E WORK PLAN AND BUDGET**

<b>Type of M&amp;E activity</b>	<b>Responsible Parties</b>	<b>Budget US\$</b> <i>Excluding project team staff time</i>	<b>Time frame</b>
Inception Workshop and Report	<ul style="list-style-type: none"> <li>▪ Project Manager</li> <li>▪ UNDP CO, UNDP GEF</li> </ul>	Indicative cost: 10,000	Within first two months of project start up
Measurement of Means of Verification of project results.	<ul style="list-style-type: none"> <li>▪ UNDP GEF RTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members.</li> </ul>	To be finalized in Inception Phase and Workshop.	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on <i>output and implementation</i>	<ul style="list-style-type: none"> <li>▪ Oversight by Project Manager</li> <li>▪ Project team</li> </ul>	To be determined as part of the Annual Work Plan's preparation.	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> <li>▪ UNDP CO</li> <li>▪ UNDP RTA</li> <li>▪ UNDP GEF Directorate</li> </ul>	None	Annually
Periodic status/ progress reports	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> </ul>	None	Quarterly

<b>Type of M&amp;E activity</b>	<b>Responsible Parties</b>	<b>Budget US\$</b> <i>Excluding project team staff time</i>	<b>Time frame</b>
Mid-term Evaluation	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> <li>▪ UNDP CO</li> <li>▪ UNDP RCU</li> <li>▪ External Consultants (i.e. evaluation team)</li> </ul>	Indicative cost: 30,000	At the mid-point of project implementation.
Final Evaluation	<ul style="list-style-type: none"> <li>▪ Project manager and team,</li> <li>▪ UNDP CO</li> <li>▪ UNDP RCU</li> <li>▪ External Consultants (i.e. evaluation team)</li> </ul>	Indicative cost : 30,000	At least three months before the end of project implementation
Project Terminal Report	<ul style="list-style-type: none"> <li>▪ Project manager and team</li> <li>▪ UNDP CO</li> <li>▪ local consultant</li> </ul>	0	At least three months before the end of the project
Audit	<ul style="list-style-type: none"> <li>▪ UNDP CO</li> <li>▪ Project manager and team</li> </ul>	Indicative cost per year: 4,000	One per program cycle and additional audit if any based on the adjusted risk rating
Spot Check	<ul style="list-style-type: none"> <li>▪ UNDP CO</li> <li>▪ Project Manager and team</li> </ul>	Indicative cost per year 2,000	Yearly
Visits to field sites	<ul style="list-style-type: none"> <li>▪ UNDP CO</li> <li>▪ UNDP RCU (as appropriate)</li> <li>▪ Government representatives</li> </ul>	For GEF supported projects, paid from IA fees and operational budget	Yearly
<b>TOTAL indicative COST</b> Excluding project team staff time and UNDP staff and travel expenses		US\$ 82,000 (+/- 5% of total budget)	


**PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)**

**A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT(S) ON BEHALF OF THE GOVERNMENT(S):**

<b>NAME</b>	<b>POSITION</b>	<b>MINISTRY</b>	<b>DATE</b>
<b>Dr. Van Tai Nguyen</b>	Director General	MINISTRY OF NATURAL RESOURCES AND ENVIRONMENT	04/02/2013

**B. GEF AGENCY(IES) CERTIFICATION**

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for CEO endorsement/approval of project.
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<b>Agency Coordinator, Agency Name</b>	<b>Signature</b>	<b>Date (Month, day, year)</b>	<b>Project Contact Person</b>	<b>Telephone</b>	<b>Email Address</b>
Adriana Dinu  Executive Coordinator, UNDP/GEF		6/26/2015	Rakshya Thapa RTA, EITT		Rakshya.thapa@undp.org

**ANNEX A: PROJECT RESULTS FRAMEWORK** (either copy and paste here the framework from the Agency document, or provide reference to the page in the project document where the framework could be found).

Complete project result framework can be found in PROJECT RESULT FRAMEWORK Section of the Project Document on page 59 to 63.

