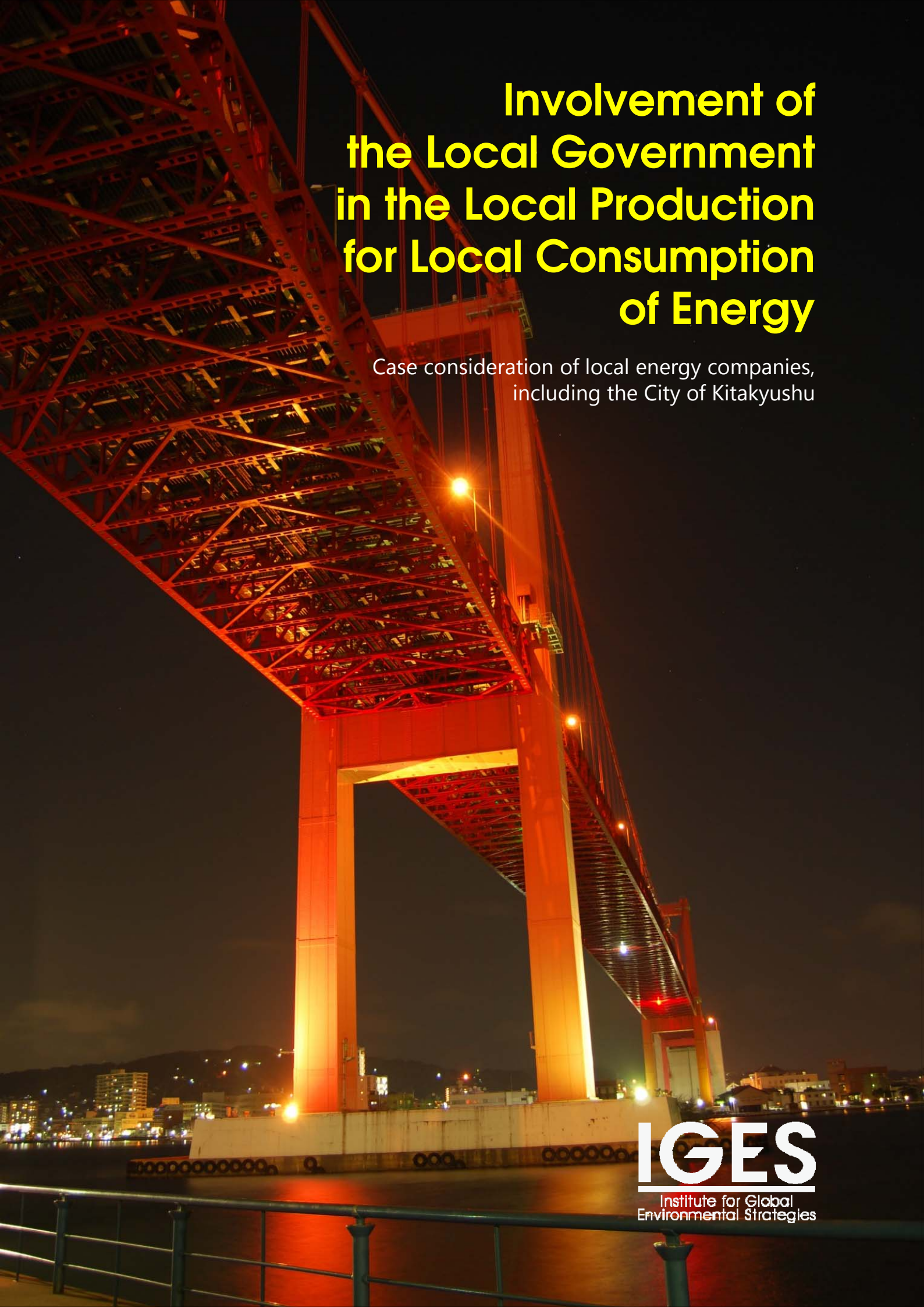


Involvement of the Local Government in the Local Production for Local Consumption of Energy

Case consideration of local energy companies, including the City of Kitakyushu

IGES
Institute for Global Environmental Strategies

1 Background of Local Government Participation in the Electric Power Retail Market

Expansion of energy creation by local governments

In the wake of the Great East Japan Earthquake in March 2011, the limitations of energy supply and the vulnerability of large-scale, centralized energy systems, including the sharp rise in electricity prices, were exposed. Given these conditions, local governments took the lead in promoting the introduction of independent and diversified energy systems that utilize local resources, such as renewable energies.

