



LITE-ON Technology Corp.

2017 Mercury Vapor Street Lamp  
Replacement Project: A Social Return on  
Investment (SROI) Analysis Report

2018 April

## Contents

Report Summary	2
I. Explanation of SROI Analysis Structure	3
1.1 Explanations of SROI	3
1.2 Analysis Principles of SROI	3
1.3 SROI Analysis Procedures	4
1.4 Limitations to SROI Analysis	5
II. Introduction to the Project	6
2.1 Project Content and Purpose	6
2.2 Project Scope	6
2.3 SROI Literature Review	7
III. Involvement of Stakeholders	8
3.1 Identification of Stakeholder	8
3.2 Stakeholder Engagement Map	8
3.3 Stakeholder Engagement Results - Interviews	12
3.4 Stakeholder Engagement Results - Questionnaire Surveys	13
IV. Project Impact Marking	14
4.1 Inputs	14
4.2 Outputs	14
4.3 Impact Map	15
V. Project Value Analysis	17
5.1 Establishing financial proxies	17
5.2 Sensitivity Analysis and Project Result Value Quantification	20
5.3 SROI Analysis Results	25
5.4 Sensitivity Analysis	25
VI. SROI Analysis Results and Recommendations for Project Advancement	26
6.1 SROI Analysis Results	26

## Appendix

- Outline and Questionnaire for Interview with Residents of Rural Areas
- Questionnaire for Interview with Regional Residents
- Statement of report assurance

## Report Summary

With the vision to become the "Best Partner in Optoelectronic, Eco-Friendly and Intelligent Technologies", LITE-ON Technology Corporation (hereinafter referred to as "LITE-ON") is committed to the development of energy-saving products, such as LED and smart street light, leading the industry in technological development. Over the years, LITE-ON has continuously participated in the government's "Mercury Vapor Street Lamp Replacement Project", which not only helped the urban and rural areas to improve nighttime road safety, but also benefited Taiwan through saving energy and reducing carbon emissions.

To further understand the social benefits brought by LED street lighting products, in 2017 LITE-ON selected the "Mercury Vapor Street Lamp Replacement Project" which was implemented in rural areas as the main target for evaluation. Leotek Electronics Corp., a subsidiary of LITE-ON Technology Corporation, is responsible for planning and coordination of program execution. KPMG Sustainability Consulting Co., Ltd. is engaged to conduct the Social Return on Investment (SROI) analysis. This study assesses the changes brought to the local government, participating organizations and community residents. It covers 18 districts in Nantou, Changhua, Chiayi, Tainan and Pingtung counties, which are classified as the 4<sup>th</sup> and 5<sup>th</sup> level administrative subdivisions and considered as rural areas in Taiwan.

Results of this study show that the SROI value of LITE-ON's "Mercury Vapor Street Lamp Replacement Project" is 2.85 (2017-2021), meaning that every NT\$ 1 invested in replacing LED street lights generates social benefits worth NT\$ 2.85. The impact results of the project, which were used as the categorizing criterion for SROI benefit distribution, show that the highest benefit lies in "improving residents' sense of security", accounting for approximately 59.97 percent of the overall effect. The second highest is "energy-saving and carbon emission reduction brought by LED street lights", taking up approximately 17.48 percent of the overall effect. In addition, the results of the analysis also indicate a decrease in traffic accidents and an increase in public security, giving residents a sense of security and greater willingness to go out at night. To LITE-ON, this project not only significantly improves relationships with both government and communities, but also helps R&D personnel to better understand actual demand for products. This in-depth learning will reduce the time and cost incurred during trial and error when developing products in the future.

Through the calculation of product-based SROI, LITE-ON can integrate this experience into our business, focusing directly on the social benefits created by our products and analyzing the future direction for continuous reinforcement of our product's social influence. Additionally, LITE-ON takes this experience into consideration when evaluating how to maximize the social benefits of our products during the design stage.

# **I. Explanation of SROI Analysis Structure**

## **1.1 Explanations of SROI**

Social Return on Investment (SROI) analysis is an extension from the Cost Benefit Analysis (CBA), and by using the Theory of Change as a core, used to quantify the changes and impacts to stakeholders from implementing a project. This result will be displayed in currency, for example, if the project SROI value is 3.5, it would mean that every NT\$1 spent on the project would generate NT\$3.5 value in changes in stakeholders and social benefit creations.

The evaluation of SROI can be classified as "Forecast" and "Evaluative" according to project types. Forecast is primarily used to evaluate projects that are still in planning stage and have not been carried out, to understand beforehand the possible social benefits. Alternatively, Evaluative is used to assess projects that have already been implemented to understand the social benefits that have been yielded from the projects.

## **1.2 Analysis Principles of SROI**

SROI analysis is used to evaluate the intangible value of a project and to monetize it. Therefore, the following 7 principles should be upheld during the entire evaluation process to ensure that the evaluation process and results could comply with SROI's approaches of "no overstatement" and "prudent analysis." Please see below for explanations of these principles:

### **1. Principle 1 - Collaborating with Stakeholders**

Identifying the stakeholders and inviting them to be involved in the SROI analysis process will help a company to effectively understand the impacts and values from the project.

### **2. Principle 2 - Understanding the Changes Brought by the Project**

Clearly identify the ways the project has brought forth changes (including positive and negative, anticipated and non-anticipated ones) through data and information collection, and to evaluate the impacts.

### **3. Principle 3 - Assigning Prices to Critical Results**

Assign monetary value (prices) to the results by using 'Financial Proxies' so that the results that cannot participate in market transactions but were subjected to influence from the project could be shown.

#### 4. Principle 4 - Only Material Information will be Taken into Consideration

Decide the type of information and evidence to be factored into consideration to draw an authentic 'Impact Map' so that stakeholders can make a reasonable decision regarding the impacts.

#### 5. Principle 5 - Reviewing the Results

Subjective judgment, analysis, and consideration may inevitably exist in the SROI analysis; hence, an appropriate and independent review can test the reasonableness of the SROI analysis and decision.

#### 6. Principle 6 - Transparent Disclosure

Document and explain the stakeholders, results, Financial Proxies, and methods of evaluation identified in the analysis. The more transparent and open of the process, the more reliable the SROI analysis results will be.

#### 7. Principle 7 - Avoid Overstatement

Eliminate irrelevant factors, and only state the values brought forth by the project.

### 1.3 SROI Analysis Procedures

There are five major steps in the SROI analysis procedures. The chart below indicates the analysis structure, and following is a brief explanation.



#### 1. Plan & Set Objectives

In the commencement stage of the projects, identify and prioritize social investment projects that will undergo SROI evaluation. Typically the selection process will focus on projects with potential significant impact, sufficient resources, and are long-term in nature. Identify overall project objective (what problem does the project aim to solve), critical stakeholders, and potential project benefit analysis for the projects chosen from the previous step. Establish a Stakeholder Engagement Map to assess the possible impacts to stakeholders from implementing the projects.

#### 2. Map Impacts

After confirming the scope of implementing the project, begin to identify the input, output, result, and impact from the project. Project input is resources dedicated toward

the project, including money and time; project output is activities from such input; project results are direct results from implementing the project, such as enhancing productivity; and finally, project impact refers to direct or indirect impacts from long-term implementation of the project, such as an increase in employment rate. Construct a Project Impact Map based on evaluation of indicators such as input, output, result, and impact.

### 3. Collect Data

Collect relevant data, supplemental information, and financial proxies needed to evaluate the initial analytical framework that has been identified in above-mentioned step 1 and 2. Methods of data collection include (but not limited to) questionnaires, phone interview, face-to-face interview, and secondary data analysis. Establish corresponding financial proxies to assess SROI results based on the results of data collection.

### 4. Analyze Impacts

To avoid overstatement, this stage aims to identify other factors that may influence the project results in sensitivity analysis. Factors may include irrelevant factors, substitute factors, and/or attribution factors. Calculate the future impacts of the project while taking decay factors into consideration. Discount the cost and benefit to the base period to calculate SROI.

### 5. Evaluate

Inspect whether benefits generated by the project are in line with its plan based on quantitative and qualitative information provided by project stakeholders as well as the SROI evaluation process and results. Moreover, propose ways to enhance the overall project based on the social benefits identified through SROI results.

## **1.4 Limitations to SROI Analysis**

The entire SROI evaluation process and calculations of social value are correlated to subjective judgment from stakeholders. This evaluation method is different from the traditional financial analytical models. This project collects the level of major changes that the project has caused through interviews and questionnaires and undertakes relevant evaluations on the prudent principle. However, differences between individuals subjected to the impact and differences between project implementation procedures may lead to distinctively different results. Different financial proxies may also need to be adopted based on differences in the content and nature of the project. Hence, the SROI values of different types of projects, or projects of the same type but are not completely the same due to differences in implementation procedures or in nature, cannot be directly compared.

