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A Report for Introduction of Renewable Energy in Rural Areas

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During the Great East Japan Earthquake, atomic power generation has been destroyed by Tsunami and lots of radioactive substances have been spread over Japan. Now conversion of energy source from atomic power generation to renewable power generation becomes much urgent issue than before, and renewable energy business causes grave concern in Japan.

This report is written by the advisory committee for introduction of renewable energy in rural areas. The Japanese government established the consultative committee in October, 2014 and the final report was submitted in January, 2015.

The report emphasized the potential of the renewable energy and importance of participation by local agents such as farmers, foresters and fishermen and municipal governments, etc. Currently lots of renewable energy business is carried on by external enterprises to the area. Then they use local resource but the profit flows out from the area.

To cope with this challenge, promotion of business led by local agents or at least business collaboration with local agents is necessary. The report grasps the current situation and discusses how to overcome the challenge from multi-dimensional viewpoints.

The original report, written in Japanese, is up loaded in the following URL;
<http://www.maff.go.jp/j/press/shokusan/soumu/pdf/150310-03.pdf>

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INTRODUCTION

Biomass such as woody biomass, water and land exist abundantly in rural areas. There is a high potential to use them as renewable resources. Especially since July in 2016 Feed-in Tariff (FIT) system has been introduced, profitability of renewable energy business has increased and so has its potential.

The Ministry of Agriculture, Forestry and Fisheries (MAFF) enacted a law named “Act on the Promotion of Renewable Energy in Rural Areas” and promoted to return back the profit earned by renewable energy production to the local community and reallocate land for the power generation. The act also promotes locally independent renewable energy business, and revitalizes the activity of the local community.

Considering the current situation of renewable energy business, however the profit from the business has not been returned back to the local community, and the revitalization has not been realized, because enterprises (such as companies) outside of the area take the lead to set up the business while the local people have spent time on discussion on how to set up the business. Moreover in the case of photovoltaic power generation that can be established easily compared with the other renewable power generation, a number of applications to the FIT submitted for a short time and power companies began to suspend judgement about some application.

Under this situation, the Food Industry Affairs Bureau of the MAFF set up a committee named “the advisory committee for introduction of renewable energy in rural areas” consisting of academics, local governments, agriculture, forestry and fishery-related organizations, advisor and experts such as financial institutions. The committee had 5 times meetings since October 2014.

Based on the meetings, this report offers aimed status of renewable energy business, and shows guideline for government’s programs and roles of local governments, private companies and farmers, foresters and fishermen. It is expected that MAFF take deals with our opinion as a central figure for revitalization of rural communities. We hope that our opinion will be reflected to government programs, and attract active participation of local governments, private companies and farmers, foresters and fishermen to the business.

Chapter 1. Current status and challenges

1. Potential of rural areas

In rural areas that account for the majority of our land, Biomass such as woody biomass, water and land exists abundantly. There is a high potential to use them as renewable resources. For example, if unused thinned trees (8 million tons per year) are used as woody biomass for power generation, the power generation amounts to about 7 billion kWh. In the case of small-scale hydropower generation in irrigation system, it amounts to about 800 million kWh. They are equivalent to private power consumption of 2.2 million households.

Otherwise photovoltaic and wind power generation can be possible on the agricultural land, which was abandoned and will not be reused anymore. The potential of renewable energy used in rural areas is very high. It is important to use the resources more actively.

Since the introduction of FIT system in July, 2006, most of approved power plants are of the photovoltaic type. The number of the other application is not enough, such as power generation by unique resources in rural areas such as woody biomass and livestock excrement and small-scale hydro power generation. A reason of few applications is relatively long construction period to set up the plants.

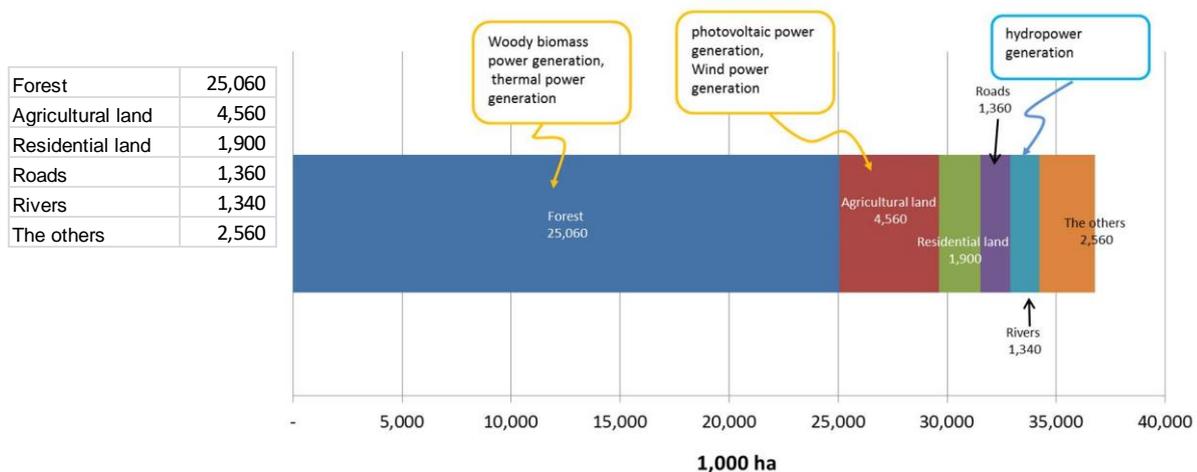


Fig. 1. Configuration of land and the amount of resource for renewable energy

2. Typing of business

The business of renewable energy can be classified as following depending from the point of view of who leads it and how it is being managed.

(1) Business led by local agents

The first one is “business led by local agents”, which is invested and managed by local agents. In this business, most of the profits can be returned back to the local area. However it often takes time to set up the business, because the local agents should raise new funds and acquire new knowledge to overcome challenges. This business-type can be further classified into the ff.

1) Business led by farmers and foresters

This type is led and carried on by a body which organizes farmers, foresters and fishermen (hereinafter referred to as farmers, etc.).

For example, farmers set up photovoltaic facilities on barns or roof of agricultural facilities or on pillars erected in the field. By the new business they can use their land and/or facilities effectively and gain income additionally, and their business is diversified and

stabilized as well. In the other case, farmers change fuel for green houses from heavy oil to woody tips for cost reduction, and sell the product named “flower of carbon off-set” with a premium, or dairy farmers use electricity generated by photovoltaic facilities, and sell the milk named “Eco-milk”, which increased their income.