The national government has also offered support for independent and diversified energy systems being developed by local governments. One example is a national project on the "Development of Diversified Energy Infrastructure Projects and Master Plans," which is being implemented by the Ministry of Internal Affairs and Communications in collaboration with relevant ministries and agencies, including the Agency for Natural Resources and Energy under the Ministry of Economy, Trade and Industry, the Forestry Agency under the Ministry of Agriculture, Forestry and Fisheries, and the Ministry of the Environment, among others. Under this project, local governments are taking the lead to promote the launch of local energy projects using local resources, such as biomass, wind power, and waste, in cooperation with customers, local energy companies, and financial institutions. To date, 28 local governments have created master plans and are working proactively to develop these master plans into projects. The Ministry of the Environment has also established a project to fund the introduction of renewable energies ("Green New Deal Fund") and offers support for the introduction of independent and diversified disaster-resilient energy systems that are being promoted by local governments.

Renewable energy sources owned by local governments have expanded through the Feed-in-Tariff (FIT) system that was introduced in July 2012. With the application of this system, electric power production projects for renewable energies, such as large-scale solar power plants operated by local governments, have spread across the country.

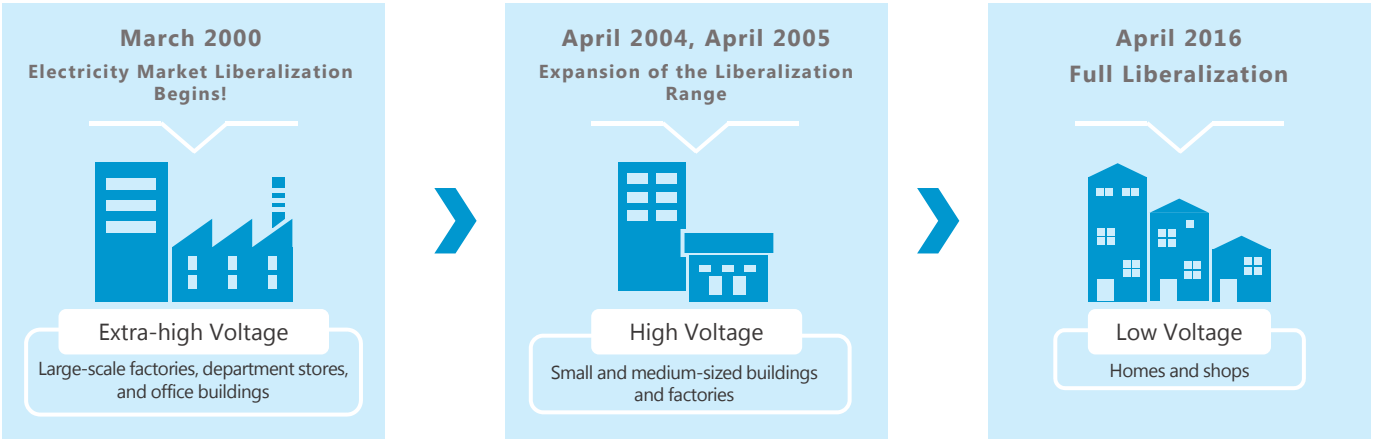
* Diversify risk and reduce CO_2 emissions by combining diverse energy supply capacities based on the features of the region and supplying electricity and thermal energy that are comparatively small in scale and are being distributed to various areas.

Market expansion by full liberalization of the electric power retail market

The liberalization of the electric power retail market is being promoted under the process of reforming electric power systems. To date, the electric power market has been partially and gradually promoted for extra-high and high voltage. However, since April 1, 2016, the market has been fully liberalized, and now includes low voltage for homes and offices. This is said to have opened up the market for electric power that had been exclusively supplied by general electric utilities, creating a market scale of about JPY 8 trillion. As of April 1, 2016, about 280 operators have registered and entered the market as retail electricity providers. With the liberalization of the electric power market, it is now possible for local governments, which have to date been limited in the sale of generated electric power, to sell electricity directly to consumers.

In addition, by supplementing services in the sale of electric power at which companies excel and promoting linkages between energy-saving services and different industries, various fee menus and services are expected to emerge, which will stimulate the market. This will result in a diverse selection of energy services for consumers as well, including the choice of purchasing local electric power, buying electric power from local electric power companies, and selecting electric power companies that specialize in renewable energies.

Expanded areas for the liberalization of electric power



(Created by IGES based on the source from the Agency for Natural Resources and Energy Website)

Note: This pamphlet has been created on the basis of information as of April 1, 2016.

