Experiences and Lessons Learned from Stakeholder Engagement in Transitioning to Use of Community Energy Business Entity
- In the Case of Remote Islands, Nagasaki -

Satoshi ISHIDA
Faculty of Regional Design and Development, Department of Public Policy, University of Nagasaki
123 Kawashimo-Cho, Sasebo, Nagasaki, Japan
st.ishida@sun.ac.jp

Hirotaka HAGA
Faculty of Regional Design and Development, Department of Business Economics, University of Nagasaki, 123 Kawashimo-Cho, Sasebo, Nagasaki, Japan
hhaga@sun.ac.jp

Abstract
Five years have passed since the liberalization of retail electricity sales in Japan. Consumers are now free to choose their own power company and can make a contract with power companies that better suit their lifestyles. As a result of this liberalization, many electric power companies have come up with their own plans. In this trend, emerging community energy business entities that aim for "local production for local consumption" have recently begun to increase. This paper attempts to identify the strategies and challenges from the experience of stakeholder engagement in community energy initiatives. Stakeholder engagement in this context is a form of community engagement used to develop a viable agenda and implementation plan in line with the interests and needs of key stakeholders and constituencies. It is important to seek strategies to involve more stakeholders in decision-making when building new energy systems within a community, especially for in the development of remote island areas with rapidly declining populations. This paper focuses the case study of Nagasaki Prefecture, which has the largest number of remote island municipalities in Japan. Based on semi-structured interviews and document analysis, this research identifies the scope and engagement strategy of the community energy initiatives, and discuss lessons learned and challenges from the experience of energy stakeholder engagement. In the context of remote islands, a geographically isolated and resource-constrained area, both theoretical and practical issues are presented. This paper also presents options and outreach issues to encourage the broader range of stakeholder participation than just energy projects.

Keywords*: Community Energy Business Entities, Stakeholder Engagement, Community Engagement, Community Energy, Remote Islands, Nagasaki*

1. Introduction

Fossil fuel-based energy infrastructure is one of the most important issues for humanity in the 21st century. On the one hand, most developed economies rely heavily on the consistency and reliability of energy provided by fossil fuels for power and transportation. On the other hand, environmental, regional, and policy efforts are underway around the world to transition from dependence on fossil fuels to renewable energy sources and technologies. It is important to recognize that the current energy infrastructure, both physical and structural, can be operated in a variety of ways. This reality inevitably creates real and perceived challenges to options that would change the status quo. The global energy system is undergoing rapid changes due to technological and institutional changes, depletion of fossil fuel resources, and climate change. At the local level, the increase in decentralized energy resources has necessitated a reorganization of the centralized energy system.

This paper examines community energy business entities (CEBEs) as a form of community energy initiatives (CE Initiatives) to integrate decentralized energy resources and reorganize the local energy system by involving the local community. Community-based energy businesses, such as CEBEs, not only

guarantee self-supply of energy in remote areas such as remote islands where the population is declining, but also have a derivative effect in solving various local issues. Although the objectives, business models, and stakeholder composition differ for each project, CEBE can be an effective means of achieving sustainability in depopulated communities, and if properly supported by the engagement of various stakeholders, including local governments, communities, and energy suppliers, it will be an important part of the future energy system.

The expansion of the use of renewable energy sources depends largely on their social, economic, and environmental context. These changes can occur not only between countries, but even between regions within the same country. For example, the renewable resources in one region of a country may be different from those in another region, or those resources may be located in one region, but the energy may be needed primarily in another part of the country. In such a case, who should bear the costs of construction and operation, in economic and social terms? How should the common good be achieved in the community while avoiding burdening only certain sectors? In a society that has been dependent on fossil fuels, some supporters of renewable energy cannot understand the opposition to "green energy. On the other hand, historically affected communities may oppose such projects, arguing for social justice. Environmentalists may also be concerned about the impact on the surrounding sensitive ecosystems. In addition, there is the question of how existing infrastructures, processes, and strategies should be handled. Who will bear the costs associated with such legacy systems, and how will such costs be handled?

As many stakeholders as possible need to be involved in these discussions. It is very important to look for ways to involve more sectors in the policy discussions that are taking place in the face of the challenge of increasing the use of renewable energy. In some cases, intergenerational perspectives should be incorporated into decision-making on these issues. To do this, decisions need to be made with long-term goals in mind, not just to solve immediate problems. With this mindset, people can avoid many (but not all) of the unintended consequences and stranded costs that may occur with the transition to renewable energy.

2. Methodology

In response to commitments and efforts to reduce greenhouse gas emissions, as well as growing concerns about energy security, Japan's energy system is shifting toward a greater share of clean energy generation and reduced energy use through the implementation of energy efficiency measures. In Japan, on June 12, 2021, Prime Minister Suga officially announced his intention to realize the government's goal of zero greenhouse gas emissions by 2050, citing the importance of future-oriented social change in the post-corona era. In Japan, the transition to a decarbonized energy system has so far been led by large corporations, but small and medium-sized enterprises, citizens, and local communities are increasingly playing an active role in realizing clean energy investments. The transition to a decentralized energy system and the gradual liberalization of energy markets are making room for energy users to play an active role, turning them into "prosumers" or co-providers of energy services for local consumption (Izui 2019). While consumer participation in the energy transition is of increasing interest to policymakers (IEA-RETD 2014; ILO 2013), community energy (CE) and shared ownership approaches to energy sector investment are developing globally (ILO 2013; Van Der Schoor and Scholtens 2015). They allow citizens to co-develop and manage energy projects and present a different ownership model than traditional business organizations (Bauwens 2016; IRENA 2020).

The literature on CE approaches often defines CE as social grassroots innovation (Seyfang et al. 2014), and social norms, environmental concerns, trust, community identity and other non-market resources are key determinants and drivers behind the emergence and composition of CE (Kalkbrenner and Roosen 2016). It is considered to be a suitable option to provide access to energy services and investments for a significant portion of the potential end-users of distributed generation and energy efficiency measures, especially those who do not have sufficient capital or suitable areas to develop projects (DECC 2014). Several literatures emphasize that the benefits and revenues from energy investments can be distributed to citizens (Bauwens 2016; Holstenkamp and Kahla 2016). Case studies from the UK and Denmark also emphasize that CE can facilitate local acceptance of renewable energy

(McLaren Loring 2007).