## **II. Introduction to the Project**

### **2.1 Project Content and Purpose**

With the vision of becoming the “Best Partner in Optoelectronic, Eco-Friendly and Intelligent Technologies”, LITE-ON focuses on the development of core optoelectronic components and key electronic components and has developed diverse energy-saving product solutions. In the large lineup of LITE-ON’s energy-saving products, LED street lights connect with the society in the widest dimension. Our LED street light products are not only the market leaders in Taiwan, but are also marketed in Europe and the United States. Over the years, LITE-ON continuously participates in the government's “Mercury Vapor Street Lamp Replacement Plan”, which aims not only to improve the nighttime lighting for the roads in urban and rural areas, but also create tremendous benefits for Taiwan through saving energy and reducing carbon emissions.

As street lamps form the major source of public lighting in rural areas, it is closely related to the daily lives of the community residents. Compared with the urban areas, LED street lights have a more significant impact on the rural areas with limited funding. To further assess the social benefits from implementation of the “Mercury Vapor Street Lamp Replacement Plan” in rural areas, LITE-ON commissioned KPMG to introduce an assessment approach through the model of social return on investment (SROI). Through assessing the changes brought by the improvement in nighttime lighting to the residents, government, participating organizations and the community in the aspects of financial administration, environment, road safety, social security and overall quality of living, we evaluated the impacts and changes on the main stakeholders who are directly affected by the projects.

The goals of LITE-ON’s “Mercury Streetlight Sunset Project” in rural areas:

1. To cut down spending on electricity and achieve energy-saving and carbon reduction by reducing use of electricity for lighting.
2. To improve public lighting, reduce nighttime accidents and public order issues and increase residents’ willingness to go out at night.
3. To reduce the impact on ecology and human health through improving street lighting design.
4. To promote local economy by collaborating with local suppliers and upgrade professional competencies of the contractors through training on the installation skills.

### **2.2 Project Scope**

The scope covered in the project analysis includes 18 4<sup>th</sup> and 5<sup>th</sup> level rural areas in Nantou, Changhua, Chiayi, Tainan and Pingtung where the Mercury Vapor Street Lamp Replacement Project were implemented, and the subjects are local residents, village and

community leaders and local governments. Project evaluation is based on the results of 2017 and the value of the effect in the next five years (including 2017) is estimated for an overall SROI results. Results will serve as an important reference for LITE-ON's product strategies in the future.

## 2.3 SROI Literature Review

In addition to evaluation, following the procedure of SROI analysis, this assessment has also taken relevant international studies into reference, including social impact assessment on LED street lights and correlation analysis of nighttime illumination and traffic accidents. A list of references is provided in Table 2.3-1.

**Table 2.3-1, Literature and studies referenced in this project**

<b>Research Institutions</b>	<b>Name of Academic Reports</b>	<b>Effectiveness of SROI</b>	<b>Year</b>
University of Bristol	Life Cycle UK SROI report	Effectiveness of community development.	2013
HDR Decision Economics (HDR)	SROI Analysis for TIB Low Energy Lighting Conversion in Small Cities in Washington State	Effectiveness of converting streetlight.	2014
Jackett Consulting	Quantifying the impact of road lighting on road safety –A New Zealand Study	Decrease the traffic accident.	2012
UK Highway Agency	Appraisal of New and Replacement Lighting on the Strategic Motorway and All Purpose Trunk Road Network	Decrease the traffic accident.	2007
The Royal Society for the Prevention of Accidents	Road Safety factsheet: Street Lighting and Road Safety	Decrease the traffic accident. Increase the safety of community.	2017
Swedish Council for Crime Prevention	Lincolnshire County, UK Police Street Lighting Executive Summary	Decrease the traffic accident.	2007

### III. Involvement of Stakeholders

#### 3.1 Identification of Stakeholder

Stakeholder involvement is a critical procedure for SROI assessment. The overall value of a social investment project can only be measured through identifying the stakeholders affected and the changes brought about by the project to the different stakeholders. Identification of the stakeholders starts from the launch of the project, exploring the potential stakeholders that will become involved in the process of project implementation, and then identifies the key stakeholders based on the degree and significance of their involvement. The stakeholders can be further divided into two groups - the "initiator (project implementer" and the "direct beneficiary", as shown in table 3.1-1. After interviewing the project implementer, stakeholders who are considered to have low degree of involvement and significance are excluded from the SROI analysis, as shown in table 3.1-1.

**Table 3.1-1, Key stakeholders**

Key Stakeholders		Reason for Inclusion
Local Government/Citizens	Local Government	Project initiators and funders
	Citizens, Head of District	Direct beneficiaries of the project
Cooperation Agencies	LED Streetlight Contractor	Project executors who are highly involved
LITE-ON	LITE-ON	Project initiators and executors
	LITE-ON Business Department (Leotek)	Project coordinators

**Table 3.1-2, Stakeholders not included in the analysis**

Excluded Stakeholders		Reason for Exclusion
Indirect Participants	Police	Organization which is low-degree involved
	Environmental organizations	
	Media	Reporters who communicate the information

#### 3.2 Stakeholder Engagement Map

After identifying the key stakeholders, engagement must be made. Before engaging the key stakeholders, we must examine the core objectives of LITE-ON's "Mercury Vapor Street Lamp Replacement Project" to further identify and verify the changes that the key stakeholders are expected to experience through this project, which will guide eventually

the engagement. Through literature review and an interview with the project implementer, we drafted the Stakeholder Engagement Map, as shown in Table 3.2-1.

**Table 3.2-1, LITE-ON Mercury Vapor Street Lamp Replacement Project**

Key Stakeholders		Reason for Inclusion	Objectives	Expected changes/results
Local government / Resident	Local government	The organizer and funder of the project, one of the initiators of the change; therefore, it needs to be included in the analysis.	1. To cut down spending on electricity and achieve energy-saving and carbon reduction by reducing use of electricity for lighting. 2. To improve public lighting, reduce nighttime accidents and public order issues and increase residents' willingness to go out at night. 3. To reduce the impact on ecology and human health through improving street lighting design.	Benefits of energy-saving and carbon reduction
	Community residents and leaders	Are direct beneficiaries of this project and therefore they need to be taken into consideration.		Improve community safety
				Reduce traffic accidents
				Give residents' a sense of security
				Provide opportunities for community interaction
				Reduce interference on human activities and growth of crops
Collaborators	LED street light contractors	As the main implementer of the project, they have high degree of involvement and therefore needs to be taken into consideration.	Impart knowledge of lighting and environmental health	
			Provide employment opportunities	
LITE-ON	LITE-ON	As the main coordinator of the project, LITE-ON is the initiator of the change and therefore needs to be included in the analysis.	Improve professional skills	
			Build an image of local involvement	
	Planner of the events (Leotek)	The unit in charge of planning and coordinating project implementation and therefore needs to be included in the analysis, in order to gain an overall view on the purpose and activities.	Improve the relationship with the government and the communities	
			Boost a sense of identification with the corporation	
			Get to know the local communities	
			Give the participants a sense of accomplishment	
			Raise awareness on environmental protection and energy conservation	

This analysis project takes the initial stakeholder engagement map shown above into reference for drafting of the interview on the internal and external key stakeholders

(please see the appendix for the outline of the interview). Based on the results of the interview, we verified whether the expected changes occurred and then proceeded to revise the stakeholder engagement map before moving on to prepare the follow up questionnaire. Through questionnaire survey and second interviews, we collected quantitative and qualitative data to complete the analysis and produce the impact map.

Interviews with internal and external key stakeholders were conducted face-to-face and those who are unavailable for face-to-face interviews were interviewed through phone conversation. Each interview lasted approximately 20 minutes, and the data collected in the process of stakeholder engagement was organized into table 3.2-2.

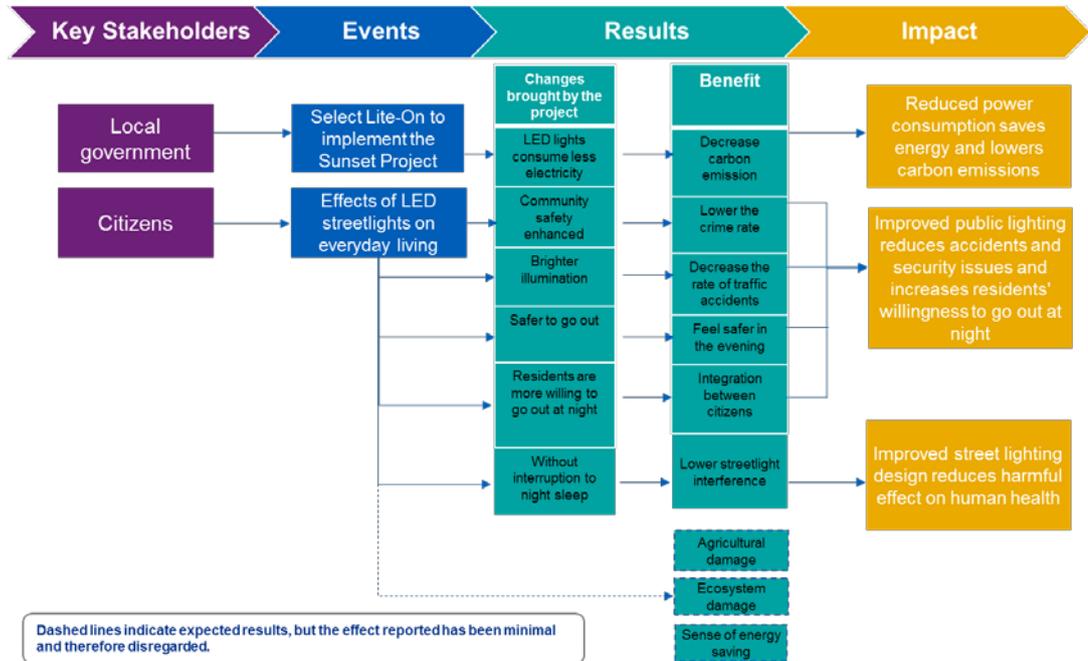
**Table 3.2-2. Data from interviews with stakeholders**

