FY2019 Project for Ministry of the Environment Japan

FY2019
City-to-City Collaboration Programme for Low-Carbon Society

Promotion of Low Carbon Society in Iskandar Regional Area (City of Kitakyushu-Iskandar Regional Development Authority Cooperation Project)

Report

February 2020

NTT Data Institute of Management Consulting, Inc.

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Chapter 1: Overview and Background

1.1 Overview

(1) Objective

The 21st Session of the Conference of the Parties to the United Nations Framework Convention on Climate Change (COP 21) was held in Paris, France in December 2015. Attended by all nations that make up the United Nations Framework on Climate Change, the session saw the adoption of the Paris Agreement, a legal framework for taking fair and effective measures to combat climate change in 2020 and beyond. The Paris Agreement promotes efforts aimed at decarbonization, calling for nations to keep global temperature rise well below 2 degrees centigrade compared to pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees centigrade. At COP21, it was decided that stakeholders would be asked to be aware of the actions of non-state actors such as municipalities, welcome the efforts of all non-governmental actors (municipalities and other local public bodies), and scale up their efforts.

COP22 was then held in Marrakesh, Morocco in November 2016. This session saw the delivery of the Marrakesh Action Proclamation for our Climate and Sustainable Development, which reemphasized the urgent need to address global warming of an unprecedented scale. It also served as a substantial opportunity to reconfirm the importance of global actions by states as well as local governments and to achieve further prosperity and sustainable development through economic change.

These sessions were followed by COP23 held in Bonn, Germany (host country: Fiji) in 2017; COP24 held in Katowice, Poland in 2018; and COP25 held in Madrid, Spain in December 2019). Japan expressed its proactive stance towards decarbonization to all nations present at the sessions.

Cities are densely-populated where people engage in activities that support social and economic development. Although cities account for less than 2% of the world's entire area, they are home to roughly 50% of the world's population. This is expected to rise to 70% by 2050. It has been estimated that, as of 2006, more than 70% of global CO2 emissions came from cities. This makes cities major players in mitigating climate change. Steady efforts by cities and surrounding urban areas to combat climate change and reduce greenhouse gas emissions are key to achieving the goals of the Paris Agreement.

In light of these circumstances, this project seeks to conduct a study aimed at realizing projects that will garner JCM credits for the purpose of deploying energy-saving and reuse technologies and waste heat recovery power generation technologies for social decarbonization and energy-related CO2 emissions reduction. The project is conducted in cooperation with the Iskandar Regional Development Authority (IRDA) and the city of Kitakyushu, which has experience and knowledge in achieving post-carbon societies. Through this study, the project also seeks to contribute to establishing an Action Plan aimed at urban development for

achieving a post-carbon society in the Iskandar Development Region (IDR).

(2) Activities

This study will be conducted with support from Malaysia's Iskandar Regional Development Authority and Kitakyushu and will involve the following activities aimed at promoting decarbonization in Malaysia and achieving a JCM project that will contribute to this goal.

- Activity set 1: Consider an Action Plan based on the completed Low Carbon Society Blueprint
- Activity set 2: Conduct follow-up studies for studies conducted in FY 2015 and FY 2016
- Activity set 3: Conduct excavations for a high-potential waste heat recovery power generation project

(3) Project methodology

(3)-1. Activity set 1: Consider an Action Plan based on the completed Low Carbon Society Blueprint

	Activity	Details
(a)	Hold direct talks with the IRDA	Hold direct talks with local governmental stakeholders and share the objective of the project. Assess the impact of the regime change, ascertain local needs, and build consensus for a study plan.
(b)	Discuss Action Plan draft details	Discuss an Action Plan extending through 2050 for achieving the goals laid out in the blueprint, taking into consideration the impact of the regime change based on the completed Low Carbon Society Blueprint.
(c)	Exchange views with the IRDA based on the Action Plan draft	Exchange views with governmental stakeholders based on the discussed Action Plan draft and facilitate the establishment of the IRDA Action Plan.

(3)-2. Activity set 2: Conduct follow-up studies for studies conducted in FY 2015 and FY 2016

	Activity	Details
(d)	Hold discussions with Japanese companies and other organizations with relevant needs	Hold direct talks with enterprises, etc. with needs identified through last fiscal year's study, brainstorm a more detailed plan and discuss a study plan for decarbonization.

(e)	Study technologies, cost performance, and CO2 reduction performance	Based on discussions with project candidate firms, perform a basic study of technologies to be deployed, conduct a cost performance study looking at investment amounts, payback periods, and internal rates of return, and study the CO2 emission reduction performance of deploying equipment.
(f)	Discuss an action framework for JCM equipment subsidy businesses	Gauge representative businesses' and local companies' willingness to participate in JCM equipment subsidy project and look into realizing projects. Make preparations when JCM equipment subsidies are applied for (consider schedules, confirm contract methods, discuss action frameworks, and identify issues).

(3)-3. Activity set 3: Conduct excavations for a high-potential waste heat recovery power generation project

	Activity	Details
(a)	Direct discussions with high-potential private enterprises	In mainly Iskandar Malaysia, find in-demand projects that are focused on waste heat recovery power generation or landfill gas generation, for example, while holding direct discussions and working out project details.
(b)	Study technologies, cost performance, and CO2 reduction performance	Based on discussions with project candidate firms, perform a basic study of technologies to be deployed, conduct a cost performance study looking at investment amounts, payback periods, and internal rates of return, and study the CO2 emission reduction performance of deploying equipment.
(c)	Discuss an action framework for JCM equipment subsidy businesses	Gauge representative businesses' and local companies' willingness to participate in JCM equipment subsidy project and look into realizing projects. Make preparations when JCM equipment subsidies are applied for (consider schedules, confirm contract methods, discuss action frameworks, and identify issues).

(3) Performance period

July 23, 2019 - March 1, 2020

(4) Action framework for study

This study will be done in cooperation with Kitakyushu and NTT Data Institute of Management Consulting, Inc., as shown in Table 1.

