Renewable energy policy scenarios as implementation moderation of fuel subsidy policy in Indonesia

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Abstract

Purpose – *This paper aims to examine the effect of communication, resources, disposition and bureaucratic structure to the success of energy subsidy policy, to examine the effect of moderation of variable scenario of renewable energy policy on the influence of communication, resources, disposition and bureaucracy structure on the success of energy subsidy policy.*

Design/methodology/approach – *This study was purposively (based on specific objectives) conducted in Jakarta, which is associated with the implementation and subsidy policy scenario, the study focused on the center of government, namely, the capital city, Jakarta. Collection of data in this research survey was conducted in June-August 2017. The sampling technique was proportional stratified random sampling that took up most of the 770 members of Masyarakat Peduli Energi dan Lingkungan and Masyarakat Energi Terbarukan Indonesia using a representative sample of results that have the ability to be generalized. Based on the formula Slovin (Solimun and Fernandes, 2017), a sample of 145 respondents was obtained. The research approach used was a quantitative with the analysis tool called the generalized structure component analysis.*

Findings – *This paper exhibited that all relationships between variables have a* p*-value of 0.05 except the third moderation and fourth moderation relationship. So it can be said that all relationships between variables are significant except the relationship between the variables of moderation to the relationship between the disposition variable (X3) on the successful implementation of subsidy policy (Y) and the relationship between the moderation variable to the relationship between bureaucracy structure variable (X4) to the successful implementation of subsidy policy.*

Originality/value – *The originality of the research refers to the following: The Policy Theory described by Edwards III (1980), and reinforced by the findings of Ratminto and Winarsih (2005), and Bloom* et al. *(2009), that communication, resources, dispositions and bureaucratic structures affect the success of the energy subsidy policy. This becomes the formulation of a hypothesized research problem whether communication, resources, disposition and bureaucratic structure affect the success of the energy subsidy policy. In fact, the conditions in Indonesia are quite different from the Western world, and the system in Indonesia has embraced subsidies. Therefore, this study also examines the moderating effects of renewable energy policy scenarios in the relationship between communication, resources, dispositions and bureaucratic structures on the success of the subsidy policy energy. Given that there is no strong theory that examines the effects of moderation of these four factors on the success of the energy subsidy policy. Therefore, as the development of Edward III Theory, this study examines the proposition of whether renewable energy policy scenarios reinforce or weaken (moderation effects) on the effects of communication, resources, dispositions and bureaucratic structures on the success of energy subsidy policies.*

Keywords *Communication, Human resourcing, Energy policy scenarios, Implementation of the subsidy policy*

Paper type *Research paper*

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1. Introduction

Public administration is needed in efforts to implement effective and efficient public policies. Public policy as a function of the pillars of the organization and management has become

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the focus of public administration studies. In public administration, a state is seen as an organization and government is positioned as management. A state is a static container that requires driving machine in the form of management. The meeting of elements of state and government will result in a provision, a law commonly called public policy. It will be run by the state administration carried out by government bureaucracy. The main focus of public policy in the perspective of the modern state is a public service. This focus of public policy in terms of public service is a very logical implication as public policy is the main output of the government. The role of government can be a policy footing as the primary instrument that can be used to improve the behavior of people in an effort to find a solution in public affairs. Ripley (1985) expresses it as a domestic policy effort, namely, distributive policy, regulatory policy protective, competitive regulatory policy and redistributive policy.

One of the policies that are currently being considered and discussed is in the field of energy. Subsidy policy is long enough in connection with energy policy in Indonesia. Some of the pros and cons of this policy need an evaluation to evaluate the success of the implementation of the policy. According to the theory of the science of public policy, issues related to implementation of the policy can be traced to the theoretical approach of policy implementation. According to Edwards III (1980, pp. 10-11), there are factors that affect the implementation of policies, namely, communication, resources, the disposition, the bureaucratic structure. Subarsono (2005, p. 99) mentions five factors from Van Meter and Van Horn that affect the successful implementation of policies. The factors mentioned by Van Meter and Van Horn have many similarities with the model of Edwards III, but Van Meter and Van Horn added factor of social, economic and political. Judging from the model of Edwards III, the problems that arise because of a lack of facilities to support the implementation can be categorized into resource factor.

Fuel is one of the few commodities that are very influential on other commodities. Changes in fuel prices will impact directly or indirectly on the price of other commodities, including basic commodities such as food, clothing and shelter, even on income and poverty levels. To protect the poors, the government needs to intervene in the price of fuel by providing subsidies.

According to Annan, the use of renewable energy needs to be improved as energy efficiency because energy is the basis of development. Therefore, the biggest challenge in the energy field of the future is how to produce alternative renewable energy. From Demirbas and Annan statement, it can be concluded that the role of energy is very large and spacious. Great influence on aspects of energy and other sectors makes energy as the basic capital development. The development, especially in modern times cannot be run smoothly and perfectly without the support of energy.

Indonesia used a subsidy mechanism to reduce fuel retail price since 1967 (Dillon *et al.*, 2008). In the 1980s, when Indonesia's oil production was higher than it is today, fuel subsidies were more affordable. Despite so, this system receives criticism as energy subsidies disrupt the overall economic system. When world oil prices increased in 2005, the government spent 24 per cent of its total expenditure on subsidies, of which 90 per cent was spent on fuel products. To reduce its spending, the government increased the price of kerosene, domestic gasoline and diesel twice during six-month periods in 2005. The first price increase was in March at 29 per cent (for fuel prices), while the second in October was 114 per cent.

Indonesia's crude oil production has declined since 1998. In 2004, Indonesia became a net oil importer and shortly afterward the government suspended its membership in the Organization of Petroleum Exporting Countries (EIA, 2011). In 2011, the upstream oil and gas regulatory body, Upstream Oil and Gas Regulatory Body (BP Migas), estimates

potential and proven oil reserves will last only 12 years, while for natural gas, it only lasts up to 46 years.

The subsidy budget allocation in the 2014 budget is the implementation of the public service function, especially for the payment of various subsidies that are part of the Government's efforts to maintain economic stability while providing protection to the community. Although subsidy spending in the 2014 budget is decreasing, the significant budget allocation for 2014 budget is the subsidy spending. Compared to other types of expenditure such as personnel expenditure, capital expenditure or other expenditures, 2014 budget subsidy spending is allocated 27.33 per cent of total central government expenditure (Ministry of National Development Planning of Indonesia, 2016).

There are indications that the deficit in the current account is closely related to the deficit in the Indonesian State Budget (APBN). Fuel subsidies and petroleum imports play an important role in explaining the phenomenon of both deficits. Based on empirical findings, there is evidence to support the strength of the second deficit correlation. The current account deficit is found to trigger a budget deficit. The role of fuel subsidy in APBN and oil in import composition is increasingly critical and at the same time strategic for Indonesia in reducing the deficit, both external trade and internal APBN. Gas import increased by 109.5 per cent in October 2012. At the same period compared to the previous year (January - October). While imports of crude oil increased by 1.6 per cent over the same period (Ministry of National Development Planning of Indonesia, 2016).

Several previous studies have tested implicitly or explicitly in relation to energy subsidy policies in the world. Examine the effect of the elimination of subsidies and job creation in Nigeria. Research results exhibit no relation between the elimination of subsidies and job creation. Ogarenko and Hubacek (2013) examine the effects of energy subsidies that have adverse effects on economies and the environment that stimulate inefficient allocation of resources and excessive energy consumption. The result of the total energy subsidy removal will increase energy efficiency by 2.5 and 3.6 per cent. Examine that energy subsidy policies lead to substantial fiscal savings, although in micro terms, it will reduce the real income of households from all income groups. Better fuel subsidies will fully protect low-income households and result in substantial fiscal savings.

Some of these researchers show that previous studies are still assessing the success rate of policies of energy subsidies and their relation to energy policy scenarios. There has not been much research that examines how energy subsidy patterns are influenced by some determinants, such as communication, resources, dispositions and bureaucratic structures on the implementation of fuel subsidy policy (Edwards III, 1980). On the other hand, this subject has not been studied in relation to the renewable energy scenario as a moderation of the relationship between communication, resources, disposition and bureaucratic structures in strengthening or weakening the implementation of fuel subsidy policy.

