FY2020 Project for Ministry of the Environment Japan

FY2020
City-to-City Collaboration Programme for Zero-Carbon Society

Project to Promote SDGs Future City with Renca, Santiago

Report

March 2021

Nippon Koei Co., Ltd.
Toyama City

FY2020
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Report

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Abbreviations

Abbreviations	Description
CNG	Compressed Natural Gas
COP	Conference of the Parties
COVID-19	Coronavirus Disease - 19
CSR	Corporate Social Responsibility
CtC	City-to-City
DDF	Dual Diesel Fuel
ESCO	Energy Service Company
FY	Fiscal Year
GEC	Global Environment Center
GHG	Greenhouse gas
HEMS	House Energy Management System
JCM	Joint Creditting Mechanism
KPI	Key Performance Indicator
LED	Light Emitting Diode
MW	Mega Watt
OECD	Organisation for Economic Co-operation and Development
PDCA	Plan Do Check Act/Adjust
PV	Photovoltaic
SDGs	Sustainable Development Goals
UNFCCC	United Nations Framework Convention on Climate Change
ZEB	Zero Emission Building
ZEH	Zero Emission House

CHAPTER 1 BACKGROUND AND OBJECTIVE

1.1 BACKGROUND

In November 2016, the Paris Agreement entered into force, and this year, 2020, the Agreement entered into implementation phase. The Paris Agreement states that non-governmental actors, including local governments and cities, should accelerate development and implementation of climate change policy in addition to the central government. The cities and local governments are key players in examination and implementation of climate change measures and projects at a regional scale. In order to realize a global decarbonized society, it is necessary to accelerate development of a sustainable decarbonized society via low-carbon society. It has been strengthend internationally to support activities of urban cities, where socio-economi activities are implemented, for realization of decarbonization and low-carbonization at the city level.

1.2 OBJECTIVES OF THE PROJECT

This project aims to (i) reduce emissions of greenhouse gas (GHG) and (ii) to develop JCM projects that contribute to (i), by utilizing the knowledge and technologies of Toyama City (herein after called "Toyama"), a leading SDGs future city, and companies in the environmental, social and economic fields where Renca municipality (herein after called "Renca") is interested in. In order to achieve the goal above, the following activities were implemented in the project.

<City to city collaboration activities>

- Toyama city shares its experience in planning process, and methodology of setting goals and indicators in its "SDGs future city plan", and shares technical information on energy conservation and renewable energy for implementation of the plan.

<Activities for formulation of JCM model project >

- Identify needs of Renca in environment, social and economic fields
- Identify potential JCM model projects through technology matching

1.3 CITIES PARTICIPATED IN THE PROJECT

1.3.1 Toyama city

Toyama City occupies almost the entire central and southeastern part of Toyama Prefecture, and it has Toyama Bay, which nurtures abundant seafood in the north, the majestic Tateyama Mountain Range in the east, a series of hills and mountain villages in the west, and rural scenery and forests in the south. As the prefectural capital with a population of 420,000, Toyama City is promoting attractive urban development (quoted from Toyama City website).

Toyama City has been actively publicated its efforts to build a sustainable city both in Japan and abroad (Table 1-1). Toyama City has experience of international cooperation in

environmental and agriculture fields, including the Ministry of the Environment's City-to-City Cooperation Project, mainly in Southeast Asia, especially in Indonesia. This year, Toyama has started the first city to city collaboration project in Latin America with the Renca.

The major initiatives by Toyama are summarized as follows.

Table 1-1 Activities of Toyama City for Sustainable Urban Development and City to City Collaboration

Year	Item	Outline
2008	ECO Model City	Efforts to shift to a "low-carbon society" , and a plan for reduction of GHG emission by means of compact urban development, were highly evaluated.
2011	Environment Future City	The strategic proposal for a compact city was considered to be a model for solving the problems that local cities face. It also contributes to dissemination of its knowledge and various initiatives in home and abroad.
2014	Sustainable Energy for All	In order to achieve the goals proposed by the United Nations SE4ALL, a plan has been developed to improve the efficiency of energy.
2014	100 Resilient City	Toyama was selected by the Rockefeller Foundation as one of the 100 Resilient Cities (RC100) that have the ability to recover from the risks and challenges that cities face, such as natural disasters.
2016	G7 environmental ministerial meeting	Promotion on city to city collaboration for development of resilient cities that achieve the best balance between quality of life, economic growth and environment was implemented. Mayor Mr. Mori summarized the discussions in the parallel session "The Role of Cities" as the Chair of the session.
2018	FY 2018 City to City collaboratoin project with Bali, Indonesia	Toyama, as a environmental city, shared its diverse knowledge and experience with Bali city, Indonesia and studied for application of JCM subsidiary scheme with low-carbon technology (energy conservation, renewable energy, fuel conversion, etc.) which companies in Toyama City have.
2018	SDGs Future Cities and model project for SDGs of local government	Toyama was selected by the Cabinet Office as a municipality that integrally tackles a wide range of issues in both social and environmental fields.

Source：prepared by Nippon Koei based on the provide information from Toyama CIty

The background of initiation of city to city collaboration between Toyama and Renca is summarized in the following table.

Table 1-2 City to City collaboration between Toyama City and Renca Municipality

#	Year/month	Activities
1	2019/3	Mayor of Toyama and Renca exchanged their ideas inan OECD Meeting
2	2019/5	Toyama and Renca signed a cooperation agreement.
3	2019/12	Discussions between Renca and Toyama in Madrid (during COP25 of UNFCCC) was made on renewable energy and city to city collaboration project. Toyama provided information on its initiative for SDGs. Mayor of Renca expressed his interest in city to city collaboration project with Toyama.
4	2020/3	Information sharing on the municipal response to Covid-19.
5	2020/9	Commencement of city to city collaboration project of Ministry of Environment, Japan (first year ends March 2021)

Source：prepared by Nippon Koei based on the provide information from Toyama CIty

1.3.2 Renca municipality, Santiago city

The partner city, Renca Municipality, is one of the 32 administrative municipalities of Santiago City, the capital of Chile, and has the following characteristics

Population：About 150,000（15％ of population: aged people）
Area ：24km^2
Climate：Mediterranean climate, Annual precipitation about 350㎜（Santiago City）
Geology：Renca hill is located on the border with Kilicula Municipality, the northern neighbor, and has become a symbol of Renca.

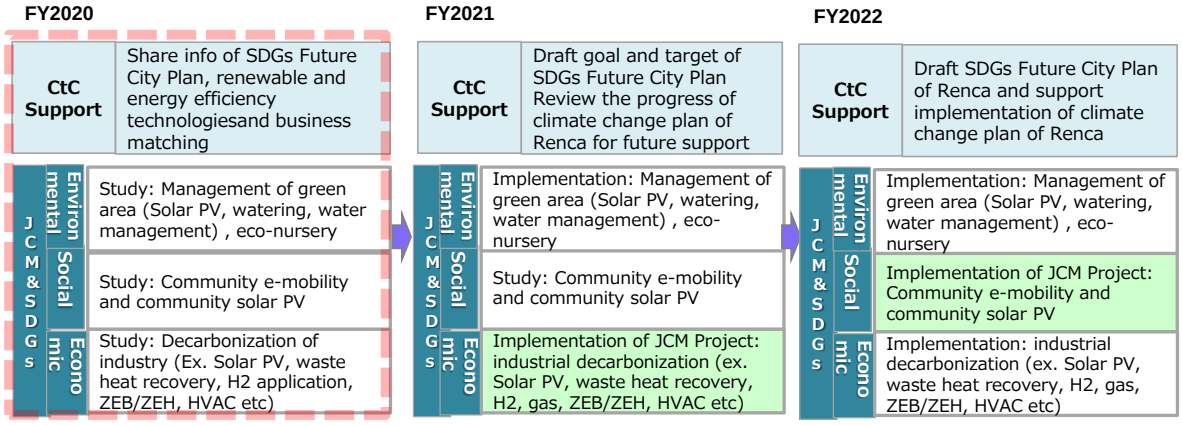
Source：Nippon Koei

Figure 1-1 Location Map of Renca Municipality and Overview of Renca Hill

1.4 THREE-YEAR PLAN

In this project, based on the results of analysis of needs and issues of Renca, potential activities were examined as 1) the support by city-to-city collaboration especially with regard to the promotion of SDGs and 2) formulation of JCM model projects that contribute to the

decarbonization of the city. The activities and targets for the next three years are planned as follows.



Source：Nippon Koei

Figure 1-2 Three-year Plan

1.5 IMPLEMENTATION STRUCTURE

The implementation structure of this project is shown the following figure. Under the umbrella of collaboration between the two local governments, companies of both cities carry out activities for project formulation, and Nippon Koei plays a role of supporting the whole process as a consultant.