Moreover in this type, some business is led by agricultural cooperative, forest association, fishery cooperative and land improvement district. They cannot only manage agricultural water ways and easily use the local resources but also have high ability for organization of local residents and collection of local capital resources. Then they have the advantage to lead the renewable business.

The profit becomes directly their income of farmers etc. , and used as a fund to develop the sixth industry for primary industry.

2) *Business led by community in a body*

This business type is carried on by local agents such as local government cooperated with farmers etc. .

In Yusuhara-cho of Kochi prefecture, the local government set up wind power generation, and the profit from the business is distributed to the foresters as subsidy for thinning. In Itoshiro-chiku of Gifu prefecture, a non-profit organization named “Yasuragi no sato itoshiro” began to process corn by electricity provided by small-scale hydropower generation. In this way, through the active participation of local agents to renewable energy business, the profit can be used to develop primary industry soundly.

(2) Business led by external enterprises collaborating with local agents

This business type is led by external enterprises with cooperation of local agents. This type can be classified as follows.

1) *Business led by external enterprises incorporating local agents*

Local agents bear less than half of business expense, and establish special purpose company etc. with the enterprise outside of the local areas. The local agents are involved in decision-making and the profits are also distributed to the local areas.

2) *Business led by external enterprises distributing some profits to local community*

This is a business type that local agents do not bear any business expense but contributes to the consensus-building for the business. Some part of the profit is distributed to the local community as well.

In Mizumasari-cho of Kumamoto prefecture, the community invited a photovoltaic power generation company from outside of the area. The company returns the 5% of the profit to the local community, by which the community sets up a natural park for revitalization of the community.

In “business led by external enterprises collaborating with local agents”, local agents are involved in decision-making and earn a part of the profit. An advantage of this business type is a shorter period of preparation. The local agents can set up the business on a short-term basis by using fund and know-how of external enterprises. In the comparison of “business led

by external enterprises incorporating local agents” and “business led by external enterprises distributing some profit to local community”, the former can distribute profit to the local community much more. On the other hand, in the later business, renewable energy business can be set up even in the case that local agents cannot raise enough funds. It is also possible for external enterprises to build up a consensus smoothly by distribution of the profit to the local community.

(3) Business led by external enterprise

In this case, only external enterprise raises a fund, makes decision-making and carries on the business. The enterprise, with enough funds and know-how can set up a big-size business in a short period of time.

Table 1. Involved degree of local agents by business type

		Ownership	Decision-making	Distribution of profit
Business led by local agents		◎ (over half)	○ (investments and decision-making are separated in some cases)	◎
Business led by external enterprises collaborating with local agents	Business led by external enterprises incorporating local agents	△ (less than half)	△ (less than half)	△ (less than half)
	Business led by external enterprises distributing some profit to local community	×	△ (some profit is distributed to local agents)	△ (some profit is distributed to local agents)
business led by external enterprise		×	×	×

3. Outflow of the profit

Regarding type of agent that carries on renewable energy business, about 20% of the agents are local corporations in photovoltaic power generation. Most of them are business led by external enterprise. In this case, only a small part of revenue such as land-rent and local government tax on estate is distributed to the local community. However the large part of the revenue from sales of electricity is outflowed. Therefore the business does not always vitalize rural areas. This is the challenge on how to channel the profit into the community.

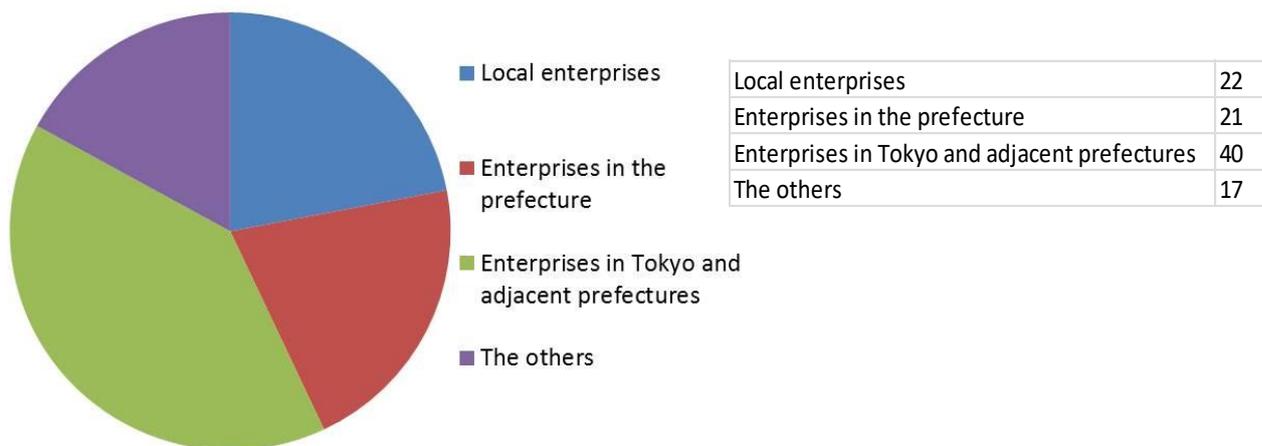


Fig. 2. Leading agents of photovoltaic power generation

4. Concern about conservation of resources

Introduction of renewable energy business into rural areas without thoughtful plan will make various problems.

For example, there is a problem of agricultural rent. The national average of agricultural rent is 12,000 yen / 10 are and 10,000 yen /10 are. However the calculation committee for procurement price of renewable resources, which was established by the Ministry of Economy, Trade and Industry (hereinafter refers as METI), estimated the land-rent as 150,000 yen /10 are. Such high rent rushes farmers to convert agricultural land to the land for photovoltaic power generation. In the forest land, scenic destructions and increase of risk of disaster by the conversion becomes a matter of concern. Illegal conversion and exploitation have been observed as well.

Not only in the case of photovoltaic power generation. Other renewable power generation has been found to create same problems. It is important to harmonize land use for renewable power generation and primary industry use. Moreover in the case of woody biomass power generation, there is risk of overharvesting of trees that suppress valuable function of the forest. The challenge is how to sustainably and fully utilize the resources of rural areas.

Chapter 2. Aimed status

1. Meaning of introduction of renewable energy to rural areas

We have to clarify the meaning of the business for promotion of renewable energy business in the rural areas. The meanings are examined in economic and functional terms.