CE initiatives are not a new phenomenon and have existed in several European countries, such as Germany and Italy, since the end of the 19th and beginning of the 20th century. It has been first associated with the production of renewable energy, such as the rise of wind cooperatives in Denmark in the late 1970s and the new wave of citizen initiatives (especially in Germany and Belgium) after the Chernobyl nuclear accident in 1986 (REN21 2016). In Japan, after the Fukushima Daiichi Nuclear Power Plant accident triggered by the Great East Japan Earthquake in 2011, interest in liberalizing energy systems and transitioning to more decentralized energy has been growing rapidly, and in recent years, new community-based electricity businesses such as "Community Energy Business Entities (CEBEs)" and "Community Power" have been increasing. This paper focuses on community energy, especially in the remote island areas of Nagasaki, where access from mainland Japan is limited. Aside from recent studies describing the role of citizen participation in energy transition (Iida and ISEP 2014; Morotomi 2017), there is very limited academic literature on CE initiatives in Japan, especially none that is limited to remote island areas. To fill this gap, this paper uses a qualitative and descriptive approach to identify trends in CE initiatives originating from remote islands, and to present the roles of stakeholders, their engagement and challenges.

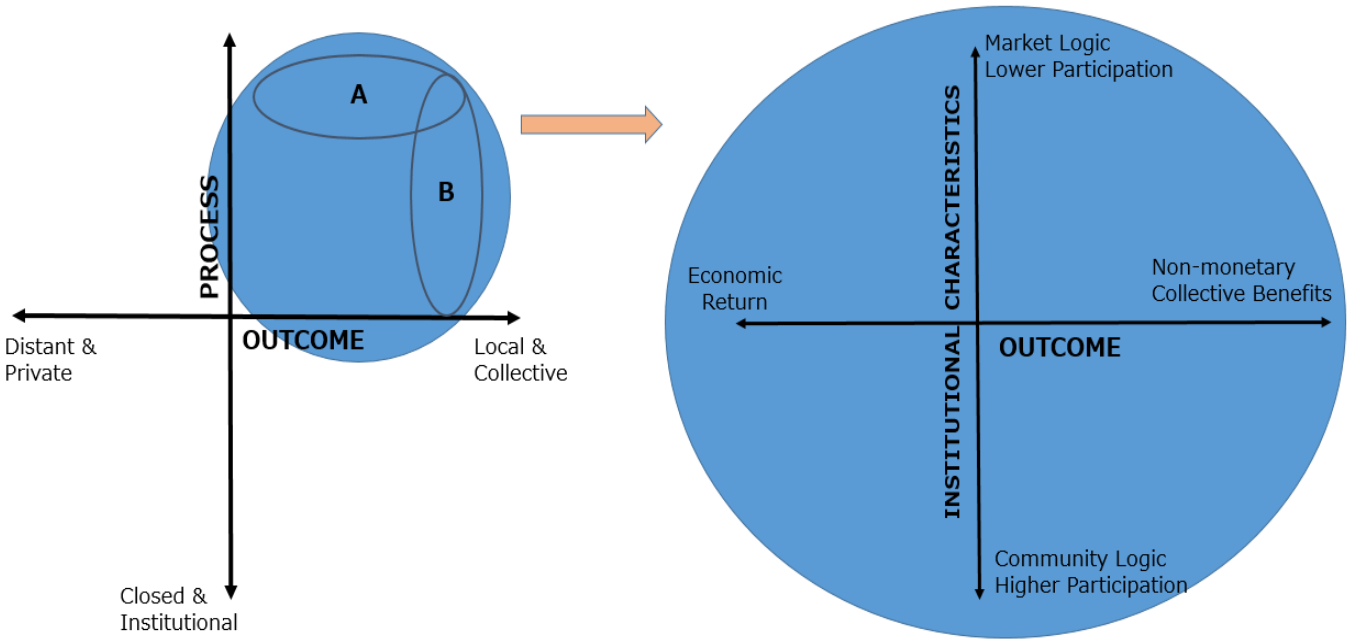
The first objective of this study is to present empirical evidence on CE initiatives in remote islands and to analyze their characteristics. Secondly, it analyzes the impact of such institutional characteristics on the outcomes provided and on citizen engagement. The paper focuses on how the heterogeneity of the characteristics of CE initiatives in remote islands reduces the level and form of citizen engagement and the outcomes provided to citizens. Indeed, in addition to providing a picture and understanding of CE initiatives, this study seeks to provide initial evidence of their implications for citizens and local communities. This paper asks: How participatory was the process? How many citizens (stakeholders) participated, and in what ways? What are the financial and non-financial benefits derived from the initiative, and how do they affect citizen participation? As a comprehensive database of Japanese community energy initiatives in remote islands is not existent, they have been identified through web based searches and grey literature, and contacting relevant organizations and stakeholders. After the initiatives were identified, data collection was qualitative, through on-location, semi-structured interviews with one or two representatives of each CE project. In some cases, further communication with the representatives was required (either in person or via email) to fine-tune and better understand the information and data collected. In particular, we collected evidence on the process and outcome aspects of the project.

This paper is organized as follows. The next section identifies the characteristics of the CE sector in Japan. Next, the institutional features of CE and their impact in terms of citizen participation are further investigated and discussed. Then, a case study of a remote island region in Nagasaki Prefecture is discussed in more detail. Finally, the results and potential policy implications are discussed.

3. Defining Community Energy and Stakeholder Engagement

Civil society's involvement in energy markets can take several forms (DECC 2014; ILO 2013), and the concept of CE has been interpreted in different ways in the academic literature. Some broad definitions refer to sustainable energy initiatives led by non-profit organizations that are neither for-profit nor government-led (Walker and Devine-Wright 2008; Hall and Bolton 2016), while others emphasize the grassroots innovation nature of CE others (Seyfang et al. 2014). In general, citizen and local stakeholder participation is considered a key feature of CE, but green associations, joint purchasing of energy services, community and local government-led schemes for renewable energy deployment, community programs for energy poverty alleviation, etc. It encompasses a wide range of initiatives. Such diversity implies different levels and forms of citizen participation and co-determination in energy service provision (Seyfang et al. 2014). This paper takes a particular perspective in interpreting citizen participation in energy service provision, focusing on CE initiatives: (1) which imply a form of citizens ownership or financing of an energy project, and control over the initiatives (along the process dimension), and (2) where citizens directly benefit from the outcomes of the initiative (along the outcome dimension).

Heterogeneity in the CE sector is represented by a wide diversity of actors, objectives, and organizational forms and has been discussed in several previous studies (Bauwens 2016; Seyfang et al. 2014). Walker and Devine-Wright (2008) argue that to characterize CE, and they propose an analytical framework for characterizing CE and identify two important dimensions. First, the process dimension is interpreted as "by whom the project is developed and managed. Second, the outcome dimension is interpreted as "who the project is for and the economic and social benefits it brings. According to their analytical framework, CE initiatives move back and forth between two extreme situations, as shown in Figure 1.



