



# 7<sup>th</sup> INTERNATIONAL WORKSHOP ADVANCES IN CLEANER PRODUCTION

“CLEANER PRODUCTION FOR ACHIEVING SUSTAINABLE DEVELOPMENT GOALS”

## External Auditing of Corporate Social Responsibility Projects: Case Study of CSR projects for Energy Company in Thailand

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### Abstract

The concept of auditing CSR toward sustainable development is connected with social, environmental and economic dimensions. Today, growing number of companies issuing such CSR projects is a part of their annual reporting. Despite there are problem in evaluating their quality. Each of the projects is different in the contexts and characteristics; consequently, the results of the CSR project are diverse. The aim of this paper is to design and determine the key performances indicators for comprehensive evaluation of sustainability CSR projects. Four CSR project case studies of energy company in Thailand are also used to verify the proposed methodology which based on ISO26000:2010 and GRI:G4 guideline. The study showed that the projects are worth for the investment as the “Social return on investment” (SROI) was greater than 1 in all of the CSR projects. Also, the CSR projects can reduce the cost and increase revenue for participating communities according to the value of direct economic value generated and distributed from the positive impacts of environmental and social conditions by the project operation. For the environmental indicators, GHG emission mitigation from the project operation is considered and converted to carbon credits value. Social performances indicators were evaluated in the form of the value or benefit for community or society from project operation. Sustainability of CSR projects offers a comprehensive principle to create shared value in order to build a more satisfaction on stakeholders, sustainable development toward society in collaboration with economic success.

*Keywords: Corporate Social Responsibility, Sustainability Development, Economic indicators, Environmental indicators, Social indicators*

### 1. Introduction

The business strategies for sustainable development is not only for making the profit but it must take into account the effects or problems on society and the environment such as global warming or oil shortages. These problems drive the society to become more awareness of the virtues and responsibilities of the business (CSR Impact, 2013). Corporate Social Responsibility (CSR) is a business approach that contributes to sustainable development by delivering economic, social and environmental benefits for all stakeholders (Financial Time, 2018). CSR can be a strategic business management concept, and charity, sponsorships or philanthropy that will directly enhance the reputation of a company and strengthen its brand; the concept of CSR clearly goes beyond those definitions (Jankalova, 2016; UNIDO, 2018).

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Presently, the international trend and encouragement of the CSR consciousness for business circle in Thailand, The Stock Exchange Market of Thailand (SET) launched to create a new award, the Best Corporate Social Responsibilities (CSR) awards to the list of the annual SET awards. The categories of the awards are to be changed from year to year corresponding to the market and economic situation. As a result, CSR is implemented as one of the principles practices by the company, organization and industry to propose the sustainability growth of business as good corporate governance (Hockerts et al., 2008; Nitaya, 2013). However, there is a still lack of the indicators to evaluate the sustainability CSR projects. The Key Performance Indicators (KPIs) sustainability assessment of CSR project is needed to be design and determine.

