

CORPORATE SOCIAL RESPONSIBILITY AND SUSTAINABLE MARKETING IN BIOMASS ENERGY POWER, THAILAND

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ABSTRACT

The objective of this study investigate factors have influenced on corporate social responsibility or CSR on sustainable marketing in biomass energy industry in north of Thailand. There were examined aspects of underlying factors of CSR that influences to sustainable marketing. SAHACOGEN green Lamphun Company is only one company in upper north of Thailand that approved the operation license for producing electricity by biomass electricity by Thai government. The data was collected in Wieng-Yong and Pasak districts, Lamphun province One thousand questionnaires were returned and analyzed. As the characteristic of electricity power plant is negative image and doubtfully as a cause of pollution, effecting to local community and environment. The conflict has been happened since the factory's establishment in 2011. The study found, local people realizes to social responsibility of the company is underlined by three dimensions; (1) community development such as the company need to established education institute, supporting the livestock in local area, and sponsor free meal for local children; (2) environment impact that measured by operations of company must be non-pollution, the company undertakes to prevent any waste of resources and company maintains bio-diversity of local area; and (3) pollution control that measured as the company takes efforts to reduce carbon emissions using carbon emission system control within the company limitation. Those are improve the marketing of the company in order to decreased the conflict and leading to sustainable business among stakeholders in the future.

Key words: Corporate Social Responsibility (CSR), sustainable marketing, community development, environment impact, and pollution control.

Introduction

For decade, Thailand has been developing country that growth up the economics and industrial investment in both public and private sector. They need to support the various energy for industry production. Energy has increased higher demand every years at an annual average rate 4.4 percent since 2010, final energy consumption had equivalence. The grow rate corresponded with the economic growth rate which the annual average rate was 4.5 percent, accounting for the "energy elasticity" at 0.98, it is considered quite high that compared with developed countries. Energy growth rate has been consumed much higher than GDP, being 3.71 times of energy consumption that compared with GDP growth rate only 2.36 times. (EEDP, 2011).

Thailand import variety forms of energy which worth many billion USD per a year. Energy crisis in the past few years has caused energy prices uncertainly and affecting to industry production nationwide. Since 2012, Thailand has consumed an energy such as Petroleum products consumption played the greatest proportion 46.9 percent of the total final energy consumption, followed by electricity, traditional renewable energy, coal & its products, commercial renewable energy and natural gas shared 18.0 percent, 13.1 percent, 9.3 percent, 6.4 percent and 6.3 percent respectively. In the next two decade, if there is no energy conservation or energy efficiency improvement, demand under the business-as-usual (BAU) scenario will increase from 71,000 Ktoe. (kilo-tonne oil equivalent) per a year at present to 151,000 ktoe, or about 2.1 times. (EEDP, 2011).

Somehow, National Energy Power Committee (NEPC) of Thailand realizes to energy conservation through promotion of renewable energy such a biomass energy power that it is biological materials derived from living, or recently living organisms from farming, land management and forestry sectors support to renewable energy generation. One of all alternative energies that are derived from five distinct energy sources as followed; (1) virgin wood such as logs, chips or pellets from forestry and

arboricultural activities or co-product from wood processing; (2) Clean non-virgin wood is any timber or timer product that has not been treated; (3) Energy crop and short rotation forestry as fast growing tree species harvested on a regular cycle; (4) Dry agricultural residues; parts of arable crops such as straw, maize, Stover, husks, kernels, and (5) Industrial waste and co-products; discarded material from manufacturing and industrial processes including woody wastes and residues.

Nowadays, Thailand has biomass energy power plants around 309 stations in Thailand, but there are only 93 stations all the country have license approved. One station in upper north of Thailand granted by SAHACOGEN green lumphun company that produce the electricity generating capacity of 9. Megawatts and 25 tons of steam per hour by biomass energy, located in the area of SAHA Group Industrial Park, Lamphun province, North of Thailand. The company began to operate the commercial electricity generator in March 2011. The company is initiatively generate electricity that generated by bio-raw material so that comply with the government policy. It should be clarified the paradigm modern technology between the company and local community in order to success in sustainable development.