[Figure 1] Evolution of Analytical Framework to Characterize CE Initiatives
Source: Walker and Devine-Wright (2008)

In the lower left quadrant are cases where the project is developed by an agency outside the community, with minimal or no citizen involvement, and benefits only the agency and its diffuse shareholders. An example would be a wind farm developed by a major power company. Citizen participation projects, on the other hand, benefit the local community and are in the upper right quadrant of Figure 1 (left) Walker and Devine-Wright (2008) emphasize the participatory nature of the process while recognizing that there are several possible combinations of process and outcome dimensions. They identify two different types of projects: those that emphasize the participatory nature of the process (Perspective A) and those that emphasize the redistribution of project benefits among citizens (Perspective B). Before addressing the specific case study, we will describe it, paying attention to following perspectives from (a) to (e).

a. The dynamics of creation, including information on when CE was established, who proposed it, and the approach adopted to develop the initiative. In particular, a bottom-up approach is defined as a case where citizens or other grassroots organizations drive the initiation and development of a project. On the other hand, in a top-down approach, other institutions (e.g., local government, private sector, etc.) lead the process, define the structural features of the project, and facilitate project development and citizen participation.
b. The main activity (energy production, energy consumption, energy services, or a combination thereof), the characteristics of the project implemented, the investment costs of the project, and the geographical scope of the initiative (in particular, whether the citizens involved are geographically close to the project (local)) type of activity and economy, including information on
c. Organizational structure, including the legal form of the project (cooperative, limited company, or other

form), the means provided to citizens (equity or debt), the degree of ownership and citizen involvement, and the structure of financing.

d. Financial benefits, return on investment provided (including potential savings on electricity bills).

e. Other services or benefits to be derived from the project (e.g., provision of other energy or community services).

4. Remote Islands Context and Stakeholder Engagement in Nagasaki Prefecture

This section outlines the characteristics of power systems in remote islands of Japan. Japan is an island nation consisting of 6,852 islands, of which 6,847 islands are defined as remote islands, excluding Honshu, Hokkaido, Kyushu, Shikoku, and Okinawa Islands. According to the "Status of Remote Islands" report published in October 2014 by the Remote Islands Promotion Division of the National Land Policy Bureau of the Ministry of Land, Infrastructure, Transport and Tourism, 418 islands are inhabited, with a total of 387,000 people living there.

Nagasaki Prefecture, located at the western end of the Japanese mainland, has the largest number of islands among the 47 prefectures, with a population of about 1,305,000 as of March 2021. In addition to its many islands, the prefecture has a large number of rias coastlines, making it the second or first longest coastline among the 47 prefectures. There are 971 uninhabited islands and 73 inhabited islands. According to Mr. Atsufumi Kikumori, President of Think Nagasaki, the share of renewable energy in Nagasaki Prefecture's total power supply is still low at present, with solar power accounting for most of it at 72%. Wind power accounts for 14%, and while onshore wind power is the majority, offshore wind power is expected to grow rapidly and become the mainstream in the future, partly due to national policies. In addition, Nagasaki Prefecture has many remote islands and peninsulas with strong winds, which are suitable for offshore wind power generation. Currently, the first floating offshore wind power plant in Japan exists in Goto City, and there are plans to build 10 power plant plants off the coast of Goto City. In addition to this, the area off Enoshima in Saikai City has been designated as the district, and specific offshore wind farm construction is being considered in the future (Kikumori 2021).

In the remote islands of Nagasaki, where there are potential energy resources such as offshore wind power, the question should be how to change and transition existing energy infrastructure and practices to maximize the potential of renewable energy and its return to the local economy. One problems in the public policy cycle is the limited participation of scientists and engineers, usually in the form of reports to policymakers. The shortcomings of this approach are many, and energy experts need to be more actively involved in the decision-making process. Therefore, it is considered crucial to establish a participatory governance structure that can involve more stakeholders in the transition to more sustainable energy solutions. In March 2018, the "Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities" was enacted. In the remote island areas of Nagasaki Prefecture, where the potential for renewable energy resources such as offshore wind is considered to be high, the question is not how to integrate renewable resources into the existing energy infrastructure, but how to change existing energy infrastructure and practices to maximize the potential of renewable energy. The question should be how to change existing energy infrastructure and practices to maximize the potential of renewable energy. In order to move forward to a more sustainable future, all stakeholders and citizens involved in energy need to be involved in the generation, evaluation, and implementation of long-term strategies (O'Neill-Carrillo et al. 2010). Particularly in Japan's remote island areas, where the population is declining rapidly, all sectors would need to assume their respective responsibilities in order to realize a sustainable energy future.

Energy-related stakeholders must have a credible mechanism to constructively discuss their concerns and views in order to address the challenge of expanding the use of renewable energy resources. An example would be a forum where groups can come to a common understanding in order to devise concrete actions to expand the use of renewable energy. In this forum, the issues of uncertainty and regional differences mentioned earlier must be addressed. Occasionally, it may also have to deal with trust issues that may exist between groups that have previously been at odds with each other (O'Neill-Carrillo et al. 2010). Any stakeholder engagement mechanism needs to have a common and transparent way to provide timely information to all sectors before policy decisions are made. This is especially true given

that many energy-related decisions are based on a hierarchical, top-down approach. As will be discussed later in this paper, one of the reasons for the lack of increased public understanding and awareness of CE is that the participation of stakeholders and citizens in the policy-making process is limited and usually delayed. Today is the time to rethink the existing paradigm and standardize the arena so that all stakeholders in the region can benefit from it without favoring any particular group or sector if we are to take advantage of the economies of scale across the region to attract participants. A transparent communication system can be used as a tool for all stakeholders to express their concerns and suggestions about energy. Transparency is not something to be feared, but rather something to be embraced for its accountability. The following sections presents a review of community power that seek to encourage inclusive stakeholder participation and local contributions in the discussion of the transition to local production and local consumption of energy in a remote island community in Nagasaki.

5. Results of the Review on the CE Sector

5.1 Process: Creative Drivers and Organizational Structure

In Nagasaki Prefecture, which has many remote islands, most CE initiatives have taken a top-down approach, except for bottom-up projects initiated by civic groups. Sustena Energy Nagasaki (SEN) in Nagasaki City, the most populous municipality in Nagasaki Prefecture with a population of 400,000, and Nishi Kyushu Sasebo Powers (NSP) in Sasebo City with a population of 250,000, have taken a government-led approach, with Sasebo City's CE initiative with 90% of the investment led by the government[1]. In the cases of Sasebo and Nagasaki, local governments have been strong drivers in promoting and coordinating projects or providing funding to deploy electricity to public facilities, or in the regulatory and financing frameworks to make these possible. This reinforces the view in the recent literature that it can be an important part of driving the energy transition and influencing changes in the local energy system (Rutherford and Jaglin, 2015).

However, the level of stakeholder participation and co-determination is determined not only by the legal form adopted (and relative internal governance as defined by national laws and regulations), but also by the level of citizen ownership and their broader involvement and influence in the development and management of the project). For example, the Hokkaido Green Fund (HGF), one of the pioneers of community power in Japan, has taken the form of a non-profit organization. HGF has also developed a "citizen's investment" program to collect small amounts of money from citizens across the country by calling for citizen participation in the construction of wind turbines, and built Japan's first citizen wind turbine (990kw output) in Hamatonbetsu, Hokkaido in 2001. Since then, HGF has been involved in supporting the launch of citizen-led CEs in Aomori, Akita and other prefectures (Omuro 2009).