Table 1 Action framework

Business operator	Role
Kitakyushu	- Coordinate discussions for meetings with IRDA, etc. - Hold discussions to establish the Action Plan
NTT Data Institute of Management Consulting, Inc.	- Hold discussions to establish the Action Plan - Conduct follow-up studies for studies conducted in FY 2015 and FY 2016 - Conduct excavations for a high-potential waste heat recovery power generation project, among other projects - Summary of the activities

(5) Study schedule

The 3-year plan envisaged for this project is shown in Fig. 1. Activity set 1 entails establishing an Action Plan during the study period and then executing and refining the plan starting the next fiscal year. For activity sets 2 and 3, this fiscal year's study will be done with the goal of applying for JCM equipment subsidies and roll out similar projects beginning the next fiscal year.

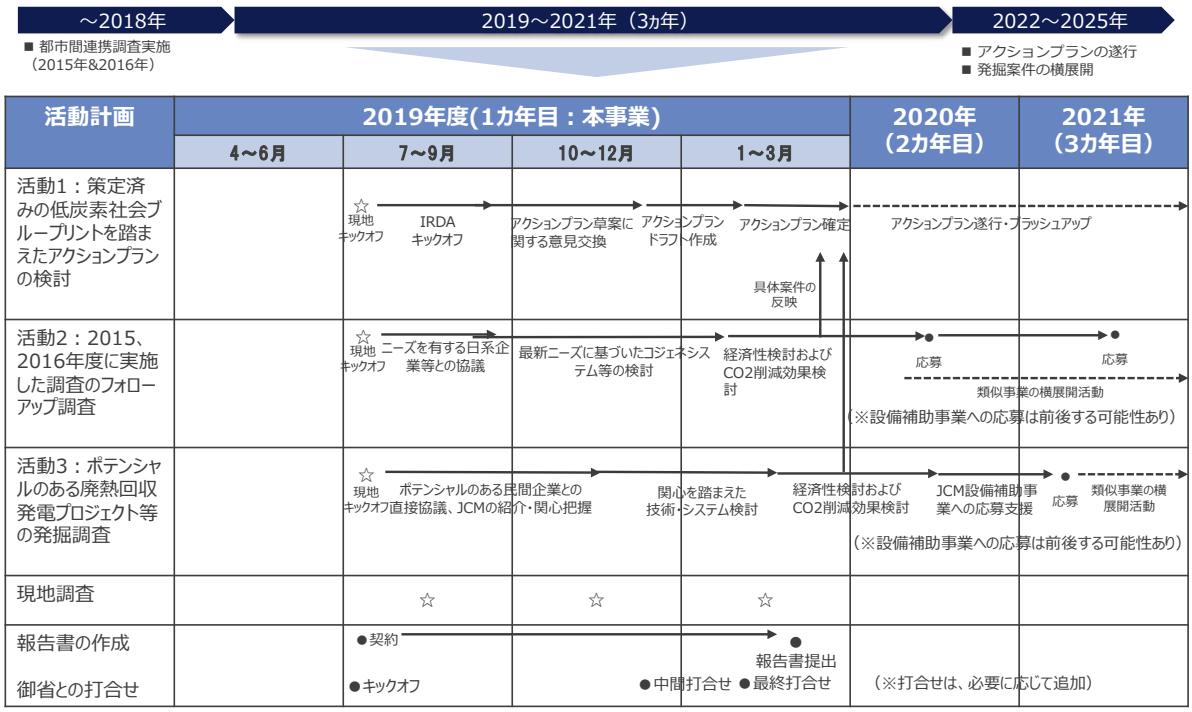

Fig. 1　Tentative study schedule

1.2　Background

1.2.1　Overview of the IRDA

(1)　About the IRDA

The Iskandar Regional Development Authority (IRDA) is a governmental agency established in 2007 to direct efforts at promoting Iskandar Malaysia. By regulating public and private interests, it aims to promote the development of a sustainable international city. The IRDA has three core functions and areas of legal authority for achieving the above objectives.

(a)　Planning

Integrating and recommending planning policy from the federal government, the state of Johor, and local governments to help improve well-being in Iskandar Malaysia. Identifying and developing strategies to enhance infrastructure, skills, and scientific research for Iskandar Malaysia development.

(b)　Promotion

Undertaking broad-based promotion of Iskandar Malaysia to the general public and potential investors.　Driving, coordinating, and monitoring the development of economic sectors and social infrastructure for both local and overseas.

(c)　Facilitation

Providing consultation and information on investing in Iskandar Malaysia. Acting as the principal coordinating agent on behalf of relevant government agencies in relation to receiving, processing, and expediting requisite approvals for investors in Iskandar

Malaysia. Assisting existing investors in resolving issues affecting their business environment.