However, the main purpose of this paper is to explore the relationship between corporate social responsibility and sustainable marketing. In this case, the key research question are: (1) how do three dimensions of corporate social responsibility that compounded community development, environment consideration, and energy conservation enhance sustainable marketing? , (2) how does corporate social responsibility has influence on sustainable marketing? (Diana Mutti et al., 2012; Monika Kansal et al., 2014) and energy conservation. Shiro Hori et.al. (2014)

Problem Statement

According to SAHACOGEN Green lumphun company (SAHACOGEN) is the producer electricity by biomass energy only one company in upper north of Thailand that granted by Ministry of industry, Thailand. They realizes to the effect of production on natural resources, biodiversity, social lifestyle and economic impact. There are controlling, prevention, reduction, and protection severely impacts with respect to the community by the principles of good governance. The company purposes to satisfy the basic demand of customer in local community with biomass energy.

But individual within the communities don't understand corporate's contribution and modern technology comply with work of Prasertsang and B. Sajjakulnukit, (2006). They were studied "Biomass and biogas energy in Thailand: Potential, opportunity and barriers" separated three categories; (1) technical barriers that is lack of understanding on biomass productive processing; (2) Information Barriers that insufficient of data and interpretation are crucial information barriers; and (3) public support barriers that is lack of awareness in biomass technologies, there lead misperception, customer doubtfully, monster image, and confliction between organization and community those are cause of irreversible problems.

Somehow, Diana Mutti et al., (2012) suggests solving the solution by Corporate Social Responsibility (CSR), it is not only activity of contributing the sustainable marketing but also could help the corporate to respond the business environment changed for long-term period (Prasertsang, 2010). CSR has become the key driven of biomass industry (Weber M., 2008) that concerned with community development (Diana Mutti et al., 2012; Monika Kansal et al., 2014) environment consideration and energy conservation (Monika Kansal et al., 2014; Shiro Hori et.al., 2014) further creation the long term customer relationship between corporate and local people in the community.

CSR strongly supports sustainable marketing of the company to improve communication any activities and understanding of biomass technology in order to achieve sustainable marketing. (Arun Shama et al., 2010) Sustainable Marketing is necessary for energy industry such a renewable industry. It is organizational strategy to creation the good relationship with local community in the long-term period. It could clear the negative image of electricity power plant that is a cause of pollution and local people's doubtfully. Accordingly with Prasertsang (2010), identified CSR has a positive effect on sustainable marketing in Thailand.

Therefore, Sustainable marketing in biomass technology has become more challenging to imply study for strengthening energy security that alleviating the pollution in post-harvest, reduce cost of production, generate household's income and make more efficiently service and recycling the natural garbage from farms in post-harvest along with acceptable of local community in factory's site which supported by corporate social responsibility that consist of community development, environment consideration and energy conservation. The critical point is what the best thing found offering to local community in order to achieve in sustainable marketing.

Objective of study

1. To determine the underlying factors measuring corporate social responsibility of local people in community.
2. To determine the effect of corporate social responsibility on sustainable marketing for local people in community.

Review Literature

Sustainable marketing as strategy of modern organization that could changes an organization's take advantage in marketplace. (Weber M., 2008). It purposes to foster an organization and collective commitment to necessary alteration of organizational settings and prince signals in favor of sustainable development in renewable industry sectors (Hargroves et al., 2005) contributed by CSR (Prasertsang, 2010) that fully synergic by sustainable marketing (Marcel Meler and Dragan Magas, 2014). There are measured by social dimension, economic goal, customer relation, and natural environment. (Hargroves et al., 2005; Obermiller et

al., 2005; Belz and Frank-Martin, 2005a). Sustainable marketing has been supported by CSR activity that focusing on sustainable relationship to local community (Gyorgy Malovics et al., 2008) that it mean initiative bring to sustainable marketing.

As sustainable marketing was discussed into four dimensions as the followed; (1) Social dimension that related with integrative theory focusing on social demands by detection, scanning social need and quick response to them in order to achieved social legitimacy, greater social acceptance and prestige (Berry, L.L., 1983). (2) Economic goal that refer to instrument theory underling economic aspect of the interaction between corporate and society (Parsons, T., 1961). (3) Customer relationship that mentioned to sustainable marketing theory on time aspect creating customer interaction (Belz and Frank-Martin, 2005b) between organization and customer as a strategy to attract, it is very importance to marketing relationship (Berry, L.L., 1983). And (4) Natural environment that discussed based on stakeholder theory it means local people as majority of key driven would be fairly earned in natural resources (Buysse et al., 2003).