Based on the empirical phenomenon described above, it will be associated with theoretical phenomena in the field of public policy implementation. In the perspective of public policy implementation theory, previous government endeavor tends to follow the "top-down" model in the implementation of public policy. In this perspective, the success of policy implementation will be determined by many variables or factors, and each of these variables is related to each other. According to Mazmanian and dan Paul (1983), there are three groups of variables that influence the success of a policy implementation: problem characteristics, policy characteristics and environmental variables. For the first, every issue faced by a policy has different degrees of freedom. The problem is divided into easy, medium and difficult categories. The easier the problems faced by a policy, the higher the likelihood of successful implementation of the policy. For the second, a policy to be

successfully implemented is also influenced by the nature of the policy, such as policy clarification, theoretical support, resource allocation, institutional support, rule consistency and commitment. For the third, the policy environment variables, namely, the form of factors that are outside the policy.

These factors are like socio-economic conditions of society, and public support. Meanwhile, according to Grindle (1980), the success of policy implementation is influenced by two big variables, namely, the content of policy and context of implementation. First, the content of the policy includes:

- the extent to which the interests of the target group or target group are contained in the content of the policy;
- the type of benefits received by the target group;
- the extent to which the desired change of a policy;
- whether the location of a program is correct;
- whether a policy has specified the implementor in detail; and
- whether a program is supported by adequate resources.

Second, the policy environment includes:

- how much power, interests and strategies that actors are involved in implementing the policy;
- the characteristics of the institutions and regimes in power; and
- the level of compliance and responsiveness of the target group.

The situation and conditions of the world energy crisis provide a picture that energy has a great influence on all aspects of human life, especially in modern life. When the world experiences a situation of energy scarcity, due to commodity limitations and rising energy prices, other sectors such as the economy, social and political will also be affected. The continuity of modern civilization is highly dependent on the various sources of energy available as written by Demirbas in energy affects all aspects of modern life. The demand for energy is increasing at an exponential rate due to the significant growth of the world population (Demirbas, 2004). In other words, energy has a close connection to other aspects of life. Therefore, this research focuses on energy subsidy policy influenced by two determinants, both internal and external, which impact on the welfare of society as one of the goals of national development.

The originality of the research refers to the following: The Policy Theory described by Edwards III (1980) and reinforced by the findings of Ratminto and Winarsih (2005) and Bloom *et al.* (2009), that communication, resources, dispositions and bureaucratic structures affect success energy subsidy policy. This becomes the formulation of a hypothesized research problem whether communication, resources, disposition and bureaucratic structure affect the success of the energy subsidy policy. In fact, the conditions in Indonesia are quite different from the Western world, and the system in Indonesia has embraced subsidies. Therefore, this study also examines the moderating effects of renewable energy policy scenarios in the relationship between communication, resources, dispositions and bureaucratic structures on the success of the subsidy policy energy. Given that there is no strong theory that examines the effects of moderation of these four factors on the success of the energy subsidy policy. Therefore, as the development of Edward III Theory, this study examines the proposition of whether renewable energy policy scenarios reinforce or weaken (moderation effects) on the effects of communication, resources, dispositions and bureaucratic structures on the success of energy subsidy policies.

Based on the above background, referring to the Policy Theory described by Edwards III (1980), and reinforced by Ratminto and Winarsih (2005), and Bloom *et al.* (2009) findings, this study aims to:

- examine the effect of communication, resources, disposition and bureaucratic structure to the success of energy subsidy policy; and
- to examine the effect of moderation of variable scenario of renewable energy policy on the influence of communication, resources, disposition and bureaucracy structure on the success of energy subsidy policy.

2. Theoretical background

2.1 Public policy

In this study, grand theory used is Theory of Public Policy. Some forms examined in this study are the formulation, evaluation and implementation of public policy. The initial stage is defined as the meaning of public policy. Public policy is a multidisciplinary science because it involves many disciplines such as political, social, economic and psychological. Policy studies developed in the early 1970s mainly through writing from Laswell. The definition of public policy earliest was proposed by Lasswell and Kaplan quoted by Howlett and Ramesh (1995, p. 2) stating that the public policy is "a program that is projected to the goals, values, and practices of a particular." In line with this definition, Edwards III and Sharkansky as quoted by Suwitri (2008, p. 10) define public policy as "a government action in the form of government programs for the achievement of goals or objectives." From the two definitions above, we can see that public policy has the keyword "goal," "values" and "practice".

2.2 Implementation of public policies

Implementation of policies is often considered just an implementation of what has been decided by the legislative or decision makers, as if this stage is less influential. But in reality, the implementation stage is so important because a policy will not mean anything if it cannot be implemented properly. In other words, implementation is the stage where a policy is implemented optimally and can achieve the purpose of the policy itself.

At the stage of policy implementation, Dunn (2000) suggested that the analysis carried out in the form of monitoring. Monitoring helps assess the level of compliance, find the consequences of unwanted, identify bottlenecks and locate the responsible parties for each stage of the policy. Dunn (2000) provides an example to the US Census Bureau that finds the median household income in the US grows from 43 to 46.7 per cent, while the other income groups are decreased. This result indicates an increase in income inequality, the erosion of the middle class and a decline in living standards.

As already described, that the implementation is the greatest resource-consuming task, then the task of policy implementation also should get more attention. Sometimes in practice, the process of public policy, there is a view of an implementation that will be run automatically after a successful policy formulation. Nugroho (2008, p. 484) states implementation myopia that often occurs in Indonesia, one of which is "So far, we consider that the policy is created, implementation will be 'moving by itself'". Sometimes, the most of the resources are spent on planning when it is supposed to be used in the policy implementation stage.

A crucial step in a policy is implementation, because at this stage, the policy is applied and measured the extent to which the policy will be implemented as the expected and desired policy objectives (Bauer, 2010). Implementation according Meter and Horn was quoted by Winarno (2007, p. 102), it leads to a limitation in the implementation which shall be

interpreted as actions taken by individuals (or groups) of government and private sector aimed at achieving the objectives set out in policy decisions beforehand. Gow and Morss as quoted by Pasolong (2010, p. 59) points out the obstacles encountered in the implementation consists of political obstacles, economic, environmental weakness of institutions, the inability of human resources in technical and administrative fields, deficiencies in technical assistance, lack of decentralization and participation, timing, information systems that are less supportive, goal difference in agenda between actors and ongoing support.

2.3 Communication in policy implementation

Based on the opinion of Robbins (2008, p. 5), Keith Davis quoted by Mangkunegara (2001, p. 145), Edwin B. Flippo quoted by Mangkunegara (2001, p. 145), Suwarto (1999, p. 165) and Usman (2008, p. 389) communications can be defined as the process of transfer of information, ideas, understanding, from one person to another by means of oral, written or nonverbal language with the intention that other people interpret it in accordance with the desired purpose.

According to Edwards III (1980, p. 17), factors that affect communication effectiveness of policy implementation are:

- *First*: Transmission. Policy decisions and implementation orders must be transmitted to the appropriate personnel before they can be followed. Naturally, these communications need to be accurate, and they must be accurately perceived by implementors.
- *Second*: Clarity. If policies are to be implemented properly, implementation directives must not only be received but also be clear. If they are not, implementors will be confused about what they should do, and they will have discretion to impose their own views on the implementation of policies.
- *Third*: Consistency. Contradictory decisions confuse and frustrate administrative staff and constrain their ability to implement policies effectively.

2.4 Resources in policy implementation

According to the model of policy implementation of Edwards III, there are four components in its resources, the staff/human resources, information, authority and facilities. Resource according to the Oxford Advanced Learner's Dictionary is:

- a supply of something that a country, an organization or an individual has and can use, especially to increase wealth;
- a thing that gives help, support or comfort when needed; and
- the ability to find quick, clever and efficient ways of doing things.

From the definition of Oxford and opinions from Edwards III (1980, p. 13), it is concluded that the provision of resources is a matter of a country, organization or individual who may be staff/labor, information, authority and facilities. Edwards III (1980, pp. 54-78) explains that there are four factors that are parts of the resources that affect the implementation of the policy, namely, staff, information, authority and facility.

2.5 Linkages if policy implementation to policies scenario

Porter (1985) defines scenario planning as an internally consistent way of thinking about how the future will happen. Scenario planning is not a prediction, but one of future results that may occur. Porter also said the scenario is not a forecast or prediction, but rather a tool

to regulate one's perceptions about alternative future environments where a decision is likely to occur. These two arguments in line with the explanation Bloom *et al.* (2009) which states that forecast only sees the future that will happen and the desired future, while the scenario is unveiling the rational and sensible, where various possibilities in the future are shown. Therefore, the use of scenarios will be demonstrating the various options that might have been overlooked when planning is just built to look just a possibility. From the definition above, it can be concluded that scenario planning is a method of strategic planning and a learning process in which the perception is directed to look at the picture of the future that might happen or the desired future.