Key Stakeholders		Interviewees	Interview Method	Date of Interview
External	Beneficial citizens or relevant members (Including members from Nantou, Changhua, Chia Yi, Tainan, PingTung)	1 Village president	Face to face	2017/12/07
		2 Technical members, head of neighborhood, head of district, polices		2018/01/05
		2 Technical members, street store owner, village president		2018/01/09
		2 Citizens		2018/01/12
	Cooperation Agencies	1 Firm's delegation	Face to face	2018/01/02
		2 Firm's delegation, employee		2018/01/12
Internal	Internal Staff	Project participants from LITE-ON business department	Face to face	2017/12/07 2018/01/02 2018/01/03

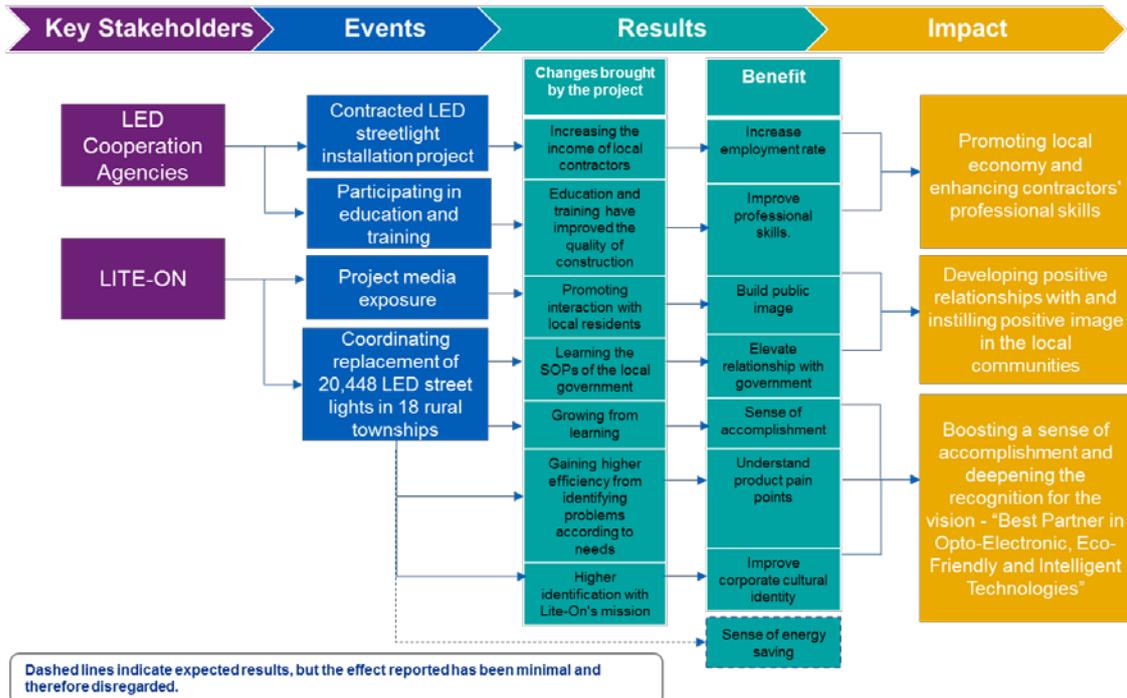
Through interviews with internal and external key stakeholders, this assessment study was able to verify whether the expected changes identified in the initial draft of the stakeholder engagement map were true, and the results of the interviews were used to confirm the relevant input and output statistics were needed in the subsequent analysis. Results of the interviews showed that the expected benefits from the dimension of "imparting knowledge of lighting and environmental protection" was minimal to the degree of non-detectable and therefore not included in the subsequent analysis. The dimension "reduce interference to growth of crops and ecology" also received minimal feedback from the literature review and interviews and therefore it is determined to have insignificant effect, it is not included in the subsequent analysis.

Finally, this assessment study consolidated the results of the interviews and questionnaires surveys to further analyze the reactions from different key stakeholders in a process of the event and analyzed the impact generated by this project. A chain of events based on the results of LITE-ON's Mercury Vapor Street Lamp Replacement Project was

drawn, as shown in figures 3.2-1 and 3.2-2. This chain of events clearly presents the contents of the events and how these events affect the key stakeholders.



**Figure 3.2-1, Results of LITE-ON “Mercury Vapor Street Lamp Replacement Project” Chain of Events - Local Government and Residents**



**Figure 3.2-2, Results of LITE-ON “Mercury Vapor Street Lamp Replacement Project” Chain of Events - LED Street Lights Contractors and LITE-ON**

### 3.3 Stakeholder Engagement Results - Interviews

Interviews with the key stakeholders were arranged for this project to respond to the content of the stakeholder engagement map and confirm the most substantial feedback. Due to the wide spread of influence involved, multiple perspectives were taken into consideration. Feedback from the residents' interviews revealed that the main effect was the increased sense of security and traffic safety. No significant impact in the negative sense was expressed on the crops. Feedback from police personnel was focused mainly on the enhanced social security brought by improved illumination. Project contractors benefited from enhancement of professional skills after education and training and LITE-ON employees gained greater insight into the needs associated with the company's products through this project. Table 3.3-1 shows detailed excerpts from the interviews.

**Table 3.3-1, Excerpts from interviews with stakeholders associated with LITE-ON Mercury Vapor Street Lamp Replacement Project**

Interviewees	Feedback Information	Corresponding Outcome
Citizens	<ul style="list-style-type: none"> <li>Citizens feel safer with new LED streetlight when riding bike, scooter and driving vehicle. Stolen rate of mango decrease in evening.</li> </ul>	Citizens feel safer
	<ul style="list-style-type: none"> <li>Citizens will not drive to ditch with new LED streetlight.</li> </ul>	Decrease the rate of accidents
	<ul style="list-style-type: none"> <li>Lighten the village during evening hours. Citizens are more willing to spend time with one another outdoors.</li> </ul>	Increase the interaction between citizens
Part of citizens, head of district	<ul style="list-style-type: none"> <li>Few citizens claim that streetlights are too bright to adversely impact sleep.</li> <li>Crops: citizens can install a cover if lights are too bright. There was concern over disturbance of the crops in the short run, but it is not a long term issue.</li> <li>Positive influence on planting dragon fruit with brighter lights.</li> </ul>	Lower the disturbing from streetlight in evening
Policies	<ul style="list-style-type: none"> <li>Increase public security by increasing visual distance with new streetlights.</li> </ul>	Increase public security
	<ul style="list-style-type: none"> <li>With the new streetlights, there is no need to turn on high beams, sparing oncoming drivers' eyes.</li> </ul>	Decrease the rate of traffic accident
Local Government	<ul style="list-style-type: none"> <li>Compared to Bayonet mount, the fixed cost of LED light is higher, but marginal cost is lower.</li> <li>LITE-ON has hired a responsible contractor to maintain the streetlight.</li> </ul>	Energy saving and carbon reduction
LED Streetlight Contractor	<ul style="list-style-type: none"> <li>Introduction of product, quality of streetlight and new employee orientation before construction are helpful.</li> <li>Opportunity of learning knowledge at High-Tech, LED and cable installation.</li> </ul>	Improve professional skills

Interviewees	Feedback Information	Corresponding Outcome
	<ul style="list-style-type: none"> <li>• Had a really good cooperative experience with LITE-ON.</li> <li>• Found out some issues that are ignored by government during the process of the project, including the height of light rods and streetlight wattage.</li> </ul>	Improve the positive relationship between firms and government
LITE-ON	<ul style="list-style-type: none"> <li>• Understood the issues and had some insight into local problems.</li> <li>• Increase the understanding of rural Taiwan. If there are customer issues, LITE-ON will communicate with affected locals directly.</li> </ul>	Understand the market
	<ul style="list-style-type: none"> <li>• Participated from the beginning to the end of the project and learned about the construction process.</li> </ul>	Increase the organizational commitment

### 3.4 Stakeholder Engagement Results - Questionnaire Surveys

Based on the consolidated results of the interviews, this assessment study designed the corresponding SROI investigation survey to collect feedback from the stakeholders and confirm whether the expected changes occurred. Corresponding questions were designed to verify the degree of changes on the stakeholders and collect relevant information on sensitivity factors for future analysis. Sampling for the questionnaire survey were conducted under 95 percent confidence level and maximum sampling error was set under  $\pm 10$  percent. The subjects were stakeholders identified in the about process.