(1) Economic meaning

There is “economic meaning” in renewable energy business in rural areas. It is to obtain monetary merit by addition of new value to unutilized resources. In other words, it is possible to earn new profit from outside of the area by selling renewable energy. In addition, the expense paid to the outside of the areas also decreases, and can create a new local economic-cycle.

This is true mostly for farmers who can increase their income, by which they can set up the sixth industry and diversify the production. Self-consumption of electricity and heat reduce the cost of fuels and materials. Moreover the products utilizing such renewable energy can be sold as “carbon offset flower”, “eco-milk” so on with premium. In this way, renewable energy business, can contribute to improvement of management.

Yusuhara-cho in Kochi prefecture, revenue of the electricity is spent to help conserve the forests. In this case, the revenue becomes a fund for the budget of local government for development of rural industry.

(2) Functional meaning

Renewable energy business in rural areas has functional meaning in itself. For example, renewable energy business can create new jobs for maintenance of facilities and give tips on production in woody biomass power generation etc. In the areas that introduced renewable energy business in advance, the number visitors to see the facilities might increase and tourists to the areas might also increase accordingly. Recently increase in the number of visitors has significant meaning for vitalization of the rural areas. Moreover renewable energy business reduces utilization of fossil fuels and mitigates emission of greenhouse gas effect. If the energy is utilized by the facilities, energy supply is ensured and not affected by fluctuation of oil price.

Especially in primary industries, specific function will be exhibited, when biomass is used in renewable energy generation. Power generation by gas emitted from fermented excrement of livestock can contribute to reduce an offensive smell and process livestock excrement appropriately. In the forest, crooked woods, branches and parts of roots have been left on the mountains after thinning. However plants of woody biomass power generation can use them and promote sound management of forest. Small-scale hydropower generation can also ensure stable electricity supply for management of agricultural facilities in times of disaster.

2. Exhibition of independency of local agents

Mentioned above, renewable energy business can contribute to the vitalization of rural areas. In running the business, exhibition of independency of local agents is significant as follows.

(1) Promotion of business led by local agents

For vitalization of rural areas, it is necessary to scale up the profit of local areas and to carry on the business based on consensus among local agents. It is also important to promote business led by local agents who can raise the fund, do decision making and earn most of the profit.

In the business led by local agents, lack of fund and know-how are problems, especially in large-scale business. However local agents can exert their originality and ingenuity and develop the business regardless of the type of power generation. Especially, in biomass power generation and small-scale hydropower generation, local agents have an advantage in procurement of fuel and water right. Then business led by local agents should be promoted in the field.

(2) Guidance to business by external enterprises collaborating with local

Even if “business led by local agents” is not easy to set up, “business led by external companies” can be converted to “business led by external enterprises collaborating with local agents” by participation of local agents from the stage of planning of the plants. In particular, the large-scale businesses of photovoltaic power generation, wind power generation and thermal power generation are carried on mainly by external enterprise. In such business efforts to conversion from “the type to the type led by external enterprises collaborating with local agents” are required.