The statement above can be associated with Indonesia energy policy scenarios that ultimately form the strategy of the future policy. Because scenario planning is also a learning process (scenario learning), the goal is to achieve the change with the new paradigm. After determining the purpose of the scenario, the next step is to build scenarios (scenario building). The process of building a scenario is most crucial because the policies that exist today do not meet the existing process. In preparing the scenario planning, although formal techniques such as impact analysis, probability matrix and computer models are sometimes used, but in fact, there is no fixed procedure in doing scenario planning. Even the approach used to develop the scenario planning is often forced to the needs, capabilities and resources of the organization.

The scenario development process proposed by Avin and Jane (2001) is apt to identify complex energy problems. Energy problems cannot be seen from one side only, but from the two sides of the public side (which would then lead to a future that is likely to occur) and the private (which then lead to the desired future). The scenario will be assessed better and appropriate if the following seven criteria, among others, the scenario must have the strength of policy-making, plausibility, have alternatives, be consistent, be distinct structurally and qualitatively, is easy to remember and a challenge for organizations in receiving future. The good and right scenario will make it more effective in its implementation.

Bishop *et al.* (2007) investigate the linkage between public policy and the scenario linkage. Scenario development is the heart of futures studies. It is a key technique that distinguishes the work of professional futurists from other professions who deal with the future. With its popularity, however, has come confusion about what exactly scenario development is, and how futurists actually produce scenarios. This catalog of scenario techniques is an attempt to lay some of that confusion to rest. Wetrust that it moves the discussion forward, but it does not end it by any means. In fact, we hope to be able to discuss scenario techniques in a new and more precise fashion. Eventually, we trust the field will settle on a consensus list that we can use to describe and improve our practice.

Alizadeh *et al.* (2016) also investigate the linkage between public policy and the scenario linkage which investigate an integrated scenario-based robust planning approach for foresight and strategic management with application to the energy industry. The proposed integrated scenario-based robust planning approach builds on the strengths of traditional scenario planning, but overcomes its weaknesses by offering a systematic process for scenario creation and easy implementation. The outcome of this approach is a limited range of core strategies. We use Iran as the case for a more detailed application of the method. Foreign investments in the energy industry, external economic sanctions and the domestic energy consumption growth were found as the key drivers and critical uncertainties in the Iranian energy industry. Three scenarios based on these critical uncertainties and expert information were developed: technology-driven, stagnation and self-sufficiency scenario. For these scenarios, a range of robust strategies was determined. National energy efficiency and productivity increases emerged as the key factors for robustness. The main macro-level result was that economic and political drivers will be the most important factors for Iran's energy futures followed by technological and social factors.

2.6 Renewable energy scenario

Based on availability, the energy source can be divided into renewable energy sources and renewable sources of energy. Non-renewable energy sources are petroleum, natural gas, coal, uranium and so on, while renewable energy sources such as geothermal, hydropower, solar power, wind power and so on. Energy sources are obtained in different forms; heat (thermal), light (radiant), mechanical, electrical, chemical and nuclear energy. This study only discusses energy based on its availability because it deals with the supply and demand of energy.

According to Annan, the use of renewable energy needs to be improved as energy efficiency because energy is the basis of development. Therefore, the biggest challenge in the energy field of the future is how to produce alternative renewable energy. From Demirbas and Annan statement, it can be concluded that the role of energy is very large and spacious. Great influence on aspects of energy and other sectors makes energy as the basic capital development. The development, especially in modern times cannot be run smoothly and perfectly without the support of energy (NRDC, 2012).

Renewable energy sources can be used indefinitely. Renewable energy sources consist of water (hydro), geothermal, biomass, solar, wind, ocean waves and nuclear. Hydro energy sources have the greatest potential with a resource of 769.69 MW in Indonesia (Ministry of National Development Planning of Indonesia, 2012). Geothermal is still the most potential. The red mark on geothermal due to data obtained from the electrymagnetic radiation is not entirely accurate because calculated geothermal does not cover the whole area, but only on the mainland. While geothermal in the volcano even in the oceans was not measurable. In addition to data that have not been accurate, renewable energy has not been exploited well, which is evident from the lack of installed capacity by the amount of available resources. Development of renewable energy development is also minimal preparation, but it took at least five years and five years in developing. It must be done consistently and continually. It is not yet too late to develop renewable energy sources in Indonesia. Therefore, it is described the availability and the potential for renewable energy from various sources (NRDC, 2012).

2.7 Conceptual framework

In this study, grand theory used is theory of public policy, the middle range theory using implementation of public policies, applied theories using communication, resource and policies scenario. Based on the theoretical background and the research aims to test the renewable energy policy scenario as a moderation of the implementation of fuel subsidy (in Indonesian *Bahan Bakar Minyak* or BBM) policy. The two concepts used in this study are public policy theories of public policy implementation and the concept of public policy scenarios. The first concept is the implementation of public policy defined an activity or undertaken by the executor of the policy in the hope of obtaining an outcome in accordance with the goals or objectives of a policy itself (Edwards III, 1980). In the concept of public policy, implementation describes the factors that influence the implementation of public policy such as communication, resources, disposition and bureaucratic structure that affect the implementation of public policy. Based on the concept, five research variables are communication factor, resource factor, disposition factor, organizational structure factor and successful implementation of subsidy policy.

The second concept is Public Policy Scenario. Mowery and Rosenberg (1979) defines that efforts to improve the quality and success of the implementation of a policy require scenarios to design and anticipate future uncertainties. In other words, the policy scenario is a learning process that challenges the organization to be able to pay attention to future situations that may be different from the current situation. This concept explains the relationship between policy implementation and public policy scenarios.

Several previous studies have examined the relationship between communication, resources, disposition, bureaucratic structure and successful implementation of policy and policy scenarios. Paul *et al.* (2002) have examined the effect of communication on the success of policy implementation. Comstock and Boedecker (2014) have examined the effect of resources on the successful implementation of the policy. Susilo (2010) and Shackelford *et al.* (2011) have examined the effect of disposition on the success of policy implementation. Global Initiative for Asthma (GINA) (2010) and Shackelford *et al.* (2011) have examined the influence of bureaucratic structures on the success of policy implementation. On the other hand, Imhof (2010), Global Initiative for Asthma (GINA) (2010), Susilo (2010), Ellis (2010), McKibbin *et al.* (2010), Shackelford *et al.* (2011), Takahashi and Asano (2011), Clemens *et al.* (2012), Ogarenko and Hubacek (2013) and Anand (2013) have examined the effect of policy scenarios on the success of policy implementation.

Petroleum fuel (BBM) is one of several commodities that are very influential on other commodities. Changes in fuel prices will, directly and indirectly, affect other commodity prices including basic commodities such as clothing, food and shelter, even at the level of income and poverty. To protect the poor, the government needs to intervene on fuel prices by subsidizing.

One example of the energy policy paradigm, namely, the supply and demand paradigm, is commonly used in developing countries. This paradigm is known as supply-side management approach and demand-side management (Sugiyono, 2006). In accordance with economic principles, if there is demand then there is inventory. In the supply-side management approach, the government provides supply based on the demand of the people, whether the demand is large. The government does not see the energy reserves, but merely meeting the demands of the community. This is what happens in some countries in the world. This problem is getting bigger when the energy supply provided is dominated by fossil energy sources, which are now on the critical threshold, so that the current energy state becomes inefficient. Renewable energy is only as an alternative energy and not used as much as possible.

With regards to the policy implementation model, the authors obtain a common thread that links between models with other models. As mentioned earlier that the main model used in this study is the Edwards III model, the authors propose the synthesis of Van Meter and VanHorn, Grindle and Mazmanian and Sabatier's models based on Edwards III basic model. This research uses two concepts in public policy, namely, the concept of public policy implementation, and the concept of public policy scenario. In the concept of public policy, implementation describes the factors that influence the implementation of public policy such as communication, resources, disposition and bureaucratic structure that affect the implementation of public policy. The second concept is the concept of public policy scenarios, in which the concept explains the relationship between policy implementation on public policy scenarios.

Based on the explanation above, it can be concluded there are four factors that generally affect the implementation of policies, namely, communication, resources, disposition and organizational structure. According to Van Meter and Van Horn models, these four factors affect each other toward implementation performance. These four factors will be used in this study to verify whether these four factors influence the implementation of subsidy policy. Although there are still other factors such as policy environment/policy context as stated by Grindle and have similarities with Van Meter and Van Horn models as well as Mazmanian and Sabatier models, but environmental policy factors are not used in this study because environmental policy factors focus on conditions/environment outside the implementation of the policy itself, such as social, economic, political and public or ruling conditions, whereas this research focuses only on what is implemented by the policy implementor at an agency (research location).