However, the degree of stakeholder involvement and joint decision-making is determined not only by the form adopted (relative internal governance as defined by national laws and regulations), but also by the level of stakeholder and citizen ownership and their broader involvement in and influence on the development and management of CE projects. For example, the *Goto Shimin Denryoku* (Goto Citizen Power: GCP), which operates community power projects including wind power in Goto City, allows local businesses and citizens to participate through equity participation. As of the end of July 2021, 52 individuals or organizations based on the island have invested in the project[2]. On the other hand, in the case of municipal-led new regional power companies (municipal new power companies) such as Nishi Kyushu Sasebo Powers (NSP) based in Sasebo City, which the authors previously interviewed, more than 90% of the investment is made by the Sasebo City[3]. The NSP was developed with a strong top-down approach by the local government; in contrast, the GCP is more private-sector driven. However, in the case of the NSP, major companies outside the city are also deeply involved in the operation of the project. Thus, top-down initiatives proposed by local governments and corporations result in an organizational structure with low citizen involvement and low citizens' right to make collaborative decisions. In Japan,

---

[1] See Nishi-Kyushu Sasebo Powers Home Page: https://nishi-kyushu.de-power.co.jp/ (Accessed 2021/10/12)

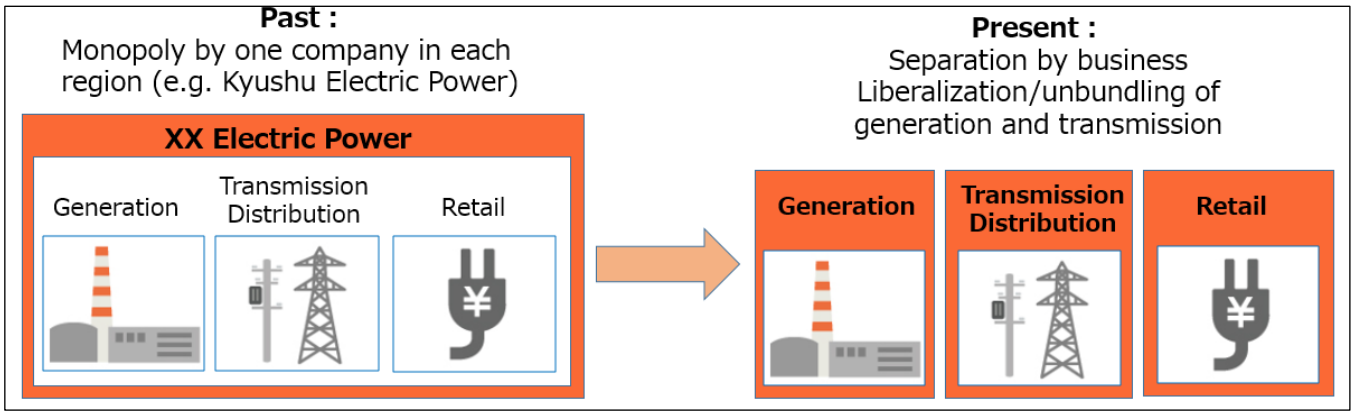
[2] See https://510power.com/company (Accessed 2021/10/08)

[3] Based on Interview Survey with staffs of Sasebo City and Pacific Power (2021/04/21)

because of the rapid increase in the establishment of CEBEs over the past five years or so, both CE projects proposed by some private companies and CE projects led by local governments are funded by some form of project finance in the initial stage, and then citizens and other stakeholders are funded in the next stage (Japan Research Institute 2021a). Candelise and Ruggieri (2017), who conducted a case study of Italy, where community power is more industrialized and unionized than in Japan, noted, among other things, that initiatives driven by commercial actors and inspired by market logic tend to have lower levels of participation and citizen co-decision making than initiatives based on stronger community logics.

5.2 Process: Types and Timing of CE Projects in Remote Islands

In Japan, CE projects have been introduced especially after 2016, when the "total liberalization of retail electricity" was implemented by the government policy. This coincides with the implementation of the Feed-in-Tariff (FIT) scheme, which led to an increase in the installation of distributed renewable energy capacity in the country. Until then, electricity sales had been monopolized by traditional major power companies such as Tokyo Electric Power Company and Kyushu Electric Power Company. However, with the deregulation of electricity, people from various industries have entered the market, and competition has begun to emerge. As a result, prices are becoming cheaper and a variety of services are becoming available. The deregulation of electricity retailing itself started in 2000, but it was only for buildings and large factories, and did not fully spread to general households. However, after the accident at the Fukushima Daiichi Nuclear Power Plant caused by the Great East Japan Earthquake in 2011, a national committee pointed out that the system monopolized by the major power companies "may have problems in terms of crisis management," and retail liberalization was quickly accelerated. In addition, there were widespread concerns and doubts about nuclear power generation, and the government began to focus on promoting the use of renewable energy sources such as solar and wind power. The following figure shows the background to the recent expansion of CE initiatives in Japan. Briefly, the conventional monopoly of power generation, transmission and distribution, and retail business by major power companies in each area is shifting to a form in which each business is operated separately according to the characteristics of each region.



[Figure 2] Background to the Expansion of the CE Initiative
Source: Authors

In the remote island areas, in addition to the aforementioned GCP case, there are other efforts to promote smart communities in the islands, such as the Island Smart Community Project in Miyakojima City, Okinawa Prefecture, and the Oki Hybrid Project in the Oki Islands, Shimane Prefecture[4]. These situations are driving the development of the CE sector in Japan's remote islands, opening a window of opportunity for development in remote island regions that typically do not have the capacity to handle

[4] The case introduced here was selected as part of the "Storage Battery Verification Project to Promote the Introduction of Renewable Energies in Remote Islands" conducted by the Ministry of the Environment in 2014, and the Oki Hybrid Project involves the Chugoku Electric Power Company, a wide-area electric power company.
See https://www.energia.co.jp/nw/safety/facility/okihybrid/project/, and https://www.nedo.go.jp/content/100788812.pdf

large, complex, and risky project development in the energy sector.

5.3 Outcomes: Monetary and Non-Monetary Benefits

In the case of the GCP, the return on investment provided to citizens is a 10% discount on electricity rates compared to Kyushu Electric Power. as of the end of March 2020, 52 companies, organizations, and individuals have invested in the GCP, and nine sales outlets (agency stores) are selling "*Goto no Denki*", mainly in Goto City. Some of the GCPs provide community contribution services and non-monetary benefits in addition to the return on electricity bills. One of the community contribution projects is the "Goto Camellia Revival Support Project". There are about 9 million camellia trees on the island, and the island boasts the largest production of camellia oil in Japan. Many of them were planted as windbreaks and tide-break forests for fields, and harvesting camellias in autumn was one of the off-farm jobs. However, with the depopulation and aging of farmers, more and more land is being abandoned, and the fields that used to be beautifully tended like a park are now covered with weeds up to waist height, making it difficult to get close to the camellia trees. It takes about 5 years for a camellia tree to bear fruit, and more than 10 years for full-scale harvesting. In addition, the production of camellia oil requires manual labor in every step of the process, including weeding, harvesting, and drying, and the amount of work required is not commensurate with the income, which directly leads to a shortage of successors. Against this backdrop, GCP has been working on a project to return a portion of its profits to "protect and nurture the camellia forests of Goto”[5].