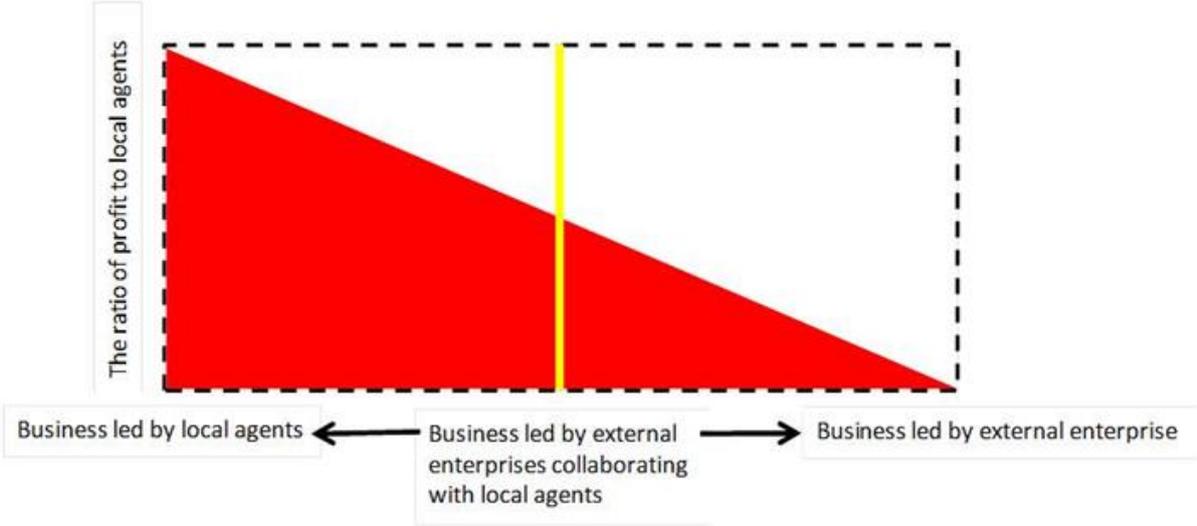


Fig. 3. Share of profit to local community by business type

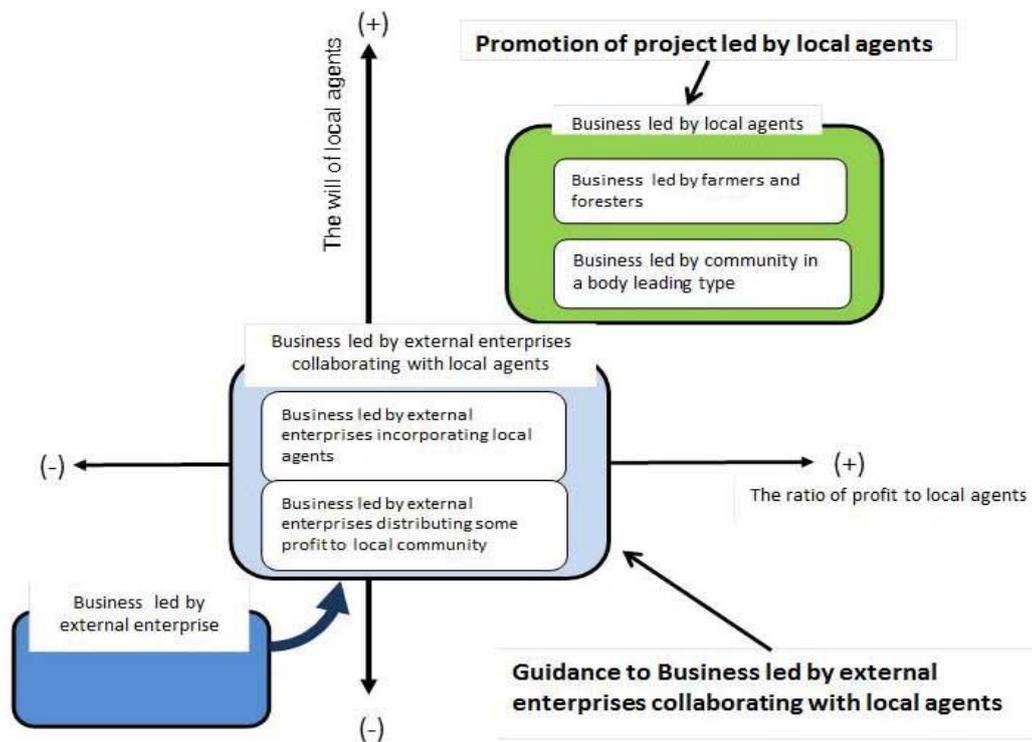


Fig. 4. Aimed status of renewable energy business (rough sketch)

(3) Positive participation of farmers etc. to business

Until today, resource such as biomass, water and land of rural areas are used mainly by farmers etc. Even though new utilization of the resources named as renewable energy has been discovered these days, farmers etc. should play a key role because of their knowledge about resources use in rural areas as before.

In Germany, farmers etc. positively utilize their resources and set up the renewable energy business, and increase income and also vitalize the local areas. In Japan, such positive action should be promoted as well.

In the case of business led by external enterprise, it is necessary for farmers etc. to participate in the business, and convert to “business led by external enterprises collaborating with local agents”.

For example, if farmers etc. can set up special purpose company (SPC) with external enterprises, and are involved in decision making, earn some part of the profit. In this case, individual farmers cannot raise the funds. Organizations of farmers etc., such as cooperatives, should loan the money to them.

In “business type led by external enterprises distributing some profit to local area”, if farmers etc. can be involved to council for decision making of distribution of the profit by the

business, they can use some part of the profit to construction of agricultural processing facilities, create job for maintenance of power generation, use electricity and heat for local agricultural facilities and built up a restraint and direct marketing place for increase of tourists and visitors, etc.

As mentioned above, farmers etc. can increase their income and vitalize the local areas by introduction of renewable energy business in the areas appropriately.

Chapter 3. Toward realization of the aimed status

1. Promotion of business exhibiting independence of local agents

(1) Understanding and sharing of the meaning of business

For vitalization of rural community by development of renewable energy business, stakeholders such as farmers etc., whose organizations were established by them and local governments should understand the meaning of the business and share the aimed status among them. The following shows the details.

(1) Understanding of business

A point in common among the areas, where renewable energy business led by local agents is successfully introduced, is the clarification of the meaning of the introduction of the business.

In Yusuhara cho of Kochi prefecture, the local government establishes a basic principle of “independence”, and has introduced renewable energy business to realize the principle. The principle is well known and shared among the residents. Therefore Yusuhara cho has introduced wind power generation and small-scale hydropower generation, and vitalized the community successfully.

An association of land improvement districts of Nasunogahara has introduced small-scale hydropower generation for realization of sustainable community, the meaning of which is well understood and shared by the residents. The electricity generated by the power plant is provided to the facility of land improvement and the residual electricity is sold to Power Company. The revenue is allocated to cover maintenance cost of water system.

In this way, it is important to clarify “the purpose”, namely vitalization of the area, and “the means”, namely renewable energy business. Moreover the meaning should be shared among the residents.

In particular, for expansion of the business led by local agents, the understanding of the meaning by farmers etc. is indispensable. MAFF should promote their understanding by materials for enlightenment as described in the section 1 of chapter1.

(2) Sharing awareness and system for consensus

To realize vitalization of rural community by renewable energy, broad consensus on organization of management, type and scale of plant, the place of plant and the distribution of profit among is necessary. Moreover the consensus should be reached among local government, power plants, farmers and residents.

In Itoshiro district of Gunjo shi in Gifu prefecture, Gunjo shi and private sector established a renewable energy business promotion council, and clarified the role between them. Thus it is necessary to establish an organization such as council to make consensus, collaboration between public sector and private sector, when the business is led by local agents.

According to the “Act on the Promotion of Renewable Energy in Rural Areas”, local government can establish an organization such as council consisting of local government, farmers, power plants and the other stakeholders, when the local government set up a basic business plan.

There are various types of management body, corporations, general incorporated associations, approved territorial groups and incorporated nonprofit organizations etc. In the Itoshiro district, agricultural cooperative was chosen, in which all of the households are involved in the business. The case of Itoshiro district is very instructive, when we plan to set up business led by local agents.

2. Human resource development and procurement

Human resource development is essential for promotion of renewable business led by local agents.

In setting up the business led by local agents, it is a serious challenge how to acquire knowledge about generation technology. Different knowledge is required in each stage, namely business plan, account plan, fund raising, maintenance of facilities. For knowledge acquisition, the following programs will be helpful.

(1) Training

Knowledge should be organized and provided to local agents who want to acquire it efficiently. Currently MAFF carries on training for renewable energy business and send experts to training held in local areas.

METI begins a series of lectures of “Green Power Workshop” since 2013, which cultivates talented persons. MEITI also sets up “Green Power Skills Standard (GPSS) ” to organize knowledge and to guide human resource development.

MAFF should enforce human resource development in the field of renewable resource business in cooperation with the other ministries.

(2) Advisors

Advisors are necessary, who can appropriately guide and suggest ideas that conform with the local situation. Especially, in the case of the business led by local agents, advisors should have knowledge not only of renewable energy business, but also of primary industries. In the following example, we showed the expected role of each agent as advisors. MAFF should support them in order for them to play their role adequately.

1) Departments of local governments

When local agents, specially farmers, make a plan, adequate advises is necessary, which is provided by staff of departments being in charge of renewable energy business in

governments of prefectures and municipalities. They can advise stocks of biomass, land and water in the areas and how to utilize the resources for renewable energy business. Workers in extension service of prefecture government can also adequately advise how to utilize the resources for farming.

However staff of the government do not have much experience because they have not been involved in renewable energy business, and there are only few talented persons who can dispense advise adequately. It is common in municipal government that collaboration between the department which is in charge of energy and the department being in charge of primary industries has not well organized, and knowledge is not shared well.

