

A Case Study on Improving Social Acceptance of Renewable Energy

By

LYU, Cheolho

CAPSTONE PROJECT

Submitted to

KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

For the Degree of

MASTER OF PUBLIC MANAGEMENT

2020

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Approval as of December, 2020

EXECUTIVE SUMMARY

Climate change is considered to be one of the greatest threats facing the planet. In fact, many important organizations say it is the greatest threat we face. The international community is compelled to take measures aimed at reducing greenhouse gas emissions and tackling climate change. Renewable energy is favored as a means of reducing the use of fossil fuels.

Concerns about energy security and climate change are enforcing significant changes in how energy and electricity specifically, is generated, transmitted and consumed. Since then, a series of formal and informal policies, directives, legislations, etc. have been developed to encourage use of renewable energy in order to reduce emissions of greenhouse gases, to decrease the energy consumption and to increase the energy efficiency. However, these efforts face many challenges both internally and externally

The South Korean government is also actively pushing for the expansion of renewable energy. However, it is difficult to expand the supply of renewable energy due to the lack of social acceptability. Although society's overall understanding and support for renewable energy is being strengthened, conflicts and clashes over the location of renewable energy facilities are frequent. The European Union believes improved social acceptance of renewable energy facilities is key to achieving renewable energy targets. As the supply of renewable energy increases, the economic and environmental impact becomes scarce, and stakeholder conflicts and confrontations over renewable energy facilities tend to increase.

The profit sharing system can be arranged in three ways. First, public institutions will lead the creation of power plants and residents will secure opportunities to participate in the investment. Second, it is a method in which profits are allocated to members made up of the local people while carrying out power generation projects led by the regional cooperative. Third, through a kind of fund, residents contribute to private projects. If the resident participation business model is refined and advanced to help create social value and create more jobs, it will affect local residents' attitudes toward renewable energy generation facilities and contribute to improving social acceptance of renewable energy in general.

TABLE OF CONTENTS

I. Introduction	6
II. Literature Review	9
III. Data	17
IV. Domestic Renewable Energy Acceptability Improvement Policy and Case Analysis	19
V. Overseas profit-sharing system case analysis	28
VI. The way to build an effective profit-sharing system	42
VII. Conclusion	45
References	48

List of Figures

Figure 1	Procedure of case study.....	17
Figure 2	Current status of domestic wind power generation business.....	19
Figure 3	Renewable energy installed capacity by ownership in Scotland.....	29
Figure 4	Process of identifying stakeholders related to profit package.....	31
Figure 5	NSW's profit-sharing system.....	36
Figure 6	Reasons for investment by members of the German energy cooperative....	43

List of Table

Table 1	Response Policy by Conflict Factor Domestic Case.....	41
Table 2	Comparison of domestic and overseas cases.....	46

I. Introduction

1. Background of study

Climate change is the most serious crisis that threatens the survival of all living things on Earth as well as humans. Without a doubt, humans are creating climate change by releasing greenhouse gases into the atmosphere (Solomon et al., 2007). The international community signed the Paris Climate Change Agreement in 2015 to reduce greenhouse gas emissions and take steps to cope with climate change. The pact was signed by 195 countries, the biggest step in international efforts to date.

With the Paris climate change agreement, countries around the world have submitted their respective contribution plans (INDCs) that include the goal of reducing greenhouse gas emissions in Post-2020 countries, discussions on technology options and policies and measures to reduce greenhouse gas emissions have been brisk. Although there are many difficulties, including the withdrawal of the U.S. from the convention, the international community's agreement to cope with climate change is becoming stronger. Accordingly, in order to achieve the international community's goal of reducing greenhouse gas emissions by less than 2°C, a de-carbonization strategy should be established and implemented in the energy sector with the largest share of greenhouse gas emissions (IEA, 2014). The International Energy Agency (IEA) assessed that the power generation sector has the greatest potential for reduction in energy scenarios to achieve these goals, and that renewable energy has a greater contribution to reducing greenhouse gas emissions than other low-carbon technologies. In addition, renewable energy has less environmental impact on the full-scale assessment (LCA) than nuclear and coal-fired power, and is effective in reducing greenhouse gas emissions.

The European Union, which has been leading greenhouse gas reduction in the international community, is pushing for a goal of cutting greenhouse gas emissions by 20

percent compared to 1990. The European Union is implementing a policy to improve energy efficiency to meet its greenhouse gas reduction targets, while increasing the share of renewable energy in energy supplies to 20 percent by 2020. While the European Union is struggling to improve energy efficiency, it expects renewable energy targets to be met smoothly, and is confident that they will be able to achieve their greenhouse gas reduction targets.

South Korea also set its target for reducing greenhouse gas emissions by 37 percent in 2030 compared to the BAU. While minimizing the burden on the industrial sector, the government is trying to further reduce greenhouse gases in the power generation sector, along with the transportation and building sectors. In addition, due to changes in domestic and foreign conditions such as the Fukushima nuclear power plant situation and serious air pollution problems such as fine dust, discussions about de-coal coal and de-nuclear power plants are rapidly progressing. The government announced “Renewable Energy 3020,” which aims to achieve 20% of renewable energy generation by 2030, and is actively promoting the expansion of renewable energy supply. In order to achieve the 3020 target, new facilities with 53GW of renewable energy will need to be supplied by 2030. It must be. As a result, the ESS market is expected to expand in order to solve the related market activation and renewable energy stability problems caused by the expansion of large-scale facilities centered on solar and wind power.

2. Purpose of study

As the No. 1 company in the domestic renewable energy sector and the mandatory supplier of RPS in the photovoltaic sector, K-water has a social responsibility to participate in the government's policy to expand the supply of renewable energy. However, the demand for the creation of social value in the public sector continues to increase. These social values must not be one-off, they must be sustainable, and they also need economic value. K-water, a public

company, must not only comply with government policies, but also take the lead in creating new social values. Therefore, raising social acceptability in the business development process is also an important issue for K-water. In practice, low social acceptability was a major obstacle to the implementation of the project, which incurred many additional costs.

This study focuses on the non-economic factors, namely procedural and trust aspects, as well as the distributional definitions linked to economic incentives, among the procedural, trust and distributive definitions raised in relation to social acceptance of renewable energy installations. Therefore, the government will seek ways to improve social acceptance of renewable energy facilities. The research direction is established by analyzing domestic and foreign discourse and preceding research through the literature survey. And through case studies at home and abroad, the government aims to analyze various domestic and foreign cases of procedural definition and confidence building while sharing the profits of renewable energy generation projects and present a model for promoting renewable energy projects that are suitable for the actual situation in Korea.

The composition of this study is as follows. First, Chapter 3 illustrates the methodology of research. Chapter 4 briefly analyzes domestic renewable energy acceptance improvement policies and cases. Chapter 5 analyzes overseas profit-sharing system cases. Subsequently, Chapter 6 analyzes how to build an effective profit-sharing system. Based on Chapters 4, 5, and 6, the report concludes with policy recommendations and measures to utilize K-water to build a system that shares effective benefits to improve social acceptability in renewable energy.

II. Literature review

1. Definition

There is a consensus around the world that climate change needs to be addressed, and people's perception of the importance of renewable energy is growing. However, conflicts in the specific implementation of renewable energy projects are also growing. As an alternative, this study focuses on social acceptability. First, we want to explore the theoretical background of the study and what achievements have been made.

Before reviewing prior studies, it is necessary to first clearly define the two terms mentioned in this study: 'social acceptability' and 'renewable energy'. 'Acceptability' is a concept that involves a response to something externally proposed, where acceptance is 'acceptance' and therefore 'giving a positive answer' to something. Social acceptance is generally defined as a positive attitude towards technology or action, which leads to supportive action when needed or requested and leads to a response to resistance by others. Acceptability of dealing with attitudes without active supportive behavior can be described as 'tolerance' (Climate policy info hub, 2015). According to the Quebec homepage (2019), social acceptance is "the product of collective judgment or collective opinion of a project, plan or policy." This concept of social acceptance has been very important in recent debate on major energy projects and other large infrastructure plans (Fournis and Fortin, 2017).