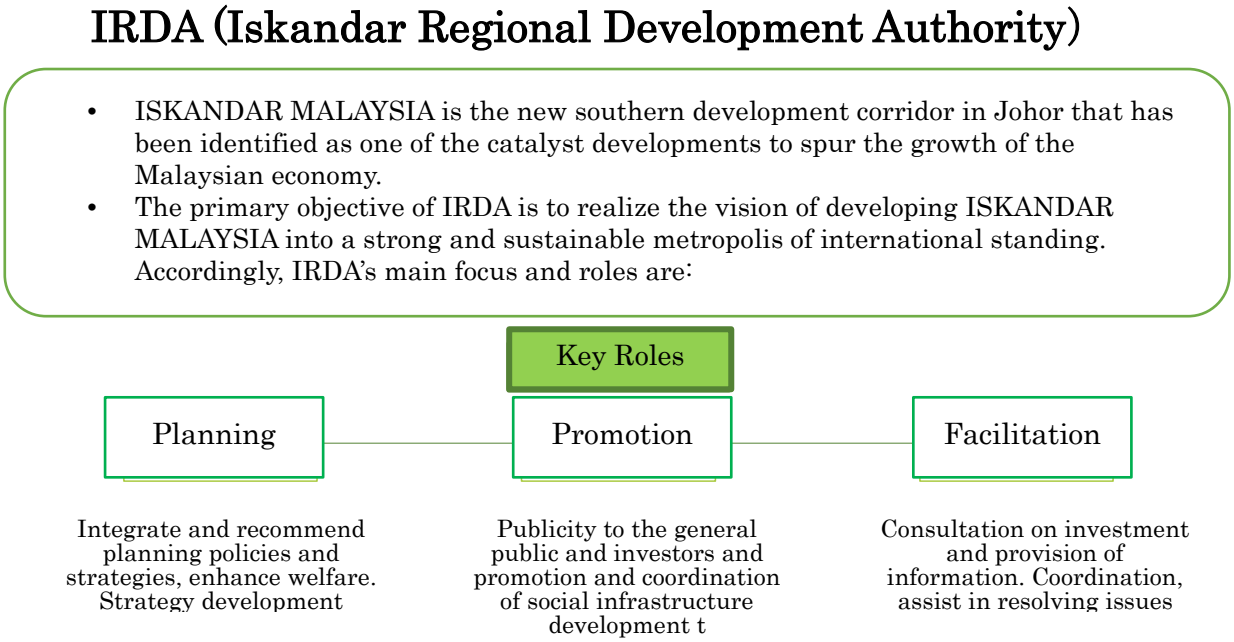

Fig. 2 Functions of the Iskandar Regional Development Authority[1]

(2) Iskandar Development Region

The Iskandar Development Region lies at the southern edge of the Malay Peninsula in southern Johor, a Malaysian state on the coast across from Singapore. With a population of around 1.9 million, it is the country's second most important center for economic activity after Kuala Lumpur. Malaysia's federal government established five economic corridors (key development regions) during the period of the Ninth Malaysia Plan (2006-2010), with comprehensive regional development projects being conducted in Iskandar Malaysia. The Eleventh Malaysia Plan (2016-2020), submitted to the Parliament of Malaysia by former prime minister Najib Razak in 2015, also establishes the Iskandar Development Region as a key development region. The five-year plan focuses on five main initiatives: environmental education and creative clusters, tourism and logistics centers, environment and energy, food, and the development of manufacturing industries focused on oleochemistry. Iskandar Malaysia occupies 2,217 square kilometers and comprises five flagship zones, namely [A] Johor Bahru City Centre, [B] Iskandar Puteri (formerly Nusajaya), [C] Western Gate Development, [D] Eastern Gate Development, and [E] Senai-Skudai. This is roughly the same area as the Tokyo Metropolitan area and three times the size of Singapore. On February 22, 2019, prime minister Mahathir Mohamad announced

[1] Prepared by NTT Data Institute of Management Consulting, Inc. based on data from the Iskandar Regional Development Authority's website

that Iskandar Malaysia would be expanded to 4,749 square kilometers, suggesting even more active development is in store for the Iskandar Development Region.

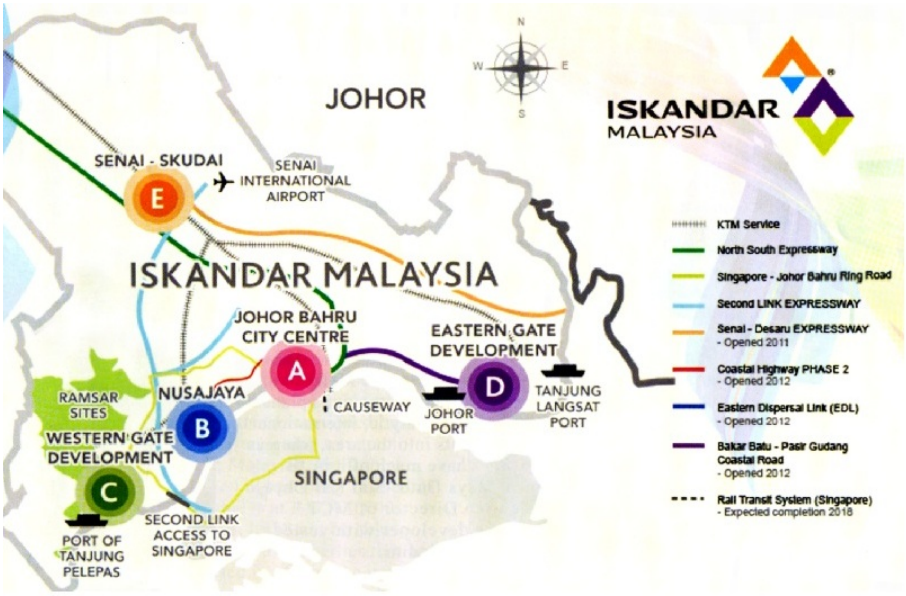

Fig. 3 Map of the Iskandar Development Region[2]

The aforementioned five flagship zones making up the Iskandar Development Region have the following functions and characteristics.

Zone A: Johor Bahru City Centre

This zone focuses on, among other things, business center development, culture and tourism, strengthening immigration functions, and waterfront property development. It has trading infrastructure, a financial center, and a service center (linked to Singapore via the Johor-Singapore Causeway).

Zone B: Iskandar Puteri (formerly Nusajaya)

Zone activities include Johor state government building construction, attracting education, medicine, and entertainment industry players, and Puteri Harbour development. Specifically, the zone comprises an academic city with universities offering foreign curricula, entertainment functions that include a movie filming studio as well as LEGOLAND and other theme parks, medical tourism and other service industries, and state government functions.

Zone C: Western Gate Development

This zone is centered on marine logistics center and power plant development and

[2] New Straits Times article published February 22, 2019 entitled "Iskandar Malaysia to be extended, covering more areas in Johor"

contains physical distribution, free trade, and oil storage port facilities. It links to Singapore via the Malaysia–Singapore Second Link.

Zone development leverages the Port of Tanjung Pelepas's geographical advantage of being near Singapore and other Southeast Asian nations and water deep enough to accommodate even larger vessels. Connected by sea routes to ports around the world, the Port of Tanjung Pelapas is the second largest in Malaysia in terms of container transaction volume and the 18th in the world[3]. [3]The port has a total area of roughly 7.8 square kilometers and comprises a container port and an adjoining free-trade zone.