Therefore MAFF should have offered training to local government for cultivation of talented persons. In addition, departments of energy and primary industries in the governments should collaborate.

2) Planners for promotion of the sixth industry

Renewable energy business can be classified into the sixth industry. Planners for promotion of the sixth industry are highly professional trained persons. They are expected as advisors to promote renewable resource business. However the number of the planners who had advised in the field is few. MAFF should advertise that planners of the sixth industry can advise, and local agents can utilize their knowledge and know-how.

3) Agricultural cooperatives, forestry association, fishermen's association and etc.

Agricultural cooperatives etc. have regular transactions with their members and have knowledge about finance. Then they are expected to be advisors who can support business planning, fund raising and carrying on the business, and they can also lead the business.

Therefore it is recommended for them to enhance their advising function with the support of the National Federation of Agricultural Cooperative Associations so on.

4) Financial institutions

Advice of local financial institutions, such as local banks, credit associations and JA banks, is helpful, when local agents make plan and raise funds to set up renewable energy business. On the other hand, the local financial institutions do not have enough knowledge about the business. Then Ministry of the Environment delivers experts of the business to local financial institutions for promotion of investments and financing to the business. From now on, local financial institutions are expected to obtain knowledge more and advice local agents adequately.

Agriculture, forestry and fisheries Fund Corporation for Innovation, Value-chain and Expansion Japan (A-FIVE), invests to business that works on the sixth industry. However it has not invested to the business working on renewable energy business yet. A-FIVE can be one of the important investors, which should be made universally known with support of planners for promotion of the sixth industry.

Moreover Norinchukin Bank and National Mutual Insurance Federation of Agricultural Cooperatives have established the fund for renewable energy business in rural areas in 2014, and invest to the business. The knowledge will be accumulated, and they can play a key role in accounting planning and fund raising by farmers, etc.

5) Experts and consultants

It is expected that experts and consultants play major role in each steps of business planning, account planning and raising funds. In particular, knowledge of the persons who have set up renewable energy business led by local agents is quite useful. They should play active role as experts.

On the other hand, local agents sometimes cannot identify who is the best expert for them, because of too many and various experts. Then MAFF should offer adequate information about the experts, who will be able to produce satisfactory results.

6) Industry association of power generation

In Japan, there are various industry associations of power generation based on power sources. They have abundant knowledge about technique of power generation. They are expected to be carry out advisory function.

		Consultation desk		Total plan		Fundraising		Photovoltaic power generation	Biomass power generation	Small hydropower generation	Wind power generation	Thermal power generation					
				Project plan		Method for fundraising											
				Income & expenditure plan													
Business led by farmers and foresters	Farmers and foresters so on	Prefecture, municipal government	Ministry of Agriculture, forestry and fishery	Consultants	Biomass for the state industry	Agricultural cooperatives	Experts, consultants	Regional banks	A-FIVE	Norinchukin Bank	Japan Photovoltaic Energy Association: JPEA	Japan Photovoltaic Energy Association: JPEA	Japan Organics Recycling Organisation	Woody Pellets Promotion Council	J-WATER	Association for promotion of hydro power generation in agricultural	Japan Wind Power Association
	Agricultural cooperatives, Forest associations			Agricultural cooperatives	Experts, consultants	Regional banks	A-FIVE	Norinchukin Bank	Japan Photovoltaic Energy Association: JPEA	Japan Photovoltaic Energy Association: JPEA	Japan Organics Recycling Organisation	Woody Pellets Promotion Council	J-WATER	Association for promotion of hydro power generation in agricultural	Japan Wind Power Association		
	Land improvement districts			Experts, consultants	Regional banks	A-FIVE	Norinchukin Bank	Japan Photovoltaic Energy Association: JPEA	Japan Photovoltaic Energy Association: JPEA	Japan Organics Recycling Organisation	Woody Pellets Promotion Council	J-WATER	Association for promotion of hydro power generation in agricultural	Japan Wind Power Association			

Fig. 5. Advisory system in each stage for business led by local agents

(3) Network with the other areas

In advanced areas of the business, the business is carried on with learning successful cases in other areas. Forming network with the areas carrying on the business is valuable for the areas that plan to set up the business. The network will provide the necessary information and knowledge among members.

MAFF sets up various places for information exchange, and is working on the establishment of a platform to promote formation of the network that becomes a starting point of the business. In concrete terms, MAFF have workshops, where persons involved in the business gather and exchange their experiences to overcome difficulties. Such networking plays important role to cultivate talented persons and procure them.

Based on “Act on the Promotion of Renewable Energy in Rural Areas” introduced in May, 2014, municipal government began to make a plan for the business. However the persons taking charge of this task in the office have not sufficient knowledge about the business. Thus, networking of them is necessary to overcome shortage of knowledge by exchange and share

knowledge. MAFF should work to build a model case for promotion of networking of the persons all over Japan.

(4) Guidebooks

Manuals and guidelines of renewable energy business is helpful as textbooks for local agents, who plan to set up the business. Currently, such manuals are edited by the government, local government and private sectors so on from various viewpoints. MAFF has to collect such information in cooperation with related ministries and bodies, and provide it to demanders. If the collected information is not enough, a new manual should be published.

(5) Consulting service

There are various support means such as training, advisors, networking and manuals. But as mentioned above, local agents sometimes cannot decide what the most adequate means is. Therefore consulting service is necessary for them. MAFF has already set up a consulting service for consulting and provision of information to local governments and local agents. After this, such service should be enforced in cooperation with consulting service at prefecture.

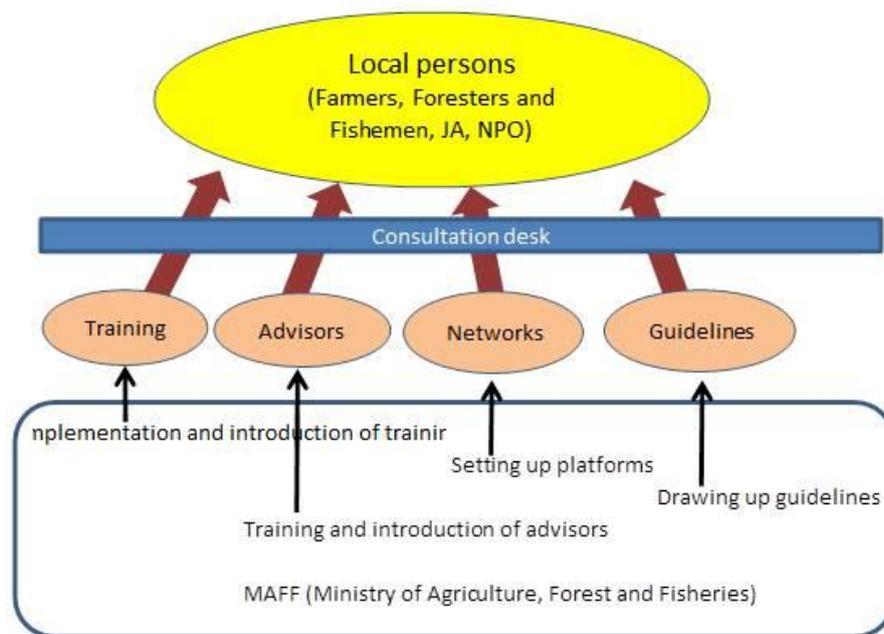


Fig. 6. How to obtain the knowledge (a rough sketch)

3. Smooth fundraising

Since the introduction of the FIT system, the price of electricity that originated from renewable energy business is adequately fixed with taking total cost and appropriate profit into account. The cost for power generation can be covered by revenue under the system. Thus the agents planning to set up the business can directly attract investments and obtain loans.

To attract investments and obtain loans, checking the risk of the business and making an accounting plan that ensures sufficient profitability is necessary in advance. Proper advice by local financial institutions, A-FIVE, Norinchukin bank and experts is necessary for the financing. MAFF also has to arrange necessary data for making adequate accounting plans, especially in biomass power generation. Moreover knowhow should be shared for lowering investment cost of facilities and maintenance cost of each plant.

For fund raising, funds investing in the sixth industry such as A-FIVE and public financing system for farmers etc. are available. “Tokushima regional energy” (a general incorporated association) attracts investments and donations from residents, and provides local agricultural products instead of dividend to the investors (civic investment system). Shihoro agricultural cooperative sets up facilities and leases them to members of the cooperative. Such various experiences of financing will be much informative.

Governments of Nagano and Hyogo prefecture subsidize some part of its initial cost for attraction of investments of financial institutes. The subsidy will be paid back to the government after operating the plants. Hence the subsidy does not support establishment of plants directly, and does not overlap subsidy provided by the FIT system.

4. Improvement of systems

Improvement of systems is also necessary to promote renewable energy business led by local agents.

For establishment of sustainable renewable energy business, proper scale of business should be planed based on stock of resources. On the other hand, FIT system fixes tariff (purchase price) regardless of the scale. Then small-scale business is often unprofitable. To cope with this problem, MAFF has to make positive approach to METI for revision of current system with respect for small-scale business. Moreover the other support system has to be examined for the business.

The German government has a contest to determine “Biomass Region” that is advanced area in utilizing biomass effectively. The contest lightens competitive spirits among the local communities. The japanese government, on the other hand, can have some system to give incentives for promotion of the business as well, such as commendation for advanced areas.

There are some areas where provision of electricity to power companies is not possible or huge cost to connect existing electric system is required by power companies, in which cases the business cannot be carried on or set up. To address this problem, revision of rule for connection from new business to existing electric system is necessary, and increase of potential of electric system is needed. MAFF should work upon METI , which takes charge of the matter of electric business as a whole, to change the system.

In addition, various applications for getting land and applications required by “Electric Enterprise Law” and “the River Law” are necessary for setting up the business. Until today each ministry has deregulated and simplified the procedures of applications. Such efforts should be continued. Reduction of deskwork concerning the application by farmers is also required. In the case of acquisition of land, place to submit the applications can be unified by “Act on the Promotion of Renewable Energy in Rural Areas”. It is named “one-stop service” for the application, which is expected to wildly spread all over Japan from now on.

5. Collaboration with external enterprises

Currently many external enterprises carry renewable energy businesses in rural areas. Local agents should make effort to attract such businesses and convert them to “business type led by external enterprises collaborating with local agents” with making consensus among local stakeholders.

In order for conversion to transpire, the role played by municipal government is critical. They should attract external enterprise that have positive attitude to vitalization of the area, and should collect information about the external enterprises in advance. Moreover they share the information with stakeholders in the areas, and have place to discuss how to attract such enterprises. There are two means for the attraction, namely regulations and preferential treatment to external enterprises.

(1) Establishment of new ordinances

Ordinances by municipal government are one of the regulations. Yufuin city in Ohita prefecture established a new ordinance, which requires application of investments in advance to external enterprises when they plan to set up plants on the area of more than 5,000 m², and also give the major competence to designated areas where renewable energy business cannot carry on. Around Mt. Fuji in Yamanashi prefecture, 11 municipal governments decided to introduce an ordinance that requires application before setting up plants and designated areas where the business is restricted as the case of Yufuin city. With the ordinance, administrative guidance is also introduced.

Such ordinance merits to reduce troubles between external enterprises and local agents. On the other hand, it should be noticed the cost paid by the external enterprises will increase by the ordinance.

(2) Preferential treatment of adequate business

As means of preferential treatments of adequate business in municipal government, the following are available; 1) running programs described by “Act on the Promotion of Renewable Energy in Rural Areas”, 2) attraction of external enterprises that can carry on “business led by external enterprises collaborating with local agents” and 3) establishment of ordinance to promote for business attractions.

The act enforced in May, 2014 has intention to convert “business led by external enterprises” to “business led by external enterprises collaborating with local agents”. Though it does not function well at present, active use of programs offered by the act is useful. Arrangement of land and provision of abounded land for external enterprises is also effective.

Iida city in Nagano prefecture defines “a right of local environment”, which is a right of residents to live in a sound environment. The right should be ensured, when renewable energy business is introduced. The city also establishes an ordinance so that the city can issue business certificates publicly, and support the certificated businesses. Moreover the city can provide interest-free loan to preliminary research before full-scale planning of the business. These forms of support by the city promote to attract “businesses led by external enterprises collaborating with local agents”. This case is very instructive for the other municipal governments.

The “business led by external enterprises collaborating with local agents” can distribute more profit to local community than the “business led by external enterprises distributing some profit to local community”. Then the former type is preferred by local agents, and should be promoted. Enactment of an ordinance, which makes investments by local agents to the business compulsory, can be a means for the promotion. Denmark actually introduced a rule that makes some part of investments born by local agents compulsory. With the rule, local agents can take part in management of the business.