Ellabban et al. (2014) defined renewable energy as a form of energy collected from renewable resources such as sunlight, wind, tides, waves, and geothermal energy. Renewable energy in Korea may differ in type and definition from country to country, including waste energy. In Korea, alternative energy is classified into new energy and renewable energy according to Article 2, 1 and 2 of the Act on the Promotion, Development, Use, and Distribution of New Energy and Renewable Energy. First, new energy is used by converting existing fossil

fuels or using electricity or heat through chemical reactions such as hydrogen and oxygen, and gasification of hydrogen energy, fuel cell, coal liquefied and gasified energy, and heavy residue oil. Classify as energy. Renewable energy is energy used by converting renewable energy sources, including sunlight, water, geothermal, precipitation and bio-organic bodies, such as solar, wind, hydro, marine, geothermal, bioenergy, bioenergy, and waste energy and hydrothermal energy.

2. Social acceptance of renewable energy

2.1 Overseas studies

Recently, research on social acceptability of renewable energy has been increasing. Many studies have shown that social acceptability is one of the limiting factors in the revitalization of renewable energy.

Among overseas studies, Rogers et al. (2008) is a representative study among the early studies that set up the residential participation renewable energy business as a research topic. The study points out the lack of existing research on how and why people want to participate in participatory renewable energy projects, and examines the local people's response to renewable energy projects planned in the UK community. Quantitative and qualitative data were collected and analyzed statistically through questioning and semi-structured interviews, and the analysis showed that the development of renewable energy in the region and the use of its power were gaining widespread support from residents, with residents expecting the most natural resource conservation and the effect of promoting the local community's. However, residents were less willing to actively participate in the project, and many of the respondents thought it was a client rather than a participant.

Atiken (2010) pointed out that one of the most important issues related to renewable energy development is the creation of a good relationship with the community, and analyzed

residents' perception of the community's benefits from the project through a case study of wind power projects in the UK. As a result, the setting up of the scope of local residents and the decision on the form of benefits that the community would gain were both most complex and controversial. Based on this, the authors argued that institutionalized guidance is essential in pursuing similar projects in the future, thereby enhancing transparency, guaranteeing business certainty to participating companies in the early stages of the project, and reducing the likelihood that community interests will be considered bribes.

Based on interviews with the majority of major stakeholders in the UK's energy policy and industry sector and the case analysis of renewable energy projects, Cass et al. (2010) outlined the views of various stakeholders (developers, local residents, politicians, environmentalists, consultants, etc.) involved in sharing community interests through the project. Differences in perception were found to be large depending on plant technology, types of incentives and levels. The authors concluded that the provision of benefits to the community itself could be accommodated by most stakeholders from a normative perspective, while the detailed process of implementation still existed the possibility of problems occurring.

Cowell et al. (2011) analyzed the role of community interests in developing renewable energy from a acceptability perspective. The authors pointed out that there are limitations to the argument that existing studies will increase social acceptability for the facilities as long as the interests of the community increase, thereby facilitating the progress of business. In other words, they argued that community interests are perceived as natural rewards for the impact of development rather than to change the social acceptability of renewables.

Howard (2015) pointed out that active community support is needed for sustainable renewable energy-related industries, and proposed a plan for community participation as a subject of empirical analysis for the development of wind farms in Australia. Through two qualitative case studies, the authors also confirmed that the profit-sharing method increases

community support for wind farms, and in the process the legal system plays a role in enhancing the interests of residents.

Strachan et al. (2015) examined why Britain was having difficulty expanding community-owned renewable businesses and whether significant changes were taking place in such circumstances, assuming that small, decentralized and community-owned renewable energy would play a critical role in achieving low-carbon energy systems in the future. The authors suggested a joint ownership venture method and a community ownership approach through the provision of community interests as key measures to promote renewable energy projects based on the community in the future, and pointed out that a mix of the two could also be effective.

Kerr et al. (2017) pointed out that it was becoming increasingly common in the UK to provide local communities with monetary incentives such as benefits and compensation procedures in the promotion of renewable energy projects, and based on three case studies in the UK, the various ways, meanings, and dynamics related to these incentives were investigated. The study pointed out that although the level of incentives provided by the progress of renewable energy projects, institutional procedures and negotiation procedures were in a wide variety of forms, they failed to take such diversity into account in detail for existing studies. The authors argued that by compiling the case analysis, the diversity of these incentives was determined by the dynamics between project developers and communities, and that policy capabilities should therefore be focused on establishing a relationship between the two.

Rudolph et.al. (2018) argues that the benefit-sharing of local communities should be understood as a process of determining how to use natural resources and share the corresponding benefits, as well as actual sharing of benefits. In order to determine how to share benefits, the parties concerned must first have a clear understanding of the (negative and positive) impact of renewable energy development, secondly what benefits can be derived from the project, and thirdly, who is the beneficiary of the benefits. And three definitive concepts

should be satisfied with the establishment of a regional community profit-sharing system. The three definitions are divided into the justice of distributive for sharing the benefits generated from the project, the justice of procedural for local communities to participate directly in the project implementation process, and the justice of recognitive for who represents the local community in the benefit design. There is no single regional community benefit-sharing system that can satisfy all renewable energy projects. Systems that share the interests of local communities can be built in a variety of ways to match the characteristics of the region and the characteristics of the project. Early involvement of local communities in the process of implementing renewable energy projects is the most important element in building systems that share benefits, even though there are many different systems that share benefits. Rudolph et.al. (2018) cites examples of regional community funds for wind power generation in Europe, existing funds, community ownership, equal distribution of revenue, direct investment and project financing, apprenticeship and studentship, education programmes, electricity discounts, community welfare agreements, indirect benefits from supply chains, etc.

Lane and Hicks (2017) argues that in order for the Victorian community in Australia to benefit from renewable energy projects, it is important for the community to participate in the early stages of project planning. Victoria has implemented a VRET auction scheme to achieve the Victorian Renewable Energy Target (VRET) by increasing the share of renewable energy electricity production to 40% by 2025. Participants in this auction system are evaluated on the basis of benefit sharing with the participation of the local community. Project participants can share community participation and benefits with DELWP (the Department of Environment, Land, Water and Planning) in five ways:

Benefit sharing program; Reporting, Monitoring and Evaluation Plan; Letter of Support - Documents must be provided. Lane and Hicks (2017) argues that for the successful and effective participation of local communities, it is necessary to provide local residents with

substantial and meaningful face-to-face meetings and to build trust between local residents and power companies. In addition, local people may feel disillusioned with participation in the project if the feedback of their claims is ambiguous during the conference. A system that shares profits can derive results that benefit both community developers, which should be discussed in consultation with stakeholders in renewable energy projects from the beginning of development, in fair processes. Benefits should be shared through transparent procedures, and benefits should be set in the form of voluntary contributions to the development of local communities, not in the form of compensation provided by power companies to local communities. A well-designed, profit-sharing system that takes into account localities can provide valuable value for all projects.

2.2 Domestic studies

Not many research cases are related to renewable energy generation facilities and social acceptability in Korea. However, the number of studies related to solar power has been on the rise, as well as the creation of wind farms has been on the rise recently. The main methodology of existing research is to use in-depth interviews, surveys and jet lag approaches for residents living in areas, or to conduct a concord analysis method for specific classes.

Bae (2007) analyzed the impact of renewable energy facilities on the community, focusing on wind farms. In particular, various properties and effects of wind farms were quantified through a concord analysis method. Part 500 Analysis using the effective questionnaire showed that the greater the effect of energy localization, the greater the effect of regional economic revitalization, the greater the effect of air pollution, the more the probability of selection was increased, the less the impact on the landscape, the less the impact on the ecosystem, the higher the probability of selection.