Furthermore, GCP has recently been active in the SDGs initiative, as part of which it has been distributing original eco-bags to new customers who apply for the service. In July 2020, Japan started charging for plastic bags as a measure to address environmental issues, including the problem of marine plastic waste, and this In July 2020, Japan have started charging for plastic bags as a measure to address environmental issues, including marine plastic waste, and this community contribution service was started with the idea of contributing to the reduction of plastic bags, even if only a little[6]. As another way of returning small monetary benefits to the community, GCP supports 1,000 yen per person round trip for elementary, junior high and high school students from remote islands to travel from Goto City to outside of the city for sports and cultural activities (Applicable period: October 1, 2020 to March 31, 2022).

GCP is redistributing the income from its investments in renewable energy projects to a wider range of activities. Thus, the CE sector, which has been growing in Japan in recent years, has the potential to facilitate community empowerment to collectively change energy, social, and economic conditions, enable citizen participation and cooperation among diverse stakeholders, and achieve a broad energy transition (Hentshcel 2020). It can be seen that CE projects even in remote island areas not only promote the installation of renewable energy power plants, but also provide citizens with a wide range of energy and community services. In some literatures, it is also found that CE projects in remote island communities provide a wide range of energy and community services to the citizens, for example, energy efficiency audits and consultations in households, joint purchasing of energy services (a wide range of services such as photovoltaic systems, energy storage devices, electric bicycles and electric vehicles, etc.), and even community development schemes (such as information campaigns and collaborative activities with schools), etc..(Candelise and Ruggieri 2017; Japan Research Institute 2021b: Takeyama 2020).

The review so far has shown that the CE sector in remote island regions is very unique due to its local characteristics. Using the aforementioned analytical framework, CE initiatives in remote islands can be located in a two-dimensional space shaped by their institutional characteristics and the range of (expected) outcomes they provide. In the lower left quadrant of the diagram on the right-hand side of Figure 1, market-based CE initiatives driven by commercial actors provide high economic benefits to citizens, but with low participation rates. In the upper right quadrant, CE initiatives formed on the basis of a stronger community logic have higher participation rates but lower economic returns to citizens and a

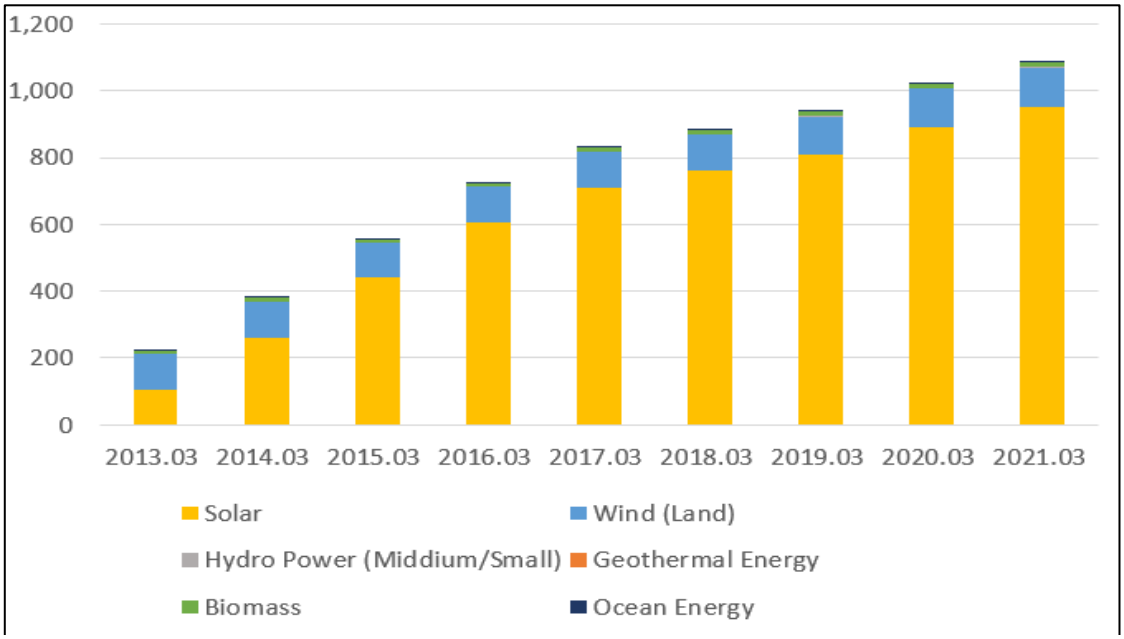
[5] GCP (2020). Goto Camellia Regeneration Support Project: FY2019 Implementation Report.
See https://510power.com/assets/pdf/report.pdf (Accessed 2021/10/10)

[6] See Goto City Renewable Energy Information:
https://www.city.goto.nagasaki.jp/energy/010/030/010/150/20200507131819.html (Accessed 2021/10/10)

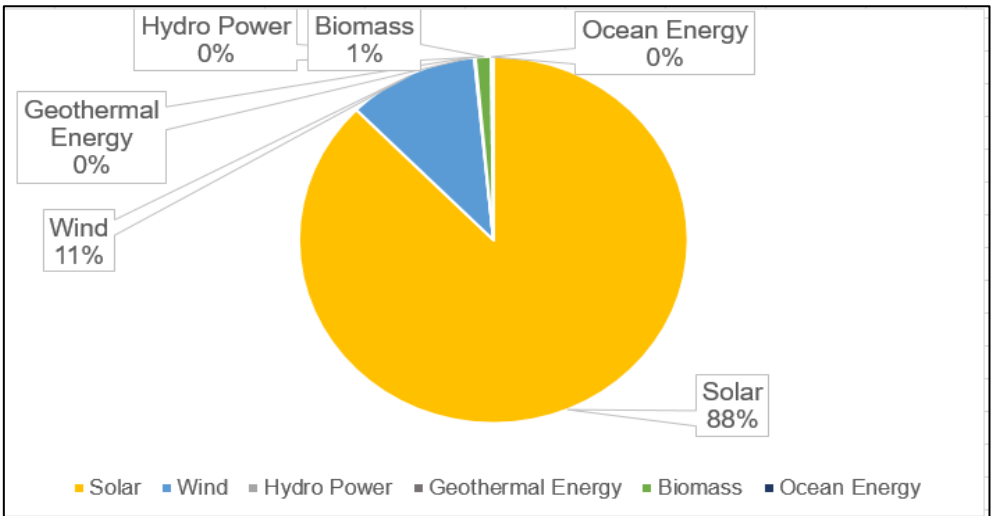
series of additional community benefits. In the lower right quadrant, there are two initiatives conceived on the basis of a community logic, providing both financial and non-financial benefits to citizens: in the case of the GCP, these are community services such as the protection of the camellia forest, succession planning and transport subsidies for school students.

