

# **FINAL EVALUATION**

## ***Vietnam Energy Efficiency Public Lighting (VEEPL)***

**Government of Viet Nam  
United Nations Development Program  
Global Environment Facility**

**Final version**

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## LIST OF ABBREVIATIONS

ADB	Asian Development Bank
APR-PIR	UNDP/GEF Annual Project Review – Project Implementation Report
APPR	Annual Project Progress Report
AWP	annual work plan
CFL	compact fluorescent lamp
CO	Country Office
CO <sub>2</sub>	carbon dioxide
DoUIT	Department of Urban and Technical Infrastructure (of MoC), now called Administration of Technical Infrastructure
ECC	HCM City Energy Conservation Center
EE	energy efficiency or energy-efficient
EEA	energy efficiency agents
EEL	energy-efficient lighting
EEO	Energy Efficiency Office of MoI (also referred to as ESO)
EEPL	energy efficient public lighting
EE&C	energy efficiency and conservation
ESCO	energy service company
EVN	Electricity of Vietnam
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
GWh	gigawatt-hour
Hapuelco	Hai Phong Urban and Electric Lighting Co.
Hapulico	Hanoi Lighting and Urban Equipment Co.
HPS	high-pressure sodium lamp
HPM	high-pressure mercury lamp
HCMC	Ho Chi Minh City
HUT	Hanoi University of Technology
ICE	Institute of Construction Economics of MoC
IEP	Institute of Engineering Physics of HUT
IFS	Institute of Financial Science of MoF
IoE	Institute of Energy of EVN
IMS	Institute of Materials Science of VAST
ISTA	international senior technical advisor
KCT	Science and Technology Television Club (STTC)
kt / ktonne	kilotonne
MEPS	minimum energy performance standard
MoC	Ministry of Construction
MoF	Ministry of Finance
MoI	Ministry of Industry, also referred to as MoIT
MoIT	Ministry of Industry and Trade
MoST	Ministry of Science and Technology
MW	megawatt
NEX	national execution
NLAC	National Lighting Advisory Committee
NPD	national project director
NSTA	national senior technical advisor
O&M	operation and maintenance
PECSME	Promoting Energy Conservation in Small and Medium-Scale Enterprises Project
PL	public lighting
PLIC	Public Lighting Information Center (of VLA)
PM	project manager

PMU	project management unit
PO	project owner
PSC	project steering committee
QUATEST	Quality Assurance and Testing Center
R&D	research and development
Ralaco	Rang Dong Light Source and Vacuum Flask Joint Co.
Sapulico	Public Lighting Company of HCMC
TWG1	Technical Working Group and EEL Standards
TWG2	Technical Working Group on EEL Technology Transfer
ULC	Urban Lighting Consultancy Research Center
UNDP	United Nations Development Program
USD	US dollar
VTV	Vietnam Television
VAST	Vietnamese Academy of Science and Technology
VEEPL	Vietnam Energy Efficient Public Lighting Project
VINAKIP	Vietnam Joint Stock Electrical Tools Co.
VND	Vietnamese Dong
VLA	Vietnam Lighting Association
WB	World Bank

## EXECUTIVE SUMMARY

The fast urbanization and modernization process in Vietnam has promoted the increased energy demand for industries and means of transport, and at the same time, strengthened in a natural way the demand for modern types of energy in cities, where people live with higher levels of income. All these factors have led to the fact that the demand for final energy use of Vietnam is increasing faster than its economic growth rate. Energy demand may triple over the next decade and Vietnam will have to rely increasingly on imported energy, including coal and oil.

Over the past decade, the Government has therefore increasingly paid attention to reducing the pressure on energy supply by issuing legislation and regulations regarding energy efficiency and conservation in the various energy consuming sectors. Given this background, the project “Vietnam **Energy Efficient Public Lighting (VEEPL)**” was conceived by the United Nations Development Programme (UNDP) and the Vietnamese Academy of Science and Technology (VAST). The project started in 2005 with co-financing from the Global Environment Facility (GEF) as well as from national government and private financial resources. The project is scheduled to end operationally in June 2011. Per GEF and UNDP procedures, the project has to undergo a **final evaluation**. A mission for this purpose was carried out by two independent evaluators and their findings and conclusions are presented in this report.

The project’s main **achievements** can be summarized as follows:

- 1) Public lighting (PL) policy development
  - Development of a regulatory framework for public lighting, including a) Vietnam National Strategy of Urban Lighting Development up to 2025, b) Decree on Urban Lighting Management (2009), c) Circular guiding the implementation of the Decree (August 2010) on integration of EEPL in city planning, d) Circular on the technical requirements for EE luminaires;
  - Energy performance standards for a number of lighting products (compact fluorescent lamps, ballasts for fluorescent lamps, tubular fluorescent lamps, high-pressure sodium lamps);
  - Formulation of local policies and plans regarding installation of EE equipment for public lighting as well as integration of EE public plans in the local urban planning
  - Design of standards lighting for schools and other public buildings;
  - Handbook on EEPL systems.
- 2) PL technical support program
  - Technical support provided to various lighting product manufacturers to improve their products (CFLs, T8, ballasts for high-pressure sodium lamps, T8, ADSL control systems),
  - Improvement of lighting test capacity at testing centers; Testing of selected CFL models at the testing centers;
  - Design software tools of lighting and lighting products transferred; Handbook with guideline on use of design software distributed;
  - Proposal on the establishment of National Lighting Testing and Certification Lab has been completed.

- 3) PL financing program
  - A number of studies have been done on appropriate financing schemes and accompanied mechanisms for public lighting improvement projects. National workshops and forums on EEPL mechanisms and appropriate schemes for the financial sector and lighting industry have been held.
- 4) PL demonstration program
  - Large cities such as Hanoi, Ho Chi Minh, Hai Phong, Da Nang, Quy Nhon, have successfully implemented several pilot lighting control measures such as lighting control boxes using power transmission line, lighting control boxes using GPRS/GRS technology, two-power ballasts, etc.
  - In 2009, the pilot implementation of Central PL System Control (CPLSC) for streets was successfully completed in Ho Chi Minh City with significant lighting quality improvements and energy savings;
  - Replication of pilot projects to other cities (street lighting) and schools;
  - Development of analytical tool to estimate the collective annual and cumulative energy savings and CO<sub>2</sub> reductions resulting from operation of demo projects as well as indirect impacts due to replication.
- 5) PL info dissemination
  - Maintenance of VEEPL website;
  - Distribution of promotional materials, printed articles, etc,

Regarding **impacts**, the project team (project management unit) mentions having surpassed its targets as set out in the original Project Document in terms of cumulative energy savings and associated greenhouse gas emission reduction as well as in the reported penetration of energy efficient products in urban and rural street lighting and school lighting systems. The Project Document mentions a target of cumulative energy savings of 398 GWh and related cumulative greenhouse gas emission reduction of 171 ktCO<sub>2</sub>. The project reporting claims to have achieved 295 tCO<sub>2</sub> and energy savings (cumulative) of 687 GWh. However, this includes direct and indirect impacts (replication). Applying a correction factor for indirect impacts, emission reduction impact is more likely to be in the order of 150 ktCO<sub>2</sub>. The correction factor takes into account that not all indirect impacts can be attributed to the project's intervention, but are also a result of the general change in the market for high-efficiency lighting towards efficiency, as well as some incompleteness in the reported data on replication. Annual local manufacture of the improved EE lighting products (lamps) increased from 37.5 million in 2008, to 41.4 million in 2009, and 46.3 million in 2010. Among them, about 50% were exported abroad.

We can conclude that, since the project's inception, significant improvements have been achieved in utilization of EE products in public lighting, to which the project has contributed significantly. However, we cannot rate the project's **progress towards achieving its objectives** as fully satisfactory, but as between *satisfactory and marginally satisfactory* for the following reasons:

- The results in the various components vary. Most success in terms of impacts has been obtained in the more technological components 2 (standards and support to industry), highly satisfactory and 4 (demonstration schemes); satisfactory). We also rate the policy development (component 1) as satisfactory. Less impact is noticeable in awareness raising component 5 (marginally satisfactory) and component 4 on the finance mechanisms (unsatisfactory). The project has raised awareness in certain beneficiary groups (street lighting in selected cities; schools), but has remained absent in another intended target groups, i.e., hospitals. The component 4 (financing) has produced some

analysis on financial issues, but this analysis has not resulted in a clear indication on how to success of the demo activities in the large cities, such as HCMC or Hanoi, can be translated to the poorer cities and regions of Viet Nam by means of sustainable technology delivery and financing models that have the support of national and local governments.

- Most of the project outputs have been completed in due time or with little delay. Theoretically this would mean that the project has been performing well and on schedule. However, the quality of some of the earlier outputs (reports) has been described as poor and more notably so in the non-technical components. This was described extensively in the Mid-Term Evaluation (MTE) report (2008).

On **project implementation**, the project has managed to pull together a network with stakeholders from lighting companies, cities, lighting manufacturers, schools and government officials from city councils as well as national ministries (MoI, MoST, MoF, MoC). To the project's credit, this has created a sound base of stakeholders that work together in promoting efficient lighting in streets and public buildings. On the other hand, since many partners were also subcontracted by the project this may have led to the above-mentioned laxity regarding quality of some of the reports produced by these partners. In project implementation, the project team has clearly focused on producing the outputs in terms of deliverables, rather than on integrating the results of the numerous technical reports and subcontracts in summary reports and easy-to-read topic papers. This would have been quite helpful to provide info to decision-makers and staff of organizations that may only be involved in efficient lighting on an occasional basis. We give a rate of *marginally satisfactory* on project implementation.

The PMU has a different view on rating of project implementation and progress towards achieving its objectives and its opinion has been annexed to this Evaluation Report.

The project team (PMU) should have acted more promptly on the lack of progress, e.g. in the component on financing. On the other hand, it also illustrates the fact, that in many UNDP/GEF documents, it is assumed that the various barriers to market development of a technology are equal in importance and can be addressed within the same timeframe. This is not the case. For example, the group of financial-related barriers proved to be more complex and intractable than others, reflecting the fact that the public sector in Viet Nam works different than commercial establishments in terms of budget allocation, fund raising and revenue sharing and commercial-financial concepts cannot automatically applied. This helps to explain the lack of progress in some components. In general, the implementation period of a typical UNDP/GEF project (4 to 6 years), may not be sufficient to address all the barriers within the same timeframe. This is one **lesson learned**.

The Evaluation Report ends with the following **recommendations**:

- While the project's outputs and deliverables have been extensively reported, what is missing for future reference is a 'Final report' that integrates the results and impacts of the various components and outputs as well as barriers still remaining and presents it in one, easy-to-read, document. If budget availability allows it, we propose that such a report be written;
- A draft exit strategy has been prepared by the project team, suggesting how the stakeholders can continue VEEPL's activities on the near term. This should be expanded with the conclusions of the before-mentioned 'final report' and be aligned with the new UNEP/GEF-supported project "Phasing out Incandescent Lamps through Lighting Market Transformation in Vietnam". Also, the issue of operation and maintenance of the project's website as well as the database on efficient public lighting applications should

be detailed further in terms of activities that the ‘successor organization’ will undertake in the coming years indicating budget availability.

- In addition, the Evaluation Team suggests a number of options for future efforts by these institutions and companies to further promote the cause of EE PL in Vietnam.

*Capacity building and awareness*

- Capacity building of energy auditors and managers
- Certification program for energy auditors and managers
- Strengthen monitor and verification mechanism (e.g., using and expanding) the VEEPL M&E tools and software);
- The VEEPL website should be continued by VLA (Vietnam Lighting Association) and current info retained and even expanded;

*Regulation and implementation*

- Establish institutional framework for monitoring of the implementation and enforcement of the various EE PL regulations and Decrees
- Technical support for integration of EE PL with other standards, such as the new Energy Management Standard (EnMs, ISO 50001)
- Consider financial incentives (tax credits, accelerated depreciation, import duties, etc., as appropriate;

*Market development and financing*

- Capacity building for financial institutions and banks as well as management of public utilities on options and issues in EE project financing, leveraging commercial finance, performance contracting and ESCO business models. The idea has been mooted to create a ‘Super ESCO’, a government ESCO with the dual responsibility of implementing EE projects in the public sector, while simultaneously building the capacity of private ESCOs. This idea, as well as options to finance such a ‘Super ESCO’ could be investigated further;
  - Some donors (WB, ADB, USAID) and institutions (VNEEP, VEPF) have expressed interest in continuing to support EE public lighting activities. This should be followed up.
- The project team of VEEPL has prepared a new proposal to be submitted through UNDP to GEF called “Promotion and Development of Local High Brightness White Light-Emitting Diode (HBWLED) Technologies for Advanced General Lighting in Vietnam”. LEDs form an emerging technology that is beginning to find wide applications in residential, office and industrial lighting applications. The Evaluation Team welcomes such an initiative to promote manufacturing in Viet Nam for domestic as well as export markets, but has two observations. First, the initiative would benefit from involving a commercially oriented organization in day-to-day implementation alongside VAST and/or Ministries as government partners. Second, there is currently a UNEP/GEF project (mentioned earlier) that focuses on phasing out incandescents (to be replaced by compact fluorescent and other energy efficient products) and the two projects should be well coordinated in both design and implementation.

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# 1. INTRODUCTION

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## 1.1 Background

### *The economy and the power sector*

The fast urbanization and modernization process in Vietnam has promoted the increased energy demand for industries and means of transport, and at the same time, strengthened in a natural way the demand for modern types of energy in cities, where people live with higher levels of income. All these factors have led to the fact that the demand for final energy use of Vietnam is increasing faster than its economic growth rate. If the GDP grows at around 6.9% per year between 2009 and 2018 and if the ratio of energy use elasticity to GDP is 1.7 as happened in the last decade, the demand for energy will increase by approximately 12.1% per year. Although slightly lower than in the previous decade, energy demand will triple in 10 years with the total final energy consumption exceeding 100 million tons of oil-equivalent (TOE) in 2018.

As the economy expands, energy consumption in Viet Nam is expected to grow 70% faster than GDP. By 2010, electricity consumption in Viet Nam was 5.5 times the 1995 levels (77,406 GWh in 2010 compared to 14,636 GWh in 1995) and grew with 15% during 2001-2005. Electricity generation was 53,462 GWh in 2005, of which 22% produced by independent power producers and 78% by the state-owned utility EVN (36% hydro and 52% fossil fuels). Available capacity was 10,937 MW with maximum power demand of 9,255 MW<sup>1</sup>. Thus, current demand for electricity is only just being met, particularly at peak time, and supply is often unstable.

If energy demand continues to triple in the next decade, Vietnam will have to rely increasingly on imported energy, including coal and oil. This will also pose a challenge for the government of Viet Nam is to honor international commitments to greenhouse gas emission reductions.

### *Energy efficiency*

Since early 2000, the government has paid attention to reducing the pressure on energy supply by issuing:

- *Electricity Law (2005)*, which devotes one chapter to EE in power generation, transmission, distribution and efficiency;
- *Governmental Decree 102/2003*, which forms the foundation for taking energy efficiency and conservation (EE&C) actions under the responsibility of the Ministry of Industry (MoI).
- *MoI Circular 01/2004*, to enforce the Decree and serving as guidelines for EE&C in factories,
- *MoI Circular 08/2006*, to enforce the Decree and serving as guidelines for EE standards and labeling;
- *EE building Code (40/2005)*, to reduce energy loss in commercial buildings,
- *Prime Minister Decision 79/2006*, establishing the National Energy Efficiency Program (described in more detail in Box 1);

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<sup>1</sup> Source: *Review of Vietnam Energy Efficiency and Conservation Policy*, Mr. Phuong Hoang Kim, Energy Efficiency Office, Ministry of Industry

- *Prime Minister Decision 80/2006*, on increasing of the public spending on electricity saving,
- *MoI Decision 919/2006*, establishing the Energy Efficiency Office (EEO) within the Ministry of Industry (MoI).
- *Economical and Effective Use of Energy Law* (17 June 2010), which provides economical and efficient use of energy; policies and measures to promote economical and efficient use of energy; and the rights, obligations and responsibilities of organizations, households and individuals in economical and efficient use of energy;
- *Law on Energy Efficiency and Conservation No 50/2010/QH2* (28 June 2010) by the Vietnam National Assembly
- *Decree No21/2011/NĐ-CP* on guiding the enforcement of the Law on Energy Efficiency and Conservation No 50.

MoIT has started drafting the regulations for implementation of the Law, but are still in draft form, for example:

- a. Decree on guiding the implementation some articles of the Law on energy efficiency and conservation.
- b. Decree on Provisions of administrative sanctions in the field of energy conservation and efficiency.
- c. Decision of the Prime Minister, specifying list of facilities and equipment that must be tagged with the energy label and has to apply minimum energy efficiency;
- d. Document on the Efficient and Effective Enforcement of Energy Efficiency Regulations in Vietnam

#### *Energy-efficient public lighting (EE PL)*

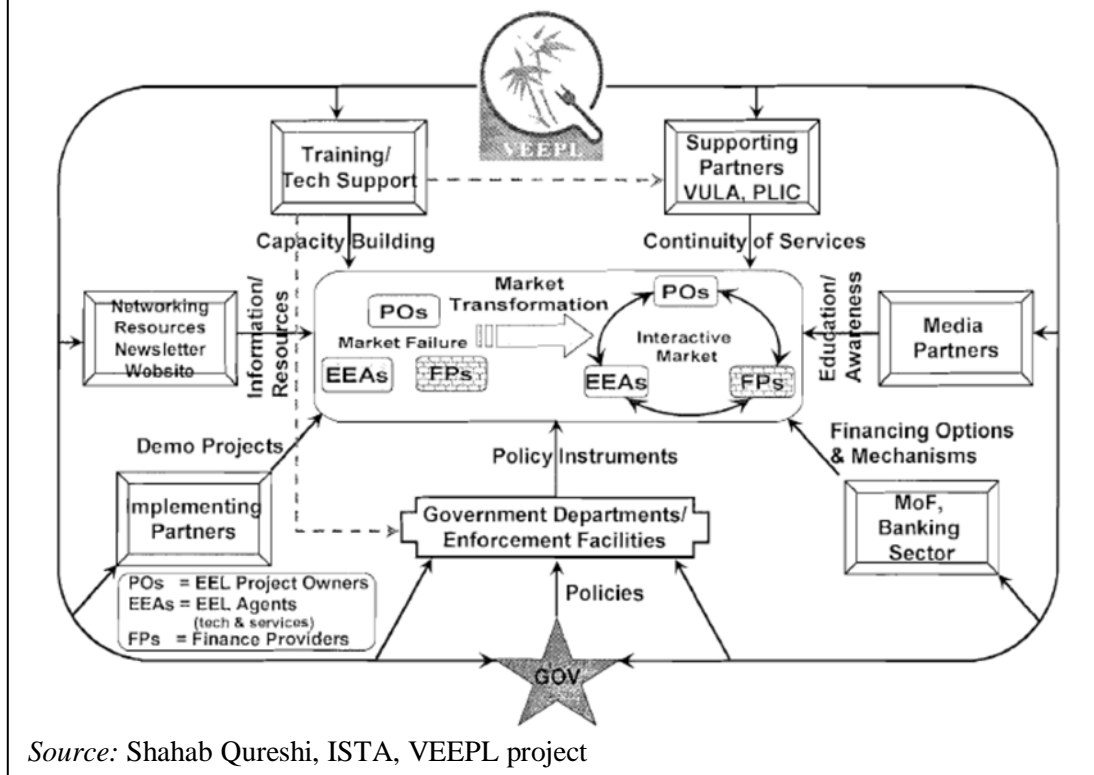
In order to reduce their energy bills and to help reduce greenhouse gas (GHG) emissions, the Project Owners (Government officials responsible for investment on lighting, new or retrofits, in schools, hospitals, and other public places termed POs) would hire services of Energy Efficiency Agents (manufacturers and vendors of energy efficient lighting products and services termed EEAs) to ensure all new and/or replacement lighting installations are most energy efficient (see Figure 1).

However, a number of barriers, which result in market failures, has prevented the desired market operation as above. The lowering of market barriers should result in transformation into a market situation that is more facilitating and close to ideal market conditions, as above. In Vietnam these market barriers/failures have been identified as<sup>2</sup>:

- Institutional:
  - Lack of national and local level policies to provide incentives for EEPL,
  - Lack of policy instruments (energy performance standards for infrastructure and equipment, labeling, consumer education/awareness, etc.),
  - Lack of ability to enforce policy instruments (testing, auditing and certification facilities and capabilities),
  - Lack of availability of skills to provide professional services for design, development and implementation of EEPL systems,
  - Lack of legal instruments to support development of ESCO (energy service companies) sector;

<sup>2</sup> Source: VEEPL Project Document

**Figure 1 Framework of VEEPL project**



- Financial:
  - Lack of funding resources available to POs for execution of their EEPL projects,
  - Lack of viable financing mechanisms to provide funding for EEPL projects under ordinary business norms;
- Socio-Psychological:
  - Lack of awareness and appreciation about the benefits of EEPL;
- Lack of ability to conduct sophisticated cost benefits analysis;
- Lack of awareness and willingness to utilize commercial financing resources for EEPL projects.

## 1.2 Project objectives and strategy

To address the above-mentioned barriers, the United Nations Development Programme (UNDP) and the Vietnamese Academy of Science and Technology (VAST) developed a project to promote the application of energy efficient lighting in the country's public sector entitled Vietnam Energy Efficient Public Lighting Project (VEEPL). The project was submitted to the Global Environment Facility (GEF) for financial support. The Project Document was prepared during 1999-2004, approved by the GEF Secretariat on February 2005 and project activities started by the end of that year.

The UNDP Project Document mentions as its project **goal** (global objective) "the reduction of greenhouse gas emissions from fossil fuel based power generation in Vietnam". The project **purpose** (development objective) is the "improvement of lighting energy utilization efficiency through the removal of barriers to the widespread application of energy efficient lighting systems in the public sector in Vietnam". It was estimated that by the end of VEEPL project, the greenhouse gas (GHG) emissions would be reduced by a cumulative amount of

171.2 kilotons of CO<sub>2</sub>. The energy savings (and GHG emission reduction) in public lighting would be derived from the installation of energy efficient public lighting (EEPL) equipment (energy-efficient lamps, high efficiency luminaries, automatic light efficiency control systems) in streets, schools, and hospitals. The total financing for the VEEPL project in 2006-2010 was USD 15.3 million of which a GEF contribution of USD 3.00 million. The project was extended in 2010 in a cost-neutral way and is scheduled to end in June 2011.

The VEEPL Project Document mentions the following project components:

- **Public lighting policy development** – activities that strengthen and improve the local and national policy and regulatory framework and encourage feasible energy efficient public lighting projects in Viet Nam.
- **Public lighting technical support program** – activities that strengthen the capacity of relevant government agencies on energy efficient public lighting product testing, market monitoring and enforcement of standards with consumers.
- **Public lighting financing program** – activities to encourage the government, financial/banking and private sectors, to provide financial assistance for the development and implementation of energy efficient public lighting system projects.
- **Public lighting system demonstration program** – activities to provide Vietnamese stakeholders with direct experience with the design, development, financing and implementation of cost-effective, energy-efficient public lighting system projects.
- **Information dissemination** – establishment of a network of technical expertise in energy efficient public lighting in Viet Nam and the production of high quality, affordable, accessible and up-to-date information services, continuing education, and awareness improvement on the application of energy efficient public lighting systems.

### 1.3 Mid-term and final evaluation; structure of the report

In accordance with GEF and UNDP rules, two evaluations have been carried out. A Mid-Term Evaluation (MTE) was carried out by two independent consultants, Mr. Jan van den Akker (Netherlands) and Mr. Nguyen Van Phuc (Viet Nam) in 2008. The mid-term evaluation report is available at <http://erc.undp.org>.

A Final Evaluation (FTE) by the same international consultant, Mr. Van den Akker, and national consultant, Mrs. Ngo To Nhien was carried out in April 2011. During the mission of the Evaluation Team, extensive discussions were held with representatives and staff from VAST, UNDP and other stakeholders (as listed in Annex B).

This report describes the findings and recommendations of the **final evaluation**. The terminal evaluation has focused on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The terminal evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits.

During the mission, the external evaluation mission drew up a table of contents that covers the issues to be addressed as mentioned in its Terms of Reference and follows the structure of this report:

- Introduction (project description and evaluation method)
- Findings on project progress
  - Project's performance in terms of results (achieving objectives and outputs by means of realized activities and inputs used) and impacts, quantitatively and qualitatively

- measured by indicators (as set in the project document and the annual project review documents)
- Description of project impacts
- Evaluator's assessment of the project design and execution
- Conclusions and recommendations
  - Conclusions, taking into account sustainability and replicability issues
  - Lessons learned and recommendations

The Evaluation Team has applied the following **methodology of evaluation**:

- i) Review of project reports, such as the Project Documents, APR-PIRs (annual project implementation reviews),
- ii) Meetings with the main project partners and stakeholders during the mission to Viet Nam.

The report is divided into three Chapters. This first chapter provides general background of the project, purpose of evaluation, project implementation setup, partners/stakeholders and evaluation methodology. The next chapter dwells on findings regarding project management and achievements. These findings are described within the logical framework design of the project, as described in the Project Document and progress reports. In the third section, conclusions from the observations and findings are discussed in the context of project objectives. These also pertain to sustainability and replicability of project. The section ends with recommendations for the further direction of the Project and some lessons learnt.

## 1.4 Project set-up and stakeholders

Figure 2 provides an overview of the implementation arrangements of the VEEPL project. The Vietnamese Academy of Science and Technology (VAST) is the national executing agency under the 'national execution' (NEX) modality. The Vice-President of VAST was appointed as *National Project Director (NPD)*<sup>3</sup> who heads the *Project Management Unit (PMU)* and is responsible for the successful execution and implementation of the project toward achieving project objectives, and accountability to UNDP and the Government for the proper and effective use of the project resources

Day-to-day operations of the PMU as well as the overall operational and financial management and reporting of the UNDP funds are under the responsibility of the *Project Manager*, supported by a National Senior Technical Advisor (NSTA) and an International Senior Technical Advisor (ISTA)<sup>4</sup>. In addition, the team consisted of 3 component coordinators, 2 administrative staff and an accounts officer<sup>5</sup>.