**ANNEX B: RESPONSES TO PROJECT REVIEWS** (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF).

(i) Comments submitted by GEF Council Members on the November 2013 work program

Country	Comment	Response
Germany	<p>Germany approves the following PIF in the work program but asks that the following comments are taken into account:</p> <p>1. The project proposes to make use of the rare type of parallel co-financing as referred to by the GEF. Germany seeks clarification especially for the question of how sustainable results shall be ensured and in how far the financing mechanisms to be established under UNDP's activity providing the parallel co-finance include loan and grant schemes or in how far the activity restricts to building up legal frameworks.</p>	<p>1. The parallel co-financing is the UNDP co-financing referred to by UNDP since the funding would be administered separately. It is in kind and cash contributions - as committed during PIF approval. The co-financing does not include loan or grant scheme and is the associated budget of ongoing baseline projects whose outputs are subsumed within the GEF Project.</p> <p>By systematically supporting barrier removal activities and facilitating stringent enforcement of EEBC and going beyond-the-code through establishment of necessary legal, institutional and market supporting mechanisms, the project will ensure sustainability of results after the end of project.</p>
	<p>2. It is recommended to integrate awareness raising as part of the project proposal. A low level of awareness among building developers, owners, administrators and operators is mentioned as a main barrier to energy efficiency in commercial and high-rise residential buildings, but is not adequately addressed in the proposal. However, encouraging building owners to improve the energy efficiency of the building is essential - especially when their tenants pay the energy bills (see also STAP).</p>	<p>2. Design and implementation of communication and awareness campaign, and capacity building are incorporated into all the project components, such as Activities 1.1.1.4, 1.2.1.2, 2.4.2, and 3.3.2. The communication and awareness campaigns under the project target building developers, owners, managers, operators, practitioners and regulators. In addition, project activities on establishment of the energy benchmarking system (Activity 1.2.3.2), and the information disclosure program (Activity 1.2.3.3) will stimulate interests of both building owners and tenants in energy consumptions in commercial and high-rise residential buildings.</p>
	<p>3. It remains unclear how the limited technical capacity of building practitioners will be improved, which is also mentioned as a major barrier.</p>	<p>3. Details of how capacity building programs for building practitioners are designed and implemented are provided in the ProDoc. The capacity building needs assessment will be conducted prior to the design and development of the capacity building program in which core components of the technical training will include classroom presentations, exercises and on-site activities on EE technologies, energy audits, technical and financial evaluation, M&amp;V, energy benchmarking, as well as marketing and communication of EE, as discussed in Output 2.3 and 2.4 of the ProDoc.</p>

<p>4. Which technologies and interventions are envisaged to improve energy efficiency? An assessment of options is recommended.</p>	<p>4. EE technologies and intervention for lighting, air-conditioning, water heating, and building management have been identified during the project formulation exercise to be the most feasible options. Hence, these are considered as primary focus of the project. The initial assessments of these interventions were undertaken during the identifications of demo projects in the PPG phase (more details are given in Annex B of the ProDoc).</p>
<p>5. It would be worthwhile to exchange with other countries and institutions on their experiences concerning the improvement of energy efficiency and revising building codes (e.g. Mexican efficient housing NAMA, EBRD sustainable energy financing facilities for the building sector, GIZ PROKLIMA targeting efficient cooling).</p>	<p>5. Reviews of international experience and practices are parts of the design and development activities under the project, for example compliance toolkits in Activity 1.1.1.1, EEBC revision roadmap in Activity 1.1.1.3, M&amp;V protocols in Activity 1.2.2.1, and financial mechanisms in Activity 2.1.1. However specific activities on information exchange per se are not part of the project due to somewhat limited experience in revision and implementation of EEBC in Viet Nam. However, the project will facilitate exchange of the best practices and experiences by reaching out to over 20 UNDP-GEF projects on Buildings EE that are currently being implemented. UNDP will facilitate this by organizing regional workshops.</p>
<p>6. The proposal would benefit from including co-benefits.</p>	<p>Facilitating the realization of co-benefits is an integral part of the project. Co-benefits such as socio-economic and gender equity benefits, in addition to energy savings and GHG benefits are described in Section 2.9 of the ProDoc and Section B.2 of this CER document. During project implementation, the actual co-benefits that will result from the activities carried out under the project will be monitored, reviewed/and evaluated. These will be reported during the Annual Project Review/project Implementation Reports. Findings will be disseminated and promoted to relevant target audience to reinforce the thrust towards increased promotion and implementation of EE applications in the building sector.</p>



<p>United States</p>	<p>The United States welcomes this project proposal and encourages the following recommendations to be taken into consideration in the final project proposal:</p> <p>1. Emission factors: On page 8, the PIF states that cumulative energy savings from the GEF intervention from 2013 to 2020 would be about 2,690 GWh, with avoided emissions of 1.092 million tons CO<sub>2</sub>e. The footnote states that this is based on a grid emission factor of 0.57 kg/kWh; however applying this factor to the 2,690 GWh yields a much larger value for the avoided emissions (over 1.5 million tons). We recommend this be checked.</p>	<p>1. The project development team used the latest grid emission factor of 0.5603tCO<sub>2</sub>/MWh published by the Vietnamese designated national authority (DNA), the Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resource and Environment.</p>
	<p>2. Does the grid emission factor account for differences in fuel mix between Hanoi and Ho Chi Minh City?</p>	<p>2. No, the grid emission factor used is the single average value published by the Vietnamese DNA.</p>
	<p>3. Did the project designers use a single average emission factor, or one that accounts for base load vs. peaking power?</p>	<p>3. A single average grid emission factor published by the Vietnamese DNA as stated above was used. See Annex IV: Calculating GHG Benefits</p>
	<p>4. From the PIF it looks uncertain whether the avoided emission calculations only include reductions from electricity use. Given the climate in Hanoi and northern Vietnam in the winter months, one would expect reductions in heating fuel use as well from improvements in the building shell, insulation etc. Are these benefits included, or are they expected to be small?</p>	<p>4. Most of commercial and high-rise residential buildings in Viet Nam use electricity for heating. Considering this, emission reductions from savings of heating fuels are expected to be negligible from the buildings targeted by the Project.</p>
	<p>5. On page 12, with respect to the risk that “low electricity tariffs could serve as a disincentive to EE,” the PIF states that “MOC and the CEEBs will coordinate with the utility and relevant government authorities to set the electricity tariff at a level that reflects the true cost.” This statement should be clarified. Is this an existing policy or plan? What is the time frame for implementation? If not, how is it expected to happen – will the GEF project itself attempt to catalyze this action? How will the program adapt if electricity prices are not increased?</p>	<p>5. Efforts to gradually remove subsidy components from electricity tariff in Viet Nam is an existing policy and ongoing implementation in Viet Nam following the effective of Prime Minister Decision No. 24/2011/QD-TTg dated 15/4/2011 which allows the utility to adjust electricity prices every three months based on changes in fuel costs or exchange rates. Through the Project Steering Committee, the project will coordinate with MOIT, which is responsible for supervision and approval of the electricity tariff adjustment, to ensure the continuation of the subsidy reduction effort. Note that the feasible economic assessments of demo projects are based on the current electricity tariff, and the project identifies low electricity tariff as a medium risk.</p>

	<p>6. Many of the objectives of this project (e.g., reforming building codes, working with ESCOs) appear to be very similar to those of the USAID Vietnam Clean Energy Program (VCEP), but VCEP does not appear to be mentioned in the PIF. To what extent has/will this project be coordinated with VCEP?</p>	<p>6. VCEP is being implemented through the MOC, and some of its activities have been subsumed into the EECB project, including building surveys, development of building database and relevant capacity building programs for stakeholders. Refer to para 27 in pp. 16 of the ProDoc</p>
	<p>7. The project should also engage with the ILO which has a presence in Vietnam on worker safety and health issues, as well as the Vietnam General Confederation of Labor (VGCL) and relevant employer organizations on worker rights and safety issues in the building energy efficiency sector. The VGCL and employer organizations may also be able to support the project to identify key stakeholders – including target employers and workers - to enhance their capacity in designing, financing, and implementing EE measures.</p>	<p>7. With respect to the safety and health issues, the project will ensure that all relevant civil, mechanical and electrical works during implementation of EE in new and retrofitted buildings will be carried in accordance with the relevant Vietnamese national codes of practice for safety of all workers and personnel involved. As such, during the Social and Environmental Screening Procedure, occupational health and safety risk to workers has been determined as low. Nevertheless, during project implementation in case this risk is reclassified as Medium to High risk, the project will engage, as necessary, with the Ministry of Labor and Social Welfare and the Department of Labor and Social Welfare in Hanoi and HCMC, through which the ILO and the VGCL will be consulted for integration of relevant safety and health issues in the capacity building programs.</p>

(iii) Scientific and Technical Advisory Panel (STAP) comments – October 7, 2013

Based on this PIF screening, STAP’s advisory response to the GEF Secretariat and GEF Agency(ies):  
 Minor revision required.

<b>Q#</b>	<b>Comment</b>	<b>Response</b>
<p>Sec. III, 2<sup>nd</sup> para.</p>	<p>STAP recommends reference to a report from GEF- STAP "Climate Change: A scientific assessment for GEF" available at <a href="http://www.stapgef.org">www.stapgef.org</a> The report provides details on the following: i) low cost and high mitigation potential; ii) high cost and high mitigation potential; and, iii) socially relevant energy access building technologies for developing countries. STAP recommends assessment of different combinations of technologies in the building sector, since there are a large number of technologies and interventions available for improving energy efficiency in buildings. Opportunities include: space</p>	<p>The "Climate Change: A scientific assessment for GEF" report was reviewed and the initial assessments of EE opportunities for the project and demonstration sites were undertaken, and incorporated into the project design. The initial opportunities identified include: cooling, lighting, water heating, ventilation, appliances, building construction materials, and building control and management systems, and these are generally classified as low cost and high mitigation potential. More detailed technical and economic feasibility assessment of the selected demo buildings will be carried out during the project implementation.</p>

	heating, cooling, lighting, water heating, ventilation, cooking, appliances, and building construction materials and literally a large number of activities and technologies are involved.	
Sec. III, 3 <sup>rd</sup> para.	The barriers mentioned are very generic and thus it is necessary to conduct an assessment to identify specific barriers to enable targeted interventions.	Specific barriers identified during PPG and included in Section 1.4 (Barrier Analysis) of the ProDoc.
Sec. III, 4 <sup>th</sup> para.	It is not clear why public buildings are being excluded, since it may be easier to implement the energy efficiency measures where the government controls and manages the building.	The revised EEBC issued by MOC include government buildings in its scope of implementation. Following discussion with stakeholders during the PPG, it was agreed that new and retrofitted government buildings in Viet Nam can also benefit from the project outputs and activities and therefore they should be included in the project scope. This has been reflected in the primary target buildings mentioned in para 42 of the ProDoc.
Sec. III, 5 <sup>th</sup> para.	STAP suggests a clear separate set of strategies for new buildings and for retrofitting of existing buildings. Both provide large opportunities.	Component 1 is comprised of actions that will stimulate EE investments in both new and existing commercial and high-rise residential buildings, while Component 2 and 3, which are more directed toward existing commercial and high-rise residential buildings are comprised of actions that will promote and support the application of EE technologies in such buildings (e.g. ESCO supports and retrofitted demo projects as detailed in Output 2.4 of the ProDoc).
Sec. III, 6 <sup>th</sup> para.	How will the technology packages be developed? Does the CEEB have the technical capacity to develop the technology packages?	The technology packages will be developed by CEEBs and building practitioners in Viet Nam. Some building practitioners already have sufficient capacity to develop EE technology packages for building. However a comprehensive capacity building programs will be designed and implemented by the project to ensure that CEEBs and more building practitioners can develop the technology packages for the building sector in Viet Nam, as outlined in Outputs 2.3 of the ProDoc.
Sec. III, 7 <sup>th</sup> para.	The focus seems to be largely on developing institutional capacity and the guidelines for the sector. However, in reality to achieve market development a large number of activities, such as technology package development, demonstrating the financial viability of the energy efficiency technologies, and creating awareness, will be necessary.	Technology package development will be facilitated by various activities under the project, such as development of EE tools and guidelines and capacity buildings for building practitioners in Outputs 1.2.1, 2.3 and 2.4. Demonstration of financial viability of EE technologies will be carried out through demonstration projects (Output 3.2); development of the economic evaluation toolkit (Activity 2.1.2), and development of M&V protocols (Activity

		1.2.2.1). The economic evaluation toolkit will help financiers and building practitioners to easily evaluate financial feasibility of EE building projects, while the results of the M&V exercise will be crucial in verifying actual energy savings and thereby validating the financial viability of EE investments. Communication and awareness activities are included in all the 3 components, such as Activity 1.1.1.4, 1.2.1.2, 2.4.2, and 3.3.2.
Sec. III, 8 <sup>th</sup> para.	Many other countries have revised their building codes to improve energy efficiency so it would be wise to initially conduct a full review to glean ideas and to learn from the experiences of others. Based on the proposal, this has possibly been undertaken already, but if not, it should become part of the proposal. But how best to enforce the code is one useful lesson, and how to overcome a possible rebound effect is one example not covered in the proposal.	<p>The revised EEBC was issued in late 2013. The project is now focusing on development of supporting mechanisms as well as toolkits to ensure effective enforcement. Review of international experience and practices has been conducted both during the PIF and project formulation stage. The project comprises activities to improve the enforcement of the 2013 EEBC. Concurrently, the project will also prepare a roadmap and action plan for the next revision of EEBC, and provide recommendations on how to best enhance the enforcement of the. Please refer to Output 1.1.1 in the ProDoc.</p> <p>Overcoming possible rebound effects of EEBC and implementation of EE in demo buildings will be respectively discussed and addressed in the beyond-code guidelines prepared by Activity 1.2.1.1, and the successful case study documents prepared by Activity 3.3.1.</p>
Sec. III, 9 <sup>th</sup> para.	It could be a useful exercise as part of the project to bring together, on occasions, the various building energy managers from the demonstrations so they can compare notes and learn from each other. The challenge to encourage building owners to improve the building efficiency when it is their tenants who pay the energy bills, appears to be under due consideration in this proposal.	Information sharing among building practitioners is one of the key elements in communication and awareness activities as outlined in Activity 2.4.2 and 3.3.2 of the ProDoc.

**ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS<sup>5</sup>**

A. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES FINANCING STATUS IN THE TABLE BELOW:

PPG Grant Approved at PIF: \$99,991			
<i>Project Preparation Activities Implemented</i>	<i>GEF/LDCF/SCCF/NPIF Amount (\$)</i>		
	<i>Budgeted Amount</i>	<i>Amount Spent To date</i>	<i>Amount Committed</i>
1. Revalidate Barriers and Baseline Projects/Activities	26,548	21,220	5,328
2. Identification, evaluation and selection of demonstrations	20,074	15,861	4,213
3. Conduct of Logical Framework Analysis (LFA) with the project stakeholders	23,750	18,494	5,256
4. Detailed Design of Project Components & Activities	18,852	15,103	3,749
5. Establishment of institutional framework for project partners/co-financiers in the project implementation and to ensure close coordination with co-financed baseline activities	10,767	7,695	3,072
<b>Total</b>	<b>99,991</b>	<b>78,373</b>	<b>21,618</b>

The project implementing partner, MOC with assistance from UNDP, assembled the project development team that carried out the PPG Exercise. The team came up with the available data and information that were utilized for the project design. The data gathering, processing and analyses have made possible the clear understanding of the current situation concerning the issues and concerns regarding the intentions and plans of the Government and buildings practitioners to promote energy efficiency improvements in commercial and residential buildings in Viet Nam. The discussions with the key stakeholders and project partners (mainly the local governments, facility owners, building energy managers and other building practitioners) have made possible the identification of relevant issues and barriers that need to be addressed and considered in the development and implementation of the Project. Intensive discussions with the key stakeholders have made it possible for the project team to fully understand the nature and extent of these issues/barriers. The logical framework analysis that was carried out by the team together with the stakeholders has enabled the confirmation of the previously defined project goal and objective, and expected outcomes. Discussions with the building owners and building energy managers, particularly regarding their technical capacity development needs, and the confidentiality concerns on corporate sensitive buildings' data became the basis of the demonstrations and specific technical assistance in various aspects of Buildings EE technology applications. The discussions with the stakeholders and project partners also resulted in getting commitments for the co-financing of the baseline activities that were subsumed into the project; as well as in the agreed

<sup>5</sup> If at CEO Endorsement, the PPG activities have not been completed and there is a balance of unspent fund, Agencies can continue undertake the activities up to one year of project start. No later than one year from start of project implementation, Agencies should report this table to the GEF Secretariat on the completion of PPG activities and the amount spent for the activities.

project coordination mechanisms and the project implementation arrangements. The outputs of these PPG activities were used in the detailed design of the Project components and activities. Overall, the PPG Exercise has achieved the PPG objective of designing, developing and documenting the Project Document.

**ANNEX D: CALENDAR OF EXPECTED REFLOWS (if non-grant instrument is used)**

Provide a calendar of expected reflows to the GEF/LDCF/SCCF/NPIF Trust Fund or to your Agency (and/or revolving fund that will be set up)

N/A

## ANNEX E: DATA, ASSUMPTIONS AND METHODOLOGIES FOR GHG ACCOUNTING

The calculation of direct and indirect GHG emission reductions follows the methodology issued by GEF in “Calculating Greenhouse Gas Benefits of the Global Environment Facility Energy Efficiency Projects, Version 1.0, issued in March 2013, and the “GEF EE Tool v1.0” was used to calculate greenhouse gas benefits based primarily on the following three methodology modules:

1. Building Code Module
2. Demonstration and Diffusion Module
3. Financial Instrument Module

For the demonstration and diffusion module and the financial instrument module, a replication factor of 2 has been applied, based on the consideration that while the project can offer profitable EE implementation models, the replications in most cases will still be restricted to availability of funds and technical capacity of the project owners. As for the top down approach, a Level 2 Causality Factor of 40%, (GEF contribution is modest, and substantial) has been applied. Other key assumptions used in calculation of greenhouse gas benefits are summarized in the following table.

### ASSUMPTIONS USED IN CALCULATION OF GREENHOUSE GAS BENEFITS

General Parameter	Project Information	
First Year of Project	2016	
Year of Project Close	2019	
Length of Analysis Period (Years After Project Close)	10	
Annual Construction Growth Rate (Commercial and High-Rise Residential Buildings)	14% (see note 1)	
Grid Electricity T&D Loss Rate (%)	10% (see note 2)	
Grid Electricity Emissions (tCO <sub>2</sub> /MWh)	0.5603 (see note 3)	
Total Floor Area of Building Stock (m <sup>2</sup> )	6,722,000 (see note 1)	
Floor Area (m <sup>2</sup> ) Subject to Code Built in Year 2016	894,000 (see note 1)	
Cumulative Floor Area (m <sup>2</sup> ) Subject to Code Built in Year 2016-2029	34,584,000 (see note 1)	
Annual Reduction in Baseline Energy Consumption	0.5% (see note 4)	
Market Assumption (see note 5)	BAU Scenario	EECB Scenario
Annual Electricity Consumption (kWh/m <sup>2</sup> )	190 kWh/m <sup>2</sup>	155 kWh/m <sup>2</sup>
Percent New Square Meters Built Compliant with Code	20% (see note 6)	25% (1 <sup>st</sup> year) 30% (2 <sup>nd</sup> year) 40% (3 <sup>rd</sup> year) 50% (4 <sup>th</sup> year)

- Note:
1. Estimation based on 2012 data published by various property management companies in Viet Nam
  2. Based on a default value in the GEF EE Tool V.1.0 which is equivalent to the World Bank data.
  3. EF for 2012, published by DNA/Department of Meteorology, Hydrology and Climate Change, Ministry of Natural Resource and Environment
  4. Assumption by the Project Preparation Team
  5. For each scenario, annual electricity consumption based on weighted average EUI (SEC) for typical building designs and EE compliant building designs.
  6. Based on discussion with MOC and national experts.



Estimation of the total market potential for emission savings is summarized in the table below.

**ESTIMATION OF THE TOTAL MARKET POTENTIAL FOR EMISSION SAVINGS**

<b>Description</b>	<b>Energy Consumption (GWh)</b>	<b>Emission (tCO<sub>2</sub>)</b>
Cumulative Baseline Scenario (2016-2029)	7593	4,254,172
Cumulative Full EE Potential Scenario (2016-2029) <small>(see note 1)</small>	6494	3,638,339
<b>Total Market Potential (Cumulative Savings 2016-2029)</b>	<b>1099</b>	<b>615,833</b>

Note 1: All new buildings from 2016-2029 meet the revised EEBC 2013, and all stock in 2015 are 10% more efficient

The overall results and GHG benefits by component produced by the GEF EE Tool V.1.0 are presented below.

**OVERALL RESULTS**

### All Components

	Cumulative			Annual			
	Total	2016-2019	2020-2029	2016	2019	2025	2035
Direct Electricity Savings (MWh)	383,531	61,137	322,395	1,947	32,495	32,495	25,508
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	1,380,712	220,092	1,160,620	7,007	116,982	116,982	91,828
Direct GHG Emission Savings (tCO2)	236,382	37,680	198,701	1,200	20,028	20,028	15,721
Direct Post-project GHG Emission Savings (tCO2)	961,277		961,277	0	0	91,564	573,634
Indirect Bottom-up Emission Savings (tCO2)	123,069		123,069				
Indirect Top-down Emission Savings (tCO2)	246,353		246,353				

### Building Codes Components

	Cumulative			Annual			
	Total	2016-2019	2020-2029	2016	2019	2025	2035
Direct Electricity Savings (MWh)	299,912	44,834	255,078	1,565	25,508	25,508	25,508
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	1,079,684	161,404	918,280	5,632	91,828	91,828	91,828
Direct GHG Emission Savings (tCO2)	184,845	27,633	157,212	964	15,721	15,721	15,721
Direct Post-project GHG Emission Savings (tCO2)	955,531		955,531			91,564	573,634
Indirect Bottom-up Emission Savings (tCO2)							

### Demonstration & Diffusion Components

	Cumulative			Annual			
	Total	2016-2019	2020-2029	2016	2019	2025	2035
Direct Electricity Savings (MWh)	70,848	13,748	57,100	382	5,710	5,710	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	255,053	49,493	205,560	1,375	20,556	20,556	0
Direct GHG Emission Savings (tCO2)	43,666	8,473	35,192	235	3,519	3,519	0
Direct Post-project GHG Emission Savings (tCO2)							
Indirect Bottom-up Emission Savings (tCO2)	105,577		105,577				

### Financial Components

	Cumulative			Annual			
	Total	2016-2019	2020-2029	2016	2019	2025	2035
Direct Electricity Savings (MWh)	12,771	2,554	10,217	0	1,277	1,277	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
N/A	0	0	0	0	0	0	0
Direct Total Energy Savings (GJ)	45,976	9,195	36,780	0	4,598	4,598	0
Direct GHG Emission Savings (tCO2)	7,871	1,574	6,297	0	787	787	0
Direct Post-project GHG Emission Savings (tCO2)	5,746		5,746				
Indirect Bottom-up Emission Savings (tCO2)	17,491		17,491				

## INDIRECT TOP-DOWN IMPACTS

	User-Specified
Total Market Potential (tCO2)	615,883
Causality factor	40%
Indirect Top-Down Emission Reductions (tCO2)	246,353

### Notes

All new buildings from 2016-2029 meet the revised EEBC 2013, and all stock in 2015 are 10% more efficient.