6. Community Attitudes toward Renewable Energy

In Nagasaki Prefecture, various measures have been taken to promote the introduction of renewable energy through the Kyoto Protocol, which came into effect in February 2006. In addition, since the Great East Japan Earthquake of March 11, 2011, renewable energy has been attracting more attention and is being promoted. In this context, the prefectural government have been promoting the introduction of renewable energy. Against this backdrop, a feed-in tariff system for renewable energy was introduced in July 2012, creating a new system to encourage the introduction of renewable energy, and the best mix of energy will also continue to be promoted. According to the "Vision for the Introduction of Renewable Energy" prepared by Nagasaki Prefecture, the four pillars of the prefecture are "utilization of renewable energy," "introduction of energy-saving technologies," "promotion of environment-friendly industries," and "construction of social systems" (Nagasaki Prefecture 2012). The following bar chart [Table 1] shows the status of achieving the numerical targets to date in the Nagasaki Prefecture Vision for the Promotion of Renewable Energy Introduction. Next, the pie chart [Table 2] shows the types of renewable energy sources in Nagasaki Prefecture as of 2021.



[Table 1] The Numerical Targets to Date in for the Introduction of Renewable Energy in Nagasaki
Source: Nagasaki Prefecture



[Table 2] Types of Renewable Energy Sources in Nagasaki (2021)
Source: Nagasaki Prefecture

In the remote island regions of Nagasaki Prefecture, the development of renewable energies is flourishing in line with the recent changes in energy policy. For example, Goto City has a self-sufficiency rate of more than 50% for renewable energy sources such as wind and solar power, making it a leading location for the spread of renewable energy. On September 27, 2021, Gotō City launched "Renewable Energy 100 (RE100)," a program to cover the island's electricity needs with "electricity produced on the island. However, as indicated in the literature on social acceptance of renewable energy technologies, the implementation of renewable energy projects, especially wind energy projects, may encounter strong community opposition around the world (O'Neill-Carrillo et al. 2010). Given the financial, technical, environmental, and political complexities involved in siting renewable energy projects, and the large amount of money required for such projects, it is necessary for project developers to be aware of all relevant information necessary for the success of the project. So what factors are important for a renewable energy project to be accepted? How are renewable energy projects perceived by the local community? What strategies, processes, and initiatives are effective in bringing local communities and developers together in the development of renewable energy projects? Reflections on the social acceptability of renewable energy technologies can help answer these questions in the planning and design stages of renewable energy projects.

The main objective of this paper is to identify qualitative data on stakeholder engagement and attitudes towards energy transition through CEBE in a remote island community in Nagasaki. It also provides general recommendations for effective community and stakeholder engagement strategies in the remote islands of Nagasaki. According to a questionnaire (N=94) conducted by the Nagasaki Shimbun and the Nagasaki Economic Research Institute in January 2021 to major companies and organizations in the prefecture, about 10% of the companies were positive about "decarbonization = abolition of coal-fired power plants," and about 30% were at arm's length. On the other hand, more than 50% of the respondents were proponents of renewable energy. The Japanese government has set a goal of reducing carbon dioxide (CO2) and other greenhouse gas emissions to virtually zero by 2050, and has a policy of phasing out inefficient coal-fired power plants with high emissions by FY30. Of these, 10 respondents said that coal-fired power plants should be actively phased out in line with the government policy. One of the respondents said, "Environmental protection is inevitable. A slightly higher cost is necessary for society" and "It is difficult to stop the global trend, and it is also difficult to operate nuclear power plants"[7]. 22 out of 94 respondents answered, "Restarting nuclear power plants should also be promoted". "Solar and wind power cannot be the main power source. Another respondent (a retailer) said, "Decarbonization of Japan is premised on the operation of nuclear power plants. On the other hand, the largest number of respondents, 64, chose "Existing renewable energy sources such as solar and wind power should be

[7] Nagasaki Shimbun (2021/01/27) Retrieved from https://nordot.app/726991432948350976 (Accessed 2021/10/08)

promoted further. In addition, 55 respondents chose "New marine energy sources such as offshore wind power and tidal power should be promoted. They expressed hope for the prefecture's measures to accumulate marine energy-related industries and for the offshore wind power generation project off Goto City. Overall, there was a positive attitude toward wind energy, with solar and wind power technologies perceived as the safest, most environmentally friendly, and viable of all alternative energy technologies.

As the world becomes more and more carbon neutral by 2050, moves are steadily being made to introduce a large amount of offshore wind power in the remote island areas of Nagasaki Prefecture. The International Energy Agency (IEA) predicts that the amount of wind power installed worldwide will exceed 150 GW by 2030 and reach approximately 350 GW by 2040. Europe and China have already been actively developing systems and investing in development, but Japan's efforts have fallen behind (Japan Research Institute 2021b). In December 2020, the Japanese government announced that offshore wind power would become the "mainstay of renewable energy" in order to achieve carbon neutrality by 2050. In December 2020, the government announced its goal of expanding offshore wind power generation to 10 million kW by 2030, and to 30-45 million kW by 2040, including floating power plants, in order to achieve carbon neutrality by 2050. 30 to 45 million kW is equivalent to 30 to 45 large thermal power plants (Agency for Natural Resources and Energy 2020). With the enactment of the "Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities," the environment for the formation of actual projects is gradually improving. Off the coast of Goto City in Nagasaki Prefecture, the period for accepting applications for developers ended in 2020, and the review of submitted plans for public use is underway.

In order for Community Energy developers and managers to promote citizen participation, they need to consider the opinions and needs of the community, not just commercial interests. With regard to the Community Energy projects proposed in remote island areas, including wind power generation, etc., what are the benefits to the remote island areas? Who are the developers? What is the status of stakeholder engagement? The success of a community energy project depends on how it addresses the issues that are prominent among remote island communities. Therefore, it is desirable that the issues to be addressed by Community Energy emanate from the perspective of the community, rather than being perceived by outsiders. This paper focuses on the socio-economic impacts of community energy projects, rather than on technical aspects such as the amount of power generated by offshore wind turbines or the condition of wind turbines. This study suggests that strategies that emphasize the early involvement of community stakeholders in the design and planning stages of planned CE projects on remote islands, and the enhancement of non-monetary services that contribute to community-based problem solving, may increase the prospects for successful project implementation.