Zone D: Eastern Gate Development

This zone's functions consist of electrical, chemical, and oleochemical product manufacturing and has a petrochemical storage port. Comprising Pasir Gudang Port, Tanjung Langsat Port, and Tanjung Langsat Technology Park, the zone occupies a total of approx. 15 square kilometers. It also contains Pasir Gudang Industrial Park, which has attracted foreign manufacturing firms from around the world.

Zone E: Senai-Skudai

This zone's functions consist of Senai International Airport, a logistics center, a high-tech industry, a space-related industry, a shopping center, and a cyber city. Home to University of Technology, Malaysia (UTM), one of Malaysia's most prestigious national universities, the zone also has Johor Bahru Premium Outlets, the first of its kind in southeast Asia, making it an attractive area for tourism as well as industry.

[3] Ministry of Land, Infrastructure, Transport and Tourism, Ranking of Global Container Handling Volume by Port (2018 preliminary figures)https://www.mlit.go.jp/common/000228237.pdf

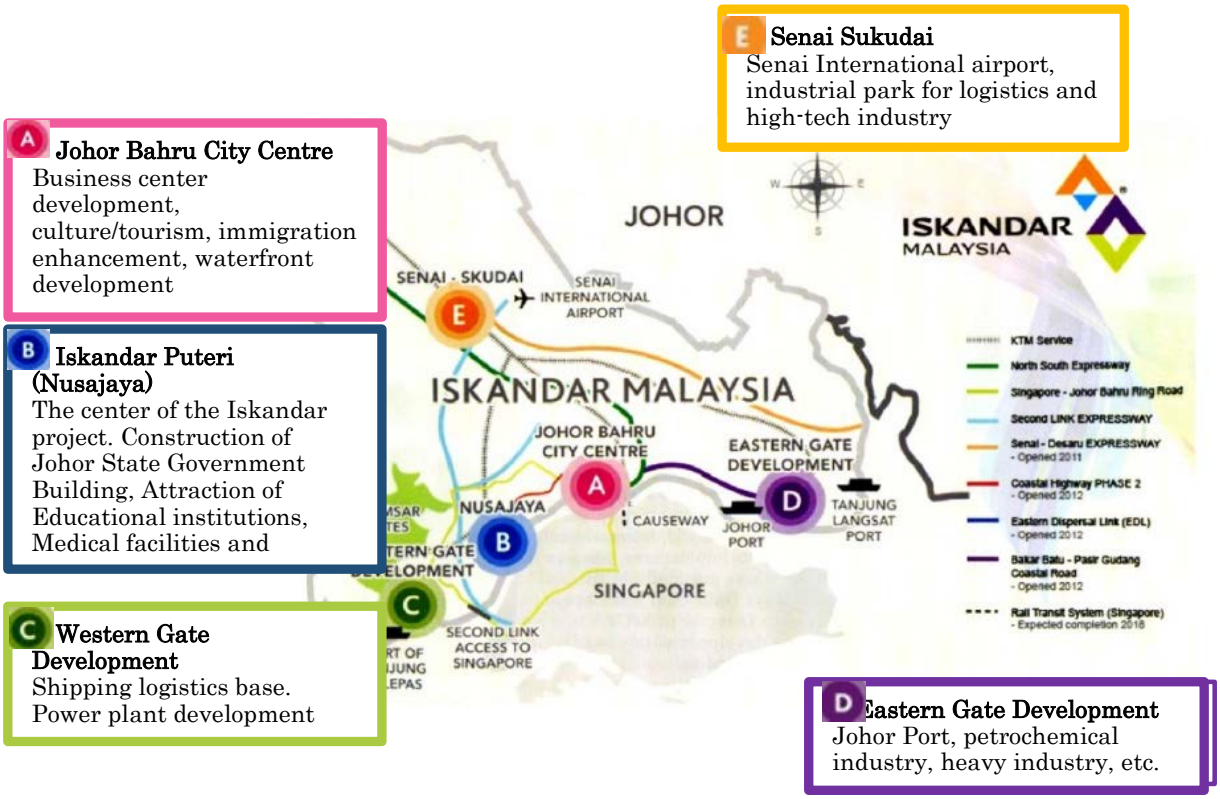

Fig. 4　Characteristics of the Iskandar Development Region's flagship zones

(3)　Industrial areas subject to the study

(a) Pasir Gudang Industrial Park

This industrial park was established 30 years ago. The area has long been a location of business expansion into Malaysia by Japanese and other firms. Among enterprises who arrived in the early years, many are now dealing with aging facilities and equipment at their plants and are facing efficiency problems.

Industrial park name	Pasir Gudang Industrial Park
Distance from major city	36 km from Johor Bahru
Japanese firms with a presence[4]	· Adeka Foods (Asia) Sdn. Bhd. · Aida Manufacturing (M) Sdn. Bhd. · Hitachi Chemical (Johor) Sdn. Bhd. · Idemitsu Chemical (M) Sdn. Bhd. · Palmaju Edible Oil Sdn. Bhd. and others

(b) Kawasan Perindustrian Senai Industrial Park

[4] Toyo Keizai Inc.: Excerpt from the Overseas Japanese Companies Database, By Country, 2019 edition

Industrial park name	Kawasan Perindustrian Senai
Distance from major city	32 km from Johor Bahru
Japanese firms with a presence	· Panasonic System Networks Malaysia Sdn. Bhd. · Mitsubishi Electric (Malaysia) Sdn. Bhd. · Hikoki (Malaysia) Sdn. Bhd. · Hitachi Cable (Johor) Sdn. Bhd. · Matsushita Precision Industrial Co. Sdn. Bhd and others

(c) Kawasan Perindustrian Tebrau Industrial Park

Industrial park name	Kawasan Perindustrian Tebrau
Distance from major city	15 km from Johor Bahru
Japanese firms with a presence	· Dan Café (Malaysia) Sdn. Bhd. · J.K. Sumi Wire Harness Sdn. Bhd. · Southern Lion Sdn Bhd · Mizuho Precision Engineering (M) Sdn. Bhd. · Chiyoda Integre Co. (Johor) Sdn. Bhd. and others

(d) Other areas

In addition to the above, studies are also focusing on finding private companies not located in the area (those in the Johor Bahru and Kuala Lumpur areas) for high-potential JCM equipment subsidy projects.