The SROI questionnaire survey for the LITE-ON Mercury Vapor Street Lamp Replacement Project was mainly conducted through physical questionnaires. A total of 136 questionnaires were collected, including 119 from the residents, 9 from the LED street light contractors and 8 from LITE-ON employees involved in the projects. The project is deemed to have directly affected a population of 194,333, estimated under 95 percent confidence level and  $\pm 10$  percent maximum sampling error. Please see the appendix for the content of the questionnaire.

## IV. Project Impact Marking

### 4.1 Inputs

The inputs for the 2017 LITE-ON Mercury Vapor Street Lamp Replacement Project in rural areas include the main expenditures (e.g., procurement of the LED light tubes, transportation and installation), cost of project promotion, salaries for employees of Leotek and labor cost for LED light replacement in the rural areas. Please see table 4.1-1 for details.

**Table 4.1-1. Inputs for LITE-ON Mercury Vapor Street Lamp Replacement Project**

Key Stakeholders		Input	Value of Input (NTD)
LITE-ON	LITE-ON	Total cost of the project. <sup>1</sup>	403,266,540
	LITE-ON	Marketing cost	130,000
	LITE-ON business department	Time cost of relevant employees <sup>2</sup>	N/A
Local Government/Citizens	Local government	N/A	N/A
	Citizens	Time cost of relevant employees <sup>3</sup>	67,777
Cooperation Agencies	LED Streetlight Contractor	Time cost of relevant employees <sup>2</sup>	N/A
<b>Total Cost (NTD)</b>			<b>\$403,464,317</b>

Notes:

1. The total project expenditure includes procurement of LED light tubes, transportation and installation.
2. The inputs of time costs attributed to the employees of Leotek and contractors for LED street light installation have already been consolidated into the total expenditure and therefore not calculated separately.
3. According to interview results, the average time input by local village and community leader was approximately 1/20 of the total installation time.

### 4.2 Outputs

The outputs from 2017 LITE-ON Mercury Vapor Street Lamp Replacement Project in rural areas include helping 18 rural townships replace LED street lights in the total of 20,448 units and receiving internet media exposure five times and broadcast media exposure two times. Please see table 4.2-1 for details.

**Table 4.2-1, Outs from 2017 LITE-ON Mercury Streetlight Sunset Project in Rural Areas**

Key Stakeholders		Total Output of 2017
Local Government/Citizens	Local Government	<ul style="list-style-type: none"> <li>Assisted 18 rural areas in replacing streetlights from incandescent to LED bulbs.</li> <li>Replaced 20,448 streetlight.</li> <li>Exposed 5 times via internet media and 2 times via broadcast.</li> </ul>
	Citizens	
Cooperation Agencies	LED Streetlight Contractor	
LITE-ON	LITE-ON	
	LITE-ON business department	

### 4.3 Impact Map

Through interviews with key stakeholders, we were able to confirm whether the project's expected impacts on the stakeholders were true and further understand what kind of impacts these changes brought to the stakeholders. The impacts on the key stakeholders of LITE-ON Mercury Vapor Street Lamp Replacement Project are described below and the projects' impact map is shown in table 4.3-1.

**Table 4.3-1. Impact Map of LITE-ON Mercury Vapor Street Lamp Replacement Project**

Key Stakeholders		Input	Output	Outcome	Description of event chain and impacts	Inclusion of Outcome	
Local government/ Citizens	Local Government	N/A	<ul style="list-style-type: none"> <li>Assisted 18 rural areas in replacing streetlights from incandescent to LED bulbs.</li> <li>Replaced 20,448 streetlight.</li> </ul>	Decrease carbon emission	To cut down spending on electricity and achieve energy-saving and carbon reduction by reducing use of electricity for lighting.	Yes	
	Citizens, head of district	Time cost of relevant employee (\$67,777)		Lower the crime rate	To improve public lighting, reduce nighttime accidents and public order issues and increase residents' willingness to go out at night.	Yes	
				Decrease the rate of traffic accidents		Yes	
				Increase sense of security		Yes	
				Increase the interaction between citizens		Yes	
				Provide light and knowledge of environmental awareness		No	
				Decrease evening disturbances		To reduce the impact on ecology and human health through improving street lighting design.	Yes
				Decrease crop and environmental damage		No	
	Cooperation Agencies	LED Streetlight Contractor		N/A	<ul style="list-style-type: none"> <li>Exposed 5 times via internet media and 2 times via broadcast.</li> </ul>	Increase employment rate	To promote local economy by collaborating with local suppliers and upgrade professional competencies of the contractors through training on the installation skills.
LITE-ON	LITE-ON	Total cost of the project(\$403,266,540) Marketing cost(\$130,000)	Improve professional skills	To build an image of LITE-ON's involvement in local communities through establishing and maintaining friendly relationships with government agencies and communities.		Yes	
			Build a strong PR image for LITE-ON			Yes	
Coordinator	N/A		<ul style="list-style-type: none"> <li>Elevate relationship with government and society</li> <li>Improve corporate cultural identity</li> </ul>	To provide professional products and services,	Yes		

Key Stakeholders		Input	Output	Outcome	Description of event chain and impacts	Inclusion of Outcome
	LITE-ON (business department)			Attain deep insight of customer's needs	encourage employees to care for the rural areas, give employees a sense of accomplishment and deepen employees' identification with LITE-ON's vision to become the "Best Partner in Optoelectronic, Eco-Friendly and Intelligent Technologies".	Yes
				Improvement of sense of accomplishment		Yes
				Promote the knowledge of environmental awareness and carbon emissions		No

Notes:

1. The inputs of time costs attributed to the employees of Leotek and contractors for LED street light installation have already been consolidated into the total expenditure and therefore not calculated separately.
2. The expected benefits from the dimension of "imparting knowledge of lighting and environmental protection" were minimal and therefore not included in the analysis. The dimension "reduce interference to growth of crops and ecology" also received minimal feedback from the literature review and interviews and therefore it is determined to have insignificant effect and not included in the analysis.

## V. Project Value Analysis

### 5.1 Establishing financial proxies

After stakeholder identification and engagement, impact marking and data collection, the next step in SROI analysis is to quantify the results of related activities, i.e., establishing evaluation indicators and financial proxies. The evaluation indicators are mainly used as the basis for measuring the occurrence of results and the degree of improvement. Information in this section is provided mainly with reference to literature review and results of the questionnaire survey of each activity.

In selection and establishment of financial proxies, the benefits of LITE-ON Mercury Vapor Street Lamp Replacement Project are monetized mainly through two methods: the Revealed Preference Method and the Blessing. Wellbeing Valuation Method. If the Revealed Preference Method is used to derive the financial proxies of the relevant activity, selection of the indicators will be based on the feedback of the stakeholders, as well as the relevance between the content of the indicator and the content of the activities, and the screening criteria will be conservative in principle. In summary, the asset proxies for LITE-ON Mercury Vapor Street Lamp Replacement Project are summarized in Table 5.1-1.

**Table 5.1-1. Financial proxies for LITE-ON Mercury Vapor Street Lamp Replacement Project**

Key stakeholders	Outcome	Indicator	Financial Proxies (TWD)	Source of Financial Proxies	Description of Financial Proxies	Valuation Technique
Local government	Lower electric fee	Expected electric fee	Saving on electricity expenditure after replacing mercury vapor lights to LED lights: 1,237 per light	Provided by LITE-ON	With 20,448 street lamps in rural areas, a total of NT\$ 25,301,890 in electricity spending can be saved each year.	Revealed Preference Method
	Decrease carbon emissions	Expected carbon emissions	External costs of carbon: 1,794 (per metric ton)	U.S. government ad hoc group technical report	Saving on electricity*power factor*carbon Cost	Revealed Preference Method
Citizens	Decrease crime rate	Crime rate (%)	Annual salary of security patrol personnel: 327,000 (per person)	Taiwan Bank Procurement Department Joint Supply Contract	Feedback from the interviews indicates that increase in nighttime illumination creates an improvement on community	Revealed Preference Method

Key stakeholders	Outcome	Indicator	Financial Proxies (TWD)	Source of Financial Proxies	Description of Financial Proxies	Valuation Technique
					security equivalent to the effect of staffing security personnel. Therefore, monetization is calculated based on the assumption of staffing one security personnel at each village/community.	
	Decrease the rate of traffic accidents	Traffic accident rate (%)	Average cost of road accidents 1,804,954 (A1 accident) 29,520 (A2 accident)	2009 Road Safety and Law Enforcement Conference - A Study on the Costs of Motor Scooter Accidents	The number of Class A1 and A2 accidents occurred at nighttime in rural areas in 2016 is calculated and multiplied by the average cost of each accident, as well as the estimated accident reduction at 10% to set the financial proxy.	Revealed Preference Method
	Increase sense of security	Degree of increasing security	The value of not worrying about crime issues (Well-being Valuation Model): 50,376 (per person)		The value is set based on the value of impact proposed in this report and then converted into the actual value based on the price index of Taiwan.	Well-being valuation method
	Increase the interaction between citizens	Degree of increasing interaction between citizens	The value of increased interaction with neighbors (Well-being Valuation Model): 14,643 (per person)		The value is set based on the value of impact proposed in this report and then converted into the actual value based on	Well-being valuation method