For a five decades, marketing concept has changed. Corporate became a part of society. They need to realize the corporate production that impact to community, environment and economics. It should focus on social value and stakeholder maximize utilization (Bowen, H.R., 1953) as responsible society. Corporate Social Responsibility or CSR is defined as “A framework for formulating and implementing the expanded roles and responsibility of the corporate sector to include incorporation of the expectations and needs of a wider community in the business model, there are mentioned to pollution from another extractive industries would recognize to the environment consideration, community development, labor employment, and human right” (UNECA and AU, 2010). Bonnie, (2012) also underline the importance of CSR framework in order to consider the changing roles played by the various factors that concerned with local government, community, public or private.

CSR could be discussed in term of three constructs such as community development, environment consideration (Prasertsang, 2010; Monika Kansal et al., 2014) and energy conservation, (Monika Kansal et al., 2014; Shiro Hori et al., 2014). Community development is organizational commitment with stakeholder engagement that included philanthropic activities such as providing scholarship, and voluntary (Ibrahim et al , 2007), Environment consideration is concerned with environment management, environment protection, and resource conservation such as green product (Jenkins et al., 2006), and energy conservation refers to reducing energy consumption that concerned with future exhaustion of resource, global warming and concentrate to carbon emissions in the air (JICA, 2005). Robert W. Marans, (2010) study the human dimension of energy conservation and sustainability, there are discussed a broader organization context in order to customer’s insight the conservation-related attitudes and beliefs.

Prasertsang, (2010) study the impact of corporate social responsibility and sustainable marketing in ISO 14000 in Thailand. Research founded CSR has a significant positive effect on sustainable marketing. Gyorgy Malovics et al., (2008) also study the role of corporate social responsibility in strong sustainability propose to analyze the natural environment and social development and economics activities. The research contribute CSR that has influenced on sustainable relationship between community and corporate. Dalia Streimikiene et al., (2009) studied corporate social responsibility for implementation of sustainable energy development in Baltic States. The result of research also contributes CSR has a positive direct effect on sustainable development that fulfilled by sustainable marketing in renewable energy industry.

Research Methodology

Target population and questionnaire design

Population is defined as the enter group of people, events, or things of interest that researcher wishes to investigate (Sekaran U., 2000). The population in this study is member of each household surround biomass energy power plant (SAHACOGEN green Lamphun co, ltd) that approximately 8,724 households in 26 villages (Ministry of Interior, Thailand, 2014) in two districts; Wieng-Yong and Prasak. However, the policy identifies that one of all members in each household who is Sui juries.

The items to measure CSR and sustainable marketing were identified from the previous literature. The survey instruments consists of three sections. Section A contains 30 items to measure CSR. These items were adapted from work of Prasertsang, (2010); Monika Kansal et al., (2014) and Shiro Hori et.al., (2014a); Shiro Hori et.al., (2014b) using a 10-point Likert scale ranging from 1 as strongly disagree to 10 as strongly agree. Section B contain 20 questions on sustainable marketing which were adapted from the work of Berry, L.L., (1983); Parsons, T., (1961); Belz and Frank-Martin, (2005b); Buysse et al., (2003) using a 10-point Likert scale from 1 as strongly disagree to 10 as strongly agree. The last section of the questionnaire was designed to gather information about local people included, gender, age, marital status, job, education, member of household, period of settlement, and factory visiting. A content validity was conducted to ensure how well dimensions and elements of the conducted to ensure how well the dimensions and element of concept have been explained (Sekaran U., 2000).

A pilot study with respondents (n = 350) that had a similar background with the actual respondents was carry out in Wieng-Yong and Prasak Sub-district, Lamphun province in order to improve the quality and efficiency of collecting data. Exploratory Factor Analysis (EFA) was performed after conducting the pilot test to reduce and summarize of CSR and sustainable marketing. In addition, EFA was conducted to identify the underling factors representing the constructs in the study. Furthermore, the pilot test was conducted to test reliability and validity of research instrument prior to the actual collecting of data.