Increase in the number of local governments participating in the electric power retail market

In line with the full liberalization of the electric power retail market, local energy companies have been established back-to-back by local governments around the country with an aim to not only produce energy, which they have been involved in to date, but to also sell their own electric power. Local governments have invested in local energy companies, and as of April 1, 2016, about 10 companies have already registered as retail electric power providers (the table below). There have also been cases where local governments have not invested in local energy companies, but have been involved in setting up companies instead (Kitakami New Electric Power, LLC (Kitakami City, Iwate Prefecture), Miyako New Electric Power Co. Ltd. (Miyako City, Iwate Prefecture), and the Higashimatsushima Organization for Progress and Economy, Education, Energy (Higashimatsushima City, Miyagi Prefecture), other). In addition to these local governments, a number of local governments around the country are also currently considering the establishment of local energy companies.

Local energy companies established by local governments

Local Governments	Name of Retail Electric Power Provider	Date Established	Capital (Local government investment ratio)	Population (2015 census)
Yamagata	Yamagata New Electric Power Co. Ltd.	Sep. 2015	JPY 70 million (33.4%)	1.122 million
Nakanojo Town, Gunma	Nakanojo Electric Power Foundation	Nov. 2015	JPY 3 million (Nakanojo Electric Power Foundation)	16,000
Clean authority of TOKYO	Tokyo Eco-Service Co., Ltd.	Oct. 2006	JPY 200 million (59.8%)	13.513 million
Hamamatsu City, Shizuoka	Hamamatsu Shindenryoku Co. Ltd.	Oct. 2015	JPY 60 million (8.33%)	798,000
Izumisano City, Osaka	Izumisano Electric Power	Jan. 2015	~JPY 3 million (33.3%)	101,000
Tottori City, Tottori	Tottori Citizens Electric Power Co. Ltd.	Aug. 2015	JPY 20 million (10%)	193,000
Yonago City, Tottori	Local Energy Co. Ltd.	Dec. 2015	JPY 90 million (10%)	149,000
Kitakyushu City, Fukuoka	Kitakyushu Power Co., Ltd.	Dec. 2015	JPY 60 million (24.17%)	961,000
Miyama City, Fukuoka	Miyama Smart Energy Co. Ltd.	Feb. 2015	JPY 20 million (55%)	38,000
Hioki City, Kagoshima	Hioki Local Energy Co. Ltd.	Nov. 2015	JPY 2.4 million (4.2%) (capital increase planned)	49,000

(Note) List of local governments based on public information that have been confirmed to have invested in the establishment of a local energy company and have registered with the Agency for Natural Resources and Energy as a retail electric power provider (as of April 1, 2016). The list does not necessarily cover all the local energy companies established by local governments.

(Created by IGES)

The reasons that local governments have for establishing local energy companies and taking part in the retail electric power market vary, and include the supply of low-price electric power to their areas and the use and application of local resources. The advantages and expected impacts of local energy companies are summarized in the table below.

Advantages and impacts for local governments in the establishment of local energy companies

Advantages & Expected Impacts	Details
Supply of low-price electricity	Expected to aid in the delivery of electricity at lower prices to consumers in the area in comparison to conventional methods and offer underlying support to local industries.
Local production for local consumption of energy	Effective use of resources and reduction of transmission losses by making use of energy utilizing local resources in the area.
Promotion of low-carbon societies	Can contribute to a reduction in greenhouse gas emissions by incorporating renewable energies as an energy source.
Money flow within area	Can aid in the construction of a mechanism to circulate money in the area by purchasing and selling electricity locally.
Job creation and industry promotion	Expected to create local employment opportunities associated with the establishment of energy companies and stimulate the development of related industries.
Creation of disaster-prevention base	Can diversify electricity supply risk by securing electric power in the event of a disaster.
Provision of additional services	Can provide additional governmental services, such as sales of heat, water supply, and public transportation, as well as public and other industrial services (Ex: elderly monitoring services and shopping services, etc.)
Demand-side management	Can promote energy savings through the provision of demand-side energy management services (Ex: adjustment of supply and demand for local electricity using CEMS*).