Key stakeholders	Outcome	Indicator	Financial Proxies (TWD)	Source of Financial Proxies	Description of Financial Proxies	Valuation Technique
					the price index of Taiwan.	
	Lower the disturbance from evening streetlights	Degree of disturbance lowering	Cost of curtain installation: 1,259 (per person)	IKEA Roman shade	The minimum cost of interference prevention is estimated by the cost of installing curtains.	Revealed Preference Method
	Increase employment rate	Degree of increasing the employment rate	Local contractor's total revenue: 30,060,320	Provided by LITE-ON	The value is calculated based on the actual income received by the local contractors from the installation works.	Revealed Preference Method
LED Streetlight contractor	Improve professional skills	Degree of professional skills improvement	Cost for class C wiring technician certification : 112(per person/per hour)	Taiwan Water and Electricity Safety Association	LITE-ON provided education and training courses for contractors, covering installation wiring and safety guidelines. Therefore, the cost of getting certified for class-C wiring technician is used as a financial proxy.	Revealed Preference Method
LITE-ON	Improve corporate public relations image	Degree of corporate cultural identity improvement	Costs for exposure on domestic media: \$180,000 (total of exposure on broadcast media and online news)	Private marketing companies	The cost for exposure on domestic network and broadcast media is used as financial proxy.	Revealed Preference Method
	Better relationship between government	Degree of improvement of relationship	The cost for tender consultation service:	Private business consultation firms	The value is calculated for the increased bid-winning rate and time saved	Revealed Preference Method

Key stakeholders	Outcome	Indicator	Financial Proxies (TWD)	Source of Financial Proxies	Description of Financial Proxies	Valuation Technique
	and corporation		300,000 (per project)		for tender preparation brought by the positive relationship based on the fee rates charged by private tender consultation firms.	
LITE-ON Business Department	Improve corporate cultural Identity	Degree of improvement of corporate cultural Identity	The cost of corporate culture development course: 3,600 (per person)	China Productivity Center	The value is calculated based on the costs for corporate culture development related courses.	Revealed Preference Method
	Attain deep insight into customers' need	Degree of understanding product and market	Cost of LITE-ON R&D personnel's time: 58,870 (per person)	Provided by LITE-ON	The value is calculated based on the time that can be saved from trial and errors, as the R&D personnel spent time to understand the product needs through participating in this project.	Revealed Preference Method
	Improvement of sense of accomplishment	Degree of improvement of accomplishment	The value of increased confidence/self-respect (Well-being Valuation Model): 22,767 (per person/year)	Social Value Manchester	Calculation is made for the yearly value of raising self-confidence based on Manchester study.	Well-being valuation method

## 5.2 Sensitivity Analysis and Project Result Value Quantification

The final step of SROI calculation is sensitivity analysis, which enables more accurate calculation on the actual value of the benefits and removal of some benefits that may be duplicated or not directly affected by the changes, so that the results comply with

the SROI methodological requirements without over-calculation and over-estimation. There are four major sensitivity factors:

1. Attribution: explores the ratio of changes can be contributed by the sunset projects.
2. Deadweight: identifies deductions of the ratio of the results that will occur even if the sunset projects have not been implemented.
3. Displacement: explores whether the results of the sunset projects will bring other significant negative effects.
4. Drop-off: explores how long the effect of the results last (analyzed by year).

This assessment study verifies whether sensitivity factors exist in each the expected benefits through interviews with the stakeholders and then integrate the sensitivity factors associated into the relevant questions in the questionnaire. Based on the results of the survey, the degree of sensitivity of each factor is then calculated. Analysis is conducted in the most conservative way during the process to prevent processing of excessive hypotheses. For the degrees of the sensitive factors of each benefit, please see table 5.2.1 to 5.2.6. For the content of the questionnaire, please see the appendix.

The formulae used for calculation of the value of each activity are described in the section below:

1. Result value = ( Amount × Index value × Attribute factor ) × ( 1 – Deadweight factor – Displacement factor )
2. Value of 2017 = Result value × Duration , (If <1, this situation did not occur in this project)
  - Value of 2018 = Value of 2017 × ( 1 - drop – off )
  - Value of 2019 = Value of 2018 × ( 1 - drop – off )
  - Value of 2020 = Value of 2019 × ( 1 - drop – off )
  - Value of 2021 = Value of 2020 × ( 1 - drop – off )
3. Value (2017~2021) = Value of 2017 + [ (Value of 2018) / (1 + Discount rate) ] + [ (Value of 2019) / (1 + Discount rate)<sup>2</sup> ] + [ (Value of 2020) / (1 + Discount rate)<sup>3</sup> ] + [ Value of 2018) / (1 + Discount rate)<sup>4</sup> ]
  - The discount rate is based on the 1-year deposit rate of 1.04% published by the five major banks in Taiwan in 2017.

As mentioned above, in the process of stakeholder engagement, this assessment study verified the effect brought to stakeholders through interviews and the results were used to design the questionnaire survey, which contains questions with sensitivity factors. For example, when touched on the benefits of improved security, the questions were designed to inquire how much improvement has been brought by installing the LED street lights, how much improvement in security has been achieved by installing LED street lights compared with community watch or patrol, and how long the effect is expected to last. The questions responded to the sensitivity factors: attribute, deadweight and drop-off. A total of 136 surveys were returned and the results were analyzed for the achieved values, as shown in table 5.2-1.

**Table 5.2-1. Sensitivity Analysis and Value Calculation for the LITE-ON Mercury Streetlight Sunset Project**

Key stakeholders	Outcome	Financial Proxies		Deadweight	Attribution	Displacement	Impact (NTD)	Duration (year)	Value Year 2017 (NTD)	Drop-off	2017-2021 Present Value
		Proxy	Value (NTD)								
Local Government	Decrease the electronic fee	Margin between LED streetlight bulb and old bulb	1,237	0%	100%	0%	25,301,890	5.00	25,301,890	0%	122,656,182
Local Government	Decrease carbon emission	External cost of 1 Mg of carbon	1,794	0%	100%	0%	16,114,141	5.00	16,114,141	0%	78,116,654
Citizens	Lower the crime rate	Annual salary per security	327,000	88.42%	72.04%	0%	5,128,545	2.90	5,128,545	34.49%	12,780,014
Citizens	Decrease the rate of traffic accident	Average cost of a traffic accident	1,834,474	0%	70.64%	0%	24,142,504	23.48	24,142,504	4%	107,579,041
Citizens	Increase sense of security	Value of worrying about criminal activity per person. (Well-being valuation model)	50,376	95.91%	69.22%	0%	267,777,709	3.05	267,777,709	33%	688,555,785
Citizens	Increase the interaction between citizens	Valuation on increasing interaction between citizens per person. (Well-being valuation model)	14,643	95.91%	62.69%	0%	41,068,782	3.05	41,068,782	33%	105,603,068
Citizens	Lower the disturbance from evening streetlights	Installation fee of a curtain per person	1,259	42.71%	41.08%	0%	679,840	5.00	679,840	20.00%	2,225,768
LED Streetlight Contractor	Increase the employment rate	Total revenue of Cooperation Agencies	30,060,320	0%	100%	0%	30,060,320	1	30,060,320	1000%	29,750,911
LED Streetlight Contractor	Improve professional skills	Program fee of entry-level electrical wiring certification	112	42.86%	100%	0%	1,343	5.00	1,343	20.00%	4,396

Key stakeholders	Outcome	Financial Proxies		Deadweight	Attribution	Displacement	Impact (NTD)	Duration (year)	Value Year 2017 (NTD)	Drop-off	2017-2021 Present Value
		Proxy	Value (NTD)								
LITE-ON	Improve corporate public relations image	Advertising cost of online media, broadcasting	180,000	72.92%	62.00%	0%	46219	2.28	46,219	43.94%	97,343
LITE-ON	Better relationship between government and corporation	Standard fee of a consulting project	300,000	74.07%	67.50%	0%	262,500	2.50	262,500	40.00%	592,391
LITE-ON Business Department	Improve corporate cultural Identity	Program fee of organization culture shaping per person	3,600	79.55%	62.86%	0%	7,290	3.14	7,290	31.82%	19,082
LITE-ON Business Department	Attain deep insight into customers' need	Research and development cost per person	58,870	69.27%	68.57%	0%	65,125	5.00	65,125	20.00%	213,216
LITE-ON Business Department	Improvement of sense of accomplishment	Valuation of self-confidence per person. (Well-being valuation model)	22,767	95.45%	55.00%	0%	10,245	3.00	10,245	33.33%	26,079