Lee (2014) suggested that the form of a residential power plant that distributes profits with

local residents will play a big role in the renewable energy business as a way to enhance social acceptability for renewable energy. In particular, it pointed to wind power as the most controversial renewable energy source for residents' water-solubility, and expected that models of residential power plants would greatly help develop wind power projects in Korea. Based on this analysis of the current situation, the research newly proposed a Korean model of renewable energy community power plants, including the participation target, participation rate and incentives.

Lee, et al. (2015) argued that distributed justice is emphasized as a way to enhance the social acceptability of renewable energy. He notes that the concept of distributive justice is the profit-sharing system, and among the various profit sharing systems, the most effective and direct way is the resident's power plant, which participates in the ownership and operation of renewable energy generation facilities in the neighborhood. Under this premise, the study proposed three ways to improve social acceptance of domestic renewable energy facilities through literature research, case studies, and interviews with officials.

Existing domestic studies on the sharing of benefits from renewable energy projects are mainly looking at the participation of residents in renewable energy projects. It was a major part of the study of how residents, such as resident power plants, directly participate in renewable energy projects or own shares. It was a major part of the study of how residents, such as resident power plants, directly participate in renewable energy projects or own shares. In addition, the study of benefit-sharing systems shows the limitations of classifying and analyzing benefits by type of benefit-sharing. However, as can be seen in many domestic cases, for power generation projects that require large investments, such as wind power, the local residents' economic power does not allow direct ownership of the plant. Therefore, studies that share the benefits of renewable energy projects will require a new perspective on moving away from discussions that only consider the direct participation of residents and sharing the benefits.

Overseas prior research considers not only the distributive justice of a system that shares profits, but also the procedural justice. In order to improve the water solubility of renewable energy projects, residents' participation is required from the beginning of the project, and discussions on sharing benefits in transparent procedures should begin. A system of sharing profits does not simply mean a fair distribution of profits. A system of sharing benefits is a compromise process in which local communities are directly involved in the decision-making process for renewable energy projects and determine how to operate and use a system of sharing benefits. In order to share profits, local residents must draw up what they want through agreements with local residents based on the extent of damage to the area.

Preliminary research abroad suggests that renewable energy projects should not be promoted solely by national energy policy, but should be promoted within regional development strategies to improve regional water solubility. Therefore, in order to share the benefits of renewable energy generation, it would be necessary to build them with long-term regional development strategies that could revitalize regional communities. In this study, we try to overcome the limitations of domestic prior research, which is limited to distributive justice and does not consider long-term development strategies. In this study, distributive justice and procedural justice are discussed in the construction of a shared-benefit system, and measures that can be expanded to share the shared-benefit economic interests of revitalizing the local community are considered.

III. Data

1. Data collection

In order to improve the social acceptance of renewable energy, first, let's look at what are the factors of conflict that lower the acceptance. After that, we will analyze the current state of policies to increase acceptance, identify the deficiencies of the current policy, and find out what efforts are being made to improve the deficiencies. To that end, this report will collect and analyze domestic and foreign conflict and policy cases. Overseas cases will be analyzed focusing on cases of attempts to improve procedural definition. The domestic case is to examine the current profit-sharing system and policies to support it.

2. Data selection

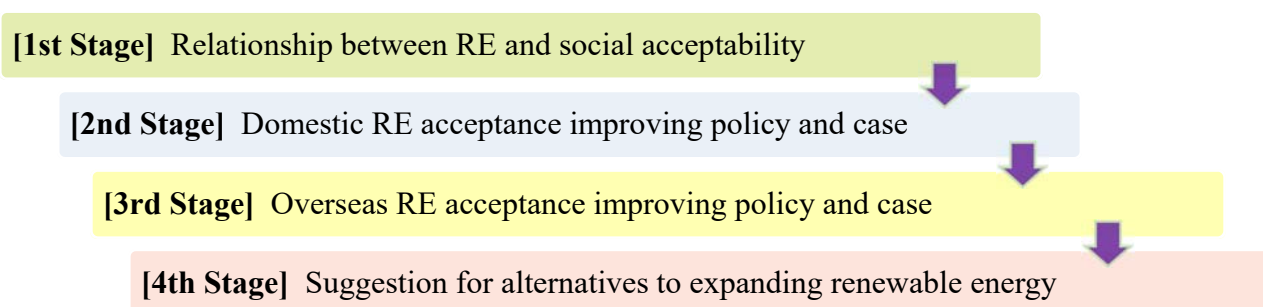


Figure 1. Procedure of case study

Based on the analysis of domestic and overseas research, we first analyze domestic renewable energy acceptability improvement policies and cases, and then analyze cases of overseas profit-sharing systems to determine the elements necessary for social acceptability improvement. We will try to identify, what kind of profit-sharing system is being applied, and what systems can be introduced in Korea. In addition, it will seek ways to ensure a procedural

definition through key provisions and guidelines. Finally, based on the analysis results, I would like to consider how to build an effective profit-sharing system and explore alternatives applicable to K-water.

The purpose of this research report is to propose an effective profit-sharing scheme for improving renewable energy acceptability. For this reason, we first analyze the relationship between renewable energy and social acceptability to date and clarify that improving acceptability is essential for the spread of renewable energy equipment. Therefore, we first briefly analyze representative domestic and international prior studies on profit sharing of renewable energy and draw implications. Afterwards, we will review the current status of renewable energy and renewable energy in Korea, and analyze government policies and application cases to improve the acceptability. It will then analyze the profit-sharing system and cases of advanced countries in overseas renewable energy to find ways to apply and revitalize the country. Finally, based on the analysis so far, we want to make policy suggestions for the establishment of an effective profit-sharing system to improve the acceptability of renewable energy.

IV. Domestic Renewable Energy Acceptability Improvement Policy and Case Analysis

1. A case of conflict over domestic renewable energy business (wind power case)

Renewable energy began to be supplied in earnest for only 10 years, but there were not a few cases of conflict due to backlash from environmental groups or residents surrounding the facility location. In particular, because wind power generates noise, transforms the landscape, or affects the ecosystem, environmental groups and residents frequently oppose it despite location restrictions. Many wind power projects have been suspended or completely canceled due to prolonged conflict with environmental groups and residents. Even at this time, there are three or four sites where conflicts between operators and residents related to wind farm construction develop.



Figure 2. Current status of domestic wind power generation business

Source. Korea Wind Industry Association, Fall 2018, Wind Power Journal 2018

1.1 The Uiryong Wind Power Complex project

The Uiryong Wind Power Complex project aims to produce 41631MWh of electricity annually by installing 25 750KW wind turbines on a site of 8,4121m² in the area of Hanwoosan, Uiryong-gun, Gyeongsangnam-do. The area around Uiryong Hanusan is characterized by the geographic characteristics of the western wind, and forest roads have been opened up to the 9th ridge, which has been mentioned as the best land wind power. In 2012, it received permission for the power generation project, and then completed the approval and approval, including road deliberation on national and local roads, including environmental impact assessment. Construction began in May 2015 after completing the license for a long time, but residents opposed the construction, concerned about landslides, noise, and low-frequency damage. Local civic groups are also participating in the opposition of the residents. This conflict extended to court disputes, including residents filing a lawsuit to cancel the disposition of permits to the court, and businesses also suing residents for obstruction. Conflict that lasted for four months reached a conditional agreement in September, and construction of some sections was resumed.(Lee, 2015)

In December 2014, an agreement was reached between the business operator and residents to use a certain percentage of sales for local support projects, and discussions are ongoing to reduce the difference in positions between the business operator and residents.