1.2.2 The Malaysian Government's Efforts to Reduce Greenhouse Gas Emissions

(1) Effects of Malaysia's regime change

In the 14th General Elections (federal and state elections) held on May 9, 2018, the United Malays National Organization (UMNO) and Barisan Nasional (BN), which had held power since Malaysia's independence in 1957, suffered a crushing defeat at the hands of Mahathir bin Mohamad and his opposition party (Alliance of Hope), who with a majority of votes marked the first regime change since Malaysia achieved independence.

The regime change effected a restructuring of the company's ministries and agencies. The country's Ministry of Science, Technology and Innovation was merged with the Ministry of Natural Resources and Environment and the Ministry of Energy, Green Technology and Water, which had dealt with environmental and climate change problems. The new ministry that arose is the Ministry of Energy, Green Technology, Science and Climate, which now oversees

initiatives pertaining to the environment, climate change, waste (specified waste) disposal, and social experiments. The ministry's mission focuses on the following four areas.

(a) Educating on the values of excellence, integrity, and focusing on the future

(b) Strategically managing energy resources, optimize renewable energy sources and energy efficiency services, and secure a continuous supply of electric power

(c) Studying, developing, and capitalizing scientific and technological advancements based on the country's economic interests through strategic R&D and environmental investment partnerships with industries

(d) Preserving the environment by providing education aimed at achieving pollution-free environments, raising awareness, and taking action

Table 2　Ministerial restructuring

Government Reorganization

1. The Najib Administration		2. The Mahathir Administration	
			Jurisdiction (Economic)
Ministry of Rural and Regional Development		Ministry of Rural Development	Local infrastructure development, improvement of economy and welfare
Ministry of Communication and Multimedia		Ministry of Communications and Multimedia	Information and communication policy, cyber security policy
Ministry of Women and Family Development		Ministry of Women and Family Development	Nursing care, social welfare, gender
Ministry of Human Resource		Ministry of Human Resource	Worker protection, professional development
Ministry of Health		Ministry of Health	Healthcare, pharmaceuticals/medical equipment regulations
Prime Minister's Department		Prime Minister's Department	Formulation of development plan, review of high-speed railway, ODA loan
		Department of Islamic Development Malaysia、Prime Minister's Department (JAKIM)	Halal
		Prime Minister's Department National Disaster Management Agency	Disaster prevention policy
		Prime Minister's Department Malaysia Maritme Law Enforcement Agency (MMEA)	Maritime law enforcement, salvage rescue
Ministry of Domestic Trade, Co-operatives and Consumerism		Ministry of Domestic Trade and Consumers Affairs	Retail regulations, product safety administration
Ministry of International Trade and Industry		Ministry of International Trade and Industry	Industrial development, TPP, RCEP, APEC, LEP2.0, National car concept
	New	Ministry of Entrepreneur Development	Halal, SMEs (especially human resource development), cooperatives
Ministry of Finance		Ministry of Finance	Fiscal policy, debt issues
Ministry of Agriculture and Agro-Based Industry		Ministry of Agriculture and Agro-Based Industry	Agriculture, livestock and fisheries
Ministry of Plantation Industries and Commodities		Ministry of Primary Industries	Forestry, palm oil, rubber
Ministry of Energy, Green Technology and Water		Ministry of Energy, Green Technology, Science and Climate Change	Environment / climate change, waste disposal (designated garbage), social experiment
Ministry of Science、Technology and Innovation			
Ministry of Urban Wellbeing、Housing and Local Government		Ministry of Housing and Local Government	Waste treatment (household garbage)
Ministry of Natural Resources and Environment		Ministry of Water, Land and Natural Resources	Water and sewage, water disaster prevention, wild animals and plants
Mnistry of Works		Mnistry of Public Works	Road transport infrastructure
Ministry of Transport		Ministry of Transport	Transportation, traffic safety and regulations
Ministry of Tourism and Culture		Ministry of Tourism, Arts and Culture	Sightseeing
Ministry of Foreign Affairs		Ministry of Foreign Affairs	International elections, ASEAN, OECD, TICAD, etc.

(2) Greenhouse gas emission reduction efforts

(State policies concerning energy)

The principal initiatives of Malaysia's renewable energy policy are as follows. Malaysia's basic energy policy aims to develop the country's economy by promoting a safe and highly cost-effective energy supply and efficient energy usage while reducing unproductive energy consumption and minimizing environmental impact as outlined in the Eleventh Malaysia Plan (2016-2020). 4,342,000,000 ringgit (4.9%) of the total budget

for the seven strategies in the plan is being budgeted to "pursuing green growth for sustainability and resilience."

Table 3 shows Malaysia's main renewable energy-related policies. In a bid to spur further renewable energy usage and thereby help Malaysia maintain energy self-sufficiency, a feed-in-tariff ("FIT") system was announced as part of the Renewable Energy Act in 2011.

Table 3　Malaysia's line of policy on renewable energy[5]

Government Policy on Renewable Energy	
1999	Five Fuel Diversification Policy
2001	The Third Outline Perspective Plan (2001-2010))
2005	The National Biofuel Policy (NBP 2006)
2009	The Renewable Energy Act
	National Renewable Energy Policy
2010	Green Technology Financing Scheme　(GTFS)
	https://www.asiax.biz/news/21065/
	Energy Commission Act
2011	The Renewable Energy Act (Rev.)
	Sustainable Development Business Law
	Sustainable Energy Development Authority Act 2011
2013/2014	The Renewable Energy Act and Sustainable Energy Development Authority Act
2015	The Eleventh Malaysia Plan (11MP)　(2016-2020)
2017	Green Technology Master Plan 2017-2030)　(GTMP)
2019	Preapration of the Twelfth Malaysia Plan, 2021-2025

(Status and goals for renewable energy deployment)

With the exception of solar power, whose price was initially set at a high level, the feed-in-tariff system implemented under the Renewable Energy Act announced in 2011 has seen little renewable energy proliferation due to a degression rate marked by perennial option price decline. Within the FIT system, a premium rate is set on products produced in Malaysia. Solar power, for example, carries a premium price with no degression rate, creating advantageous conditions for companies producing in Malaysia.