A *Project Steering Committee (PSC)* was set up to achieve coordination between the various project partners<sup>6</sup> and to ensure high-level guidance to the PMU and to ensure that the outputs

<sup>3</sup> Prof. Nguyen Khoa Son

<sup>4</sup> Prof. Phan Hong Khoi, Dr. Nguyen Thi Bac Kinh and Dr. Shahab Qureshi, respectively

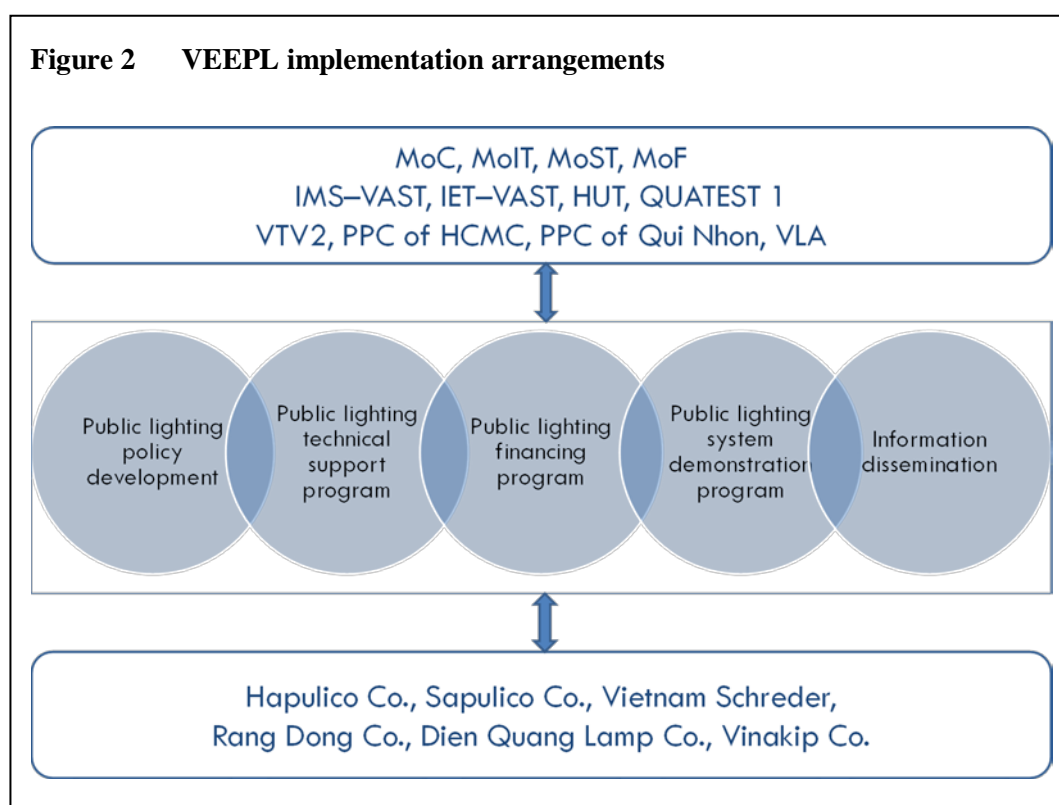
<sup>5</sup> Coordinator Policy and Finance: Ms. Bui Thu Hien, Coordinator Dissemination and Demonstration: Mr. Tran van Be, Coordinator Lighting Technology: Mr. Nguyen Tri Dung, administrative assistant and interpreter: Ms. Nguyen Thi Minh Tien, administrative officer: Ms. Tran Thi Hanh Ha, accountant: Ms. Vu Thi Anh Thu

<sup>6</sup> The Project Document mentions *central government agencies*, such a Ministry of Construction (MoC), Institute of Materials Science (IMS) and Institute of Environment Technology (IET) of VAST, Hanoi University of Technology, QUATEST1 and Vietnam television (VTV-2), *local government*, HCM City and Quy Nhon City as well as *private sector* (Hapulico, Schreder, Viettronics, Dieng Quang and Vinakip).

Other important partners are the Ministries of Industry and Trade (MoIT) and Science and Technology (MoST), Electricity of Viet Nam (EVN), National Center for Standards Development, Hanoi City, public lighting companies as well as multilateral donors (such as Asian Development Bank and World bank

produced meet the requirements of the government and all beneficiaries. The PSC was originally chaired by the President of VAST<sup>7</sup>. The PSC usually has met twice a year and has provided an opportunity to discuss the project progress reports, such as the Annual Project Progress Report (APPR)<sup>8</sup> and Annual Project Review - Project Implementation Reports (APR-PIRs) and provide guidance to the Project Management Unit.

As designated by the UNDP resident Representative, a Program Officer acts<sup>9</sup> as focal point of the UNDP Country Office (CO) in Viet Nam in facilitating and monitoring project implementation. The UNDP participates in project review, steering committee meetings,



work and budget planning meetings and monitoring and evaluation visits. In addition, the UNDP CO provides a range of project services, such as recruitment of project personnel, overseas travel and procurement of equipment upon request from the PMU.

The Project Documents and PIRs mention the following sources of financing:

- GEF (managed by UNDP): USD 3.00 million
- Managed by partners (co-financing): USD 12.318 million
  - VAST: USD 118,000
  - Ministry of Construction; USD 90,000
  - Testing laboratories (such as Quatest-1): USD 600,000
  - Vietnamese television: USD 600,000
  - Lighting equipment manufacturers and providers USD 2,790,000
  - Local government (USD 8,120,000)

<sup>7</sup> Prof. Dang Vu Minh, who continued as Chairman of the Project Steering Committee after leaving VAST and currently is the Chairman of the Science, Technology and Environment Committee of the National Assembly

<sup>8</sup> Normally referred to as APR (Annual Performance Reports) in 'UNDP language', but we have used the title as been given the PMU

<sup>9</sup> Currently, Ms. Vu Thi Thu Hang



## 2. FINDINGS

### 2.1 Implementation: achievement of project outcomes and outputs

For each of the three outcomes, as mentioned in paragraph 1.2, this section assesses the progress in the implementation of the project's outcomes and outputs, following the format and information provided as given in the UNDP Project Document and as reported by the Project Management Unit (PMU) in the annual UNDP/GEF Annual Project Review - Project Implementation Reports (APR-PIRs), the PMU's Annual Project Progress Reports (APPRs) and the Mid-Term Evaluation report. The exact formulation of outputs and corresponding indicators in the APPRs and PIRs may differ sometimes in comparison with the original Project Document, but the Evaluators have tried to capture the essence of the wording. This section tries to provide a quantitative overview, while Section 2.3 will provide a more qualitative in-depth assessment of the achievements of the outputs.

#### 2.1.1 Component 1 Public lighting policy development

*Outcome: Existing PL (public lighting) system policies & accompanied regulations are enhanced and new ones are developed*

**Table 1 Outputs and performance indicators of Component 1**

<i>Numbers: Outputs</i> (see Project Document) <i>Bullets: Indicator</i> (see APR-PIR)	<b>Value of indicators</b>	
1.1 An national lighting advisory committee (NLAC) that was established and operational	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>• No Committee</li> </ul> <p><i>Target:</i> NLAC established and operational</p> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>• NLAC established</li> <li>• Organization of national workshops in July 2006 and August 2007</li> </ul>	<p><i>Recommendation MTE<sup>10</sup>:</i> Where possible, define the roles &amp; responsibilities of the NLAC in promoting EEPL after the VEEPL project, including a proposed plan of action or program that will sustain their mandate. VEEPL to carry out actions to enable the NLAC to be the “watch dog” for the implementation and enforcement of EEPL policies and laws.</p> <p><i>Achieved 2009-2010</i> NLAC provided consultancies to the development of the Urban Lighting Strategy and Circular (see output 1.2).</p>
1.2 Comprehensive national policy study on public lighting	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>• Limited guidelines and EE standards on lighting</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>• 1 comprehensive study of policy</li> </ul>	<p><i>Recommendation MTE:</i></p> <ul style="list-style-type: none"> <li>• Quality of final reports A3 and A4 should be re-assessed as well as the new report on Urban Lighting Strategy and see how they feed into the</li> </ul>

<sup>10</sup> See also Section 2.3.1 on how the Project Management Unit in general has responded to the Mid-Term Evaluation's recommendations

<p>policy framework and submitted to MoC, MoF</p> <ul style="list-style-type: none"> <li>• Number of recommendations of the studies used in policy making</li> </ul>	<p>framework on EEPL completed and submitted to MoC, MoF by end of 2007;</p> <ul style="list-style-type: none"> <li>• 2 recommendations of the report are used in public lighting policy making</li> </ul> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>• 1 study to review national policies on EEPL completed and 2 recommendations on National policy framework on EEPL and on the outline of the Government Decree on EEPL completed and consulted and used as input in Government Decree (subcontract A3)</li> <li>• One assessment of the current legal document system on public lighting and survey on urban lighting status up to 2008 and a draft outline of Decree and Strategy (Standard letter A3)</li> <li>• Overseas study tour (Thailand) to learn from EEPL experiences</li> </ul>	<p>ongoing Decree development; it should be made sure that the work to be carried out includes actions to ensure or at least facilitate the implementation of the national policy on public lighting.</p> <p><i>Achieved 2009-2010</i></p> <p>The Government's approval has been obtained in 2009-2010 for:</p> <ul style="list-style-type: none"> <li>• National Strategy of Vietnam Lighting Development up to 2025 (No.8174/QĐ-TTg by Prime Minister),</li> <li>• Government Decree No. 79/2009/QĐ-CP on Urban Lighting Management (regulating in cities and recommended for regions outside cities)</li> <li>• Circular No.13/TT-BXD guiding the implementation of the Decree</li> </ul>
<p>1.3 Evaluation of opportunities for EE improvements in public lighting</p> <ul style="list-style-type: none"> <li>• Number of designs of new and expanded EEPL systems</li> <li>• Number of EE projects financed and implemented</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>• Limited guidelines and EE standards on lighting</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>• 20 designs of new and expanded EEPL (2010)</li> <li>• 9 EEPL projects financed</li> </ul> <p><i>Achieved by June 2008:</i></p> <p>3 cases studies of urban PL systems and proposed model (management, operation, maintenance) for three cities (Hanoi, HCM, Quy Nhon; (subcontract A3)</p>	<p><i>Recommendation MTE:</i></p> <p>The February report on 'comprehensive model' should be assessed once translated into English and then this activity should be merged with activity 3.3 and 4.1 with the idea to develop a real comprehensive 'technology delivery model' that includes an assessment of the investment requirements for the identified feasible EEPL opportunities.</p> <p><i>Achieved 2009-2010</i></p> <ul style="list-style-type: none"> <li>• Completed 3 standard designs of new and expanded EEPL system for primary, secondary, and high schools based on completed evaluation of opportunities for EE improvement in PL, and submitted to Dept. of Construction (DoC) of Hanoi for approval</li> <li>• 5 designs for new and expanded EEPL systems for A to D level roads and alleys</li> <li>• 3 EE public lighting projects that adopted the approved standard designs and are financed and implemented.</li> </ul>



<p>1.4 Development of economic and technical tools to support public lighting investments</p> <ul style="list-style-type: none"> <li>• One EEPL resource book published</li> <li>• Number of staff trained</li> <li>• Number of cities using the resource book</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>• No tools</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>• 1 resource book published by 2008</li> <li>• 10 cities/towns use the resource book</li> </ul> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>• 1 handbook has been completed, published and distributed (Standard letter A5) and one training course on use of handbook conducted in June 2008</li> </ul>	<p><i>Recommendation MTE:</i> Make a user-friendly Excel spreadsheet model as a 'tool'. This can be then be used in training workshops as well as provided to the target group (local government units, schools, hospitals and offices)</p> <p><i>Achieved 2009-2010:</i></p> <ul style="list-style-type: none"> <li>• A report on M&amp;E results on the target indicator achievement including: (i)- At least 20 lighting companies and lighting service providers using the resource handbook in their PL programmes/projects; (ii)- At least 90% of satisfied users of the resource handbook</li> <li>• Completed development of the software for calculation of economic and technical tools in the resource handbook.</li> <li>• Reportedly, about 30 lighting companies and providers use the resource book</li> </ul>
<p>1.5 Development and assistance in the enforcement of public lighting regulations</p> <ul style="list-style-type: none"> <li>• Number of PL Implementation Rules and Regulations (IRR)</li> <li>• Number of consultation workshops</li> <li>• Number of IRRs approved</li> </ul> <p>1.8 M&amp;E of PL IRRs</p>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>• No IRRs</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>• 1 PL rule and regulation (circular) formulated</li> <li>• 2 consultative workshop during 2008-2009</li> <li>• 1 Circular issued by the Ministry of Construction (MoC) on PL management IRR (2009)</li> <li>• 80% of towns complying with EEPL policy IRRs</li> </ul> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>• Review of existing IRRs (subcontract A6);</li> <li>• A proposal on sustainable development solutions for public lighting system and the first draft of circular on public lighting management developed (Standard letter A6)</li> </ul>	<p><i>Recommendation MTE:</i> Draft report on Circular (once available in English) should be assessed and recommendations linked with 1.2. The report should clearly list the actions needed to ensure or at least facilitate the implementation of the public lighting regulations.</p> <p><i>Achieved 2009-2010:</i></p> <ul style="list-style-type: none"> <li>• 2 IRRs on technical requirements on design, on O&amp;M and management submitted to MoC and provincial authorities (incl. consultation workshops)</li> <li>• M&amp;E on enforcement of IRRs (completed in 2009)</li> </ul>
<p>1.6 Integration of EEPL in local development plans</p> <ul style="list-style-type: none"> <li>• Ministerial guidance on how to integrate EEPL in cities'</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>• No or limited integration of EEPL in urban plans</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>• 1 ministerial guidance (2007)</li> </ul> <p>15 cities/towns integrating EEPL in</p>	<p><i>Recommendation MTE:</i> Output (reports) should be re-assessed and, if add-ons are needed, merged with activities 1.5 and 1.7</p> <p><i>Achieved 2009-2010:</i></p>

<p>development plans</p> <ul style="list-style-type: none"> <li>• Number of cities integrating EEPL in their construction planning</li> </ul>	<p>development plans (2009)</p> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>• 1 review and proposal on existing PL planning status and proposal on content for integrating public lighting plans in urban development plans completed ( Standard letter A7)</li> <li>• Decision on integration promulgated by MoC in March</li> </ul>	<ul style="list-style-type: none"> <li>• Reports on technical assistance to 6 cities (Haiphong, Hue, Vung Ang, Phu Yen, Vien Tri, Phuc Ninh) on how to integrate EEPL in construction planning, of which 4 cities have approved plans (Haiphong, Phu Yen, Phuc Ninh and Vung Ang)</li> </ul>
<p>1.7 Development of local public lighting policy</p> <ul style="list-style-type: none"> <li>• Number of proposals developed</li> <li>• Number of consultation meetings</li> <li>• Number of evaluations of proposed policies</li> <li>• Number of policy proposals submitted to local authorities</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>• No policy proposals</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>• 10 draft proposals of new local PL (2007)</li> <li>• 6 consultation meetings during 2007-2008</li> <li>• 1 evaluation of proposed policies (2007, annual)</li> <li>• 10 finalized policy proposals (2008)</li> </ul> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>• Development of 10 outlines for proposals and 5 new proposals on local EEPL policy developed (subcontract A8)</li> <li>• 3 consultation workshops conducted</li> <li>• 1 evaluation conducted</li> </ul>	<p><i>Recommendation MTE:</i></p> <p>Outputs 1.5, 1.6 and 1.7 are strongly interlinked, suggesting potential overlaps and gaps at the same time, while reports should feed into one another. The reports should be re-assessed by an independent consultant/reviewer to make clear the link with central Government Circular and local-level PL policies as well as with local-level PL policies and local-level urban spatial planning and PL regulations</p> <p><i>Achieved 2009-2010:</i></p> <ul style="list-style-type: none"> <li>• Reports on proposed local policies (HCMC, Nha Trang) and M&amp;E of development of policies in cities (<i>completed in 2009</i>)</li> </ul>

### Summary of main achievements

In the period from June 2006 to December 2008), the Project completed studies on public policy, technology, and financing. From the studies several recommendations were put forward to relevant ministries (MoC, MoST, MoIT)<sup>11</sup> to develop the national policy in terms of National Strategy, Government Decree, Circular; and accompanied tools (MEP standards, EE codes, technical-economic tools).

At the time of the Mid-Term Evaluation (MTE) in 2008, both the text of the Strategy on Urban Lighting Development, the Decree on Urban Lighting Management and the Circular on implementation of the Decree were still in draft form. By the end of 2010 these had been passed and we can conclude that most of the project targets for Component 1 have been achieved. The achievements can be summarized as follows:

- VEEPL provided technical assistance and inputs in the development of a regulatory framework for public lighting:
  - Vietnam National Strategy of Urban Lighting Development up to 2025, issued by Ministry of Construction (MoC) and approved by the Government (Decision 1874/QD-TTg)
  - Decree on Urban Lighting Management (79/2009/QD-CP)

<sup>11</sup> Ministry of Construction, Ministry of Science and Technology, Ministry of Industry and Trade

- Circular No13/2010/TT-BXD guiding the implementation of the Decree (August 2010) on integration of EEPL in city planning
- MoIT Circular 13/2008/QT-BCD on technical requirements for EE luminaires
- VN EE Standards (TCVN:7896, TCVN:7897) for 02 lighting products (see Section 2.1.2)
- Inputs were provided into the formulation of local policies that have been proposed for implementation to eight cities and/or provinces, including:
  - Ho Chi Minh City: regulation on technical specifications of EEPL equipment enforced in city (submitted to the People’s Committee);
  - Qui Nhon city: regulation on installation/replacement by EEPL equipment; regulation on management, operation of public lighting system towards EE; regulation on short-term planning of public lighting system;
  - Tien Giang province: regulation on enforcement of installation/replacement by EEPL equipment for public lighting system and office buildings.

Other outputs include:

- Handbook, together with software, on technical-economic tools for investment, installation and exploitation of EEPL systems was finalised in 2009 and distributed to stakeholders, while training sessions were provided;
- Completion of the integration of EEPL plans into local construction planning in some cities/towns such as Phu Yen, Vinh Phuc, Viet Tri, Hai Phong, Vung Ang and Hue.
- Standard lighting designs for schools of all kinds were completed, approved by Hanoi DoC, and has been submitted to the Ministry of Construction (MoC) for adoption as ‘standard design’ throughout the country

### 2.1.2 Component 2 EEPL technical support

*Outcome: Potential & requirements for the improvement of EEPL systems, as well as the support provisions for such initiatives established (see Table 2)*

**Table 2 Outputs and performance indicators of Component 2**

<i>Numbers: Outputs</i> (see Project Document) <i>Bullets: Indicator</i> (see APR-PIR)	<b>Value of indicators</b>	
2.1 Technical capacity building for lighting energy standards and labeling <ul style="list-style-type: none"> <li>● Number of upgraded lighting standards for street and public premises</li> <li>● Upgraded energy performance standards for PL</li> </ul>	<i>Baseline:</i> <ul style="list-style-type: none"> <li>● Outdated and inadequate EEL standards for streets, schools and hospitals</li> </ul> <i>Target:</i> <ul style="list-style-type: none"> <li>● 3 energy efficiency standards for streets, schools and hospitals</li> <li>● 6 energy performance standards for EEL products (CFL, T8, HPS electromagnetic ballast for HPS and electronic ballasts for T8, and road lighting luminaries) and issued by MoST by 2008-2009</li> </ul>	<i>Recommendation MTE:</i> Integrate with policy-oriented activities of component 1. For example, project should assist MoIT and MoST in study on market shift indications of the current S&L schemes and how to go from a voluntary to a future mandatory scheme with MEPS. In general, the impacts of the training should be reviewed and action plans developed to ensure the enforcement of policies and regulations on S&L.  <i>Achieved 2009-2010:</i> Standards are adopted on a

	<p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>Proposals on energy performance standards (MEPS) for CFLs, T8, HPS and electromagnetic ballast for HPS drafted by project (2007).</li> <li>Proposals on MEPS for electronic ballasts for T8 and road lighting luminaires drafted by project (2008).</li> <li>Two MEPS for CFL and electronic ballasts for T8 has been being developed by MOST (2008).</li> <li>Proposals on EEL standards for streets, schools and hospitals drafted by project (2007).</li> <li>National EEL standards for streets, schools and hospitals have been being integrated in the lighting standards systems by MOC (2008).</li> <li>Study tour to Thailand</li> </ul>	<p>voluntary basis. As part of the Government's drive to have mandatory standards and labelling for selected electric appliances, these standards might become mandatory in the near future</p> <p><i>Completed in 2008</i></p>
<p>2.2 Provision of TA to Vietnamese lighting manufacturers</p> <ul style="list-style-type: none"> <li>Number of designs and production lines upgraded</li> <li>Number of EEPL products manufactured and sold</li> <li>Number of products with EE labels</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>Manufacturers produce less efficient lighting devices; Limited demand for EEPL products</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>At least 10 product designs upgraded annually during 2006-07</li> <li>At least 1 million of upgraded EE lighting products sold (starting '08)</li> <li>At least 2 lighting products labeled (starting '07)</li> </ul> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>Provision of TA to 5 local manufacturers (Rang Dong, Dien Quang, Hapulico, Schreder and Vinakip) in improving designs and production technologies on CFLs, ballasts for T8, luminaires and ballasts for HPS lamps</li> </ul>	<p><i>Recommendation MTE:</i></p> <p>Consider further missions of int'l experts, such as Guan Fumin (as e.g. requested by Ralaco), if these missions are in line with the originally approved technical assistance (TA) or if additional, should be "incremental" (if not, these cannot be funded by the GEF). For this reason, a justification should be submitted for the additional activities (to be endorsed by the PSC).</p> <p><i>Achieved 2009-2010:</i></p> <ul style="list-style-type: none"> <li>Report on M&amp;E on impact of TA to manufacturers (number of EEL products manufactured and sold; number of lighting products (CFLs) that will be labelled under the national labelling scheme)</li> </ul>
<p>2.3 Consultation assistance on EEL technology transfer</p> <ul style="list-style-type: none"> <li>TT working group established</li> <li>Software for lighting and design</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>Limited capacity in designing EEL products and EEL systems</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>1 working group established (2007)</li> </ul>	<p><i>Achieved 2009-2010:</i></p> <ul style="list-style-type: none"> <li>A report on M&amp;E results (20% of lighting service providers using guidelines for lighting design software)</li> </ul>

<p>of products compiled</p> <ul style="list-style-type: none"> <li>• % and number of companies using software</li> </ul>	<ul style="list-style-type: none"> <li>• Compilation of lighting design software (2007)</li> <li>• 50% of local companies utilizing the software</li> </ul> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>• Technology Working Group on technology Transfer (TWG-3)</li> <li>• Compilation, publishing and distribution of a user guideline of lighting design software in Vietnamese (Calculux, Dialux, and Ulysses).</li> <li>• Compilation of a user guideline of luminaire design software in Vietnamese (Photopia, Solid Works).</li> <li>• Completion of design software for HPS ballasts.</li> </ul>	
<p>2.4 Percentage of EEPL manufacturers participating in International forum on EEPL</p>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>• Limited opportunities of international and national information exchanges on EEL for the local lighting industry</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>• 50% of local EEPL manufacturers have participated in International Forum (2008)</li> </ul> <p><i>Achieved by June 2008:</i> Promotion of Forum to local manufacturers; 1 online forum linking local and international lighting industry</p>	<p><i>Achieved 2009-2010: Completed in 2008</i></p>
<p>2.5 Upgrading of national testing capabilities</p> <ul style="list-style-type: none"> <li>• No. of testing laboratories upgraded</li> <li>• No. of testing reports submitted</li> <li>• No. of CFLs certified</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>• Inadequate testing capabilities; no M&amp;E of products compliance to standards</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>• 3 laboratories upgraded for lighting product testing (2007)</li> <li>• 3 testing reports submitted (end of 2008)</li> <li>• CFL and electronic ballasts certified</li> </ul> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>• Assessment of testing capacity of 3 laboratories (Quatest 1; Institute of Materials Science; Institute of Engineering-Physics, Hanoi University)</li> <li>• Development of testing procedures for EE lamps and ballasts</li> </ul>	<p><i>Achieved 2009-2010:</i> See June 2008, in addition to the 3 testing reports:</p> <ul style="list-style-type: none"> <li>• M&amp;E report on CFLs tested and certified</li> <li>• Testing training program report</li> <li>• Proposal for setting up Nat'l. Laboratory for Lighting Product Quality Certification and Testing</li> </ul>

	<ul style="list-style-type: none"> <li>Testing equipment upgraded and, pending, evaluation report on implementation results;</li> </ul>	
<p>2.6 Assessment of capacities of the local lighting system service providers:</p> <ul style="list-style-type: none"> <li>No. of EEPL service providers assessed</li> <li>No. of recommendations on capacity building for providers of technical and maintenance services</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>Limited capacity in supplying and maintaining EEPL products</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>20 largest PL service providers have been assessed by mid-2007</li> <li>2 recommendations for capacity building submitted to MoC (2008)</li> </ul> <p><i>Achieved by June 2008:</i> 10 biggest providers have been assessed and recommendations on improvements completed</p>	<p><i>Achieved 2009-2010:</i></p> <ul style="list-style-type: none"> <li>Report on M&amp;E on 20 technically and financially capable service providers;</li> </ul>
<p>2.7 Technical capacity on the design, operation and maintenance of EEPL</p> <ul style="list-style-type: none"> <li>No. of training courses</li> <li>% of trainees implementing EE design and O&amp;M of lighting systems</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>Limited capacity in design, installation, O&amp;M</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>Training program for institutions and staff relevant to EEPL systems</li> </ul> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>Training program was prepared and 02 training courses were completed</li> <li>Development of certification and labeling program</li> </ul>	<p><i>Achieved 2009-2010:</i></p> <ul style="list-style-type: none"> <li>Training courses conducted on EEL system O&amp;M</li> <li>Report on M&amp;E (see 2.6)</li> </ul>
<p>2.8 EEPL sustainable technical development</p>	<p>Added activity</p>	<p><i>Achieved 2009-2010:</i></p> <ul style="list-style-type: none"> <li>Report on technology development program of EEPL submitted to MoST and MoIT</li> </ul>

### *Summary of main achievements*

During the period 2006-2010, the project has had significant results in favor of adopting energy efficient standards and practices, as summarized below:

- Development and promulgation of minimum energy performance standards for lighting products by the end of 2009 for implementation by MoIT and MoST as part of the Government's Vietnam National Energy Efficiency Program VNEEP (currently, on a voluntary basis):
  - Vietnam Standard TCVN 7896 : 2008 Compact fluorescent lamps - Energy efficiency
  - Vietnam Standard TCVN 7897 : 2009 Electronic ballasts for fluorescent lamps - Energy efficiency
  - Vietnam Standard TCVN 8248 : 2009 Electromagnetic ballasts for fluorescent lamps - Energy efficiency



- Vietnam Standard TCVN 8249 : 2009 Tubular fluorescent lamps – Energy efficiency
- Vietnam Standard TCVN 8250 : 2009 High-pressure sodium vapor lamps
- Technical support to the Vietnam lighting products industry via:
  - Capacity enhancement to local manufacturers to improve their EE lighting product quality and market transformation (quality improvement of EEL products: CFLs, T8, ballasts for HPS and road luminaires, electronic ballasts for T8, T5 lamp, bi-power level ballasts for HPS lamp and ADSL control systems)
  - Improvement of testing capacity to lighting testing centers (at QUATEST, HUT, IMS) during 2007-2009;
  - Conducting several training workshops on EEL (technology, design, installation, operation, management, maintenance),
  - Transferring design software tools of lighting and lighting products; Handbook of the guideline on use of design software: published and distributed
- EEL Standards for streets, schools and hospitals, Promulgation by the end of 2009, by MoC and MoST;
- CFLs put forward to be labelled under the country’s labelling scheme; 27 CFL models of Ralaco, Dien Quang, Philip tested and certified (under the CFL labelling program/ scheme) by the upgraded testing laboratories.
- The annual outputs of the upgraded EE lighting products have been strongly increased (from 2.6 million in 2006, 15.5 million 2007, 37.5 million in 2008, 41.4 million in 2009 and 46.3 million in 2010). Among them, about 50% was exported abroad;
- About of 85% local lighting service providers are utilizing the developed guideline for lighting design software; 75% trainees applying advanced EEL technology & management; about 16 lighting companies are capable of providing lighting services to the local and international market<sup>12</sup>.