1.2 Daegi-ri wind farm development project

The project to create a wind power complex is aiming to produce 5,6765 MWh of electricity annually by installing 13 units of 2MW wind power generators on a 7,8798m² site in Daeji-ri, Wangsan-myeon, Gangneung-si. The expected wind power area is located at the boundary between Daeji-ri, Gangneung-si and Suhari, Pyeongchang-gun. After obtaining permission for the power generation project in 2007, the residents of Pyeongchang-gun expressed their

dissatisfaction with the fact that they were excluded from the residents' briefing session, environmental impact assessment, and settlement agreement, and filed a lawsuit to cancel the disposition of permits. Since then, the project to build a wind farm in Daegi-ri has drifted for more than six years. The revocation lawsuit filed by the residents was dismissed in July 2012 and was defeated by the Supreme Court in February 2014. After that, in July 2015, it received approval for the development license from Gangwon-do and commenced construction. However, the spark of conflict remains as residents plan to oppose the installation of a transmission line through the Suhari area.(Lee,2015)

2. Renewable energy acceptance status and influencing factors

2.1 Renewable energy acceptance status

There are no official indicators or statistical data to grasp the current status of renewable energy acceptance at a glance. Therefore, it is currently the best way to infer the degree of acceptance through indirect numbers.

For example, as a result of a survey on the expected rate of return from participation in renewable energy power plants, a research result (Jung, 2017) or 'The acceptance of renewable energy is significantly lower than that of the general public'. According to a media report saying that 37.5% of solar and wind power generation projects whose permits were rejected or withheld last year (2016) were due to the acceptance problem of residents' backlash, the acceptance of local residents was very low, and it became a serious social problem You can guess that it is doing.

The bigger problem is that, with the government's policy to expand renewable energy, the conflict over renewable energy is increasing. Looking at the trend of the number of media reports on'anti-solar power', in the case of 2010-2016, the average annual average was 386, but in 2017 and 2018 (as of November 25), the number of reports on the same subject was 652 and

809, respectively. It increased more than 2 times. Reports on “anti-wind power” also increased significantly from 293 annually between 2010 and 2016 to 505 and 422 in 2017 and 2018, respectively.

2.2 Factors influencing acceptance

The reason for opposing renewable energy can be largely divided into three factors. (Lee et. al., 2015)

The first is environmental factors. In the case of solar or wind power generation, environmental influences such as light reflection, electromagnetic waves, low-frequency noise, soil and water pollution, shadows, migratory birds, and damage to the landscape are accompanied during the operation process. In addition, forest damage and ecosystem destruction that occur during the construction process are inevitable. This is why criticism is raised that renewable energy is eco-friendly energy, but the construction process is not eco-friendly. The question is, how seriously these influences affect residents' daily life or ecosystem, and opinions are divided between the pros and cons of renewable energy, and the research results used as evidence are also contradictory, making it easy to solve Not in a state.

The second is the procedural factor. It is also necessary to look at the procedural factor from two perspectives. One is the feeling of alienation due to restrictions on participation. Since solar and wind power generation are generally intended for long-term operation of more than 20 years, once constructed, local residents are bound to continue to be affected by the operation and construction of power plants, whether they like it or not. However, looking at the solar and wind power generation projects that have been carried out so far, it has been extremely rare for local residents to participate directly from the beginning of construction. In some cases, residents will not know until the actual construction has started after the developer has obtained both the business license and the development activity license. As such, the sense of alienation

that local residents, who are practical stakeholders in power plant construction and operation, are excluded from the decision-making process leads to the opposition of residents. The other is distrust of formal administration. In the case of Sinan-gun and Muan-gun, Jeollanam-do, 2,600 applications for solar power plant construction have been received in recent months. Applications were rushing by abolishing or easing the ordinance of limiting development within 500m to 1km away from villages, roads, houses, and the coast. (Lee et. Al., 2015) Although there are differences in degree, the surge in applications for construction of solar power plants is a national phenomenon. The problem is that there is a tremendous shortage of local government personnel to handle administrative tasks such as environmental impact assessment and permission for development activities of the received projects. For this reason, at the site, one or two officials in charge have decided on the basis of the catastrophic environmental impact assessment report that the permission for development activity is not effective at all, and system improvement is urgent.

Therefore, in order to solve the procedural obstacles related to the acceptability of renewable energy (exclusion, distrust), it is necessary for a business operator to transparently disclose the business procedure to local residents from the beginning of development and induce participation through medical and convergence. Through administrative support, it is necessary to provide assistance so that residents can have a sense of trust in the project.

The third factor of low renewable energy regional acceptance is the distributional factor. From the perspective of local residents, the renewable energy power generation project is a sheltered facility with many incentives to cause economic losses in the construction and operation process. Therefore, if sufficient economic benefits and compensation are not provided to them, the incentives to accept them will inevitably decrease. As previously examined, the lack of distributive justice in which outsiders monopolize profits from business and local residents exposed to direct damage do not receive sufficient compensation is one of

the main reasons for impeding resident acceptance. Profit-sharing, the subject of this study, is suggested as a solution.

3. Policy examples for improving acceptance

In this section, with regard to the three factors that impede acceptance of acceptance, policies introduced and implemented at the level of the central government and local governments are summarized.

3.1 Environmental factors: regulatory policy

The representative policy of the government (including local governments) to resolve environmental factors is location regulation. The Ministry of Environment prepared the 'Environmental Evaluation Consultation Guidelines for Onshore Solar Power Projects' to minimize the 'possibility of damage to the natural environment', which is a weakness of solar power generation, and to produce eco-friendly energy, and implemented it from August 1. (Ministry of Environment, 2018)

According to this, ecologically sensitive areas such as Baekdudaegan and Vein Protected Area, Ecological Landscape Preservation Area, habitat of legal information species, ecological and natural level 1 grade areas, and other areas with an inclination of 15° or higher are considered site avoidance areas. It was classified, making it virtually impossible to permit. In addition, due to factors such as natural ecological environment, topography and geology, water quality, and landscape, a wide range of areas are classified as areas requiring careful review, making development difficult.

There are two contradicting views of the government's renewable energy regulation policy. As there is a negative view that the development process of eco-friendly renewable energy is not eco-friendly due to indiscreet development, some say that applying stricter

regulations will help raise positive awareness of renewable energy from a long-term perspective. There are also opinions that it is unfair to apply stricter regulations to renewable energy facilities than golf courses, which are known to have an even worse impact.(Kim, 2018) In addition, there are voices saying that there is no objective standard for other local governments' regulation of separation distances, and that it hinders the progress of the project, while there are opinions that it is desirable to regulate the separation distance differently depending on the degree of acceptance within the region.

3.2 Procedural factors: ensuring prior acceptance

The Ministry of Industry, through the revision of the 2018 Power Generation Project Permit Standards Announcement, requires that the power generation business operator notifies the local government head of the project before applying for the power generation project permit, and the local government head post it in an electronic gazette and a place where local residents can easily recognize it for at least 7 days. By making it mandatory, residents can recognize the contents of the project from the beginning of the renewable energy project. In addition, the planned location system is being introduced in order to secure resident acceptance and environmental characteristics in advance.

3.3 Distributive factor: resident participation incentive system and profit sharing

This policy has been introduced and implemented since January 2017 as a policy that additionally assigns REC weights according to the degree of participation when local residents participate in solar power and offshore wind power projects. Initially, only equity investment was recognized, but now it includes participation through bonds and funds. In the case of preferential REC weighting, the main content is to add a REC weight of up to 20% to the renewable energy power generation projects with local residents. Solar and wind power

generation projects with 1MW and 3MW or more, respectively, and 5 or more residents who have been registered as residents for more than 1 year in administrative districts within 1km radius of the power plant participate, The REC weight is applied by simultaneously considering the total project cost investment ratio.

In addition to the government's resident participation incentive system, there are cases of institutionalizing profit sharing through ordinances at the level of local governments. In addition to the plan to expand wind power generation, Jeju Island is to return a certain portion of the profits to Jeju Island so that operators and local residents can share the excess profits generated by the exclusive use of wind resources for public management of wind resources and fostering the wind industry. The wind power development profit sharing system was established.