*CEMS (Community Energy Management System): System that integrates the management of supply and demand for electric power in the area

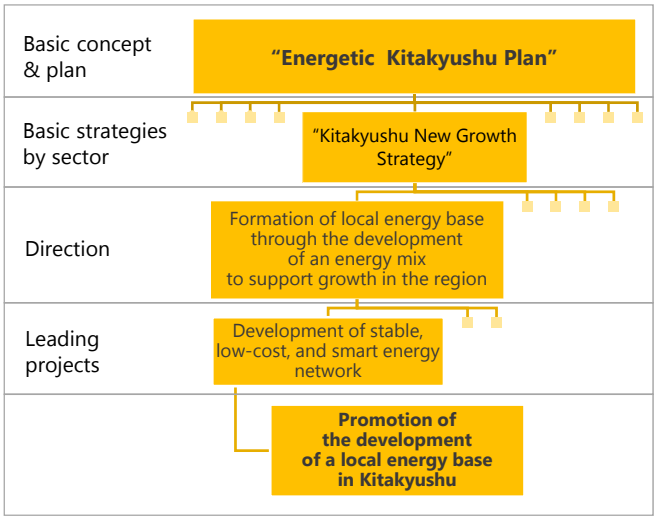
(Created by IGES)

2 Promotion of Local Energy in the City of Kitakyushu

Policy background

To date, the City of Kitakyushu has been involved in promoting the introduction of energy savings and renewable energies from the perspective of global warming measures. However, since the Great East Japan Earthquake in March 2011 and amidst concerns of soaring electric power prices, the City of Kitakyushu has started to think that the local government must have a stable supply of low-price energy in place from the vantage point of supporting industrial activities within the city. Therefore, the City of Kitakyushu has embarked on a project to promote the development of a local energy base in the city that centers on the Hibikinada district. This project to develop a local energy base in the City of Kitakyushu is being promoted to give shape to "the creation of a stable, low-cost, and smart energy network", a leading project under "the formation of a local energy base through the development of an energy mix to support growth in the region", which is one of five stated directions to promote the Kitakyushu New Growth Strategy (developed in March 2013).

Political positioning of projects
to promote the development of a local energy base in Kitakyushu



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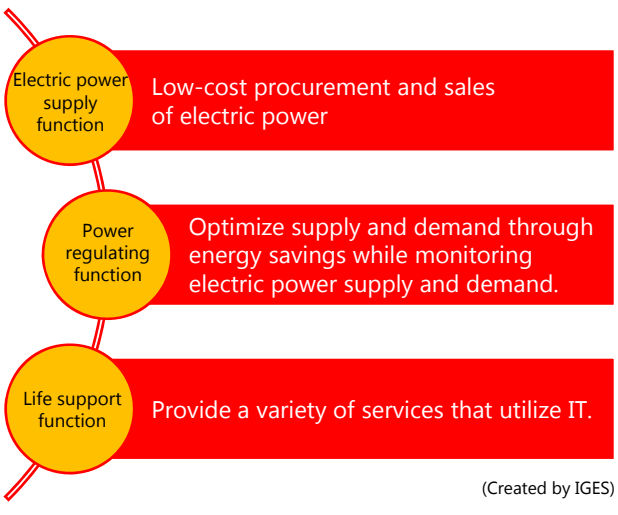
Background on the establishment of local energy companies

In the promotion of the development of local energy, the City of Kitakyushu has both the experience and capacity in the areas of energy supply and demand. On the supply side, there is high potential for the use of existing waste-to-energy projects and offshore wind power generation, as well as the location of fuel import bases for coal and LNG, and a vast piece of land that is suitable for power generation. The City of Kitakyushu is also working on promoting the establishment of new power plants for offshore wind power generation and high-efficiency thermal power from mixed biomass. On the demand side, with demonstrations and assessments on the control of supply and demand using CEMS, as well as recognition of Kitakyushu's advanced technical and social systems, such as dynamic pricing which creates peak shift reactions in consumers located in the demonstration areas, the know-how on energy management that has been developed through the Smart Community Demonstration project that the City of Kitakyushu has worked on in recent years will become a major advantage for the city.

Prior to the establishment of a local energy company in Kitakyushu, the city also conducted questionnaires and interviews of potential local consumers in the city about their intention to purchase electricity from local energy companies and their intention to participate in a system if such an energy management system could be developed. From these findings, the City of Kitakyushu determined the necessity of providing a menu of low-price electricity exclusively for the Kitakyushu region and developing services for smart communities being created in the city by establishing its own local energy company together with the private sector. Here, the city established "Kitakyushu Power Co., Ltd." as a local energy company that would be able to supply low-carbon, stable, and low-price energy together with companies, or what is referred to as "locally produced for locally consumed energy."