Regarding future activities:

- A proposal on the establishment of National Lighting Testing and Certification Lab has been completed.
- National sustainable technical development program developed (Vision of Science-Technology Development for Vietnam Lighting Industry) and submitted to MoST and MoIT.

### 2.1.3 Component 3 EEPL financing program

*Outcome: Government, financial/banking & private sectors are providing financial assistance to the development and implementation of EEPL projects*

**Table 3 Outputs and performance indicators of Component 3**

<i>Numbers: Outputs</i> (see Project Document) <i>Bullets: Indicator</i> (see APR-PIR)	<b>Value of indicators</b>

<sup>12</sup> Lighting service providers that have worked with the project, include Hapulico, Schreder, Ralaco, Dienquang, Hapuelco, Sapulico, Danang Lighting an Electricity Company, Cantho Lighting Company, Baninh Environment and Public Works Company, Thanh Hoa Environment and Public Works Company, Thang long Neon Light Company, Ngoc Khang Joint Stock Company, Vegastar, Scitech, Dai Quang Phat Joint Stock company, Vinakip

<p>3.1 Promotion of EEPL to the public sector</p> <ul style="list-style-type: none"> <li>No. of promotion workshops on EEPL to the financial sector</li> <li>No. of brochures printed and distributed</li> <li>% of targeted financial staff interested</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>Limited financing for EEPL projects; non-sustainable financial support from Government</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>2 promotional workshops on EEPL by mid-2007 and mid-2008</li> <li>1 VEEPL brochure printed and distributed</li> <li>50% of targeted financial sector staff expresses interest</li> </ul> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>Prepared and published 1 brochure</li> <li>1 promotional workshop</li> </ul>	<p><i>Recommendation MTE:</i></p> <p>Workshops should be organized that bring interdisciplinary expertise, e.g. bringing together from Government, financial sector and manufacturers / service providers at various levels: (a) decision-makers, (b) local managers. Before doing so, the impacts of the promotional and capacity building activities that were carried out should be reviewed and action plans be developed that ensure the application of the principles and fundamentals learned by the relevant stakeholders, primarily those in the banking and financial sector.</p> <p><i>Achieved by Q1, 2011:</i> <i>See June 2008</i></p>
<p>3.2 Capacity building for financial sector</p> <ul style="list-style-type: none"> <li>No. of training courses</li> <li>% of targeted financial institutions committed</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>Limited financing for EEPL projects; non-sustainable financial support from Government</li> </ul> <p><i>Target</i></p> <ul style="list-style-type: none"> <li>A training program on financial mechanism and policies, financial arrangement and financial tools for EEPL in Vietnam</li> <li>Organization of 1-2 training course;</li> </ul> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>Training program prepared</li> <li>First training course conducted (September 2007)</li> </ul>	<p><i>Recommendations MTE:</i></p> <p>See 3.1</p> <p><i>Achieved 2009-2010:</i></p> <ul style="list-style-type: none"> <li>Some donors (WB, ADB, USAID) and institutions (VNEEP, VEPF) have expressed interest in future EE PL activities</li> </ul>
<p>3.3 Study on public lighting schemes</p> <p>3.4 Development of a proposal on applicable financing schemes</p> <ul style="list-style-type: none"> <li>No. of studies completed regarding financing for EEPL;</li> <li>No. of proposed financing schemes</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>No comprehensive financing schemes for EEPL and EE in general</li> </ul> <p><i>Target</i></p> <ul style="list-style-type: none"> <li>1 study regarding financing completed by 2008</li> <li>1 mechanism for innovative funding proposed</li> </ul> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>A study on international and national financial schemes completed with the findings</li> </ul>	<p><i>Recommendations MTE:</i></p> <ul style="list-style-type: none"> <li>Study should be completely re-done and linked closely with the studies of activity 4.1, which need to be re-done as well and with activity 1.3 to develop viable technology delivery models. The study could then feed into national (act. 1.2) and local policy and planning (act. 1.6 and 1.7)</li> <li>The availability of local sources of financing should be explored, such as</li> </ul>



	<p>and recommendations put forth.</p> <ul style="list-style-type: none"> <li>• A study on potential community or beneficiary cost sharing for public lighting projects completed.</li> <li>• Proposal on appropriate financing schemes and accompanied mechanisms for public lighting improvement projects towards EE drafted</li> <li>• Consultation workshop conducted</li> </ul>	<p>environmental funds and Vietnamese development banks</p> <p><i>Achieved 2009-2010:</i> See 3.2</p>
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### *Summary of main achievements*

A forum and training course on EE public lighting was conducted in 2009. A number of donor and lending agencies (WB, ADB) as well as local organizations, such as the Vietnam Environment Protection Fund (VEPF) and VNEEP have expressed interest in EE public lighting project. A number of studies have been done on appropriate financing schemes and accompanied mechanisms for public lighting improvement projects and a national workshop on EEPL mechanisms and appropriate schemes for the financial sector and lighting industry has been held. In general, capital mobilization from financial institutions and banks for the development of EEPL systems has faced a lot of difficulties. One of them is lack of efficient financial mechanisms and tools for encouraging energy efficiency in the public sector. This prevents financial institutions, banks from committing to provide funding for EEL projects implementation. This will be discussed in more detail in Box 1 in Chapter 3.

### *2.1.4 Component 4 EEPL demonstration program*

*Outcome: Continuous promotion & support for the development and implementation of EEPL systems*

**Table 4 Outputs and performance indicators of Component 4**

<i>Numbers: Outputs</i> (Project Document) <i>Bullets: Indicator</i> (APR-PIR)	<b>Value of indicators</b>	
<p>4.1 Review of technical and economic feasibility of demonstration schemes</p> <ul style="list-style-type: none"> <li>• Findings of Review of technical and economic feasibility of demonstration schemes</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>• No such technical and economic reviews</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>• 6 feasibility reviews completed in 2006-2007</li> </ul> <p><i>Achieved by June 2008:</i> Technical and economic assessments (including engineering and construction designs and cost estimates) for the demo projects (32 constructions in Ho Chi Minh</p>	<p><i>Recommendations MTE:</i></p> <ul style="list-style-type: none"> <li>• Study should be re-done by expert in financial and economic feasibility analysis and feed into the financing mechanism study of activity 3.1. That the systems will have different lifetimes should be included in the analysis. The idea is to develop technology delivery models that are viable and feasible for financing.</li> <li>• One would expect not only a financial analysis (from the beneficiary's perspective), but also an economic analysis (from</li> </ul>

	city, 15 constructions in Quy Nhon; 5 high schools, 6 secondary schools and 6 primary schools in Hanoi) <sup>13</sup>	<p>perspective of the nation as a whole, e.g. by removing subsidies from the financial equation). Economic analysis would also look at impacts other than electricity consumption reduction, such as reduction of peak power demand and would try to assign a value to it based on long-run marginal cost of the national grid system. If we can show that reducing peak demand by EEPL is cheaper than building new power plants, maybe we can the politicians' (and EVN's) attention.</p> <p><i>Achieved 2009-2010: No new activities</i></p>
<p>4.2 Baseline data information on the demo sites</p> <ul style="list-style-type: none"> <li>• Number of surveys on baseline data and information of PL systems and socio-economic conditions in the three demo cities conducted;</li> <li>• Number of energy audits conducted</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>• Unknown baselines in socio-economic in demonstration sites</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>• 5-12 surveys in the three demo cities conducted during 2006-2009</li> <li>• 9-16 energy audits completed during 2006-2009</li> </ul> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>• 8 surveys completed (for 3 demonstration schemes) in three cities</li> <li>• 16 energy audits conducted</li> </ul>	<p><i>Recommendation MTE:</i></p> <p>A good justification for this extension should be submitted. Progress report and energy audit results should feed into report of 4.1; PMU proposes to focus on offices instead of hospital. According to the recommendation of the GEF regional coordinator, the objectives of the project should be kept as before. Therefore, PMU has agreed to keep the implementation of EE schemes in the hospitals. If sufficient budget is available, the Evaluators think it is a good idea to include offices if it can be combined with an adequate promotion campaign (see component 5). It is estimated that electricity use for lighting is about 35% in offices (the other big power consumer is air-con) and accounts for 10-50% of total potential savings</p> <p><i>Achieved 2009-2010: Completed in 2008</i></p>
<p>4.3 Specific barrier removal activities</p> <ul style="list-style-type: none"> <li>• Number of written agreements of recommended stakeholder obtained</li> <li>• Number of demonstration projects verified, confirmed and financed</li> </ul>	<p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>• 6 written agreements of recommended stakeholder obtained in 3 cities;</li> <li>• 8 demo projects are verified, confirmed and financed</li> </ul>	<p><i>Recommendation MTE:</i></p> <p>See 4.1</p> <p><i>Achieved by Q1, 2011: Completed</i></p>

<sup>13</sup> The reader is referred to Section 2.3 for the quality assessment of these outputs

<p>4.4 Implementation of demonstration schemes:</p> <ul style="list-style-type: none"> <li>• Number of detailed engineering designs completed and approved by local authorities.</li> <li>• Number of demo projects operated</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>• Conventional design applicable to PL systems; Technical design of PL using conventional methods and benchmark</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>• 6-9 written agreements of recommended stakeholder obtained during 2006-2009</li> <li>• 6-9 demo projects verified, confirmed and financed during 2006-2009</li> </ul> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>• Technical assistance in the design and implementation of demo projects</li> <li>• Demo projects are implemented in 3 selected cities (see below)</li> </ul>	<p><i>Recommendation MTE:</i> See 4.1</p> <p><i>Achieved by the end of 2010:</i> Observation: Outputs 4.1-4.4 can be regarded as one output with the following deliverables:</p> <ul style="list-style-type: none"> <li>• Feasibility analysis and energy audits</li> <li>• Project design and approval</li> <li>• Project implementation</li> <li>• M&amp;E results and quality assessment</li> </ul> <p>The activities have been implemented in:</p> <ul style="list-style-type: none"> <li>• HCMC: PLCC (Control Center) and replacing lamps by EE PL (demonstration)</li> <li>• Quy Nhon: EEL demonstration</li> <li>• EEL in offices (Hanoi City)</li> <li>• EEL in hospitals (E Hospital in Hanoi and one hospital in Phu To province)</li> </ul>
<p>4.5 Impact assessment</p>		<p><i>Recommendation MTE:</i> Subcontract D1 should not only produce a manual, but also a ‘tool’ in terms of a user-friendly Excel spreadsheet; CO<sub>2</sub> reduction and energy savings are one impact, but a true impact analysis should also include socio-economic impacts as mentioned in table 9.</p> <p><i>Achieved 2009-2010:</i></p> <ul style="list-style-type: none"> <li>• Calculation of energy savings and CO<sub>2</sub> emission reduction in demos as well as in replication activities in reports and in spreadsheets</li> <li>• Tool has been transferred to VLA</li> </ul>
<p>4.6 Action plan for dissemination of demo results</p> <ul style="list-style-type: none"> <li>• Number of case studies showcasing project costs, benefits and lessons learned;</li> <li>• Number of EE benchmarks for comparison with the future EE projects;</li> <li>• Number of cities to be replicated in the proposed</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>• EEPL activities might be implemented, but no info dissemination on EEPL in Vietnam and no scaling up program in place</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>• 3 case studies completed by the end of 2007;</li> <li>• 02 EE benchmarks for comparison with the future EE projects;</li> <li>• 10 cities replicating EEPL success during 2008-2010</li> </ul> <p><i>Achieved by June 2008:</i></p>	<p><i>Recommendation MTE:</i> Details of the proposed extension should be prepared given with a justification for the proposed ‘incremental’ activity. The Evaluators note that replication is OK, but it is important that not only the technological aspects are demonstrated but also the economic viability, institutional setup and financing options are explained and promoted.</p> <p><i>Achieved 2009-2010</i></p> <ul style="list-style-type: none"> <li>• ToR for subcontract on Assessment of Control Center Application.</li> <li>• Proposal for replication in schools in 6 cities and in Thai Binh</li> </ul>

Action Plan	<ul style="list-style-type: none"> <li>• 3 case studies showing project costs, benefits and lessons learned.</li> <li>• Two EE benchmarks for comparison with the future EE projects.</li> <li>• Action plan for replication of EEL demo results.</li> <li>• 49 cities/towns replicating EEPL demo results in street lighting (Source: PLIC report Quarter II/2008).</li> <li>• 3,415 classrooms in 187 schools replicating EEL systems (Source: Report of RALACO)</li> </ul>	<p>province’.</p> <ul style="list-style-type: none"> <li>• Reports on procedures for approval of new and upgraded EEPL products.</li> </ul>
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### *Summary of main achievements*

During 2007-2008, large cities such as Hanoi, Ho Chi Minh, Hai Phong, Da Nang, Quy Nhon, etc. successfully implemented several pilot lighting control measures such as lighting control boxes using power transmission line, lighting control boxes using GPRS/GRS technology, two-power ballasts, etc. In 2009, the pilot implementation of Central PL System Control (CPLSC) for streets was successfully completed in Ho Chi Minh City with significant lighting quality improvements and energy savings. This is the first stage of implementation of the CPLSC in Ho Chi Minh City (12,000 luminaires to be controlled). An assessment supported by VEEPL helps the City’s authority to confirm the possibility of enlarging the Center to 90,000 luminaires in Ho Chi Minh City in the future years.

An analytical tool was developed that provides estimates of collective annual and cumulative energy savings and CO<sub>2</sub> reductions resulting from operation of demo projects developed and integrated in website with name of EEPL M&E system.

Thanks to the workshops and project’s dissemination campaigns up to now, 6 cities (Hanoi, Hai Phong, Ho Chi Minh, Tuy Hoa, Danang, and My Tho) have committed to develop budget plans for EEL replication for more than 50,000 classrooms.

### *2.1.5 Component 5 Information dissemination and awareness raising*

*Outcome: Adequate, affordable, accessible & up-to-date information services, continuing education and awareness improvement on the application of EEPL systems*

**Table 5            Outputs and performance indicators of Component 5**

Outputs (Project Document) Indicator (APR-PIR)	Value of indicators	
5.1 Establishment of a public lighting database facility <ul style="list-style-type: none"> <li>• Number of cities providing main information on PL</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>• Information in PL scattered; no means to collect info</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>• 64 cities and towns all over</li> </ul>	<p><i>Recommendations MTE:</i></p> <p>ISTA recommends an Access-type of interface accessible through internet for cities to put data in rather than Excel sheet. However, it should be assessed</p>

	<p>Vietnam provide the main information on public lighting by 2010.</p> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>• 1 public lighting database facility established.</li> <li>• 1 Public Lighting Energy Consumption Reporting and Monitoring Program (PLECRM) developed and partly implemented.</li> <li>• 17 cities provided the main information on public lighting</li> </ul>	<p>whether this is practical for small towns, schools and hospitals. That aside, a more important question is whether VULA will be able maintaining the database after the project's end and who (e.g., MoC, MoST, lighting manufacturers) will use the results for what purposes. These questions should be firmly answered first before committing additional funds</p> <p><i>Achieved 2009-2010:</i></p> <ul style="list-style-type: none"> <li>• Data collected from 64 urban and rural cities and towns, as well as data from 1,336 schools and product info from 5 local manufacturer</li> <li>• 4.8% of schools are covered in the database; 1.2% annual increase in public lighting reported;</li> <li>• As mentioned in the 2010 PIR, the quality of data needs to be improved</li> </ul>
<p>5.2 VEEPL branding and identity</p> <ul style="list-style-type: none"> <li>• Number of visits to the VEEPL Website;</li> <li>• Number of VEEPL newsletters printed and distributed;</li> <li>• Number of press and publications on VEEPL</li> </ul>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>• VEEPL unknown to stakeholders</li> </ul> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>• At least 3,000 visits to the VEEPL Website each year from 2008;</li> <li>• 2 VEEPL newsletters printed and distributed each year from 2007;</li> <li>• 10 publications on VEEPL each year from 2007</li> </ul> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>• 19,500 visits to the VEEPL Website completed;</li> <li>• 3 newsletters (4,500 copies) on VEEPL printed and distributed;</li> <li>• 24 publications on VEEPL completed and published in local newspapers.</li> </ul>	<p><i>Recommendations MTE:</i></p> <p>The website should be improved with more downloadable VEEPL information, such as leaflet and summaries of reports as themselves, for example, 2-4 pager describing each EEPL demo in layman's language (technology, benefits, economics, setup); 2-4 pages on the work of standards and labeling; 2-4 pager on local product improvement. VEEPL reports should be available on the website as far as possible.</p> <p><i>Achieved 2009-2011:</i></p> <ul style="list-style-type: none"> <li>• VEEPL website maintained and updated (over 90,000 visits</li> <li>• 170 articles on VEEPL printed in newspapers;</li> <li>• 8 VEEPL Newsletters, 6 brochures and 14 documentary films</li> </ul>
<p>5.3 Efficient public lighting promotion campaign</p> <p>5.4 Public lighting performance rating and recognition</p>	<p><i>Baseline:</i></p> <ul style="list-style-type: none"> <li>• VEEPL unknown to stakeholder; no award scheme in place</li> </ul>	<p><i>Recommendation MTE:</i></p> <p>The Plan should be assessed by PR expert to see whether proposed actions (meetings,</p>

<p>5.5 Provision of info to Vietnamese lighting industry</p> <ul style="list-style-type: none"> <li>No. of EEL awareness raising and promotion of programs developed and implemented;</li> <li>% of the stakeholders/target groups that understands the VEEPL project</li> <li>Rating program prepared and no. of awards conducted</li> <li>No. of training courses on lighting engineering and consulting</li> </ul>	<p><i>Target:</i></p> <ul style="list-style-type: none"> <li>At least 3,000 visits to the VEEPL Website each year from 2008 and 9,000 in 2010</li> <li>2 VEEPL newsletters printed and distributed each year from 2007 and 8 by 2010;</li> <li>10 publications on VEEPL each year from 2007 and 40 by 2010</li> <li>program of awareness raising and promotion of EE lighting is in place by mid-2007 and carried out every year thereafter; 80% of the stakeholders/target groups understand the VEEPL project by mid-2007</li> <li>1 guideline for rating program prepared by middle 2008 and 2 annual ratings and awards conducted starting 2009</li> <li>1 training course conducted in 2008 and 3 local lighting/consulting companies registered as PL service providers during 2008-2010</li> </ul> <p><i>Achieved by June 2008:</i></p> <ul style="list-style-type: none"> <li>An EEPL Promotional Campaign Package completed, consulted and having been implemented; 500 participants attended project workshops; 6 TV programs including colloquies, 3 TV films on EEL and on VEEPL;</li> <li>1 guideline for rating program prepared by middle 2008;</li> <li>N/A</li> <li>N/A</li> </ul>	<p>workshops, radio/TV, newspapers, workshop papers, etc.) are appropriate for each target group (decision-makers in policy, local decision-makers and technical staff for installing and O&amp;M of PL, schools, offices). The Plan should be linked with outputs of other components. For example, if a sound techno-economic analysis of the demo sites has been done, the results could be disseminated as part of promotion campaign.</p> <p><i>Achieved 2009-2010:</i></p> <ul style="list-style-type: none"> <li>Distribution of promotional material, printed articles, etc</li> <li>VEEPL materials and info;</li> <li>M&amp;E reporting on replication in street lighting, school lighting and local government</li> <li>Procedures drafted for pilot implementation of rating scheme</li> </ul>
<p>5.6 Establishment of a public lighting information center (PLIC)</p> <p>5.7 VEEPL project outputs distribution</p> <ul style="list-style-type: none"> <li>PLIC with its mechanism for info exchange set up;</li> <li>No. requests for information by other organizations (local</li> </ul>	<p><i>Baseline:</i></p> <p><i>Target:</i></p> <ul style="list-style-type: none"> <li>PLIC set up by 2007</li> <li>120 requests for information by other organizations and personnel (local and abroad) are served by PLIC during 2007-2010</li> </ul> <p><i>Achieved by June 2008:</i></p>	<p><i>Recommendations:</i></p> <p>VEEPL reports should be PLIC library (or at least be transferred at the project's end). Sustainability aspects of PLIC should be assessed (see section 3.1.2)</p> <p><i>Achieved 2009-2010:</i></p> <ul style="list-style-type: none"> <li>PLIC set up and in place</li> <li>About 800 organizations and</li> </ul>



and abroad) are served	<ul style="list-style-type: none"> <li>• PLIC caters to the information needs of the government and citizenry regarding public lighting EC&amp;EE.</li> <li>• 91 organizations/institutions and 64 people provided with PL information by PLIC.</li> </ul>	individuals have requested
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### *Summary of main achievements*

A summary of main achievements is given in the table above. It should be noted that implementation of the M&E tool developed by VEEPL for data collection, monitoring and reporting on lighting energy consumption nationwide in Vietnam has faced some difficulties. Up to now, except for the bigger cities, the facilities of the public lighting in rural towns are rudimentary. This has made collection of country-wide data difficult. The M&E will be transferred to MoIT, MoC, VLA (Vietnam Lighting Association) to maintain and use in the future when all the public lighting companies can reach the internet and use it. The Public Lighting Information Center including public lighting database was established at VLA and has been operating.

## **2.2 Project relevance and design**

### *2.2.1 Project relevance*

In terms of overall electricity consumption in Vietnam, the share of public lighting is small. However, as the country quickly develops, also public lighting is expected to grow quickly. Furthermore, public lighting is highly correlated with the early morning and evening peak demand.

At the same time, city councils are pressured by the central Government to reduce costs, among others by reducing the budget for public (street) lighting. This has been done by cutting back lighting at night, but this action compromises lighting quality and safety and security<sup>14</sup>. Therefore, cities are becoming interested in other options, such as putting in automatic control centers (enabling to match luminance with lighting needs at certain hours) and utilization of higher-efficiency lamps (e.g. high-pressure sodium lamps, HPS instead of mercury lamps) and more efficient luminaires. In public buildings, such as schools, lighting is not always optimal. Better lighting design and EE lamps (e.g., by using T8 instead of T10 tubular fluorescent lamps) improve lighting efficiency and quality as well as energy efficiency.