4. Implication

The government (including local governments) has implemented various policies to improve acceptance, but there are some limitations as follows. Policies to improve environmental impediments are designed with excessive regulation. The purpose of regulating reckless development and stably fostering the industry and supply of renewable energy in the long term is reasonable at first glance, but the issue of equity with other facilities is a part that requires further consideration. Regulatory policy should not be the purpose of the regulation itself, but should be a policy guide that enables the industry to grow properly through regulation. In addition, at a more fundamental level, there is a need for a policy to prevent conflicts due to inaccurate information in advance by conducting objective and continuous research on the environmental impact of renewable energy and promoting results. In order to solve the procedural and distributional factors, the effectiveness of the prior notification, planned location system, and profit-sharing incentive system seems to be limited as specific measures

are not presented or insufficient. For example, in the case of the equity investment incentive system, it was not clear about the transfer and transfer of participating residents, and in the case of newly added fund investments, public offering funds or certain assets/revenues that cannot be restricted to participants. There are no specific plans on how to apply a private equity fund that only investors who meet the criteria can participate.

Above all, profit-sharing discussions so far have focused only on 'economic and financial interests', so the profit-sharing incentive system is limited only when residents invest in power plants in the form of equity or bonds and share operating profits. There is a limit to that. In this study, the scope of discussion is expanded in a 'value sharing' or 'broadly profit sharing' method that shares tangible and intangible values, including solutions to environmental and procedural conflict factors, to enhance the acceptability of renewable energy. I would like to propose a more effective policy for this. This will be discussed in detail in Chapter 7.

V. Overseas profit-sharing system case analysis

The problem of acceptance of residents, which acts as a major obstacle to the supply of new and renewable energy, is no exception to overseas. In order to spread the supply of new and renewable energy and to increase the acceptance of residents, many countries have adopted the benefit-sharing system.

As can be seen from the preceding studies in Chapter 2, the type of profit sharing of new and renewable energy projects does not have only one type, but has various types. There is no single type of benefit sharing that is suitable for renewable energy projects with various conditions. Therefore, some countries are focusing their policy on how to build benefit sharing. In other words, rather than focusing on choosing the type of benefit sharing, the policy is focusing on the process and method of sharing the benefits. To this end, several local authorities or central governments have recently published guidance on how to create benefit sharing.

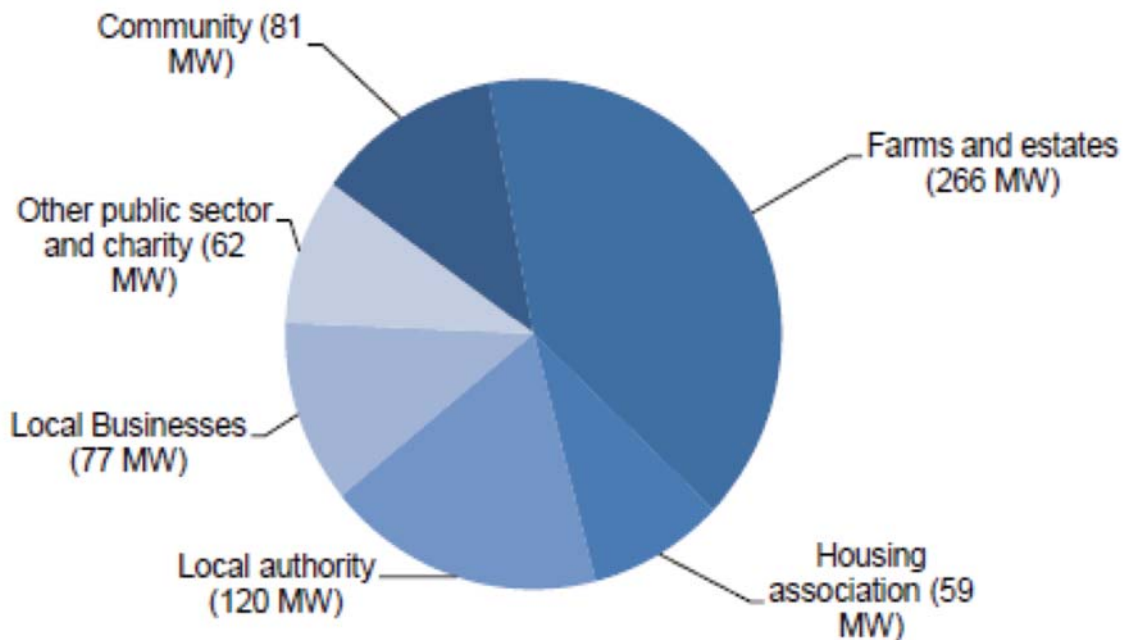
In this chapter, we will introduce guidelines for building a benefit-sharing system recently published by major national and regional authorities and derive implications accordingly.

1. Scotland

The Scottish government stated in Natural Scotland (2015a, 2015b, 2015c) that it aims to install 1GW of 'locally and locally owned' renewable energy by 2020 and 2GW by 2030. 'Community and locally owned' means Community groups, Local authorities, Housing associations, Other Scottish public bodies, Charities including religious organizations, including faith organizations), further and higher education establishments, local businesses, Scottish farms and estates.

Looking at Figure 3. In Scotland, as of June 2017, the installed capacity of local communities and locally owned renewable energy is 496 MW, and the installed capacity is

owned by local farmers, landowners (40%) and local authorities (18%). This occupies the highest proportion.



Source : Leyla Usmani(2017, p.3)

Figure 3. Renewable energy installed capacity by ownership in Scotland

The Scottish government has published three “Good Practice Principles Guidance” to increase local ownership of renewable energy. These are 'Scottish Government Good Practice Principles for Community Benefits From Offshore Renewable Energy Development, "Scottish Government Good Practice Principles for Community Benefits From Onshore Renewable Energy Development,' and 'Scottish Government Good Practice Principles for Shared Ownership of Onshore Renewable Energy Development'.

According to these reports, the community benefit package should be proposed by the developer and developed through communication with the local community. Here, the meaning of “package” does not mean that the benefit-sharing system exists as one, but that the benefit-

sharing system must be designed in various ways and include various elements. Benefit packages can vary depending on the location of the project, the size of the project, the technology applied, and the nature of the project. In addition, the benefit package should make it clear to local residents selected by clear criteria that the benefits return through a fair system. In order to develop a fair benefit-sharing system, it is important to create a number of opportunities for communication between the developer and local residents, and communication should take place as early as possible.

The Scottish government does not have the authority to force developers to share interests with local communities, but encourages them to voluntarily share interests. The main principle of Scotland's national guidance is to provide a community benefit package worth £5,000 per MW per year during the operation of the wind turbine. The Scottish government wants local communities to invest profit packages in the project, and established CARES (Community and Renewable Energy Scheme) in 2011 to increase local community ownership of renewable energy projects. Together with CARES, REIF (Renewable Energy Scheme Investment Fund) to support local communities in investing in renewable energy projects.

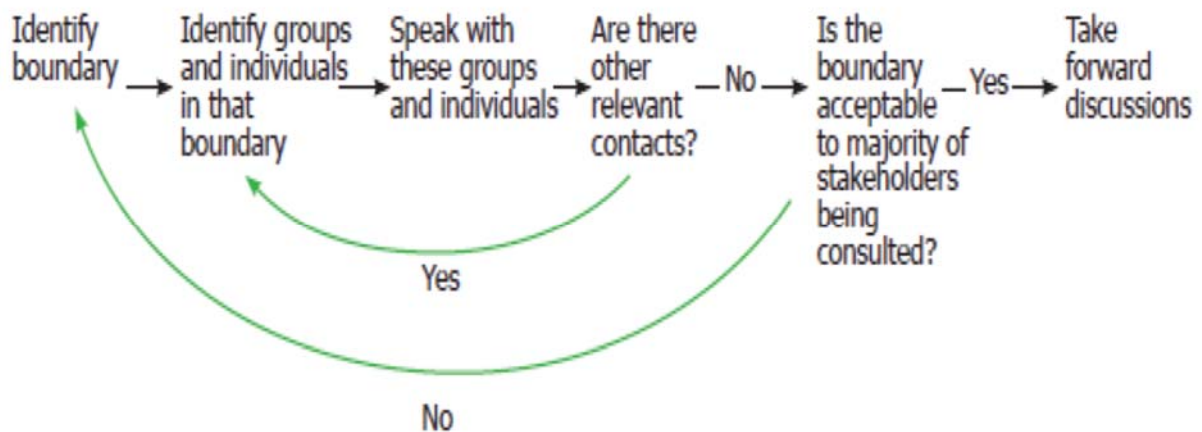
Discussions on the design of benefit packages with developers and stakeholders are conducted in accordance with the Act (National Standards for Community Engagement and Planning Advice Note 03/2010). Before proposing a profit package, the developer should understand who the profits received from the project will be and who is the representative local community that can discuss the profit package.