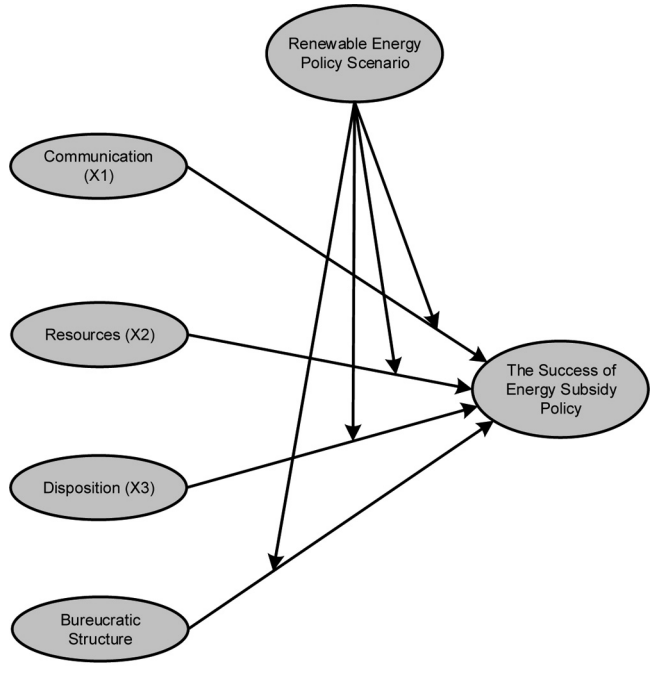
In an effort to improve the quality and success of policy implementation, scenarios are needed to design and anticipate future uncertainties (Mowery and Rosenberg, 1979). The various techniques are basically an effort to determine a rational decision (policy implementation). This explanation shows that the policy scenario is one of the techniques that can be used for policy development both to develop new strategies and to examine existing options, as quoted by Ringland (2002, p. 221) scenario planning traditionally used possible future outcomes (scenarios) to improve the quality of decision-making (planning), and the emphasis has moved in recent years from building scenarios to successfully using them.

The use of scenario planning in strategic decision-making is related to the reactions that arise to the high uncertainty and complexity of the circumstances of the implementation of a policy. The importance of the use of scenarios for the completion of policy implementation according to Ringland (2002) is because scenarios are built on simple assumptions but related to the various determinants that lead to future changes. On the basis of that, the authors limit the factors/variables tested on the communication, resource variables, disposition, and bureaucratic structure in the direction of successful implementation. Furthermore, the success of the implementation is related to the renewable energy policy scenario, as shown in Figure 1:

Based on the above conceptual framework, the hypotheses tested are based on Edwards III (1980), Ratminto and Winarsih (2005) and Bloom *et al.* (2009) as follows:

H1. Communication in the implementation of fuel subsidy policy has a significant effect on the success of energy subsidy policy.

Figure 1 Concept research framework



Source: Edwards III (1980), Ratminto and Winarsih (2008) and Bloom and Menefee (2009)

H2. Resources in the implementation of fuel subsidy policy have a significant effect on the success of energy subsidy policy.

H3. The disposition in the implementation of fuel subsidy policy has a significant effect on the success of energy subsidy policy.

H4. The bureaucratic structure in the implementation of fuel subsidy policy has a significant effect on the success of energy subsidy policy.

In addition, this study involves the proposition as the development of Edwards III (1980), Ratminto and Winarsih (2005) and Bloom *et al.* (2009) by involving the following moderate variables of policy scenarios:

P1. The renewable energy policy scenario moderates the effect of communication in the implementation of the fuel subsidy policy toward the success of the energy subsidy policy.

P2. Renewable energy policy scenarios moderate the influence of resources in the implementation of fuel subsidy policies on the success of energy subsidy policies.

P3. Renewable energy policy scenarios moderate the influence of dispositions in the implementation of fuel subsidy policies on the success of energy subsidy policies.

P4. Renewable energy policy scenarios moderate the influence of bureaucratic structures in the implementation of fuel subsidy policies on the success of energy subsidy policies.

3. Material and method

This study was purposively (based on specific objectives) conducted in Jakarta, which is associated with the implementation and subsidy policy scenario, the study focused on the center of government, namely the capital city, Jakarta. Collecting data in this research survey conducted in June-August 2017. The sampling technique was proportional stratified random sampling that took up most of the 770 members of MPEL and METI using a representative sample of results that have the ability to be generalized.

The object studied in this research was Indonesia's Government policy. According to Dunn (2000), the process of public policy is basically to regulate and prosper the society. Therefore, the main object of public policy is the society. The population of this research was the whole society that is able to assess the energy policy, especially subsidy policy. This research involved two communities, namely, *Masyarakat Peduli Energi dan Lingkungan* (*MPEL*) as the representative of the society who is able to assess the energy policy, especially subsidy policy, and also *Masyarakat Energi Terbarukan Indonesia (METI)* Indonesian Renewable Energy People. Therefore, the research population size amounted to 770 people, consisting of 540 people from *MPEL* and 230 people from *METI*.

Given the size of the population was large enough, the researcher took partly samples considered able to explain (generalize) population. The sampling was done using a stratified proportional random sampling technique, which took some of the 770 members of *MPEL* and *METI*. Research using representative samples gives results that are able to be generalized. The representative sample criteria depend on two interrelated aspects, namely, accuracy and precision. An accurate sample is related to the extent to which the sample statistics can accurately estimate the population parameters, whereas a precise sample is related to the extent to which the sample-based research result can precisely reflect the reality of the population (Solimun and Fernandes, 2017). The sample size of this research was determined using Solvin Formula at the 5 per cent precision so that it was obtained 145 samples/respondents. From the above Solvin calculation, based on its proportion, the samples obtained in this research were 102 people from *MPEL* and 43 people from *METI*.

The research approach used was a quantitative with the analysis tool called the generalized structure component analysis (GSCA). The reasons for using GSCA analysis are the relationship between structural variables (structural model/inner model), involving four exogenous variables (X1 communication, resource *X*2, disposition X3 and bureaucratic structure X4), one moderate endogenous variable (renewable energy policy scenario) and one pure endogen variable (successful implementation of energy subsidy policy, Y); measurement models representing the relationship between the latent variables (X1, *X*2, X3, X4 and Y) and their manifest or observable indicators. In the GSCA analysis, it includes inner model/structural model and outer model/measurement model (Solimun, 2013).

This research aimed to examine the factors influencing the policy of energy, especially fuel and its effect on renewable energy policy scenarios. Therefore, in this research, there were two concepts used as the main theory of public policy, namely, the concept of public policy implementation and the concept of public policy scenarios. The further explanations of both concepts are as follows:

3.1 The concept of public policy implementation

Is an activity or effort undertaken by the implementer of a policy in the hope of obtaining an outcome which is in accordance with the objectives or targets of the policy itself (Edwards III, 1980). Moreover, the concept of public policy implementation describes the factors influencing the implementation of public policy such as communication, resources, disposition and bureaucratic structures. This concept suggests five research variables that can influence the implementation of public policy, namely, communication factor, resource factor, disposition factor, organizational structure factor and subsidy policy implementation success. Each variable is further outlined as follows:

1. *Communication factor (X1) variable* can be defined as a process of transferring information, ideas and understanding from one to another either through the oral, written or nonverbal way in the hope that the other person can interpret it according to the desired meaning or intention. The indicators of this variable include message transmission to appropriate personnel, message clarity, message consistency, message sender and receiver's ability to understand the intended message, message delivery method and message delivery media/means. The communication intended here is the granting of understanding about the subsidy policy to the society (socialization). Here is the definition of each indicator:

    - *Message transmission to appropriate personnel (X1.1)*: According to Edwards III (1980, p. 17), the command to implement a policy should be transmitted to the appropriate personnel before the command is followed.
    - *Message clarity (X1.2)*: Edwards III (1980, p. 17) stated that a command should not just be delivered but it must also be clear enough to understand. If a command is not clearly delivered, the command implementer (receiver) will be confused about what to do and ultimately makes discretion to interpret the implementation of the policy or command according to his own view.
    - *Message consistency (X1.3)*: As suggested by Edwards III (1980, p. 17), a conflicting decision will confuse and frustrate administrative staff as well as hamper their ability to implement a policy effectively.
    - *Sender and receiver's ability to understand the intended message (X1.4)*: Sedarmayanti (2001, p. 88) explained that the sender or communicator of a message should try to express the things in his mind clearly, and the delivery of news (message) must be adjusted with the knowledge of the receiver of the news.