### 5.3 SROI Analysis Results

After the sensitivity analysis and quantification of the project values are done, we divide the present value for 2017 to 2021 by the total value of input to calculate the social return on investment (SROI) of the final LITE-ON Mercury Vapor Street Lamp Replacement Project. The SROI is:

$$\text{SROI} = 1,148,219,929 / 403,464,317 = 2.85$$

### 5.4 Sensitivity Analysis

The process of overall evaluation of SROI involves subjective judgment of stakeholders, and the assessment is not done with the traditional predictive financial analysis model. Although the study collected the statistics on the degree of changes through interviews and questionnaire surveys and analyzed the results under the conservative principle, there may still be discrepancies in the result off SROI, due to the facts that different subjects were involved or different financial proxies were used. In order to understand the sensitivity of the projects' SROI values for conservative and objective disclosure, we used the main benefits reflected by the stakeholders (the largest or second largest outcome category) for the sensitivity analysis and adopted the second-rank financial proxies (less conservative or relatively low relevance) to calculate the SROI. From which, we derived a scope of analysis for the SROI sensitivity analysis, as shown in the table below:

**Table 5.4-1. Sensitivity analysis on SROI results of the LITE-ON Mercury Streetlight Sunset Project**

Main Outcome	Adjustment of Financial Proxies	Range of SROI
Decrease rate of traffic accidents	Adjust the main outcome "Decrease rate of traffic accidents" to the second priority in the <b>Financial Proxies</b> .	2.85~2.90
Increase sense of security	Adjust the main outcome "Citizens feel safer in the evening" to the second priority in the <b>Financial Proxies</b> .	2.85~4.32
Increase level of professional skills	Adjust the main outcome "Citizens feel safer in the evening" to the second priority in the <b>Financial Proxies</b> .	2.85~2.85
Attain deep insight of customers' needs	Adjust the main outcome "Attain deep insight of customers' needs" to the second priority in the <b>Financial Proxies</b> .	2.85~2.85

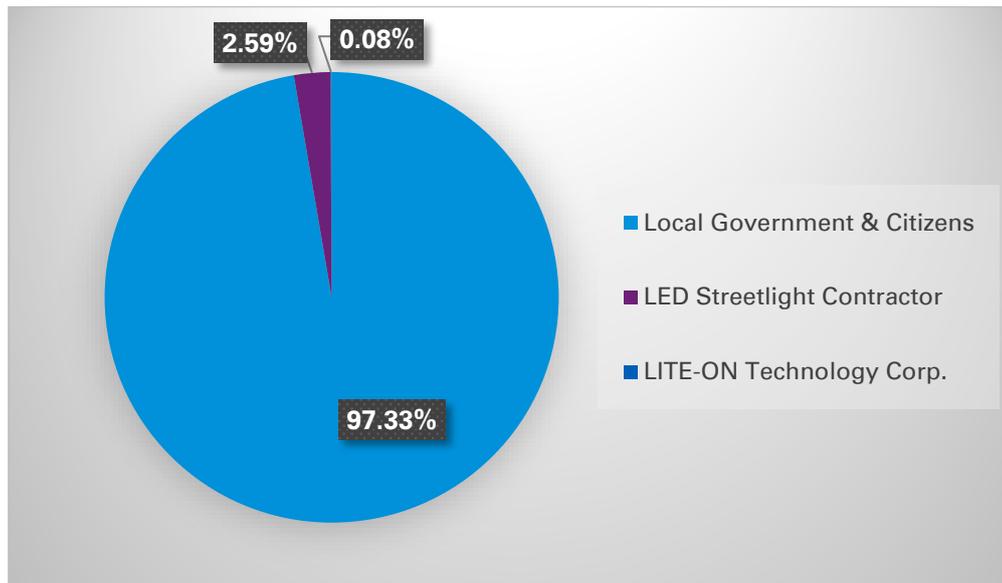
## VI. SROI Analysis Results and Recommendations for Project Advancement

### 6.1 SROI Analysis Results

#### Analysis by stakeholder category

According to the results of the above analysis, the SROI value of the LITE-ON Mercury Vapor Street Lamp Replacement Project is 2.85 (2017 - 2021), which means that input of NT\$ 1 generates a social value of NT\$ 2.85.

An overview on the distribution of the overall social return by stakeholder category indicates that the major beneficiaries of the Mercury Vapor Street Lamp Replacement Project are the local governments and citizens, taking up 97.33 percent, and other stakeholders affected by the projects are LED streetlight contractors and LITE-ON Technology Corporation, taking 2.59 and 0.08 percent respectively, as shown in figure 6.1-1. This result reveals that the local governments and residents are the most benefited stakeholders in the projects.

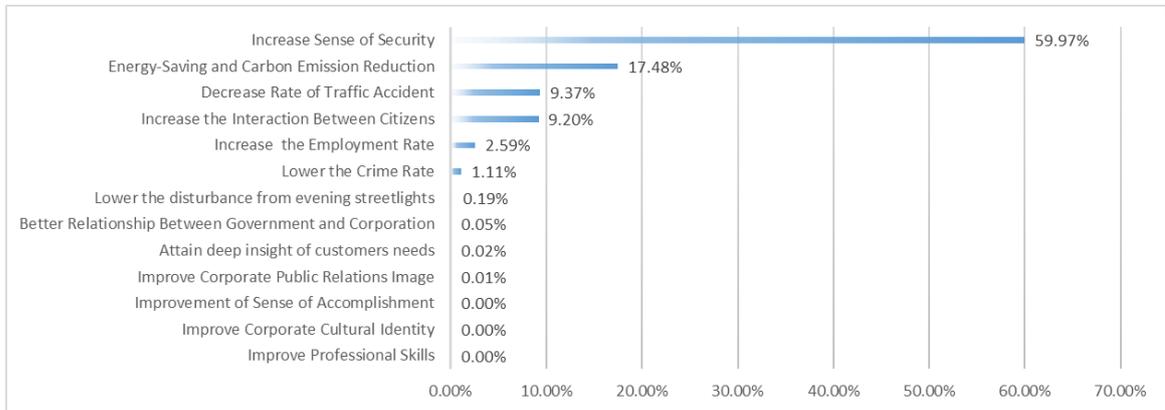


**Figure 6.1-1, LITE-ON Mercury Vapor Street Lamp Replacement Project SROI Benefit Distribution - by Stakeholder Category**

#### Analysis by benefit

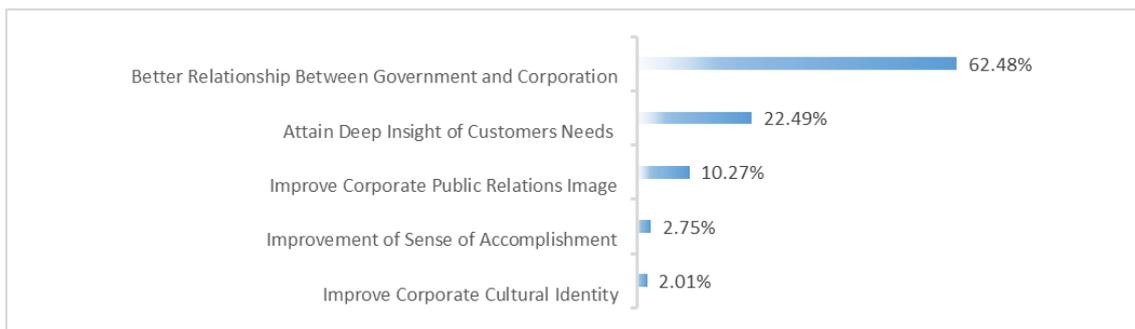
Viewing from the distribution of benefits, the major benefit brought by the projects is giving the residents an increased sense of security at 59.97 percent, which is followed by energy-saving and carbon emission reduction and decrease rate of traffic accident at 17.48 and 9.37 percent respectively, as shown in figure 6.1-2. This result shows that, through providing high-quality lighting products in the Mercury Vapor Street Lamp Replacement Project, LITE-ON effectively improved the quality of illumination in the

rural areas, which reinforced the resident’s sense of security, reduced road accidents and indirectly increased the opportunities for community interaction.



**Fig. 6.1-2, LITE-ON Mercury Vapor Street Lamp Replacement Project SROI Benefit Distribution - by Benefit Category**

In addition, if we look into the effect of the Mercury Vapor Street Lamp Replacement Project on LITE-ON, we can see that LITE-ON not only significantly improved its relationship with the local governments and communities, but also helped its R&D Personnel to better understand the actual customers’ needs for their products. This will help the R&D Personnel in the future, in the sense that the cost for repeated trial-and-errors during product development can be cut down significantly. The results are shown in figure 6.1-3. From the results, we can see that implementation of the projects not only brought the residents in rural areas a reinforced sense of security, but also enabled the Company to integrate the experience into its product designs.