In the course of implementation of the project, the contract for this project was amended to divert budget for travel expense from Japan to Chile, to additional local outsourcing work and local consultants since international trips need to be canceled due to pandemic of COVID-19 (new-type coronavirus infectious disease). After amendment to the contract, as shown in the figure below, subcontracting work to La Fabrica (public enterprise in Renca) and Sherpas (private consulting enterprise) were added for smooth implementation of the project.

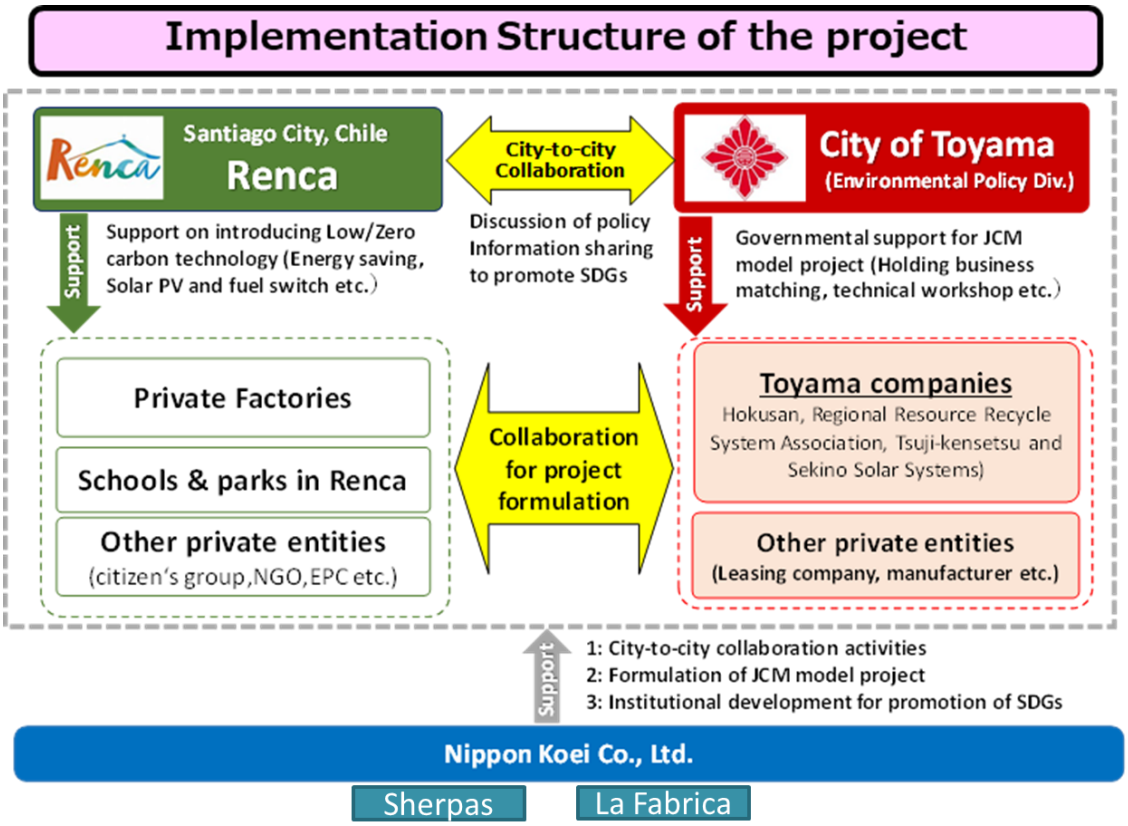


Figure 1-3 Implementation Structure (Final: after amendment to the contract)

1.6 SCHEDULE

The schedule of this project is shown in the following figure.

#	Work items	Sept	Oct	Nov	Dec	Jan	Feb	Mar
City-to-city collaboration								
1	Study on promotion strategy of SDGs in Renca	→	→	→	→			
2	City-to-city collaboration							
	1)Preparatory works (preparation of materials)	→	→	→				
	2)Sharing technical information and target setting	→	→	→	→	→	→	
	3)Support on business matching and project formulation		→	→	▼	→	→	
JCM Project Formulation								
1	Discussion/study for project formulation	→	(Local staff/remote meetings)	→	→	→	→	
2	Discussion of consortium members (companies)				→	→	→	
3	Study on monitoring						→	
4	Preparatory works for proposal writing					→	→	
Others								
1	Monthly report (NK-->MOEJ)		▼	▼	▼	▼	▼	▼
2	Periodical meeting (Toyama/MOEJ)	▼			▼	▼	▼	
3	Kickoff meeting (Renca/Toyama)	▼						
	Business matching seminar (Renca/Toyama)				▼			
	Regular meeting (Renca/NK)	▼	▼ ▼	▼ ▼	▼ ▼	▼ ▼	▼ ▼	
	Final seminar (Renca/Toyama)					▼		
4	Visit to Japan (Renca)					▼		
5	JCM Seminar (MOEJ)				▼			
Business trips and report								
1	Work in Renca	(Local staff/remote meetings)	▪▪▪	▪▪▪	▪▪▪	▼ ▪▪▪	▪▪▪ →	
2	Meeting in Japan (Toyama/NK)			▼	▼	▼		
3	Final report					→	→	▼ Submission

Source: Nippon Koei

Figure 1-4 Schedule

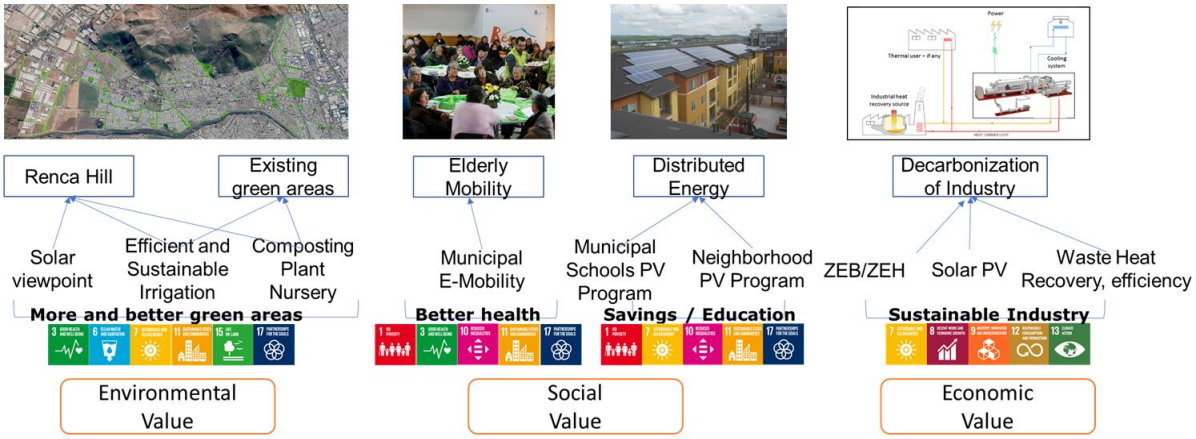
1.7 OVERVIEW OF THE SITE ACTIVITIES

As mentioned above, field survey by Japanese consultants could not be conducted this year due to the pandemic of COVID-19. Therefore, for smooth implementation of the activities in Renca, subcontract work to local entities and employment of local consultants were added.
Chapter 4 describes the series of online meetings, and Chapter 2 describes on-site activities for formulation of JCM model projects.

CHAPTER 2 ACTIVITIES RELATED TO ENERGY CONSERVATION, RENEWABLE ENERGY, AND TRANSPORTATION INFRASTRUCTURE

2.1 SUMMARIZING NEEDS OF RENCA MUNICIPALITY FROM ENVIRONMENTAL, SOCIAL AND ECONOMIC VALUE

In order to examine the direction of JCM project formulation, the needs of Renca were studied by interview with personels of the local government, and confirmed at the kick-off workshop (detailed in Section 4.1), where various needs were presented by Renca. In order for efficient collaboration between Renca and Toyama and definition of approach to formulation of JCM projects, the three values presented in the Toyama City SDGs Future City Plan, namely i) environmental, ii) social, and iii) economic values, were used for classification of Renca's needs. The classified result showing approach of project formulation was agreed by both cities, which is shown in the figure below.



Source: Nippon Koei

Figure 2-1 Direction of Project Formulation based on the Needs of Renca Municipality

2.1.1 Needs of Renca for environmental value

(1) Reforestation of the Renca hill metropolitan park

Renca has a hill with an altitude of about 900m in the north, and occupies about 20% of the municipality's area. Reforestation and park development of the hill are listed as one of the measures in the Renca Municipality Climate Change Plan (2019). Renca developed the Master Plan for the area of 207ha owned by the municipality in the hill in a participatory manner for involvement of the inhabitants. The plan includes activites such as plantation of native tree species, development of park facilities (parking lots, walkways, sightseeing platforms, gymnasium, etc.). Renca has started implementation of the Master Plan since 2017 together with contractors and residents.