Figure 4 shows the process of identifying relevant stakeholders before discussing profit packages. This identification process is carried out by the local community.

First, you need to select a region related to the project. Then select groups or individuals residing in the area. Selected Stakeholders are discussed and checked to see if any Stakeholders have not been selected. If other implementing parties exist, they go through the process of

selecting stakeholders again, and if other implementing parties do not exist, the next step is taken.

In the next step, the selected stakeholders will review whether the regional setting made in the first step is feasible. If the region setting is wrong, it goes back to the first step, and if the region setting is valid, it goes to the next step.



Source : Natural Scotland(2015b, p.12)

Figure 4. Process of identifying stakeholders related to profit package

When the relevant stakeholders and regions are set up, local consultations are held in which the stakeholders participate to build a profit package. Regional consultations should be fair, transparent and open. In the local consultation process, the developer encourages the participation of stakeholders. The regional agreement process should be flexible so that it can be adjusted according to the characteristics of the region in which the project is being conducted. The Scottish Government uses the National Standards for Community Engagement and VOICE as a means of encouraging participation to present a flexible and well-planned regional consultation process to local communities.

2. England

The Government of England has published 'Community Benefits from Onshore Wind Developments: Best Practice guidance for England' to better understand the community benefits that local communities receive from wind power and to help local communities, generators and local authorities. Here, community benefits include various types of benefit sharing, such as community funds and community investment. This guideline should be timely, transparent, constructive, inclusive, fair, and unconditional to build local community interests.

This guideline tells you what needs to be discussed at each project stage for the benefit of the local community. During the preparation phase, parties involved in renewable energy projects should discuss local community interests, target audiences, and effective communication. First, it is necessary to discuss the types of interests (profit sharing) in local communities. Community interests include community funding, in-kind profits, investment in renewable energy power plants, and infrastructure improvements. Local community interests must be set according to the needs of the local community, and may not consist of only one type, but may consist of various types of interest. That is, benefit packages can be configured. Local authorities do not make judgments on the package of benefits. In other words, community interests are not taken into account when local authorities select power generation operators. This means that community interests are provided voluntarily by power generation operators. Second, we need to discuss who is involved. It is important to identify the stakeholders and define a “community”. Third, effective communication must be established. Communication is the key to getting results that are appropriate for your area. The right outcome is to gather community opinions on the project and exchange information to create a community benefit package that maximizes local interests.

In the planning stage, the role of local authorities is important. Local authorities can support community interest negotiations by advocating local community initiatives or

developing local policies accordingly to promote sustainable development in the area.

According to UK planning system regulations, the proposal must be selected on the basis of legislation. Planning legislation prohibits local planning authorities from soliciting developer contributions from developers, except in special cases. Therefore, local authorities should make them aware that local community benefit-sharing negotiations do not significantly affect the selection of operators. In the UK there are “planning obligations” known as section 106 agreements. While planning obligations may be perceived as development contributions, they are measures that can mitigate many of the negative impacts that may arise from project development. The planning obligations are measures that can be taken to create nature reserves, provide convenience facilities such as roads, improve infrastructure, and build schools. Developers can provide in-kind benefits to local communities by using the planning obligation system. In the post-consent phase of the plan, negotiation and agreement, governance and administration are important. If consent is obtained for the plan, the details of the community benefit package should be confirmed. In order to finalize the details, sometimes a third party supports negotiations, but most of them are negotiated through direct dialogue between the developer and the local community. During the negotiation process, in most cases, there is no unified opinion among local communities. In this case, the development business operator can intervene to help gather opinions among local communities. In addition, when the local community establishes an activity plan for revitalizing the local community, the development company can provide benefits for the local community activity.

The following five points must be involved in order for community interest funds to be used successfully. First, there is a need for a clear agreement on the community interests provided by power generation operators. Second, there must be a mechanism to maintain the interest clause of the local community regardless of the power generation operator. Third, the purpose and use of funds must be clear. Fourth, a clear and stipulated system for money

management and distribution is required. Fifth, there should be details about the roles of all parties participating in the fund. Consensus on community interests between local communities and developers requires legal agreement to minimize the risk of conflict. And a lawyer can be involved in this process.

Once a community benefit package is agreed upon, the mechanisms to manage it must be determined. For example, if you create a community interest fund, you can get help from experts and official agencies who can manage it and raise additional funding.

Community fund management in the UK is run primarily by community groups, local authorities and independent fund managers. Community interest funds are managed by professional groups or experts, but all decisions for this should be made with the participation of representatives of the local community. In addition, matters on fund management should be shared with members of the local community. Distribution of fund management is determined by representatives who are organized to revitalize the local community.

3. Australia New South Wales

Ernst & Young (2014) argued that Australia's New South Wales (NSW) has tried to create a benefit-sharing system to unite communities after experiencing the fact that the community is divided into two by wind power generation.

In order to establish a benefit sharing system, NSW published “Strategic options for delivering ownership and benefit sharing models for wind farms in NSW” to increase the acceptance of wind power and to distribute benefits equally to local communities.

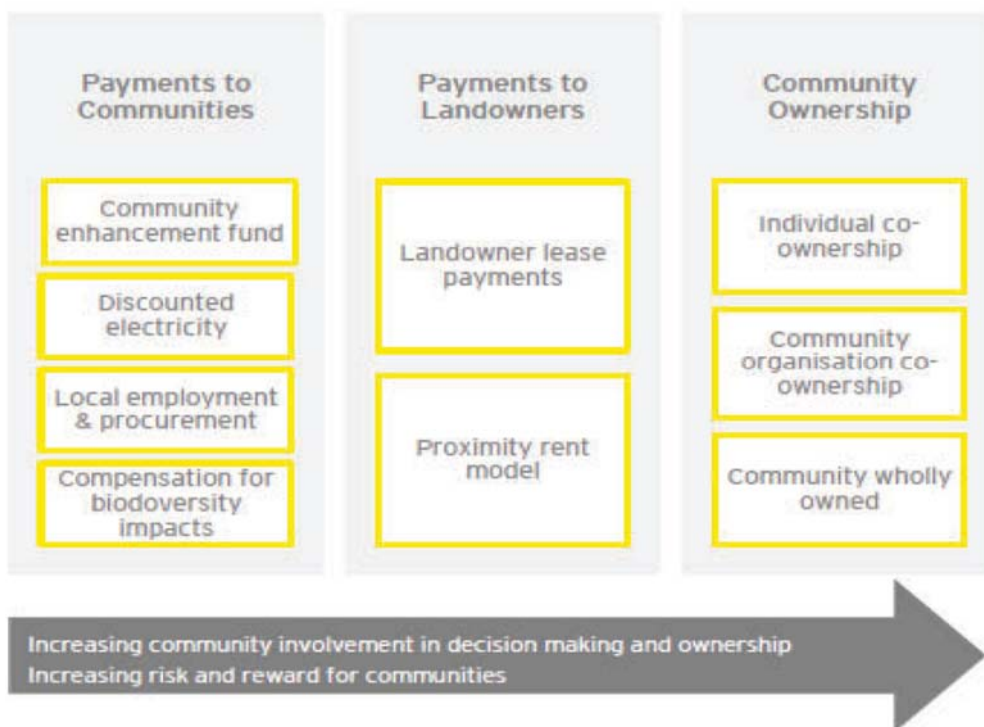
In NSW, despite the high potential of wind power generation, there was a problem in the acceptance of residents due to changes in landscape, noise, and problems in consultation between the developer and the local community. In NSW, developers are not obligated to provide local communities with benefits from power generation projects, but in general,

developers voluntarily provide community improvement funds or land usage fees for power generation facilities to landowners. However, neighbors close to the power generation facility did not receive any benefits, resulting in inequality problems. The NSW government has announced the NSW Renewable Energy Action Plan to achieve the vision of “Safe, Reliable, Economical and Clean Energy”. The goal of this action plan is to raise the target for renewable energy to 20% by 2020, and a key strategy for this is to increase renewable energy generation in NSW through close cooperation between the NSW community and the renewable energy industry.

