

Analysis of Development Biogas with Creating Shared Value (CSV) at Ciherang Bogor

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Abstract: *Creating shared value is based on Porter & Kramer (2011) is created to improve the operational policies and advancing the economic and social conditions. CSV must be create at each stage of the business chain to emphasizes the concept in business strategy and solve social problems. According to BPS (2015), the percentage of distribution of the GDP in the procurement of electricity and gas has Increased since 2010 in the local area of Bogor. PT Perusahaan Gas Negara (PGN) is one of the main supplier and distributor of natural gas the which is an integral part of the government's plan to boost economic growth, national development and, Realizing energy independence. Biogas is an alternative energy of Indonesian Government to produce 25% of the enegy mix from renewable sources by 2025. Biogas targets of production and liquid waste in Bogor ciherang based on small scale industry from farm household waste to be used as the main energy sources.*

Keywords: Biogas, Creating Shared Value (CSV), feasibility study

1. Introduction

Definition of the concept and the term Corporate Social Responsibility (CSR) is deemed necessary in view of social responsibility is not only an obligation for the company, but also for all part. In order to realize the responsibility for all parties, Company are creating mutual benefits or Creating shared value (CSV) so it can form a shared responsibility.

According to Porter and Kramer (2011), Creating Shared Value (CSV) is an operational policies and technical processes that improve the value of the company's competitive and simultaneously advancing the economic and social conditions. However, in order that responsibility happen effectively and efficiently, the CSV must be created at each stage of the business chain. CSV also emphasizes the concept in business strategy that addresses social problems and needs in the design of the company's strategy. Porter said, *companies can creating economic value by creating societal value*. Resolve the problem of social harmony to generate economic benefits, but also the value of its economic benefits.

CSV definitions is a concept that requires the company plays a dual role creates economic value and social values jointly (shared), without any of the preferred or excluded. Creating Share Value (CSV) is not equal to Corporate Social Responsibility (CSR), although both have the same basis that doing well by doing good.

The main difference is that the CSR both talk about responsibility, while CSV has been retracing the creation of shared values or creating share value. CSV is the transformation or the development of CSR. In an article entitled *The Big Idea: Creating Shared Value*, Porter of Harvard University explained that implementation of CSR and CSV far above that generally focuses on reputation. "The creation of shared value is an integral part of the profits and competitiveness of enterprises. However, changing social values into economic value is not easy," said Porter.

Creating Shared Value (CSV) is a transformation and combination between the interests of business, government and society that envolved from the company's Corporate Social Responsibility program and community development programming are the responsibility of the Government. The Companies in this case is PT. Perusahaan Gas Negara Tbk (PGN), which is one of the energy producer in Indonesia to develop the concept of cooperation and fostering communities of shared value by developing a community of farmers and ranchers around the territory in ciherang bogor, With the use of farm waste, especially cattle which became one of the sources of environmental pollution and problems in the biggest emitters, so that the need to foster and Actualization Bionergi based on shared value with the social and cultural aspects of society are expected to add value to the development of agriculture and farms in the region Ciherang Bogor Indonesia.

PT Perusahaan Gas Negara (PGN) is one of the main supplier and distributor of natural gas Indonesia which is an integral part of the government's plan to boost economic growth, national development and realizing energy independence. PGN took several steps further towards becoming a world-class gas company in 2016. The Company continued to pursue its long term strategy of progressive investment in various fields in order tp build a balanced energy business with a strong presence upstream, downstream and midstream, while leading the development of the infrastructure and technology that will enable indonesia to benefit from the vast potential of gas in future.

Natural Gas of PGN has touched every aspect of life to reach the transport sector, industry, households and as a good source of energy made from fossil environment friendly. The development of alternative energy in the form of natural gas as a source of renewable energy into new vistas for the Indonesian government in addressing the problem of scarcity of energy through renewable energy sources that are environmentally friendly and sustainable.

This Research is formulated to develop biogas system and sustainability as well as animal husbandry and integrated agriculture with an innovation business model canvas for quality improvement and Improving the value for agribusiness.

The research problems are How to form the resulting both social and economic benefits for the company and the community?, What is the strategies of PT.Perusahaan Gas Negara (PGN) in the development of biogas and sustainable agribusiness?, How to increasing Quality and Productivity Biogas with Creating Share Value (CSV)?.

This research aims are to analyze what social benefits and economic benefits gained for the company and the surrounding community as well as suggestions for improvements for the sustainable agribusiness?, Analyzing Activity Creating Share Value (CSV) and agribusiness development strategy of PT.Perusahaan Gas Negara Tbk (PT. PGN) and the community?, Formulate business model and feasibility study to improving the quality of business generated through Creating Shared Value Program?

2. Method

The scope of research is to investigate and formulate a development strategy implementation of social responsibility by implementing Creating Share Value (CSV) by the company to the community that supports business continuity biogas and agribusiness in the region ciherang, Bogor and how the implementation of social responsibility programs conducted on the productivity and benefits for society and the company.

The good cooperation between PT.Perusahaan Gas Negara Tbk (PGN) with Bogor Agricultural University (IPB) to do the program, which is called "Tanaman Obat Keluarga dan Kebun Bergizi" Togabuzi (*Family Medicinal Plants*), are created to integrating system of biogas and how to develop people with a motivation to the citizens and make a model of cooperation of community empowerment are integrated with Collaboration Innovation Center, as well as the application of processing of medicinal plants be a herbal medicinal plants that can be utilized properties by citizens.

Methods using the quantitative and qualitative data which is collected by interview (*in-depth interview*) data collection using interviews with company mainly Parts of stakeholders PT. Perusahaan Gas

Negara Tbk division of Corporate Social Responsibility (CSR) and Lembaga Penelitian dan. Pengabdian masyarakat (LPPM) as well as the surrounding community and sustainable agribusiness farms in the region Ciherang.

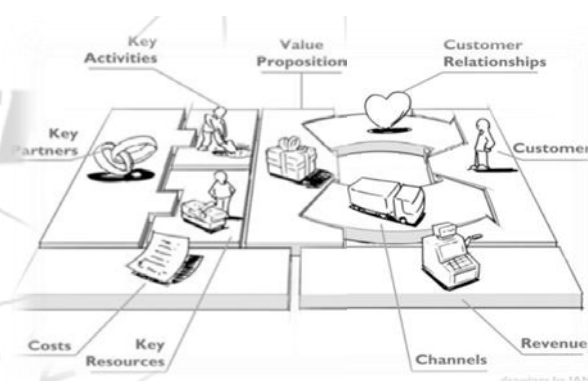
2.1 Creating Shared Value

Shared Value concept proposed by Porter and Kramer (2011) explains that the contemporary developments, the company began the spotlight because they cause degradation of the quality of the community both in the sphere of social,

environmental and economic. Porter and Kramer (2011) proposes a new perspective on their shared value is the relationship between "societal and economic progress" as one of the power to support global growth. Reversing the old logic that the social cost is external costs for companies, in this shared value of social harms became the internal cost for the company, therefore the social need (societal needs) that determine the market (not only the sheer economic necessity). Shared Value is different from the approach of redistribution (as applied in a fair trade) but is "expanding the total benefit of economic and societal value".

The concept of Shared Value in the process needs the support of other elements, namely the government. The government's role mainly lies in the creation of policies that support Shared Value. responds to the concept of Shared Value, and in practice supporting the convergence of business and social aspects simultaneously. In practice shared value measurement has appeared in business cooperation and social systems in many places. Application of the values shared value in the business activity namely the five indicators of measurement, namely the creation of social value and business cooperation, efficiency in the use of inputs (natural resources and labor) and develop the impact of product and community, socio-economic development long term, how the social impact can contribute to the reputation of the business community as well as compliance with laws and policies volunteerism, standardization and codes of conduct.

2.2 Business Model Canvas (Canvas Business Model)



Source : Business Model Generation Alexander Osterwalder, 2014

Business Model Generation (2010), Osterwalder and Pigneur describe the business model canvas of the rationale of how an organizations or companies create, deliver and capture value. Business Model Canvas described how thinking organization creates, delivers and captures value to customers, supply, infrastructure, and financial feasibility.

Mapping the new business models and innovative begins by analyzing strengths, weaknesses, opportunities and threats of each element of the existing business model to find out the shortcomings in the existing business model concept so that future improvements or changes can be done in a sustainable manner. Formal descriptions of the business become the building blocks for its activities. Many different business conceptualizations exist, and this model propose a single

reference model based on the similarities of a wide range of business model conceptualizations. With this business model design template, an enterprise can easily describe their business model. The following list of questions will help brainstorming the precise idea for the business model innovation such as key partners, key activities, value proposition, customer relationship, customer segment, key resource, Distribution channel, cost structure, and revenue stream.

2.3 Business Feasibility Study

The criteria that a product / service that will be produced has a good demand in the long term and with the support of adequate power, and research and sequencing a viable proposal. According to Husein Umar, 2007, notes the analysis of financial aspects were examined quantitatively using criteria NPV, IRR, Net B / C and Payback Period (PP) with firstly be discounted cashflow preparation and analysis of profit and loss of business.

Cost Analysis of cash flows to a waste treatment facility convert manure into biogas categorized to the Inflow and Outflow fees. Inflow to the cost in the first year, comprising sales of biogas, organic fertilizer farm sales and the residual value of the total inflow generated divided by the cycle of cattle and income from the sale of biogas and organic fertilizer. Business analysis is used to describe the biogas development efforts in generating profits from the beginning of the effort. Based on the calculation results based on the attachment unit waste management cash cow manure into biogas, biogas generated in the first year, the cost is greater than revenue and stable movement in subsequent years. the tendency for expenditure for a year (since the first month up to twelve months) showed a profit and profits crept up and is potentially significant as incomes increase sales of biogas and organic fertilizer.

At a cost Outflow described in the form of cost investments that investments in land and buildings, investments biogas, terminal installations biogas, the installation of pipelines and waterways as well as production equipment as well as the initial investment in the form of cow dung, strater and fixed costs the employee's salary, cost of the treatment and the gross profit as well as corporate income tax business that began in the second year. With DF (Discount Factor) of 7% resulted in a gross profit of Rp.159.955.000 with NPV of Rp.203.696.246, - and an IRR of 26.41% and PP (Payback Period) for 4.33 years and Net B / C of 2,439 showed that the development effort biogas feasible. For cash flow of biogas and the project is calculated from sales and fattening for 6 months and evaluate the profitability of the investment plans made by comparing the calculation results obtained with the justification of eligibility

3. Results

The Code of Good Corporate Governance (GCG), the company always carry out and implement the principles of Good Corporate Governance (GCG), which is mandatory for every unit business stakeholders and shareholders. The

Vision and Mission stated in Code of Good Corporate Governance PT Perusahaan Gas Negara (Persero) to be a reference company in developing the business unit. The Vision PT PGN is Becoming a World-Class Energy Company in Natural Gas Utilization and Mission PGN that increase added value for stakeholders by strengthening the company's core businesses in transportation, trade of natural gas and development; development of gas processing business; business development services operations, maintenance and engineering related to the oil and gas industry; profitable business resources and assets of the company to develop other businesses.

PGN has formulated a corporate culture with the principle of "procise". PGN has a strong commitment to encourage the successful implementation of the corporate culture in accordance with the purpose of the company. "Procise" consists of five grades as follows:

- 1) *Professionalism*: Always give the best results with increasing competence in their field and are responsible for every action and decision taken. Value professionalism consists of two main behaviors are competent in their field and are responsible.
- 2) *Continuous Improvement* (Completion continuous) : Committed to continuous improvement. Value Continuous Improvement consists of two main behaviors namely Creative and Innovative and adaptive to change.
- 3) *Integrity* (Integrity): Be honest with yourself and others. Consistent between thought, word and deed by lofty ethical standards. Integrity value consists of two main behavior that is honest, open and positive thinking, discipline and consistency.
- 4) *Safety*: Always put the health and safety, both for themselves and the surrounding environment. Values Safety consists of two main behaviors that prioritize safety and health and social care and the natural environment.
- 5) *Excellent Service*: Giving priority to the satisfaction of both internal and external customers by providing the best services. Value Excellent Service consists of two behaviors that put customer satisfaction and proactive (*quick response*).

PT. Perusahaan Gas Negara (PT. PGN) as the Badan Usaha Milik Negara (BUMN) in the development of alternative energy based on fossil understand the importance of good corporate governance and true in improving sustainability and livelihood of communities to become productive and at the same time be able to sustain the earth. To achieve these objectives, a sustained effort PGN did reflected in each company's business operations, daily activities and every business decision. PGN believes that the new energy era will be coming soon in Indonesia with great potential to improve the Indonesian economy in a sustainable manner and PGN duty and responsibility in the active contribution separately explore the potential and continuous improvement of living standard. According to PGN sustainability report in 2014, states that the level of effectiveness of the distribution of the Partnership Fund in 2014 declined by 92.88% with a number of partners Patronage of the 6755 partners spread throughout Indonesia, as well as aid distributed to local communities with disaster relief, education aid, medical assistance, aid the

development of public facilities and infrastructure, help religious facilities, support nature conservation, and social assistance as stipulated and are listed in the sustainability report.

Biogas Production Process Flow fairly simple. Its main ingredient is a mixture of feces, urine, and the remainder of feed (*organic materials*) with dilution water. Comparison of water and dirt is 2: 1 with a calorific value of biogas is determined by methane (CH_4) and carbon dioxide (CO_2). The main ingredients are housed in a digester (digesting organic material) tailored to the capacity and number of livestock. The first charging must have been created anaerobic conditions. Biogas processing wait time of about 13 to 20 days from the first field. Digester with a capacity of 4 -5 square meters can accommodate 2-4 head of cattle dung adult cattle and produce as much as 1800 liters of biogas. Biogas as much as is sufficient for the needs of family cooking (5 members of the family each day). The daily used activity of biogas can substitute energy needs of household electricity. When compared with kerosene, every one liter of biogas is able to generate electrical energy equivalent of 1.4 liters of kerosene capabilities. Biodigester cement with a capacity of 5-7 cubic meters are able to process cow manure. In addition to biogas from sewage treatment processes have gained solid and liquid waste which are both developed as fertilizer. Every one biogas production process, the obtained 200 liters of liquid and solid wastes. Waste will fill the bottom of the tube. While the upper part is empty space shelters biogas. In a few days been fermented biogas that can be used. The gas produced is passed as fuel for cooking and turn on the electric generator. Manure from cows selected for methane content of biogas in the form of a very nice, rather than waste food animals. The Dregs of biogas can also be used for fertilizers, both liquid fertilizer and organic fertilizer. An anaerobic process for 21-30 days in mixing the biogas decomposition and changes into methane (CH_4). Approximately 60% of biogas is methane (CH_4), 38% carbon dioxide (CO_2) and the remaining hydrogen sulfide gas (H_2S)

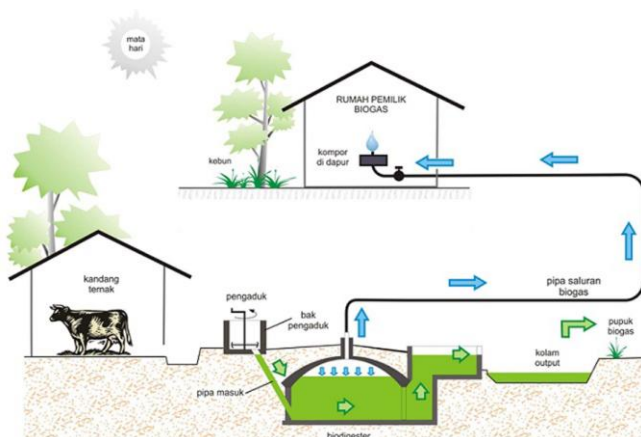


Figure 1: Biogas management system

The Installation of Biogas Development in Bogor Ciherang region today begins with dissemination to the public to facilitate the process and awareness of the importance of protecting the environment around the farm. Training and seminars as well as the development of biogas units in

Ciherang are conducted every Saturday and Sunday are included from the Civitas IPB and the company (PT Perusahaan Gas Negara Persero Tbk). IPB Students, Teachers and corporate training how to made a liquid fertilizer and compost assisted by mothers Toga group and the Pembinaan

Kesejahteraan Keluarga group (PKK) in the region Ciherang and supervised and monitored by the district of Bogor. Training on the development of biogas and liquid fertilizer and compost is so that people understand the intent and purpose of the construction of biogas installations and try to introduce to the citizens how livestock waste management techniques by utilizing the biogas installation. Their project development of biogas installations is welcomed by the community, especially farmers and ranchers in the region villages around IPB campus.

The real benefit that can be felt by the biogas installation is the fuel needs daily for cooking and as a fuel alternative electricity. If the comparison is made with the LPG gas cylinder size is 3 kg at a price of Rp 20,000, - can be discharged within 2 weeks - 4 weeks. So with the use of biogas, biogas energy sources can save up gas usage 6 weeks - 8 weeks. The use of biogas in addition to the perceived benefit in spending cuts domestic industry, it is also the electrical efficiency and the use of LPG gas. Biogas produced from the digester (*tube*) that can be directly streamed to the cooking tools or household industries. Making the digester to one cow of 1.5 m^3 plus the gas storage space of about 50% or 0.75 m^3 so that the hole for the digester can be made with a size of $1.5 \text{ m} \times 1.5 \text{ m} \times 1 \text{ m}$ or using a drum with a diameter of 1 m and 0.8 m high. on the corner of the wall over a distance of 10 cm from the man hole planted a pipe with a diameter of 0.75 inches (25cm) from the wall surface. At the end of the pipe is installed gas valve that serves to open or close the flow of gas from the digester. Channel was created from the pipe with a diameter of 10 cm (inlet chamber) with the vent pipe with a diameter digester at a distance of 30 cm from the bottom of the tub. The hole is connected with the pipe to a height above the surface of the tub with a slope of 400 degrees. At the end of the pipe is made funnel for the container and filtering the feed biogas. The inlet funnel is made with size 30 cm x 30 cm x 50 cm which is directly connected to the line coming from the cage.

Followed by the manufacture of the outlet (*outlet chamber*) that serves the slurry towards a sewer pipe with a height of 50 cm and a width of 25 cm. at the top of the outlet hole by the door as a waste stream. Funnel shelter at the outlet is lower than the inlet. It is made so that the dirt on the inlet does not burst out and waste gas can flow toward the drain at the outlet chamber. Once connected to the channel flowed to the stove as a burner gas, then the gas pressure generated by the digester is measured using a manometer and gas lines made from 0.75 inch diameter plumbing that serves to open or close the gas line from the digester to the stove or streamed through gas pocket bag to the houses. Besides the use of the house as well as a filler biogas stored in tubes. At the stop tap is placed near a pipe T-connector as a branch of the gas line to the household and huts that can be used for lighting and

powering the controller in the form of kerosene lamp was lit every night. Besides, as a light, kerosene lamp is also a measure and control the production of gas produced by the digester.

The Observations of gas quality can be seen from the flame kerosene lamp. If the light is bright and stable, the production of gas going well, and when the lights dimmed, the production of gas is not good or the lack of water in the mixture of feces.

Table 1: The composition of the gas contained in biogas

<i>The type of Gas</i>	<i>Volume (%)</i>
Methane (CH ₄)	40-70
Carbon Dioxide (CO ₂)	30-60
Hydrogen (H ₂)	0-1
Hydrogen Sulfide (H ₂ S)	0-3

Source : Primary data

Table 2: The Components for household-scale biogas

<i>type Gas</i>	<i>Volume (%)</i>
Methane (CH ₄)	± 60%
Carbon dioxide (CO ₂)	± 38%
O ₂ , H ₂ , and H ₂ S	± 2%

Source : Primary data

Table 3: Biogas as compared to other fuels

<i>Information</i>	<i>Other Fuels</i>
1 m ³ Biogas	0.46 kg LPG
	Kerosene 0.62 liter
	0.52 per liter of diesel oil
	Petrol 0.80 liter
	1.50 m3 of city gas
	Firewood 3.50 kg

Source : Primary data

Table 4: The production of biogas from various organic materials

<i>No.</i>	<i>Organic ingredients</i>	<i>Amount (kg)</i>	<i>Biogas (lt)</i>
1	Cow dung	1	40
2	Buffalo dirt	1	30
3	Pig dung	1	60
4	Chicken manure	1	70

Source : Primary data

At the cost components described in the form of cost of investments are the investments in land and buildings, investments of biogas property, the thermal installations biogas, the installation of pipelines and waterways as well as production equipment as well as the initial investment in the form of cow dung, strater and fixed costs the employee's salary, cost of the treatment and gross profit and corporate income tax business that began in the second. With DF (Discount Factor) of 7% resulted in a gross profit of Rp.159.955.000 with NPV of Rp.203.696.246, - and an IRR of 26.41% and PP (Payback Period) for 4.33 years and Net B / C of 2,439 showed that the development effort biogas feasible. For cash flow. This was calculated from sales and fattening for 12 months and evaluate the profitability of the investment plans made by comparing the calculation results obtained with the justification of eligibility

Table 5: Biogas Development Feasibility

<i>No.</i>	<i>Criteria</i>	<i>Value</i>	<i>justification Eligibility</i>
1	NPV (Rp)	203 696 246	> 0
2	IRR	26.41%	> 6%
3	Net B / C Ratio	2,439	> 1.00
4	Pay Back Period	4.63 years (54 months)	<100 months

Source : Primary data

4. Conclusion and Suggestion

4.1 Conclusion

The Social benefits and economic benefits gained for the company, PT Perusahaan Gas Negara (Persero) Tbk want the welfare of society and increase revenues by providing education and training on biogas in order to support energy conversion program to gas so that people more independent. To the public as well as groups of crop farmers and ranchers in the region ciherang helped in terms of increasing resources and energy to develop the biogas system and Togabuzi independently used to reduce the emissions of the use of gas and electricity as well as the empowerment of communities in a sustainable manner.

By calculation biogas feasibility study which shows that the biogas project feasible with NPV of Rp.203.696.246, - and an IRR of 26.41% and PP (Payback Period) for 4.33 years and Net B / C of 2439 demonstrate that the business development of the biogas is feasible.

For cashflow was calculated from sales and fattening for 12 months and evaluate the profitability of the investment plans made by comparing the calculation results obtained with the feasibility justification. The depiction of a business model that aims to increase the strategies and mapping business model being developed is expected to Development Project of biogas are implemented in a sustainable manner on an industrial scale households and can be prototype pilot development of biogas self-sustainable in the Lingkar Kampus of Bogor Agricultural University (IPB)

4.2 Suggestion

The need for additional procurement of such cooperation with cooperative or unit Capital to further develop biogas development. Creating Share Value (CSV) can be applied both to domestic business and become the Prototype companies in the development of biogas unit independently based on a scale of rural households, especially in rural areas around Ciherang Bogor. The need for active participation by both the public, academic community and institutions regarding the development and sustainability if it wants to develop into larger scale of biogas.

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