Technical needs related to implementation of the plan are presented by Renca as below: i) development of sustainable irrigation facilities for tree plantation, and ii) introduction of solar

power generation systems and lighting facilities in the park (seedlings nursery, parking lots, and lookout etc.). The image of some of the facilities is shown in the following figure.

Image of eco-nursery of Renca hill

Image of lookout of Renca hill

Source: Renca Municipality

Figure 2-2 Example of Facilities of Renca Hill Metropolitan Park

2.1.2 Needs of Renca for social value

(1) Improvement of transportation for welfare of the elderly

In Chile, aging of population has progressed significantly in recent years, and welfare of the elderly people has become an important issue. In June 2019, Japan and Chile signed a Memorandum of Understanding on Cooperation for an Aging Society, and it is of high interest to provide technical assistance from Japan, which has a wealth of experience in the welfare of the elderly. Approximately 15% of the Renca municipality's population accounts for over 60 years of age, of which 65% receive basic solidarity pensions which are supposed to be provided to the elderly people with lower pension income. Since it was found that the cost of transportation to hospitals and government offices is a significant burden for the elderly people, Renca started to development of free transportation for the elderly as a part of welfare services. In 2020, an electric vehicle was introduced as a part of CSR activities from a private company, and pilot activity of this welfare service was started. In the future, in order to increase the number of buses for expansion of the target area and increase of circulation routes, introduction of electric/hydrogen vehicle was prresented as a need by Renca.

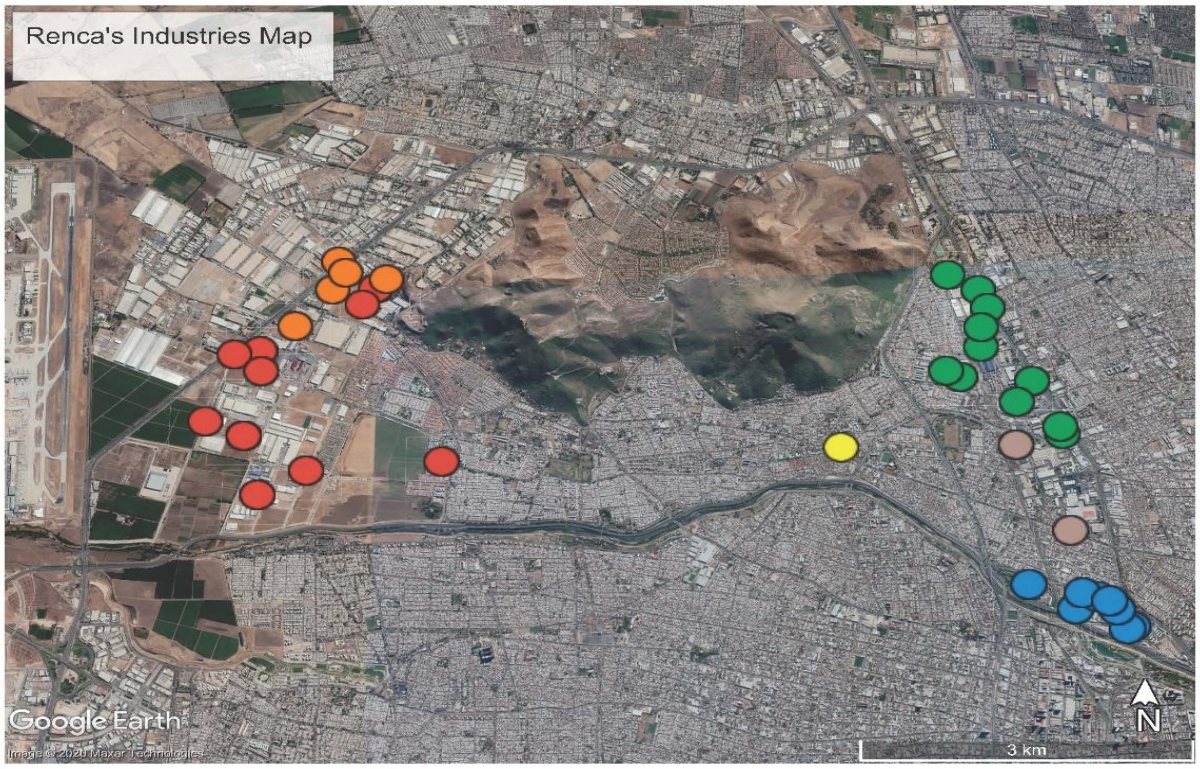
(2) Development of distributed power sources for schools and social houses

Renca has more than 10 schools and some social houses for low-income earners. In order to strengthen sustainability of the facility, Renca presented a need for development of distributed power sources through introduction of photovoltaic (PV) power generation systems for sustaible energy source, as well as environmental education.

2.1.3 Needs of Renca for economic value

(1) Decarbonization of Renca Municipality-related Companies

Since Arturo Merino BenIez International Airport is located just outside the western edge of Renca, there are many factories, warehouses, etc. of enterprises (e.g., beverage manufacturers, refrigerated warehouses, etc.) engaged in industrial activities within Renca for better access to distribution and transportation. These companies and facilities are the main sources of GHG emission of Renca, thus Renca presented its need for promotion of decarbonization of the companies/factories by formulation of JCM projects. As decarbonization technologies, the following potential technologies were presented: energy saving of factory buildings, energy saving in industrial processes (waste heat recovery power generation, etc.), and private power generation by PV system, etc..



* Colored circle: Industries

Source: Renca Municipality

Figure 2-3 Location of Main Industrial Facilities in Renca

2.2 IDENTIFICATION OF POTENTIAL JCM PROJECTS THROUGH TECHNOLOGY MATCHING

(1) Flow of identification of potential JCM projects based on the Renca's needs through technology matching

<u>Identification of potential projects with the companies in Renca</u>

Among the needs summarized in Section 2.1, for the need 2.1.3 (1) Decarbonization of the companies in Renca, the following activities was carried out for identification of potential JCM projects.

1) Identification of energy-saving technologiesof the companies of Toyama
2) Needs survey of the companies in Renca
3) Introduction of technology of companies of Toyama to Renca (Business Matching Seminar, detailed in Section 4.2)
4) Individual discussion and identification of the potential projects with the Renca companies that are interested in JCM scheme

Regarding the need for improvement of transportation means 2.1.2 (1), as mentioned above, since there is a possibility of providing vehicles as CSR from private enterprises, the flow of 3)-4) above was applied.

Identification of potential projects with Renca

Regarding the following needs; i) 2.1.1 environmental value (reforestation and development of metropolitan park) and ii) 2.1.2 (2) social value for distributed power supply development to schools and social houses, the detail plan was confirmed with the contractor and persons in charge of the master plan implementation, and technologies of companies in Toyama which may meet the needs were introduced to Renca in the business matching seminar, activity 3) above.

(2) Identification of zero carbon technologies of companies in Toyama

The following 3 companies of Toyama were identified as the ones with the technologies to meet the needs described in Section 2.1, and information on the main technologies and products of each company was collected.

- Hokusan Co., Ltd.
  Experience of JCM: JCM project for fuel conversion from diesel to CNG/ Dual Diesel Fuel (DDFs) in CtC collaboration project between Toyama City and Semaran City, Indonesia
  Main energy-saving/re-energy-related technologies: hybridization (DDF), introduction of photovoltaic power generation systems, installation of hydrogen stations, etc.
- TSUJI CONSTRUCTION Co., Ltd.
  Major energy-saving/re-energy-related technologies: installation of photovoltaic panels on roofs, house energy-management systems (HEMS)
- SEKINO SOLAR SYSTEM
  Major energy-saving/re-energy-related technologies: design for installation of photovoltaic panels on roofs, manufacture of PV panel fixtures that do not pierce roofs, etc.

(3) Questionnaire survey on the needs of companies of Renca

Renca sent invitation to to the business matching seminar, which will be described later, to approximately 40 companies in Renca, together with a questionnaire. The question items in the questionnaire are as follows.

- Interest in energy conservation and reduction of greenhouse gas emissions
- Targets of interest in reducing greenhouse gas emissions (manufacturing processes, lighting, air conditioning, other energy, distribution and transport, electric transport, and other modes of transport)
- Interest in renewable energy
- Type of renewable energy interested in (solar, biomass, biogas, waste heat, renewable energy purchases)
- Target of GHG emissions reduction (by 2030 and by 2050)
- Current reduction of GHG emission etc.

Of these, 13 companies responded. The results are summarized in the following table.