Data Collection

Data collection for the actual study was carried out in Wieng-yong and Prasak Sub-district, Lamphun province, Thailand. A self-administered questionnaire was distributed to the respondent to each households the study used two stages sampling process that sampling area and systematic sampling in selecting the study sample. Meanwhile, systematic sampling involves drawing every n^{th} element in the population starting with the randomly chosen element between 1 and n . The sample will select every 9th that number of household passed list. A total of 1,000 questionnaires were distributed to research area and were returned all.

Data Analysis

Descriptive analysis such as means and frequencies were applied to examine the respondents' demographic profile. Confirmatory Factor Analysis (CFA) was applied in the study to confirm the measurement model derived by EFA (Hair et al., 2010). After conducting Confirmatory Factor Analysis (CFA), assessment for reliability and validity were applied to evaluate the quality of measurement process. (T. Jitpaiboon, 2005). Reliability was assessed using two criteria, namely internal reliability and construct reliability. Internal reliability was used to ensure that the research instrument were from free random error or without bias using Cronbach's Alpha or coefficient alpha to test the scale of CSR and sustainable marketing respectively (N. K. Malhotra, 2007). Hair et al., (2010) recommended that value for coefficient alpha greater and equal to 0.7 is generally considered to be the acceptable lower limit of reliability.

Structural Equation Modeling (SEM) was applied to the data set to test the causal relationship between CSR and sustainable marketing. Construct Reliability was used with SEM model to measure reliability and internal consistency of the measured variables (Hair et al., 2010). A value of 0.6 or higher is acceptable to achieve construct reliability (Z. Awang., 2014). Construct validity was performed to measure the extent to which a set of items actually reflect theoretical latent construct. Validity of the construct was assessed using convergent validity and discriminant validity. Convergent validity is achieved by checking the Average Variance Extracted (AVE). An AVE of 0.5 or higher is good rule of thumb suggesting adequate convergence (Hair et al., 2010). Discriminant Validity can be fulfilled by looking at square root values of AVE constructs and comparing them with the correlation estimates between two constructs (Hair et al., 2010).

Finding

Demographic profile

Most of people who settle near biomass energy factory (SAHACOGEN green Lamphun Company) is female (48.90%), work of general employment (48.9%), average member in householder three persons (29.1%), average age between fifty to sixty years old (27.5%), they are local people, (91.9%) established household near factory three kilometer (34.4%), average fees electricity monthly payment around 500 – 1000 bath (48.5%) and most of never visit the factory, (74.5%)

Assessment of Normality, Reliability and Validity.

The normality test was conducted by looking at the skewness and multivariate kurtosis. The suggested value for skewness ranged between ± 3.00 (R. B. Kline, 2005) although some would suggest that the absolute value of skewness should be ± 1.00 . However, the use of SEM using the Maximum Likelihood Estimator (MLE) is fairly robust to skewness greater than ± 1.00 if the sample size is large and a sample greater than 200 is consider large. The value of multivariate kurtosis should be less than 50.0 (Z. Awang, 2014). In this study, the value of skewness and kurtosis are less than the recommended cut-off point. In addition, multivariate kurtosis are less than 50.

Therefore, these values indicated that there is no univariate non-normality affiliated with the data. Reliability and validity test were performed on local people of CSR and sustainable marketing The Table 1 illustrate the outputs from the test measuring CSR and sustainable marketing respectively. The analysis indicated that the factor loading of the items measuring CSR and sustainable marketing for local people in biomass zone achieved unidimensionality, with all the factor loading being equal to or more than 0.6. In addition, the results of these tests indicated that the Cronbach's alpha coefficient value (α) met the required cut-off point and thee analysis revealed that all items were free from random errors.

Meanwhile, the values of Average Variance Extracted (AVE) and Composite Reliability (CR) also achieved the required level which are above 0.5 and 0.7 respectively. Result in Table 1 that all items measuring CSR and sustainable marketing fulfilled the requirement of reliability and convergent validity. Table 2 the discriminant validity index summary for local people in biomass zone. The result indicated that diagonal value (the square roof of AVE) are higher than the correlations between the respective constructs suggest that discriminant validity for construct is achieved.