7. Toward Further Community-Based CE Initiatives

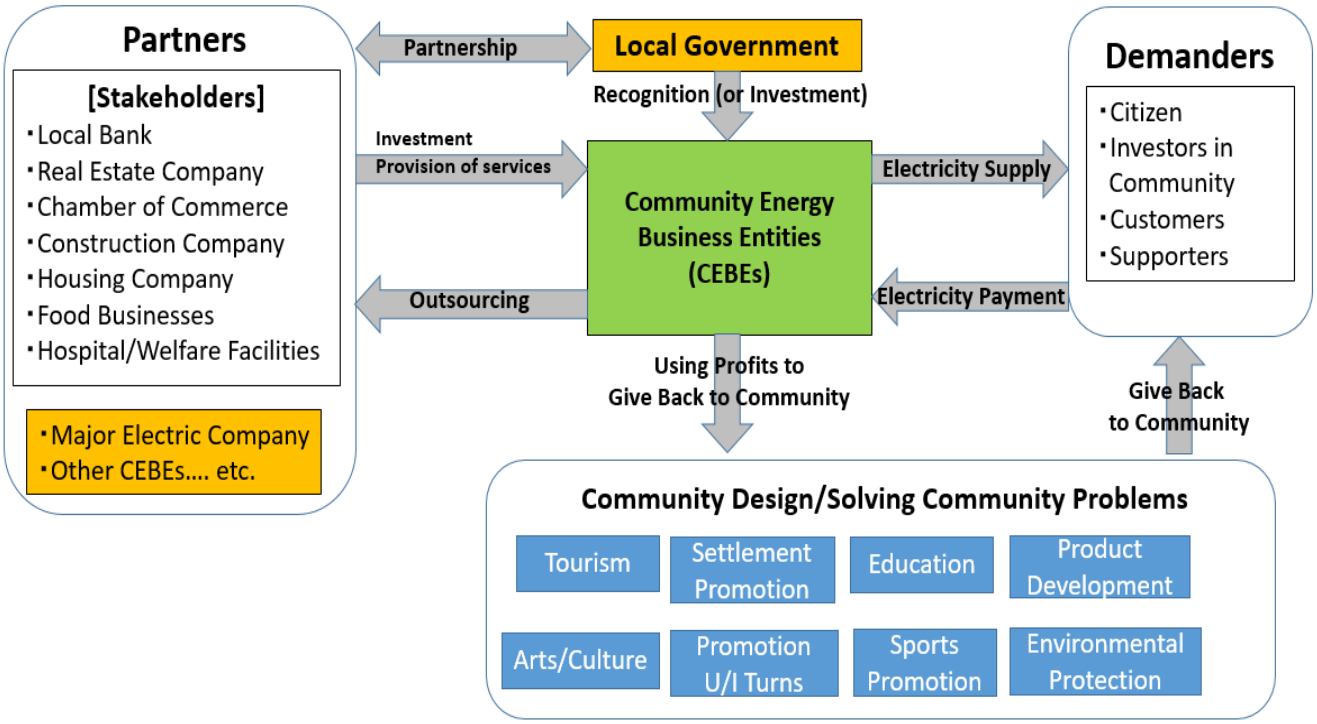
As of June 2021, the number of CEBEs funded by local governments has increased to more than 60, although there are various names in Japan for community energy as defined in this paper, such as Community Power and Community Energy Business Entities (CEBEs). As of June 2021, the number of municipal-funded CEBEs had increased to more than 60. Less than 10% of new power plants are CEBEs, and if we add CE initiatives that sell power in specific regions but are not funded by local governments, the total number reaches about 150 (Muratani 2021). Unfortunately, however, the sales volume of new regional power companies accounts for less than 10% of all new power companies. Many municipalities and emerging CEBEs are struggling to meet the growth curve (Muratani 2021).

The model for CE is shown in the figure, where a local company establishes a CEBE. In some cases, as in the case discussed in this paper, several companies invest in the project. Electricity is procured from other CEBEs at a stable price[8]. The electricity is then supplied to municipal facilities such as schools, private company facilities in the municipality, and residents of the municipality. In addition, the CEBE can obtain "foreign currency" from outside the region, as in the case of "hometown tax" *(furusato nōzei)*[9],

[8] According to Muratani (2021), since the market price of JEPX is expected to skyrocket in recent years, electricity is often procured at a fixed price to avoid 100% of the risk.

[9] The hometown tax (*furusato nōzei*) is a system in Japan that allows taxpayers who live in urban areas to contribute to rural

and use the revenue to return business profits to the region in the form of solving local issues and revitalizing the economy. Whether or not such a cycle can be realized is important for the acquisition and sustainment of CEBE consumers.



[Figure 3] The Scheme of CE Initiatives in Japan
Source: Adapted from Muratani (2021)

First, it is crucial to ensure that the activities of CE Initiatives are properly understood by local residents, businesses, and stakeholders so that they are in a position to continue to be chosen by consumers. In some cases, CE initiatives may not be able to provide value beyond providing low-cost electricity, and may be switched out when new electricity providers with lower prices appear. Second, CE Initiatives has a core value of "returning profits to the community. For this reason, it is necessary to continue to secure sufficient revenue. Muratani (2021) points out that there have been numerous cases in which companies have engaged in inexpensive price competition, thereby cutting into profits and making it difficult for them to continue their business, exposing their fragile business foundations that can be blown away by even a small increase in market prices. Finally, the third factor is attachment to the power source. For example, if the electricity procured by CE Initiatives is 100% locally produced renewable energy, it will be a great way to promote "local production for local consumption". In addition, if a premium can be added to the purchase price, there is no complaint in terms of returning profits to local renewable energy businesses. For example, GCP in Goto City, introduced in this paper, aims to procure most of the electricity it supplies from local wind farms. In addition, in the hope of becoming a community-based electric power company familiar to local residents, GCP is promoting itself to the community by revitalizing local specialty products and supporting cultural and sports activities of students and others in the remote island region. In this way, the company is pursuing its original purpose as a CE and ensuring the continuity of its business.

8. Conclusion: Lessons Learned

One of the lessons learned from the CE Initiatives in remote island communities in Japan that could be applied in other countries and regions is the need for participatory structures that allow for local and

areas in return for a credit from income tax and residence tax.

regional collaboration to make the decisions necessary to promote sustainable energy projects. Another important lesson is that there is a need to go beyond the traditional cost-benefit analysis and include social factors in community energy, such as revitalizing the local economy and solving local problems. Especially in remote island areas with limited transportation access, infrastructure, and resources, it is necessary to think big picture and identify how decisions in the project are connected to other disciplines and sectors, and how they contribute to the community, rather than thinking within the framework of one's own discipline or sector. Furthermore, local expertise and workforce development would be necessary to address specific local problems. Education and outreach to the general public, as well as energy-related workforce development, must be done in a holistic, integrated, and participatory manner.