Table 2-1 Interest in Energy Conservation Technologies of Renca Companies

(Unit: Number of companies)

Target of energy conservation	Very interested	Somewhat interested	Not interested
Production process	6	3	0
Lighting	8	1	0
Air conditioning	5	3	1
Other energy	6	2	1
Distribution and transportation	7	2	0
Electric means of transport	6	2	1
Other means of transportation	4	4	1

Source: Nippon Koei

Table 2-2 Interest of Renca Companies by Renewable Energy Types

(Unit: Number of companies)

Renewable energy	Very interested	Somewhat interested	Not interested
Photovoltaic power generation	4	2	0
Biomass power generation	0	4	2
Biogas power generation	1	5	0
Waste heat utilization	2	3	1
Purchase of renewable energy	3	2	1

Source: Nippon Koei

Energy-saving technologies of interest are widely dispersed in various fields, and in renewable energy, particularly, the introduction of photovoltaic power generation systems has been confirmed to be highly interested. On the other hand, many companies have also been interested in biomass and biogas, indicating that there are many companies that are highly interested in decarbonization.

(4) Introduction of technology of companies in Toyama to Renca companies

Business matching seminars were held for Renca companies that showed interest in introducing energy-saving technologies using JCM scheme. In the seminar, the following contens were explained; i) outline of the project, ii) JCM scheme, and iii) technlogies of Toyama companies (detailed in Section 4.2). Through this seminar, understanding of Renca companies on energy conservation technology of Toyama companies, requirements and schedule of application of JCM scheme were facilitated, and the seminar catalysits identification of potential JCM projects.

(5) Individual discussion and identification of the potential projects with the Renca companies that are interested in JCM scheme

Follow-up interviews with 16 companies that showed interest in application to JCM were offered with Renca Municipality, and the details of their needs were studied in the interview meetings for individual technology matching and identification of potential projects.

2.3 PRELIMINARY STUDY FOR IDENTIFICATION OF POTENTIAL JCM MODEL PROJECTS

The following table summarizes the results of preliminary study for identification of potential JCM model projects. As a result of individual discussions, the number of potential Renca companies for JCM model projects was narrowed down from 13 to 6 as shown in the table below.

The identified potential JCM model projects are categorized into the following five patterns: i) introduction of photovoltaic power generation system on the roof of the factory (private enterprise facilities and public facilities), ii) reduction in volume of industry waste which contributes to reduction of traffic load, iii) energy conversion of vehicles (forklifts, trucks, etc.) (conversion of fuel to DDF/natural gas/electrification), iv) introduction of hydrogen/electric bus, and v) wastewater treatment. The Future plans for each potential JCM model projects are detailed in Chapter 6.

Table 2-3 Results of Preliminary Study for Identification of Potential JCM Model Projects

	Company/Organization Name	**Industries, products and services**	**Potential applicable technologies**	**Progress/ result of discussion**	**Future plans**
Economic Value (Decarbonization of Industrial Sector)	Company A	Chemical manufacturers	Photovoltaic power generation (1-3 MW)	- Interest in introducing PV system to facilities (warehouses) consuming 5 MW. - Obtained information on the roof shape of the subject facility. - Examine potential of	Examine applicability of PV panel fixtures produced Sekino Solar System based on the information on roof shape and

	Company/Organization Name	**Industries, products and services**	**Potential applicable technologies**	**Progress/ result of discussion**	**Future plans**
				expansion of the target facilities to the ones of group companies - Started discussions with ESCO company.	material. Define target facilities, scale of power generation, implementation structure etc.
	Company B	Warehouse	Rooftop PV system (max 0.3MWp)	- Obtained drawings of warehouse. - Under study of structure of rooftop	Upon obtaining information on roof structure, confirm applicability of PV panel fixtures of Sekino Solar System Define target facilities, scale of power generation, implementation structure etc.
	Company C	Warehouse	PV power generation LED High-efficiency chiller Insulation material Improvement of efficiency of compression machine for waste cardboard Disposal of waste pallets	Under discussion with company C for planning the details of the projects Under confirmation of potential companies in Toyama which has technology on cardboard compression and waste pallet disposal	Collection of information on target facilities and
	Company D	Metal	Emission reduction from vehicles (forklifts, etc.) by conversion of fuel to natural gas, electrification, etc.	Under internal discussion on model project in Company D Under collection of information on the potential target vehicles	After confirming the results of internal discussions, feasibility of introducing natural gasification technology will be studied based on the information on the target vehicles.

	Company/Organization Name	**Industries, products and services**	**Potential applicable technologies**	**Progress/ result of discussion**	**Future plans**
Environmental value (Reforestation of Renca hill) Social value (provision of water resources)	Company E	Foods and beverages	Wastewater Treatment, Recycled Water, etc. (under discussion)	- Interested in activities that contribute to social welfare as well as energy saving and emission reduction in its own manufacturing processes. It is necessary to formulate an activity plan for three years by the end of February. - Another beverage manufacturer compnay has provided treated wastewater to the local communities free of charge. Similar activity for production of irrigation water for Renca hill reforestation is proposed and under discussion. - Plantation of Renca hill will begin in May 2021 and terminate in FY 2021 as a memorial for those who passed away by Covid-19.	Continue discussion for formulation of model project based on the there year plan.
Social value (transportation for the elderly)	Company F	Energy	Fuel cell (FC) bus	Donated an electric bus. Interested in donating a fuel cell bus as well. Under internal discussion of the company for application to JCM scheme.	After confirming the results of tinternal discussion, preliminary feasibility study of introduction of FC bus will be implemented.

	Company/Organization Name	**Industries, products and services**	**Potential applicable technologies**	**Progress/ result of discussion**	**Future plans**
Environmental value (Reforestation and development of Renca hill metropolitan park)	Renca Municipality	Local governments	PV system (max 1MW)	- Memorial monuments and forest parks are to be developed for those who havepassed away by Covid-19. Installation of PV system to the roofs of parking lots for visitors, gymnasiums, and office etc. Generated power will be self-consumed, and surplus power is transmitted to the grid system. - Under discussion on details of the master plan and implementation plans with the personnel in charge.	- Study on the structure of roof, capacity of PV to be installed, etc. - Confirm institutional barriers in implementation of power generation by local governments.

Source: Nippon Koei

CHAPTER 3 SUPPORT FOR INSTITUTIONAL DEVELOPMENT

3.1 TO ORGANIZE AND TRANSLATE SDGS RELATED MATERIALS

The project aims to promote SDGs efforts by sharing information and knowledge related to SDGs of Toyama City among partner cities in Renca Municipality, Santiago City.
In June 2018, Toyama City was selected by the Japanese Cabinet Office as both a "SDGs Future City" and a "Local Government SDGs Model Project." "SDGs Future Cities" are local governments that propose excellent approaches to achieving SDGs among Japanese municipalities. In the first year of 2018, 29 local governments, including Toyama City, were selected. In addition, the "municipal SDGs model project" refers to a project that is making particularly leading SDGs efforts, and 10 projects were selected in the first year of FY2018, including the project of Toyama City.
For this reason, Toyama City, which is actively engaged in SDGs among Japanese municipalities, can provide information and innovations on actual initiatives from SDGs planning through city-to-city collaboration. Therefore, Toyama City is considered to be very useful for Renca Municipality, which is also considering the promotion of SDGs.
For Toyama City as well, the fact that SDGs's efforts are not limited to Toyama City, but also serve as a reference for foreign cities, and that they are positioned as one of the initiatives for international cooperation is in line with SDGs's goals. Therefore, the promotion of SDGs has significant merits for both cities.
In this fiscal year, we first reviewed the "SDGs Future City Plan (1st)" formulated by Toyama City, which was selected as SDGs Future City, and the "SDGs Future City Plan (2nd)" updated in February 2021, and summarized the planning processes and changes. In addition, in order to collect more detailed information, an on-line interview survey was conducted with the staff in charge of SDGs in Toyama City, and in order for Renca Municipality to tackle SDGs, ideas, systems, and contrivances that can be utilized regardless of the national system were extracted. This information was shared to the current municipality side at a local workshop (on-line) in February 2021, and the feedback was obtained so far as the results of this fiscal year's activities.

In the three-year project of city-to-city collaboration, it is assumed that the two cities will discuss SDGs promotion methods and required support in accordance with urban issues and characteristics of Renca Municipality in the following fiscal year.

3.2 OUTLINE OF SDGS FUTURE CITY PLAN

In recent years, plans formulated by local governments based on national guidelines require the establishment of key performance indicators (Key Performance Indicator, hereinafter referred to as KPIs). For this reason, KPIs have been established in the Toyama City SDGs Future City Plan since the first version. First of all, Toyama City has set three values, namely

"economy", "society" and "environment" as its ideal vision for 2030, and shows KPI and priority goals and targets for each value.

The project also promotes initiatives that contribute to the promotion of municipal SDGs in five areas: urban shapes, citizens' livelihoods, energies, industries, and cities and regions. These initiatives are aimed at deepening the content that Toyama City has been working on to date and creating an autonomous virtuous cycle of the Compact City strategy by promoting cross-sectoral and complex initiatives in collaboration with diverse stakeholders for the value of each area of the economy, society, and the environment.

