

Summary of the Consigned Operation for Examining the Plans for Community-led Renewable Energy Projects FY2013 Report

1. Outline of the Task

This task is aimed at the development of the following project plans based on the “Summary of the Consigned Operation for Examining the Plans for Community-led Renewable Energy Projects” of the Ministry of the Environment.

- (1) Solar power generation driven by a community association
- (2) Wind power generation with the voluntary participation of a municipality, etc.

2. Operation of the Committee

The Kochi Renewable Energy Project Study Committee was set up, and, to realize the projects, in-depth discussions and studies were conducted at the Solar Power Generation Study Group, the Wind Power Generation Study Group, and community workshops on solar power generation.

Three community coordinator candidates were newly selected, who participated in the discussions and workshops on project realization and were sent to training sessions provided by support business operators to promote the development of core human resources in the community and increase knowledge on power generation projects.

3. Development of Project Plans

3.1. Development of a Small-scale Solar Power Generation Project Plan

A hearing survey of a multiple number of candidate community associations was conducted to develop a project plan in the case where small-scale solar power generation is introduced, being anchored by a community association, and the Negitani/Karato Community Association in Kochi City was selected as a model community association.

Also introduction of such equipment was to be promoted after developing consensus among members at a general meeting of the association. Specific matters, including the scale of the project, were discussed by the directors of the community association at workshops.

Figure: Community association model (proposal)



(1) Study on the introduction scale

To introduce solar power generation equipment, quotations were solicited from four vendors, which were then narrowed down to two vendors. A hearing was conducted with two vendors to confirm details with a focus on equipment warranty, construction method, compensation in the case of a rainwater leak, compensation for movable assets in the event of a natural disaster, etc.

Based on the hearing results, it was decided to introduce the equipment with a solar power generation module output of 4.9 kW and a construction company was chosen.

Introduction of storage batteries was put off due to the relatively high price.

(2) Study on financing and profitability

A half of the project costs is covered by a subsidy from Kochi City, so it was decided to raise the community association's own funds for the remaining half of the costs.

The solar power generation equipment to be introduced has a power conditioner output of 4.5 kW, and the period for selling surplus power will be 10 years based on the Feed-in Tariff (FIT) scheme.

Power consumption is very small at the meeting hall during the day. As a result of a preliminary calculation with a ratio of self-consumption and sale of surplus power at 1:9, the investment was expected to be recovered in six or seven years.

Investment in small-scale equipment below 10 kW was likely to be recovered within 10 years because the calculation included a city subsidy. However, a calculation without the subsidy indicated that it would be difficult to recover the investment in 10 years even if self-consumption were reduced to the extent possible through power-saving efforts.

Additionally, the calculation clarified that corporate income tax, etc. will be imposed and the number of years consumed to recover the investment will further increase if the sale of surplus power by the community association is deemed as a profit-making business.

(3) Outline of the project plan

The project plan is outlined as follows:

Table: Outline of the project

| | | |
|---------------------------|--------------------------------|---|
| Project name | | Introduction of solar power generation equipment into a community association |
| Project implementing body | | Negitani/Karato Community Association in Kochi City |
| System to be introduced | Energy system to be introduced | Solar power generation system |
| | Planned project site | Negitani/Karato Community Association Meeting Hall in Haruno-cho, Kochi City |
| | Energy use | Self-consumption-type sale of surplus power (already approved under the FIT scheme) |
| | Project scale | Solar power generation module output: 4.9 kW Power conditioner output: 4.5 kW |

| | | |
|---------------------------------|---------------------------------|--|
| | Energy generation capacity | Power generation capacity: 6,201 kWh/year |
| | CO2 emission reduction effect | Approx. 4,000 kg CO2/year Approx. 40,000 kg CO2 (10 years) * Calculated using the 2013 Shikoku Electric Power CO2 emission factor (adjusted emission factor) |
| Project scheme | | An authorized territorial group will install the solar power generation equipment and sell surplus power. |
| Financing plan | Project costs | 2,100,000 yen (tax included) |
| | Financing method | Own funds (1,050,000 yen) Subsidy from the city (1,050,000 yen) |
| | Business feasibility assessment | The investment is expected to be recovered in the seventh year according to a preliminary calculation that takes the degradation rate into consideration. |
| Project implementation schedule | | October 2013: Construction contract November 2013: Installation work December 18, 2013: Interconnection |
| Consensus building | | Workshop, etc. within the community association |
| Issues and measures | | It will be difficult to recover the initial investment by selling surplus power under the FIT scheme (10 years) if the sale of surplus power is deemed as a profit-making business and if corporate income tax, etc. is imposed. |

(4) Study on future development

It is difficult to use the revenue from the sale of surplus power to revitalize community activities, so a larger-scale, sell-all model needs to be considered. For this purpose, the community association exchanged opinions on a solar power generation project using roofs, etc. of the houses in the community.

As a result, the following matters to be studied and concerns were pointed out.

<Matters to be studied>

- Availability of roofs and vacant land that can be rented
- Rent fee setting
- Project implementing body
- How to finance the project costs, etc.