The Evaluators do ask themselves why in project conceptualization it was chosen to narrowly focus on public lighting only as a subset within the broader area of public, commercial and residential lighting and this subsector itself within the subsector of electric energy efficiency and conservation. The Project Document maybe gives one clue on its page 4; “Product counterfeiting is a serious concern, but is a relatively small threat to VEEPL due to the focus on public lighting as opposed to mass- market consumer lighting products (such as compact fluorescent lamps). Cities and town and other customers will purchase public lighting in bulk

<sup>14</sup> EVN has estimated that cutting down on public lighting between 19.00-4.30 hrs with 50%in the whole country would save 340 GWh with peak power demand savings of 50 MW.

from distributors and have access to current lists of qualifying manufacturers and products maintained by VEEPL”. This sounds as a rather ambiguous way to avoid problems. Rather than tackling barriers to efficient lighting in general, the focus is on public lighting (instead of on industrial or residential lighting), because technologically this appears to be more easily implementable. On the other hand, the focus on public lighting can be appreciated, knowing that Electricity of Viet Nam’s (EVN) DSM program has already focused at the time of project design on promoting EE in the residential sector (CFLs and EE tubular fluorescent lamps) as well as office buildings. Also, before 2004, in the market in Vietnam there were efficient lighting products for the residential and commercial markets, but these CFL lamps had a very short service life, because of (1) lack of stability in the power grid, (2) lamp quality was poor (3) there was not really a competitive environment due to high import duties. CFL import tax has only reduced since Vietnam joined AFTA (ASEAN Free Trade Area) in 2003; import tax of this item was reduced from 40% to 20% in 2003, 15% in 2004, 10% in 2005 and 5% in 2006. The issue of protection of domestic production companies through high tariffs on imported CFLs was identified by WB and EVN as the major barrier to cause low quality and high prices of CFL bulbs, which make people not interested in using these lamps at that time. A recently approved UNEP/GEF project “Phasing Out Incandescent Lamps through Lighting Market Transformation” will focus on the promotion of energy efficient lighting products, in particular CFLs.

### 2.2.2 Conceptualization

The Project Document provides a detailed list of activities in its policy development, technical support, finances, system demonstration and information and awareness components. The budgetary inputs, contracts and consultancies (with Terms of Reference attached) needed to carry out these activities are clearly indicated and provided in surprising level of detail.

The project’s logical framework (also sometimes referred to as strategic planning framework) is rather vague. Fortunately, the project’s Annual Progress Reports (APPRs) and UNDP-GEF APR-PIRs)<sup>15</sup> provide (a number of) indicators with initial and target values in great detail and these were updated after the mid-term evaluation. However, most indicators are defined to measure outputs quantitatively (e.g., number of reports) rather than qualitatively (e.g., how does the content and recommendations lead to impact and how are the outputs related to one another). In fact, the indicators are output indicators, but no indicators for the outcome themselves are given. This deliverable-oriented design, in the logical framework (rather than focusing on higher-level impacts) may be partly responsible for some of the problems in achieving real progress in certain components of the project, as will be discussed in the next section 2.3<sup>16</sup>.

<sup>15</sup> APR-PIR: Annual Progress Review – Project Implementation Report

<sup>16</sup> It should be noted that was conceptualized and designed during GEF-2 when the project planning framework was more output-oriented. During GEF-3 and thereafter, slightly more emphasis was given on outcomes and impacts. This is also the reason why the initial set of annual targets had been prepared for the purposes of being able to rate the project during the 1<sup>st</sup> PIR (project implementation review).



## 2.3 Effectiveness of project implementation

### 2.3.1 Progress towards results; management, monitoring and evaluation

The progress reports produced by the PMU, APPRs, as well as the PIRs, claim significant progress both in terms of outputs being produced. The conclusion of the Evaluators of the Mid-Term Evaluation (2008) was that progress was most visible in the more ‘technically oriented’ components 2 (Support to lighting industries) and 4 (Demonstration), but least visible in Component 3 (Financing) with Components 1 and 5 (policy development and info dissemination) having limited achievements.

#### Progress in terms of quantity of outputs

The project has produced about 290 technical reports by subcontractors. Usually the task, e.g. a survey, an assessment or a policy or technical analysis, is awarded to an entity by means of subcontract or to a project partner by means of a ‘standard letter’ procedure. The quality control approach system requires that the contracted party provides in accordance with the Terms of Reference:

- Inception report, describing objectives, approach and methods to be used, outputs and schedule/timeframe, and intermediary reports;
- Draft reports and, at the end of implementation, the deliverable in the form of a final reports appraised by an independent reviewer, the NSTA<sup>17</sup> (and/or sometimes the Coordinator of the particular cluster of activities) and finally the Project Manager (PM) approves.

#### Progress towards achievements of goals in terms of quality of outputs; project implementation

This large number of reports produced in the various components (described in the previous section 2.1) might be taken as an indicator for the level of effort involved and the good progress being made. However, the Mid-Term Evaluation expressed some critical observations on the quality of some of the reports produced. In some reports information was poorly presented and conclusions and recommendations very general or not matching the objectives or ToR (Terms of Reference) of the report. Reports submitted by one contractor often did not refer to other reports, sometimes not even within the same subcontract. In one case, a report submitted reportedly was very identical to a report submitted in another UNDP/GEF project (PECSME<sup>18</sup>). Although a quality management system had been in place, even substandard technical reports had been signed off as ‘acceptable’ in quality by project management.

The Mid-Term Evaluation had the following observations:

- Subcontractors are hired theoretically through competitive process by short-listing them, but in many cases it turns out that the selected and contracted party is always from the same list of organizations of the VEEPL network. Being partners in the project, it may have been difficult for project management to criticize when the outputs turned out to be disappointing;
- In cases where the co-financier (or a subsidiary) has to contribute, but at the same time becomes a recipient party of GEF funding, by means of subcontracts, it becomes unclear what the net co-financing contribution is;

<sup>17</sup> National Senior Technical Advisor

<sup>18</sup> Promoting Energy Conservation in Small and Medium Enterprises in Viet Nam (PECSME)

- The report under the more technical components 2 and 4 seem to be better in general than reports in the non-technical components 1, 3 and 5. One reason may be that the work done by VEEPL partners as subcontractor, which tend to have a technical background rather than expertise in policy making or economic-financial analysis;
- Subcontractors are awarded monthly payments. In order to ensure that work is done according to schedule, the project design seems to excessively focus on breaking down activities in unnecessarily small components to ensure that milestones for payment are met; many subcontracts have an inception report, progress report, intermediate report and final versions. This absorbs lots of energy in producing paper, which otherwise could have gone into doing proper research with only one, but well-formulated, report;

The project's orientation seems to have been producing reports as if they were a series of research papers, instead of focusing on the broader aim of integrating the results of the reports into understandable documents of information that are convincing by their attractiveness in layout and that are complete but succinct. The Team also noticed a strained working relation between the UNDP CO and ISTA on one side and the PMU management (management and NSTA) on the other.

A summary of the main recommendations of the MTE were as follows:

- The PMU should adopt a culture of being more outward looking (inviting expertise for non-technical issues outside the VEEPL network of partner organizations by opening up announcing vacancies in public media), less rigid (more results-oriented, rather than deliverable-oriented) and delegating authority (involving the ISTA and other project staff more in project decision-making);
- Some stock-taking should take place as to where the info generated in the reports has led to. The analysis and recommendations in these reports should be reviewed in a holistic approach, i.e. in an integrated way (meaning outputs produced under one component can have meaningful input in other components) and with the idea in mind how recommendations will lead to higher-level goal of lowering of barriers to achieve market transformation. Where gaps exist, these should be identified. As a consequence, the objective and methodology of the remaining activities and subcontracts should be reviewed and where needed revised, while new activities should be introduced if needed and some activities/subcontracts may need to be redone. This will imply deviating from the original list of activities as laid down in the project document (adaptive management) and updating the list;
- All final reports of the various subcontracts or 'standard letter' assignments should be made publicly available as downloads on the VEEPL webpage; in case this is not technically feasible or confidentiality is an issue, at least a good executive summary should be made available;
- A 'technology delivery model' goes further than just demonstrating technology (say, e.g. 1000 efficient street lighting in street A in city B in Vietnam) but linking it with an appropriate financing scheme and feeding the results into local and national policy making. It should be noted that success in big cities, such as HCMC, Hanoi or Haiphong, cannot automatically translated in future similar success in small rural town that will not have the same infrastructure and funds available as their big sister cities have;
- Such EEPL technology delivery model should be supported with appropriate policy instruments that promote EE with a 'carrot and stick' approach. The project has in policy so far concentrated on the 'stick' (decree, standards) that force people to do something, and the Evaluators do not deny that VEEPL has contributed to progress here. But an appropriate policy should also have a 'carrot' component (e.g., financial incentives and providing independent information) and here the link between components 1 and 3 becomes crucial.

After the MTE, some of these project implementation issues have been tackled. The MTE was followed by a revised strategic planning and addition of some new activities to bring project implementation in line with changing conditions in Vietnam. With the implementation of a stricter quality assurance process and an analytical M&E system, the overall quality of project outputs has improved and project impacts have become more quantifiable on the basis of data collected from field using reliable samples. Some issues have remained, such as quality of data and quality of outputs by some subcontractors.

### Role of VAST

Some of the above can be explained, by the fact that VAST (the implementing agency) is an academic research institute in nature. Initially, it has managed VEEPL as if it were a technical academic project with outputs regarded as individual research, instead of integrating their findings and main recommendations in a few, more readily accessible, summary reports. On the other hand, VAST's prestige may have helped to coordinate activities with national and regional-level authorities. In general, we can conclude that working with VEEPL has provided an important self-learning opportunity for VAST to take a lead role in international cooperation projects.

### Monitoring and evaluation

The cooperation with the ISTA (international technical advisor) in all activities of the project encountered many difficulties regarding language, management styles and viewpoints. Fortunately, the relationship between ISTA and PMU got better after the MTE, as evidenced by a closer integration of the ISTA's M&E activities in the overall project's outputs.

The team has responded to the MTE's recommendations by:

- Updating the list of the project indicators<sup>19</sup>;
- Revised annual project targets (with success indicators)<sup>20</sup>;
- Action Plan for follow-up activities<sup>21</sup>.

The Action Plan recommended the following:

- Refocus the team to achieve specific outcomes by analyzing the workloads and review capacities among PMU core members as well as reallocating tasks and responsibilities to enhance team performance and team effectiveness.
- Identify the specific tasks and major functions to be performed by current ISTA;
- Develop an agreed set of standards and guideline on quality assurance and apply an adequate peer review system for quality assurance; Important reports will be reviewed and posted to the VEEPL website;
- Conduct an inventory of existing outputs/deliverables, Identify the gaps; New activities will be identified and build further on project achievements. TORs for will be developed based on the identified gaps; Hired consultants are encouraged to use the outputs/deliverables from other components and collaborate for more integrated project outputs.;
- An international consultant will be hired to develop a master plan for VEEPL replication (model and mechanism).

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<sup>19</sup> See file "VEEPL Indicator Files October V2 Oct20"

<sup>20</sup> See file "VEEPL Revised Annual Targets and Indicators V3.0"

<sup>21</sup> Discussed at a retreat at Son Tay City in September 2008

### *2.3.2 Partnership strategy and cooperation with stakeholders*

Stakeholder mobilization and a close network has been created with stakeholders from lighting companies, cities, lighting manufacturers, schools and government officials from city councils as well as national ministries (MoI, MoST, MoF, MoC). To the project's credit, this has created a sound base of stakeholders that work together in promoting efficient lighting in streets and public buildings.

Given the limited timeframe of the Final Evaluation (basically 1 week), it was decided to send out a questionnaire to stakeholders to have a wider base of opinions. The results of the survey are presented in Annex G.

In general stakeholders expressed satisfaction. It should be noted that some stakeholders have been intrinsically involved in the project; some are contracted parties and beneficiaries of the technical and financial assistance provided by the VEEPL project and will therefore be inclined to have a positive view or reluctant to share their reservations. On the other hand, the active support of the project has brought considerable benefits to some stakeholders. One example; lighting products manufacturers, such as Dien Quang, Rang Dong, Vinakip and Scherer companies have been able to increase competitiveness through product quality improvements through the hiring of international experts to provide advice on the production process of high quality lamps, high quality light production technology transfer to Vietnam.

There has been a close and effective coordination and collaboration with the National Energy Efficiency Program in the development and implementation of a National Labeling Program for Lighting Products. CFLs of 27 types of Dien Quang, Rang Dong, Phillip companies got MOIT's EE labels in October 2010. These lamps were included in the list of high-efficiency lights of the Ministry of Finance (MoF).

### *2.3.3 Financial planning and delivery of co-financing*

The tables 6 and 7 provide an overview of the GEF and co-financing budget as originally planned, actual disbursements during 2006-2010. By the end of 2010 most of the budget had been disbursed with only small budget left (for project management, this final evaluation and wrapping up activities).

It should be noted that the level of disbursements during 2006-2010 more-or-less follows the rate of implementation as detailed in section 2.1 of this report. Per budget category, there is a remarkable correspondence between planned and spent budget, as is indicated in Table 7.

This on one hand indicates that PMU has closely followed the budget original budget design. On the other hand, it confirms in budgetary figures what has been described in Section 2.3.1. That is, funds have been spent on subcontracts as planned, but without allowing for non-payment or delayed payments in case of low quality of some of the outputs or without shifting between output to reflect changing circumstances and need for changes in project activities.

Table 6 indicates that fewer funds have been spent on Component 5 (Financing mechanism) and more on technical support (e.g. Component 2) which can indicate both the seriousness of issues and barriers in the financing of public lighting as well as the fact that the project has not been able to fully address these issues.

**Table 6 Budget as originally planned and actual expenditures, 2006-2010**

<i>Amounts in USD</i>	<b>Original budget</b>	<b>Expenditures</b>					
		<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>TOTAL</b>
PL Policy development	<b>319,000</b>	<b>45,759</b>	<b>84,059</b>	<b>119,228</b>	<b>55,384</b>	<b>35,821</b>	<b>340,251</b>
- Consultants and travel	106,500	1,000	16,842			8,700	26,542
- Subcontracts and services	164,000	38,398	50,000	112,373	24,198	10,005	234,974
- Study tour					11,549		11,549
- Workshops and other costs	28,700	4,002	10,615		15,214	8,184	38,015
- M&E	19,800	2,359	6,602	6,855	4,423	8,932	29,171
PL Technical support	<b>727,520</b>	<b>120,768</b>	<b>296,246</b>	<b>209,107</b>	<b>88,887</b>	<b>70,942</b>	<b>785,950</b>
- Consultants and travel	140,000	24,429	183,897	5,880		56,358	270,564
- Equipment	60,000		59,350				59,350
- Subcontracts and services	428,000	91,328	20,000	156,947	56,019		324,294
- Study tours	11,000						0
- Workshops and other costs	35,720		20,059	35,057	21,848	-7,641	69,323
- M&E	52,800	5,011	12,940	11,223	11,020	22,225	62,419
PL Financing	<b>141,300</b>	<b>15,699</b>	<b>25,890</b>	<b>24,395</b>	<b>30,493</b>	<b>13,855</b>	<b>110,332</b>
- Consultants and travel	33,000	1,416	5,636				7,052
- Subcontracts and services	20,000		7,000	12,892	6,592		26,484
- Study tours	35,000						0
- Workshops and other costs	33,500	11,924	7,589	4,648	19,478	13,855	57,494
- M&E	19,800	2,359	5,665	6,855	4,423		19,302
PL Demonstration	<b>434,250</b>	<b>40,948</b>	<b>88,429</b>	<b>140,515</b>	<b>125,550</b>	<b>21,345</b>	<b>416,787</b>
- Consultants and travel	61,000		73,129	11,954		11,392	96,475
- Subcontracts and services	336,000	40,948	10,000	101,725	117,799	4,500	274,972
- Study tour	7,000						0
- Workshops and other costs				20,000		-7,390	12,610
- M&E	30,250		5,300	6,836	7,751	12,843	32,730
PL Info dissemination	<b>299,250</b>	<b>54,014</b>	<b>40,059</b>	<b>89,171</b>	<b>73,861</b>	<b>129,821</b>	<b>386,926</b>
- Consultants and travel	98,000	22,000	1,731	10,872	5,499		40,102
- Subcontracts and services	132,000	18,988	30,198	71,463			120,649
- Study tour	9,000	10,207					10,207
- Workshops and other costs	30,000				57,679	114,598	172,277
- M&E	30,250	2,819	8,130	6,836	10,683	15,223	43,691
Project management, M&E	<b>1,078,680</b>	<b>122,519</b>	<b>128,148</b>	<b>310,627</b>	<b>224,514</b>	<b>130,838</b>	<b>916,646</b>
- PMU	425,158	104,451	80,936	92,639	96,808	76,575	451,409
- ISTA	468,000		39,000	190,375	127,386	54,263	411,024
- M&E, general	166,022	3,877	8,212	27,613	320		40,022
- Inception phase	19,500	14,191					14,191
<b>TOTAL</b>	<b>3,000,000</b>	<b>399,707</b>	<b>662,831</b>	<b>893,043</b>	<b>598,689</b>	<b>402,622</b>	<b>2,956,892</b>
Percentage		13%	22%	30%	20%	13%	99%
Cumulative		13%	35%	65%	85%	99%	

*Note:* Compiled by the Evaluation Team, based on financial data provided in the annual progress reports (APPRs). PMU: project management unit; ISTA: international technical advisor.

**Table 7** Planned and actual expenditures, 2006-2010; per budget category

<i>Amounts in USD</i>	<b>Original budget</b>	<b>Expenditures (2006-2010)</b>
<b>Budget component</b>		
- Consultants and travel	438,500	440,735
- Subcontracts and services	1,080,000	981,373
- Equipment	60,000	59,350
- Study tour	62,000	21,756
- Workshops and other costs	127,920	349,719
- M&E; inception	338,422	241,526
- PMU	425,158	451,409
- ISTA	468,000	411,024
<b>Total</b>	<b>3,000,000</b>	<b>2,956,892</b>

Note: see table 6

**Table 8** Co-financing: original budget and actual disbursements

	<b>Original</b>	<b>Disbursements</b>					
		<b>Total</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>
National gover't (MoC, IMS, HUT, IET, VTV, TST, QUATEST 1; VTV)	1,408,000	1,083,300	92,500	222,800	291,200	476,800	0
Local gover't (HCMC, Qui Nhon, Hanoi)	8,120,000	16,325,440	1,641,040	3,067,400	2,982,000	8,635,000	0
Private (Hapulico, Schreder, Dien quang, Vinakip, Ralaco)	2,790,000	8,085,680	3,392,930	1,862,750	1,715,000	1,115,000	0
<b>Total</b>	<b>12,318,000</b>	<b>25,494,420</b>	<b>5,126,470</b>	<b>5,152,950</b>	<b>4,988,200</b>	<b>10,226,800</b>	<b>0</b>

Note: Own estimates, based on Mid-Term evaluation report and APR-PIR (2008, 2009, 2010) reports and data provided by the Project Management Unit

## 2.4 Implementation: assessment of the project's impacts

This section provides an overview of the envisaged or potential environmental and socio-economic impacts of the project.

### Energy savings and greenhouse gas emission reduction

Table 9 presents data on the energy saving and greenhouse gas emission reduction impact, based on info provided by the project, while Figure 3 gives an overview of the utilization of EE public lighting (streets, schools).

**Table 9 Reported energy savings and emission reduction impacts of the project (2006-2016)**

Description	Energy savings (GWh)		CO <sub>2</sub> reduction (kt)	
	Annual	Cumulative	Annual	Cumulative
<b>Direct Impact</b>				
Demo in streets	5.73	12.55	2.46	5.40
Demo in schools	0.70	2.31	0.30	0.99
<b>Subtotal</b>	<b>6.43</b>	<b>14.86</b>	<b>2.76</b>	<b>6.39</b>
<b>Indirect Impact</b>				
1. Technical assistance to Manufacturers	55.71	121.24	23.96	52.13
<b>Subtotal</b>	<b>55.71</b>	<b>121.24</b>	<b>23.96</b>	<b>52.13</b>
2. Replication of streets	114.10	240.55	49.06	103.44
3. Replication of schools	146.25	310.60	62.89	133.56
<b>Subtotal</b>	<b>260.36</b>	<b>551.16</b>	<b>111.95</b>	<b>237.00</b>
<b>TOTAL</b>	<b>322.49</b>	<b>687.25</b>	<b>138.67</b>	<b>295.52</b>

Source:

Project Management Unit; see Excel spreadsheet “VEEPL 2010 Projected Impact Results V 1.2”. Annual savings and emission reduction are reported for the year 2010. Cumulative emissions are the sum of emission calculations for 2006 (89.28 ktCO<sub>2</sub>), 2007 (15.84 ktCO<sub>2</sub>), 2008 (51.17 ktCO<sub>2</sub>), 2009 (89.28 ktCO<sub>2</sub>) and 2010 (projection; 138.67 ktCO<sub>2</sub>). More info on the annual energy savings calculations is given in Annex C.

The project mentions in the original Project Document a target of cumulative energy savings of 398 GWh and related cumulative greenhouse gas emission reduction of 171 kiloton of (ktCO<sub>2</sub>). The project reporting claims to have achieved 295 tCO<sub>2</sub> and energy savings (cumulative) of 687 GWh. However, this includes direct and indirect impacts (replication). Applying a correction factor for indirect impacts, emission reduction impact is more likely to be in the order of 150 ktCO<sub>2</sub>. The correction factor takes into account that not all indirect impacts can be attributed to the project’s intervention, but are also a result of the general change in the market for high-efficiency lighting towards efficiency. Annual local manufacture of the improved EE lighting products (lamps) increased from 37.5 million in 2008, to 41.4 million in 2009, and 46.3 million in 2010. Among them, about 50% were exported abroad.

We can conclude that, since the project’s inception, significant improvements have been achieved indeed in Viet Nam in utilization of EE products in public lighting. Nonetheless, we do have the following observations on the project’s influence:

- Most of the GHG (and energy savings) are *indirect*. Not all of the emission reduction impact can be attributed to the project’s intervention, but would have been undertaken by the beneficiaries, as in general in the country (and the region) the penetration of EE products has increased and by pressure by the Government to save funding. It would be appropriate to multiply the indirect emission reduction impact by a *causality factor*, in accordance with the GEF manual on GHG reduction calculations<sup>22</sup>;

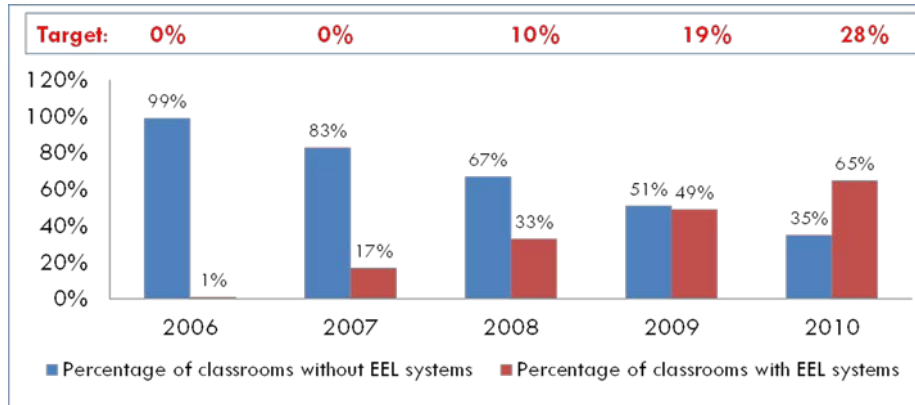
<sup>22</sup> Manual for Calculation of of GHG Benefits of GEF Projects (GEF/C.33/Inf.18)

Applying a causality factor of 40% to the replication component gives emission reduction of 94.8 ktCO<sub>2</sub>. Adding direct impacts (demos) of 6.4 ktCO<sub>2</sub> and manufacturer’s support of 52.1 ktCO<sub>2</sub> (which we prefer to label as direct impact as well) gives a total reduction of 153.3 ktCO<sub>2</sub>. We note that data on replication needs to be further checked on accuracy in reporting and expanded to be more representative.

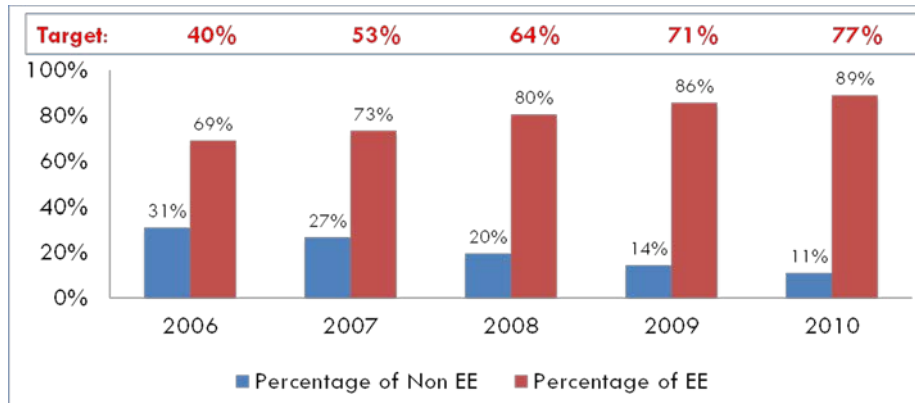


**Figure 3 Reported VEEPL impacts**

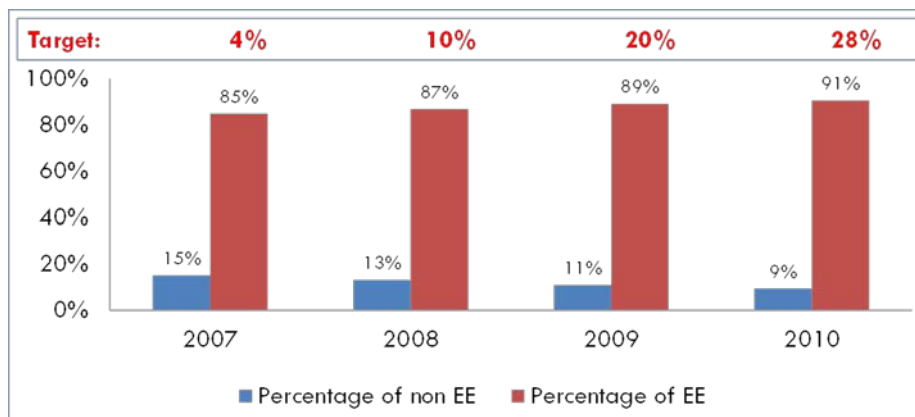
**(a) Market transformation for school lighting systems**



**(b) Market transformation for urban EE lighting**



**(c) Market transformation for rural street lighting**



Based on data provide by Project Management Unit, based on data provided by 64 cities and/or provinces and around 1,300 schools



### **Box 1 Financing for public efficient lighting**

Public lighting is currently in the hands of state-owned enterprises (or are shareholding companies with majority/ dominant state participation). Their investment basically comes from Government budget. There exists a disconnect between the investment decision in purchasing technology (e.g. efficient lighting products) and the operating account decision taken by the management of the state-owned company involved (e.g. paying the electricity bill). This may not always be the case. The public lighting company in Ho Chi Minh City (HCMC) has taken quite a commercial approach, which the Evaluators view as combining longer-term investment decisions with the shorter-term operating expenses account under a mild profit objective. But Sapulico may not be exemplary for most of the Vietnamese cities. It is based in the richest of the Vietnamese cities. In the smaller cities, the lighting companies may not be able to raise sufficient funds from the state or other budget sources. There may not be a separate public lighting company at all and might be part of a general public utilities company. In the end, the (national and local) government's responsibility of efficient public lighting is limited by its capability, including its financial resources for both investment in building lighting facilities as well as technical ability for maintaining and utilising them.