Table 3-1 Points of Initiatives Contributing to Promotion of SDGs by Toyama City Municipalities 31

#	Item	Overview
1	Shape of the city	Realization of compact town development centered on public transportation
2	Daily lives of people	Building a healthy and transportation city and establishing a high-quality lifestyle
3	Energy	Building a safe and environmentally friendly smart city and a self-supporting distributed energy system
4	Industry	Building Technological and Social Innovation by Improving Industrial Vitality
5	Cities and regions	Enhancing Urban Brand Strength through Collaboration with Diverse Stakeholders

Source: Toyama City SDGs Future City Plan (2nd)

3.3 GATHERING INFORMATION ON TOYAMA CITY SDGS

In order to collect detailed information on the development processes and updates of the Toyama City SDGs Future City Plan, an on-line interview survey was conducted with the staff in charge of SDGs in the Environmental Policy Division of the Toyama City Environment Department. Mainly, the following four items were confirmed, and materials were collected for the purpose of providing information to Renca Municipality.

Since local governments have different systems and rules in Japan and overseas, it is necessary to confirm whether the efforts of Toyama City can be shared in the Renker Municipality as they are through discussions with the Renker Municipality in the future.

Table 3-2 Interview Items and Results for Toyama City 32

#	Question Items	Collected information
1	History of SDGs's Initiatives and the System of City Hall	・Toyama City was certified by the Ministry of the Environment of Japan as an "environmental future city" and "environmental model city", and it can be said that there was originally an activity as a foundation for the SDGs. ・Therefore, since the existing initiatives such as the Compact City were recognised from SDGs's point of view, it was possible to formulate plans efficiently.

#	Question Items	Collected information
		・The mayor's leadership is particularly effective in promoting SDGs of Toyama City. ・After discussion in the government, the Environmental Policy Division was designated as secretariat. ・In the planning process, SDGs was first examined in the city hall, and the opinions were exchanged at the strategic meeting of the Intelligent Council (once or twice a year, turning PDCA), and after the pabcome, it became the flow to receive approval from the Cabinet Office. ・SDGs Future City Plan (2nd) will be updated by March 2021.
2	Methods and Points of Formulation of SDGs Future City Plan	・Plans to solve the issues in five areas: KPIs, PDCA, and so on. The KPI is made along with it. ・Based on the KPIs of Toyama City Comprehensive Plan which is a top-level plan, and major existing plans, the KPIs for SDGs future city plan were selected. ・Every year, PDCA cycle is conducted. ・The Strategy Council is chaired by the mayor. ・As issues, since the KPI was made based on the KPI of the other existing policy and plans, there are cases where the KPI does not fit goals of SDGs. It was reviewed so that the data acquisition and evaluation could be completed at the city level. ・No new indicators are planned for only for SDGs future city plan, as they cannot be compared with historical data. ・The initial period was three years, but after the revision, the period will be five years (Toyama's own judgment, which has been approved by the Cabinet Office). ・Confirm consistency with related plans. ・The existing "Future Cities" and "Energy-Efficiency Improvement Plans" will not be updated, but will be consolidated in SDGs Future City Plan in the future.
3	Benefits from the selection of "SDGs Future Cities" and "Local Government SDGs Models"	・One of the merits is that the selection of SDGs Future Cities led to cooperation between cities with Renca Municipality. ・Diversity in SDGs is an advantage (concepts that can be used in various fields) ・Collaboration with various stakeholders has become easier. Concretely speaking, agreements with private sector entities became easier. ・It is advantageous to be able to receive support from the national government (50% of model projects and 100% of subsidies for dissemination and deployment) such as a grant for local creation (Cabinet Office). ・In order to promote educational SDGs, a supplementary book distributed to public schools contains SDGs on public transportation and environmental issues. ・Implemented on-site lectures at elementary and junior high schools (on-site lecturers from municipal office staff)

#	Question Items	Collected information
		・Schools that are actively engaged in activities are extracted, and panel displays of events are also carried out. ・There is a subsidy system for Toyama City's own schools to promote SDGs.
4	SDGs promotion system, concrete initiatives, and budgets	・The promotion headquarters, the Strategic Committee for External Experts, and the Environment Policy Division (Secretariat) are responsible for implementing programs for welfare and public transportation. It is necessary to devise lateral coordination among organizations. ・Approximately 20% of the city's SDGs budgets will be subsidized by the national government. ・SDGs training for staff (using SDGs cards games by outside instructors) is provided. Implementation from the next fiscal year onmunicipality is under consideration.
5	Reasons for Including International Cooperation in SDGs Future City Plan	・It is an Environmental Future City Plan which is the predecessor of SDGs future city plan, and it is a catalyst that the international expansion is included. The project is underway to support the overseas expansion of SMEs in the city. ・At the time of formulation, some outside experts pointed out that they would like to implement "global expansion" from a SDGs perspective. ・For this reason, "international development" is specified in the five objectives. ・We believe it will be necessary to examine how to tackle the corona problem in the future.

Source: Prepared by Nippon Koei based on interviews with staff in charge of SDGs in Toyama City

3.4 ANALYZING KPIS IN SDGS FUTURE CITY PLAN

Partially extracted the changed part on the key performance indicator (Key Performance Indicator, hereinafter referred to as "KPIs") of the updated Toyama City "SDGs Future City Plan (2nd)". The KPI of the economy and environment has been changed in accordance with this revision in order to more accurately reflect the actual situation.

Table 3-3 SDGs Future City Plan (1st) Targets (KPIs) 33

Value	KPI	FY2020	FY2030	SDGs goals
Economy	Annual shipments of manufactured goods from business establishments with four or more employees in the Industrial Statistics	1.255 trillion yen (FY2016)	1.4142 trillion yen (FY2028)	9,2、11,3、17,17
Society	Percentage of citizens who feel healthy	81.1% (FY2016)	86.0% (Fiscal 2022)	3,8、11,3、17,17
Environment	Pace of improvement in energy efficiency	0.7% (FY2011)	1.4% (Fiscal 2030)	7,3、11,3、17,17

Source: Toyama City SDGs Future City Plan (First)

Table 3-4 SDGs Future City Plan (2nd) Targets (KPIs) 34

Value	KPI	FY2020	FY2030	SDGs goals
Economy	Gross local product (Changes)	1 trillion 972.5 billion yen (FY2017)	2.1054 trillion yen	9.2,11.3,17.17
Society	Percentage of citizens who feel healthy (No change)	81.1% (FY2016)	86.0% (FY2026)	3.8,11.3,17.17
Environment	Reductions in GHG emissions (compared to FY2005) (Changes)	11.4% (FY2017)	30.0%	7.3,11.3,17.17

Source: Toyama City SDGs Future City Project (Secondary)

3.5 CONCRETE EXAMPLES OF SDGS ACTIVITIES IN TOYAMA CITY

Examples of SDGs efforts in Toyama City introduced to Renca Municipality are shown below.

1) Examples of "Toho-iki" Initiatives Based on the KPI of "Citizen's Life"

In "Toyama City SDGs Future City Plan", KPIs of "citizen's life", which is one of the measures contributing to the promotion of municipal SDGs, are set in two types as follows.

Table 3-5 KPI in "Citizens' Life"35

Item	KPI	2020	2030	SDGs
Daily lives of people	Percentage of citizens who feel healthy	81.1%	86.0%	3,8、11.3、17,17
	Percentage of elderly people feeling healthy	-95. 8% (age 65-74) -66. 9% (75 years old or older)	-96. 0% (age 65-74) -66. 0% (75 years old or older)	3,8

Source: Toyama City SDGs Future City Project (Secondary)

The first is the proportion of citizens who feel healthy. Currently, 81% of citizens feel healthy, but the target is 86% by 2030. The second is the rate at which elderly people feel healthy. Because the figure is high between the ages of 65 and 74, we would like to maintain it in 2030. Japan is the world's most aging country. About 30% of the population is over the age of 65, and the average life expectancy continues to grow. For this reason, the target value for people 75 years of age or older is set to be slightly lower than the current value by minimizing the decline.

In order to encourage citizens to become healthier, Toyama City encourages citizens to "walk." Since walking tends to actually reduce the cost of medical care, Toyama City has developed the smartphone application "Toho-katsu". It has a system in which points are accumulated by the number of steps, use of public transportation, and participation in events, and prizes are presented by lottery-like system according to the acquired points.

Benches for resting are also being added to city centers, along with toho-katsu. It is installed by donation from a company, and a plate with the name of the donor is attached to the bench. This bench aims to be established for 100 units in four years, and in this way, efforts are being made to create opportunities for citizens to walk and to promote the use of public transportation when moving in city centers.

Image of the Tohokatsu logo and apps

Bench installed by donation

2) SDGs events (Toyama City SDGs Week)

Toyama City held the Toyama SDGs Week in January 2021 as a SDGs event. In order to encourage the participants to feel SDGs as a familiar "one-on-one," the following various projects were carried out.