Structural Models Goodness-of-fit

Confirmatory Factor Analysis (CFA) was used to confirm the measurement model after conducting Exploratory Factor Analysis (EFA). The result from EFA would provide the underling factors that best represent the data together with their respective measuring items. Following EFA, CFA was carried out to test the goodness-of-fit of the variables measuring the studied construct. Any measuring items that obtained factor loadings of less than 0.6 and squared multiple correlations (R^2) of less than 0.4 should be dropped from the analysis (Z. Awang, 2014). As supported by the literature Figure 1 illustrates the structural model depicts the relationship between CSR and sustainable marketing for local people in biomass zone. Several indexes were used to test the structural model goodness-of—fit as indicted below.

The result of the test proved that these models achieved fitness indexes at the acceptable level of goodness-of-fit as illustration 1.

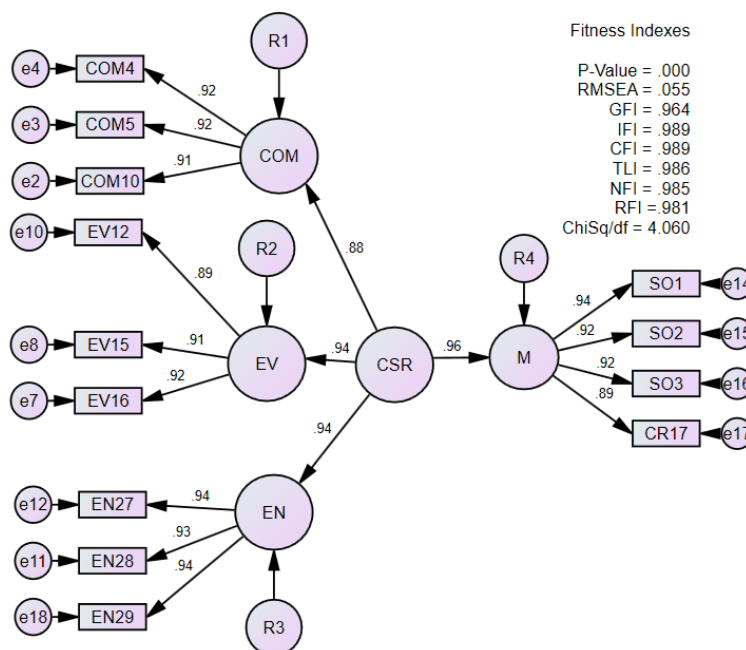
Table 1. Reliability and convergent validity of corporate social responsibility and sustainable marketing.

Items	Loading	α	AVE	CR
CSR - Community Development (COM)		0.94	0.84	0.94
The company has established several educational institutions.(COM4)	0.92			
The company involved in livestock development. (COM5)	0.92			
The company has sponsored meals for local children. (COM10)	0.91			
CSR - Environment Consideration (EV)		0.93	0.82	0.93
The operations of company are non-polluting. (EV12)	0.89			
The company undertakes to prevent any waste of resources from happening. (EV15)	0.91			
The company maintains bio diversity of local area. (EV16)	0.92			
CSR - Energy conservation (EN)		0.96	0.87	0.95
The emissions have been done by the company within the limitations. (EN27)	0.94			
The company takes efforts to reduce carbon emissions. (EN28)	0.93			
The company uses carbon emission management system. (EN29)	0.94			
Sustainable marketing (MS) social dimension		0.95	0.84	0.96
The company has improved community health and safety. (SO1)	0.94			
The company shows its concern for the visual aspects of the firms' operations. (SO2)	0.92			
The company notifies its environmental impacts to the general public. (SO3)	0.92			
Sustainable marketing – Customer relation	0.89			
The company keeps customer abreast with important information related to customers. (CR17)				

Table 2. Discriminate Validity Index Summery

Construct	Factor	COM	EV	EN	MS
CSR	COM	0.91			
	EV	0.83	0.90		
	EN	0.83	0.89	0.93	
MS	na	0.85	0.90	0.91	0.91

Figure 1. Structural model of corporate social responsibility and sustainable marketing



The Causal Effect of CSR on sustainable marketing

The finding in figure 1 indicated the nine items are grouped into three underlying factors measuring CSR for local people in biomass factory zone. These factors are labeled as “Community Development”, “Environment Consideration” and “Energy Conservation”. An earlier study corporate social responsibility would be measured by community development, environment consideration, (Prasertsang, 2010; Monika Kansal et al., 2014) and energy conservation (Monika Kansal et al., 2014; Shiro Hori et al., 2014b). Interestingly, this study proposed that three factors which are identify as community development, environment consideration, and energy conservation, effect on sustainable marketing among local people contrasted with the biomass energy power plant in area.