**Fig. 6.1-3, LITE-ON Mercury Vapor Street Lamp Replacement Project SROI Benefit Distribution - LITE-ON**

## Appendix 1. Outline and Questionnaire for Interview with Residents of Rural Areas

### 1. Background Information

- **Description:**

Questions in the first section are target to collect the background information of the respondent, which will serve as a reference for the next stage interview and a control point for subsequent consolidation.

- **Please answer the following questions:**

1. What is your last name and daily work hours?

2. Do you hold a position in the community?

Did you personally participate in the Mercury Streetlight Sunset Project (e.g. pre-construction census, replacement of streetlights or follow-up maintenance, etc.)? If so, what was your role in the process?

### 2. Information on the benefits

- **Description:**

In this section, we will ask you to answer questions regarding the degrees of changes brought by the Mercury Vapor Street Lamp Replacement Project. Please recall from your memory as much as you can. You will also be requested to answer some of the questions by indicating the degree of enhancement on a 5-point scale (none, a little, some, substantial, full-scale).

#### →Inquiries on the overall effect of the project

No.	Question	Purpose of this question
1.1	Do you think you have been benefited from the LED street light replacement project in the community?	- Open question on the overall benefits - Interfacing the follow-up questions

	- For example, the benefits to the community, to you personally and to the society as a whole? (ex: promote local tourism or economy)	
<b>1.2</b>	- If this project was not implemented, do you think the above benefits are still possible? (please specify the types of benefits and describe in quantitative levels) - Is there any alternative way to achieve the above benefits? (Please specify the types of benefits and what kind of alternatives can be used)	- If this project was not implemented, will the extent of this benefit still be generated? (Deadweight)
<b>→Reduce electricity consumption on lighting and raise awareness on environmental protection and energy conservation</b>		
<b>2.1</b>	- Do you have more knowledge on lighting and environmental protection after communicating with the installation team or observing the effects brought by replacement of streetlights? (Please indicate the quantitative level and make further inquiries on whether relevant courses or activities are available in your community) =- Are you more willing to observe energy-saving and carbon-reduction practices, such as replacing the lights at your home, after gaining more knowledge of LED lights?	- Benefit Confirmation
<b>2.2</b>	- Compared with observations of LED street light replacement, will courses or seminars provided through your Community Learning Center be more effective in terms of enhancing your knowledge on environmentally-friendly lighting? - Evaluate the relevance (in quantification levels), regardless whether your response is yes or no.	- If this project was not implemented, will the extent of this benefit still be generated? (Deadweight)
<b>→Improve environmental lighting and reinforce community safety</b>		

3.1	<p>- Based on your experience and observations, was the lighting at nighttime insufficient before LED street lights were installed?</p> <p>- After the streetlights were replaced, is public safety improved because of the improvement in night illumination? Please indicate the area with the most notable differences with examples (make inquiries with quantitative levels).</p>	<p>- Benefit Confirmation</p> <p>- Collecting qualitative information</p>
3.2	<p>- Compared with LED street light replacement, to what degree community watch or patrol improve safety?</p>	<p>- If this project was not implemented, will the extent of this benefit still be generated? (Deadweight)</p>
3.3	<p>- Do you think that LED street light replacement will or will not improve nighttime security on a long-term basis? How long do you think the improvement will last?</p>	<p>- Confirming the degree of effect diminution (Drop off)</p>
3.4	<p>- Do you think that any negative effect may come with improvement in environmental lighting, e.g., affecting night sleep, disturbing growth of crops, interfering with animal and plant ecology, etc.? Please indicate the most affected category with examples? And how can this problem be solved?</p> <p>- If yes, make further inquiries on the percentage that may be improved?</p>	<p>- Negative Benefit Survey (Displacement)</p>
<p><b>→ Improve night illumination, give the residents a reinforced sense of security and increase their willingness to go out at night</b></p>		
4.1	<p>- Has LED street light replacement given drivers, riders of motor scooters and bicycles and pedestrians a higher sense of safety? (Make inquiries with quantitative levels).</p>	<p>- Benefit Confirmation</p>

	- Do you think that the residents' willingness to go out at night would be boosted by LED street light replacement, since public lighting is now improved? (Make inquiries with quantitative levels).	
4.2	- Compared with the improvement in night illumination brought by LED street light replacement, how much is the sense of security improved by community watching or patrols?	- If this project was not implemented, will the extent of this benefit still be generated? (Deadweight)
4.3	- Will LED street light replacement improve your sense of safety on the road for a prolonged period of time? - Will better night illumination brought by LED street light replacement increase your willingness to go out at night for a prolonged period of time?	- Confirming the degree of effect diminution (Drop off)
<b>→Reduce nighttime road accidents</b>		
5.1	Will improvement of night vision brought by LED street light replacement reduce nighttime road accidents? (If yes, please explain with quantitative levels)	- Benefit Confirmation
5.2	Do you think that LED street light replacement will reduce nighttime road accidents on a long-term basis? Compared with LED street light replacement, will adding traffic lights at crossings and filling holes in roads better solve the problem of road accidents and to what degree?	- Confirming the degree of effect diminution (Drop off) - If this project was not implemented, will the extent of this benefit still be generated? (Deadweight)
<b>→ Effectively establish LITE-ON's image in the local communities as a company devoting to local affairs and environmental protection</b>		
6.1	- Will LITE-ON's investment in local development (such as providing job opportunities to the local communities	- Benefit Confirmation

	and quality products, etc.) enhance LITE-ON's corporate image? (If yes, please explain with quantitative levels)	
<b>6.2</b>	<ul style="list-style-type: none"> <li>- Will the LED street light replacement enhance the corporate image of LITE-ON in the long run?</li> <li>- Compared with the LED street light replacement, will LITE-ON enhance your impression on the company through advertising and marketing?</li> </ul>	<ul style="list-style-type: none"> <li>- Confirming the degree of effect diminution</li> <li>- If this project was not implemented, will the extent of this benefit still be generated? (Deadweight)</li> </ul>
<b>6.3</b>	The interview ends here. We would like to ask you if you have any feedback or suggestions for this project.	- Collection of extra information

## Appendix 2. Questionnaire for Interview with Regional Residents

### Questionnaire Subjects- Regional Residents

#### Description of the Questionnaire

<b>Surveyor</b>	Leotek Electronics Corp., LITE-ON Technology Corporate Social Responsibility Committee (CSER), KPMG Sustainability Consulting Co., Ltd.
<b>Purpose of the Questionnaire</b>	LITE-ON invests in LED street light project on a long-term basis and provides professional installation and maintenance services nationwide, helping rural areas improve road illumination and promoting development of local Industries. This study aims to evaluate the Mercury Vapor Street Lamp Replacement Project implemented in 2016 and the changes it has brought to the relevant government agencies, organizations and Community residence to gain an insight into the changes and impact this project has brought to your personal life and the influence in the society.
<b>Length of Questionnaire</b>	The questionnaire contains a maximum of 34 questions (skip questions that are not applicable) and will take about 10 minutes to answer.
<b>Background</b>	To improve nighttime illumination and achieve energy-saving and carbon reduction, LITE-ON offers high quality lighting products and implemented the Mercury Vapor Street Lamp Replacement Project to improve road lighting in rural areas. Services offered by LITE-ON integrates our own products, including LED and smart lighting systems. We are committed to promoting development of the local industries and improving the quality of road illumination. This project is a high-degree integration with LITE-ON Group's vision to become the "Best Partner in Optoelectronic, Eco-Friendly and Intelligent Technologies".
<b>Data usage statement</b>	We hereby declare that the data collected in this questionnaire survey will be provided to the KPMG team for evaluation of the social return on investment for LITE-ON Technology Corporation only. The collected information will not be used for any other purposes. Neither will the personal information of the respondents be disclosed internally or externally.

**Basic Data**

	Answers
Your gender? (required)	<input type="checkbox"/> Male <input type="checkbox"/> Female <input type="checkbox"/> Other
What is your actual age? (required)	<input type="checkbox"/> Under 19 <input type="checkbox"/> 20-25 <input type="checkbox"/> 26-35 <input type="checkbox"/> 36-45 <input type="checkbox"/> 46-55 <input type="checkbox"/> 56-65 <input type="checkbox"/> Over 66 year-old
Which area are you currently residing? (required)	Nantou County : <input type="checkbox"/> Zhongliao Township <input type="checkbox"/> Ren'ai Township Changhua City : <input type="checkbox"/> Fangyuan Township <input type="checkbox"/> Dacheng Township Chiayi County : <input type="checkbox"/> Lucao Township <input type="checkbox"/> Fanlu Township <input type="checkbox"/> Dapu Township <input type="checkbox"/> Alishan Township Tainan City : <input type="checkbox"/> Dongshan District <input type="checkbox"/> Yujing District <input type="checkbox"/> Nanxi District <input type="checkbox"/> Nanhua District <input type="checkbox"/> Zuozhen District Pingtung County : <input type="checkbox"/> Shinpi Township <input type="checkbox"/> Fangshan Township <input type="checkbox"/> Laiyi Township <input type="checkbox"/> Chunri Township <input type="checkbox"/> Shizi Township
How long have you lived here? (required)	<input type="checkbox"/> Less than 6 months <input type="checkbox"/> 6 months-2 years <input type="checkbox"/> 2-5 years <input type="checkbox"/> 5-10 years <input type="checkbox"/> Above 10 years
Before the LED street light replacement, is there an issue of insufficient night illumination in some areas? (required)	<input type="checkbox"/> Yes <input type="checkbox"/> No
Your Name	
Your current job and position?	

## Information Regarding Benefits

The questions in the section below will inquire your personal opinions on the changes and feelings brought by the LED street light replacement. There will be 7 subsections and each of them will contain one of the following 7 dimensions: enhanced community safety, reduced road accidents, residents' sense of security, interference with ecology and residents' life, opportunities for community interaction, expanded knowledge on environmental protection/lighting and corporate image. Please choose the answer that best represents your opinion. The answer options represent the following:

Options	The degree represented by the option	Description of option
<b>None</b>	0%	No effect, no improvement
<b>Minimum</b>	25%	Minimum effect, minimum improvement
<b>Medium</b>	50%	Some effect, some improvement
<b>Substantial</b>	75%	Substantial effect, substantial improvement
<b>Full</b>	100%	Full effect, full improvement

### I. Enhanced community safety

Question	Answers
1. After the streetlights were replaced, is public safety improved because of the improvement in night illumination?	<input type="checkbox"/> Yes <input type="checkbox"/> No (If no, go to 6 <sup>th</sup> )
2. To what degree?	<input type="checkbox"/> Did not feel it <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Excellent
3. Do you think that LED street light replacement will or will not improve nighttime security on a long-term	<input type="checkbox"/> Yes <input type="checkbox"/> No (If no, go to 5 <sup>th</sup> )

Question	Answers
basis?	
4. How long do you think the improvement will last?	<input type="checkbox"/> 1 year <input type="checkbox"/> 2 years <input type="checkbox"/> 3 years <input type="checkbox"/> 4 years <input type="checkbox"/> Above 4 years
5. Compared with LED street light replacement, to what degree community watch or patrol improve safety?	<input type="checkbox"/> Did not feel it <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Excellent

## II. Reduced road accidents

Question	Answers
6. Will improvement of night vision brought by LED street light replacement reduce nighttime road accidents?	<input type="checkbox"/> Yes <input type="checkbox"/> No (If no, go to 9 <sup>th</sup> )
7. What is the degree of improvement?	<input type="checkbox"/> Did not feel it <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Excellent
8. Do you think that LED street light replacement will reduce nighttime road accidents on a long-term basis?	<input type="checkbox"/> Yes <input type="checkbox"/> No (If no, go to 9 <sup>th</sup> )

## III. Residents' sense of security

Question	Answers
9. Has LED street light replacement given drivers, riders of motor scooters and bicycles and pedestrians a higher sense of safety?	<input type="checkbox"/> Yes <input type="checkbox"/> No (If no, go to 14 <sup>th</sup> )
10. To what degree?	<input type="checkbox"/> Did not feel it <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Excellent

Question	Answers
11. Will LED street light replacement improve your sense of safety on the road for a prolonged period of time?	<input type="checkbox"/> Yes <input type="checkbox"/> No (If no, go to 13 <sup>th</sup> )
12. How long do you think your sense of road safety can be improved?	<input type="checkbox"/> 1 year <input type="checkbox"/> 2 years <input type="checkbox"/> 3 years <input type="checkbox"/> 4 years <input type="checkbox"/> Above 4 years
13. Compared with the improvement in night illumination brought by LED street light replacement, how much is the sense of security improved by community watches or patrols?	<input type="checkbox"/> Did not feel it <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Excellent

#### IV. Interference with ecology and residents' life

Question	Answers
14. Compared with the original streetlights, has the LED street lights had an impact on your nighttime activities?	<input type="checkbox"/> Strong influence <input type="checkbox"/> Less influence <input type="checkbox"/> Did not feel it (If no, go to 18 <sup>th</sup> )
15. What is the degree of the impact?	<input type="checkbox"/> Did not feel it <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Excellent
16. Before the streetlights were replaced with LED lights, did you take any actions to improve the situation, such as installing curtains to reduce light hazard?	<input type="checkbox"/> Yes <input type="checkbox"/> No (If no, go to 18 <sup>th</sup> )
17. Continued from the above question, to what degree the problem has been improved?	<input type="checkbox"/> Did not feel it <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Excellent
18. Compared with the original streetlights, has the LED street lights affected the growth of crops and the	<input type="checkbox"/> Strong influence <input type="checkbox"/> Less influence <input type="checkbox"/> Did not feel it (If no, go to 20 <sup>th</sup> )

ecology?	
19. What is the degree of the impact?	<input type="checkbox"/> Did not feel it <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Excellent
20. Before the streetlights were replaced with LED lights, did you take any actions to improve the situation, such as installing shades to reduce light hazard?	<input type="checkbox"/> Yes <input type="checkbox"/> No (If no, go to 22 <sup>th</sup> )
21. Continued from the above question, to what degree the problem has been improved?	<input type="checkbox"/> Did not feel it <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Excellent

## V. Opportunities for community interaction

Question	Answers
22. After the streetlights were replaced with LED lights, are you more willing to go out and chat with friends and neighbors at night?	<input type="checkbox"/> Yes <input type="checkbox"/> No (If no, go to 25 <sup>th</sup> )
23. To what degree?	<input type="checkbox"/> Did not feel it <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Excellent
24. Will better night illumination brought by LED street light replacement increase your willingness to go out at night and chat with friends and neighbors?	<input type="checkbox"/> Yes <input type="checkbox"/> No

## VI. Expanded knowledge on environmental protection/lighting

Question	Answers
25. Do you have more knowledge on lighting and environmental protection after communicating with the installation team or observing the effects brought by replacement of streetlights?	<input type="checkbox"/> Yes <input type="checkbox"/> No (If no, go to 29 <sup>th</sup> )

26. What is the degree of knowledge expansion?	<input type="checkbox"/> Did not feel it <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Excellent
27. Compared with observations of LED street light replacement, will courses or seminars provided through your Community Learning Center be more effective in terms of enhancing your knowledge on environmentally-friendly lighting?	<input type="checkbox"/> Yes <input type="checkbox"/> No (If no, go to 29 <sup>th</sup> )
28. What is the degree of knowledge expansion?	<input type="checkbox"/> Did not feel it <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Excellent

## VII. Corporate image

Question	Answers
29. Will LITE-ON's investment in local development (such as providing job opportunities to the local communities and quality products, etc.) enhance LITE-ON's corporate image?	<input type="checkbox"/> Yes <input type="checkbox"/> No (End of questionnaire if you answer no)
30. What is the degree of enhancement?	<input type="checkbox"/> Did not feel it <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Excellent
31. Will the LED street light replacement enhance the corporate image of LITE-ON in the long run?	<input type="checkbox"/> Yes <input type="checkbox"/> No
32. How long do you think LITE-ON's corporate image will last?	<input type="checkbox"/> 1 year <input type="checkbox"/> 2 years <input type="checkbox"/> 3 years <input type="checkbox"/> 4 years <input type="checkbox"/> Above 4 years
33. Compared with the LED street light replacement, will LITE-ON enhance your impression on the company through advertising and marketing?	<input type="checkbox"/> Yes <input type="checkbox"/> No (End of questionnaire if you answer no)
34. To what degree?	<input type="checkbox"/> Did not feel it <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Good <input type="checkbox"/> Excellent

*Thank you very much for your answer!*

# SOCIAL VALUE

## INTERNATIONAL

### Statement of Report Assurance

Social Value International certifies that the report "LITE-ON Technology Corp. 2017 Mercury Vapor Street Lamp Replacement Project SROI Analysis Report", by KPMG Sustainability Consulting Co., Ltd, published in April 2018, satisfies the requirements of our report assurance process.

The assurance process seeks to assess whether or not a report demonstrates a satisfactory understanding of, and is consistent with, the Seven Principles of Social Value. Reports are independently reviewed by qualified assessors and must demonstrate compliance with the Social Value assessment criteria in order to be certified. The Social Value assessment criteria document can be downloaded from the website [socialvalueuk.org](http://socialvalueuk.org).

Assurance here is against the Social Value principles only and does not include verification of stakeholder engagement, report data and calculations.

Awarded 5 June 2018



Jeremy Nicholls  
Chief Executive Officer  
Social Value International



Social Value UK carries out the assurance service on behalf of Social Value International. Social Value International is the global network focused on social impact and social value. We are the global network for those with a professional interest in social impact and social value. We work with our members to increase the accounting, measuring and managing of social value from the perspective of those affected by an organisation's activities, through our Social Value Principles. We believe in a world where a broader definition of value will change decision making and ultimately decrease inequality and environmental degradation.

Disclaimer: Social Value International will not be responsible for any actions that an organisation takes based upon a report that has been submitted for assurance. An assured report does not grant Accredited Practitioner status to the author/authors of the report unless it is part of a full application for Accredited Practitioner status.