- *Message delivery method (X1.5)*: According to Sedarmayanti (2001, p. 91), a message can be difficult to be received by the receiver due to its improper way of delivery.
- *Message delivery media/means (X1.6)*: According to Sedarmayanti (2001, p. 89), there are 3 (three) types of news, namely, audible news (can be heard), visual news (can be seen) and audio-visual (can be heard and seen).

2. *Resource factor (X2) variable* is the provision of human or things in a country, organization or individual. It can be staff/workforces, information, authority and facilities. The resources referred to here are the resources used in relation to the subsidy policy. Each of the indicators is explained as follows:

   - *Staff/personnel (X2.1)*: This indicator was measured by two items. The first item is the adequacy of policy implementer personnel. As stated by Edwards III (1980, pp. 54-78), the shortage of staff is an obstacle in policy implementation. The second item is the capability of technical support. Edwards III (1980, pp. 54-78) also suggested that a more technical policy will require more specialized staff.
   - *Information (X2.2)*: This indicator was measured by the item of information sufficiency. According to Edwards III (1980, p. 80), lack of knowledge about what should be done to implement a policy causes delays or even deadlock in its implementation.
   - *Authority (X2.3)*: According to Edwards III (1980, pp. 54-78), a message/command implementer sometimes does not have authority, or if he has, the authority must be limited.
   - *Facility (X2.4)*: According to Edwards III (1980, p. 77), lack of building, equipment, supply or land can impede policy implementation.

3. *Disposition factor (X3) variable* can be interpreted as an evaluative statement of a person to a condition consisting of cognitive, affective and action components. The disposition referred to here is the evaluative nature of the subsidy policy. The indicators used to determine this variable are as follows:

   - *Cognitive component (X3.1)*: According to Robbins *et al.* (2008, p. 93), a cognitive component is a segment of opinion or belief of an attitude.
   - *Affective component (X3.2)*: According to Robbins *et al.* (2008, p. 93), an affective component is a segment of emotion or feeling of an attitude.
   - *Action component*: According to Robbins *et al.* (2008, p. 93), action (behavior) component is the intention to behave in a certain way to someone or something.

4. *Bureaucratic structure factor (X4) variable* is an organizational structure that defines how work is divided, grouped and coordinated formally. The indicators of this variable include division of work, a chain of command, a span of control, formalization of rules and standard operating procedure. The bureaucratic structure meant here is the nature of division, grouping and coordination of works related to subsidy policy. The indicators are further described below:

   - *Division of work (X4.1)*: Frederick Taylor as cited by Robbins (1990, p. 35) explained that one of the principles of scientific management is the division of responsibilities between managers and employees. Managers are responsible for conducting planning and supervision, while employees are responsible for executing what is planned by managers.

- *Clarity of command chain and coordination (X4.2)*: Robbins *et al.* (2008, p. 215) stated that one of the questions about organizational design is to whom individuals and groups give their responsibilities and how many people that a manager can direct or guide efficiently and effectively.
- *Span of control (X4.3)*: Henry Fayol as cited by Robbins (1990, pp. 35-37) suggested that one of the organizational principles is the existence of scalar chain or span of control, meaning that there should be interconnected control in an organization.
- *Standard operational procedure (X4.4)*: According to Edwards III (1980, p. 125), SOPs are responses arising from implementers to answer job demands due to lack of time and resources, as well as the willingness of uniformity emerging in a complex organization.

5. *Subsidy policy implementation success (Y) variable* is a successful state of a policy implementation that includes the indicators of effectiveness, efficiency responsiveness, responsibility, accountability, openness/transparency, adaptability, survival, competence and access. The implementation success meant here is the measurement of the success rate of the fuel subsidy policy implementation. Of all the indicators mentioned above, only six indicators were used in this research. The six indicators are further explained below:

   - *Effectiveness (Y1)*: According to Ratminto and Winarsih (2005, pp. 179-182), effectiveness is the achievement of the established objectives, either in the form of targets, long-term goals or mission of an organization.
   - *Efficiency (Y2)*: Ratminto and Winarsih (2005, pp. 179-182) defined that efficiency is the best comparison between output and input.
   - *Responsiveness (Y3)*: As explained by Ratminto and Winarsih (2005, pp. 179-182), responsiveness is provider's ability to recognize community needs, set up service agendas and priorities and develop service programs according to community needs and aspirations.
   - *Responsibility (Y4)*: According to Ratminto and Winarsih (2005, pp. 179-182), responsibility is a measure that indicates the conformity level between governance and the established laws, regulations and procedures.
   - *Accountability (Y5)*: As explained by Ratminto and Winarsih (2005, pp. 179-182), accountability is a measure that indicates the conformity level between governance and the external measures existing in society and owned by stakeholders such as values and norms applied in society.
   - *Openness/transparency (Y6)*: According to Ratminto and Winarsih (2005, pp. 179-182), the transparency of a policy implementation is obtained when the procedures, governance and other matters related to public service processes are transparently informed so that it can be easily understood by the public, either requested or unrequested.

3.2 The concept of public policy scenario

Mowery and Rosenberg (1979) suggest that the efforts to improve the quality and success of a policy implementation require scenarios to design and anticipate future uncertainties. In other words, policy scenarios are learning processes that challenge organizations to pay more attention to future situations that may be different from the current situations. This concept explains the relationship between the implementation and the scenarios of public policy. In the concept, it is mentioned one research variable, namely, *subsidy policy*

scenario, which was used also in this research. Here is the further explanation of the research variable:

6. *Renewable energy policy scenario (X5)* is an implementation step related to the success of subsidy policy implementation. The scenario will be judged and considered better or more appropriate if it follows five criteria. The five criteria include that the scenario must have the power of policy-making, plausibility, alternatives, consistency, difference (either structural or qualitative difference) and be memorable. Such a scenario is a challenge for organizations to accept or face the future. The policy scenario meant here is the policy scenario of renewable energy used as an alternative to the fuel subsidy policy. According to Bloom *et al.* (2009), an effective policy scenario will provide the following benefits:

    - *Rationality and readiness (X5.1)*: Policy scenarios allow for more rational decisions because the decisions are made first in a more orderly manner.
    - *Integration and awareness (X5.2)*: Policy scenarios describe the dynamics of various social, political, economic, cultural and other various forces, as well as the ways in which the forces can be combined to shape the future.
    - *Exploration and experimentation (X5.3)*: Building a policy scenario allows leaders and planners to consider diverse ideas in a formal planning process.
    - *Guidance for changes (X5.4)*: Policy scenarios can function as guidance for monitoring changes. It will enable them to more adapt rather than react to changes.
    - *New and unique idea facility (X5.5)*: This process allows for the emergence of opinions from different points of view through communication channels without worrying and being afraid that the opinions will be automatically terminated or refused.

In this research, the measurement of the variables was done using a Likert scale with five categories in the form of statements on each research instrument question item (Sekaran, 2006). Likert scale was also applied to assess the respondents' attitude that can be plotted to get an idea about the perception of the respondents.

4. Result and discussion

4.1 Analysis result: generalized structure component analysis

4.1.1 Linearity assumption testing. In the analysis of GSCA, there is an assumption that must be met before the analysis which is the assumption of linearity, which requires the linear relationship between variables. The study used the curve fit method which means the relationship between variables is linear when meeting one of the following possibilities:

- The significant linear model (sig linear model <0.05); and
- The non-significant linear model and all non-significant models (sig linear model$>$ 0.05, and in addition to linear models sig $>$ 0.05).

The test results showed that the linear model value of <0.05 so that the model is said to be linear and satisfy the assumptions set.