Somehow, the study suggested that biomass energy power (SAHACOGEN green Lamphun company) to do social responsibility as the following; (1) community development that would offers education institutional establishing, supporting livestock, and treating a meal for local children; (2) Environment consideration that would undertake the prevention of any waste of resource, operating non-pollution and maintaining biodiversity in local community; and (3) energy conservation that the corporate must done emission by company limitation, effort to reduce carbon emission, and management carbon emission as systematic.

In additional, the finding of the study also found CSR influences to sustainable marketing that there are four items measured sustainable marketing for local people in biomass zone. Local people appreciate sustainable marketing of the corporate that would notify environment impact of corporate’s commitment to public, show visual aspect of corporate’s operation, keep local people abreast with important information, and improving local people as healthy and safe.

Table 3. The unstandardized regression weight for local people in biomass zone

			Estimate	S.E.	C.R.	P
COM	<---	CSR	1.000			
EV	<---	CSR	.967	.030	32.263	***
EN	<---	CSR	.985	.029	34.345	***
M	<---	CSR	1.017	.029	35.566	***
COM10	<---	COM	1.005	.021	47.498	***
COM5	<---	COM	.982	.020	49.321	***
COM4	<---	COM	1.000			
EV16	<---	EV	1.024	.023	44.878	***
EV15	<---	EV	.988	.022	43.945	***
EV12	<---	EV	1.000			
EN28	<---	EN	1.000			
EN27	<---	EN	1.011	.018	56.067	***
SO1	<---	M	1.000			
SO2	<---	M	.975	.018	53.457	***
SO3	<---	M	1.002	.019	53.815	***

			Estimate	S.E.	C.R.	P
CR17	<---	M	.971	.020	47.808	***
EN29	<---	EN	1.022	.018	55.699	***

Discussion and conclusion

As the objective of study explore the factors that underline measuring corporate social responsibility (CSR) effect on sustainable marketing. There are consist of three components such as community development which renamed “community contribution”, environment consideration that renamed “environment protection” and energy conservation renamed “carbon emission control”. These factors need to be considered for sustainable marketing improvement. Even though the company is the good commitment, but the study found the ineffective of communication and misunderstanding in biomass energy power for local people.

The study found carbon emission control is critical factor that must be done within the company’s limitation (EN27) and the company need to manage carbon emission (EN29) it impact to sustainable marketing that measured health and safety of local people in community (SO1), In addition, it should clear the visual aspects of the company’s productions (SO2), notification the environmental impacts to the general public. (SO3). In the same way, environment protection is as well as controlling the carbon emission which the company would achieve maintaining the bio-diversity in local area (EV16), undertakes to prevent any waste of resources from operation of company (EV15), and non-pollution (EV12).

The company need to clear the question in carbon emission and environment impact issues to local community. Otherwise invitation local people to visit in factory and available biomass presentation. Furthermore, the company need to provide hot-line service for answer any questions and complaints for feedback along with personal selling and public relations as door-to-door strategy, local radio broadcasting with phone-in bonus prize and games so that promoting biomass energy though local media especially the local people who stay within 5 kilometers from factory.

However, community contribute is also underlines CSR that it positive effect on sustainable marketing. It’s measured by the establishment educational institutions for local community (COM4), supporting livestock. (COM5) and sponsorship meals for local children. (COM10). The result of study argued with social responsibility of company in any activities that could not respond to local demand such as cultural conservation, to donate for religion’s activities. The study strongly advised to SAHACOGEN Green Lamphun applied with aforementioned factors which improve sustainable marketing based on stakeholder participation.

Conclusion, SAHACOGEN Green Lamphun Company would be done in social responsibility issues in term of carbon emission control, environment protection, and community contribution in order to improve marketing of company for sustainability. In the future study, the effectively perceive information and public relation strategy would be revised in conceptual framework so than local people surround factory will be cleared the commitment of biomass energy power. Finally maximize utilization would be occurred on both side between the company and local community as fairly social environment resources.

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