The threat of global warming and climate change calls for major changes in the energy system for the future. In the context of the transformation of municipal energy policies and the transition to community energy, the positive and effective outcome of the development and implementation relies heavily on the understanding and engagement of citizens and stakeholders. Based on a literature review, qualitative interviews, and several case studies, this paper attempts to present the experiences and lessons learned from the current stage of CE Initiatives in remote island areas in Japan. As a result, the following issues were identified: understanding by residents and stakeholders, return to the community using project revenues, and formation of attachment to the local power source (local production and local consumption of energy). The lessons learned and challenges presented are intended to increase stakeholder participation in the future development of CE Initiatives and to motivate citizens and stakeholders towards a more sustainable lifestyle. However, further systematic research is needed to verify whether these objectives are being fully met.

References

Agency for Natural Resources and Energy (2020) "Toward the Creation of a Renewable Energy-based Economy and Society: Early Realization of a Main Source of Renewable Energy (July 7, 2020) Retrieved from: https://www.meti.go.jp/shingikai/enecho/denryoku_gas/saisei_kano/pdf/018_02_00.pdf

Bauwens, T. (2016). Explaining the Diversity of Motivations behind Community Renewable Energy. Energy Policy Vol.93: 278-290.

Candelise, C. and Ruggieri, G. (2017). Community Energy in Italy: Heterogeneous Institutional Characteristics and Citizen Engagement. IEFE. The Center for Research on Energy and Environmental Economics and Policy at Bocconi University. Working Paper Series. Vol.73

DECC (2014). Community Energy Strategy: People Powering Change. Department of Energy and Climate Change. January 2014. Retrieved from: https://www.gov.uk/government/publications/community-energy-strategy.

Goto City (2021). The Future of Goto City, Illuminated by Ocean Energy. Kouhou Goto Vol.208 (August 2021): 4-7.

Hall, S., Foxton, T., and Bolton, R. (2016). Financing the Civic Energy Sector: How Financial Institutions Affect Ownership Models in Germany and the United Kingdom. Energy Research and Social Science Vol.12: 5-15.

Hentschel, V. (2020). Empowering Civic Engagement in Energy Concepts: Design Implications for Citizen Participation.

Holstenkamp, L. and Kahla, F. (2016). What Ae Community Energy Companies Trying to Accomplish? An Empirical Investigation of Investment Motives in the German Case. Energy Policy Vol.97: 112-122.

IEA-RETD 2014. Residential Prosumers – Drivers and Policy Options. IEA-RETD Report. September 2014 (Revised Version of June 2014). Retrieved from: http://iea-retd.org/wp-content/uploads/2014/09/RE-PROSUMERS_IEA-RETD_2014.pdf.

Iida, T. and ISEP [eds.] (2014). Community Power: Enriching the Community with Energy. Gakugei Shuppansha

ILO (2013). Providing Clean Energy Access through Cooperatives. International Labour Office

Cooperative Unit Report. Green Jobs Programme. Geneva, 2013.
IRENA (2020). Community Ownership Models: Innovation Landscape Brief. International Renewable Energy Agency.
Izui, Y. (2019) Community Model of Electricity and Energy Local Production and Local Consumption. Electrical Engineering in Japan Vol.139 (4): 233-236.
Japan Research Institute (2021a). The Role and Significance of Municipal Energy Business Entities in Promoting the Introduction of Renewable Energy in the Region and Points to Consider When Establishing Them (March 2021). Department of Research and Consulting, Japan Research Institute.
Japan Research Institute (2021b). Strategies to be Taken by the Community to Achieve Carbon Neutrality in 2050. Retrieved from: https://www.jri.co.jp/template/print.html/ (Accessed 2021/10/08)
Kalkbrenner, B.J. and Roosen, J. (2016). Citizens' Willingness to Participate in Local Renewable Energy Projects: The Role of Community and Trust in Germany. Energy Research & Social Science Vol.13: 60-70.
Kikumori, A. (2021). "Nagasaki Prefecture's Decarbonization and Changing Power Supply Structure". Think Nagasaki. Retrieved from http://www.think-nagasaki.or.jp/column/detail.php?id=76
Koirala, B.P., Koliou, E., Friege, J., Hakvroot, R.A., and Herder, P.M. (2016) Energetic Communities for Community Energy: A Review of Key Issues and Trends Shaping Integrated Community Energy Systems. Renewable and Sustainable Energy Reviews Vol.56: 722-744.
Mclaren, L.J. (2007). Wind Energy Planning in England, Wales and Denmark: Factors Influencing Project Success. Energy Policy Vol.35: 2648-2660.
Morotomi, T. (2017). Renewable Energy and 'Stadtwerke': Establishments of Public Energy Utility Companies by the Japanese Municipalities and Their Significance. Kyoto Economic Review 190(4): 1-12.
Muratani, K. (2021). "Community-Based is the Winning Edge for Community Energy Business Entities". Project Design Online (August 2021). Retrieved from: https://www.projectdesign.jp/articles/80674243-6767-4b54-8d17-8070d10acae0
Nagsaki Prefecture (2012). Nagasaki Prefecture Renewable Energy Introduction Promotion Vision. Retrieved from: https://www.pref.nagasaki.jp/bunrui/kurashi-kankyo/kankyohozen-ondankataisaku/saiseiene/saienevision/ (Accessed 2021/10/15)
Nagasaki Prefecture (2021). Report on Zoning Map and Zoning for Offshore Wind Power Generation in Nagasaki Prefecture
O'Neill-Carrillo, E., Ortiz-Garcia, C., Pérez-Lugo, M., and Baiges, I. (2010). Experiences with Stakeholder Engagement in Transitioning to An Increased Use of Renewable Energy Systems. Proceedings of the 2010 IEEE International Symposium on Sustainable Systems and Technology
Omuro, N. (2009). Social Innovation: A Case Study of NPO Hokkaido Green Fund's Citizen Windmills. Kyoto Management Review Vol.16: 63-100.
REN 21 (2016). Renewables 2016 Global Status Report. REN 21 Report. 2016. Paris: REN21 Secretariat. Retrieved from: http://www.ren21.net/status-of-renewables/global-status-report/
Rutherford, J. and Jaglin, S. (2015). Introduction to the Special Issue - Urban Energy Governance: Local actions, capacities and politics. Energy Policy 78: 173-178.
Seyfang, G., Hielscher, S., Hargreavets, T., Martiskainen, M. and Smith, A. (2014). A Grassroots Sustainable Energy Niche? Reflections on Community Energy in the UK. Environmental Innovation and Societal Transitions Vol.13: 21-44.
Takeyama, N. (2019). An Argument over Energy Policy based on Regional Autonomy: For or Against. The Bulletin of Musashino University Institute of Environmental Sciences. Vol.8: 1-19.
Van der Schoor, T. and Scholtens, B. (2015). Power to the People: Local Community Initiatives and the Transition to Sustainable energy. Renewable and Sustainable Energy Reviews Vol.43: 666-675.
Walker, G. and Devine-Wright, P. (2008). Community Renewable Energy: What Should It Mean?. Energy Policy Vol.36: 497-500.