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In NSW, monetary compensation for wind power was a problem between landowners and developers. In the process of making such compensation, many inequalities have arisen as the participation of local communities is limited. And discussions with local communities on wind power generation have been late in time. NSW has reduced the need to establish a new benefit-sharing system in which local communities can participate in order to overcome the concerns

and inequality considered by the local community. Rather than the distribution problem, the new benefit-sharing system should consider local community harmony, activation of local community participation, and return of wind power project profits to land owners and local communities. In addition, the benefit-sharing system is a voluntary agreement between the local community and the developer, and is largely classified into three types. Local community benefits, land owner benefits, and local community ownership.



Source : Ernst & Young(2014, p.12)

Figure 5. NSW's profit-sharing system

The new benefit-sharing system can enhance the acceptability of new and renewable energy projects and play a financial support role in vitalizing local communities. In NSW, community funding and compensation for landowners were established as a general benefit-sharing system. However, one benefit-sharing mechanism does not apply to one project. The benefit-sharing system is developed in consultation with stakeholders to reflect the needs of local communities and land owners. Through this consultation process, the acceptance of new

and renewable energy projects can be increased.

In NSW, three factors must be considered for state governments and developers to establish a benefit-sharing system. First, the benefit-sharing system should be included in a policy or plan. There are no regulations in Australia that require wind power operators to provide financial support to local communities.

The benefit-sharing system is also not included in the draft planning guidelines. To expand the developed benefit-sharing system, the state must calculate the costs and benefits of the benefit-sharing system being mandated by law.

Second, the benefit-sharing system must be established through consultation with local communities. In the early stages of development, the benefit-sharing system, which proceeded without consultation with the local community, cannot satisfy the needs of the local community. Only by establishing an open and transparent consultation process can trust between local communities and development companies be built. To this end, in the consultation process, a lot of information on development must be provided, advice from experts in legal, planning, governance, accounting and finance is required, and funds must be provided on reasonable terms from financial institutions and states.

Third, it is necessary to consider the change in profits arising from the use of the profit sharing system. If the local community invests in wind power development, it may take risks as an investor and demand a high return on investment.

4. Implication

A review of the recently published guidelines for building benefit-sharing can reveal some common facts.

First, distributional justice is also important in constructing benefit-sharing, but procedural definition must be established first. There are many ways to share profits. There is

no single benefit-sharing method that can be applied to all renewable energy projects and that everyone can be satisfied. There are various types of benefit-sharing, and the plan for benefit-sharing should contain various opinions from different people. In order to satisfy the diverse opinions of various stakeholders, the process of establishing a benefit sharing system must be transparent and fair. From the initial stage of the new and renewable energy project implementation, site selection, local residents of the region must participate in the project plan and communicate with the project development company. If local residents feel that they are formally involved in the project development discussion process, the chances of success of the project are lowered and the conflict only deepens. Clear feedback on the opinions expressed by local residents in the process should be provided.

A communication process involving local residents can be the key to the success of renewable energy projects. In this communication process, information on environmental, social, and economic impacts related to new and renewable energy projects must be provided accurately and transparently to local residents. When providing information, it is also possible to express opinions of experts directly. You can improve the quality of your choice.

Second, a clear definition of local residents who are involved in the project must be accompanied. In order to establish a procedural definition of a benefit-sharing system, an accurate scope for local communities and local residents must be established.

Without a clear definition of the local residents involved in the project, the number of issues to be solved can become too diverse, such as increasing the number of stakeholders participating in the project and generating too many complaints.

In order to establish a successful profit sharing system, it is necessary to establish a clear scope for local residents, and must precede procedural justice, such as communication between local residents and developers from the early stages of development, and providing clear feedback on local residents' opinions. The benefit-sharing plan selected by procedural justice

will also facilitate obtaining an allocative justice.

Third, local community benefits provided by renewable energy generation are used to revitalize local communities by implementing a “profit sharing package” based on the needs of various local residents. The benefit-sharing system for local communities following the implementation of new and renewable energy project projects should be able to lead to regional vitalization based on locality. As mentioned earlier, there is no single type of benefit sharing that can satisfy all participants. In order to capture the diverse opinions of the local community, various profit sharing must be implemented. So, we replace profit-sharing with the term “package” for profit-sharing. Various types of benefit-sharing are organized into one package to satisfy the needs of local residents.

Profit-sharing packages are not used to reward individuals. The benefit-sharing package is not given to each individual in the local community in the form of cash rewards, but is used to revitalize the local community.

Fourth, the operation of the profit-sharing package is operated by the local community, but it can be consulted by experts and external organizations, and the operation should be conducted fairly, transparently and systematically. The local community can form a separate organization to operate the benefit-sharing package, or it can form a committee in which local governments, local organizations, and regional representatives jointly participate. Profit-sharing packages must be operated within a documented system, and advice from lawyers, accountants, financial experts, etc.

Fifth, profit-sharing packages provided to local communities are voluntarily provided by power generation companies, but the effect of providing profit-sharing packages on the acquisition of business rights differs depending on the system of each country. Although it is not legally institutionalized for power generation companies to propose profit-sharing to local communities, it is often voluntarily made by power generation companies in terms of

enhancing the acceptance of local residents and revitalizing local communities. In addition, local governments recommend profit sharing to power generation companies in terms of cost due to social, economic, and environmental changes following the implementation of new and renewable energy projects.

The degree to which this benefit-sharing provision affects the acquisition of business rights differs according to local institutions. While England legally does not allow you to assess the availability of benefit-sharing in your business selection, the state of Victoria, Australia, does require you to offer a benefit-sharing program when you select a business.

Sixth, the role of local governments is important in establishing a profit-sharing system. The strategy for building new and renewable energy can begin with addressing local concerns, not national policy. In order for renewable energy projects to revitalize local communities, they must be merged with regional development plans as well as regional energy policies so that they can affect regional vitalization. Regional issues that are important to each region are different. Therefore, profits from renewable energy are invested in projects that can revitalize local communities by solving different regional problems. At this time, local governments can provide administrative or tax support for various projects carried out by local communities. Renewable energy projects can increase the local tax revenue, and the increased revenue can be used preferentially to improve the environment and revitalize local communities. Local governments can link regional development policies with regional revitalization programs in regions where renewable energy projects have been implemented.

	Conflict factors	Current system
Environmental factors	Heavy metal pollution, electromagnetic waves, noise, forest damage, etc.	Consultation guidelines for environmental evaluation of onshore solar power generation business (Ministry of Environment, 2018)
Procedural factor	In case of proceeding without sufficient prior notice of facility location, project promotion plan, environmental damage, etc. and consultation with residents	Amendment to the Notification of the Power Generation Project Permit Standards (2018)
Distributive factor	Profit monopoly through development projects led by outsiders Insufficient compensation system for village residents exposed to actual damage	Resident participation renewable power generation project incentive system

Table 1. Response Policy by Conflict Factor Domestic Case

VI. The way to build an effective profit-sharing system

This chapter is the concluding chapter of this report. Based on the preceding studies and domestic and overseas cases summarized and described above, this chapter intends to present a plan for benefit-sharing to increase acceptance of renewable energy power plants from three perspectives. And through this, we intend to contribute to creating a profit-sharing system for K-water.