4.1.2 Goodness of fit. The model evaluation tools in GSCA include FIT (Henseler, 2012), adjusted FIT (Hwang *et al.*, 2016), GFI (Jöreskog and Sörbom, 1986) and SRMR (Hwang *et al.*, 2016) measures for the overall model fit. The values of FIT range from 0 to 1 and can be interpreted as the variance accounted for by the model specification; the larger the value, the more the model's variance is explained as in linear regression. The model that

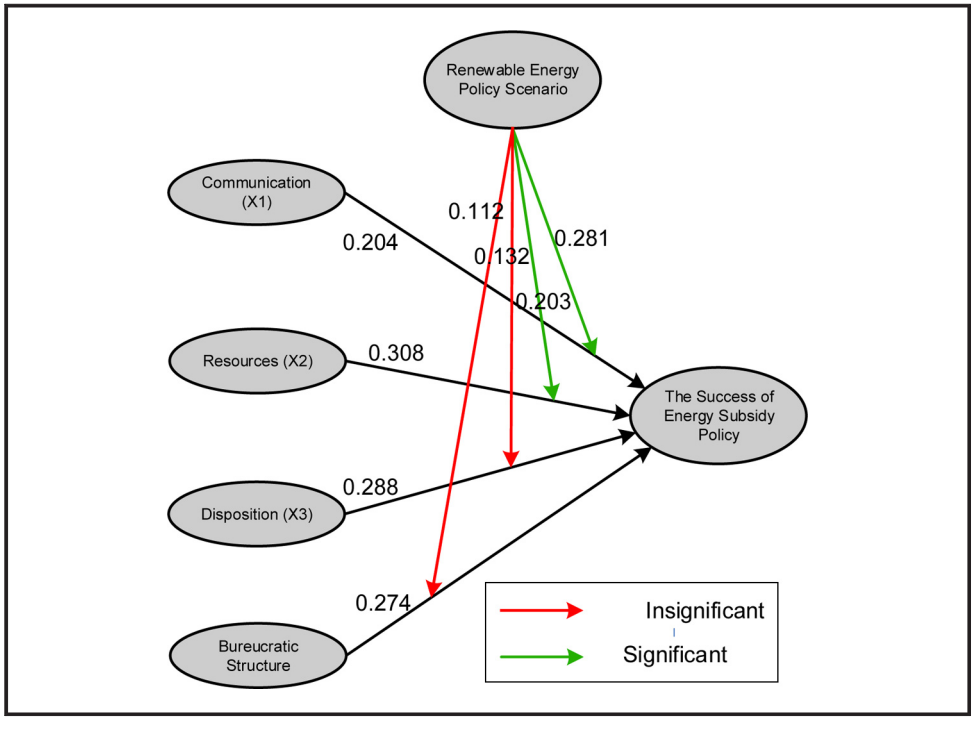
maximizes AFIT can be regarded as the most appropriate among competing models. In general, GFI values close to 1 and an SRMR close to 0 is considered indicative of a good fit. In addition to the global fit indices, there are local fit indices such as FITM, and FITS in GSCA. FITM (and FITS) indicate how much the variance of indicators (and latent variables) is accounted for by a measurement (and a structural) model. These fits can also be interpreted in a similar way to that used in FIT. Here, the local fits were not considered but instead composite reliability was used (Werts *et al.*, 1974) as a local fit when interpreting the factor reliability in the Results section.

Based on the results of testing the feasibility of the model is structurally measured using FIT and AFIT, FIT value is obtained for 0.711 and AFIT value is 0.695. The FIT value explains that the total diversity can be explained by the model amounted to 71.1 per cent. It means the model can explain all its variables by 71.1 per cent. The diversity of variable communication, resources, disposition, bureaucratic structure, renewable energy policy scenarios and successful implementation of the subsidy policy can be explained by the model at 71.1 per cent, and the remaining 28.8 per cent can be explained by other variables outside the model. While the results of testing the feasibility of the overall model is measured using SRMR and GFI, GFI values is obtained for 0.941 and SRMR value is 0.031. GFI value is greater than 0.900 and the value of SRMS is less than 0:08 that indicate that the model is a good fit.

4.1.3 Analysis generalized structure component analysis. Testing inner model (structural model) essentially tests the hypothesis. Hypothesis testing is done by *t*-test at each direct effect partially. The results of the GSCA analysis and the results of hypothesis testing are summarized in the following Figure 2. The model is presented as follows (the red line indicates a non-significant effect, and the black line indicates a significant effect).

Based on examination result, it exhibited that all relationships between variables have *p*-value ≤ 0.05 except the third moderation relationship and fourth moderation. So it can be

Figure 2 GSCA structural model



said that all relationships between variables are significant except the relationship between the variables of moderation to the relationship between the disposition variable (X3) on the successful implementation of subsidy policy (Y) and the relationship between the moderation variable to the relationship between bureaucracy structure variable (X4) to the successful implementation of subsidy policy.

The influence of the relationship between research variables are as follows:

- Examination on direct influence between Communication (X1) on a Successful implementation of Subsidy Policy (Y), the value of the structural coefficient is 0.240, with *p*-value value of 0.024 <0.05, then there is a significant direct influence between Communication (X1) to Successful implementation Subsidy Policy (Y). As the structural coefficient is positive, it indicates that the relationship is both positive. Higher Communication (X1) will result in the higher successful implementation of subsidy policy (Y).
- Examination of direct influence between the Resources (X2) on the success of the implementation of subsidy policy (Y), structural coefficient value obtained 0.308, with a *p*-value of 0.001. As *p*-value <0.05, there is a significant direct influence on Resources (X2) on the Successful Success of Subsidy Policy (Y) implementation. Given the structural coefficients. Positive sign indicating that the relationship is both positive. Higher value of Resources (X2), will affect the higher also successful implementation of Subsidy Policy (Y).
- Examination of direct influence between Dispositions (X3) on the Successful implementation of Subsidy Policy (Y), obtained by structural coefficient value of 0.288, with a *p*-value of 0.000. Where *p*-value < 0.05, there is a significant direct influence between Disposition (X3) on a successful implementation of Subsidy Policy (Y). Given the structural coefficient marked positive, indicating that the relationship is both positive. Higher disposition (X3) will result in the higher Successful implementation of Subsidy Policy (Y).
- Examination of direct influence between bureaucratic structures (X4) on a successful implementation of Subsidy Policy (Y), a structural coefficient value obtained is 0.274, with the *p*-value of 0.005. Where *p*-value <0.05, then there is a significant direct effect between bureaucratic structure (X4) on a successful implementation of Subsidy Policy (Y). Given the structural coefficient marked positive, indicating that the relationship is both positive. Higher the bureaucratic structure (X4) will result in the higher successful implementation of Subsidy Policy (Y).
- Examination of direct influence between renewable energy policy scenario (M) on successful implementation of subsidy policy (Y), a structural coefficient value obtained is 0.289, with a *p*-value of 0.004. As the *p*-value value <0.05, there is a significant direct effect between the renewable energy policy (M) scenario on the successful success of subsidy policy (Y) implementation. As the structural coefficient is positive, it indicates that the relationship is both positive. This means that the higher the renewable energy policy (M) scenario, the higher the success of subsidy policy (Y) implementation.
- Examination on the influence of the variable of renewable energy policy scenario (M) moderating the influence of communication (X1) on the successful implementation of subsidy policy (Y), the structural coefficient value of 0.281 with *p*-value < 0.05, then renewable energy policy scenario is significant as variable moderation. The value of the coefficient of interaction influence is marked positive which means higher renewable energy policy (M) scenario, increases communication influence (X1) to a successful implementation of subsidy policy (Y).
- Examination on the influence of the variable of renewable energy policy scenario (M) moderating the influence of resource (X2) on the successful implementation of subsidy

policy (Y), the structural coefficient value of 0.203 with *p*-value < 0.05, then renewable energy policy scenario is significant as variable moderation. The value of the coefficient of interaction influence is marked positive which means higher value of renewable energy policy scenario (M), affecting the higher influence of resources (X2) on a successful implementation of subsidy policy (Y).

- Examination on the influence of the variable of policy scenario of renewable energy (M) moderating the influence of disposition (X3) on the successful implementation of subsidy policy (Y), the value of a structural coefficient of 0.132 with p-value > 0.05, the variable of renewable energy policy scenario is not significant moderation variables. The value of the coefficient of interaction effect with a positive sign but which does not significantly mean the high or low value of renewable energy policy scenario (M), will not affect the influence of disposition (X3) on the successful implementation of subsidy policy (Y).
- Examination on the influence of the variable of policy scenario of renewable energy (M) moderate the influence of bureaucratic structure (X4) on the successful implementation of subsidy policy (Y), the structural coefficient value is 0.112 with *p*-value > 0.05, then the variable of renewable energy policy scenario is not significant as variable moderation. The value of the coefficient of interaction effect with a positive sign that does not significantly mean the high or low value of renewable energy policy (M) scenario will not affect the influence of bureaucratic structure (X4) on the successful implementation of subsidy policy (Y).

4.2 Discussion

This study found that the results of Communications (X1) affect the success of the implementation of the Subsidy Policy (Y1). Communication is high, which is evident from the high transition messages to the appropriate personnel, clarity of message, consistency of message, ability of the giver and the recipient to understand the intent of the message, means of delivering a message that will have an impact on the high successful implementation of the subsidy policy (Y1), which is reflected on effectiveness, efficiency, responsiveness, responsibility, accountability and transparency.