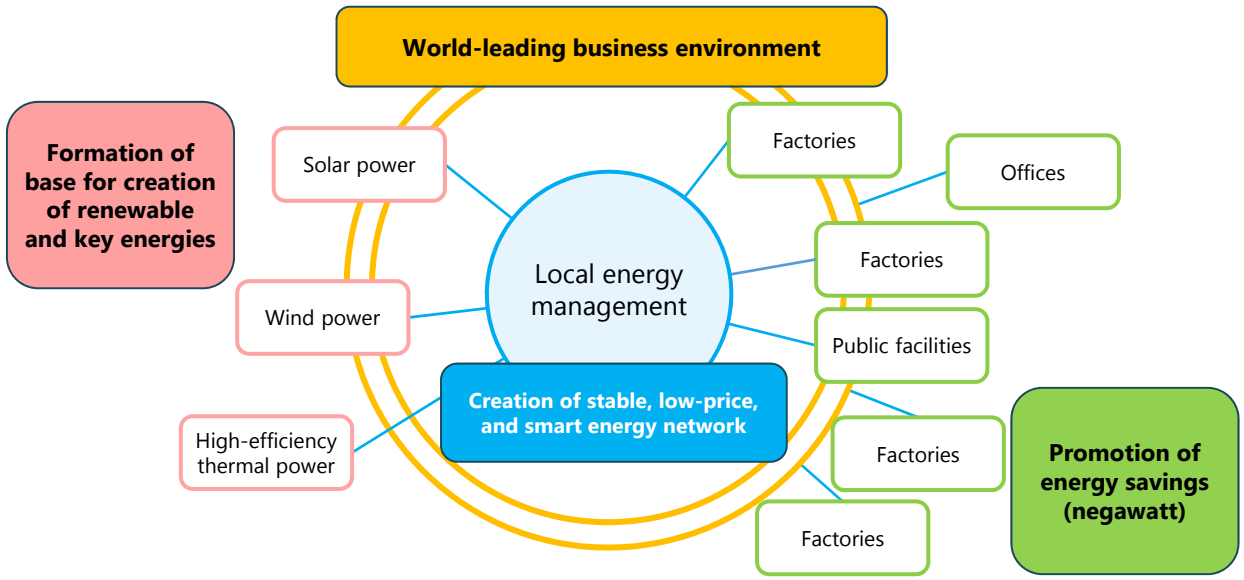
Kitakyushu Power Co., Ltd. has raised the following points as part of its mission as a local energy company: (1) support operations through the supply of stable and low-price electricity to businesses in the city to lead to industrial promotion, and (2) create energy management services (systems using the know-how of smart communities in order to generate the benefits that may result from power savings) in which a number of customers have shown interest.

Development and expansion of services offered
by Kitakyushu Power Co., Ltd.



(Created by IGES)

Image of project for the development of a local energy base being promoted by the City of Kitakyushu



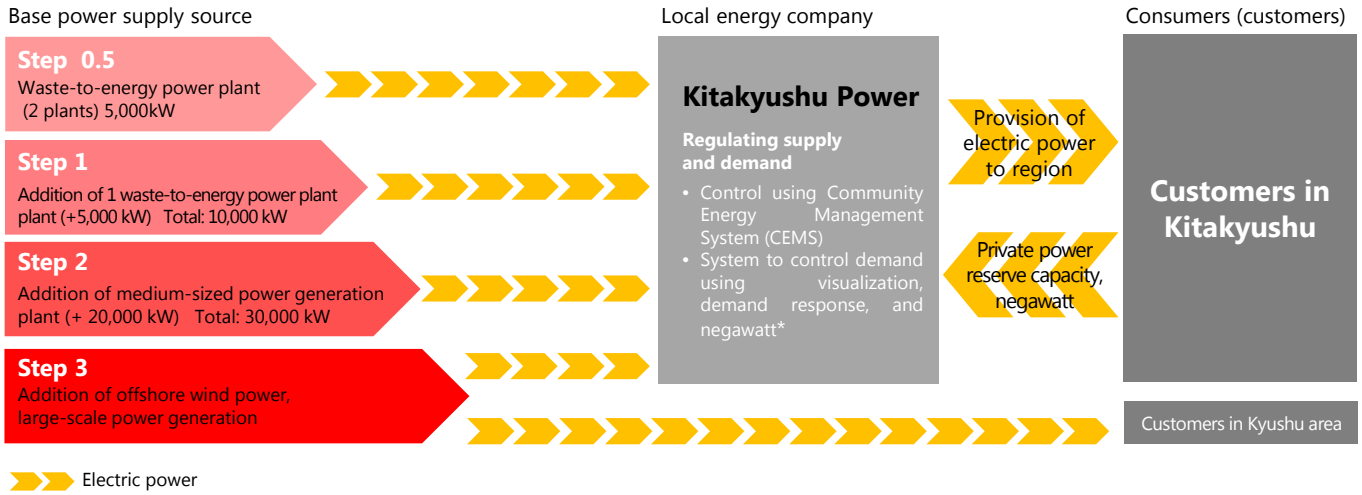
(Source: Handouts from the Kitakyushu Community Energy Promotion Council)