The “business led by external enterprises collaborating with local agents” is profitable not only to local community but also to external enterprises, because the collaboration mitigates conflicts with local residents. Moreover external enterprises can get positive cooperation of local residents from initial stage of planning. Then the business can also be more sustainable. External enterprises are being expected to understand the situation and positively set up “business led by external enterprises collaborating with local agents”.

3. Comprehensive management of resource in the area

Full-utilization of unique resources to rural areas with thoughtful devise is important. Such resources consist of unutilized thinned timbers, livestock excrement and agricultural water system so on.

To realize the full-utilization of the resources, balance between utilization and conservation of the resources should be noticed (resource management). After grasping stock of resources and local consumption of energy, sustainable and full-utilization should be found (the best mix of local resources-use).

Concerning biomass, besides renewable energy use, trees can be utilized to timbers and tips for pulp production, and residues of agricultural products can be utilized for feeds or fertilizers in multistep fashion. In each stage, the products have to be fully-utilized in a way that can be sustainable.

Regarding land that is closely and inseparably connected to the local area, there are various systems for utilization of land as agricultural land and forest land. Municipal governments set up plans of agricultural promotion area in consistent to “Act on Establishment of Agricultural Promotion Areas”, and designate land zone for agricultural use that consists of excellent land such as land gathered in large-scale and land improved by public funds. Such zones cannot be used by others. In addition, municipal governments set up new plans named “Residents and Farmland Plan”(Hito Nouchi Plan) . By the plan, farmlands can be used systematically and effectively for local communities. Concerning forest land, the national government, prefecture and municipal governments make plan for management, logging and afforestation in consistent with program for forest planning. Moreover municipal governments can designate promotion areas of renewable energy business in accordance with “Act on the Promotion of Renewable Energy in Rural Areas”.

Thus there are plural land-use plans by municipal governments. Municipal governments should zone their land for use of primary industries, conservation of resources and renewable energy business so on from the integral and comprehensive viewpoints. In the process of planning, farmers etc. have to be involved.

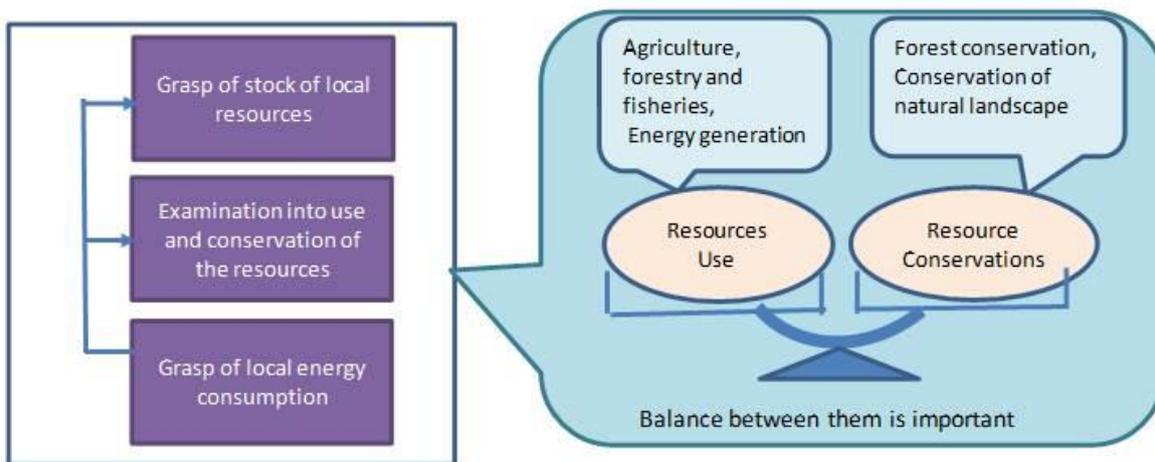


Fig. 7. Flow chart for sustainable use of local resources

Chapter 4. A course of action for middle and long-term basis

1. Coping with new situation

Reforms in electricity system will liberalize the new enterprises to enter the electric power retail market by around 2016. The size of the retail market amounts to 17 trillion yen including 7.5 trillion yen demanded by households. If the amount of electricity generated is over a level, electric power retail business will be possible even in rural areas. On this occasion, if local community-oriented “specific scale electrical power suppliers” can sell the power to local communities, local economic circulation can be established and job demand in the areas will be created. In addition, such suppliers can set up a system that they sell the electric power to town areas directly, namely “direct marketing of electric power”, by which profit gained by local community will increase. Upon determining its profitability of local community, MAFF should create good condition for local agents to enter the electric power retail market.

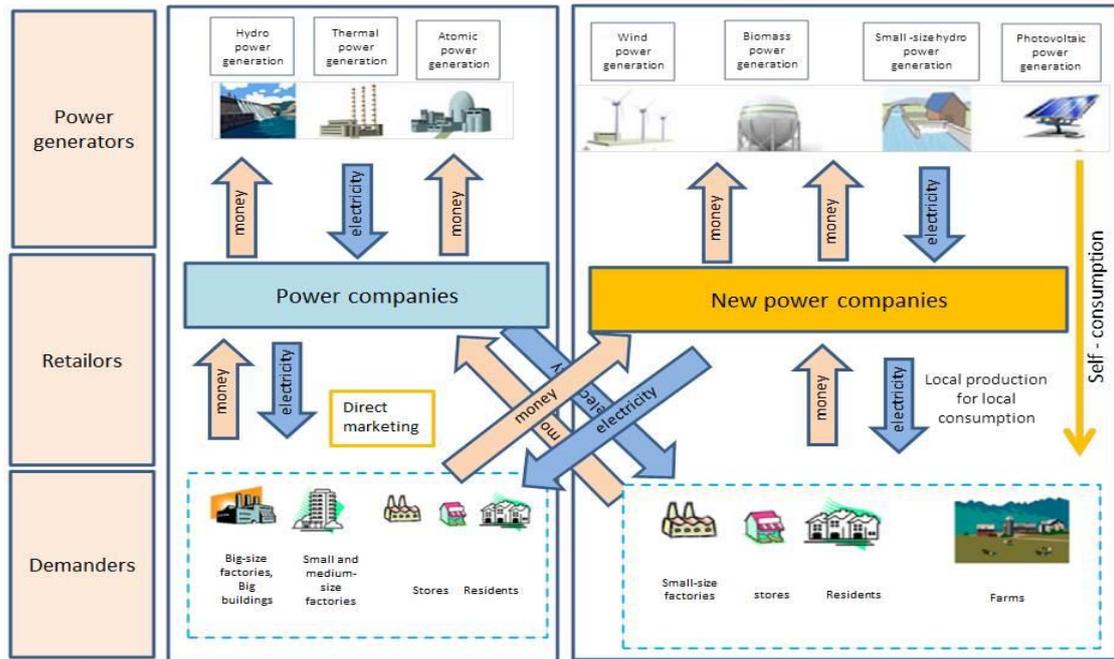


Fig. 8. Marketing of electric power in rural areas after liberalization of retail market