<Concerns>

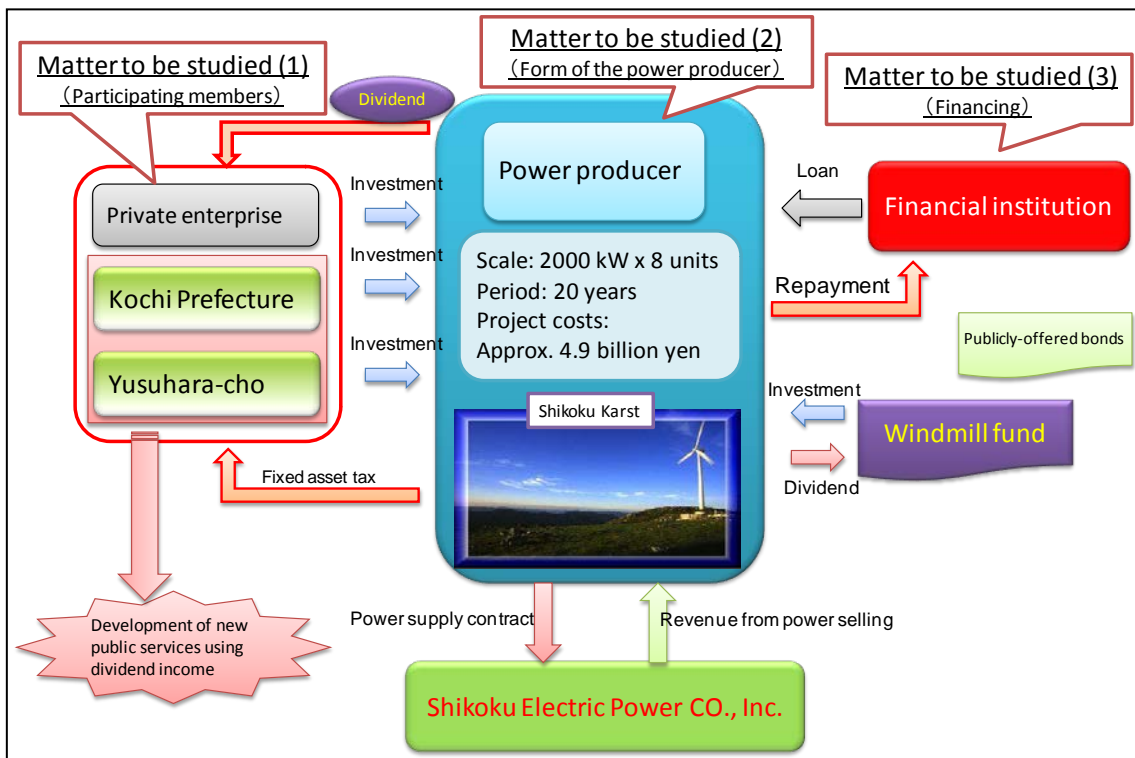
- Concern over earthquake resistance because many buildings are old
- Concern over the possibility of repair and rehabilitation of buildings because of 20 years of the project period
- How to handle at the time of inheritance
- Concern over the profitability of the project because the purchase price is expected to decline

Meanwhile, the use of deserted arable land in the community was suggested. Regulations on power-selling projects through solar sharing in farmlands are being eased, but rules on the handling of uncultivated farmlands have yet to be developed. Therefore, it is necessary to continue to deepen the study, paying attention to the trends.

3.2. Development of a Wind Power Generation Project Plan

The following matters were studied based on the results of the preceding studies.

Figure: Yusuhara-cho wind power generation project scheme (basis for further discussion)



(1) Studies on members and form of the project implementing body

Considering the scale of the project (2 MW x 8 units), compliance with the Environmental Impact Assessment Act, and implementation of a wind condition survey, it is more effective and efficient to use know-how and funds of private enterprises than to realize the project independently by a municipality.

A stock company-based SPC is assumed as the form of the project implementing body, but it is necessary to promote a better form for both the municipality and the partner company depending on the proposals, etc. of the partner in the private sector.

(2) Study on financing

Project finance is usually used for the assumed project scale (2 MW x 8 units), and it is necessary to prepare own funds worth 20% of the total project costs.

The total project costs were calculated as approximately 5 billion yen, so it is necessary to secure approximately one billion yen as capital (equity).

<Study on the investment ratio of the municipality>

The municipality is making efforts to achieve the goal of 100% self-sufficiency in its power consumption (approx. 19,000 MWh). To realize this, the municipality needs to secure units equivalent to four 2 MW windmills and to invest in 50% equity (0.5 billion yen).

With regard to the equity, private enterprises included in the hearing survey suggested, based on their own know-how, that the municipality need not make the 20% investment required by financial institutions. They suggested that flexible measures are available, such as a loan from a group company of the participating company and initial cost reduction through leasing. It is necessary to discuss and study the measures and proposals, along with the scale of the project in detail, based on the proposals presented at the time of public competition.

<Study on the resident participation approach>

Direct investment, citizen fund, and publicly offered mini bond were studied as an approach to invest in the equity, so that benefits from local resources will be given directly to community residents.