This research is consistent with the concept of public policy implementation that sets factors that affect the implementation of the public policy such as communication, resources, disposition and bureaucratic structures. According to the model of Van Meter and Van Horn, these four factors together influence each other toward implementation's performance. The study also reinforces the results of research studies Paul *et al.* (2002) that have investigated the effect of communication on the successful implementation of policies.

Apart from that was also discovered that the results resources (*X*2) affect the success of policy implementation Subsidy (Y1). Resources are high, which is evident from the high staff/personnel, Information and facilities authority that will have an impact on the high successful implementation of the subsidy policy (Y1), which is reflected on effectiveness, efficiency, responsiveness, responsibility, accountability and transparency.

This experiment supports the results of previous studies of Comstock and Boedecker (2014) that have studied the effect of the resources to the successful implementation of policies, the concept of public policy implementation and the impact of renewable energy policy scenario (M) toward successful implementation of the subsidy policy (Y). Renewable energy policy scenario is high, which is visible from the rationality and readiness, integration and awareness of the profession, exploration and experiments, guide to change and facilities of new ideas and uniqueness that will have an impact on the high successful implementation of the subsidy policy (Y1), which is reflected on effectiveness, efficiency, responsiveness, responsibility, accountability and transparency.

This research is consistent with the concept of public policy scenario, in which this concept explains the relationship between the implementation of the policy against public policy scenarios. In an effort to improve the quality and success of the implementation of a policy, it is necessary to design scenarios and anticipate the future state of uncertainty (Mowery and Rosenberg, 1979). As well as supporting research from Imhof (2010), Global Initiative for Asthma (GINA) (2010), Susilo (2010), Ellis (2010), McKibbin *et al.* (2010), Shackelford *et al.* (2011), Takahashi and Asano (2011), Clemens *et al.* (2012), Ogarenko and Hubacek (2013) and Anand (2013) have tested the effect of policy scenarios to the successful implementation of policies.

The study also found that the variable of renewable energy policy scenario moderates the effect of variable of Communications (X1) and Resource (*X*2). Because the direct influence and interaction effects are equally significant on the success of the implementation of the subsidy policy (Y), the variable of renewable energy policy scenario becomes quasi moderator (moderator false). The value of the coefficient of the interaction effect is also positive which means the renewable energy policy scenario variable (M) is said to be strengthening. It means the higher the value of the renewable energy policy scenario (M) affects the increasing influence of communications (X1) and resource (*X*2) toward successful implementation of the subsidy policy (Y).

This study found that the renewable energy policy (M) scenario influenced the successful implementation of subsidy policy (Y). High renewable energy policy scenarios visible from rationality and preparedness, integration and professional awareness, exploration and experiments, guide for change, new facility and unique ideas affect high successful implementation of subsidy policy (Y1), reflected in effectiveness, efficiency, responsiveness, responsibility, accountability and transparency.

This research is in accordance with the concept of public policy scenario, where this concept explains the relationship between policy implementation to public policy scenario. In an effort to improve the quality and success of policy implementation, scenarios are needed to design and anticipate future uncertainties (Mowery and Rosenberg, 1979). As well as supporting research Imhof (2010), Global Initiative for Asthma (GINA) (2010), Susilo (2010), Ellis (2010), McKibbin *et al.* (2010), Shackelford *et al.* (2011), Takahashi and Asano (2011), Clemens *et al.* (2012), Ogarenko and Hubacek (2013) and Anand (2013) have examined the effect of policy scenarios on the success of policy implementation.

The concept of a renewable energy policy scenario is needed to improve the successful implementation of renewable energy policies. Currently, EBT has started to socialize, though not to the whole community. This EBT project is still not developed as conventional as the bank party could not comprehend well. Finally, they provide a high-risk component, the effect is expensive interest. But this has become a common understanding, such as OJK (Financial Services Authoritya), which has started to push the green banking program, so this program encourages the portfolio for investment loan for green businesses to be improved.

Understanding of energy policy can be understood from existing energy resources, paradigms, models, institutional and energy policy issues. In general, energy is defined as the ability to perform work, in the form of heat, light, mechanics, chemistry and electromagnetics. Energy is divided into primary energy, secondary energy and final energy. Primary energy is a form of energy obtained in nature or from natural resources that have not been converted or transformed into other forms of energy. Examples of primary energy are petroleum, natural gas, coal, hydropower and others. While secondary energy is a form of energy resulting from the transformation of primary energy, such as electricity and fuel.

The other form of energy is the final energy. Final energy is a form of energy available for consumer use derived from primary energy (coal and natural gas) or from the process and

conversion of primary and secondary energy (electricity, fuel, LPG, biofuel). Final energy is important because to estimate the energy needs of a country, the energy calculated is final energy. Primary energy is still raw energy. With the existence of a process, the primary energy is transformed into secondary energy. Conversion of a secondary energy will make the formation of final energy, i.e energy that is ready to use and can be consumed and traded. The sources of energy are something that can be processed/converted so as to provide the ability to perform the work required to support all life activities.

Energy sources can be classified on the basis of availability (stock), based on commercial value (commercial) and by use (Yusgantoro, 2009). Based on commercial value, energy sources can be divided into three parts, namely, commercial energy sources, non-commercial energy sources and new energy sources. Commercial resources consist of petroleum, natural gas, coal, hydropower, geothermal, uranium and so on. Non-commercial energy sources consist of fuelwood, agricultural waste and so on, while new energy sources consist of solar, wind, ocean, biomass, solid, liquid and gas, peat and so on. Based on usage, the energy source can be divided into two primary energy sources and secondary energy sources. Primary energy sources consist of petroleum, natural gas, coal, hydropower, geothermal and so on. While secondary energy sources consist of electricity, LPG, fuel, non-fuel, natural gas, coal briquettes and so on. As for availability, energy sources can be divided into renewable energy sources and non-renewable energy sources. Non-renewable energy sources are petroleum, natural gas, coal, uranium and so on, while renewable energy sources include geothermal, hydropower, solar power, wind power and so on. The sources of energy are obtained in different forms; heat (thermal), light (radiant), mechanical, electrical, chemical and nuclear energy. This study deals only with energy based on availability, as it relates to energy supply and demand.

Energy policies in one country are different from other countries. Generally, countries in the world especially developing countries, its energy policy put forward economic growth without paying attention to national energy availability will cause problems (Sugiyono, 2006). This resulted in the energy development effort not integrated resulting in an energy crisis. The energy crisis in the world one of them is the result of the application of the paradigm. This condition requires a policy based on a new paradigm that is currently being ogled by countries in the world. According to Sugiyono, some of the new paradigms are as follows:

- The policy-making process should be transparent and open to the public so that the public can participate to perfect the policy itself.
- The policy should not only be qualitative but also quantitative in nature so that the impact can be easily evaluated.
- The scarcity of petroleum resources and the possibility of Indonesia becoming an oil importing country.

Hence, the government should start thinking about the policy on energy security.

The paradigm holds an important key in the development and utilization of energy. Good country energy management also depends on the paradigm owned by the people and especially the government in the country. Correct paradigm will ensure a country's future. Incorrect paradigm will cause world energy crisis due to the enormous dependence on petroleum.

The energy policy paradigm has many variations. Marquad (Tyler, 2009) built several possible energy policy paradigms when analyzing energy policy in South Africa in 2006. An analysis and paradigm will provide a deep understanding of energy policy at a broader level.

- The bottom paradigm is autarky, where there is no coordination in the energy sector. The policy objective is simply to ensure that the energy supply is adequate for economic growth.
- The supply-demand paradigm, which sees energy demand as a factor policy. This can be seen in the OECD energy system.
- The third paradigm is a structural-cultural paradigm that looks at social and behavioral factors as part of the energy system.

Supply and demand paradigms and structural-cultural paradigms are expected to be better able to respond to any policy challenges such as climate change, where the paradigm provides a broad view of the energy system and its interaction with society as a whole. One example of the energy policy paradigm, namely, the supply and demand paradigm, is commonly used in developing countries. This paradigm is known as supply-side management approach and demand-side management (Sugiyono, 2006). In accordance with economic principles, if there is demand then there is inventory. In the supply-side management approach, the government provides supply based on the demand of the people, whether the demand is large or not. The government does not see the energy reserves, merely meeting the demands of the community. This is what happens in some countries in the world. This problem is getting bigger when the energy supply provided is dominated by fossil energy sources, which are now on the critical threshold, so that the current energy state becomes inefficient. Renewable energy is only as an alternative energy and not used as much as possible. While demand-side management is an approach that is based on the availability of reserves so that the amount can be limited to occur energy security.