(1) Marketing of renewable energy after liberalization of retail trade of electricity

Currently the production cost of renewable energy is higher than the other energy. To cover the gap, FIT system was introduced. However it is expected that the renewable energy production cost will reduce to the same level of the other energy in both the middle or long-term basis. In Germany, the reduction, which is called “Grid parity”, is achieved in some types of power generation, such as photovoltaic power generation. Heat generated renewable resources can provide stable heat energy regardless of the fluctuation of oil prices, even though the cost is still high. The diffusion of the heating system is expected. In this way, we should focus what we should do now with careful consideration to future status.

Farmers’ use energy for agricultural machines, facilities for horticulture, water ways and processing plants of agricultural products. Without energy, they cannot carry on the production. It is important that farmers generate energy on site, and stabilize energy supply with complementary use of national wide energy supply system.

MAFF began to collect data for farmers who generate renewable energy and use it in their facilities via “specific scale electrical power suppliers”. Based on the data, development of new programs is expected. Local biomass energy use such as woody biomass heat generation is being diffused. Promotion for such activities is necessary. Moreover biogas use in households or automobiles should also be promoted. In Germany, the system has been introduced. In Japan the association of land improvement districts of Nasunogahara in Tochigi prefecture plans to introduce light cars in the same type of electric vehicle, which use power generated by the association. The association also plans to set up electric vehicle charging stations, and issue prepaid cards for the station.

In the areas that connects to electricity, it is not easy and demand of heat energy is low, marketing of power might also be difficult. At the time, attraction of external enterprises demands to consider electric power or heat.

(2) “Independence of local community” from the view point of renewable energy

In the stage where there is shrinking population, there is fear for the continued survival of local communities in the rural areas. Then the most important challenge is how to keep such communities sustainable.

Güssing in Austria was well known as an extreme poor village. It introduced renewable energy generation business, which uses abandoned wood resources and generates power more than local demand. As a result, the village earns profit from outside of the area, and attracted enterprises related to power generation created new jobs in the village. Payment to energy was from the village to outside. However now it is reversed. Japan has enough resources in rural areas. Therefore there is high potential to realize sustainable society by renewable energy business just like Güssing.

Communities in rural areas highly depend on outside areas not only in the field of energy but also of other economy. However renewable energy business can provide energy and economic value, which will reduce the dependence on the outside of the areas, and ensure sustainability of the communities. Thus “independence of the community” can be possible. Local communities have necessary information for decision making and have to accept the risk brought by the decision. Therefore they should decide by themselves how to realize “independence of the community” in the field of energy and economy, and the process of decision making should also be independent from outside force.

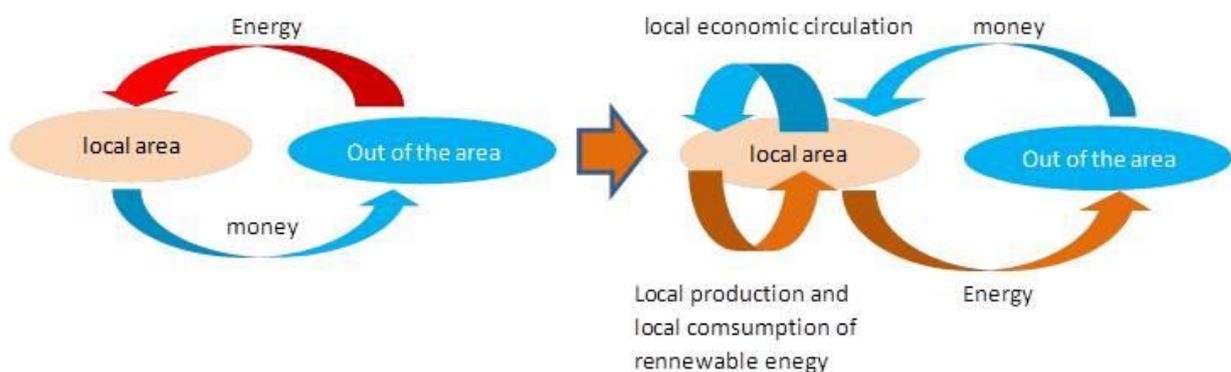


Fig. 9. Regime shift toward local independence in terms of renewable energy

CONCLUSION

“Act on the Promotion of Renewable Energy in Rural Areas” was enforced in May, 2014, which induced programs for promotion of renewable energy business in rural areas.

However in September, 2014, plural electric companies suspended the answer to application submitted by renewable energy enterprises for new connection to electric system. The suspension made confusion among the enterprises, which seems adverse wind to promotion of renewable power business.

To cope with this problem, FIT was revised in January 2015, by which inadequate enterprises were urged to exit from the market, and designated small-hydro power generation and thermal power generation as stable power source. Preferential treatment to biomass power generation also begun.

This change is a chance to vitalize local communities by renewable energy business. New programs named “regional vitalization” will become a tail wind for promotion of the business.

Business led by local agents takes time to cultivate talented persons in rural areas, and biomass power generation and small-scale hydropower generation are also take time before operation. Organization of stakeholders for adequate management of local resources cannot be completed in one day. However such efforts surely contribute to realize “independence of the community”.

Local agents, who aim for “independence of the community”, are expected to promote renewable energy business by full-utilization of the resources. These businesses should be supported by municipal and prefecture governments and financial institutions. Conversion from “business led by external enterprise” to “business led by external enterprises collaborating with local agents” and attraction of “business led by external enterprises collaborating with local agents” by municipal governments are needed.

Finally, MAFF should rank the programs related to renewable energy business as a part of promotion programs for primary industries (industry policy) and promotion programs for rural areas (regional policy) . In other words, MAFF is required to collaborate with the other ministries, and promote “fusion of policy for primary industries and renewable energy”. The business will be expanded from now on. The potential is not small. MAFF has to work on the challenge with a strong will.

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