[5] Prepared by NTT Data Institute of Management Consulting, Inc. based on NEDO's Survey Report on Smart Community-related Technology and Service Standardization and International Trends

Table 4　Renewable energy deployment (installed capacity, unit: MW)[6]

Year	Biogas	Biogas (埋立て、農業廃棄物)	Biomass	Biomass (固形廃棄物)	Small Hydro	Solar PV	Geo-thermal	Total
2012	2.00	3.16	36.90	8.90	11.70	31.54	0.00	94.20
2013	3.38	3.20	0.00	0.00	0.00	107.00	0.00	113.58
2014	1.10	0.00	12.50	0.00	0.00	65.15	0.00	78.75
2015	0.00	5.40	12.50	7.00	6.60	60.34	0.00	91.34
2016	0.00	15.46	19.50	0.00	12.00	77.81	0.00	124.77
2017	0.00	22.54	0.00	0.00	0.00	38.09	0.00	60.63
2018	0.00	3.60	0.00	5.85	0.00	1.54	0.00	10.99
累積	6.48	53.36	80.90	21.75	30.30	381.47	0.00	574.26

Annual renewable energy generation from 2011 to 2050, shown in Table 5, suggests deployment is still insufficient to achieve target levels.

Table 5　Renewable energy environmental targets for 2011 to 2050[7]

年	年間バイオマス GWh	年間バイオマス GWh	年間小水力発電 GWh	年間太陽光発電 GWh	年間 固形廃棄物 GWh	年間再生可能エネルギー電力 (GWh)	年間CO2回避 (t/年)	累積CO2回避 (t)	再生可能エネルギー累積 (MW)
2011	675	123	300	7.7	123	**1,228**	**846,975**	**846,975**	**217**
2015	2,024	613	1,450	61	1,223	**5,374**	**3,707,825**	**10,816,136**	**975**
2020	4,906	1,472	2,450	194	2,208	**11,229**	**7,747,900**	**41,803,181**	**2,065**
2025	7,297	2,146	2,450	456	2,330	**14,680**	**10,128,817**	**88,071,821**	**2,809**
2030	8,217	2,514	2,450	1,019	2,392	**16,592**	**11,448,339**	**143,444,366**	**3,484**
2035	8,217	2,514	2,450	2,128	2,453	**17,762**	**12,255,721**	**202,908,742**	**4,317**
2040	8,217	2,514	2,450	4,170	2,514	**19,865**	**13,707,192**	**268,207,951**	**5,729**
2045	8,217	2,514	2,450	7,765	2,575	**23,522**	**16,229,914**	**343,765,293**	**8,034**
2050	8,217	2,514	2,450	13,540	2,637	**29,358**	**20,256,975**	**436,426,797**	**11,544**

(Green Technology Financing Scheme)

The Green Technology Financing Scheme is a financing system established for green business development with an eye to achieving sustainable economic growth for Malaysia. The scheme provides low-interest loans to all green technology producers, green technology users, and ESCOs that pay corporate taxes, whether they be foreign or local enterprises. Loans were originally intended to be provided only for facilities constructed on or before December 31, 2020, but the application period was extended to 2023.[8]

[6] Prepared by NTT Data Institute of Management Consulting, Inc. based on data from SEDA's website (http://seda.gov.my/?omaneg=0001010000000101010)
[7] Ministry of Energy Green Technology and Water : National Renewable Energy Policy &Action Plan
[8] SEDA: Extension of Green Investment Tax Allowance (GITA) & Green Income Tax Exemption (GITE) until 2023 http://www.seda.gov.my/reportal/re-incentive/

Table 6　Green Technology Financing Scheme[9]

Summary			· The Green Technology Financing Scheme is a financing system established for green business development with an eye to achieving sustainable economic growth for Malaysia · Enterprises established in Malaysia are eligible · In the fiscal year following deployment, enterprises pay less taxes due to a roughly 40% corporate tax deduction for the cost of deploying equipment capable of reducing greenhouse gas emissions and energy usage · MIDA (Malaysian Investment Development Authority) is the point of contact
Details	Companies that can apply		· Foreign and local companies paying corporate taxes
	Tax break eligibility		· Eligible equipment deployment costs
	Tax break impact		· Roughly 40% of eligible costs (GITA+CA) reimbursed via corporate income tax refund
	Application period		· Extended to the end of 2022
	Point of contact for application		· MIDA (Malaysian Investment Development Authority)
	Corporate income tax refund		· Deduction from corporation's taxable income in the year following the business year in which equipment investment was made
	For solar power	Eligible equipment	· Green Mark certified products
		Installation work	· SEDA (Sustainable Energy Development Authority) certified businesses
		Power generation amount	· Assumes self consumption (up to 75% of maximum power demand as a general rule)
		MIDA certifications	· 318　(RM3,288Mil)（as of December 2016)

[9] Prepared based on data from the website of the Malaysian Investment Development Authority

1.2.3 The IRDA's greenhouse gas emission reduction initiatives

(1) Iskandar Malaysia's low carbon society plan for 2025

With support from Japan Science and Technology Agency (a National Research and Development Agency) and the Japan International Cooperation Agency (JICA), an international research team comprising members from such organizations as Kyoto University, the National Institute for Environmental Studies, Okayama University, University of Technology Malaysia, and the Iskandar Regional Development Authority began activities in 2010 aimed at Iskandar Malaysia and in November 2012 announced the Low Carbon Society Blueprint toward 2025 ("the Blueprint"). The plan was officially approved as an official document for the development program by the Iskandar Regional Development Authority at a March 20, 2014 meeting of the Approvals and Implementation Committee.

The Blueprint was formulated in response to concerns Iskandar Malaysia development projects would bring about a rapid rise in greenhouse gas emissions following the region's being designated a special economic zone in 2006. The Blueprint, a low carbon society plan aimed at making the region into a low-carbon area, establishes a goal of reducing greenhouse gas emissions by 40% by 2025 in a Business as Usual scenario (56% emission strength compared to 2005). The plan outlines 12 Actions and 281 Programs concerning areas such as transportation systems, construction (green buildings), energy systems, waste management, industrial processes, governance, air pollution, urban structure, and education.