- SDGs Card Games ~ Thinking at Toyama ~
- SDGs online talk cafe
- SDGs seminars of the Toyama Small and Medium Enterprise Club
- "Itadaki-masu (*Bon Appétit*) 2～This is the fermentation Paradise" screening
- SDGs Laboratory (SME Promotion Seminars)
- SDGs Cafe-NOC Tram Festival
- SDGs Corporate Seminars-Tomunicipality an Age of Uncertainty
- Toyama Prefecture Hydrogen Energy Promotion Council
- Second Toyama Egoma Boy Spice Curry Department
- Toyama City SDGs Promotion Forum
- Agricultural-Fuku Collaboration Seminar
- Sixth Industrialization Seminar

Source: Extract from Toyama City website

3) Examples of Public-Private Partnership (Partnership with Financial Institutions and Private Enterprises)

Toyama City has concluded cooperative agreements with local banks during SDGs Week, assuming cooperation in a variety of situations, such as raising awareness of SDGs and regional development among SMEs. In addition to banks, the company has also entered into a

collaboration agreement with Coca-Cola Co., Ltd., which has a plant in the prefecture, to promote SDGs.

As a specific initiative by Coca-Cola Co. and Toyama City, the first SDGs vending machine in the country by a Japanese municipality is installed on the first floor of the city hall. In order to reduce food loss, this vending machine is sold at a lower price than the normal sales price. A portion of the sales is donated to the city and used as a financial resource for SDGs efforts.

<table>
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<tr>
<td>Establishment of food-loss countermeasures vending machines with beverage companies</td>
<td>Enlightenment of SDGs Future Cities</td>
</tr>
</table>

3.6 SHARING SDGS RELATED DATA TO RENCA MUNICIPALITYS

Through this survey and analyses, it was confirmed that various information related to SDGs Future City Plan in Toyama City can be provided to Renca Municipality in this city-to-city collaboration project. However, it was also found that it is important to present an approach suitable for Renca Area after thoroughly examining national institutions, local cultures, and issues.

Therefore, in this fiscal year, the background, purpose, and items of the plan formulation were sorted out from the Toyama City side, and the initiatives which appeared to be of high interest in Renca Area were extracted, and the final seminar of the city-to-city collaboration was first presented from Toyama City in the city-to-city collaboration consultation. See Section 4.5 for details.

3.7 TRANSLATING SDGS RELATED INFORMATION

Materials on SDGs prepared for the final seminar were translated into Spanish and shared with Renca.

CHAPTER 4 RESULTS OF SEMINARS

This chapter summarizes the results of holding various workshops and seminars, as well as regular technical meetings at the working level. Since we could not travel to the site of the Corona disaster, all the meetings were held online. Through these meetings, we grasped the needs and issues of Renka Municipality from the perspective of Toyama City SDGs Future City, and discussed specific support by Toyama City. At the same time, we examined the possibility of JCM projects for existing projects and facilities with high potential for renewable energy and energy conservation.

4.1 KICK-OFF WORKSHOP (28 SEP 2020)

The kick-off workshop for Toyama City - Renca Municipality City-to City Collaboration Project was held online. The summary and results of the workshop are shown in the table below. For the presentation materials, please refer to Attachment-1.

Table 4-1 Outline of Kick-off Workshop

Item	Kick-off Workshop
Implementation method	Online
Period of implementation	September 28, 2020, 20:30-22:00
Outline	An official workshop for the start of the city-to-city collaboration project in Toyama City and Renca Municipality.
Objective	Officially declare the start of the city-to-city collaboration project.
Agenda	Opening Remarks / Both Cities 2. SDGs Future City, City-to-city Collaboration / Toyama City (20 minutes) 3. Introduction of Renca Municipality's initiatives (20 minutes) 4. Introduction of technologies and JCM projects of companies in Toyama (20 minutes) 5. Question and answer session (20 minutes) 6. Closing remarks by both cities (10 minutes)
Participants	-Toyama City -Renka Municipality (including the municipality head) -Nippon Construction, local staff -One interpreter (Japanese⇔Spanish)
Results	-There was an enthusiastic presentation from Renca Municipality on their initiatives and needs, and it was decided to postpone Agenda 4. to the next regular technical meeting due to lack of time. -It was decided that regular technical meetings will be held every other week for this project.

Source: Nippon Koei

4.2 BUSINESS MATCHING WORKSHOP (1 DEC 2020)

A business matching workshop was held online to introduce the technologies of three companies in Toyama City participating in this project to companies in Renca Municipality and companies related to Renca Municipality. The outline and results of the workshop are shown in the table below. The importance of green recovery in the Corona disaster was also explained. Please refer to Attachment-2 for the presentation materials.

Table 4-2 Outline of Business Matching Workshop

Item	Business Matching Workshop
Implementation method	Online
Period of implementation	December 1, 2020, 20:30-22:30
Outline	An online business matching seminar was held to introduce companies in Toyama City and the JCM system and case formation, as well as to receive company introductions from the Renca Municipality side.
Objective	We will form JCM projects using the technologies of companies in Toyama City.
Agenda	1. Opening remarks / Both cities (20 minutes) 2. Introduction of Toyama City / Toyama City (15 minutes) 3. Introduction of the project and JCM: Nippon Koei (20 minutes) 4. Technology introduction by companies in Toyama: Hokuso (15 min) 5. Technology introduction by companies in Toyama City: Tsuji Construction (15 minutes) 6. Technology introduction by companies in Toyama City: Sekino Solar System (15 minutes) 7. Question and answer session (20 minutes) 8. Closing remarks by the Chilean Ambassador to Japan (5 minutes)
Participants	- Toyama City, companies in Toyama City - Renca Municipality (including the mayor) and companies in Renca Municipality - Embassy of Chile in Japan (including the Ambassador) - Nippon Koei, local staff - One interpreter (Japanese⇔Spanish)
Results	- A lot of questions were raised about the JCM model project scheme, etc. - The Renca Municipality sent invitations to companies in the municipality and related companies, and it was decided to make a list of those who actually showed interest in the seminar and those who showed particular interest, and to contact them in the future. - The Chilean Ambassador to Japan and the Mayor of Renca Municipality expressed their strong expectations for this project.

Source: Nippon Koei

4.3 CHILEAN JCM SEMINAR

The JCM Chile Webinar "Webinar on the Implementation of the Bilateral Credit Mechanism (JCM*1) in Chile: Utilization of JCM in the Corona Era" was held by the Global Environment Centre (GEC) on December 1, 2020. As a representative of the city-to-city collaboration, Nippon Construction made a presentation titled "Formation of JCM Projects through the Toyama City - Renca Municipality City-to-city Collaboration Project", which outlined the project, introduced the efforts of the two cities, and explained the approach to the city-to-city collaboration project based on the SDGs. Please refer to Attachment-3 for the presentation materials.

Introduction of city-to-city collaboration projects

4.4 SEMINAR ON CITY-TO-CITY COLLABORATION SPONSORED BY THE MINISTRY OF THE ENVIRONMENT (IN ENGLISH)

On February 1, 2021, the Ministry of the Environment hosted an "City-to-city collaboration Seminar for the Building of a Decarbonized Society." More than 100 people participated in the seminar, including Japanese cities, overseas cities, implementing businesses, and joint ventures engaged in city-to-city collaboration projects.

After the remarks from the organizers, the International Cooperation and Environmental Infrastructure Strategy Office of the Ministry of the Environment, the Market Mechanism Office of the Ministry of the Environment, and the Asian Development Bank announced the "Outline of the Support Menu for Building a Decarbonization Society" as follows: city-to-city collaboration projects, JCM facility subsidy projects, trends and trends of the JCM Japan Fund. In a subsequent panel discussion, Kitakyushu City, Oriental Consultants Co., Ltd., and Nippon Koei discussed how to promote city-to-city collaboration in the event of a corona disaster, and how to think and devise necessary for overseas expansion.

In the closing address, the Deputy Director-General of the Office of International Cooperation and Environmental Infrastructure Strategy of the Ministry of the Environment expressed the importance of strengthening Japan's alliance and providing support for newly emerging needs in the course of conducting activities for green recovery, as well as sharing experiences from overseas as well as Japan's experiences.

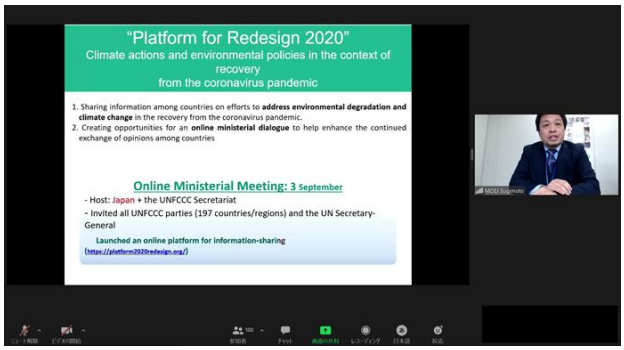
The program outline of this seminar is shown in the table below. Materials for introducing this project and data for presentations made by Nippon Koei in panel discussions are shown in the Attachment-4.

Table 4-3 Program Summary of City-to-city collaboration Seminar 41

#	Date and time	Content	Participants (viewers)
1	January 27 (Wednesday) to	1.city-to-city Partnership Project to Realize a Decarbonized Society in Fiscal 2020: Introduction of	General Applications for

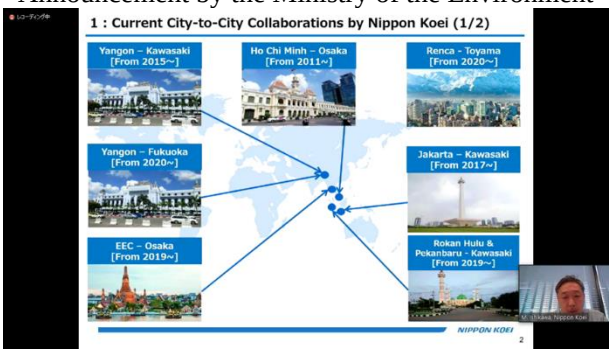
#	Date and time	Content	Participants (viewers)
	February 3 (Wednesday)	Outline of Individual Projects (On Demand) ■Introducing the outline of 20 projects adopted this fiscal year, on-demand viewing of videos	Business Related Parties
2	February 1 (Monday) Japan Time 14:00-16:00	2. Private seminars (Zoom meetings) ■Outline of support menu for building a decarbonized society ■[Panel Discussion] How to Promote Overseas Development in Corona Disaster	Only business associates

Source: Extract from IGES Preparation Materials

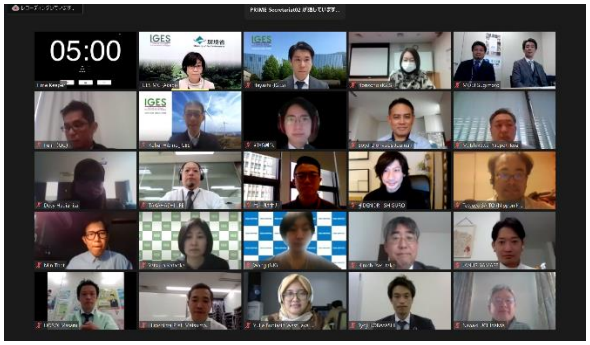


Announcement by the Ministry of the Environment

Panel discussion



Announcement by Nippon Koei



Group photography

4.5 FINAL SEMINAR (24 FEB 2021)

The final online seminar was held to report on the results of this year's activities of the Toyama City-Renca Municipality City-to-City Collaboration Project and to discuss the activity policy and specific candidate projects for the next year.
The summary and results of the final seminar are shown in the table below. For the presentation materials, please refer to Attachment-5.

Table 4-4 Outline of Final Seminar

Item	Final Seminar
Implementation method	Held online
Period of implementation	February 24, 2021, 20:30-22:00
Outline	A workshop to share Toyama City's efforts related to the SDGs as an

	outcome of this year's project, to confirm the progress of project formation, and to discuss and agree on the details of continued cooperation in the future.
Objective	Based on the needs of Renca Municipality, we will organize and discuss the contents of future cooperation by Toyama City through JCM and SDGs initiatives.
Agenda	1.Opening remarks / Both cities (10 minutes) 2.Initiatives for SDGs Future City / Toyama City (20 minutes) 3. Progress of this year's project / Nippon Construction (20 minutes) 4.Activities for the next year 1. Application for the next year / Nippon 5.Construction Co. 6.Interest of Renca Municipality/Renca Municipality 7.Q & A 8.Closing remarks / both cities (10 minutes)
Participants	- Toyama City, companies in Toyama City - Renka Municipality (including the municipality head), companies in Renka Municipality - UNEP - Nippon Construction, local staff - One simultaneous interpreter (Japanese and Spanish)
Results	- The City of Toyama shared information on the SDGs, including many examples of concrete initiatives. - The Mayor of Toyama City expressed his expectation for the realization of the SDGs in the future, citing specific projects. - Private sector companies interested in participating in the JCM project also participated and asked questions. - The Renca side expressed their hope for the next year's activities.

Source: Nippon Koei

4.6 REGULAR TECHNICAL MEETINGS

After the kick-off workshop, it was decided that regular technical meetings at the working level would be held every other week to confirm the progress of the JCM project formation and exchange various information. In response to the request from the Renca side, the meetings were held from 9:00 a.m. local time in Chile (9:00 p.m. in Japan) and lasted about one to one and a half hours. As described below, regular technical meetings were held a total of nine times from October 2020 until February 2021, before the final seminar, to discuss and examine specific needs and issues in Renca, and to narrow down candidate projects and technologies. One of the achievements of the project was that the meetings led to the promotion of understanding and the building of a relationship of trust between the two cities.

Table 4-5 Contents of Regular Technical Meetings42

#	Date	Overview
1st	October 16, 2020	- Presentation on JCM that could not be explained at the kickoff - Discussion on the overall schedule
2nd	October 23, 2020	- Discussion on business matching seminar - Discussion on the proposed project in Renca Municipality - Confirmation of overall schedule

#	Date	Overview
3rd	November 9, 2020	- Discussion on preparations for the business matching seminar - Discussion on the proposed project in Renca Municipality
4th	November 24, 2020	- Final confirmation of business matching seminar schedule and contents - Confirmation of invitations and responses to questions - Report on business trip to Toyama City - Discussions on the proposed project in Renca Municipality
5th	December 7, 2020	- Review of business matching seminar results - Actions based on the seminar implementation - Re-consignment contract
6th	December 21, 2020	- Confirmation of the progress of the case formulation study - Discuss the overall schedule - Preparation for re-commissioning
7th	January 18, 2021	- Confirmation of the progress of the project formation survey - Policy discussion on SDGs - Explanation of the City-to-city collaboration Seminar
8th	February 1, 2021	- Confirmation of the progress of the case formulation study - Discussion on the final seminar policy - Confirmation of the overall schedule
9th	February 15, 2021	- Confirmation of the progress of the project formation study - Discussion on the final seminar - Administrative procedures for re-commissioning

Source: Nippon Koei

CHAPTER 5 INITIATIVES FOR IMPLEMENTATION OF PROJECTS IN COVID-19

5.1 IMPACT OF COVID-19

This project has been affected in various ways by the global outbreak of COVID-19. The major impacts are listed below.

(1) Unable to travel: As this is the first year of the project, neither Toyama City nor Nippon Construction had direct contact with the officials of the government departments in charge.

(2) The city of Santiago, where Renca Municipality is located, has been locked down several times, making it difficult to conduct field visits by local people or by re-commissioning.

(3) Restrictions on the government budget: In Renca Municipality, health and education are in the same department, and the budget and manpower were affected by COVID-19, so it was not possible to budget for the introduction of solar power in schools.

(4) Private companies were also affected by the decrease in sales: some companies postponed their capital investment due to their business conditions and cash flow.

5.2 MEASURES TO COPE WITH THE IMPACT OF COVID-19

The following measures were taken in this project to mitigate the impact of the above.

Table 5-1 Measures to cope with the impact of COVID-19

#	Impact	Measures
1	Unable to trave	・ By holding bi-weekly web conferences, we ensured smooth communication between the Renca and Toyama sides. In addition, the schedule for case formation was thoroughly managed every other week. ・ In the main seminars, Japanese-Western translation was used to promote mutual understanding. ・ A self-introduction sheet was prepared for the people involved in the project, including their photos, hobbies, and favorite foods to make them as familiar as possible. ・ The research system in the field was strengthened by re-commissioning and adding local staff.
2	Field inspections were restricted.	・ By re-commissioning and adding local staff, we were able to make the field survey as flexible as possible. ・ By using a combination of Google Map satellite images and on-site photographs, it was easier to grasp the atmosphere of the location and buildings.
3	Restrictions on the government budget	It was decided to flexibly consider the installation of solar PV facilities in schools, including the possibility of installing it in the next fiscal year instead of the next.
4	Private companies were	There were companies that needed to renew their contracts due to the term of their power purchase agreements, so we targeted those

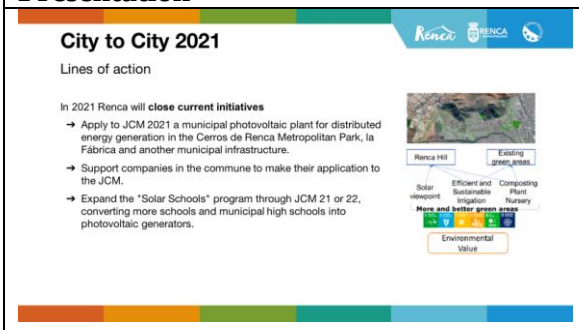
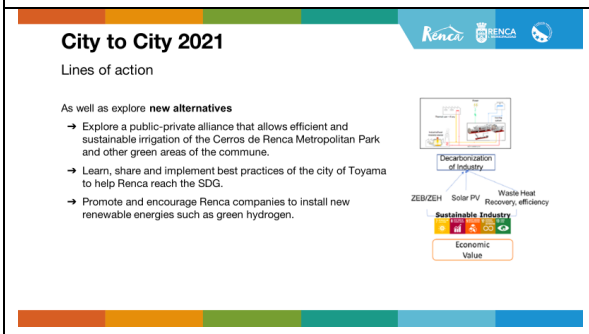
#	Impact	Measures
	also affected by the decrease in sales	companies. We proposed mainly the ESCO model. We decided to exclude some private companies from this year's survey and contact them again after their business settles down in the next fiscal year. The business matching seminar was held as a seminar for green recovery in order to raise interest in green recovery.