Plan of energy supply

Currently, electric power is supplied to consumers in the City of Kitakyushu with the use of waste-to-energy facilities in the city (Hiagari plant and Kogasaki plant). In the future, the City of Kitakyushu aims to expand power supply capacity in three steps in line with the current situation of power supply in the city (see figure below).

In step 1, the City of Kitakyushu plans to add one waste-to-energy plant (Shin-Moji plant, 5,000-kW capacity). In step 2, a medium-sized thermal power plant (capacity of 20,000 kW) will be constructed, and in step 3, an offshore wind power facility is expected to be added (capacity of 10,000 kW). The City of Kitakyushu is also considering the addition of large-scale thermal power as part of the city's long-term outlook.

Steps towards the establishment of local energy companies



*Negawatt: Concept where surplus power from the power-saving efforts of consumers is regarded as being equivalent to power generated.

(Created by IGES based on the handouts from the Kitakyushu Community Energy Promotion Council)

Kitakyushu Power Co., Ltd.

Company name: Kitakyushu Power Co., Ltd.
Location: 3F, Kitakyushu Techno-Center Building, 2-1, NakabaruShinmachi, Tobata-ku, Kitakyushu
Date of Establishment: December 1, 2015
Starting Date for Supplying Electric Power: April 1, 2016
Capital: JPY 60 million
CEO: Akihiro Chitose

Main business activities:
1. Retail sales of electric power
2. Implementation of energy management services

Charter for establishment:
1. Support industries in the city by providing stable and low-price energy to the region.
2. Low-carbon development in the city through local production for local consumption of low-carbon energy.
3. Creation of energy-saving society and new environmental businesses by expanding and implementing energy management know-how.

Investment companies and investment ratio:

City of Kitakyushu	JPY 14.5 million	(24.17%)
YASUKAWA Electric Corporation	JPY 11 million	(18.33%)
Solnet Corporation	JPY 10 million	(16.67%)
Fuji Electric Co., Ltd.	JPY 10 million	(16.67%)
The Kitakyushu Bank, Ltd.	JPY 2.9 million	(4.83%)
The Nishi-Nippon City Bank, Ltd.	JPY 2.9 million	(4.83%)
The Bank of Fukuoka, Ltd.	JPY 2.9 million	(4.83%)
Mizuho Bank, Ltd.	JPY 2.9 million	(4.83%)
Fukuoka Hibiki Shinkin Bank	JPY 2.9 million	(4.83%)

3 Comparison of Local Energy Companies Established by Local Governments

On April 15 (Friday), 2016, the City of Kitakyushu held a "Commemorative Event for the G7 Kitakyushu Energy Ministerial Meeting: Nationwide local government PPS symposium on the significance of local energy companies and the concept of local production for local consumption of electric power" (Venue: Main Hall, Kitakyushu International Conference Center). In addition to Kitakyushu Power, other PPS attended, including Nakanojo Electric Power Foundation (Nakanojo Town, Gunma Prefecture), Tottori Citizens Electric Power Co. Ltd. (Tottori City, Tottori Prefecture), and Miyama Smart Energy Co. Ltd. (Miyama City, Fukuoka Prefecture). The symposium featured introductions of the local energy companies established by local governments and provided information to local governments that are considering establishing this type of company in the future through panel discussions. Here, four local energy companies are compared from the perspectives of (1) securing stable power supply sources as the perspective of energy supply, (2) controlling supply and demand, and (3) electric power sales contacts on the demand side, which are challenges that these companies face from a management perspective.

1 Supply Side (Securing Stable Power Supply Sources)

Common to all four local energy companies is the base power supply source of renewable energies, such as solar power generation and waste-to-energy generation, and the purchase of 5 MW of electric power from local government holdings or private companies in the area. In the future, each local energy company is considering diversifying the power supply sources of renewable energies, such as biomass and small hydropower generation, in addition to solar power generation. Kitakyushu Power is examining the use of thermal power from mixed biomass and wind power generation as its base power supply sources.