Good progress is being made in conducting the programs: 60 (21%) of the 281 Programs have been completed, 201 (72%) are in progress, and 19 (7%) have not yet begun.

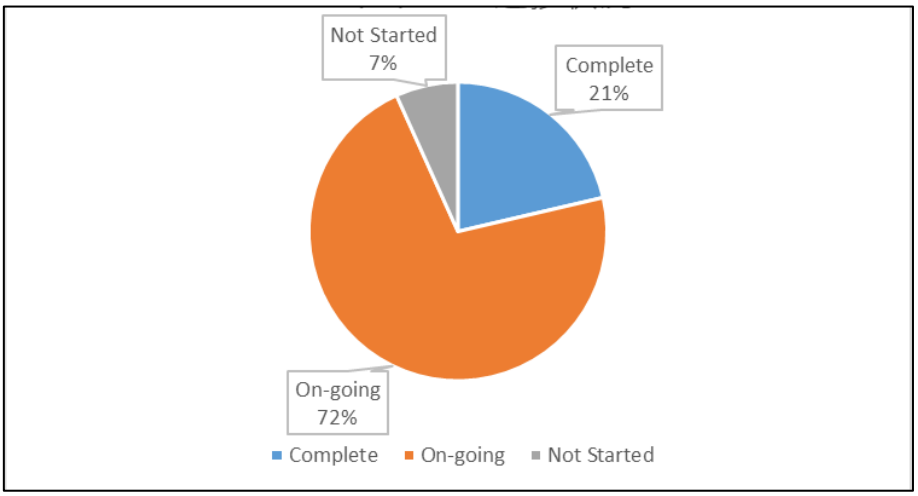

Fig. 5 Blueprint Program progress[10]

1.2.4 Cooperative relationship between Kitakyushu and the Iskandar Regional Development

[10] Prepared by NTT Data Institute of Management Consulting, Inc. based on information gathered from the IRDA

Authority

With the goal of reducing carbon emissions in the Iskandar Development Region, Kitakyushu has worked with the IRDA in fiscal years 2014, 2015, and 2016. The details of these activities are provided below.

(a) Activities in FY 2014

In the FY 2014 Large-scale JCM Project Creation Feasibility Study Project for Realizing Low-carbon Societies in Asia, Kitakyushu conducted a basic study aimed at helping to reduce carbon emissions in an industrial park in the city of Pasir Gudang, while also building a relationship with the city.

The study, which involved holding discussions with Pasir Gudang stakeholders and gathering information from enterprises in the industrial park, proposed a path towards establishing four key programs for a "Pasir Gudang that aspires to be a green and healthy city."

Fig. 6 Path to establishing four key programs for Pasir Gudang

(b) Activities in FY 2015

Kitakyushu conducted the Foundation Building Project for Across-the-Board Expansion of Decarbonization Projects (Kitakyushu-State of Johor Cooperation Project) in Iskandar Malaysia as part of the FY 2015 Cooperation Project for Realization of Low Carbon Societies in Asia. The following three studies were discussed with the goal of industrial park decarbonization in Pasir Gudang.

· Activity 1: Waste heat collection, cogeneration, and energy-saving efforts in industrial

parks

- Activity 2: Industrial waste recycling and general waste power generation
- Activity 3: Developing JCM businesses in Iskandar Malaysia and supporting the design of systems to advance such development

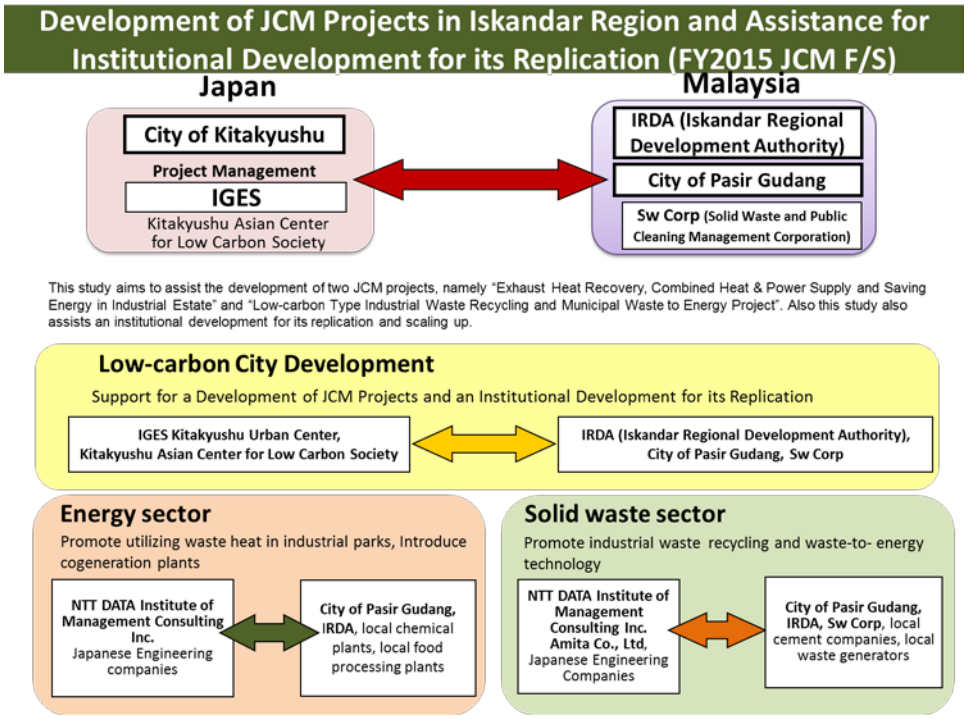

Fig. 7 Overview of activities for developing JCM businesses in Iskandar Malaysia and supporting the design of systems to advance such development

(c) Activities in FY 2016

Kitakyushu conducted the Project to Accelerate Low Carbonization Model Projects in Iskandar Development Area for Expansion of JCM (Kitakyushu-IRDA Cooperation Project) as part of the FY 2016 Large-scale JCM Project Creation Feasibility Study Project for Realizing Low-carbon Societies in Asia. Following on the FY 2015 study, this study targeted mainly local governments and businesses with their own factories or other production facilities and closely examined the feasibility of JCM adoptability. With the goal of promoting activities aimed at establishing model businesses in order to facilitate Malaysia's timely participation in the JCM, the following two energy-saving related projects were studied.