Source：Nippon Koei

CHAPTER 6 FUTURE PLAN

6.1 RESULTS OF DISCUSSIONS WITH RENCA MUNICIPALITY

In the final seminar held in February, the concerned parties discussed the contents of the project for the coming fiscal year and Renca Municipality presented their interest for FY2021.

Presentation	Outline
	FY2021: Achieve results of efforts to date. Apply to the JCM model project scheme for FY2021 for a municipal solar power plant for distributed energy generation in Renca Hill Park, La Fabrica, and other municipal infrastructure. Support businesses in Renca municipality to apply for the JCM. Expand the "Solar Schools" program through JCM 21 or 22 to convert more schools and municipal high schools to solar generators.
	FY2021: New Initiatives Explore public-private partnerships that will enable efficient and sustainable irrigation of green spaces in Renca Municipality, including Renca Hill Park. Learn, share, and implement best practices in Toyama City to help Renca achieve the SDGs. Promote and encourage Renca businesses to adopt new renewable energy sources, such as green hydrogen.

Source： Renca municipality

Figure 6-1 Proposals from Renca Municipality on Activities for the Next Year

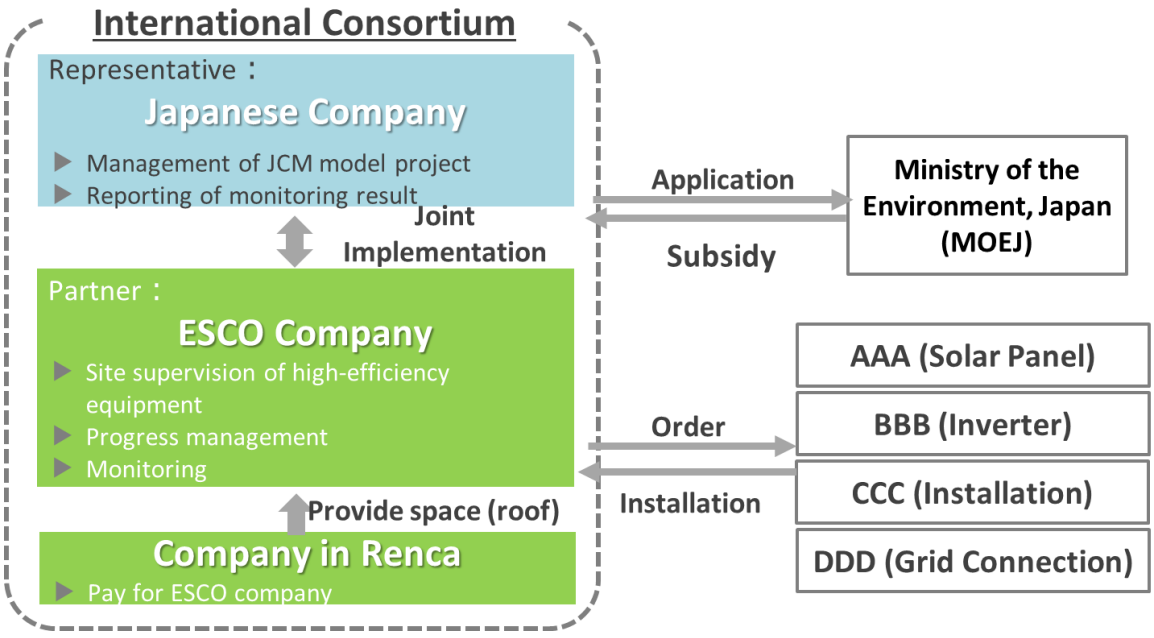
6.2 JCM MODEL PROJECTS

Of the projects considered this year, we believe that 1) the introduction of roof-mounted solar power generation at the plant of a chemical manufacturer group and 2) the introduction of solar power generation related to the COVID-19 memorial monument being promoted by Renca Municipality are the most feasible.

For 1), we are currently confirming the materials and structures of the roofs of several buildings, and based on this we will confirm the applicability of the Sekinoh solar technology.

For 2), we will consult with local contractors on the structure of the necessary girders, etc., and use Tsuji Construction's knowledge as necessary to study the plan, since it is expected that the system will be installed not only on roofs but also in parking lots, etc.

It should be noted that since the project sponsors wish to implement both projects with low initial investment through the ESCO scheme, it is necessary to form an international consortium with ESCO companies as intermediaries. At present, several candidates for the ESCO companies have been identified, and we plan to hold discussions with each company to compare their track records and conditions, and to evaluate reliable companies as joint operators.



Source: Nippon Koei

Figure 6-2 Examination of the Implementation Structure with ESCO companies

6.3 PLAN FOR NEXT YEAR'S CITY-TO-CITY COLLABORATION PROJECT: FORMATION OF JCM MODEL PROJECT

1) Since there has been a lot of interest in the transportation sector this year, we conducted a preliminary study on DDF (Diesel Dual Fuel) technology (introduced by Beisan Corporation in the subsidized project in Semarang, Indonesia, to reduce the carbon footprint of buses) and hydrogen fuel cell vehicle/bus technology. A preliminary study on hydrogen fuel cell vehicle and bus technology was conducted. In the next fiscal year, we would like to make a proposal to the companies with the results of the study.Although the use of EVs is rapidly progressing in the local market, several local companies gave us feedback that they are relatively positive about the idea of using low-carbon technologies such as gas once and then finally aiming for decarbonization, especially for heavy-duty commercial vehicles, rather than aiming for immediate decarbonization.

2) The renewable energy sector has the highest needs, and the desire to install photovoltaic power generation systems is expected to remain high. On the other hand, even with JCM subsidies, it is expected that the initial investment will continue to be a burden due to the impact of COVID-19, so we will continue to actively discuss with ESCO companies and propose JCM model projects. (2) In the field of simple solar power, the number of projects in Chile is increasing and the subsidy rate is decreasing, so we will also propose the combination with batteries.

3) In the field of energy efficiency and conservation, since we have heard from Renca that they are interested in irrigation and lighting in Renca Hill, we will continue to make proposals. In the next fiscal year, we would like to encourage them to reconsider the project in cooperation with Renca Municipality, while confirming their availability.

4) In addition, the Chilean side is very interested in the field of hydrogen, and the Ministry of the Environment has announced that it is considering a new support scheme from next fiscal year. In particular, since Nissan Chemical Co., Ltd. manufactures ammonia in Toyama City, we would like to explore the possibility of cooperation with this company and ask them to participate in the project next year.

6.4 PLAN FOR CITY-TO-CITY COLLABORATIVE PROJECTS FOR NEXT YEAR: INSTITUTION BUILDING FIELD

As shown in section 3.4, Renca Municipality has responded positively to the information sharing on the SDGs Future City Plan from Toyama City, and we believe it is important to continue to share specific initiatives related to the SDGs.
Renca Municipality is also interested in Toyama City's knowledge on approaching citizens and evaluating citizens' satisfaction, and we would like to actively share information on these topics. Since Renca Municipality, where major beverage companies are located, is interested in Toyama City's cooperation with Coca-Cola on SDGs, it would be effective to translate relevant information on the cooperation with these private companies into English.

In addition, cooperation with these companies, which generate a lot of wastewater, is a necessary partner in the Lengka Hill afforestation project, where irrigation using gray water is essential.
In the next fiscal year, we would like to increase collaboration with private companies in the area of institution building, and also explore the possibility of cooperation in the area of JCM JCM model projects, leading to the formation of complex projects. We believe that by enjoying the combined benefits of the city-to-city collaboration projects, the projects will be highly effective as well as highly effective in terms of public relations. We would like to identify candidate companies that are capable of such activities and form strategic partnerships in consultation with Renca Municipality.

End