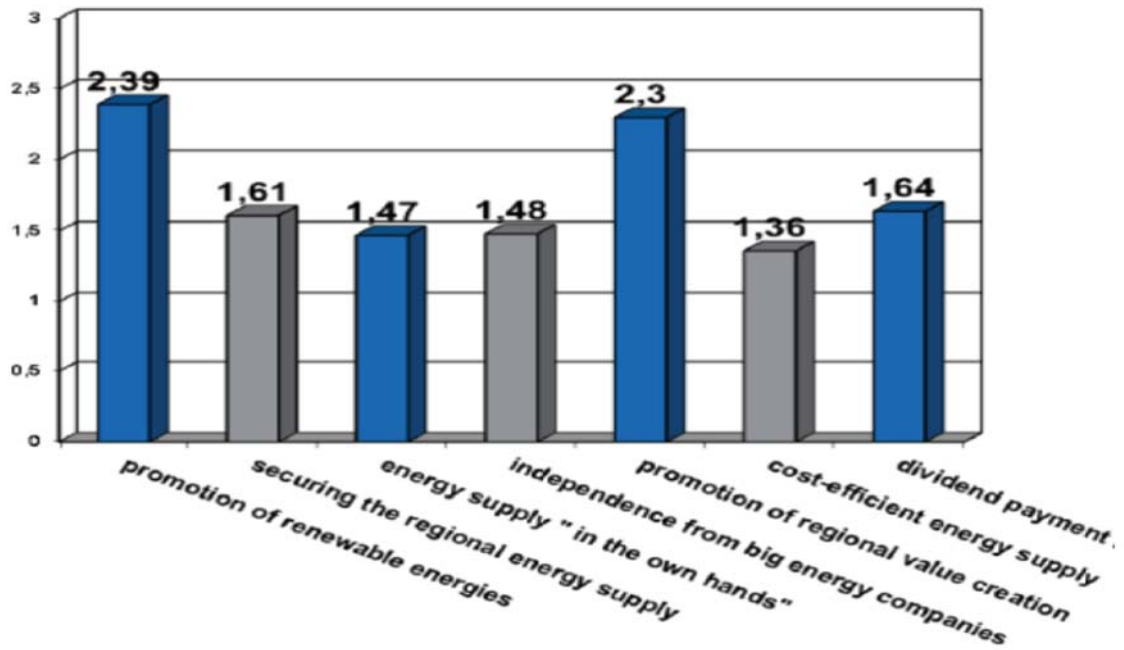
1. Providing various profit-sharing incentives

1.1 Limitations of the current resident participation incentive system

Not only overseas cases but also domestic and overseas previous studies show that various types of benefit sharing can be applied in relation to improving the acceptability of renewable energy. However, the resident participation incentive system currently in effect in Korea is basically designed to be applicable only when residents invest more than a certain level, such as equity or bond/fund investment.

The incentive system has limitations in two aspects. One is that it is designed in consideration of only economic factors among the three factors that hinder acceptance: environmental, procedural and economic factors, and the other is that in the case of local residents, direct investment is not enough, so the effectiveness is low in reality.

In order for the incentive system to increase acceptance to be effective, it is important to discover and spread a number of successful cases early in the introduction. However, due to the limitations mentioned above, it has become an ineffective system.



Source : Wieg, 2018, The Development of Energy Cooperatives in Germany

Figure 6. Reasons for investment by members of the German energy cooperative

Economic benefit sharing is a very important factor in improving acceptance. However, Figure 6 shows that economic benefit-sharing is not the only way to improve the acceptance of renewable energy and may not be the best way. Figure 6 shows that the results of a survey conducted on members who have invested in energy cooperatives in Germany show that economic benefit sharing (dividends) is only the third highest reason.

And the first and second motives for investment, which received far higher scores than economic benefit sharing, were the supply of renewable energy itself and the creation of local value. In other words, through renewable energy, meaningful value is created in the region, and direct participation in this series of activities is enough to motivate members. This shows that the incentives through resident participation are not limited to economic benefit sharing, but need to be expanded to more meaningful values such as eco-friendliness, sustainability, and local value creation of renewable energy.

Another problem with the current system is that residents in areas around solar or wind

power plants often do not have enough wealth to cover the minimum level of investment. For this reason, in reality, business operators pay compensation to residents and induce them to reinvest in the project and promote it as a resident participation type. In addition, additional procedures are required for the resident participation incentive system, such as discussions on ways to lend low interest to residents who wish to participate. In addition, the change in the investment ratio due to the moving in and out of participating residents is also a task that the current incentive system must solve.

1.2 Introduction of an incentive system from the perspective of revitalizing local communities

Even if the residents do not directly invest, incentives such as REC weights are given when the business owner and village residents consult each other to promote various types of village revitalization projects such as village welfare or village projects in connection with local renewable energy projects. In this case, inducing projects through social economic organizations within the region (town) including cooperatives can be an effective measure in terms of increasing regional income and improving acceptance. In addition to the tangible results from the silk project, the process of discussing the content of the local project and the implementation method itself has the advantage of becoming an intangible asset for local residents, thereby creating a foundation for local revitalization.

In any case, road construction is often accompanied by the need for transportation of equipment and materials necessary for the construction of renewable energy power plants, so it has the advantage that the expansion of village/regional infrastructure in connection with this can be provided without extra-large expenses from the perspective of the business owner. Therefore, if the incentives are provided, it is expected that business owners will be able to more actively consult with local residents to provide a local business base, as well as motivate them to promote them more environmentally.

VII. Conclusion

One of the reasons why the current profit-sharing systems are less effective in improving acceptance is that incentives are focused only on the economic side. In this section, I would like to present specific improvement measures to enhance the effectiveness of the resident participation incentive system, a representative renewable energy acceptance improvement system adopted by K-water.

1. Incentive system for residents' participation type of renewable energy generation

Funds are mainly mentioned as resident participatory renewable energy projects. Funds are classified into private equity funds and public offering funds according to the method of recruiting investors. Public offering funds are unsuitable as a way to participate in specific local residents because recruitment activities for specific investors are not possible. On the other hand, private equity funds are only for investors who can invest more than a certain level under the Capital Markets Act, so there are some restrictions to apply as residents' participation. In order to expand the incentive system to the fund, concrete application plans must be presented based on understanding and interpretation of various legal and institutional procedures.

The advantage of investing in renewable energy through cooperatives is that both equity investments and fund investments are possible. If a co-operative owns a certain stake, even if some members of the co-operative withdraw due to relocation or the like, not only can the co-operative maintain its level of equity, but it is also possible to invest in private equity funds as a corporation.

	Overseas Case	Domestic Case
Essential Factor	Procedural justice as much as distributive justice	Cash compensation and bond investment
Improving Acceptance	Activating local communities through profit sharing packages	Transparent and objective environmental evaluation system and financial support for local residents

Table 2. Comparison of domestic and overseas cases

2. Recommendation

As an incentive model suitable for K-water, social value creation such as promotion of the tourism industry through the creation of landscape or preferential hiring of local manpower is considered to be appropriate. To this end, when promoting renewable energy projects, not only economic feasibility but also public interest must be considered as an essential condition.

Improving the distribution of profits is not the only way to solve the problem of resolving the conflict over the location of renewable energy facilities. Non-economic factors such as fair procedures and democratic communication are also important factors in improving the acceptance of residents, such as profit distribution.

And above all, a balanced social awareness of renewable energy must be established. If the resident-participating renewable energy business model becomes a reality through concrete project design and successful pilot projects based on social support for renewable energy, it will be an important turning point in properly utilizing domestic renewable energy resources. As a result, these changes will make an important contribution to expanding the spread of renewable energy.

3. Limitation and future research

This study tried to derive effective measures to improve resident acceptance based on the results of analysis of policies and efforts to improve acceptance at home and abroad. However, it is true that due to various physical and temporal constraints, it is not sufficient to review and analyze various issues and alternatives related to resident acceptance. In addition, various approaches and attempts were not sufficient for K-water's recent efforts to improve acceptance.

Therefore, it is necessary to study a plan to establish an effective benefit-sharing system that can induce voluntary participation of local residents and also improve the acceptance of local governments through follow-up studies. In addition, continuing efforts will be needed on what profit sharing system is needed for K-water as a public company pursuing social values.

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