- Activity 1: Deploying cogeneration technologies at factories that require steam
- Activity 2: Promoting energy-saving efforts for factories and buildings inside factories

Table 7 Overview of activities conducted for the Accelerate Low Carbonization Model

Projects in Iskandar Development Area for Expansion of JCM

	Company A	Company B	Company C	Company D	Company E
Project Content	Surfactant production	Epoxy resin production	Styrene monomer production	Polymer production	Paper bag production
Project Possibility	(Low)	(High)	(High)	(Medium)	(Low)
Situation toward Energy saving implemen tation	At the present time, it is not the time to renew various energy-saving equipment.	Already company B is implementing energy conservation initiatives, but, with further energy conservation, it is considering possibility of using the subsidy scheme.	As projects abandoned due to cost reasons in the past, considering possibility of using the subsidy scheme. Renovation to LED lighting in factory is also considered.	As interested in energy saving project, already have project candidates. Under consideration about possibility of utilization of subsidy scheme	Energy saving targets are set in factories, although there's possibility of energy saving with air conditioners, etc., the equipment will not be renewed on timely basis.
Local status	 Shot at the site	 Shot at the site	 Shot at the site	 Shot at the site	 Shot at the site

On August 22, 2016, Kitakyushu concluded a Letter of Understanding with the IRDA which clearly stipulated the city's intention to promote decarbonization in the Iskandar Development Region.

Fig. 8　Signature ceremony at the IRDA office

The above are among the many steady efforts Kitakyushu has made to engage with the IRDA. By conducting follow-up studies of projects based on past project results, facilitating the development of an Action Plan for Malaysia's Iskandar Development Region, and finding new projects, this project is expected to promote a post-carbon society in the region.

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Chapter 2: Considerations for the Action Plan Based on the Low-carbon Blueprint

2.1 Project Overview

(1) Objectives

In the "Low Carbon Society Blueprint for Iskandar Malaysia 2025" (hereinafter the Blueprint) formulated in November 2012, the target is set for a 58% reduction of GHGs in 2025, in comparison to that of 2005. Based on this, the Blueprint details 281 programs that will be implemented to achieve the target. However, taking into account that a long time has passed since the formulation in 2012, and the impact of the regime change that took place in 2018, this project has set an objective to review the achievements so far and the direction of future activities, while also re-examining and refining the action plan to achieve a realistic low-carbon model when assuming that there will be no changes in the 2025 target.

(2) Examination Method

The action plan was examined with the Blueprint taken into account, through a total of 3 discussion sessions with Iskandar Regional Development Authority (IRDA).

No.	Review Date	Discussion Objectives
1st Session	August 20, 2019	· Kick-off · Check the current progress status of the Blueprint · Check the programs that IRDA is considering implementing in the future
2nd Session	September 18, 2019	· Achieve mutual understanding of the action plan's concept · Check the tasks of the action plan
3rd Session	February 13, 2020	· Achieve mutual understanding of the action plan (draft) and WBS

2.2 Investigation of the Current Status

(1) Current Progress Status of the Blueprint

The current progress status of the Blueprint is as described in Chapter 1, and good progress is being made in conducting the programs: 60 (21%) of the 281 Programs have been completed, 201 (72%) are in progress, and 19 (7%) have not yet begun. The regime change in FY 2018 has had a positive impact in promoting the Blueprint's programs. This has added momentum to IRDA's activities pursuing a low-carbon society.

(2) Challenges in Accomplishing the Blueprint

The programs scheduled to be implemented according to the Blueprint are making smooth progress. However, the amount of GHGs reduced in 2017 was 12.9%, and this does not yet

meet the Blueprint's target level of "58% reduction of GHGs by 2025." Taking these circumstances into account, IRDA is considering implementing new projects ((a) resource circulation at industrial parks; (b) development and promotion of eco-towns; (c) energy recovery from waste) in pursuit of further reduction of GHGs. However, IRDA has not been able to concretize its considerations for the points (a)-(c) at present, and it has become clear through discussions that support is required to promote these projects.

(a) Industrial Symbiosis-Pilot Project (Green industry) (Resource circulation in industrial parks)

(b) Eco-town (Realize eco-towns)

(c) Waste to Energy (Energy recovery from waste)

(3) Review of the Points to Consider Based on IRDA's Challenges

This project proposal was originally designed to revise and refine the entire Blueprint. However, the progress of the Blueprint itself has been extremely positive, and IRDA is in need of support in its action plan to promote (a) resource circulation at industrial parks; (b) eco-town; (c) energy recovery from waste.

As such, an action plan for the fiscal year of 2020 will be formulated in the project's Activity 1, aimed at a comprehensive realization of (a) resource circulation at industrial parks; (b) eco-town; (c) energy recovery from waste.

2.3 Considerations for the Action Plan

(1) Action Plan Overview

This project will examine an action plan for the fiscal year of 2020, for the "Industrial Symbiosis/Eco-town" project, which will comprehensively implement the following three projects that IRDA is considering giving priority to in the future. Through the actions taken in 2020, we aim to launch a pilot project of the "Industrial Symbiosis/Eco-town" project in 2021.

(a) Industrial Symbiosis-Pilot Project (Green industry) (Resource circulation in industrial parks)

(b) Eco-town

(c) Waste to Energy (Energy recovery from waste)

Industrial Symbiosis is a project based on the concept of achieving a society with sound material cycle. IRDA aims to recycle and facilitate resources between factories in industrial park. This comprehensive resource circulation project aims for a zero-emission of waste in specified areas such as industrial parks by using discharged resources. For example, the waste from Factory A can be used as a basic material for Factory B's products, and the waste from Factory B can be used as a raw material for biomass energy which supplies electricity to the factories. