MASTER THESIS

STRATEGIC OF ENERGY EFFICIENCY IN HIGHER EDUCATION
Case Study Faculty of Social and Political Sciences, Dago, Bandung
Universitas Padjadjaran, Indonesia

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ABSTRACT

A case study about quality improvement of campus infrastructures and electricity usage in academic performance which can cause high level energy consumption in higher education (case study Faculty of Social and Political Sciences UNPAD Dago, Bandung). This study aims to determine appropriate strategies toward energy efficiency which can be applied in higher education. This research used a quantitative method with dominant position, while the qualitative method as less-dominant position. The analysis method for this research use Contextual Interaction Theory (CIT) with the characteristics of implementer and target group which consist of motives, cognitions, and power. Those variable will be the main point for arranging basic strategic about energy usage in Faculty of Social and Political Sciences, Dago (FISIP Dago). The contextual issue also as influential external factors were considered in determining level of efforts for energy efficiency in campus. Regarding to CIT measurements which have been analyzed, the score of motives from implementer is -0.33, cognitions +0.37, and power +50. Then, overall for target group get positive score which consist of motives +0.62, cognitions +0.45, and power +0.33. The result of type interaction between two actors point out number 10 which is about obstructive. Also, there are three contextual issues which are influence characteristics of actors. First, specific context is about any other interests or other priority besides energy efficiency. Structural context is about the accessibility of resources and authority of the implementer. Also, the wider context is about moral responsibility of the actors in protecting their environment. The strategic planning to pursue energy efficiency in campus FISIP Dago consist of motivation improvement by campaign in energy saving and giving rewards. Then, cognitions improvement with energy audits and socialization of energy efficiency. The last, power improvement through the implementation of policies and continuous programs.

Keywords: *energy efficiency, contextual interaction theory, strategic planning of energy efficiency*

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CHAPTER I

INTRODUCTION

1.1 Background

In decades, energy crisis and environmental degradation affected the lives of billions of people in developing countries. Growing population and human activities become a threat to the availability of energy resources. Many of them are mainly dependent on fossil fuels, coal, oil and natural gas. The largest using of energy sources as main fuel of power plant to supply many of electricity needs among people. Global consumption of fossil fuel and coal still continues dominate among energy sources, it reach 31.1% for oil and coal 28.9% (IEA, 2015). On the other hand, fossil fuel and coal predicted will extinct in a hundred year ahead, that makes some countries try to find a solution to tackle this problem. The possible solution is changing the energy sources into renewable energy or energy conservation.

Not all of countries can supply their electricity needs from renewable energy, Indonesia as one of developing country in Asia with large area which is still lack in maximized their natural resources. In 2015, Indonesia with over 250 million people still struggling to supply their energy needs. Energy consumption in Indonesia has risen 3.1% in 2014 and predicted increasing more than doubled over the last 16 years. Moreover, there is just one legal supplier which has authorities to produce and supply electricity in all of resident, it is PLN (State Electricity Company). At sub macro level of national energy systems, the electricity system in West Java is relative crucial sub-systems from the national energy system.

Data of electricity supplier in 2014 explained that the Java-Bali power supply reached 130.510 GWh. Electricity consumption in West Java itself needs 46.144 GWh while the total electricity demand of Java-Bali 156.743 GWh. This indicates a deficit from electricity supplier as amount of 26.233 GWh. That means electricity supplier must buy electricity supply from outside, such as Captive Power and Independent Power Produce (PLN Statistics, 2014). On the other hand, using coal as a fuel of the power plant is still dominated in Indonesia. That means, increasing demand for electricity means increasing coal consumption and now coal consumption already reached 82 million tons. Certainly, it has an impact on environmental degradation. According to Baskhoro *in* Hidayati (2010), coal mining can give several of challenges to environment such as soil erosion, dust, noise, water pollution and disturbance to biodiversity.

Besides that, the burning coal could increase carbon emissions, based on data from Indonesian Statistic (2015), in 2013 the total emissions from power plants reach amount 169.5 million tonnes of CO_2e. It means if the level of electricity consumption is still high, it will be predicted to be 2223.4 million tonnes of CO_2e in 2050. With these circumstances, it cannot be denied that demand of electricity in Indonesia still very high in many communities and it will make the environment getting worse. The possibility for taking care this condition is implement energy conservation. That means, using energy by efficiently and rationally with energy saving and without reducing benefit of energy itself. Most of energy saving are low-effort, low impact and many individuals can do in different actions (Attari et al., 2010). Moreover, there is a suggestion to improving energy literacy throughout all level education because it will encourage energy saving behavior in daily activities (Liu et al., 2015).

Education has important role to ensure the sustainable future, even United Nation support the higher education to integrate value of sustainable development in encouraging behavior change towards energy using (UNESCO, 2005)

In global movement, Universities have important role to build an awareness among young people toward students' practical actions such as personal energy saving behaviors. It seems that higher education has been highlighted consistently in responsible for future generation through Green Campus initiatives (particularly energy saving), research, and education for sustainability (Sterling et al., 2013; Wals, 2014). Education through real practice in learning systems more easily to do and there is strong potential for universities to encourage students about implementation of energy saving behavior. This research assist higher education regulation to maintain energy efficiency strategies which help environment being more sustainable. In the end, this research would be undertaken to know the barrier of energy using in higher education and find the possibilities strategies in energy efficiency. Also, this research will contribute to the literature in compliance existing problem and expanding knowledge about energy efficiency.

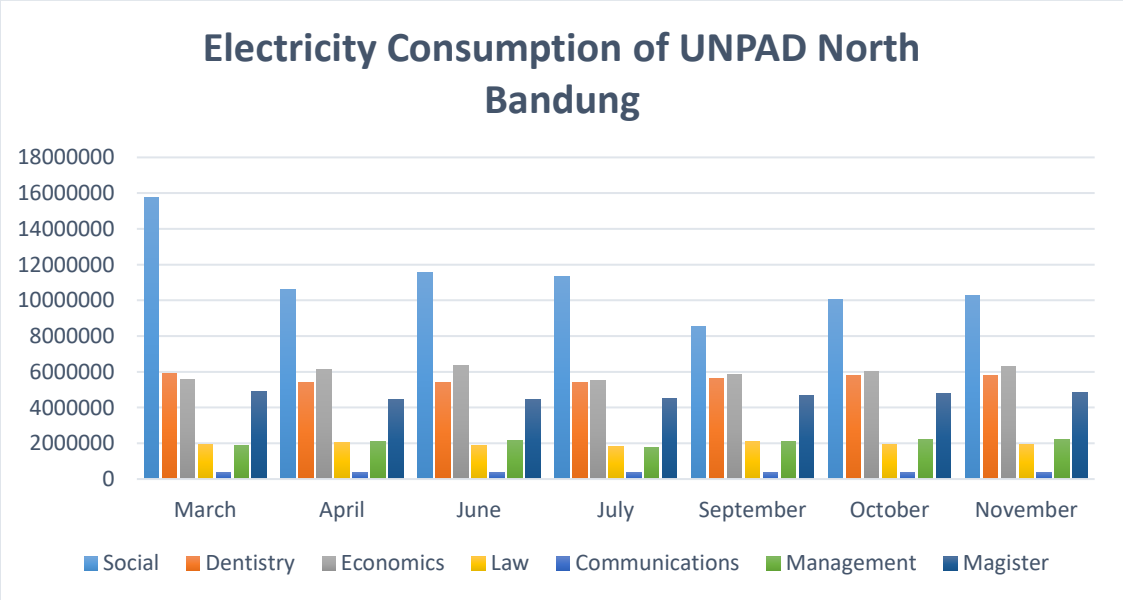
1.2 Problem Statement

In term of global competition, universities around the world improving their education system in the image of "World Class University" (WCU). UNPAD has a vision to be WCU in 2026 with a focus on quality of research by national and international journals. Besides that, the quality of graduates has to be reflect from university reputation. Therefore, the quality of higher education cannot be separated from development teaching methods and

campus infrastructure. Since then, UNPAD has developed many facilities and infrastructures to support academic performances.

Undoubtedly, every construction must have an impact to the environment. Proven by the increasing of electricity consumption as an impact from development of campus facilities. It has been analyzed by researchers in University of New Hampshire, United States in 2015 that the addition of new building and expansion building in the university will increase the electricity consumption as much as 3%.

Based on the data from electricity usage of UNPAD Bandung (PLN Rayon North Bandung) in March 2016 - November 2016 showed that there is a faculty with high electricity consumption, that is Faculty of Social and Political Sciences (FISIP) which is located in Dago, Bandung. Total of electricity consumption are more apparent than other faculties in the same area, it can be seen in the picture below:



(Source: Department of Resources UNPAD, 2016)

Figure 1. 1 Electricity Consumption of UNPAD North Bandung

This research is about evaluating the problem of energy consumption in campus and find out how to tackle the barrier of using energy in effective ways through the characteristics of actors, they are implementer and target group. As known, every actor has different interest in regulation and they could affect to the implementation process. Refer to Bressers's theory (2013), actor as an ultimate driving from implementation process and not as an effect from a policy. In the process, there are several factors which affect to the characteristics of actors and known as contextual issues, such as location, governance and environment, etc. In order to make good strategies about energy efficiency, the implication of strategic issues should be considerate toward characteristics of actors. That is because energy usage is all about awareness and behavior in daily activities. If they know how to use electricity devices in effective ways, it makes the energy consumption is not higher as before. Actually this research still rare in Indonesia because until now the strategic of efficiency still focus on technical work without concern in characteristics of actors.

To conclude, researcher interested to undertake this research relating to energy efficiency in higher education by taking the case in UNPAD. That is because this university has earned the title as Green Campus and now heading to international level as "World Class University". In the end, the result of this research is expected to be some advices in using energy more effectively and support the university towards environmental sustainability.

1.3 Research Objectives

The aim of this research is to determine appropriate strategies toward energy efficiency that can be applied in higher education. By doing this research, the author expects UNPAD become a role model for other institutions as a sustainable campus. The sub-objectives of this research are:

1. Knowing the implementation of energy consumption from Faculty of Social and Political Sciences, Dago.
2. Knowing the characteristics of the actor and contextual issues which contribute to energy consumption in Faculty of Social and Political Sciences, Dago.
3. Giving strategic recommendations of energy efficiency in Faculty of Social and Political Sciences, Dago.

1.4 Research Questions

Based on the background, problem statement and research objectives, the research questions in this study are as follows:

1. How do the implementation of energy consumption from Faculty of Social and Political Sciences, Dago?
2. How do the characteristics of involving actors and contextual issues contribute to the energy consumption in Faculty of Social and Political Sciences, Dago?
3. What is the right strategies to pursue the implementation of energy efficiency in Faculty of Social and Political Sciences, Dago?

1.5 Organization of The Master Thesis

To show the clarity of the thesis components and its structure, the organization of the research thesis is elaborated as the following:

1. Chapter I elaborates the main components of the introduction including background, problem statements, objectives and research questions.

2. Chapter II contains literature review which presents an overview of the theoretical background and other relevant information that related with the scope of the research.

3. Chapter III describes the approach, methodology, location of study, research framework sampling method, and how the research questions will be answered through determining data collection and data analysis techniques.

4. Chapter IV elaborates the actual observation towards energy usage and in Faculty of Social and Political Sciences, Dago

5. Chapter IV analysis characteristics of both actors and the contextual issues that contribute to the energy consumption in Faculty of Social and Political Sciences, Dago

6. Chapter VI present strategic recommendations of energy efficiency in Faculty of Social and Political Sciences, Dago

6. Chapter VII present the conclusions and recommendations strategic based on the findings.

CHAPTER II

LITERATURE REVIEW

2.1 Energy Conservation

During this time, the energy demand in Indonesia still depend on fossil fuel and coal as the main fuel of power plants. No doubt that the stock of energy in the future will be depleted slowly. To prevent an energy crisis, the government made an energy policy as outlined in the Indonesian Government Regulation No. 70/2009. These regulations explained that energy conservation means a systematic, planned and integrated in order to conserve energy resources in the country and improve the efficiency of utilization.

According to Manan (2009), conservation is an effort to use energy more efficiently by not reducing the growth rate of development. This effort should be supported and implemented from all sectors, for example households, transport, infrastructures, industrial, agricultural and others. This principle needs to be applied by people with grown understanding and awareness about energy issues, especially about the scarcity and energy-efficient lifestyle. In Semuel (2014), energy conservation, can be done through two approaches, technologies and behavioral approaches. With technologies, electricity conservation is done by providing additional tools to carry out conservation or efficiency power automatically. In addition, the Minister of Energy and Mineral Resources No. 14/2012 describes about energy management. That is a kind of regulation setting for using electrical energy in effective and efficient way.

One of method for applying the electrical energy management is to conduct an energy audit of electricity. Audit of electrical energy is energy observations which made periodically or regularly to provide information or profile of energy usage in a particular process or tool that can identify energy savings opportunities, and recommendations.

In energy management, it can be seen from the side of the consumer and the side of producer. The energy setting from consumer side, or better known as Demand Side Management is a method to reduce or alter the load curve of power with the aim of reducing the rate of energy demand, such as using energy saving lamps. The energy setting from producer side or known as the Supply Side Management is energy savings from side of power producers, this method is to increase the capacity of electricity supply. In general, the producer will purchase energy from Captive Power and Independent Power Producer.

This research is more emphasis on Demand Side Management by consumers as a target in the implementation of energy efficiency. This method can be used as behavioral approach. This approach can be achieved through increasing awareness and knowledge related conservation or saving energy use. Energy conservation through behavioral approach in efficiency and productivity is a concern of researchers in disclosing the strategy.

2.2 Energy Efficiency

Efficiency is a 'measure' which compares the planned use of inputs with the actually used. The percentage of 100% of efficiency is very difficult to achieve, but the efficiency is close to 100% is expected and this concept is more oriented on input rather than output (Clancy, 2002). In the second law of Thermodynamic mentions that the energy is converted

into other forms for specific purposes, the output of useful energy is never equal to the energy input (Beggs, 2011). Some of the energy will always end up in the unwanted forms as lost or wasted. So it can be said that the process of efficiency is the ratio of useful output to the input needed, it can be expressed in the following equation: (Clancy, 2002)

$$efficiency = \frac{output\ energy}{input\ energy} \text{ x } 100\ \%$$

Energy efficiency in Indonesia is the implementation of energy conservation as assign in Government Regulation No. 70/2009. Energy efficiency refers to use less of energy produce as a same number of useful output (mass balance energy). In the Ministry of Energy and Mineral Resources No. 31/2005 states that the energy savings is using energy efficiently and rationally without reducing the required of energy usage.

In IEA (2014), energy efficiency refers to the limitation or reduction of energy consumption by adopting the efficient equipment (e.g. fluorescent lamp). Hidayati (2010) says that the energy savings can be a part of energy efficiency. The energy savings can be achieved by using less energy, or by reducing the consumption and activities of energy usage without reducing their benefit. In other words, energy efficiency does not mean lower / reduce function or benefit of something, but maximize energy use as little as possible (Hidayati, 2010). Refer to Ministry of Energy and Mineral Resources of the Republic of Indonesia No. 13/2011, electrical energy savings must be done efficiently and rationally without reducing their safety, comfort and productivity (Ministry of Energy, 2012).

2.3 Efforts towards Energy Efficiency in Indonesia

According to regulation from the Ministry of Energy and Mineral Resources No. 14/2012, there are several efforts to support energy efficiency in daily activities. Those activities are carried out through technical measures structured and economical way to minimize the energy usage, including energy for production processes and minimize the consumption of raw materials and supporting materials. Some activities to support on energy efficiency are described in the following table:

Table 2. 1 The efforts towards energy efficiency

Focus	Indicator
The Air Systems	1. Using air conditioning with inverter technology and use power system in accordance with the size of the room. 2. Using refrigerant with hydrocarbon 3. Putting the AC compressor unit at a location that is not exposed to direct sunlight 4. Turning off the air conditioner if the room is not in use 5. Installing the indoor thermometer to monitor the temperature of the room 6. Set the temperature and relative humidity in accordance with the Indonesian National Standard (SNI) a. Workspace with temperatures ranging from 24ºC to 27ºC with relative humidity between 55% to 65% b. Transit Lounge (lobby corridor) with temperatures ranging from 27ºC to 30ºC with relative humidity between 50% to 70% 7. Operating the central air conditioning: a. turning on the air conditioner 30 minutes before the working hours b. turning off the air conditioner 30 minutes before quitting time 8. Ensure no air from outside come into the room because it will reduce the cooling effect 9. Perform regular maintenance according the manufacturer's guidelines
The Lighting Systems	1. Using energy saving lamps according to its purpose 2. Reducing the use of decorative lights 3. Using electronic ballasts in fluorescent lamp

	4. Set the maximum electrical power for lighting in accordance with the Indonesian National Standard (SNI) to: a. Receptionist 13 Watt/m^2 with a minimum illumination level of 300 lux b. Workspaces 12 Watt/m^2 with a minimum illumination level of 350 lux c. Meeting room, active archive space 12 Watt/m^2 with a minimum illumination level of 300 lux d. Warehouse archive 6 Watt / m^2 with a minimum illumination level of 150 lux e. Emergency exit, 4 Watt/m^2 with a minimum illumination level of 150 lux 5. Using the lamp housing (armatures) which has a high light reflection 6. Set the switch based on group area with the accordance utilization of the room 7. Using the automatic switch by using timing (timer) and / or the light sensor (photocell) for garden lighting, and corridor 8. Turn off lights in rooms when not in use 9. Utilizing natural light (sunlight) in the day by opening window so the light levels sufficient enough to do the job activities 10. Clean the lamp and the lamp housing (armature) if it is dirty and dusty so it will not obstruct the light
Support Systems	1. Shutting down the computer if leaving the working space more than 30 minutes 2. Turn the printer off when not in use and only turn on shortly before going to print 3. Using a copy machine in a standby mode with low power consumption 4. Operate audio-video equipment as needed 5. Turning on the water heater and dispenser equipment a few minutes before use and switched off after completion of use

(Source: Ministry of Energy and Mineral Resources No. 14/2012)

2.4 Standard Value Intensity of Energy Consumption in Indonesia

According to the guidelines for the implementation and supervision of electrical energy conservation from the Ministry of National Education (Technical Energy Audit Department of Education, 2006), the degree of efficiency of electrical energy use for offices and commercial buildings can refer to the standard value of IEC (Intensity of Energy Consumption). In the SNI-03-6196-2000, intensity of energy consumption is described as

formula apportionment between the consumption of energy by unit area which is conditioned buildings in one month or one year. Standard Intensity of Energy Consumption (IEC) is shown in the following table:

Table 2. 2 Standard value intensity of energy consumption

Criteria	Room with AC (kWh/m^2/month)	Room without AC (kWh/m^2/month)
Highly efficient	4.17 -7.92	-
Efficient	7.92 – 12.08	0.84 – 1.67
Quite efficient	12.08 – 14.58	1.67 – 2.5
Rather wasteful	14.58 – 19.17	-
Extravagant	19.17 – 23.75	2.5 – 3.34
Very Wasteful	23.75 – 37.5	3.34 – 4.17

(Source: SNI-03-6196-2000, National Indonesia Standard about energy audit)

Table 2. 3 Standard value of energy consumption based on type of building

No.	Type of Building	IEC (kWh/m^2/year)
1.	Office (Commercial)	240
2.	Department Store	330
3.	Hotel and Apartment	300
4.	Hospital	380

(Source: SNI-03-6196-2000, National Indonesia Standard about energy audit)

In order to get value from intensity of energy consumption. IEC calculation using this following equation below:

$$= \frac{Total\ Energy\ Consumption}{Room\ Size}\ (kWh/m^2)$$

2.5 Strategic Concept

This research used a strategy that refers to the theories of Bressers (2009), that is Contextual Interaction Theory. This theory is a deductive theory and realistic parsimonal which can be useful in analyzing of the implementation. There are two actors which involves in the interrelated process. The first is the implementer or actors who responsible for organizing the policy. The second is the target group who responsible to cooperate or accept and realization of the policy application. The theory says that the characteristics of actors as the ultimate driving in the process of implementation and not just as an affected object (Ostrom, 1999; Bressers & Cheryl de Boer, 2013). The concepts in this theory focuses on the three characteristics, there are motives, cognitions and power from the implementer and target groups.

a) Motives

Broussard & Garrison (2004) broadly defines motives as an attribute which can be trigger to do or not to do something. Guay et al. (2010) defined motives as the reason underlying the behavior. The variables of motives are expectations and values (Linnenbrink & Pintrich, 2002). It is known that the actor has its own values and interests that sometimes may not in accordance with the involving activities, it can be said the policy only as a symbol. The phenomenon is very well known among the people where the policy is not taken seriously by implementers and not backed by a serious commitment from the actors (Bressers, 2004).

b) Cognitions

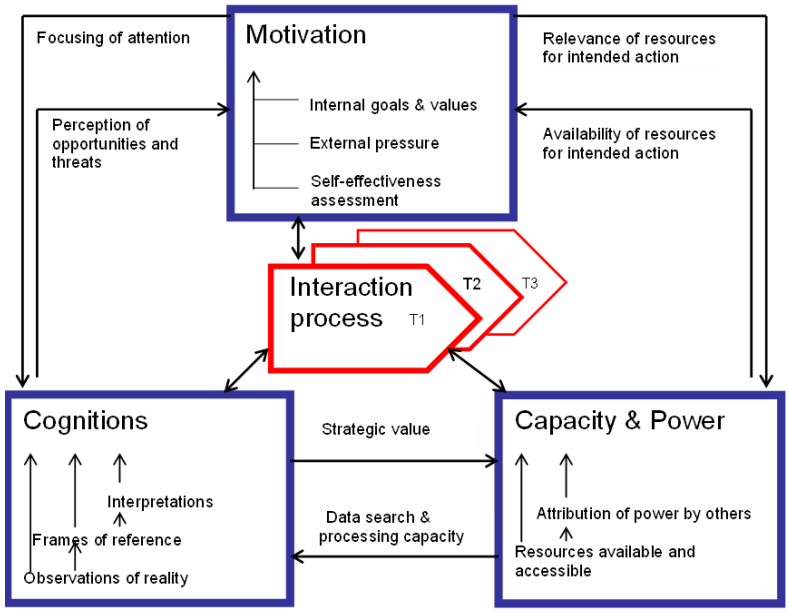
Cognitions is a mental process of an understanding, including aspects such as awareness, perception, reasoning and judgment (Pawlik & d'Ydewalle, 2006). According to Pearson (2013) cognitions is a wide range of human thinking about what they see, hear, learn and understand. The variables of cognition are information, background knowledge, and self-regulation (Linnenbrink & Pintrich, 2002). The successful of application from policy instrument depend on the understanding of information / knowledge from actors because it would lead to their awareness.

c) Power

The third characteristic that affects to the implementation process is power between implementers and target groups. In this context, power is defined as the ability to influence others to believe, behave and respect the decision or social forces that allow a person to persuade another person to act (Petress, 2002). In power you need to know who will be empowered to apply the rules and the extent to which the implementation of these policies can be implemented. In general, power exclusively held by the authorities, but in some cases, the rules can be carried out at the request of the target group, for example subsidies (Bressers & Cheryl de Boer, 2013).

These three characteristics above represent different perspectives in the process of social interaction and explanation of the dynamics of policy processes. It is said that, motives and cognitions play a crucial role in creating a situation productive and unproductive ways. Furthermore, power will be affected significantly when associated with cognitions and

motives in the implementation process. (Owens, 2008; Bressers & Cheryl de Boer, 2013). To be clear, the relationship these three characteristics can be seen in figure below:



(Source: Bressers, 2004)

Figure 2. 1 The interaction between characteristics of the actors and the dynamic process of interaction

As in the implementation process, the characteristics of actors are also influenced by a wide range of contextual issues which occurred. It could be argued these issues from different kinds of layers that can give effect to the implementation process usually comes from government / institutions, regional condition and environmental factors. Contextual issues in this theory are described as follows:

a) Specific Context

In the specific context, the involvement of characteristic location will enforce policies (Kotzebue et al., 2010). One of the specific context is analyze the previous policies on the site and the process of developing a system that will be set. By knowing the previous policy

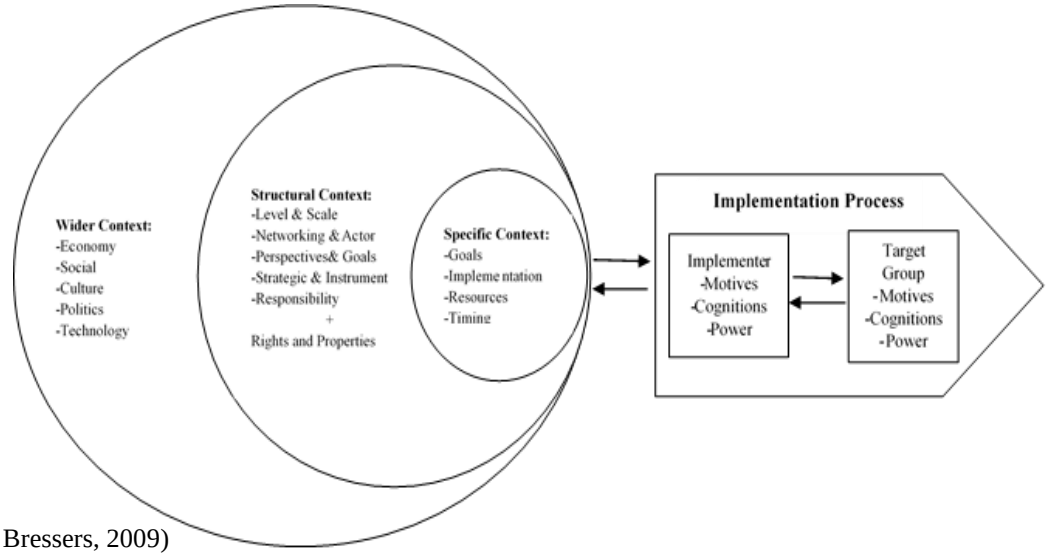
it will affect to the next of decision making and institutional system conditions which affect the characteristics of the actors (Bressers & Cheryl de Boer, 2013).

b) Structural Context

The structural context elements of the implementer and the target groups can be viewed as the linkage structure and the use of property rights (Bressers & Kuks, 2004). Structural context will be slightly affected by policy and implementation. The implementer also influence each other when facing new situations, such as degree of relatedness and connectedness that affect the characteristics of the instrument and the instrument selection process (Bressers & Cheryl de Boer, 2013).

c) The wider context

In wider context does not have anything specific where many considered from several aspects, such as culture, economics, technology development and political systems (Brynard, 2005). Description contextual layers in the study described above in the following figure:

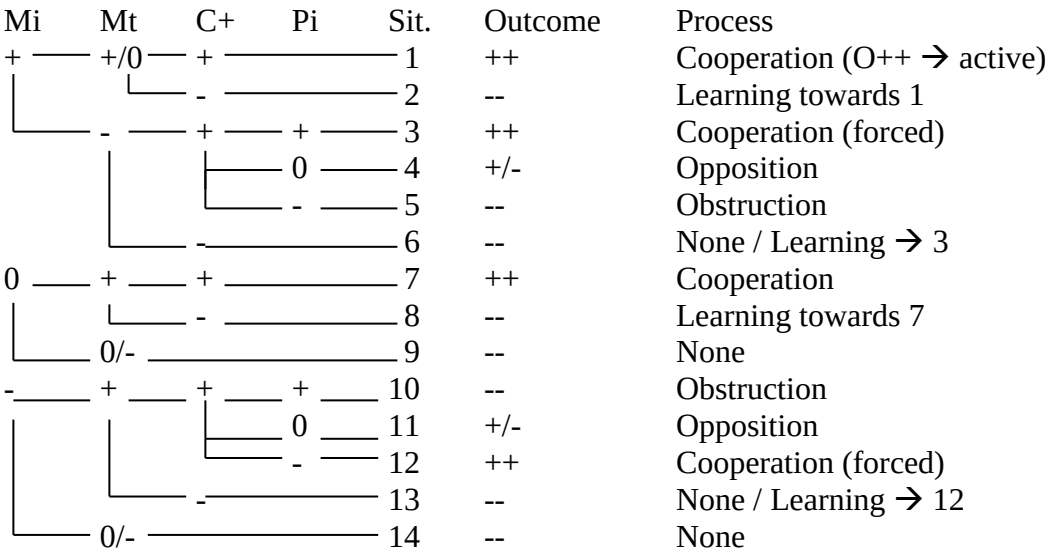


(Source: Bressers, 2009)

Figure 2. 2 Layers of Contextual Interaction Theory

2.5.1 Type of Interaction Process in Contextual Interaction Theory (CIT)

The results of Contextual Interaction Theory provides various types of interactions based on a combination of variables characteristic of involving actors (motivation, cognitions, power). Types of interaction are generated as follows: cooperation (active, passive or forced), conflicts and learning towards. The explanation of the types of interactions are illustrated in this diagram form as the following:



Mi = Motivation implementers viz. application

Mt = Motivation target group viz. application

C+ = Cognitions for application of positive partner(s)

Pi = Balance of relevant resources (power) viewed from position implementer

(Source: Bressers, 2004)

Figure 2.3 Types of interaction in Contextual Interaction Theory

2.6 Attitude and Behavior Energy Consumption

Human behavior cannot be separated from the individual condition and the living environment. Human behavior is driven by specific motives that humans behave in a certain ways as well (Walgito, 2003). According to Skinner *in* Notoatmodjo (2003) states that behavior is a person's response or reaction of stimulus from the outside. Therefore, the behavior occurs through their stimulus on living beings and then the living creatures respond.

According to Azwar (2007) attitude is an evaluation from feeling reactions. Attitudes towards an object is the feeling support (favorable) or feelings of not support (unfavorable) to the object. In addition, the attitude is the shape of a constellation of cognitive components (trust), affective (emotional) and conative (behavior) which interact in understanding, feel and behave towards an object.

Changing behavior in energy usage requires some awareness associated with psychological or motivational variables. This is supported by the journal Abrahamse & Steg (2009), which assumes that the behavior of energy usage as a result of the process in consideration of costs and benefits. That is related with the behavior of their accomplishments, for example cost, effort and social acceptance. In their journal, pro-environmental behavior as a form of alturistic behavior whereby one must defeat to private interests into the public interest. Alturistic behavior is believed to be determined by personal norms as a feeling of moral obligation. Behavior according to the norm can lead to a sense of pride, while the behavior is incompatible with the norms and lead to be guilty.

There are two additional factors are involved in activating the personal norm. First, realize the consequences of their own behavior to others or the environment (awareness). Second, feel personally responsible for their energy usage performance (Abrahamse & Steg, 2009). People who believe in using energy has a negative impact to environment and feel personally responsible for the problems will feel the strong duty to overcome the problem by reducing their energy consumption.

In the end, the author assumes that energy saving efforts strongly supported by psychological variables (Brandon & Lewis, 1999; Abrahamse & Steg, 2009). Moreover, more positive attitude towards energy conservation and high perceived behavioral control will create an increasing awareness of energy efficiency. That is expected environmental problems become motivation to change behavior. In particular, awareness of the consequences, responsibility and personal norms positively related with the implementation of energy efficiency.

2.7 Research Location and Condition

Faculty of Social and Political Sciences Dago Campus located at Jln. Bukit Dago Utara No. 25, Bandung. This campus is a center of Diploma course, Master Program and Doctoral Studies Program of Social Sciences. Meanwhile, sometimes students from undergraduate program usually have class in Dago Campus. Geographically this campus is located in the District Dago at coordinates 6 ° 52'8 " - 107 ° 37'5". This area has the shape of a hilly area with a slope rate of 15-25% (a bit steep).

In terms of elevation of the land, the region at an altitude of 770 meters above sea level. The minimum and maximum temperatures ranging from 18 °C - 30 °C, while in terms of rainfall ranges from 2385 mm / year and the number of days with the highest rainfall of 226 days. Total area of this campus is 7.706 m^2 with five main buildings around this area. The amount and spacious room are described on table below:

Table 2. 4 Details of land function in campus area

No.	Function	Total Room	Size Room (m^2)
1.	Building A	5	229
2.	Building B	5	358
3.	Building C	16	1,067
4.	Building D	3	267
5.	Building E	5	489
6.	Student Union	1	141
7.	Mosque	1	47
8.	Kitchen	1	21
9.	Cafeteria	1	171
10.	Library	1	399
11.	Office	1	117
12.	Security	1	8
13.	Warehouse	1	225
	Total		**3,539**

(Source: FISIP UNPAD, 2016)

There are three multimedia in Building D, they are Multimedia Language Laboratory, Conventional Language Laboratory, and Laboratory Office. Details of the number of classes and the size room from each building will be described in the Appendix 5. The number of buildings and the number of classes in FISIP Dago effect on the amount of electricity needs.

To meet the demand for energy, FISIP Dago has installed electric power of 65,000 Watts per month for the entire existing building.

The number of active students in FISIP Dago in 2016 can be seen in below:

Table 2. 5 Total number of student in FISIP Dago

Level Education	**Years**						**Total**
	2011	**2012**	**2013**	**2014**	**2015**	**2016**	
Diploma	2	6	3	196	249	-	456
Master		4	27	124	125	51	331
Doctor	9	40	36	88	102	59	334
Total							**1,121**

(Source: FISIP UNPAD, 2016)

CHAPTER III

RESEARCH DESIGN AND METHODOLOGY

3.1 Research Design and Methods

This research use a mixed method with less dominant design with qualitative and quantitative approaches (Cresswell, 2010). This research design use a quantitative approach as dominant position, while the qualitative approach as less-dominant position. This study is a non-experimental study by involving problem-analysis research perspective. This type of research involves a certain conceptual perspective by framing an answer research questions (Verschuren and Dooreward, 2010). To avoid any bias in the results of the research carried out cross-checking with the method of triangulation. That is about the data collection through the source of interview, observation and document analysis (Cresswell, 2010).

3.2 Data Collection

Researchers used several data collection techniques with the following details:

a. Structured interview

This interview is conducted by using technique of in-depth interview with interview guides that have been prepared. The results of the interviews were analyzed using qualitative methods. Selection of key informant for interview is conducted by purposive sampling with considered actors who understand the problems and has the ability in making policy / strategy for the existing problems (Renosori, 2012).

The key informants in this interview Vice Dean II of Faculty Social and Political Sciences (person who response in Planning, Resources and Infrastructure Management). The interview guide can be found in Appendix 1.

b. Semi-structured interviews

Researcher use this technique to explore how far the implication of energy usage in faculty. The key informant for this interview is Manager of Public Affair and Infrastructure in Faculty Social and Political Sciences. That is because the key informant has a responsibility towards infrastructure management in FISIP Dago. The semi-structured interview guide has been specified in Appendix 4.

c. Questionnaires

Researcher use a questionnaire technique to collect data from respondents. The result of questionnaires are used to obtain quantitative methods. Respondents as the target group will carry out the objective of the policy, they are students in FISIP Dago. Model of questions in this questionnaire has been detailed into the specific options. Guide of questionnaire in Appendix 2.

d. Structured observation

The observations are made as the supporting data to see the real condition of energy consumption in FISIP Dago. Observations such as lighting system, HVAC (Heat, Ventilation, and Air Conditioning) system, and supporting systems which is need electricity as listed in Appendix 3. In this observation, researcher used semi-structured interviews to obtain information about management of energy usage.

e. Study documentation

Study documentation is one of qualitative approach from data collection by analyze the certain document that has been made. The required documents in this study are document which are relating to the energy consumption in UNPAD. The type of document is an administrative report of energy consumption of each faculty during March 2016 - November 2016.

3.3 Sample Selection Method

Population of students in FISIP Dago consist of Diploma, Magister, and Doctoral students. The number of active students from whole programs are 1,121 students. Determining the total of sampling data used formula from Slovin (Sevilla et al. 2007), it can be seen below:

$$n = \frac{N}{1 + Ne^2}$$

Known: n = total sample
N = population of students
e = error margin (10% = 0.1)

Based on that formula, sampling population can be calculated as:

$$n = \frac{1121}{1+1121\,.(0.1)^2} \quad ; \quad n=92$$

Thus, total sampling to become respondents in this research are 92 students

3.4 Data Analysis

3.4.1 Quantitative Analysis

The quantitative analysis refers to the Contextual Interaction Theory. The indicators in this theory consists of three variables, they are motivation, cognitions and power. Those

variables would be given a certain score to assess conformity with all parameters that have been made. Regarding to the positive and negative responses, they are based on parameter reflection from daily implementation on energy usage. The calculation of total score is the proportion of positive response divided by total of overall response. Formula can be seen as follows:

Proportion score of motivation (M) $= \frac{M+}{M\ total}$

Proportion score of cognitions (C) $= \frac{C+}{C\ total}$

Proportion score of power (Pi) $= \frac{Pi+}{Pi\ total}$

By this way the score will be on a scale of 0.0 - +1.0. However, the score for variable motivation the negative response will be reduced by 0.5 to change the scale (0.0 to +1.0) to (-0.5 to +0.50). In the end score (-0.50 to +0.50) is transformed into a scale (-1.0 to +1.0) by multiplying the previous score with 2 (Owens, 2008). Configuring the result of scale for motivation is determined as follows:

-1.0 to -0.21 = negative

-0.20 to +0.20 = neutral

+0.21 to +1.00 = positive

3.4.2 Qualitative Analysis

The qualitative analysis using a model from Miles, Huberman and Saldana (2014) , it based on three stages: data reduction, data presentation, drawing conclusions or verification. The explanation of interaction models can be described as:

Components of data analysis in interactive model is described as follows:

1. Data Reduction

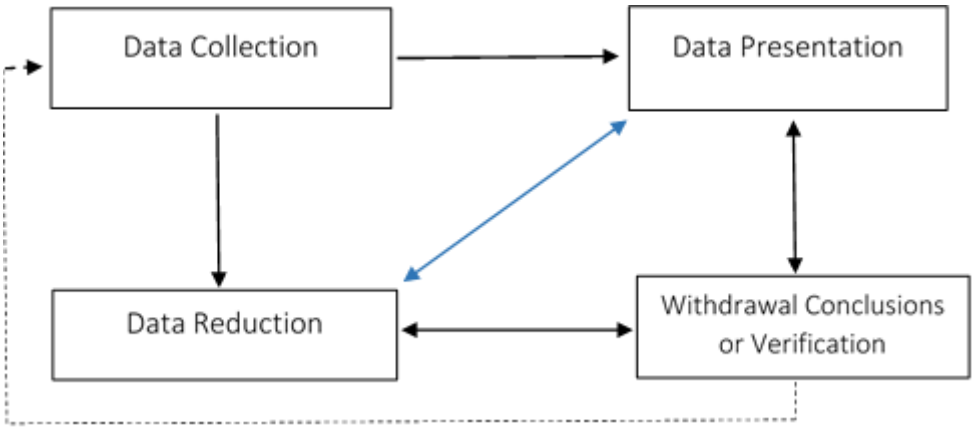
Data obtained by researchers through interviews, observation and documentation. They are reduced by summarizing, selecting and focusing data on the objectives of the study. At this stage, researcher conducted a data reduction by sorting, categorizing and making abstraction in notes, interviews and documentation

2. Data Presentation

Data presentation is done after the data has been reduced or summarized. Data obtained from observation, interviews and documentation analysis then presented in the form of interview transcripts, observation notes and documentation notes. Every data which collected will be presented in the text.

3. Withdrawal Conclusions or Verification

The final step in the qualitative data analysis is drawing conclusions or verification. Based on data reduction and data presentation, researcher made a conclusion which is supported by strong evidence at the stage of data collection. The diagram of interaction model can be seen on Figure 3.1:



(Source: Miles, Huberman and Saldana, 2014)

Figure 3. 1 Interactive model on qualitative analysis

3.5 Research Framework

Along with globalization, universities around the world trying to improve the quality of teaching and their infrastructure to gain the title of "World Class University". Indonesia is no exception, especially UNPAD who had planned on being an international university. Therefore, the development and improvement of learning facilities have been conducted at this campus. On the other hand, the consumption of electrical energy in various faculties are still in high demand. It can be seen from electricity consumption per month of several faculties. One of the faculty to be a focus from this research is the Faculty of Social and Political Sciences (FISIP), Dago Bandung.

This campus is not the main campus of UNPAD but their energy consumption is bigger than the other faculties. Undoubtedly, it becomes a serious concern in this research because using electronic equipment on a large scale means adding the burden of energy use. As a solution to these problems, the university as the largest electricity users in education

sector should apply energy efficiency. In fact, UNPAD still cannot optimized the procedures for implementing energy efficiency, it means this time UNPAD needs good strategies by the right regulations.

Energy efficiency becomes a solution to overcome the problem of excess electricity usage on campus FISIP Dago. In this study, terms of characteristics the implementer and the target group become focusing to reach a goal of energy efficiency. It is believed that energy efficiency activities in FISIP Dago not only become a responsibility from the implementer but also the entire campus community which involved in teaching and learning activities, such as students and lecturers. It can be said that the attitude and behavior of actors need to be considered in defining a strategy, as an intention to behave an encouragement of objective norms and control people's behavior (Ajzen, 2005).

The preparation of strategy is not easy because there are several factors that are influence in framing of understanding. The characteristics of actors that will be examined in this study as internal factors consist of motivation, cognitions and power. As for external factors to be analyzed in this research are specific context, structural context, and wider context. These factors are considered to have a relevance issue on determining level of effort about energy efficiency in campus. In the end, we will get an appropriate strategies according to the environmental conditions which is occurred in FISIP Dago. Thus, analyzing those problems will determine the right strategies in optimizing of environmental friendly on electrical energy in campus. For more details framework in this study can be seen in Figure 3.2:

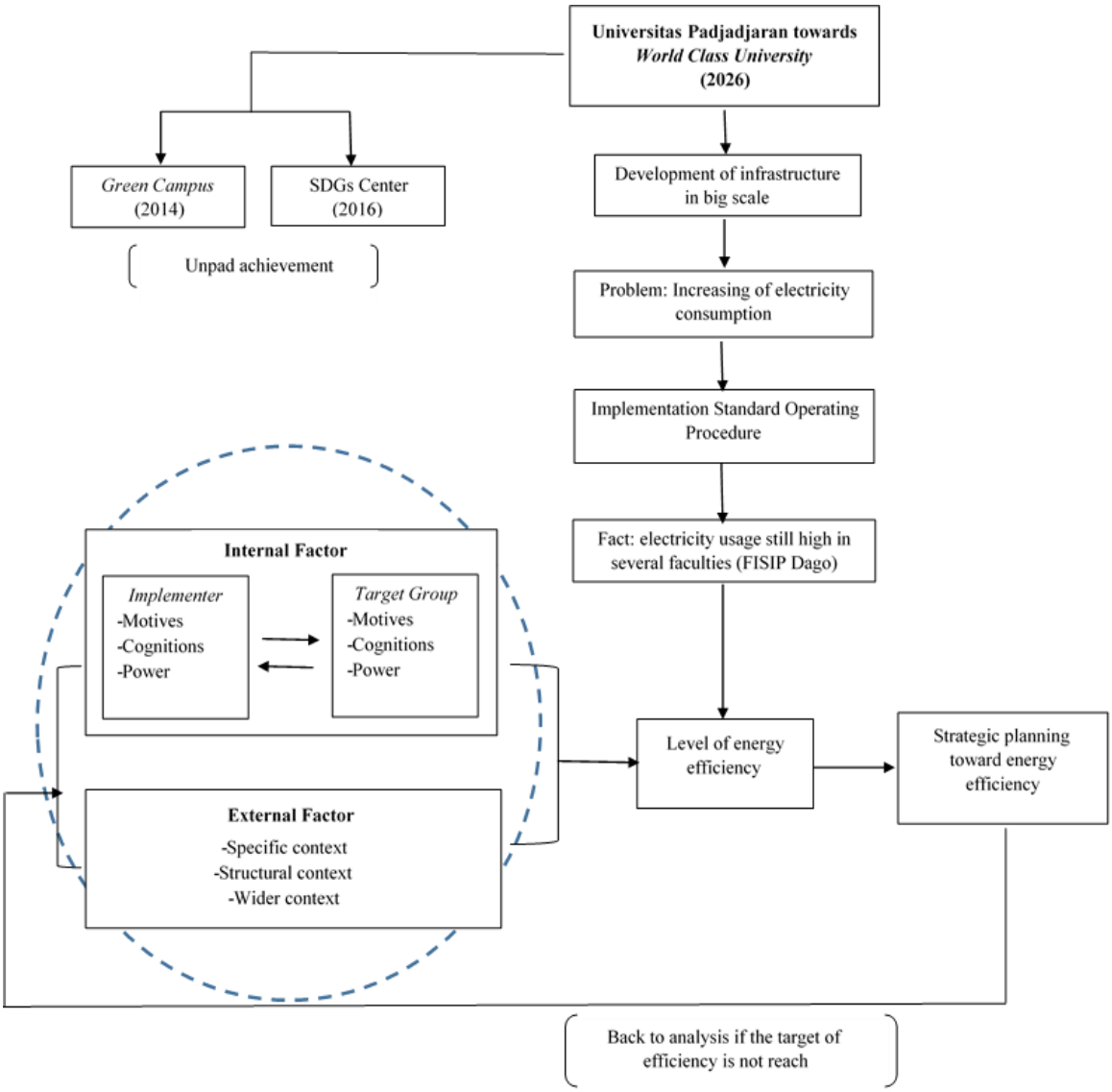


Figure 3. 2 Research framework

3.6 Requirement of Data and Information

The Contextual Interaction Theory describes the relationship between characteristics of the actors with the level of cooperation in the implementation of the situation. Based on that theory, the independent variable of characteristics described in terms of motivation, cognitions and power between two actors, they are the implementer and the target group.

In this section, researcher explains how these variables are deconstructed into its component parameters to be used to answer the research question. The supporting data in this study are from the questionnaire form with details which have been prepared in some aspects and supported by their indicators. The explanation can be seen in the table with following operational variables:

Table 3. 1 Operational variables

No.	Focus Study	Variable	Indicators	Source	
				Implementer (Interview)	**Target group (Questionnaire)**
				Questions number	Questions Number
1.	Characteristic of Actors	Motives	Compatibility with the goal of implementing energy efficiency.	6,11	5,6,7,8,23
			Attitudes towards implementation of energy efficiency.	8,10	7, 9, 10, 13, 44
			Benefits in implementation energy efficiency.	11,13	20,21,22,24, 45, 46
		Cognitions	Awareness of the implementation for applicable efficiency	6,7,9	6, 7, 11, 14,25
			Comprehension of information on implementation of energy efficiency.	14	15, 16, 17, 18, 26, 37, 38
			Transparency and accessibility of documents	12,17	27, 28, 37, 38, 39, 40
			Level of difficulty and uncertainty in the implementation of energy efficiency.	15,27	29, 41, 42, 43
		Power	The availability of resources	4,21,22	32, 33, 34, 39, 40, 47
			Monitoring	12,16,19,20	35, 36,
			Responsibility formal	18	12, 19, 37, 38

2.	Contextual Issue	Specific context	Obstacles in implementation	15,23	
			Situation and locations	7,9,28	
		Structural context	The role and structure of involving actors in policy implementation	1,2,3	
			Instruments in the implementation	12,16	
			The authority in the application of policies on energy efficiency	18,19,20	
		Wider context	Financial	5,24	
			Social pressure	25	
			Politic pressure	26	

CHAPTER IV

OBSERVATION OF ENERGY CONSUMPTION

It has been showed that the total of power consumption in FISIP Dago is 65,000 Watt with total of room size in each buildings is 3,539 m^2. Based on those data, we will know the standard value of Intensity of Energy Consumption (IEC) in FISIP Dago. The calculation can be seen on Appendix 6. Regarding to the result from calculation, the Intensity of Energy Consumption (IEC) in FISIP Dago shows 3.82 kWh/m^2/month.

This result compared with the IEC standard values in Table 2.2 and this faculty is indicated as extravagant faculty in energy consumption. The overall result of energy usage from observations in FISIP Dago are reported in three aspects below:

4.1 Lighting Systems

In term of lighting systems, informant mentioned that the light system in Campus FISIP Dago generally using lights types Phillips TL 40 Watt. Lights installed in every classroom and corridors inside the building by using light house (armature). The type of armature in different shapes depend on the location, for example: the classroom using armature with two types of open tube, while the corridors inside the building using one open tube type. In addition, there is also another type of lights in the form of LED bulbs Phillips with power capacity 19 Watt which is used in the corridor outside the building. Mostly, lights fitted with reflector in armature to help lighting becomes brighter.

The total of lights which are used in every class around 12-16 of fluorescent lights depends on the size of the room. The lights are always switched on during the class due to the utilization of sunlight are not really optimal. That is because of the dominating type of black glass as windows in every classrooms. The reasons of using this type of glass is to reduce the interference from outside during the class. If the situation in the class is quite bright, usually only half of the lights are on (± 6-8 lights), while if the light level is quite dark then all the lights in the classroom will be on.

The circumstances of classes are generally used white color for the ceiling while beige color or light brown color for the walls. There are a small windows for the entry of light, the size is less than 20 percent of the wall area so that the entry of light just bright slightly.

(Source: Personal documentation, 2016)

Figure 4. 1 Classroom condition in Building C FISIP Dago

(Source: Personal documentation, 2016)

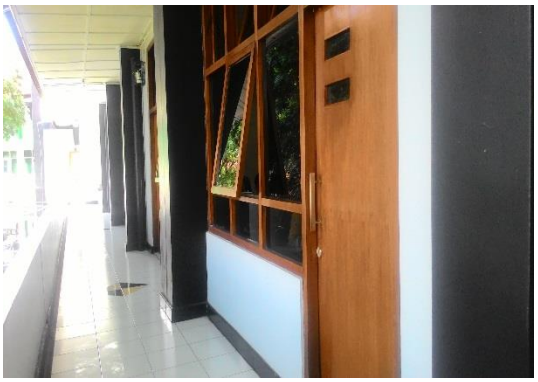
Figure 4. 2 Windows condition in classroom

The results of observations about light usage in FISIP Dago showed that some of lights in the corridor always switch on even though only half of the lights are turned on, for example along the corridor there are six lights TL then only 3 are switch on. That is because the building condition is always dark and low lighting from the outside.

At the time of the observations, there are still many who turn on the lights even though the conditions is bright enough, for example the lecturer room and administrative offices. The mechanism of light treatment in campus is rarely done and no special time for controlling. There is a case, if some devices get damage then it will be followed up immediately, for example, the lights are broken or damaged then it will be replaced with new ones. In the implementation of process in turning on and turning off the lights in the building are always assisted by security guards and staff in faculty. The lights will be on around 7am and turned off around 5pm or after the administrative activities are done.

4.2 HVAC Systems

Generally, classrooms in FISIP Dago are not using Air Conditioning (AC) and only depend on natural air system which is coming from the vents. Actually, the environmental conditions in FISIP Dago are pretty cool with the range of temperature about 20ºC - 25ºC. That condition is supported by the vegetation around campus so it will reduce from the heat.



(Source: Personal documentation, 2016)

Figure 4. 3 Optimization of natural air system

(Source: Personal documentation, 2016)

Figure 4. 4 Vegetation around campus

The statements are supported from informant, he said that FISIP is really support about greening program. That program is done by extending the vegetation or trees planting around campus. Figure 4.4 shows some vegetation in FISIP Dago and even the vegetation get good treatment almost every day, it done by watering and pruning. Certainly, it is not just a support of natural air system but also supports the neatness of the campus.

In addition, optimization of natural air systems are done by opening windows so the air circulation running smoothly. Classrooms around campus building in FISIP Dago have ventilation and windows in every area. The windows are always open during the class so the air can get in and get out into the room. Air circulation in classrooms is not always through the windows and vents, sometimes it is coming from opening door to get more air coming.

In term of an artificial air systems, the air conditioning used ½ sized PK with power capacity is about 320 Watt. The total amount of the entire AC which is used in campus about 45 units. The air conditioning in the FISIP Dago just used in some rooms like five classrooms, offices, hall, multimedia, and a library. Using of air conditioning is not a priority on campus, for example when the temperature inside the library is pretty hot then all AC will be turned on but usually only one or two air conditioning unit will be switched on. AC temperature is usually set in the range of 18ºC - 20ºC depending on the circumstances temperature inside the room.

4.3 Supporting Systems

Supporting systems in Campus FISIP Dago consists of computers, printers, projectors, and microphone wireless. The total of computers in campus is quite a lot about 120 units, because there are three of computer labs are often used. The power capacity of computer is 250 Watt PSU (Power Supply Unit) with LCD screens. This type of computer with LCD typically more efficient than a computer with tubular display. Generally, the power capacity of LCD is 76 Watt while the power capacity from tubular display is 113 Watt. Usually, computer labs are used about 2 times a week with duration 2 hours per day.

In addition, there are also computers that are used in administrative offices and library with total systems about 2-4 units per room. Those computers are used in long duration, around ± 8 hours. Computers in the work space are very actively used, as well as the printer. The type of printers with commonly used is laser jet with a power capacity is 350 Watts when it is active and 1.4 Watts when in standby.

Using the projector in campus is inseparable from learning activities. Total projectors in FISIP Dago are about 14 units with a power capacity around 180 Watt. Generally, the type of projector that is often used for lectures is LCD projector. Duration of using projector during the class around 8 hours a day. Furthermore, another supporting systems is microphone wireless. Total number of microphone wireless are 12 units with power capacity around 120 Watt. Microphone wireless is typically used in specific time or during activity in hall. Usually, microphone wireless is rarely used in the class because the size of class.

CHAPTER V

CHARACTERISTIC OF ACTORS

5.1 Motives

Based on calculation, a negative score is obtained from the motivation of implementer, it shows -0.33. Key informant indicates that there is no interest to conduct energy efficiency and there has never been a regulation about energy efficiency. Meanwhile, this faculty is flexible to support any other environmental programs such as "Clean and Green Campus". Only in case of energy savings still cannot be implemented due to lack of socialization from UNPAD headquarter and any other prioritize programs. It can be seen from the proportion of attitude response, it is about -0.50 in Appendix 7.

Moreover, until now stakeholders in FISIP Dago still did not get any disadvantages from using high electrical energy on campus. This affects their motivation to behave refer to activities which have a favorable evaluation or unfavorable from the relevant behavior (Huijts, et al., 2012). If FISIP Dago did not get any impacts from not doing energy efficiency then there is no action which triggered to conduct electrical energy savings on campus.

On the other hand, the positive proportion is shown by the variable motivation from target group as students in FISIP Dago with the resulting score is +0.62. The desire to conduct electrical energy efficiency on campus is very high and strongly supported by students as a learning process. The participation of the target group to conduct electrical energy efficiency on campus are supported by their understanding of the purpose of energy saving behavior and their responsibility as young generation as pro-environment. The proportion and score of motives are described in the following table:

Table 5. 1 Analysis result of motives

	M+	M-	M tot	Proportion	Score
Implementer	2	4	6	-0.33	Negative
Target	13	3	16	+0.62	Positive

5.2 Cognitions

At the level of cognitions, implementer shows positive value with proportion score is +0.37. Based on questions about energy wise, key informant argue that electrical usage in FISIP Dago is considering to the amount of electrical energy consumption as needed. The statement proven by their good maintenance devices, if there is an equipment gets any damaged, it will be repaired rather than change with additional electrical load. The additional of electronic devices should be coordinate with the Manager of Public Affair and Infrastructure in FISIP Dago to determine the exact amount of devices should be added. Meanwhile, the old electronic equipment will be returned to UNPAD headquarter to dispose or destroyed.

On the other hand, the key informant assumed that the monitoring about energy consumption has not been done in Campus FISIP Dago because any reports about energy usage is not become a responsible of faculty. It claimed that any reports about energy usage and the bills are responsible from UNPAD headquarter. Therefore, everything related to the level of energy consumption in campus, their stakeholder do not know clearly about the measure and exact amount energy which is used per month.

Because of that reason, there is no precautions are taken to reduce the consumption of electrical energy, for example there is no norms relating electronic usage in campus. Based on analyzed, a lack of understanding about the level of consumption of electrical energy affects to lack of efforts to reduce the use of electrical energy. Actually, a basic understanding can change people's opinion, the higher level of self-understanding about any risks will make stronger the correlation between management environments with the risks they will perceived (Siegrist & Cvekovich, 2000)

Moreover, the target group also shows a positive value with a score of +0.45. In questionnaires which given to students, the awareness and understanding about the implementation of energy efficiency get a lot of positive response. They tend to understand to use electronic devices properly, such as turn off devices when they are not use. However, students cannot do much about the activity of energy saving at the faculty. It is supported by the results of the assessment of level difficulty which is the majority of students find it difficult to do energy savings in the FISIP Dago.

The lack of socialization from implementer and social support become reasons which affects to students behavioral. As mentioned before, in the research framework that social factors get special attention in the context of reduction the electrical energy consumption. In this case the system of energy use is regarded as socio-technical systems that focus on implementation condition, the influence of actors and organizational aspects (Jonsson et al., 2011). Social perspectives on reducing energy consumption needs to be emphasized in social changes, including lifestyle, consumption measurement and method of assessment (Dusyk et al., 2009)

Total score of the two sides are not more than +0.50 and has a value of negative cognitions (C-) which is greater than the positive cognitions (C+). It is analyzed from the lack of binding regulations to carry out energy efficiency on campus. Both sides are believed to be well-informed about the attitude of energy saving electricity but the driving factor in the form of norms and regulations to trigger action does not exist on campus. Thus, the implementation of energy savings in the faculty was never implemented as habitual because of the lack of environment norms as reminder. The proportion and score of cognitions are described in the following table:

Table 5. 2 Analysis result of cognitions

	C+	C-	C tot	Proportion	Score
Implementer	3	5	8	+0.37	Positive
Target	10	12	22	+0.45	Positive

5.3 Power

Based on calculations, the implementer shows positive values with scores obtained +0.50. Implementer position as high authorities with leadership duties as a provider for any facilities which are needed by students to support the learning process. Moreover, the informant stated that the structure systems regarding to responsibility always in accordance with the functions and positions respectively.

On the other hand, the target group also has a positive value in proportion to the strength score of +0.33. The score indicates that the target has a capacity sufficient ability to implement the relevant optimal efficiency and use of electrical energy. Capacity or resources have the ability to strengthen or weaken the position of an individual, an organization or a particular actor (Bressers, 2004)

The result shows the proportion of power the implementer is higher than the target. The difference shows score +0.17 (greater than +0.15) so it can be said that the implementer has a dominant position in the aspect of power for the target group. Therefore, FISIP Dago in a good situation which is implementer as the formal authorities and supported by the capacity of target groups in their positions. The proportion and score of power are described in the following table:

Table 5. 3 Analysis result of power

	P+	P-	P tot	Proportion	Score
Implementer	4	4	8	+0.50	Positive
Target	3	6	9	+0.33	Positive

5.4 Contextual Issue

a) Specific Context

Based on interviews and questionnaires indicated that specific factors that hinder the implementation of energy efficiency in FISIP Dago is no previous program about energy efficiency in the faculty. Recently, focusing program in FISIP Dago is “Clean and Green

Campus". With the focus of that program, FISIP Dago need strong reasons to involve their actors to switch another environmental program. This is supported by Kotzebue et al. (2010) that with their previous decision making it will influence the institutional area to affect the process of participation of actors and to consider the extent to which the policy norms can be applied. Therefore, a decision that has not been in favor of energy efficiency program affect to policy considerations in FISIP Dago.

Furthermore, the availability of resources in FISIP Dago in favor of energy efficiency are not yet fully available. Resources in campus could be light sensor, efficient electronic appliances, energy-regulation or norms of pro-environment. Those resources cannot be realized due to another prioritize of "Clean and Green Campus" program and supporting duty on provide the learning process. It can be said electrical energy efficiency has not been a priority in the program in FISIP Dago.

According to George C. Edwards III (1980) *in* Widodo (2011) resource factors may include human resources, the implementer competence and financial resources as well as infrastructure. Resources are supporting factors which to be able to implement a policy program. If the implementer lack of resources so the implementation of the policy will not be effectively.

b) Structural Context

Based on analysis, UNPAD headquarter as the highest authorities in holding policy and they have full access in campus resources management. Since 2016, any decision regarding the provision of electronic equipment, maintenance and transformation of the

building forms comes from the agreement of UNPAD headquarter, which is particularly from Vice Rector II. If the energy efficiency programs carried out on a large scale which is involving replacement of all electronics equipment more efficiently and modification the structure of the building, it requires the approval of the Vice Rector II. However, if it involves only a small scope such as the application of the norms of pro-environment then Vice Dean II can provide self-decision and the program can be implemented.

In the UNPAD headquarter involvement, the provision of infrastructure facilities could not be separated from the role of Director of Infrastructure and Vice Rector II. The submission process about infrastructure management is always done in early year with the required of some faculty necessity. However, these requirements cannot be fully realized consider to high funding for infrastructure. Therefore, the submission process is highly considered about the importance and usefulness of infrastructure. Although, it will be turn into planning energy-saving electronic device or modification of the building structure and they should still pay attention in terms of how important infrastructure is needed.

In the structural context is about how the implementer use of their property rights relating to the resources they have (Ostrom, 1999 ; Bressers & Cheryl de Boer, 2013). It shows how each implementer or legal stakeholders in UNPAD involved to have an access and authority which given to campus community. Structural context is directly related to the policy process in broadly or by the system (Bressers and Kuks, 2004). As the structures occurring in FISIP Dago that all are intertwined in the process of implementation of the program.

c) Wider Context

The result shows that social pressure affects the electrical energy use, it is about moral responsibility that created in campus environment. In conducting electrical energy savings means an individual should be aware for their behavior or actions in intentionally or unintentionally. With supporting environment conditions which is encourage campus community to be more aware about energy usage, it will be able to create conditions become conducive to every individual to do so. Specifically, the value of awareness in the understanding of energy issues will affect the extent to which moral individual will responsible for the issue and do something about the energy policy (Steg et al., 2005)

If the involving actors consciously understand about environmental sustainability with social norms (pro-environment), the implementation of energy efficiency can work as expected. Most people consider the moral responsibility as an attempt to follow the interests of society as a norm of behavior (normative behavior) (De Groot & Steg, 2008). Basically, the goal of energy efficiency is not only consider the convenience and cost savings, but also the moral aspects such as environmental quality and sustainability for future generations (Oikonomou et al., 2009).

During observations and interviews already seen that the awareness of energy use are still sidelined. The understanding on energy efficiency is not the responsibility of implementer and target group, so this awareness will not be created. The responsibility is not only individual duty but also whole groups because it needs the morality to overcome the problem. Changing the perspective and human behavior towards a fundamental and radical nature are believed will changing lifestyle or culture of society as a whole.

CHAPTER VI

STRATEGIC PLANNING OF ENERGY EFFICIENCY

Strategic planning programs are based on analysis from characteristics of implementer and target groups within the Contextual Interaction Theory frameworks. These three core of variables compared with prediction of type interaction in Contextual Interaction Theory. Regarding to CIT measurements which have been analyzed, it was found that the implementer has motives negatively about the program, while the target shows the opposite. Both actors showed a considerable level of cognitions even though the target has a higher cognitions than the implementer. Meanwhile, the balance of power by using CIT analysis shows controlling from implementer more powerful than the target groups. The scores from all of the three variables are summarized in table below:

Table 6. 1 Overall score from three variables

	Motives	Cognitions	Power
Implementer	-0.33	+0.37	+0.50
Target	+0.62	+0.45	+0.33

Regarding to the prediction of Contextual Interaction Theory, there are 14 possible interactions that may occur. The results of the measurement in Table 6.1 shows the interaction of electrical energy consumption in the FISIP Dago are illustrated below:

Mi	Mt	C+	Pi	Situation	Result	Process
-	+	+	+	10	-	*Obstruction*

Figure 6. 1 Type of interaction actors based on Contextual Interaction Theory

CIT analysis indicates the type of interaction in situation number 10 is obstruction. Situation number 10 explained that the implementation of the policy will contribute positively to the objectives for one actor, while the other actors were negatively respond, with the cognitions of actors is slightly positive, then the character of the interaction process will depend on the balance of power between the actors. In addition, programs which have not been implemented will tend to be impossible in cooperation due to the beginning of the process before opposition actors involved. (Owens, 2008).

In other words, the situation number 10 occurs when the implementer is not motivated towards programs that will be addressed. The situation concern to the interests of implementer who have no priority in implementing efficiency of energy use. Implementer cannot fully reduce the energy use on the campus where they primary interest are to provide a quality of campus facilities and running “Clean and Green Campus” program. Motivation to change campus into more friendly in sustainable energy is still far from the current time. Therefore, the strategy for the implementation of the program is based on the priority scale variables are sorted as follows: motivation, cognitions, and power.

6.1 Strategic to improve motivation

It is known that motivation variable is affected by several internal factors which consist of values and expectations (Linnenbrink & Pintrich, 2002). Values can determine the level of interest or action by using a principle or standard of living (normative ethics) (Schwartz, 1994; Schwartz, 2012). The application of environmental norms in principle is expected to appear and would motivate them.

Furthermore, expectations is intended as goal orientation on the implementation of the program and become a feedback that will be earned by the organizers (Lunenburg, 2011). Therefore, to increase the motivation of actors should make efforts by including the values and expectations in the following below:

a) Campaign to promote electrical energy savings

Energy savings required basic information as a form of intervention approaches to promote energy conservation (Abrahamse et al., 2005). This intervention in the form of campaign which is involving a group or organization in a program so it can be implemented easily and sustainably on a large scale. Environment related behaviors of individuals are influenced by their context in understanding their interactions in groups. The influence of groups proved by changing behavior of the environment with bounding controls (Gifford, 2008)

The campaign mechanism give effect through communication and social norms to encourage behavior and change the perception of a group of actors (Carrico & Riemer, 2010). For example, put a sign in some rooms such as classrooms, administrative offices and lecturer room to turn off the electronic device when they are not used, that is reference social norms which is approved in energy efficiency programs (Schultz et al., 2008). Moreover, social norms is one mechanism through effective education to direct action in accordance of norm which can motivate people to do (Abrahamse et al., 2005; Carrico & Riemer, 2010).

b) Giving Rewards

According to the Minister of Energy and Mineral Resources No. 14/2012, supporting energy savings can be done by giving awards to the organization which can reduce at least 2% per year. It can be a trigger for expectation / goal in conducting electrical energy efficiency in the faculty. Orientation to reduce electrical energy consumption will give good advantages which can trigger the motivation of actors to support energy efficiency programs on campus (Feiler & Soll, 2009).

Giving rewards to actors becomes positive feedback as a consistency on achievement of their dedication to protecting their environment. The relationship between rewards and motivation is a form of achievement as target by conducting electrical energy efficiency programs, it is intended to give profits between both actors (Carrico & Riemer, 2010). Related actors may be individuals or groups / organization. Therefore, rewards are given for raising their awareness and motivation in saving energy.

6.2 Strategic to improve cognitions

Cognitions factor which is need to be improved in the implementation of energy efficiency programs in campus is about understanding the information / knowledge belongs to both actors. The successful of implementation policy instruments depend on human thinking about what they see, hear, learn and understand (Pearson, 2013). Therefore, it is necessary to create a condition where the implementer understand the level of energy demand in order to do any further action in campus. Strategic efforts can be explained as follows:

a) Implementation of energy audit

As a first step to determine the level of energy consumption in the faculty, one way is pursued by an energy audit. Based on President Instruction No.10 of 2005 on energy savings, energy management needs to be done in energy usage, especially use electrical energy in efficiently. The purpose of an energy audit is to determine the profile of energy use and energy savings opportunities so it can improve the efficiency of energy use (Trimunandar et al., 2015).

The importance of conducting energy audits on campus FISIP Dago is to assist actors on campus to understand in detail of level energy usage from electronic devices. Considering to the lack of information regarding to the level of consumption of electrical energy which can cause the lack of electrical energy efficiency efforts. Furthermore, knowing the information in the energy audit will encourage actors to prevent or avoid, even they will steer and respond the pressure what their experience (Lindenberg & Steg, 2007)

In journal of European Environment Agency in 2013 declared that there is a direct relationship between the energy audit with energy-saving achievement. Energy audits have linkages between consumer behaviors with how procedure they use. To strengthen the link between energy audits and consumer behavior, the energy audit should be part of a long-term program and not just the activities in once performed. Thus, the information in the energy audit is one effective way to raise awareness about the importance of energy efficiency in FISIP Dago (Schüle, 2009).

b) Socialization of efficiency energy programs

One of the problem in the implementation energy efficiency programs in the Campus FISIP Dago is a lack of awareness from campus community about the importance of energy saving. Therefore, the proposed strategic in the implementation of energy saving is about socialization to all actors related to energy usage in campus. The socialization is about persuasive method in low-cost ways or do not require a lot of expenses. The implementation requires the cooperation of high level actors in campus to deliver the knowledge other groups or other members.

The implement of socialization is important to deliver a program that will be implemented. For example, Vice Dean gave an order to implement energy efficiency in campus then this instruction should be proceed to the other relevant actors in the faculty. In addition, socialization can also be done by describing the attitude of energy saving about how to do energy saving, in general and specific method of each faculty (Yogaswara, 2012).

6.3 Strategic to improve power

After both actors understand the current condition of energy usage in campus, a key factor in activating the norm is focusing to the pro-social behavior with adoption of attitude which have benefit to others as a result of the moral sense in performing certain actions (Schwartz, 1981 ; Huijts et al., 2012). Strategic efforts can be explained as follows:

a) Implementer apply regulation in efficiency energy

A crucial step in the implementation of the policy is the attitude of the leadership from the actor in high level, including the implementer in UNPAD headquarter or any other actors in planning institution with a wider influence. Part of challenge in developing energy efficiency is improve the cooperation among multiple actors which involved in resolving conflicts between actors and try to build synergies (Bailie et al, 2006).

Attitude of leadership can influence any other actors to act in accordance with the authorities. This is supported by the opinion of Thoha (2008) which states that the implementer has the authority to regulate the behavior of other actors by allocating value of knowledge on them. The synergy which is created from high-level actor to another actor will build a cooperation for supporting the implementation of the program. The authority to support the policy regulation is a necessary, it is supposed to make a success of electric energy efficiency strategy in long term commitment. Thus, making authority related to energy efficiency regulations will strengthen the position of implementer and to be able to contribute to environmental sustainability.

b) Implementation of continuous programs

Some of the regulation from high level-actors can be done to support energy efficiency by implement continuous programs regarding to the Regulation of the Minister of Energy and Mineral Resources No. 14 of 2012, there are:

a. Implementation of energy savings in lighting system, HVAC systems and supporting systems based on Regulations of the Minister of Energy and Mineral Resources and SNI (Indonesian National Standard)

b. Doing monitoring and evaluation, including measurement, recording of electrical energy usage in the faculty periodically.

In conclusion, these programs are expected not only running accordance with the regulation of energy efficiency but also as social behavior. The program must be supported by high-level actors in the faculty and the university. Thus, the contribution should made by the implementer which can support the goal of energy efficiency programs in the faculty.

CHAPTER VII

CONCLUSION AND RECOMMENDATION

7.1 Conclusion

1. Contextual Interaction Theory analysis results indicate that the Campus of Social Dago is at number 10 is the interaction situation obstruction. The conditions describe that the implementer has a negative motivation to implement energy efficiency programs and indicated by their attitude of disinterest.
2. There are three contextual issues which are influence characteristics of actors, there are specific context which is about other interests or priority besides energy efficiency. Structural context is about the accessibility of resources and authority of the implementer. The wider context is about moral responsibility of the actors in protecting their environment.
3. Strategic planning to pursue energy efficiency in campus FISIP Dago consist of motivation improvement with campaign in energy saving and giving awards. Improve their cognitions by energy audits and doing socialization program of energy efficiency. Power improvement through the implementation of policies and running continuous programs about energy efficiency.

7.2 Recommendation

1. The implementer should have an access to know the energy consumption or electricity bill per month in their faculty per month. The aim is to facilitate the monitoring level of energy usage in the faculty. Thus, it can help faculty to determine their targets in energy efficiency.

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APPENDIXES

Appendix 1. Structured interview

INTERVIEW GUIDELINES

STRATEGIC OF ENERGY EFFICIENCY IN HIGHER EDUCATION

Case Study Faculty of Social and Political Sciences, Dago, Bandung

Universitas Padjadjaran, Indonesia

A. Actor: Implementer

Informant identity

Name :

Age :

Job :

Level of education :

1. What is your responsibilities regarding to management in campus?
2. What is the structural system in your job position?
3. What is the mechanism related the availability of infrastructure in FISIP Dago?
4. What kind of infrastructures that campus always need?
5. How to maintenance the charge and additional costs related with infrastructure in FISIP Dago?
6. Do you consider about energy consumption when get additional infrastructure, such as electrical appliances?
7. Do you know the real condition of energy consumption rate in FISIP Dago?
8. What is your response about these conditions?
9. Do you think that energy efficiency implementation is quite appropriate to regulate power consumption in FISIP Dago?
10. Are there any specific plans regarding implementation of energy efficiency?
11. Do you understand purposes of applying energy efficiency in FISIP Dago? (Eg, more efficient in financial, environmental protection or social consideration)
12. Is there any regulation related to energy usage in the Campus?

13. In your opinion, is there any specific benefits if you apply energy efficiency regulation?
14. Is there any effort to control energy consumption that has been applied?
15. In your opinion, do you think that energy efficiency would be an obstacle to the performance of activities in campus?
16. How the regulation that are applied to control of using electronic devices in campus?
17. Is the information related energy usage can be delivered appropriately and understandable among actors?
18. Who are stakeholders who have responsibility for the energy consumption in campus?
19. Is there any controlling mechanisms that used between UNPAD headquarter with the faculty related regulation on the maintenance of infrastructures?
20. How do the controlling systems from faculty on using of campus facilities and infrastructures?
21. Have you ever did energy audits in FISIP Dago?
22. Have you ever performed energy management in FISIP Dago?
23. Are you able to predict all barriers on energy efficiency implementation in campus?
24. Is there any financial pressure to do saving energy in campus?
25. Is there any social pressure which make less concern about energy use in campus?
26. Is there other interest that override the insistence of energy efficiency?
27. Are there any things that you feel are not confident to apply energy efficiency in campus?
28. How would you describe about energy efficiency strategy as a whole that you will do in FISIP Dago?

Appendix 2. Questionnaire

QUESTIONNAIRE GUIDELINES

STRATEGIC OF ENERGY EFFICIENCY IN HIGHER EDUCATION

Case Study Faculty of Social and Political Sciences, Dago, Bandung

Universitas Padjadjaran, Indonesia

B. Actor: Target Group

Informant identity

Name :

Age :

Job :

Level of education :

No.	Questions	Yes	No
1.	Currently the oil stocks, coal and natural gas in Indonesia will be extinct in the next few years		
2.	You know that coal as the largest source of fuel on power plants in Indonesia		
3.	You realize that using electrical energy excessively can reduce the energy resources		
4.	Now Indonesia need energy efficiency programs to solve the impact of energy crisis		
5.	You think that energy saving program in higher education is very important to dealing with energy crisis		
6.	Energy efficiency programs in higher education can encourage energy saving behavior for young generation.		
7.	University has an important role as an initiation of green location, especially in energy saving measurement		
8.	Implementation of energy efficiency programs in higher education can support the social experience and environmental practice for the young generation		
9.	You always do energy savings on daily activities		
10.	You are very concern with the amount of energy consumption in your faculty		
11.	By looking at, you can estimate that your faculty need high energy consumption		
12.	You have a responsibility to the faculty about condition relating energy usage		

13.	You will support with any policies regarding energy efficiency on campus		
14.	You are trying to reduce electric energy consumption on campus by using electronic devices in necessary		
15.	You will try to do more energy savings if you know how		
16.	You will turn off the lights when the classroom is not used		
17.	You will turn on the AC when the class is cool		
18.	You will turn off the air conditioner if the class is not used		
19.	You will let the light on and leave it to someone to turn of the light.		
20.	You think that energy efficiency programs will give benefit to the campus community		
21.	You think that energy efficiency programs on campus will profitable for you		
22.	You think energy efficiency programs on campus have a negative impact to campus community		
23.	You think that the policy about energy efficiency programs on campus is really important		
24.	You believe with energy efficiency can reduce negative impact in environment		
25.	You know clearly the basic concepts of energy efficiency		
26.	You understand how to do energy saving in your faculty		
27.	There is an existence of information regarding the procedure for energy savings in faculty		
28.	You get information easily regarding the procedure for energy savings in faculty		
29.	You feel difficult on applying energy savings in faculty		
30.	There are any signs about how to do energy savings in faculty		
31.	You know about any electronic device that are more environmentally friendly in your faculty		
32.	You know there is a light sensor in your faculty		
33.	You know the availability of mechanism in maintenance of electronic devices in your faculty		
34.	You know there are any monitoring evaluation of the policy from UNPAD headquarter to the faculty, related energy saving		
35.	Manager of Public Affair and Infrastructure have full responsibility about high energy condition		
36	Vice Dean has full responsibility about high energy condition		
37	Rules regarding use of electronic equipment in your faculty is clear		
38	Information using electronic devices efficiently in your faculty is understandable		

39	If there is unclear information regarding using electronic devices, you know who to ask		
40	There is a person / companion who can provide advice, guidance or information regarding using electronic devices efficiently		
41	You feel difficult to get information about guidance of energy usage efficiently		
42	You find that information about energy usage as efficiently is very complicated		
43	You are feeling unsure about activities related energy savings in your faculty.		
44	In the future you are willing continue to support the energy efficiency program in your college		
45	The application of energy efficiency can reduce expenditure of your faculty		
46	You believe there will be any changes situation before and after implementation of energy efficiency in your faculty		

Appendix 3. Observation Guidelines

OBSERVATION GUIDELINES

For observations, researchers using the guidelines by referring to Regulation of the Minister of Energy and Mineral Resources No. 14/2012 and based on the Indonesian National Standards.

Focus Study	Parameter
The Air Systems	1. Using air conditioning with inverter technology and using power in accordance with the size of the room 2. Using refrigerant with type hydrocarbon 3. Placing the compressor unit of AC at a location that is not exposed to direct sunlight 4. Turn off the air conditioner if the room is not in use 5. Install indoor thermometer to monitor the temperature of the room 6. Set the temperature and relative humidity according to Indonesian National Standard (SNI): temperatures ranging from 24ºC-27ºC with a relative humidity between 60% 7. Operating the air conditioning: by turning up 30 minutes before the hour and switched off 30 minutes before quitting time. 8. Ensure there is no outside air enter the room to reduce cooling effect 9. Perform regular maintenance according the manufacturer's guidelines 10. Reduce the temperature around the building by planting plants and / or making the artificial pond
The Lighting Systems	1. Using energy saving lamps in the manner intended e.g. fluorescent tubes 2. Reduce the use of decoration lights 3. Using electronic ballasts in fluorescent lamp 4. Set the electrical power for lighting according to the Indonesian National Standard (SNI): a. Classrooms 15 Watt / m2 with the lowest level of 250-300 lux illumination b. Library 12 Watt / m2 with a minimum illumination level of 300 lux c. Laboratories 16 Watt / m2 with a minimum illumination level of 500 lux d. Workspaces 12 Watt / m2 with a minimum illumination level of 350 lux e. Meeting rooms, active archive space 12 Watt / m2 with a minimum illumination level of 300 lux f. Archive room 6 Watt / m2 with a minimum illumination level of 150 lux 5. Using the lamp housing (armatures) which has a high light of reflection

	6. Set the switch based on group area in accordance with the utilization of the room 7. Using the automatic switch with timer) or the light sensor (photocell) for garden and corridor 8. Turn off the room lights if not used 9. Utilizing the natural light (sunlight) in the day by opening the window so the light levels sufficient enough to do the job activities 10. Clean the lamp and the lamp housing (armature) if it is dirty and dusty so not to obstruct the light
Support Systems	1. Turn off the computer if leaving the working space of more than 30 minutes 2. Turn the printer off when not in use and only turn on shortly before going to print 3. Using a copy machine in standby mode with low power consumption 4. Operate the audio-video equipment as needed 5. Turn on the water heater and dispenser equipment a few minutes before using and turned off after completion of use 6. 6. Operate laboratory equipment as necessary and as possible

Appendix 4. Semi-structured interview

INTERVIEW GUIDELINE

The Air System

1. Operation of air conditioning
2. Maintenance of Air conditioning
3. Conditioning of the room in favor of the air system

The Lighting Systems

4. Selection the type of lights
5. Replacement lamp
6. Operation light
7. Utilization of natural light from the sun
8. Treatment of lamp and armature

The Support Systems

9. The operation of audio-video tools in the classroom
10. Operation of computer and electronic equipment in the workspace
11. The use of laboratory equipment in accordance with the capacity

Appendix 5. Details of class room measurement in every buildings

Buildings	No.	Room	Room's code	Room's size (m^2)
Building A	1.	A. 1.02	GO1BD0102	55
	2.	A. 1.03	GO1BD0103	48
	3.	A. 1.08	GO1BD0108	53
	4.	A. 1.09	GO1BD0109	35
	5.	A. 1.10	GO1BD0110	38
Building B	6.	B. 1.01	G02BD0101	67
	7.	B. 1.02	G02BD0102	68
	8.	B. 1.03	G02BD0103	68
	9.	B. 2.01	G02BD0201	77
	10.	B. 2.02	G02BD0202	78
	11.	B. 2.01	G02JT0201	147
	12.	B. 2.02	G02JT0202	105
	13.	B. 2.03	G02JT0203	105
	14.	B. 2.04	G02JT0204	84
	15.	B. 2.05	G02JT0205	63
	16.	B. 3.02	G02JT0301	252
	17.	B. 3.03	G02JT0302	252
Building C	18.	C. 1.01	G03BD0101	61
	19.	C. 1.02	G03BD0102	63
	20.	C. 1.03	G03BD0103	61
	21.	C. 1.04	G03BD0104	64
	22.	C. 2.01	G03BD0201	61
	23.	C. 2.02	G03BD0202	63
	24.	C. 2.03	G03BD0203	61
	25.	C. 2.04	G03BD0204	64
	26.	C. 2.05	G03BD0205	71
	27.	C. 2.06	G03BD0206	89
	28.	C. 3.01	G03BD0301	89
	29.	C. 3.02	G03BD0302	71
	30.	C. 3.03	G03BD0303	61
	31.	C. 3.04	G03BD0304	63
	32.	C. 3.05	G03BD0305	61
	33.	C. 3.06	G03BD0306	64
	34.	C. 2.01	G03JT0201	105
	35.	C. 2.02	G03JT0202	84
	36.	C. 2.03	G03JT0203	63
	37.	C. 2.04	G03JT0204	63
	38.	C. 2.05	G03JT0205	84
	39.	C. 2.06	G03JT0206	105

	40.	C. 302	G03JT0301	168
Building D	41.	D.3.01	G04JT0301	84
	42.	D.3.02	G04JT0302	84
Building E	43.	E.1.02	G05BD0102	60
	44.	E.1.03	G05BD0103	57
	45.	E.1.04	G05BD0104	60
	46.	E.1.05	G05BD0105	38
	47.	E.1.06	G05BD0106	59
	48.	E.2.02	G05BD0202	204
	49.	E.2.03	G05BD0203	108
			Total	**4,088**

Appendix 6. Calculation Intensity of Energy Consumption

IEC measurement using this following equation below:

$$= \frac{Total\ Energy\ Consumption}{Room\ Size}\ (kWh/m^2)$$

In order to get the value of Intensity of Energy Consumption (IEC) using the calculation based on this following assumptions:

a. Total consumption of electricity = 65,000 Watt

b. Operating time = ± 8 hours each day, for 26 working days in a month

c. Total of room size = 3,539 m^2

The total of power energy (kWh) of all equipment within one month:

= 65,000 Watt x 8 hours x 26 days

= 13,520 kWh / month

The amount of energy consumption around indoor area of 5,217 m^2, then the Intensity of Energy Consumption (IEC) is:

$$IEC = \frac{13.520}{3,539}$$

= 3.82 kWh/m^2/month

Appendix 7. Proportion motives of implementer

Indicator	Total questions	Positive responses	Negative responses	Proportion of calculation	Score
Compatibility with the goal of implementing energy efficiency.	2	1	1	$\left(\left(\frac{1}{2}\right) - 0.5\right) x\ 2$	0
Attitudes towards implementation of energy efficiency.	2	0	2	$\left(\left(\frac{0}{2}\right) - 0.5\right) x\ 2$	-0.5
Benefits in implementation energy efficiency.	2	1	1	$\left(\left(\frac{1}{2}\right) - 0.5\right) x\ 2$	0
Total	6	2	4	$\left(\left(\frac{4}{6}\right) - 0.5\right) x\ 2$	-0.33

Appendix 8. Proportion cognitions of implementer

Indicator	Total questions	Positive responses	Negative responses	Proportion of calculation	Score
Awareness of the implementation for applicable efficiency	3	2	1	$\frac{2}{3}$	0.67
Comprehension of information on implementation of energy efficiency.	1	0	1	$\frac{0}{1}$	0
Transparency and accessibility of documents	2	0	2	$\frac{0}{2}$	0
Level of difficulty and uncertainty in the implementation of energy efficiency.	2	1	1	$\frac{1}{2}$	0.5
Total	8	3	5	$\frac{3}{8}$	0.375

Appendix 9. Proportion power of implementer

Indicator	Total questions	Positive responses	Negative responses	Proportion of calculation	Score
The availability of resources	3	1	2	$\frac{1}{3}$	0.33
Monitoring	4	2	2	$\frac{2}{4}$	0.5
Responsibility formal	1	1	0	$\frac{0}{2}$	0
Total	8	4	4	$\frac{4}{8}$	0.5

Appendix 10. Proportion of three variables from target group

Respondent	**Proportion of Variables**		
	Motives (M)	**Cognitions (C)**	**Power (P)**
1	0.75	0.41	0.56
2	0.88	0.73	0.44
3	0.75	0.64	0.22
4	0.63	0.55	0.56
5	0.13	0.36	0.11
6	0.50	0.45	0.11
7	0.25	0.55	0.33
8	0.75	0.64	0.67
9	0.88	0.64	0.44
10	0.88	0.82	0.44
11	1.00	0.55	0.22
12	0.75	0.41	0.00
13	1.00	0.50	0.33
14	0.13	0.45	0.00
15	0.75	0.41	0.22
16	0.63	0.36	0.33
17	0.63	0.59	0.78
18	0.75	0.36	0.44
19	0.88	0.41	0.33
20	0.75	0.36	0.22
21	0.88	0.73	0.11
22	0.25	0.50	0.33

23	0.50	0.23	0.11
24	0.63	0.77	0.33
25	0.63	0.41	0.56
26	0.00	0.36	0.22
27	0.88	0.41	0.33
28	0.75	0.59	0.56
29	0.63	0.36	0.44
30	0.50	0.55	0.22
31	1.00	0.68	0.56
32	0.50	0.50	0.33
33	0.88	0.59	0.44
34	0.50	0.41	0.33
35	0.63	0.27	0.44
36	1.00	0.45	0.33
37	1.00	0.45	0.33
38	0.75	0.36	0.44
39	0.75	0.50	0.33
40	0.75	0.45	0.22
41	0.75	0.18	0.33
42	0.63	0.18	0.33
43	0.75	0.27	0.11
44	0.63	0.45	0.22
45	0.88	0.68	0.33
46	0.63	0.41	0.33
47	0.88	0.45	0.22
48	1.00	0.41	0.44
49	0.50	0.23	0.22
50	0.88	0.32	0.33
51	0.50	0.68	0.89
52	0.75	0.64	0.22
53	0.75	0.45	0.11
54	1.00	0.45	0.33
55	1.00	0.82	0.33
56	0.50	0.41	0.33
57	0.38	0.36	0.11
58	1.00	0.73	0.33
59	0.63	0.27	0.44
60	0.25	0.18	0.11
61	1.00	0.50	0.33
62	0.75	0.77	0.44
63	0.88	0.36	0.33
64	1.00	0.50	0.44
65	0.75	0.45	0.44

66	0.63	0.45	0.33
67	0.88	0.41	0.33
68	0.63	0.45	0.33
69	0.00	0.23	0.00
70	0.38	0.27	0.00
71	0.63	0.32	0.22
72	0.75	0.45	0.44
73	0.50	0.27	0.33
74	0.38	0.45	0.00
75	0.63	0.23	0.44
76	0.25	0.27	0.56
77	0.75	0.68	0.78
78	0.63	0.45	0.33
79	0.63	0.45	0.44
80	0.50	0.45	0.33
81	0.75	0.36	0.56
82	0.88	0.45	0.33
83	0.75	0.82	0.44
84	0.75	0.41	0.11
85	0.75	0.68	0.22
86	0.50	0.55	0.33
87	0.25	0.32	0.67
88	0.38	0.82	0.44
89	0.63	0.45	0.33
90	0.88	0.36	0.33
91	0.75	0.45	0.44
92	0.75	0.68	0.78
Average	**0.62**	**0.45**	**0.33**

Appendix 11. Negative responses from target group

Respondent	Negative Responses		
	Motives (M)	Cognitions (C)	Power (P)
1	2	13	4
2	1	6	5
3	2	8	7
4	3	10	4
5	7	14	8
6	4	12	8
7	6	10	6
8	2	8	3
9	1	8	5
10	1	4	5
11	0	10	7
12	2	13	9
13	0	11	6
14	7	12	9
15	2	13	7
16	3	14	6
17	3	9	2
18	2	14	5
19	1	13	6
20	2	14	7
21	1	6	8
22	6	11	6
23	4	17	8
24	3	5	6
25	3	13	4
26	8	14	7
27	1	13	6
28	2	9	4
29	3	14	5
30	4	10	7
31	0	7	4
32	4	11	6
33	1	9	5
34	4	13	6
35	3	16	5
36	0	12	6
37	0	12	6
38	2	14	5
39	2	11	6

40	2	12	7
41	2	18	6
42	3	18	6
43	2	16	8
44	3	12	7
45	1	7	6
46	3	13	6
47	1	12	7
48	0	13	5
49	4	17	7
50	1	15	6
51	4	7	1
52	2	8	7
53	2	12	8
54	0	12	6
55	0	4	6
56	4	13	6
57	5	14	8
58	0	6	6
59	3	16	5
60	6	18	8
61	0	11	6
62	2	5	5
63	1	14	6
64	0	11	5
65	2	12	5
66	3	12	6
67	1	13	6
68	3	12	6
69	8	17	9
70	5	16	9
71	3	15	7
72	2	12	5
73	4	16	6
74	5	12	9
75	3	17	5
76	6	16	4
77	2	7	2
78	3	12	6
79	3	12	5
80	4	12	6
81	2	14	4
82	1	12	6

83	2	4	5
84	2	13	8
85	2	7	7
86	4	10	6
87	6	15	3
88	5	4	5
89	3	12	6
90	1	14	6
91	2	12	5
92	2	7	2
Average	**3**	**12**	**6**