Paradigms play an important role in overcoming past energy policy mistakes. To stabilize situation and condition, it is necessary to change the paradigm of energy policy, especially on energy management. As for some of the things listed in the new paradigm (e.g. demand-side management) is to streamline energy needs, maximize the supply and utilization of renewable energy (at least with the price on avoided fossil energy cost, if necessary subsidized), use fossil energy as a counterweight and energy source unused fossils are used as inheritance for posterity or export.

The process of policy formulation is complicated as it concerns the right alternative to a public problem. Therefore, in formulating an energy policy, it is necessary to consider the vision and objectives of national development in which it has integrated various aspects of the national life of a country (Inductive) (Yusgantoro, 2009). Policy formulation can also be developed with regard to the strategic environment as well as the development of current supply-demand energy balance (deductive). The use of a deductive-inductive approach in the formulation of policy is called a systems approach, as it formulates comprehensive and integral inputs. From various considerations or inputs, vision, goals, strategies and national energy policy can be developed.

4.3 The scenario of renewable energy policy in Indonesia

Scenarios are formed in several stages, and so does the development or planning of renewable energy policy scenario in Indonesia. Based on the scenario planning process initiated by Avin and Dembner (2001), there are eight stages in constructing policy scenarios. In this research, the main stages of scenario planning processes applied were the first to sixth stage. The first stage is to identify the scope project, setup process, review data and resources, and understand political environment. Based on the previous chapter data of this research, it is known that the scope of this research was Indonesia's renewable energy policy, which began with understanding the portrait of such a complex Indonesia's renewable energy. The second stage is to identify the goals of various parties. Hence, in

this research, it was also identified the trends, constraints, issues and driving forces coming from the public sector, as well as the stakeholders along with their goals and conflicts from the public sector. After that, it was obtained the possible future and desired future. Based on these two future scenarios, various scenarios were then constructed.

There were two scenarios derived from two dominant driving forces, namely, *Bright Future Scenario* and *Wave of Hope Scenario*. The Bright Future Scenario illustrates that the population is under control and reflected in an optimistic scenario in the population scenario. This scenario also reflects that in 2035, the population of Indonesia will reach 324,107.80 million people with a pressable growth of 0.88 per cent. From 2015 to 2035, Indonesia's population growth rate is also estimated to decrease with the aggregate total of 0.33 per cent.

Such a condition can occur if the Family Planning initiative program promoted by the government goes well. The Family Planning program is assumed to be no longer merely an appealing program, but an obligation for all Indonesian citizens. Furthermore, the population spread or distribution between Java-Bali and outside Java-Bali shows a tendency toward equity. The increasingly equitable distribution of the population is driven by the success of the regional autonomy system that is capable of creating prosperity at the local level. The prosperity is characterized by the increasing regional economic growth. The success of the regional autonomy also suppresses the rate of separatist movement and disintegration emerging from the regional community movement. Thus, the defense and security in the country are relatively stable due to the regional economic stability that began to build.

Social stability does not only occur at the regional level. Instead, at the central level, the political fragmentation also tends to decline and strengthens the position of the government due to the lower attractiveness of political interests. The declining trend of political fragmentation will create political consolidation that tends to be more effective. On the other side, the solid government position is also corroborated by a strong check and balances mechanism from other policy actors. Therefore, the mechanism of good governance is increasingly performed to foster the economy and government through the process of accommodating the desires of the public and private.

In fact, good governance can create a conducive economic climate so as to attract investment both from the country and abroad. Moreover, guarantees of economic, social and security stability further create a conducive climate of economic growth. It is estimated that Indonesia's economic condition up to 2035 tends to increase. The high increase in Indonesia's economic growth rate brings Indonesia's economic structure toward industrialization.

In this scenario, renewable energy will be greatly needed by the economic sector to support production activities to increase the country's GDP. However, as the perspective of renewable energy strategies has been initiated by the government both to the public, businesses and government agencies, the extravagant lifestyle of renewable strategy has been slowly suppressed. The efficiency of renewable energy increasingly shows a significant result with the declining intensity and elasticity of renewable energy. On another side, the global renewable energy prices tend to show stable conditions due to stable geopolitical factors.

This scenario will be the best scenario if the condition and trend of each driving force are supporting. However, in the context of Indonesia today, this scenario is such a utopian scenario to occur because the conditions and trends of the existing driving forces show the opposite. The current population growth trend shows an increase and the population spread is still only around Java-Bali. On the other side, the current regional autonomy shows new forms of problems. Besides, the increase in production and consumption of renewable energy, especially fossils, due to the rapid economic growth, must be accompanied by

high-technology development so as not to cause trade-off to the environment. However, to date, the development of environmentally friendly and efficient technology has not been seriously done in Indonesia. The naming of the scenario into *the bright future scenario* is based on good and conducive socio-political and economic conditions that will create widely opened prosperity in the future.

The second scenario is *Wave of Hope Scenario.* The Wave of Hope Scenario illustrates that until 2035, the indicators of Indonesia's social-political driving forces tend to show optimistic results. However, in contrast, the indicators for Indonesia's economic driving factors indicate a declining trend. This assumption is built by this scenario by describing the condition of Indonesia's economic growth that tends to slow down and indicate a downward trend. It is because the economic structure of Indonesia is unable to create economic growth. Until 2035, it is assumed that Indonesia's economic growth declines to 4-5 per cent. The limited supply of renewable energy becomes one of the main issues in production activities. The limited supply of renewable energy will inhibit production and gradually lower the rate of economic growth. Meanwhile, renewable energy prices tend to fluctuate as a result of the domestic economy that is unable to respond to the world economy. Due to the declining economic climate, the investment also shows a declining trend. On the other hand, the economic strategy of the Government of Indonesia leads to import activities of renewable energy, especially oil, to cover the shortage of renewable energy in the country so that the economic growth can get improved.

The Wave of Hope Scenario also tends to be impossible to occur in Indonesia which currently shows a significant trend of economic growth. None of the various sources illustrates that in the future, Indonesia's economic growth will decline. Instead, the economy of Indonesia increasingly gets improved and shows a significant growth. The naming of this scenario into the *Wave of Hope Scenario* is based on the social condition that tends to be optimistic while the economic condition tends to be pessimistic. The assumption that the social condition is running well will lead to the possibility of creating great hopes for prosperity, although the economic condition tends to be in a state of crisis. Moreover, the power of social and political factors will slowly change the economic condition to be better. To realize this scenario, it requires good communication of all stakeholders and adequate resources (human, financial and political resources). Therefore, the implication of this research is that the success of the subsidized energy policy in Indonesia requires scenarios of renewable energy policy with good communication guide and resources.

5. Recommendations and limitation

The results of this study and the findings produced have not been able to provide a holistic explanation of the issues concerning renewable energy policy as the implementation of fuel subsidy policy. This is due to the inherent limitations of the researchers themselves and the obstacles that exist in the implementation of research, including the following:

- Primary data of this study obtained through questionnaires, the choice of answers based on the perceptions of some members of the Community Care and Environmental Concern (MPEL) and Indonesian Renewable Energy Society (METI) sampled. Assessment based on this perception can experience social desirability bias, which is the bias that arises because the respondent gives an answer that he or she considers appropriate or good according to his own personal size, but does not necessarily reflect the variables studied (Arnold and Feldman, 1982). This makes it difficult for researchers to oversee the truth and honesty of members of the Concerned Environmental and Energy Community (MPEL) Community and the Indonesian Renewable Energy Society (METI) in their choice of answers in accordance with actual circumstances and reality, although the letter of introduction to the questionnaire has

been submitted that the honesty of completing this questionnaire will not reveal the general identity of the customer.

- Although the number of samples in this study meets SEM assumptions, the number of samples still needs to be enlarged so that the results can be used to generalize the renewable energy policy moderation model in its implementation on the fuel subsidy policy.

Based on the findings, there are several suggestions for future research, to the company, the customer which are described as follows:

- The Government of Indonesia needs to construct policy on Indonesia's Renewable Energy Sustainability to create future energy sovereignty situation by placing energy as a leading sector.
- Second, the Government of Indonesia should develop the potential of renewable energy resources to create a mixed energy development. On the other hand, the development of renewable energy will reduce the impact of climate change due to global warming.
- Third, the Government of Indonesia should have a plan for the management and utilization of Indonesia's energy in the long run. This plan became a patent plan so that the change of government did not change the management plan and utilization of the energy sector.

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