* The current power generation capacity of Tottori Citizens Electric Power is 500 kW. However, the company plans to open a 2-MW solar power plant in November 2016.

2 Regulation and Control of Supply and Demand

The risk of imbalance*1 for many new electric power companies in simultaneous/commensurate regulated power supply systems*2 is a major issue. In order to avoid the risk of an imbalance, it is effective to work with private companies that have the necessary experience and know-how. Three local energy companies have taken part in balancing groups*3 and have outsourced the regulation of supply and demand to private companies. On the other hand, Miyama Smart Energy has not taken part in a balancing group, but rather regulates supply and demand on their own using their own system.

*1 In a simultaneous/commensurate regulated power supply system, a penalty must be paid if the excess or insufficient amount of supply and demand is over 3% of the plan.
*2 This is a rule in which the amount of electric power is matched in 30-minute increments by constantly bringing the balance of power supply and demand into line.
*3 This is a mechanism to avoid imbalanced risk for general electric utilities with the formation of a group by several retail electric power companies that mutually support electric power.

3 Demand Side (Electric Power Sales Contacts)

The four local energy companies have started to supply electric power from public facilities and private companies in their areas. However, with the full liberalization of the retail electric power market in April 2016, Miyama Smart Energy started contracts to supply electric power for general households and Nakanojo Electric Power also announced that they would start accepting applications from July in the same year. Tottori Citizens Electric Power also plans to offer electric power supply in the future for general households. Kitakyushu Power supplies locally-produced and locally-consumed electric power to residents through electric power supply to public facilities from the perspective of ensuring fairness, since it is difficult to supply electricity to all households in the city area at the current level of power generation.

4 Features of Each Local Energy Companies

Some of the features of the local energy companies created by each local government include the active involvement of Nakanojo Electric Power in increasing the number of solar power generation plants to diversify base power supply sources, future plans for small-scale wind power generation and power generation from woody biomass, as well as securing electric power from existing hydropower generation plants in the city. Tottori Citizens Electric Power is funded by the city and private companies and is cooperating in the promotion of projects with the launch of the "Tottori Environmental Energy Alliance," which is responsible for supporting the development of local power supply sources and consulting. Miyama Smart Energy provides additional services with the government, including services to monitor the elderly and bundling rates with water charges, and promotes new local services based on the sales of electric power. In addition to the stable and low-cost supply of electric power to support local industries, in the future, Kitakyushu Power will continue to implement energy management technologies that have been developed in smart community demonstration projects by taking advantage of existing waste power generation as a stable power supply source.

References

1. Ministry of Internal Affairs and Communications. "Jichitai shudō no chiiki enerugīshisutemu seibi kenkyūkai: Dai 5-kai shiryō" (Study Group for the Deployment of a Local Government-led Community Energy System: Materials from 5th Meeting). http://www.soumu.go.jp/main_content/000402597.pdf. (Japanese only). (Viewed April 15, 2016).
2. Agency for Natural Resources and Energy. "Saisei kanō enerugī no dōnyū sokushin ni kakaru seido no genjō to kadai" (Current Status and Challenges of System to Promote the Introduction of Renewable Energies). http://www.meti.go.jp/committee/sougouenergy/kihonseisaku/saisei_kanou/pdf/001_02_00.pdf. (Japanese only). (Viewed April 15, 2016).
3. Agency for Natural Resources and Energy. "What does Liberation of the Electricity Market Mean? http://www.enecho.meti.go.jp/en/category/electricity_and_gas/electric/electricity_liberalization/what/. (Viewed April 15, 2016).
4. City of Kitakyushu. "Dai 3-kai Kitakyūshū-shi chiiki enerugī suishin kaigi (Kitakyūshū-shi chiiki enerugī kyoten-ka suishin jigyō no jitsugen ni mukete)" (3rd Kitakyushu Community Energy Promotion Council Meeting (Towards the creation of projects to develop a community energy base in Kitakyushu) (2014). (Japanese only).