Views on advantages and disadvantages vary among respective partners, so it is necessary to continue to study the details.

(3) Study on giving the municipality's revenue to the community

Currently, the municipality's revenues from selling power under the wind power generation project are saved in the environmental fund and used to promote the use of wood materials produced in the municipality, as well as for forestry development and the use of new energy.

Revenues from the project will exceed the current amount provided from the fund if new windmills operate smoothly. Therefore, it is necessary to study the use of the fund for municipality creation as an environmental model city, and for a variety of fields such as settlement, employment, and welfare.

(4) Issues, etc. for future efforts

◆ Measures for environmental impact assessment, etc.

The planned project site is located on the border with Ehime Prefecture, so consideration is needed for surrounding municipalities and residents.

For this purpose, it is necessary to carry forward the procedures as specified in the Environmental Impact Assessment Act, but a considerable period of time will be required until the Final Environmental Impact Statement is completed.

◆ Measures to secure grid connection

Of the 600,000-kW wind power connection capacity in the Shikoku area, 450,000 kW has already been occupied. As a requirement for the application for grid connection, which is decided by the order of application, a series of procedures need to be completed based on the Environmental Impact Assessment Act.

◆ Declined in the purchase price

The preferential treatment period for the purchase price in the Feed-in Tariff (FIT) scheme,

which started in July 2012, is three years. The wind power purchase price is expected to decline after the preferential treatment period ends, having a major impact on the profitability of the project.

→ To address these issues and realize the project, it is necessary to select a partner in the private sector as soon as possible and start procedures, etc. serially.

(5) Outline of the project plan

The project plan is outlined as follows:

Table: Outline of the project

| | | |
|---------------------------|--------------------------------|--|
| Project name | | Wind power generation project in the Shikoku Karst |
| Project implementing body | | A consortium composed of Yusuhara-cho and private enterprise, etc. selected through a public competition (A stock company is assumed.) |
| System to be introduced | Energy system to be introduced | Wind power generation system |
| | Planned project site | Shikoku Karst in Yusuhara-cho, Takaoka-gun, Kochi Prefecture Land located between Godanjo and Mezurudaira and owned by Yusuhara-cho (approx.1 km ²) |
| | Energy use | Sale of all power under the FIT scheme |
| | Project scale | 2,000 kW x 8 units (16,000 kW) * To be decided through discussion based on the proposal made by the partner company |
| | Energy generation capacity | Power generation capacity: 35,418 MWh/year |
| | CO2 emission reduction effect | Approx. 23,000 t-CO2/year Approx. 465,000 t-CO2 (20 years) * Calculated using the 2013 Shikoku Electric Power CO2 emission factor (adjusted emission factor) |
| Project scheme | | Yusuhara-cho, private enterprise, etc. will jointly establish a power producer to implement the wind power generation project. |
| Financing plan | Project costs | Approx. 4.9 billion yen (Preliminary survey (150 million yen), windmills (2,500 million yen), construction work (2,170 million yen), and electricity contribution (80 million yen)) |

| | | |
|---------------------------------|---------------------------------|---|
| | Financing method | <ul style="list-style-type: none"> • 20% project costs (1 billion yen) is secured through investment. • Basically, the remaining cost is covered by a loan from a financial institution. |
| | Business feasibility assessment | <p>Project IRR 7.62% (after tax) 9.33% (before tax) [Unit power-selling price: 22 yen (tax included)]</p> |
| Project implementation schedule | | <p>(Plan)</p> <p>FY 2014: Selection of the partner in the private sector Study on details Start of the wind condition survey Environmental impact assessment: Preparation of an environmental impact statement → Preparation of an environmental impact scoping document</p> <p>FY 2015: Environmental impact assessment: On-site survey</p> <p>FY 2016-FY 2017: Environmental impact assessment: Draft environmental impact statement → Final environmental impact statement Design of the use of wind power generation equipment Grid access study and referral → Application for grid connection Application for equipment authorization</p> <p>After FY 2017: Construction work → Start of power generation</p> |
| Consensus building | | Briefing session for community residents, etc. |
| Environmental impact assessment | | <p>The project is a Category 1 project.</p> <p>To be initiated immediately after selecting the partner in the private sector</p> |

4. Training Sessions, etc. to Realize the Renewable Energy Project

Preliminary calculation of earnings and expenses of the wind power generation and individual study sessions on the maintenance and management of windmills led to the confirmation of specific matters for realizing the project.

Community coordinator candidates submitted reports on the study sessions on renewable energy and energy saving, as well as on training sessions, to the community association. The sessions and training promoted the development of human resources who will play a core role in the community-driven projects, and created an opportunity to promote community-based efforts.

5. Conclusion and Issues

In the small-scale solar power generation project, in which the community association serves as the project implementing body, the introduction plan allowed equipment to be introduced to one site. To expand such efforts across the prefecture, it is necessary to continue to study how to resolve the issues related to incorporation of a community association, taxes, and financing.

In the wind power generation project, a project plan was prepared by horizontally developing the mega solar project scheme, which has already been implemented through joint government-private investment. In the future, specific efforts will be made to realize the community-driven, large-scale wind power generation project.