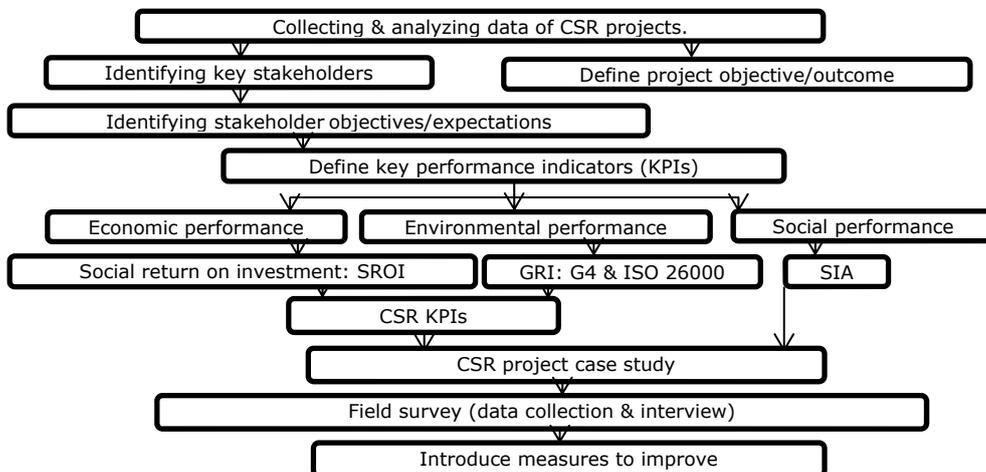
The Key Performance Indicators (KPIs) is designed according to the social responsibility guidance given in ISO 26000:2010 to the reporting guidance provide by the global reporting initiative (GRI) G4 that promotes the use of sustainability reporting as a way from organizations to become more sustainable and contribute to sustainable development (Paul and William, 2010). Both of ISO 26000 and the GRI G4 Guidelines have significant overlap and convergence in terms of the topics. ISO 26000 offers a comprehensive guidance which provides a structure for companies to organize their activities which can be measured and presented in the organization’s report by using the GRI guidelines (Bastian and Laura, 2014). By using ISO 26000 in conjunction with GRI Guideline, these two reports can synergize and be a practical set of tools to assess on their social responsibility performance of CSR projects for Energy Company in Thailand. Social Return on Investment (SROI) is a measure of economic indicators. Global Reporting Initiative (GRI) G4 in conjunction with ISO 26000:2010 is applied for environmental indicators (Paul and William, 2010). For social perspectives, Social Impact Assessment (SIA) is concerned on social indicators.

CSR program are well established in Thailand among leading companies, industries and organization. In 2010, Thaipat institute reported that 70% of CSR run by large firms is focused on Bangkok region, while 70% of CSR projects and activities launched in the provinces by small and medium-sized firms. These major cooperates have started publishing their own CSR annual reports. Also, Ministry of industry supported company to launch CSR projects, and promote ISO26000 which enables firms to track CSR progress. Habek and Woniak (2016) assessed the quality of corporate social responsibility reports using the reporting practices in European Union member states. The article presented the current state of CSR reports, identify the differences in quality and categorize the mandatory and voluntary model of disclosure in thier reports in six EU Member States as well as presenting an assessment tool created for measuring the quality of CSR in their study. Thus, this paper is one of the first attempts to design and determine the key performances index for evaluation of sustainability CSR projects in quantitative and qualitative analysis involved four CSR projects of energy company as the renewable energy, agricultural and mangrove reforestation projects.

**2. Methods**

*2.1 Methodology Design*

The flowchart of methodology Design/tools/indicators to be used in the evaluation of the sustainability of CSR projects is shown in Figure 1.



**Fig.1** Flow chart of methodology design/tools/indicators.

## 2.2 Selected CSR tool/Indicators performance

ISO 26000: 2010 and GRI: G4 guideline are the methods and tools which used to evaluate the performance of CSR projects in order to control quality and help manage, correct, and prevent the changes of the project. The strategy for project management should consider the feedbacks of stakeholders both inside and outside the organization (Bottom Up) in order to sustain the project and determine the impact on the organization and the environment. There are still lacks of the standard on reporting and the scope for disclosure of CSR projects has varied. Therefore, external auditing is required which ensure the satisfaction of stakeholders. In this study, the key performances indicators for evaluation of CSR projects is designed and divided into 3 aspects: social sustainability indicators referred to the Social Impact Assessment (SIA). The Social Return on Investment (SROI) used to assess the economic sustainability assessment. The environmental sustainability assessment referred to The Global Reporting Initiative(GRI)guideline:G4. The details of each indicator is described below.

### (I) Economic sustainability assessment

For economic sustainability assessment, the Social Return on Investment (SROI) and the direct economic value generated and distributed are chosen in this study as *Economic sustainability indicators*:

- (i) The Social Return on Investment (SROI) is calculated by the net present value of total outcomes of the projects in monetary term, by using the formula as shown in Equation.1 (Millar and Hall, 2013).

$$\text{SROI} = \frac{\text{the present value of the total outcomes}}{\text{the present value of the investment made}} \quad (1)$$

- (ii) The direct economic value generated and distributed from the positive impacts of environmental and economic conditions is accounted from (1) the reduced expense in energy consumption, (2) the income creation by the project operation, employment, ecological service, payment as instructor, selling the products, and (3) the carbon credit value from GHG emission reduction. All of these indicators were being used in the economic sustainability assessment with different scopes of applications.

### (II) Environmental sustainability assessment

Environmental sustainability assessment referred to Global Reporting Initiative (GRI) guideline. Both of ISO 26000 and the GRI: G4 Guidelines have significant overlap and convergence in terms of the topics. Table 1 shows the example of the linkage between the GRI Standard disclosures relate to the ISO 26000 clauses which concerned in such CSR projects. The left columns of this table list the ISO 26000:2010, and the right columns list the clauses in GRI Standard Disclosures which offer similar contents.

**Table 1. Linkage table between ISO 26000:2010 and GRI: G4 Guidelines in this study**

ISO 26000: 2010 CLAUSES		GRI: Reporting Principles and Standard Disclosures	
<b>Core subjects: The environment</b>			
<b>Issue 1: Prevention of Pollution</b>	6.5.3	G4-EN22	Total water discharge by quality and destination
		G4-EN23	Total weight of waste by type and disposal method
		G4-EN26	Identity, size, protected status, and biodiversity value of water bodies and related habitats significantly affected by the organization's discharges of water and runoff
		G4-EN27	Extent of impact mitigation of environmental impacts of products and services
<b>Issue2: Sustainable</b>	6.5.4	G4-EN6	Reduction of energy consumption
		G4-EN7	Reductions in energy requirements of products

<b>resource use</b>			and services
<b>Issue 3: Climate change mitigation and adaptation</b>	6.5.5	G4-EN6	Reduction of energy consumption
		G4-EN7	Reductions in energy requirements of products and services
		G4-EN19	Reduction of greenhouse gas (GHG) emissions
<b>Issue 4 :Protection of the environment, biodiversity and restoration of natural habitats</b>	6.5.6	G4-EN11	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas
		G4-EN12	Description of significant impacts of activities, products, and services on biodiversity in protected areas and areas of high biodiversity value outside protected areas
		G4-EN13	Habitats protected or restored
<b>Core subjects :Community involvement and development</b>			
<b>Issue 5 : Community involvement and development</b>	6.8	G4-SO1	Percentage of operations with implemented local community engagement, impact assessments, and development programs
<b>Issue 6 :Social investment</b>	6.8.9	G4-EC1	Direct economic value generated and distributed
		G4-EC8	Significant indirect economic impacts, including the extent of impacts

*Environmental sustainability indicators:* The environmental indicators were chosen and focused in the greenhouse gas (GHG) emission mitigation (tCO<sub>2</sub>eq/year).

(i) *Emission Reduction Calculation*

The clean development mechanism (CDM) was used as the guideline for calculating the GHG emission mitigation from the biogas production system and power generation from floating PV via the following equation;

$$ER_y = BE_y - PE_y - LE_y \quad (2)$$

where:

$ER_y$  = GHG emission reduction in year y (tCO<sub>2</sub>eq/year)

$BE_y$  = Baseline GHG emission in year y (tCO<sub>2</sub>eq/year)

$PE_y$  = Project GHG emission in year y (tCO<sub>2</sub>eq/year)

$LE_y$  = Leakage GHG emission in year y (tCO<sub>2</sub>eq/year)

(ii) *The calculation of biomass and carbon sequestration*

The study is aimed to estimate the amount of biomass, CO<sub>2</sub> absorbent, and the carbon sequestration. Using the following equation to calculate biomass of the tree

$$W = a(D^2H)^b \quad (3)$$

W is the biomass of the tree (kg).

D is the diameter (cm).

H is the height (m).

a, b is the coefficient of each tree.

\*Carbon sequestration was measured by multiplying the conversion factor by 0.47 (IPCC, 2006).

\*Determine the amount of carbon dioxide: the carbon sequestration value was multiplied by the conversion factor of 3.6667

(iii) *The calculation of greenhouse gas mitigation*

The greenhouse gas reduction coefficient is equivalent to 3 tCO<sub>2</sub>eq/yr. This can be calculated as the following equation.

$$\text{GHG mitigation (tCO}_2\text{eq/yr)} = 3 \text{ tCO}_2\text{eq/yr} \times \text{growing areas (m}^2\text{)} \quad (4)$$

The GHG mitigation for trees was calculated by using the calculation of biomass and carbon sequestration according to the study of Sathienpakul et al., (2012).

(III) *Social sustainability assessment*

The Social Impact Assessment (SIA) is concerned on social sustainability assessment. CIPP Model of Stufflebeam (2002) is the model used to design social indicators for evaluation of CSR projects. CIPP stands for Context evaluation, Input evaluation, Process evaluation and Product evaluation. CIPP is an evaluation model that is a comprehensive assessment or systematic assessment to find the relationship and consistency of context, input, process and product in judging a program's value.

*Social sustainability indicators:* The social indicators were considered and selected within the aspect of community involvement and development which are classified into four main categories. The Social sustainability results derived from key stakeholders by interviewing and using questionnaires. The details in each indicator are described below:

- i) The increasing in the employment resulted from project operation: This indicator indicates the benefit from the project to hire the local people and promote the employment in the community.
- ii) The good relationship within the community resulted from the project operation: The direct and indirect relationship may be from within the community or between the organizations which illustrated the satisfaction and engagement between stakeholders and the organizations.
- iii) Health and safety in the community resulted from the project operation: For the better health and safety in the community affected by the project operation, the project should provide the mitigation measure, guideline and prevention plan on serious diseases, satisfaction, stability and safety to the community. Also, maintaining the organization's social license to operate in a community or region.
- iv) Human developments and trainings: The projects need to provide the training program that expanding the knowledge to the community such as the installation or maintenance the biogas system to the participating community.

### 2.3. Overview case study of CSR projects

(I) *The biogas production system from the swine farm*

The biogas production and distribution system from the swine farm is one of the selected case studies of CSR projects for Energy Company in Thailand which verify by proposed methodology. The biogas production and distribution system was launched to solve many adverse environmental problems from swine farms such as wastewater, unappealing odor, and sludge causing the adverse effects to the environment and surroundings community areas. The biogas production can be used to substitute the fossil fuels such as Liquefied Petroleum Gas (LPG), firewood and charcoal. The biogas production system is designed in the form of Channel

Digester Junior (CD-Junior) with the capacity of 100 m<sup>3</sup> with the addition of biogas digester which covered with PVC sheet. The biogas production capacity is approximately 29.4 m<sup>3</sup>/day. For the wastewater treatment process, it can be divided into 2 main systems which are consisted of biogas production and distribution system.

(II) Power generation systems from Floating PV for water management

The floating solar panel system consists of 300 watts of 8 panels in total of 2.4 kW can be used to generate electricity for using in water distribution system to the community and agricultural areas.

(III) Natural Resource Conservation in Coffee Plantation and Production project for Sustainable Development

This project is jointly held by the Royal Project Foundation and Energy Company in Thailand which give knowledge and investment to local farmers on how to properly grow and maintain coffee trees with conservation on natural resource and forest. The project area is divided into 2 parts: 3 rai of traditional coffee growing areas and 128 rai of new area including the construction of distribution pond for soil and water conservation system.

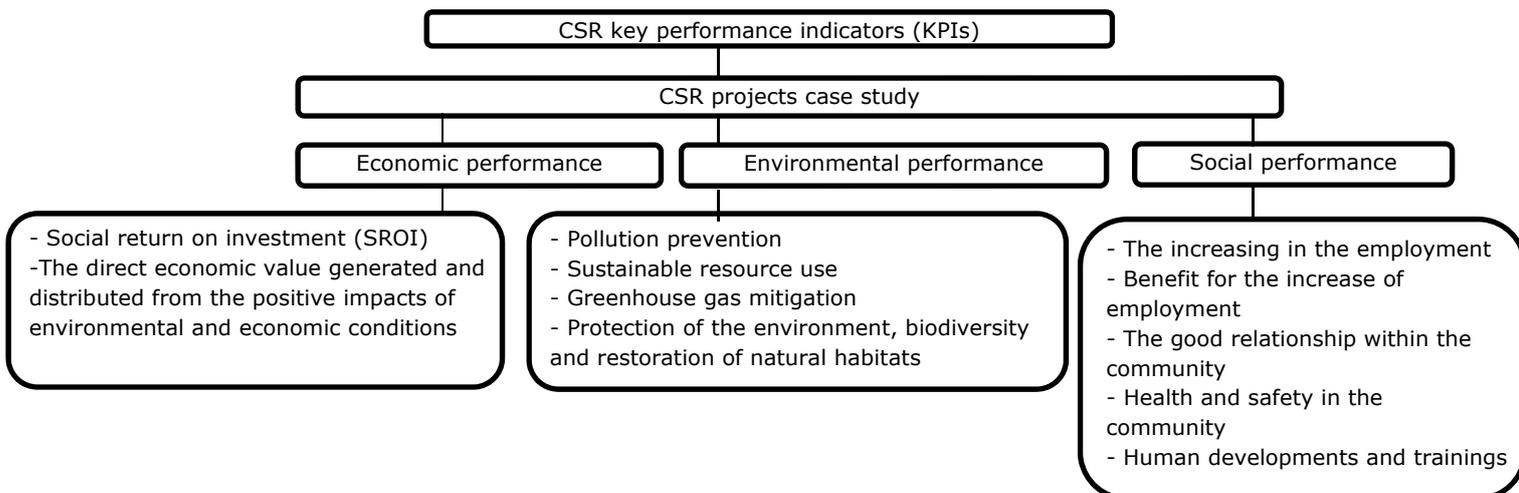
(IV) Mangrove reforestation project

This project was started in 1996. It was recognized to rehabilitate mangrove area which invaded by shrimp farm and contamination with chemical residues. Totally 848 rai of mangrove plantation was completed in 1997. Later on, this project was developed as a learning center for mangrove forestation. It is open to the public to study, research, leisure and tourism for ecosystems and sustainable management of mangrove forestation. The center was officially opened in 2007 and being the first learning center for mangrove reforestation in Thailand.

**3. Results and Discussion**

*3.1 Designing Key performance indicators (KPIs) for CSR project assessment*

KPIs are used to evaluate the success and efficiency of projects. The study design based on the ISO 26000: 2010 Clauses Core Subjects: Environment and Core Subjects: Community Involvement and Development. The KPIs are based on GRI: G4 which covers economic, environmental and social as shown in Fig 2.



**Fig 2.** Key performance indicators (KPIs) for sustainability CSR project assessment

For example, CSR KPIs of environmental indicators which relevant to the CSR project content are summarized in Table.2

**Table 2.** The indicators for environmental sustainability assessment

Aspect		Indicators
Sustainable resource use Prevention pollution	Reduction in energy consumption:	- Biogas production within the farm (m <sup>3</sup> gas/year) - Energy/fuel consumption reduction (MJ/year) - Total volume of wastewater in treatment system (m <sup>3</sup> /year) - Swine manure treated by weight (ton/year) - Percentage of sludge used as fertilizer (%) - Reduction in chemical fertilizer (kg/yr)
	Utilization of water	-Percentage of water recycled and reused (%)
Protection of the environment, biodiversity and restoration of natural habitats		- Increase of tree species, crab, butterfly and bird in the mangrove forest - Increase of Biodiversity
		-Total rehabilitation areas for reforestation and land use for agricultural

### 3.2. Evaluation of case study of CSR projects for Energy Company in Thailand

The result of economic, environmental and social value in the evaluation of sustainability CSR projects were summarized in Table 3.

**Table 3.** Evaluation of the economic, environmental and social performance of CSR projects

Key Performance Indicators (KPIs)	a	b	c	d
<b>1.Value or Benefit for community/society</b>				
<b>1.1 Economic Value</b>				
SROI	✓	✓	✓	✓
The direct economic value generated and distributed*(THB/yr)	✓	✓	✓	✓
<b>1.2 Environmental Value</b>				
Greenhouse gas (GHG) emission reduction (tCO <sub>2</sub> eq./yr.)	1,324	0.93	61.37	65,670
Sustainable resource use	✓	✓	✓	-
Pollution Prevention	✓	-	-	-
Protection of the environment, biodiversity and restoration of natural habitats	-	✓	✓	✓
<b>1.3 Social Value</b>				
The increasing in the employment resulted from project operation	✓	✓	✓	✓
The good relationship within the community resulted from the project operation	✓	✓	✓	✓
Better health and safety in the community resulted from the project operation	✓	-	-	-
Human developments and trainings	✓	✓	✓	✓

\*The direct economic value generated and distributed from the positive impacts of environmental and economic conditions.

**Note:** ✓ The value or benefit of the project

a: Renewable energy for a community project as the biogas production from swine farm

b: Power generation systems from Floating PV for Water Management Project

c: Natural Resource Conservation in Coffee Plantation and Production project for Sustainable Development

d: Mangrove reforestation

(I) *Economic sustainability assessment*

In this study, the Social Return on Investment (SROI) which is the net present value of total outcomes of the projects in monetary term were used to assess the economic value for all CSR projects. SROI is calculated based on the project's lifetime assumption of 10 years. The results showed that SROI was greater than 1 in all of CSR projects which is worth for the investment. For the direct economic values generated and distributed from the positive impacts of environmental and social conditions by the project operation, most of the projects have benefit from the value of carbon credit from GHG emission mitigation.

(II) *Environmental sustainability assessment*

The evaluations of environmental performance were specific to the nature of each project. The reduction in greenhouse gas emissions from the project operation is one of the appropriate environmental indicators. The Greenhouse gas (GHG) emission reduction from the biogas project operation is accounted for 1,324 tCO<sub>2</sub>eq, /yr. and 0.93 tCO<sub>2</sub>eq, /yr. for the Floating PV for Water Management Project. Coffee Plantation and Production and mangrove forestation projects could reduce in GHG emission of 61.37 and 65,670 tCO<sub>2</sub> eq, /yr., respectively. Furthermore, the project operation could benefit the environmental value in term of the sustainable usage of resources, pollution prevention, and protection of the environment, biodiversity and restoration of natural habitats. For example, the floating PV for water management project could decrease in usage of diesel fuel and utilize for water consumption. The biogas production from swine farm could reduce various environmental problems such as the unappealing odor, waste water, sludge which can be used as the fertilizer resulting in the reduction of chemical utilization etc. There is a growing of green space for Coffee Plantation and Production project. And the biodiversity is gained from the operation of mangrove reforestation projects.

(III) *Social sustainability assessment*

As previously mentioned, the social value was evaluated within the community development and involvement perspectives upon the selected social indicators. The study showed that all of CSR projects resulted in the increasing of the employment, the good relationship within the community, human developments and trainings as resulted from the project operation. In term of the better health and more safety in the community, it is benefit in the biogas production from swine farm project. Health and safety training for villagers was held in the community in order to provide knowledge or advice on installation systems including in the instruction for monitoring system, biogas system and gas pipeline system.

#### 4. Conclusion

For sustainable development goals, the key performances index of corporate social responsibility projects were evaluated in all dimensions including social, economic and environmental. The Social Return on Investment (SROI) and the direct economic value generated and distributed were used for the index of the economic performance. The SROI was greater than 1 in all of the CSR projects in this study which indicated that the project is worth for the investment. Also, considering the direct economic value generated and distributed from the positive impacts of environmental and social conditions by the project operation, we concluded that all CSR projects can reduce the cost and increase revenue for participating communities. Greenhouse gas (GHG) emission reduction, sustainable resource use, pollution prevention, protection of the environment, biodiversity and restoration of natural habitats were used as an index of the environmental performances. The total reduction of GHG emission in all the CSR projects is 67,056 tCO<sub>2</sub>eq a year that it is also the benefit in country level. In term of environmental biodiversity and rehabilitation, it was found that the project operation was able to restore the nature habitats and degraded areas to be used for agriculture, thus increasing the green space in the community. In term of the social performance, the selected indicators in the aspect of community involvement and development were used to evaluate the social value from project operation. This study designed KPIs for CSR project assessment for Energy Company. The economic, environment and

social performance were evaluated for sustainability assessment of CSR projects. The research emphasized that the effectiveness of evaluation results are based the selected KPI. The results from economic, environmental and social aspects could be useful information for the project operators or company which can improve CSR program in order to meet the requirement of all stakeholders toward sustainable development of societies with economic success of the organization and its industry.

## 5. Acknowledgments

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