Comparison of four local energy companies established by local governments

	Nakanojo Electric Power	Tottori Citizens Electric Power	Miyama Smart Energy	Kitakyushu Power
Charter of establishment	•Development of power supply sources with renewable energies by taking advantage of rich natural resources (adoption of declaration, "Renewable Energy Town Nakanojo")	•Promotion of locally produced and locally consumed energy •Flow of money within area •Business development and expansion of energy-related industries	•Resolution of challenges facing local governments through the "provision of public energy services" •Stimulation of local economy with the involvement of the local government	•Support for local industries through the supply of stable and low-price electric power •Development of low-carbon society •Creation of business opportunities in relation to energy management
Supply side (includes base power supply sources and backup power supply sources)	•Town-operated solar power generation plants (2) •Invited private solar power generation facilities to town-owned land (1) •Purchase of electric power from JEPX	•City-run solar power generation plant •Purchase of electric power from Itochu Enex, JEPX, Chugoku Electric Power	•City-owned solar power generation plants •Purchase of excess solar power from households •Purchase of electric power from JEPX, Kyushu Electric Power	•Waste power generation plants (2) •Purchase of electric power from JEPX
Power generation output	5 MW	500 kW	5.5 MW	5 MW
Future plans (Secure power supply source)	•New construction of solar power generation plant •Hydropower generation plant •Woody biomass power generation plant	•Solar power generation plant (2 MW capacity, Nov. 2016) •Small hydropower generation plant •Biomass power generation plant	•Linkages with nearby local governments (Kimotsuki Town, Kagoshima Prefecture)	•Addition of 1 waste power generation plant •Thermal power generation plant using mixed biomass •Wind power generation plant
Regulating supply and demand	Balancing group (V-Power)	Balancing group (Itochu Enex)	Carried out independently	Balancing group (F-Power)
Demand side (Consumers)	Public facilities in town (30)	City-owned facilities (75 facilities, including city elementary and junior high schools and civic halls, etc.)	•Public facilities in city (36) •Private facilities (18) •General households (about 500)	•Public facilities in the city •Small- and medium-sized companies in the city
Electric power supply to general households	Applications accepted from July 2016	Planned in future	Start of contracts from April 1, 2016	No plans
Features of project	•First new electric power company established primarily by a local government •Provision of energy management systems for households using HEMS*	Launch of "Tottori Environmental and Energy Alliance," which is responsible for supporting the development of local energy power supply sources and consulting (funded by the city and private companies in December 2015)	•Attachment of HEMS to about 2,000 households in the city •Bundling charges together with water charges •Use of points from Internet shopping at local malls, etc. •Services to watch over the elderly, etc.	•Secure stable power supply sources (waste-to-energy power) that do not rely on FIT •Independent implementation of sales activities and supply/demand forecasts •Implementation of energy management technologies that have been developed in smart community demonstration projects

*HEMS (Home Energy Management System): System to manage energy in households.

(Created by IGES)

4 Challenges and Future Prospects for Local Energy Companies Established by Local Governments

The establishment of other local energy companies by various local governments around the country is also being examined and planned as a result of the full liberalization of the electric power retail market. In the future, as the activities of local energy companies operated by local governments expand to other parts of the country, several challenges and measures based on the experiences of existing companies will be introduced (Note: The discussion points from the panel discussion at the abovementioned symposium have been provided as reference.)

Securing power supply sources to contribute to the stable supply of electric power

Securing and expanding stable power supply sources is important because many local energy companies established by local governments use renewable energies as their base power source. Efforts may include the new construction of facilities for other power supply sources for renewable energies, such as small hydropower and biomass, as well as securing electric power in existing local power plants, ensuring stable power supply sources that do not depend on natural conditions and FIT prices, and the stable supply of electric power through flexibility between municipalities.

Linkages with private companies

Regulating and controlling supply and demand in cooperation with private companies that have experience in these areas is considered to be effective, since it is difficult for local governments that lack the experience and know-how in the electric power retail market to develop independent systems, including the regulation of supply and demand in simultaneous/commensurate regulated power supply systems.

Financial back-up

Since there are gaps in payment periods due to the payment of electric power prices from the market and payments for FIT purchase prices, it is important to have support from a financial perspective to alleviate financial burdens. In this, cooperation with financial institutions and private businesses is essential.

Creation of a "local identity" in combination with the provision of other administrative services

As a means to sell electric power, it is important to provide new local services and develop and expand highly public services that are unique to the municipality, and which consumers have come to expect. Setting up a detailed fee structure in line with the needs of consumers and creating linkages with heat supply businesses will also be of reference.

Support from local residents

For products, such as "electric power," that are difficult to differentiate, it is important for local residents to have an attachment to the electric power created in the region, and to have a sense of returning electricity charges that have been paid back to the area.

Involvement of the Local Government
in the Local Production for Local Consumption of Energy

Case consideration of local energy companies, including the City of Kitakyushu

May 2016

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