The (commercial) market for public lighting services is, therefore, not established in Vietnam yet. In each city/ town, a local state owned enterprise is selected or established for the purpose of providing public lighting services for that location. These institutions are allocated by the local government agency with a certain amount of money for public lighting as a guidance indicator. At the end of each year, the whole expenditures for local public lighting would be disbursed, even if they exceed the plan (according to the principle of disbursing on the baseline of the real/ actual expenditure and administrative decision) or are short of the funds actually needed. This system works against energy efficient (EE) investments, as the EE investment will be higher than the investment in conventional technology (which the budget provider might not consider for not being the beneficiary of savings of the energy bill of the institution involved).

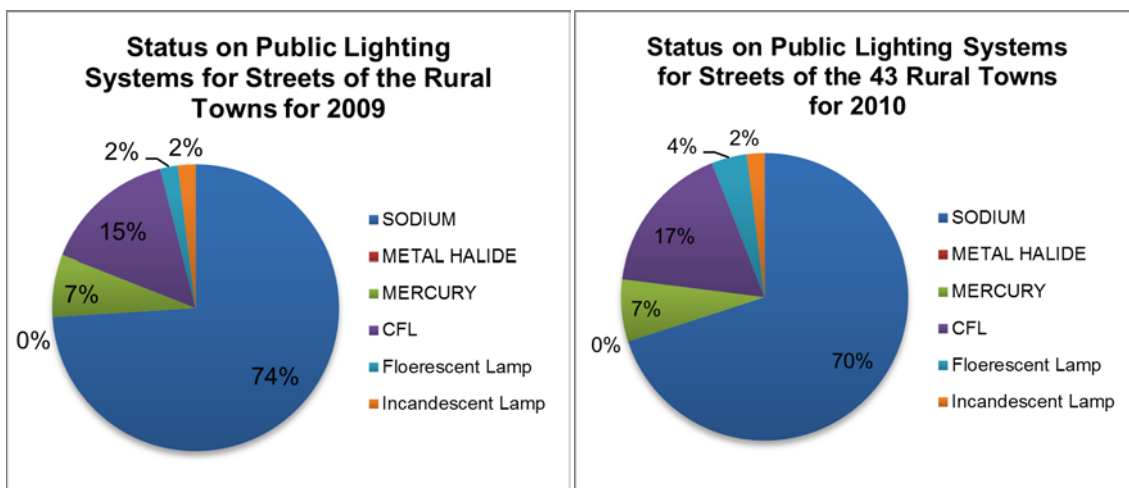
The financial schemes/ mechanism for the public lighting depends strongly and essentially on the organisation and the mechanism of public lighting service delivery, such as involving independent energy service companies (ESCOs). The Government has tried to set up the legal-institutional framework for such financing mechanism. However, public lighting institutions do not like commercial financing options, but prefer the government budget they have always depended on. One key reason for this behaviour is the passive role/ attitude of existing public lighting institutions' management. While being interviewed, their representatives indicated that "procedures for getting government budget are complicated and time consuming, but the money is ensured and creates no risks". The habit of the majority of staff related to the public lighting is dominated by the thinking of subsidised operations, not in terms of innovative finance mechanisms. There are exceptions, such as HCMC's Sapulico, which have become pioneers for testing new, innovative business-oriented way of service delivery, giving consultancy advice to other public lighting companies.

Linkages between the commercial financing institutions and public lighting agencies are lacking. The latter prefer government budget, not commercial loans and credits. On the other side, banks and credit institutions prefer to give loans to "really-doing-business companies" and do not consider lighting companies as commercial companies. Another element is the level of investment; most public lighting projects are small scale projects and are considered 'light-weight' by the big national banks. The ESCO mechanism has been proposed as a remedy, but this can be practiced only if the public lighting sector could be organised and operated more according to market-based mechanisms.

In the case of lighting in schools, VEEPL has tried to promote the mobilisation of beneficiaries' and citizen's contribution. However, this could be done for a short time, but could be difficultly done for a long time and only in areas where the beneficiaries have sufficient income.

- Because the full costs of public lighting systems in Vietnam are covered by the government's funds, in this area there is almost no motivation to save costs. The annual funds are transferred from the Ministry of Finance to the provincial People's Committees for the urban lighting service. Each province or major town usually has a (state-owned) company belonging to the Department of Construction responsible for public lighting system. In this case, if lighting companies offer saving solutions, their expenditures will be less and this has the adverse impact that in next year's budget application the total funding for their activities gradually will go down in accordance with the lowered expenditure level. Box 1 presents more on the issues related to financing of public lighting in Viet Nam.
- Despite these (financial) issues not being fully resolved, the continuous awareness-raising and capacity building efforts by the VEEPL project over the past years has had an impact on the utilization of energy-efficient products in urban lighting. It is difficult to exactly quantify the impact of the VEEPL project to public lighting in rural areas. In the VEEPL database the numbers of light bulbs currently in use in rural areas are given, but responses from rural areas are not complete and vary from year to year. Also, there is little information available on hospitals.

**Figure 4 Data on equipment for street lighting in rural towns**



## 3. CONCLUSIONS AND RECOMMENDATIONS

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### 3.1 Conclusions

To lower the existing technical, financial, policy, and informational barriers to a more widespread application of energy efficient public lighting (EEPL), the Vietnam Energy Efficient Public Lighting Project (VEEPL) implements activities under the following components:

- Public lighting policy development;
- Public lighting technical support program;
- Public lighting financing program;
- Public lighting system demonstration program;
- Information dissemination.

The following summarizes the main findings of the evaluation. Each of the points discussed below has been dealt with in more detail in the previous chapter 2.

#### 3.1.1 *Project design and project implementation*

##### Project design

The Project Document provides a detailed list of outputs and activities under the main components of policy development, technical support, finances, system demonstration and information and awareness component. Unfortunately, the Project Document does not make clear the special need for focusing on public lighting within the area of public, commercial, industrial and residential and the focus on lighting within the area of electricity conservation in general<sup>23</sup>. This may not be as trivial as it may sound. Regarding public lighting, VEEPL focuses on street lighting and lighting in schools and hospitals. So far, hospitals have not apparently shown much interest. Is that because they are not interested in efficient lighting *per se*? Or because, contrary to a public lighting company (whose main cost will be the power bill), lighting in hospitals may only a fraction of their energy and non-energy bills? We find such issues being glossed over.

While the annual Project Implementation Reports (APR-PIRs) provide a detailed list of project performance indicators, there exists a strong tendency in these indicator to focus on outputs under each outcome, while to the outcomes themselves no indicators are attached. Also, the indicators tend to measure quantitatively (e.g., no. of reports produced under an activity) rather than result (e.g. actions taken based on the recommendations of the report). Also, output has been defined as very 'deliverable'-oriented. This has resulted in a large number of reports. The project would have benefited from summary reports per outcome

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<sup>23</sup> It should be noted that the Government-commissioned study report "Potential for Energy Efficiency Improvement in Lighting in Vietnam (1997)" identified a potential to save 100 MW (100,000 tons of CO<sub>2</sub>/yr) from more efficient use of lighting in Vietnam. The report suggested programs to reduce lighting energy consumption in the transportation, industrial, commercial and the domestic sectors. However, only one of these recommendations received further support (related to Public Lighting) following the private sector funding of a demonstration project in Hai Duong city (1998-2001) proving the feasibility of the overall public lighting project.

and/or per thematic area<sup>24</sup>. In view of the explanations given above, we propose to rate project design as ‘marginally satisfactory’.

### Removing barriers in an integrated way to achieve market transformation in PL towards EE products and practices

To the Evaluators’ opinion:

- Most success in terms of impacts has been obtained in the more technological components 2 (standards and support to industry), *highly satisfactory* and 4 (demonstration schemes); here we can give a rating of *satisfactory*. We also rate the policy development (component 1) as *satisfactory*;
- Less impact is noticeable in awareness raising component 5 (*marginally satisfactory*) and component 4 on the finance mechanisms (*unsatisfactory*). On one hand, the project has raised awareness in certain beneficiary groups (street lighting in selected cities; schools), but has remained absent in other target groups, e.g., hospitals.

Overall, the Evaluators give a rating of ‘meeting the project’s objective’ as between *marginally satisfactory* and *satisfactory*. VEEPL has managed to put EE in public lighting on the political decision-making map and has given appreciated assistance to Vietnamese manufacturers of lighting products. But we fail to see a clear model on how EE PL can be replicated beyond the richer public lighting companies and schools. It is not that we expect the project team to have miraculously come up with *the* solution, which may not be possible given the institutional constraints; but at least should have clearly outlined these constraints and hinted at possible avenues forward. We therefore suggest in the Section on recommendations (3.3) to have an analysis of the results in mitigating barriers in the proposed ‘Final Report’ and what actions are recommended to the Government in lowering the barriers still remaining.

### Project implementation

Most of the project outputs have been completed in due time or with little delay. Theoretically this would mean that the project has been performing well and on schedule. However, a closer look at the quality of the outputs (reports) reveals a difference among components (outcomes), as was described extensively in the Mid-Term Evaluation (MTE) report. The information associated has been captured into a large number of reports, although they differ in quality and, in terms of achievements<sup>25</sup>, especially in the more non-technical project components. The project team should have had the flexibility here to solicit more outside advice and consultancy in these areas. Given this observation, we would like to rate the implementation approach as *marginally satisfactory*.

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<sup>24</sup> This also reflects management style of ‘non-adaptive management’ in the first years of project implementation. For UNDP monitoring and evaluation, it shows that a project cannot be judged only on quantitative success indicator, but a qualitative description should be given in addition.

<sup>25</sup> In terms of quality of reports, most success has been obtained in the components 2 and 4. This may not be a surprise, since the nature of the executing agency, VAST, is that of a technology institute, so one can naturally expect that more results have been in the two technology-oriented components 2 and 4. While a framework of for efficient public lighting has been partially constructed with appropriate policy instruments (standards, finance, etc.) to which the project has given valuable inputs, the issue has remained how to integrate the results of the various components in such a way that sustainable and replicable technology delivery models can be developed for the various beneficiaries.

### 3.1.2 Sustainability and replicability

#### Exit strategy

The PMU has anticipated finalizing the major logistic and institutional arrangements with potential partners (VAST, VLA, MoIT, MoC, MoST, MoET, MoNRE, DoCs, DoETs) regarding the role and transfer of responsibilities after the conclusion of VEEPLP, before the end of the project, to be taken place during January-June 2011. To ensure immediate continuation of the project's activities after the closure of operational activities (in June 2011), the PMU has proposed the following:

**Table 10: The arrangement for transfer of the VEEPL project**

No	Outputs to be transferred	Successor	Deadline
1	Standardized designs of new and expanded EEPL system <i>for streets</i>	Urban Technical Infrastructure Department (UTID), MOC	April, 2011
		DOCs of Ha Noi, Hai Phong, Da Nang, Quy Nhon, ...	May, 2011
	Standardized Designs of new and expanded EEPL system <i>for primary, secondary, and high schools</i>	Urban Technical Infrastructure Department (UTID), MOC	April, 2011
		Department of Material Facilities and School Equipment (DMFSE), MOET	April, 2011
	DOET of Ha Noi, Hai Phong, Thai Binh, Da Nang, Quy Nhon, .	May, 2011	
2	Investment plan for the National Lighting Product Quality Certification and Testing Laboratory	QUATEST1, MOST	April, 2011
		VNEEP, MOIT	April, 2011
3	Vision and 2011 – 2020 investment plan for R&D research development of the Vietnam lighting industry	Science-Technology Development Strategy Institute (STDSI), MOST	May, 2011
		Science-Technology Department (STD), MOIT	May, 2011
4	A handbook "Guideline on technical-economic tools for EEPL management" with the calculation software	Institute of Economic Construction (IEC), MOC	May, 2011
		DOCs of the cities	April, 2011
5	M&E tools	VNEEP, MOIT	May, 2011
		VLA	March, 2011
6	Results of pilot rating program of EEL	VNEEP, MOIT	May, 2011
		Urban Technical Infrastructure Department (UTID), MOC	May, 2011
7	Appropriate lighting control center model for the cities of first and second level	Urban Technical Infrastructure Department (UTID), MOC	May, 2011
		The DOCs of cities of first and second level	June, 2011
8	Results of GHG emission factor calculation	VNEEP, MOIT	April, 2011
		International Relation Department, MONRE	April, 2011
9	VEEPL Website	VAST	June, 2011
		VNEEP, MOIT	
10	Financing schemes	MOF, WB, ADB, VEPF	June, 2011
11	Asset and equipment	VAST	June, 2011

## Sustainability and replicability

Regarding *sustainability* of VEEPL's activities, a number of Vietnamese institutions and organizations will continue the promotion of EEPL in Vietnam after the project will end in 2010. VLA<sup>26</sup>, being an association of lighting manufacturers, government representatives, would ideally be placed to play such a role, but may not have sufficient capacity (staff, financial resources) to do so. A second concern is about the availability of all the information and knowledge generated, since currently it is difficult for outsiders to have full access to the many reports produced by VEEPL. Other organization and institutions will play an important role as well:

- MoC: Monitors and evaluates the execution of various policies and codes on EE lighting system management and operation and helps to maintain and update the EE lighting database and PLIC;
- MoST: Monitors and evaluates the application of EE lighting technologies; the enforcement of MEPS and the development of national lighting testing laboratory;
- MoIT: Monitors and evaluates the EE certification and labeling for lighting products; promotion and communication on EE lighting; helps manufacturers to improve their product quality and production line;
- Local Governments (City/Provincial People's Committees, relevant Departments and Agencies): Develop urban lighting plans for their localities in each phase and develop their local EE lighting systems in conformity with the Orientation of Government Strategy and Provisions of the various Decrees.

In terms of *replicability*, the demonstration schemes have been technically shown to work in Ho Chi Minh and Quy Nhon cities (street lighting) and Hanoi (schools). A replication of efforts has taken place, especially in schools in various cities. One of the beneficiary public lighting companies, Sapulico, is now providing advice to other public lighting companies or municipalities. On the other hand, it is not always clear how the experiences in richer cities, provinces and schools can be translated into replication for the less wealthy companies and municipalities.

From the policy side progress has been made on integrating public lighting into policy, at the national level and, spatial planning, at the urban level. However, the financial side has been largely left untouched, and one cannot speak of a 'technology and financial delivery' model being developed yet, integrating technology, economic and financial aspects, in a way that it can be showcased and replicated to smaller cities. Currently and in the near future, local governments cover all the expenditures for public lighting (installation, operation, maintenance and electricity bills) through the state budget allocation. Therefore, this aspect should be factored into the possible financial-economic model, while indicating how other investment resources for public lighting should be mobilized (especially for school and hospital lighting).

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<sup>26</sup> The Vietnam Lighting Association is a professional organization under the Vietnamese Construction Association and supported by the Ministry of Construction (MoC). The major task of VULA is providing advices on various issues relating to EE lighting system management, policy, science and technology to MoC and other government entities as well as to collect and provide information on nationwide lighting systems.



## 3.2 Lessons learnt

Some lessons learnt are:

### Project organization

- Creating a strong partnership and effective coordination with project partners and stakeholders from national and local governments, local and international industry, financial sector, NGOs/research institutes and beneficiaries (public lighting companies, schools and public offices) is important to promote EE PL. The building of a strong working PMU is important that brings together a multi-disciplinary core team as well as short-term consultants and subcontractors. The latter should be contracted by open and transparent procedures and allow for amendments in view of changing circumstances (adaptive management);

### Removing barriers

- The barriers identified at the outset of the VEEPL project were in general those that require addressing. However, a number of barriers proved to be more complex and intractable than others and also the timeframe to be able to address these varies between groups of barriers. Technical capacity by means of targeted technical assistance, workshops and seminars can be most easily implemented as in the end only a few people are involved in decision-making, such as the beneficiary company's management or a government agency that decides to send people to training. Policy-institutional barriers take more time to mitigate. A much wider array of people, from ministries, public companies, law-makers, People's Committees, etc. are involved and decisions are made at a higher level. To reach consensus and agreement on the final text and its subsequent endorsement or promulgation can then be quite time-consuming. In the case of VEEPL, one can observe that the typical duration of a UNDP/GEF project of 4 to 5 years is hardly enough to have such a policy-legal-institutional framework formulated, let alone its implementation monitored. In terms of financing, the public sector companies in Viet Nam work different from commercial companies and financial barrier removal activities should be built around this reality. Without a political-regulatory framework, local authorities and public companies are not motivated into EE-relevant decision-making. In the end, a holistic barrier mitigation approach is needed with the goal of convincing management of local public utilities not only by the 'stick' (legislation and regulation), but also by the 'carrot' (incentives for management to implement EE measures) and the timeframe needed is probably longer than 5 years.

## 3.3 Recommendations

### Final impact report

While the project's outputs and deliverables have been extensively reported, what is missing for future reference is a *'Final report' that integrates the results and impacts of the various components and outputs and presents it in one, easy-to-read, document.* If budget availability allows it, we propose that such a report be written. The contents of the 'Final Report' could be:

- Executive Summary
- Introduction (role of VEEPL project, institutional setup regarding public lighting)



- Public lighting (manufacturers, beneficiaries; choice of technology; benefits of using efficient public lighting; description of current policy, legal and regulatory framework)
- Impacts of VEEPL in removing barriers (policy and institutional; awareness and info; technical capacity and financial) and identification of barriers still remaining
- Conclusions and lessons learned
- Recommendation for future EE PL activities to tackle the remaining barriers

A draft exit strategy has been prepared by the project team, suggesting how the stakeholders can continue VEEPL's activities on the near term. This should be expanded with the conclusions of the before-mentioned 'final report' and be aligned with the new UNEP/GEF-supported project "Phasing out Incandescent Lamps through Lighting Market Transformation in Vietnam". Also, the issue of operation and maintenance of the project's website as well as the database on efficient public lighting applications should be detailed further in terms of activities that 'successor organization' will undertake in the coming years and indicating budget availability.

#### Options for future efforts on EEPL:

The momentum generated by VEEPL must be maintained for a more widespread dissemination of EE PL. A number of Vietnamese government entities, NGOs as well as lamp manufacturers will continue their efforts in promoting energy efficient public lighting (EE PL), as indicated in Table 10. We suggest a number of options for future efforts by these institutions and companies to further promote the cause of EE PL in Vietnam.

#### *Capacity building and awareness*

- Capacity building of energy auditors and managers
- Certification program for energy auditors and manager
- Strengthen monitor and verification mechanism (e.g., using and expanding) the VEEPL M&E tools and software)

#### *Regulation and implementation*

- Establish institutional framework for monitoring of the implementation and enforcement of the various EE PL regulations and Decrees
- Technical support for integration of EE PL with other standards, such as the new Energy Management Standards (EnMs, ISO 50001)
- Consider financial incentives (tax credits, accelerated depreciation, import duties, etc., as appropriate

#### *Market development and financing*

- Capacity building for financial institutions and banks as well as management of public utilities on options and issues in EE project financing, leveraging commercial finance, performance contracting and ESCO business models;
- Some donors (WB, ADB, USAID) and institutions (VNEEP, VEPF) have expressed interest in continuing to support EE public lighting activities. This should be followed up.

The idea has been mooted to create a 'Super ESCO', a government ESCO with the dual responsibility of implementing EE projects in the public sector, while simultaneously building the capacity of private ESCOs. This idea, as well as options to finance such a 'Super ESCO' could be investigated further.

### New project proposal on LEDs

The project team of VEEPL has prepared a new proposal to be submitted through UNDP to GEF called “Promotion and Development of Local High Brightness White Light-Emitting Diode (HBWLED) Technologies for Advanced General Lighting in Vietnam”. LEDs form an emerging technology that is beginning to find wide applications in residential, office and industrial lighting applications. The Evaluation Team welcomes such an initiative to promote manufacturing in Viet Nam for domestic as well as export markets, but has two observations. First, the initiative would benefit from involving a commercially oriented organization in day-to-day implementation alongside VAST and/or Ministries as government partners. Second, there is currently a UNEP/GEF project, mentioned earlier, focusing on phasing out incandescent bulbs (to be replaced by compact fluorescent and other energy efficient products) and the two projects should be well coordinated in both design and implementation.

## ANNEX A. TERMS OF REFERENCE (TOR)

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The original text of the ToR has been amended in the sense that numbering has been added that refers to parts of the main text of the report, but otherwise the original text has been left in place.

### I BACKGROUND AND CONTEXT

Since the adoption of Doi Moi (renovation) policy in 1986 the Government of Vietnam's focus has been to industrialize and modernize to transform Vietnam from an agriculture based economy to an industrialized nation. Consequently, Vietnam has experienced strong economic growth that has strained the national infrastructure in general and energy supply in particular. In addition, Vietnam is assessed to be one of the most critically affected countries as a result of climate change. As such, while Vietnam maintains its ambitions for rapid economic growth, it has adopted the strategy to do so in an environmentally responsible manner. Energy efficiency is a critical component of that strategy. A number of energy efficiency related policies and programs are currently ongoing in Vietnam. UNDP country office (UNDP CO) in Vietnam is assisting the Government of Vietnam (GoV) to achieve its economic, social and environmental objectives. UNDP Vietnam is currently implementing a number of projects in these areas.

The Vietnam Energy Efficient Public Lighting (VEEPL) project was strategically designed to address primarily the environment barriers identified in Outcome 1 of the UNDAF for UN development assistance, which mainly focuses on supporting economic growth that takes into account environmental protection and rational use of natural resources. The project also aims to support the roll-out of the Decree on Energy Conservation and Efficiency issued on September 3, 2003<sup>1</sup>, as well as the Socio-Economic Development Plan 2006-2010<sup>2</sup>.

Given the above strategies, the project was designed to stimulate and accelerate transformation of the market for energy efficient public lighting in Vietnam by providing high quality technical information to relevant stakeholders, and by helping to build the capacity of Vietnamese institutions, organizations and businesses. It mainly addresses the issues of lack of capacity and institutional reform in the local governments in order to facilitate the realization of the expected outcomes of the project, particularly the estimated CO<sub>2</sub> emissions reduction. With rapid economic growth, it was anticipated that the share of public lighting in overall national electricity consumption would grow multifold over the coming years. Energy efficiency measures introduced at earlier stages of such growth has ensured substantial reduction in GHG emissions without compromising the pace of modernization of towns and cities.

The key stakeholders include federal government ministries, provincial and city government, research and development institutes, manufacturers and suppliers of lighting products, and professional associations. The major stakeholders, who are also the co-financiers to the project, include:

- Ministry of Construction (MoC)
- Institute of Material Science (IMS – VAST)
- Hanoi University of Technology (HUT)
- Institute of Environment Technology (IET-VAST)
- Vietnam Television (VTV-2)
- Quality Assurance and Testing Center 1 (QUATEST 1)
- People's Committees of Ho Chi Minh City (PPC of HCM city)
- People's Committee of Quy Nhon city
- HAPULICO Co.
- Vietnam SCHEDER Co.
- RALACO
- VINAKIP Co.
- Dien Quang Lamp Co.
- Vietnam Urban Lighting Association

These stakeholders have remained active partners during the period of project implementation. In addition to the above some other stakeholders, such as Ministry of Industry and Trade (MoIT) and Ministry of Science and Technology (MoST), became active stakeholders at later stages of the project implementation. The list of beneficiaries include local lighting equipment manufacturers and suppliers, local governments that are responsible for installation and maintenance of public lighting (street, parks and school lighting), and general citizens of Vietnam.

### **Vietnam Energy Efficient Public Lighting (VEEPL) Project**

The Vietnam Energy Efficient Public Lighting (VEEPL) Project is a joint initiative of the Global Environment Facility (GEF), United Nations Development Programme (UNDP) and Vietnamese counterparts, aimed at stimulating the application of energy efficient public lighting in Vietnam, thus contributing to the reduction of greenhouse gas (GHG) emissions in the sector.

The VEEPL project is a multi-disciplinary project with activities ranging from development and implementation of policy, to providing technical assistance, identifying financial resources and conducting awareness/education campaigns. The project is aimed at transforming the general market environment surrounding public sector decision-makers to create a facilitating environment that encourages the introduction of energy efficiency measures in the public sector. To achieve this end, 5 components were designed to play the following roles:

1. **Policy Development:** To encourage introduction of government policy and policy instruments (regulations, standards, etc.) that encourage adoption of energy efficient end-uses by a target group – e.g. public sector or local governments and authorities in case of VEEPL project.
2. **Technical Assistance:** To improve capacity and capability of local manufacturers and other stakeholders who in turn will support provision of high quality energy efficient lighting products and testing services at competitive prices and thus encourage adoption of energy efficient lighting products as compared with standard counterparts.
3. **Financing:** To identify and promote viable financing options that public sector decision-makers can utilize, other than relying on government funding, to implement energy efficiency projects in general and energy efficient public lighting projects in particular.
4. **Demonstration:** To offer operational projects as testimonials for decision-makers to be confident of technical, financial and economic viability of different types of energy efficient public lighting projects.
5. **Communication:** To publicize widely the concepts and principles, supported by case studies, of energy efficient public lighting in order to create awareness and educate the general public and decision-makers about the benefits of energy efficient lighting in public places.

The project has been implemented since 2006 and is expected to conclude by the end of June 2011. Consequently, a terminal evaluation is required to be conducted alongside the remaining activities to formally conclude the project.

### **OBJECTIVE OF THE ASSIGNMENT**

The Vietnam Energy Efficient Public Lighting Project is scheduled for completion on 30 June 2011. UNDP-GEF policy requires that an independent terminal evaluation take place three months prior to the final Project Board meeting. The terminal evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term evaluation, if any such correction took place). The terminal evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits. The main stakeholders of the evaluation include:

- The Global Environment Facility (GEF)
- Vietnam Country Office of UNDP
- Vietnam Academy of Science and Technology (VAST)
- All co financiers as described in Background and Context

### **III SCOPE OF WORK**

The international consultant will work together with a national consultant as a team to deliver the final product. The International Consultant will be the Team Leader. The national consultant will be recruited by UNDP Viet Nam under another TOR

The terminal evaluation of the Vietnam Energy Efficient Public Lighting Project shall properly examine and assess the perspectives of the various stakeholders. The following areas should be covered in the terminal evaluation report:

### **1. General Information about the Evaluation**

The terminal evaluation report should include information on when the evaluation took place; places visited; who was involved; the key questions; and, the methodology. The terminal evaluation report will also include the evaluation team's TOR and any response from the project management team and/or the country focal point regarding the evaluation findings or conclusions as an annex to the report.

### **2. Assessment of Project Results**

The terminal evaluation will assess achievement of the project's objective, outcomes and outputs and will provide ratings for the targeted objective and outcomes. The assessment of project results seeks to determine the extent to which the project objective was achieved, or is expected to be achieved, and assess if the project has led to any other short term or long term and positive or negative consequences. While assessing a project's results, the terminal evaluation will seek to determine the extent of achievement and shortcomings in reaching the project's objective as stated in the project document and also indicate if there were any changes and whether those changes were approved. If the project did not establish a baseline (initial conditions), the evaluator should seek to estimate the baseline condition so that achievements and results can be properly established.

Assessment of project outcomes should be a priority. Outcomes are the likely or achieved short-term and medium-term effects of an intervention's outputs. Examples of outcomes could include but are not restricted to stronger institutional capacities, higher public awareness (when leading to changes of behavior), and transformed policy frameworks or markets. An assessment of impact is encouraged when appropriate. The evaluator should assess project results using indicators and relevant tracking tools.

To determine the level of achievement of the project's objective and outcomes, the following three criteria will be assessed in the terminal evaluation:

- **Relevance:** Were the project's outcomes consistent with the focal areas/operational program strategies and country priorities?
- **Effectiveness:** Are the actual project outcomes commensurate with the original or modified project objective?
- **Efficiency:** Was the project cost effective? Was the project the least cost option? Was the project implementation delayed and if it was, then did that affect cost effectiveness? Wherever possible, the evaluator should also compare the costs incurred and the time taken to achieve outcomes with that of other similar projects.

The evaluation of relevancy, effectiveness and efficiency will be as objective as possible and will include sufficient and convincing empirical evidence. Ideally the project monitoring system should deliver quantifiable information that can lead to a robust assessment of the project's effectiveness and efficiency. Outcomes will be rated as follows for relevance, effectiveness and efficiency:

- **Highly Satisfactory (HS):** The project had no shortcomings in the achievement of its objective, in terms of relevance, effectiveness or efficiency.
- **Satisfactory (S):** The project had minor shortcomings in the achievement of its objective, in terms of relevance, effectiveness or efficiency.
- **Moderately Satisfactory (MS):** The project had moderate shortcomings in the achievement of its objective, in terms of relevance, effectiveness or efficiency.
- **Moderately Unsatisfactory (MU):** The project had significant shortcomings in the achievement of its objective, in terms of relevance, effectiveness or efficiency.
- **Unsatisfactory (U)** The project had major shortcomings in the achievement of its objective, in terms of relevance, effectiveness or efficiency.

- **Highly Unsatisfactory (HU):** The project had severe shortcomings in the achievement of its objective, in terms of relevance, effectiveness or efficiency.

When rating the project's outcomes, relevance and effectiveness will be considered as critical criteria. If separate ratings are provided on relevance, effectiveness and efficiency, the overall outcomes rating of the project may not be higher than the lowest rating on relevance and effectiveness. Thus, to have an overall satisfactory rating for outcomes, the project must have at least satisfactory ratings on both relevance and effectiveness.

The evaluators will also assess other results of the project, including positive and negative actual (or anticipated) impacts or emerging long-term effects of a project. Given the long term nature of impacts, it might not be possible for the evaluators to identify or fully assess impacts. Evaluators will nonetheless indicate the steps taken to assess long-term project impacts, especially impacts on local populations, global environment (e.g. reduced greenhouse gas emissions), replication effects and other local effects. Wherever possible, evaluators should indicate how the findings on impacts will be reported to the GEF in future.

### 3. Assessment of Risks to Sustainability of Project Outcomes

The terminal evaluation will assess the likelihood of sustainability of outcomes at project termination, and provide a rating for this. Sustainability will be understood as the likelihood of continued benefits after the GEF project ends. The sustainability assessment will give special attention to analysis of the risks that are likely to affect the persistence of project outcomes. The sustainability assessment should explain how the risks to project outcomes will affect continuation of benefits after the GEF project ends. It will include both exogenous and endogenous risks. The following four dimensions or aspects of risks to sustainability will be addressed:

- **Financial risks:** Are there any financial risks that may jeopardize sustainability of project outcomes? What is the likelihood of financial and economic resources not being available once the GEF assistance ends (resources can be from multiple sources, such as the public and private sectors, income generating activities, and trends that may indicate that it is likely that in future there will be adequate financial resources for sustaining the project's outcomes)?
- **Socio-political risks:** Are there any social or political risks that may jeopardize sustainability of project outcomes? What is the risk 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 the project benefits continue to flow? Is there sufficient public / stakeholder awareness in support of the long term objectives of the project?
- **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 know-how, in place?
- **Environmental risks:** Are there any environmental risks that may jeopardize sustainability of project outcomes? The terminal evaluation should assess whether certain activities will pose a threat to the sustainability of the project outcomes.

Each of the above dimensions of risks to sustainability of project outcomes will be rated based on an overall assessment of the likelihood and magnitude or the potential effect of the risks considered within that dimension. The following ratings will be provided:

- **Likely (L):** There are no or negligible risks that affect this dimension of sustainability. **Moderately Likely (ML):** There are moderate risks that affect this dimension of sustainability.
- **Moderately Unlikely (MU):** There are significant risks that affect this dimension of sustainability. **Unlikely (U):** There are severe risks that affect this dimension of sustainability.



All the risk dimensions of sustainability are critical. Therefore, the overall rating for sustainability will not be higher than the lowest rated dimension. For example, if a project has an ‘Unlikely’ rating in any dimension, then its overall rating cannot be higher than ‘Unlikely’.

#### 4. Catalytic Role

The terminal evaluation will also describe any catalytic or replication effect of the project. If no effects are identified, the evaluation will describe the catalytic or replication actions that the project carried out. No ratings are requested for the catalytic role.

#### 5. Assessment of Monitoring and Evaluation System

The terminal evaluation will assess whether the project met the minimum requirements for project design of M&E and the implementation of the project M&E plan. GEF projects must budget adequately for execution of the M&E plan, and provide adequate resources during implementation of the M&E plan. Project managers are also expected to use the information generated by the M&E system during project implementation to adapt and improve the project. Given the long duration of many GEF interventions, projects are also encouraged to include long-term monitoring provisions to measure mid-term and long-term results (such as global environmental effect, replication effects, and other local effects) after project completion. The terminal evaluation report will include separate assessments of the achievements and shortcomings of the project M&E plan and of implementation of the M&E plan.

**M&E design.** Projects should have a sound M&E plan to monitor results and track progress towards achieving project objectives. An M&E plan should include a baseline (including data, methodology, etc.), SMART (specific, measurable, achievable, realistic and timely) indicators and data analysis systems, and evaluation studies at specific times to assess results and adequate funding for M&E activities. The time frame for various M&E activities and standards for outputs should have been specified.

**M&E plan implementation.** The terminal evaluation should verify that: an M&E system was in place and facilitated timely tracking of progress towards the project objective and outcomes by collecting information on chosen indicators continually throughout the project implementation period; annual project reports were complete, accurate and with well justified ratings; the information provided by the M&E system was used during the project to improve performance and to adapt to changing needs; and, the project had an M&E system in place with proper training for parties responsible for M&E activities to ensure data will continue to be collected and used after project closure.

**Budgeting and funding for M&E Activities.** In addition to incorporating information on funding for M&E while assessing M&E design, the evaluators will determine whether M&E was sufficiently budgeted for a the project planning stage and whether M&E was funded adequately and in a timely manner during implementation. Project monitoring and evaluation systems will be rated as follows on quality of M&E design and quality of M&E implementation:

- Highly Satisfactory (HS): There were no shortcomings in the project M&E system. Satisfactory (S): There were minor shortcomings in the project M&E system.
- Moderately Satisfactory (MS): There were moderate shortcomings in the project M&E system. Moderately Unsatisfactory (MU): There were significant shortcomings in the project M&E system. Unsatisfactory (U): There were major shortcomings in the project M&E system.
- Highly Unsatisfactory (HU): The Project had no M&E system.

The overall rating of M&E during project implementation will be based solely on the quality of M&E plan implementation. The ratings on quality at entry of M&E design and sufficiency of funding both during planning and implementation stages will be used as explanatory variables.



## 6. Monitoring of Long-Term Changes

The monitoring and evaluation of long-term changes is often incorporated in GEF supported projects as a separate component and it may include determination of environmental baselines, specification of indicators, provisioning of equipment and capacity building for data gathering, analysis and use. This section of the terminal evaluation report will describe project actions and accomplishments toward establishing a long-term monitoring system. The review will address the following questions:

- Did this project contribute to the establishment of a long-term monitoring system? If it did not, should the project have included such a component?
- What were the accomplishments and shortcomings in establishment of this system?
- Is the system sustainable — that is, is it embedded in a proper institutional structure and supported by financing?
- Is the information generated by this system being used as originally intended?

## 7. Assessment of Processes that Affected Attainment of Project Results

When relevant, the evaluation team should consider the following issues affecting project implementation and attainment of project results. Note that evaluators are not expected to provide ratings or separate assessments on these issues, but these could be considered in the performance and results sections of the report:

**Preparation and readiness.** Were the project's objectives and components clear, practicable and feasible within its timeframe? 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 the 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?

**Country ownership/drivenness.** Was the project concept in line with the sectoral and development priorities and plans of the country? Are project outcomes contributing to national development priorities and plans? Were the relevant country representatives, from government and civil society, involved in the project? Did the recipient government maintain its financial commitment to the project? Has the government approved policies or regulatory frameworks that are in line with the project's objectives?

**Stakeholder involvement.** Did the project involve the relevant stakeholders through information sharing, consultation and by seeking their participation in the project's design, implementation, and monitoring and evaluation? For example, did the project implement appropriate outreach and public awareness campaigns? Did the project consult with and make use of the skills, experience and knowledge of the appropriate government entities, NGOs, community groups, private sector, local governments and academic institutions in the design, implementation and evaluation of project activities? Were perspectives of those who would be affected by project decisions, those who could affect the outcomes and those who could contribute information or other resources to the process taken into account while taking decisions? Were the relevant vulnerable groups and powerful supporters and opponents, of the processes properly involved? Gender perspective: To what extent did the project account for gender differences when developing and applying project interventions? How were gender considerations mainstreamed into project interventions?

**Financial planning.** Did the project have the appropriate financial controls, including reporting and planning, that allowed management to make informed decisions regarding the budget and allowed for timely flow of funds? Was there due diligence in the management of funds and financial audits? Did promised co-financing materialize?

**GEF Agency supervision and backstopping.** Did UNDP staff identify problems in a timely fashion and accurately estimate their seriousness? Did UNDP staff provide quality support and advice to the project, approve modifications in time and restructure the project when needed? Did UNDP provide the right staffing levels, continuity, skill mix, and frequency of field visits for the project?

**Co-financing and Project Outcomes and Sustainability.** If there was a difference in the level of expected co-financing and the co-financing actually realized, what were the reasons for the variance? Did the extent of materialization of co-financing affect the project's outcomes and/or sustainability, and if so, in what ways and through what causal linkages?

**Delays and Project Outcomes and Sustainability.** If there were delays in project implementation and completion, what were the reasons? Did the delays affect the project's outcomes and/or sustainability, and if so, in what ways and through what causal linkages?

## 8. Lessons and Recommendations

The evaluators will present lessons and recommendations in the terminal evaluation report on all aspects of the project that they consider relevant. The evaluators will be expected to give special attention to analyzing lessons and proposing recommendations on aspects related to factors that contributed to or hindered: attainment of project objective, sustainability of project benefits, innovation, catalytic effect and replication, and project monitoring and evaluation.

Evaluators should refrain from providing recommendations to improve the project. Instead they should seek to provide a few well formulated lessons applicable to the type of project at hand or to GEF's overall portfolio. Terminal evaluations should not be undertaken with the motive of appraisal, preparation, or justification, for a follow-up phase. Wherever possible, the terminal evaluation report should include examples of good practices for other projects in a focal area, country or region.

The Team Leader will have overall responsibility for the quality and timely submission of the final products. Specifically, the team leader will perform the following tasks:

- Lead and manage the evaluation mission;
- Design the detailed evaluation scope and methodology (including the methods for data collection and analysis);
- Decide the division of labor within the evaluation team;
- 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.
- Certify the work of the team member and submit to UNDP for making payment

**Note:** The Team Leader is requested to include in his/her financial offer all associated costs for the team to deliver the final product (i.e. printing, communication, etc) plus his/her own consultancy fee.

## IV. METHODOLOGY

An outline of an evaluation approach is provided below; however the evaluation team is responsible for revising the approach as necessary.

The methodology to be used by the evaluation team should be presented in the final report in detail. It shall include information on:

- Documentation review (desk study) - the list of documentation to be reviewed is included in Annex 1 a of the Terms of Reference;
- Meetings will be held with the UNDP Vietnam, project team and key stakeholders
- Field visits;
- Questionnaires, participatory techniques and other approaches for the gathering and analysis of data.

It is anticipated that the evaluation team would have completed most of its desk review prior to the field mission. The team shall use the time during the field mission to verify and cross check its analysis and assessment before conducting the stakeholder workshop and presenting preliminary results.

Evaluations in UNDP will be conducted in accordance with the principles outlined in the UNEG ‘Ethical Guidelines for Evaluation’. Moreover, the evaluation will be undertaken in-line with GEF principles:

- Independence
- Impartiality
- Transparency
- Disclosure
- Ethical
- Partnership
- Competencies and Capacities
- Credibility
- Utility

## V. FINAL PRODUCT

The key product expected from the evaluation is a comprehensive analytical report. The length of the terminal evaluation report shall not exceed 50 pages in total (not including annexes). The report shall be submitted to the UNDP Vietnam CO. See Annex 1 b for required project identification and financial data forms to be covered in the report and Annex 1 c for a suggested outline of the report.

<b>Deliverable</b>	<b>Timeline</b>
<b>Presentation</b> by evaluators to project stakeholders on overview of the terminal evaluation, the methodology applied, progress to date, the anticipated outcomes, and some preliminary results if possible.	22 <sup>nd</sup> March 2011
Completion of <b>stakeholder consultations</b>	1st April 2011
<b>Draft terminal evaluation report</b> that adheres to the outline and structure as provided in Annex 1 c. The draft report will be circulated among key stakeholders for their review and feedback.	15 <sup>th</sup> April 2011
<b>Final terminal evaluation report</b> that incorporates feedback and recommendations from the stakeholders.	12 <sup>th</sup> May 2011

The evaluation must provide evidence-based information that is credible, reliable and useful. It must be easily understood by project partners and applicable to the remaining period of project duration. The evaluation should provide as much gender disaggregated data as possible.

## ANNEX B. ITINERARY OF THE EVALUATION TEAM AND LIST OF DOCUMENTS

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### B.1 Mission schedule and list of people met

We 13/04	<ul style="list-style-type: none"> <li>• Meeting at UNDP (Mr. Dao Xuan Lai, Ms. Vu Thi Thu Hang, Ms. Pham Ngoc Lan).</li> <li>• Meeting of Evaluation Team with VEEPL Team at PMU Office, VAST (Mr. Nguyen Khoa Son, Mr. Phan Hong Khoi, Ms. Nguyen Thi Bac Kinh, Mr. Shahab Qureshi)</li> <li>• Meeting with MoIT (VNEEP), Mr. Danh Hai Dzung</li> <li>• Meeting with MoC (Urban Technical Infrastructure; Mr. Nguyen Hong Tien)</li> </ul>
Thu 14/04	<ul style="list-style-type: none"> <li>• Meeting with DoC – Hanoi (Mr. Thai Tran Duc, Hapulico; Mr. Nguyen Van Kien, Hapulico; Mr. Nguyen Nguyen Tra – Department of Construction – Hanoi)</li> <li>• Meeting with RALACO (Mr. Nguyen Doan Thang; also Vice-President VLA)</li> <li>• Flight to HCMC</li> </ul>
Fri 15/04	<ul style="list-style-type: none"> <li>• Meeting with PLC HCMC (Sapulico; Mr. Tran Hung, Mr. Nguyen Van Nghia, Mr. Nguyen Huy Khuong, Mr. Hoang, Mr. Luong)</li> <li>• Meeting with LED manufacturer (Mr. Le Dong Trinh, Kim Dinh Company)</li> </ul>
Sat-Mon 16-18/04	<ul style="list-style-type: none"> <li>• Review of reports, internal discussion and drafting report</li> </ul>
Tue 19/04	<ul style="list-style-type: none"> <li>• Presentation of preliminary findings at PMU office, VAST, Mrs. Vu Thi Thu Hang, Mrs. Pham Ngoc Lan, Mrs. Nguyen Thi Bac Kinh)</li> </ul>

### B.2 List of documents reviewed by Evaluation Team

#### General project documents

*Project Document – Vietnam Energy Efficient Public Lighting (VEEPL)*  
UNDP (2004)

*Annual Project Progress Reports*  
UNDP VEEPL Project (2006, 2007, 2008, 2009, 2010)

*Project Implementation Review*  
VEEPL and UNDP (2007, 2009, 2010)

*Project Implementation Review for Mid-Term Review*  
VEEPL Project (2008)

*Review of the Quality Management in the VEEPL Project*  
Le Van Hung (UNDP, 2007)

*Inception Report; Strategic Approach to Project Planning; Knowledge Gap and Information Management; Submission to MTR Team*  
Selected papers, Mr. Shahab Qureshi (2007, 2008)

*A Strategy of VEEPL Project Exit*  
Ms. Nguyen Thi Bac Kinh (2011)

### **Selected VEEPL technical reports**

*Subcontract A3, reports No.2 (Overview of International and Regional Policies), No. 3 (Real Situation of National and Local Policies on Public Lighting, Identification of Shortcomings, No. 4 (Proposal Draft National Policies on Public Lighting in Vietnam)*  
Vietnam Urban Lighting Association (VULA, 2006, 2007)

*Subcontract C1, Commercial Financing Schemes/Financing for Public Efficient Lighting Projects in Vietnam*  
Mr. Nguyen Van Phuc (2009)

*Subcontract C2, reports No. 2 (Evaluation Report on Experiences and Lessons on Financial Mechanism for Public Service), No. 4 (Financial Mechanism and Scheme for Upgrading Public Lighting Projects)*  
Institute of Financial Science (2007)

*Subcontract D1, report No. 3 (Methodology and Tools for Calculation of Energy Savings and the CO<sub>2</sub> Emissions as a Result of Installing and Upgrading Energy Efficiency Lighting Products and Technical Assistance of VEEPL to Local Manufacturers)*  
Institute of Energy (2008)

*Subcontract D2, reports 4 on Technical – Economic Effectiveness of the Project of Efficient Public Lighting in (a) Ho Chi Minh City, (b) Quy Nhon and (c) High Schools in Hanoi and No. 7a (Findings and Recommendations for the Project of Efficient Public Lighting of Streets in Ho Chi Minh City*  
Institute of Materials Science – VAST (2006, 2007)

*Subcontract D3, report 3C (supplement) – Lighting System and Power Supply Installation of Secondary Schools in Inner Area and Suburban Area of Hanoi City*  
Rand Dong Light Source and Vacuum Flask Joint Stock Company (2008)

*Subcontract A5 – Guide to Using the Economic Tools in the Process of Investment, Construction and Maintenance for the High Efficiency Public Lighting*  
Institute of Construction Economics (ICE), Ministry of Construction (2008)

*Comprehensive assessment and design appropriate models of public lighting control center for urban cities grade 1 and 2.*  
Sapulico (2011)

## ANNEX C. CO<sub>2</sub> REDUCTION ESTIMATES REPORTED BY ISTA

YEAR	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>ANNUAL Energy Savings (GWh)</b>										
										Emission Factor
<b>1. TECHNICAL ASSISTANCE (ALL)</b>										
Year 1	0.118	5.80	8.89	8.65	10.62	0.00	0.00	0.00	0.00	0.00
Year 2		0.92	11.14	17.08	16.56	20.34	0.00	0.00	0.00	0.00
Year 3			0.92	11.13	17.06	16.54	20.31	0.00	0.00	0.00
Year 4				0.91	10.66	16.13	15.05	18.33	0.00	0.00
Year 5					0.80	9.96	14.16	12.73	15.05	0.00
Year 6						0.75	9.54	13.08	11.49	13.33
Year 7							0.56	6.21	8.68	7.14
Year 8								0.47	4.63	6.55
Year 9									0.41	3.70
Year 10										0.34
<b>TOTAL ANNUAL</b>	<b>0.118</b>	<b>6.71</b>	<b>20.94</b>	<b>37.76</b>	<b>55.71</b>	<b>63.71</b>	<b>59.62</b>	<b>50.82</b>	<b>40.27</b>	<b>31.06</b>
<b>CUMULATIVE</b>	<b>0.118</b>	<b>6.83</b>	<b>27.77</b>	<b>65.53</b>	<b>121.24</b>	<b>184.95</b>	<b>244.57</b>	<b>295.39</b>	<b>335.65</b>	<b>366.72</b>
<b>2. STREET LIGHTING DEMO PROJECTS</b>										
Year 1	0.107	0.08	0.95	1.48	0.00	0.00	0.00	0.00	0.00	0.00
Year 2		0.65	0.17	1.92	2.99	0.00	0.00	0.00	0.00	0.00
Year 3			0.65	0.17	1.92	2.99	0.00	0.00	0.00	0.00
Year 4				0.65	0.17	1.92	2.99	0.00	0.00	0.00
Year 5					0.65	0.17	1.92	2.99	0.00	0.00
Year 6						0.65	0.17	1.92	2.99	0.00
Year 7							0.65	0.17	1.92	2.99
Year 8								0.65	0.17	1.92
Year 9									0.65	0.17
Year 10										0.65
<b>TOTAL ANNUAL</b>	<b>0.107</b>	<b>0.73</b>	<b>1.77</b>	<b>4.22</b>	<b>5.73</b>	<b>5.73</b>	<b>5.73</b>	<b>5.73</b>	<b>5.73</b>	<b>5.73</b>
<b>CUMULATIVE</b>	<b>0.107</b>	<b>0.84</b>	<b>2.61</b>	<b>6.82</b>	<b>12.55</b>	<b>18.28</b>	<b>24.02</b>	<b>29.75</b>	<b>35.48</b>	<b>41.21</b>
<b>3. STREET LIGHTING REPLICATION PROJECTS</b>										
Year 1	0.000	10.97	27.71	19.71	33.56	0.00	0.00	0.00	0.00	0.00
Year 2		0.00	15.77	36.52	28.25	41.11	0.00	0.00	0.00	0.00
Year 3			0.00	15.77	36.52	28.25	41.11	0.00	0.00	0.00
Year 4				0.00	15.77	36.52	28.25	41.11	0.00	0.00
Year 5					0.00	15.77	36.52	28.25	41.11	0.00
Year 6						0.00	15.77	36.52	28.25	41.11
Year 7							0.00	15.77	36.52	28.25
Year 8								0.00	15.77	36.52
Year 9									0.00	15.77
Year 10										0.00
<b>TOTAL ANNUAL</b>	<b>0.000</b>	<b>10.97</b>	<b>43.48</b>	<b>72.00</b>	<b>114.10</b>	<b>121.66</b>	<b>121.66</b>	<b>121.66</b>	<b>121.66</b>	<b>121.66</b>
<b>CUMULATIVE</b>	<b>0.000</b>	<b>10.97</b>	<b>54.45</b>	<b>126.45</b>	<b>240.55</b>	<b>362.21</b>	<b>483.86</b>	<b>605.52</b>	<b>727.18</b>	<b>848.83</b>
<b>4. SCHOOL LIGHTING DEMO PROJECTS</b>										
Year 1	0.033	0.17	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Year 2		0.12	0.33	0.24	0.00	0.00	0.00	0.00	0.00	0.00
Year 3			0.12	0.33	0.24	0.00	0.00	0.00	0.00	0.00
Year 4				0.12	0.33	0.24	0.00	0.00	0.00	0.00
Year 5					0.12	0.33	0.24	0.00	0.00	0.00
Year 6						0.12	0.33	0.24	0.00	0.00
Year 7							0.12	0.33	0.24	0.00
Year 8								0.12	0.33	0.24
Year 9									0.12	0.33
Year 10										0.12
<b>TOTAL ANNUAL</b>	<b>0.033</b>	<b>0.30</b>	<b>0.58</b>	<b>0.70</b>	<b>0.70</b>	<b>0.70</b>	<b>0.70</b>	<b>0.70</b>	<b>0.70</b>	<b>0.70</b>
<b>CUMULATIVE</b>	<b>0.033</b>	<b>0.33</b>	<b>0.91</b>	<b>1.61</b>	<b>2.31</b>	<b>3.00</b>	<b>3.70</b>	<b>4.40</b>	<b>5.09</b>	<b>5.79</b>

Greenhouse gas emission reductions are derived (in ktCO<sub>2</sub>) by multiplying energy savings with the emission factor of 0.43. More details are given in the spreadsheet 'VEEPL 2010 Projected Impact Ver 1.2.', available at the Project Management Unit

## ANNEX D. OBSERVATIONS OF PROJECT MANAGEMENT UNIT ON THE EVALUATION REPORT

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The Project Management Unit (PMU) has expressed a view different from the Evaluation Team's rating on 'progress towards achieving the objective' and 'project implementation'. We reproduce their message sent by e-mail without editing or deletions.

### PMU'S RESPONSES TO AND COMMENTS ON THE FINAL EVALUATION REPORT

By VEEPL Project Management Unit

**On page 5, 6,** Component 3 EEPL Financing is incorrectly labelled as component 4, and again on Page 37 as Component 5.

**On page 6;** *"Less impact is noticeable in awareness raising component 5 (marginally satisfactory) and component 4 on the finance mechanisms (unsatisfactory). The project has raised awareness in certain beneficiary groups (street lighting in selected cities; schools), but has remained absent in another intended target groups, i.e., hospitals. The component 4 (financing) has produced some analysis on financial issues, but this analysis has not resulted in a clear indication on how to success of the demo activities in the large cities, such as HCMC or Hanoi, can be translated to the poorer cities and regions of Viet Nam by means of sustainable technology delivery and financing models that have the support of national and local governments".*

#### **Feedback:**

(1)- The project's information and dissemination activities on the EEPL and project outputs have been implemented widely and deeply, particularly from 2008-2011. This is one of the project's programs assessed by GOV and project's stakeholders as "very success". From the beginning of the project (2005), very little people know about EEL technology, its benefits, and its relation with environment protection. According to statistic reports of the project, due to several national, regional, and local workshops organized by the project and project's information dissemination materials distributed, as well as due to actively and efficiently taking part of all key communication means such as VOV, VTV, campaigns, press, newspapers, etc., up to now, there are 100% central and local governments of the cities/towns in Vietnam acknowledge the EEPL and as a result, they promulgated GOV policies and many local regulations on EEL technology and management application. The project Website has been updated with news uploaded. Until June 2011, there are more than 114,000 visits at the Website counted. The impact of this program is the wide implementation and replication of EEL models in 63 cities/provinces all over the country. This is confirmed by the following facts: by the end of 2010 there are 89% EEL in the urban streets, 91% EEL in the rural streets, and 65% EEL in the schools of all kinds. The wide VEEPL recognition is not only in Vietnam but also abroad. The VEEPL project information has been disseminated and known widely not only in Vietnam, but also abroad. . Some international donors such as Bill Clinton Climate Change Fund, Clean Energy Foundation, USAID ECO-Asia Clean Development and Climate Change Program, United Nations Environment Program, CDM program, ADB, WB, Penn Institute of Urban Research, ELI program, etc., well know the VEEPL project and expressed their wish to cooperate and exchange experiences in EE



lighting projects implementation and development. In addition, the project has received various invitations to attend the international workshops, conferences, exhibitions on lighting and energy saving all over the world. Being aware of the wide and good impact of the project together with the project implementation experiences of Vietnam, in October 2008, the representatives of Department of Science-Technology and Environment of the USA. Representative House together with the USA. Embassy in Vietnam had a special working meeting in Hanoi with VAST's President and VEEPL project on the project achievements, lessons and experiences and discuss the future collaboration and support to the project between the USA and Vietnam for the aim of effective contribution to global environment protection. By the end of 2011 year, the VEEPL project has been invited to be a supporter and speaker to share experience to 03 international big lighting events including exhibitions-workshops to be organized by Hong Kong, Singapore, and Korea in Hanoi and Ho Chi Minh City.

Therefore, based on the achievements of this component, we would suggest the rating of the Component 5 (Information dissemination) be *"Satisfactory"*.

(2)- For component 3 (Financing for EEPL): The project completed all activities under this component according to Project Document and plan. The quality of all submitted reports of this component significantly improved since MTE and all were approved by NSTA and ISTA. According to the Project Document, there are 5 activities under financing component. All these 5 activities were completed and the reports were produced with good assessment from NSTA and ISTA. Besides, in this component we studied and put forth a recommendation on development of ESCO, but not established ESCO because the establishment of ESCO is not a subject of the project. The MOIT (Vietnam Energy Efficient Program - VNEEP) is now starting a study on pilot ESCO development in Vietnam. Based on this point of view we would suggest the rating for this component at least *"Marginal Satisfactory"*.

(3)- Yes, hospital is one of our project's target groups. We undertook several activities for the promotion of EEL for this target group, namely: (1)- development of EE lighting standards for streets, schools and hospitals. These standards are now under approval by MOST; (2)- design and demonstration of EEL system in some hospitals in Hanoi and other cities; (3)- promotion of EEL and demo results for streets, schools and hospitals in almost project workshops. But the wide replication of EEL in hospitals in Vietnam has faced with some difficulties, one of them is no time period available for the installation of EE lighting systems because the hospitals in Vietnam are now in the overloaded with patients.

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**On page 6; "We give a rate of *marginally satisfactory* on project implementation".**

**Feedback:** The significant improvements have been made from 2008 after MTE and a lot achievements were obtained during the project implementation, particularly from 2009-2010. The project objectives were achieved, even surpassed in terms of energy savings, CO2 emission reduction and percentages of EEL for streets and schools. All the planned activities were completed, all outputs/deliverables were produced with good quality and on time. The quality of submitted reports was significantly improved and assessed as "good" with no delay. Therefore we would suggest the rating for the project implementation be *"Satisfactory"*.

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**On page 10; "Energy Efficiency".**

**Feedback:** It is suggested to supplement to the list : (1)- the Law on Energy Efficiency and Conservation No 50/2010/QH2 dated on June 28, 2010 by the Vietnam National Assembly;

(2)- the GOV's Decree No21/2011/NĐ-CP on guiding the enforcement of the Law on Energy Efficiency and Conservation No 50.

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**On page 14;** In the note part: Pls. change the phrase *“Prof. Dang Vu Minh, who continued as NPD after leaving VAST...”* to *“Prof. Dang Vu Minh, who continued as **Chairman of Project Steering Committee** after leaving VAST..”*.

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**On page 15;**

- The phrase *“Lighting equipment manufacturers and providers USD 8,120,000”* must be change to *“Lighting equipment manufacturers: **USD 2,790,000** and Local Government Agencies: **USD8,120,000”***.

- On the Figure 2: Pls., add the MOF, Vietnam Lighting Association (VLA) in the VEEPL implementation arrangements.

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**On page 19;** *“At the time of the Mid-Term Evaluation (MTE) in **2009**”* must change to *“At the time of the Mid-Term Evaluation (MTE) in **2008**”*.

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**On page 30;** In the Table 5, Pls., revise the phrases *“Achieved 2009-2010: VEEPL website maintained and updated (over **90,000** visits); **170** articles on VEEPL printed in newspapers, 8 VEEPL newsletters, 6 brochures, **14** documentary films”*.

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**On page 36;** Pls., correct MOI by MOIT.

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**On page 37;** Pls., correct Component 5 (Financing) by Component 3 (Financing).

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**On page 43;** *“So far, hospitals have not apparently shown much interest. Is that because they are not interested in efficient lighting per se, or because, contrary to a public lighting company (whose main cost will be the power bill), lighting in hospitals may only a fraction of their energy and non-energy bills. We find such issues being glossed over”*.

**Feedback:** Yes, hospital is one of our project's target groups. We undertook several activities for the promotion of EEL for this target group, namely: (1)- development of EE lighting standards for streets, schools and hospitals. These standards are now under approval by MOST; (2)- design and demonstration of EEL system in some hospitals in Hanoi and other cities; (3)- promotion of EEL and demo results for streets, schools and hospitals in almost project workshops. But the wide replication of EEL in hospitals in Vietnam has faced with some difficulties, one of them is no time period available for the installation of EE lighting systems because the hospitals in Vietnam are now always in the overloaded with patients. (Pls. refer to our previous response on page 6)

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**On Page 37;** *“Table 6 indicates that less funds has been spent on Component 5 (Financing mechanism) and more on technical support (e.g. Component 2) which can indicate both the seriousness of issues and barriers in the financing of public lighting as well as the fact that the project has not been able to fully address these issues.”*

**Feedback:** It is worth noting that project **has generally exceeded allocated** component-wise budgets except for Component 3 and Component 4. The overspending is generally at the cost of budget allocation for project administration and management. As such it may not be reasonable to claim that this indicates seriousness of issues and barriers in the financing component, even though there is no argument about less impressive performance of the component.

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**On page 42;** *“While the annual Project Implementation Reviews (PIRs) provide a detailed list of project performance indicators, there exists a strong tendency in these indicator to focus on outputs under each outcome, while to the outcomes themselves no indicators are attached. Also, the indicators tend to measure quantitatively (e.g., no. of reports produced under an activity) rather than result (e.g. actions taken based on the recommendations of*

the report). Also, output has been defined as very 'deliverable'-oriented. This has resulted in a large number of reports. The project would have benefited from summary reports per outcome and/or per thematic area. In view of the explanations given above, we propose to rate project design as 'marginally satisfactory'.

**Feedback:** Following the MTE recommendations, the PMU produced a strategy to implement such recommendations comprehensively. As part of such strategy all project indicators were redefined with clear description of outcomes, in light of MTE recommendations, together with revised annual targets. Copies of the two documents are attached. We propose that such effort should be acknowledged in the report appropriately.

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**On page 44;** *"Less impact is noticeable in awareness raising component 5 (marginally satisfactory) and component 4 on the finance mechanisms (unsatisfactory). On one hand, the project has raised awareness in certain beneficiary groups (street lighting in selected cities; schools), but has remained absent in other target groups, e.g., hospitals"*

**Feedback:** (Pls. refer to our previous response on page 6). There is no argument about less impressive performance in Component 3. However, we believe that activities in component 5, while initially being less on par, have significantly improved during past last years with the inclusion of new communication consultant. Substantial printed and AV promotional materials have been developed and disseminated. We therefore, believe that Component 5 as well as the overall project deserves at least "satisfactory" rating.

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**Page 47;** *"While the project's outputs and deliverables have been extensively reported, what is missing for future reference is a 'Final report' that integrates the results and impacts of the various components and outputs and presents it in one, easy-to-read, document. If budget availability allows it, we propose that such a report be written. The contents of the 'Final Report' could be..."*

**Feedback:** This is an important recommendation. Before the terminal evaluation, the project had already initiated the process to produce a final project report. The recommended report structure shall assist in improved quality of the report's Thank.

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## **ANNEX E. DETAILED REPORTING OF PROJECT OUTPUTS**

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### *List of deliverables, Component 1*

This part presents a full list of deliverables (reports) of the VEEPL project as given in the APPRs 2006-2010 and according to information provided by the PMU.

#### Activity 1.2 – Subcontract A3 (VULA) – (August 2006-'07)

- Inception report (2006).
- Overview of international and regional policies on public lighting & practical lessons (2006)
- Real situation of national and local policies on public lighting, identification of the shortcoming (2006).
- Proposal draft national policies on public lighting of Vietnam (2007).
- Report on consultant workshop on proposal draft national policies on EE public lighting of Vietnam (2007).
- Final proposal framework of the national policies and draft of government decree on public lighting (2007)

#### Activity 1.2 – Standard letter A3, part II – Decree (DoUI-MoC) – (Jan.2008- 2009)

- Inception report (2008)
- Report on evaluation of the current legal document system on public lighting relevant to the content of Government Decree draft and a preliminary outline of Government Decree on urban lighting (2008).
- A detail outline of Government Decree on urban lighting (2008).

#### Activity 1.2 – Standard letter A3, part II – Strategy (DoUTI) – (Jan - Dec.2008)

- Inception report (2008).
- Report on survey and evaluation of current urban lighting status in the whole country upon the updated data up to 2008 (2008).
- The first draft of development strategy with the forecast on need of urban lighting development up to 2020 (2008).

#### Activity 1.3 – Subcontract A4 (Lighting Project Construction Enterprise) – (Sept. 2006-'08)

- Inception report (2006).
- Assessment report of management, operation, of energy conservation and Energy efficiency (EC&EE) of other countries' (2006).
- Report on collection of data and information and assessment of current status of management, operation, maintenance and EE&EC of public lighting systems in 3 big cities (Hanoi, Ho Chi Minh City and Qui Nhon). Findings, recommendations and comprehensive model for opportunities for improving EE (2007).

#### Activity 1.4 – Standard Letter A5 (ICE) – (Aug. 2006 – 2008)

- Inception report (2006).
- Evaluation report on existing national and international policies and regulations relevant to electricity (2006).
- Report on development of methodology for calculating EEPL system construction investment rate and assessing of socio-economic effectiveness of EEPL construction investment projects (2006).
- Report on development of methodology for defining the price of EEPL products (2007).
- Report on determination of investment rate of EEPL project construction and estimate standards for constructing and installing EEPL project (2007).
- Report on rate of cost estimation for maintaining the EEPL system (2007).
- Hand book "guideline on technical-economic tools for EEPL management" (2007).

- A training program with an assessment of training needs for use of handbook "guideline on technical economic tools for EEPL management" (2008).
- Report on training course conducted in June 2008.

Activity 1.5 – Standard Letter A6 (DoUTI) – (April 2007 – Jun. '09)

- Inception report (2007).
- General remark and estimate the situation of public lighting management in Vietnam (2007).
- Proposal on solutions for sustainable development of a public lighting system (2007).
- A first draft of Circular on public lighting management (2008).

Activity 1.6 – Standard Letter A7 (DoUTI) – (April 2007 – March '09)

- Inception report (2007).
- Report on general evaluation on existing public lighting system planning (2007).
- Proposal on content of integration of public lighting plans into the urban construction planning (2007).
- A Decision promulgated by MoC with regulation on integration of public lighting plans into urban construction planning (Decision no 03/2008/QD-BXD issued in March 31, 2008).

Activity 1.7 – Subcontract A8 (Hapuelco) – (Aug. 2006 – June. '08)

- Inception report (2006).
- Evaluation report on local public lighting policies in Vietnam and in other countries with findings and recommendations (2006).
- Report on study and proposal for developing the local public lighting policies (2006).
- 10 proposals on the local public lighting policies: (i) proposal on regulation on investment and management for public lighting alley; (ii) proposal on enhancing public lighting management capacity for the city's public lighting management enterprises; (iii) proposal on regulation on norms of electricity consumption and losses due to application of the public lighting control systems of local urban areas; (iv) proposal on regulation on operation, management and maintenance of public lighting (unit price for operation, management of public lighting systems); (v) proposal on replacement of low efficient lighting devices by high ones; (vi) proposal on regulation on short term and long term planning for city's public lighting; (vii) proposal on regulation on renovation of management mechanism of the city's public lighting; (viii) proposal on regulation on investment for outdoor lighting of the constructions towards energy efficiency; (ix) proposal on instruction on enforcement of Circular No 02/2007 issued by MOC on regulations on the project appraisal; (x) regulation on lighting fee collection. (2007)
- Report on consultation meeting for 10 proposals on local public lighting policies.

*List of deliverables, Component 2*

Activity 2.1

- 2006-2008: Proposals on EE product performance standards for T8 and CFLs (subcontract B7A, VULA), ballasts for T8 and CFL (subcontract B7A – part II, VSQC) and HPS lamps and ballasts (subcontract B7B, ULC); consultation workshops
- TA to MOST to develop EE Standard (voluntary) for all kind of fluorescent lamps and ballast for all kind of fluorescent lamps and HPS lamps (VSQC; 2009)
- 2006-2007: Proposal on lighting standards for streets, schools and hospitals (subcontract B8, NILP); 2009: TA to MOC to complete national EEL Standards for street, school and hospital (ULC)

Activity 2.2 – Standard Letter B9 (A to E) – (July 2007 – Oct '08)

- Four Evaluation reports on current production status of Hapulico, Vinakip, Schreder and Ralaco including: (a) production technology; (b) quality of products; testing and measuring capability; (c) market; and (d) findings and recommendations on solutions for technology upgrading, product quality improving and market expanding
- Reports on technological and technical consultancy results on upgrading/improving products designs and production lines of luminaries: Maccot, Master, Rainbow, Indu, Z1, Onyx-S, Onyx-S

- Bi Power (Hapulico, Schreder), electro-magnetic ballast for HPS 75W, 150W, 250W lamps (Vinakip), 50 W CFLs, electronic ballasts for T8 (Ralaco) and CFLs < 20 W, T8 (Dien Quang)
- Reports on monitoring and evaluation results on improving project designs and production lines

Activity 2.3 – Subcontracts B.10 (A to C) – Schreder, Vinakap, Urban Lighting Design and Consultancy company – (Oct’ 2006 – Dec. 2008)

- Selection of software and design of software for HPS ballasts; guidelines documents in the form of hardcopy and CD-ROM; reports on implementation projects

Activity 2.5 – Standard Letter B.11 (A, B, C with IMS, HUT and QUATEST 1, respectively) – (August 2006 – Aug. ’08)

- Inception reports (2006)
- Reports on current status and capacity, including: (a)-Infrastructure; (b)-Testing equipment; (c) - Personnel; (d) – Capacity in developing the Quality Testing Process; and (e) - Findings and recommendations on solutions for upgrading capacities in measuring and testing electrical parameters of the EE lighting products (2006)
- Reports by IMS (2006-2007) on measuring lighting characteristics of HPSs, T8s and CFLs (e.g., luminescence, spectrum, frequency, color rendering), by IEP-HUT on development and implementation of quality testing for electromagnetic ballasts
- Report on consultancy results (training process, instruction to staff in implementing quality testing as well as monitoring and evaluation (M&E) reports for the above (IMS, HUT, QUATEST1, 2007-2008).
- Subcontract B.12 (2009-2010): Development of a proposal on establishment of a National Laboratory for Lighting product Quality Certification and Testing (IIEC)

Activity 2.6 – Subcontract B13 (ThangLong Neon) – (May 2007 – Aug. ’08)

- Inception report
- Evaluation report on situation and capabilities of 10 selected biggest local lighting system service providers with findings and recommendations (2007)
- A proposal on solutions for improving the capabilities of 10 selected providers (2007)

Activity 2.7:

- Subcontract B14 (CFMI-HUT) – Report on consultation workshop and draft training curricula; Report on Training Course on Design, Operation, Management, and Maintenance of EEPL Systems (2007, finished)
- Subcontract B15 (MoST) - Report on the review of overseas experiences on a Certification and Labeling Program for EE Lighting Products; Draft report on the formulation of the Certification and Labeling Program for EE Lighting Products

### *List of deliverables, Component 3*

Activity 3.1

- Workshop on promotion of EE public lighting to the financial sector (Sept. 2006).
- A VEEPL brochure (2007).

Activity 3.2

- A report on training course on financial mechanism and policy for energy efficient public lighting (including training program and assessments) (Sep.2007).

Activity 3.3

- Subcontract C2, (IFS) - Report on public lighting financial mechanisms (international, national) with findings and recommendations; Report on potential community and beneficiary cost-sharing – (May 2007 – June ’08)

### *List of deliverables, Component 4*

Activity 4.1 – Subcontract D2 (IMS-VAST) -



- Inception report (2006)
- Review of technical and economic feasibility of demonstration scheme (including engineering and construction designs and cost estimates) for the demo projects (32 constructions in Ho Chi Minh city, 15 constructions in Quy Nhon; 5 high schools, 6 secondary schools, and 6 primary schools in Hanoi) (2006-mid 2008)

Activities 4.2, 4.3 and 4.4 – (2006-end, 2010)

Implementation of demonstration schemes (Subcontracts/Standard Letters D3 A to C, with People's Committees of Ho Chi Minh city, Quy Nhon and Hanoi with Ralaco )

- Inception reports (2006)
- Reports on the results of technical assistance to People's Committee/Sapulico (Ho Chi Minh City) and City People's Committee in Quy Nhon and People's Committee/Ralaco Hanoi;
- *Ho Chi Minh City*: EEPL system demonstration at selected 32 constructions;
- *Quy Nhon City*: EEPL system demonstration at 15 selected constructions;
- *Hanoi*: EEPL system demonstration at 5 high, 6 primary and 6 secondary schools

Activity 4.6 – Action plan – subcontract D4 (ECC) – (July 2007 – June '08)

- Inception report (2007)
- Report on 3 case studies of the demo schemes in the three cities showcasing project costs, benefits and lessons learned (2007)
- 02 EE benchmarks for comparison with the future EE projects (2008).
- Report on action plan for replication of EEL demonstration results (2008).

#### *List of deliverables, Component 5*

Activity 5.1 - Subcontract E5 (ULC) – (Sept. 2006 – Dec. '10)

- Inception report (2006)
- Development of public lighting data facility (2006).
- Design of the PLECRM Program (2006)
- Quarterly reports on the collected and processed information/data on public lighting equipment installation, on public lighting energy consumption (2007-mid 2008).

Activities 5.3-5.4

- Standard Letter E6 (TSTC) – (Sept '06 – Dec. '10)  
Design and implementation of promotional program
  - Inception report (2006)
  - Evaluation report on the local needs of EE lighting information dissemination and awareness raising including findings and recommendations (2006).
  - Report on overseas study tour (2006)
  - Report on the collected and processed international and local information on issues related to EE public lighting including EE public lighting policies and regulations, available EE lighting products and technologies, EE public lighting financing, and promotion activities on EE&EC in public lighting (2006).
  - Report on the developed promotion and dissemination program package (2007).
  - Quarterly reports on implementation of the developed promotion and dissemination program;
- Subcontract E7 (MOST) – (May 2007 – Dec. '09)  
Design and implementation of EEPL performance rating
  - Inception report (2007)
  - Report on results of the collected data/information on the existing EE performance rating schemes in public lighting in Vietnam and in other countries (2007).
  - Evaluation report on the existing EE performance rating schemes in public lighting in Vietnam and in other countries.
  - Report on findings and recommendations on public lighting EE performance rating scheme (2007).
  - Design of an EEPL performance rating scheme (including guidelines, rules and regulations of implementation) (2008).



Activity 5.6

- Subcontract E8 (VULA) –(Sept. 2006 – Dec. '10): Establishment of PLIC
  - Inception report (2006).
  - Reports on establishment of PLIC (2006).
  - A brochure on the PLIC (2007).
  - Quarterly reports on developed database on public lighting for PLIC.

## ANNEX F. BUDGET AND CO-FINANCING

### I. Project Identification

**GEF Project ID: 1106**

**GEF Agency Project ID: 2031**

**Countries: Viet Nam**

**Project Title: Vietnam Energy Efficient Public Lighting (VEEPL)**

**GEF Agency (or Agencies): UNDP**

### II. Dates

Milestone	Expected date	Actual date
Pipeline entry		27-07-2000
CEO endorsement/approval		14-02-2005
Agency approval date		
Implementation start		18-12-2005
Midterm evaluation		09-06-2008
Project completion		30-06-2011
Terminal evaluation completion		31-07-2011
Project closing		30-06-2011

### III. Project Framework

Project component	Activity type	GEF financing (in \$)		Co-financing (in \$)	
		Approved	Actual (until 31-12-010)	Promised	Actual
1. Policy	TA	319,000	340,000	90,000	90,000
2. Technical support	TA	727,520	785,950	3,290,000	8,070,680
3. Financing	TA	141,300	110,332		
4. Demonstration	TA	434,250	416,787	8,360,000	16,825,440
5. Awareness and info	TA	299,250	386,926	600,000	411,000
6. Project management		1,078,680	916,646	118,000	118,000
<b>Total</b>		<b>3,000,000</b>	<b>2,956,892</b>	<b>12,458,000</b>	<b>25,515,120</b>

Activity types are investment, technical assistance (TA), or scientific and technical analysis. Promised co-financing refers to the amount indicated at the point of CEO endorsement/approval. It should be noted that the Project Document does not give details on co-financing per project component, only per contributing party. Also, project progress reports do not provide co-financing details per component.

### IV. Co financing

Sources of Co-financing	Type	Project preparation		Project implementation		Total	
		Expected	Actual	Expected	Actual	Expected	Actual
Contribution of national, local government and agencies	Grant			9,528,000	17,408,740	9,528,000	17,408,740
Private sector		65,000	65,000	2,790,000	8,085,680	2,855,000	8,150,680
NGO							
Other							
<b>Total Cofinancing</b>		<b>65,000</b>	<b>65,000</b>	<b>12,318,000</b>	<b>25,494,420</b>	<b>12,383,000</b>	<b>25,559,420</b>

Expected amounts are those submitted by the GEF Agencies in the original project appraisal document. Co-financing types are grant, soft loan, hard loan, guarantee, in kind, or cash.

## STAKEHOLDER SURVEY

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### F.1 Summary of survey findings

The table below present the quantity of survey sends out and number of feedback. The sample was chosen based on names and addresses of project stakeholders and beneficiaries, provided by the Project Management Unit.

	Manufactures	Stakeholders agents
Send out	5	16
Feed back	5	9

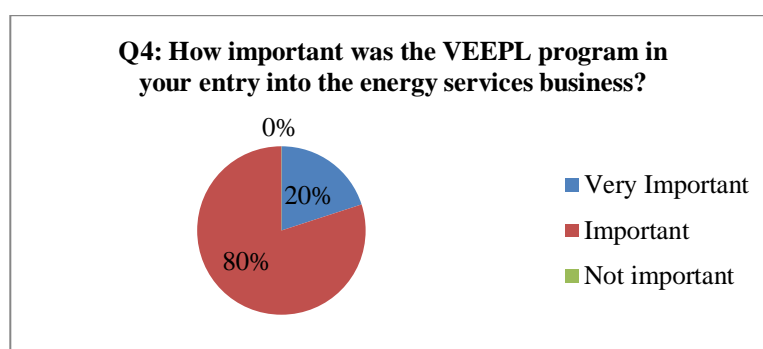
There are 7 stakeholders don't response the surveys are:

- 1- HAPULICO Coltd.
- 2- Hanoi University of Technology
- 3- Vietnam Television VTV2.
- 4- Hai Phong Lighting Company
- 5- Viện Khoa học Tài Chính
- 6- Vietnam Energy Efficiency National Program, Ministry of Industry and Trade
- 7- Thang Long Neon Lighting Company

#### *Manufactures survey result*

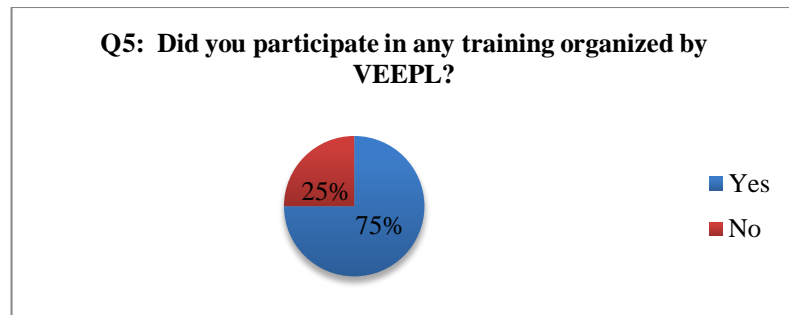
From the survey results it can be seen that most of manufactures established more than 15 years, special Dien Quang Company established 36 years ago and VINAKIP established 44 years ago. Only Rang Dong Light Source & Vacuum Flask Company was formed in 1964 but also just started providing services in energy savings in 2005. With a team of fledgling businesses, the energy efficiency lighting business almost was only started in 2005 with technical assistant support by VEEPL.

Therefore when being asked “How important is VEEPL Program in penetrating the energy services business in your company?”, 100% enterprises have evaluated VEEPL program as being important and very important for businesses in penetrating the energy saving services business market. Detailed evaluation results are as follows:

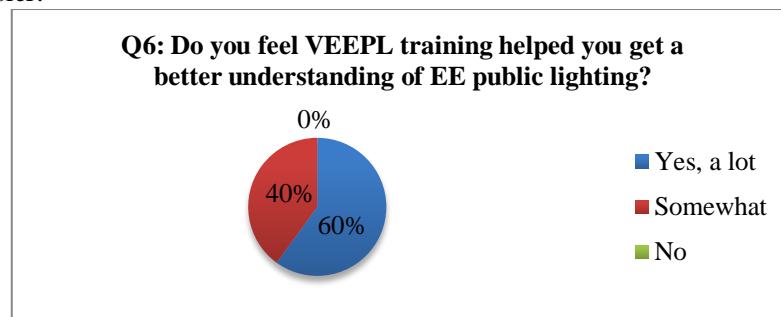


Survey results have also been able to partly assess the importance of VEEPL program in the promotion of energy efficiency market in Vietnam, especially the capacity building process of the enterprises from the first steps to build brand and reputation in the market. 100% of

businesses agreed that the training courses of VEEPL program were helpful and very useful for businesses in the capacity building process and ensuring the full technical, financial, market and business management knowledge.



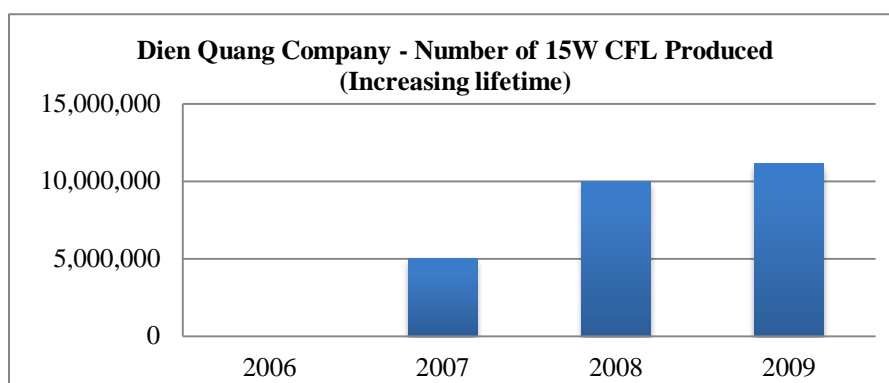
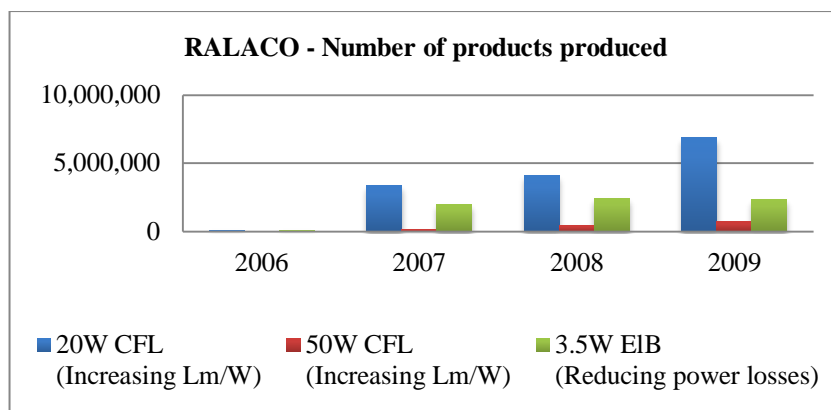
In addition, 60% of businesses also confirmed the quality of the training courses under VEEPL program is quite good. Therefore, businesses feel their access to energy-saving projects is easier.



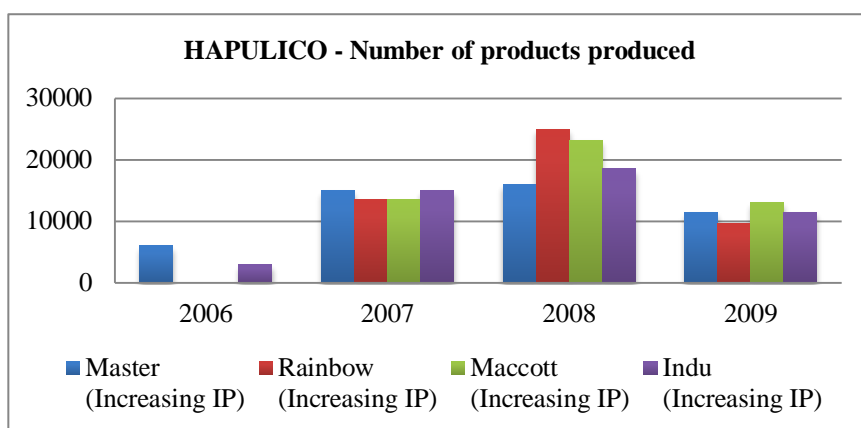
It can be seen that in the all the manufactures involved project with some work related to improved lighting products, and demonstration the energy efficiency lighting system.

Most of the manufactures do not answer directly the “question 7: What were the main types of projects or activities you worked with?” and the question 8: How many projects or activities did you conduct under VEEPL?”. The answer of “Question 9: How many equipment you provided under VEEPL?”, the specific technical assistance activities of the project to improve the quality of light at 5 different lighting manufacturing companies in Vietnam, as follows:

- Rang Dong company (RALACO): Production technology and quality of its CFLs >20W and ballasts for T8. The following results were reported:
  - o Improved the luminous efficacy from 55lm/W to 65lm/W.
  - o Reduced energy consumption of the electronic ballasts for T8 from 6W to 3.5W.
  - o Rang Dong has overseas study tour to Thailand to study and learn the experiences in the EEL technology application and EEL product manufacture.
- Dien Quang company: Upgrading production technology and quality of its CFLs<20W. By support from VEEPL, the company were successful to increase the lifetime of the CFL<20W from 4000 hours to 6000 hours. The picture below show the number of CFLs produced by Dien Quang company:



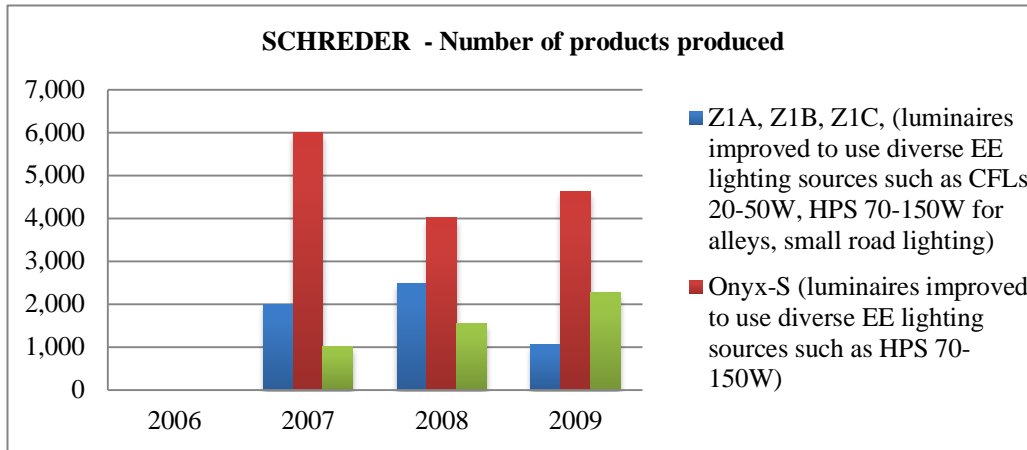
- Hapulico: the technical assistance is upgrading production technology and quality of its Rainbow and Maccott luminaries. The company successfully improved the IP of the Rainbow and Maccott luminaries from 54 to 66. The IP is an index of how waterproof the equipment is. The picture below show the number of products were produced by Hapulico:



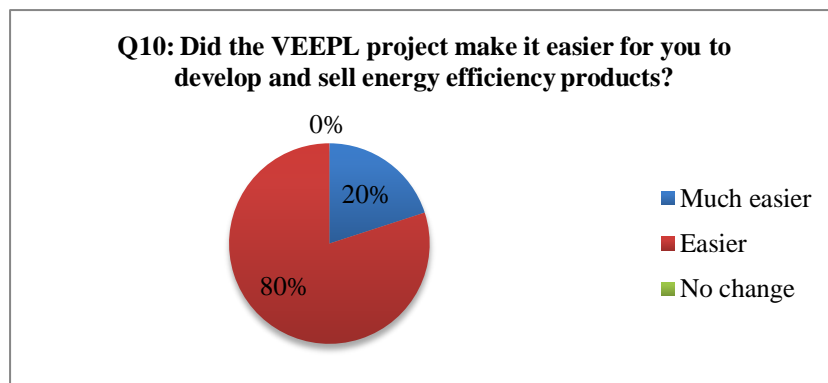
- Schreder Company: the technical assistance from VEEPL project to the Schreder Company is upgrading production technology and quality of its Onyx-S and Onyx-S Bi Power luminaries. With the supported by VEEPL the company able to produced:
  - o Z1A, Z1B, Z1C: luminaries improved to use diverse EE lighting sources such as CFLs 20-50W, HPS 70-150W for alleys, small road lighting.

- Onyx-S: luminaires improved to use diverse EE lighting sources such as HPS 70-150W.
- Onyx-S bi-power: luminaires improved to use bi-power ballasts of 250/150W.

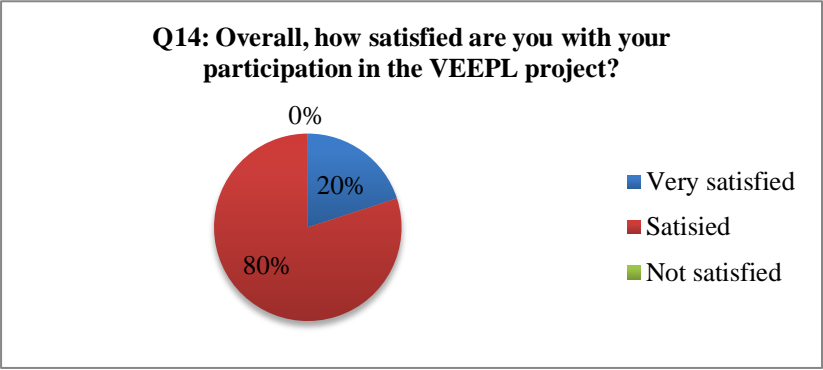
The picture below show the number of products were produced by Schreder:



After five years of program implementation, the effectiveness of the program was clearly confirmed by the fact that all the enterprises assert they will continue to maintain and develop the provision of energy saving services. The picture below shows that 80% companies think the VEEPL project support them to make their business project easier.



Answer question 11, 100% manufactures will be continuing your energy services business after the end of VEEPL project. Answer the question 12, Rang Dong Light Source & Vacuum Flask Company has deployed more than 1,000 energy efficiency lighting projects at schools, or VINAKIT answer they have 2 projects, but the others companies do not answer this question.

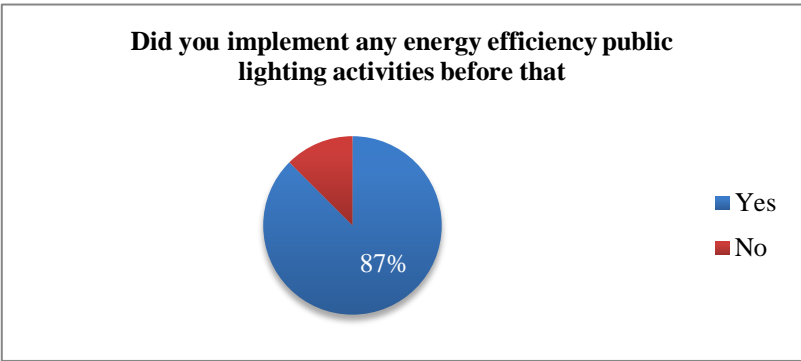


Answer question 13, 100% manufactures believe their business on energy efficiency lighting will continue to grow after VEEPL has ended.

**Stakeholder survey result**

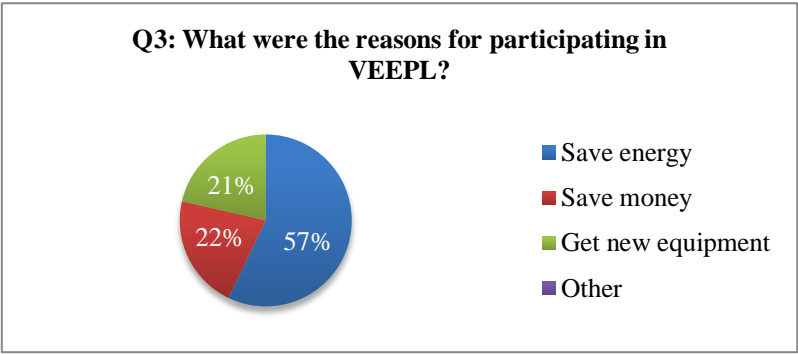
16 survey forms were sent to stakeholder but only 9 replies were received; but 01 response from the QTEST 1 was in wrong survey form. It can be seen that the stakeholders do not care much for the VEEPL program. The purpose of the survey forms sent to stakeholders is to identify how stakeholders involved to VEEPL project.

From the survey results it can be seen that most of manufactures get to know VEEPL after 2005, except the Institute of Materials get to know about VEEPL project from 2003 and the Public lighting Company in Quy Nhon heard about VEEPL project from 2000. It seems all the stakeholders very well aware about energy efficiency public lighting activities. 87% stakeholders said that they already involved to implement energy efficiency public lighting activities before involved in the VEEPL project.



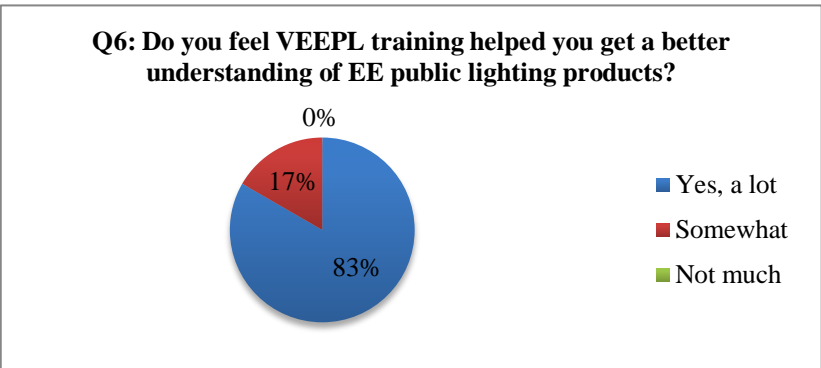
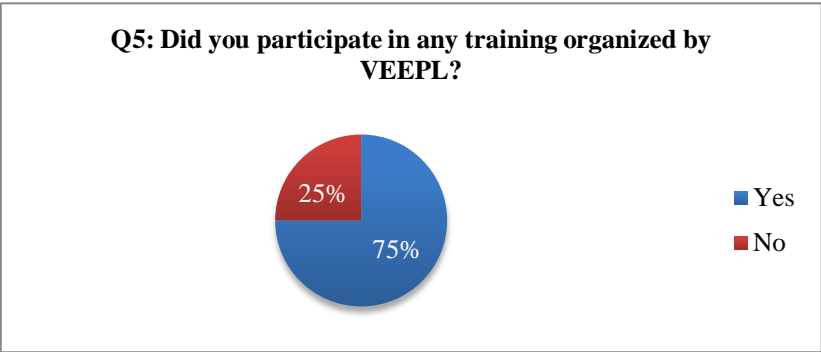
Regarding the views of the stakeholders on the implementation of EEL projects, over 57% stakeholders confirmed the deployment of EE projects in enterprises is mainly to save energy; 22% mentioned money savings factor and 21% confirmed that they were expect to get new equipment.

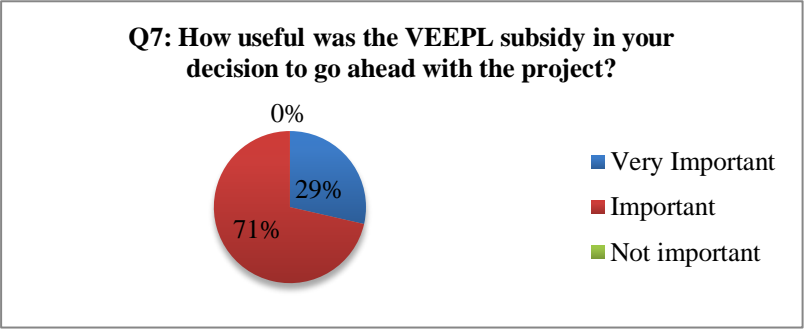




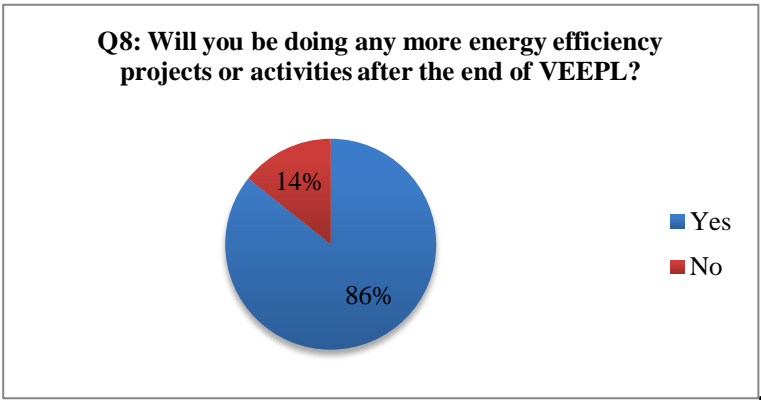
Among these stakeholders, 75% stakeholders have been involved in training courses of VEEPL program; this may be one factor promoting the implementation of energy saving measures.

83% of stakeholders think the VEEPL training helped them get a better understanding of EE public lighting products. Evaluated the funding support for implementation of EEL projects by VEEPL program has spurred businesses to make project investment and implementation decisions.

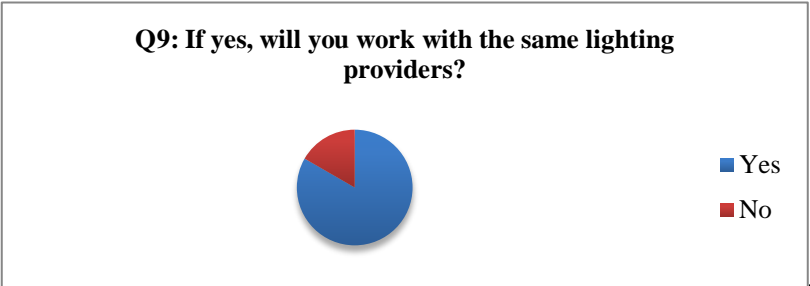




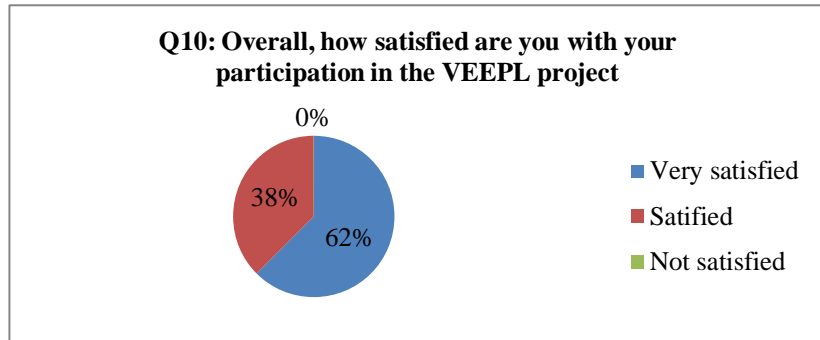
Generally 86% stakeholders answer that they will continue energy efficiency projects or activities after the end of VEEPL. The rest don't think EEL is good business for them.



17% stakeholders don't really like the products provided by the manufactures, the picture below show the interested cooperation between stakeholders and manufactures.



Most of the stakeholder satisfied with VEEPL project, but this survey only sent to the stakeholder acting like government, energy services providers or test lab.



The PMU should distribute survey to the school, the people committee where has EEL street demonstration and should consider to send the right survey to the group to have result close to reality.

## F.2 Questionnaires

### *Survey to manufacturers*

#### BACKGROUND INFORMATION

Name of Firm: \_\_\_\_\_

Name of contact person: \_\_\_\_\_

Contact address: \_\_\_\_\_

E-mail: \_\_\_\_\_ Phone: \_\_\_\_\_

#### INFORMATION OF PROJECTS OR ACTIVITIES UNDER VEEPL

1. When was your firm established? \_\_\_\_\_

2. When did you start energy efficiency public lighting services business? \_\_\_\_\_

3. When did you first participate in VEEPL? \_\_\_\_\_

4. How important was the VEEPL program in your entry into the energy services business?  
 Very Important \_\_\_\_\_ Important \_\_\_\_\_ Not important \_\_\_\_\_

5. Did you participate in any training organized by VEEPL? Yes \_\_\_\_\_ No \_\_\_\_\_  
 If yes, in how many trainings? \_\_\_\_\_

6. Do you feel VEEPL training helped you get a better understanding of EE public lighting?

Yes, a lot \_\_\_\_\_ Somewhat \_\_\_\_\_ Not much \_\_\_\_\_ Not at all \_\_\_\_\_

7. What were the main types of projects or activities you worked with? \_\_\_\_\_

8. How many projects or activities did you conduct under VEEPL? \_\_\_\_\_

9. How many equipments you provided under VEEPL?

Type of equipment: \_\_\_\_\_ Quantity: \_\_\_\_\_

Type of equipment: \_\_\_\_\_ Quantity: \_\_\_\_\_

Type of equipment: \_\_\_\_\_ Quantity: \_\_\_\_\_

Type of equipment: \_\_\_\_\_ Quantity: \_\_\_\_\_

10. Did the VEEPL project make it easier for you to develop and sell energy efficiency products?

Much easier \_\_\_\_\_ Easier \_\_\_\_\_ No Change \_\_\_\_\_

11. Will you be continuing your energy services business after the end of VEEPL? Yes \_\_\_\_\_ No \_\_\_\_\_

12. How many new projects or activities have you signed up after the end of VEEPL project? \_\_\_\_\_

13. Do you believe your energy services business will continue to grow after VEEPL has ended?

Yes, quite a lot \_\_\_\_\_ Yes, somewhat \_\_\_\_\_ No \_\_\_\_\_

14. Overall, how satisfied are you with your participation in the VEEPL project?

Very satisfied \_\_\_\_\_ Satisfied \_\_\_\_\_ Not satisfied \_\_\_\_\_

15. Any other comment or observation?  
\_\_\_\_\_

### ***Survey to other stakeholders***

#### **BACKGROUND INFORMATION**

Name of stakeholder:

Name of contact person:

Contact address:

Contact e-mail:                      Phone:

Name of organization:

INFORMATION OF PROJECTS OR ACTIVITIES UNDER VEEPL

1. When did you first hear of VEEPL?
  2. Did you implement any energy efficiency public lighting activities before that?  
  
                Yes      No
  3. What were the reasons for participating in VEEPL?  
                Save energy      Save money      Get new equipment      Other
  4. What types of activities were undertaken in your facility?
  5. Did you participate in any training organized by VEEPL? Yes      No  
                If yes, in how many trainings?
  6. Do you feel VEEPL training helped you get a better understanding of EE public lighting products?  
                Yes, a lot      Somewhat      Not much      Not at all
  7. How useful was the VEEPL subsidy in your decision to go ahead with the project?  
                Very Important      Important      Not important
  8. Will you be doing any more energy efficiency projects or activities after the end of VEEPL? Yes  
                No
  9. If yes, will you work with the same lighting providers? Yes      No
  10. If not, why not?
  11. Overall, how satisfied are you with your participation in the VEEPL project?  
                Very satisfied      Satisfied      Not satisfied
- Any other comment or observation?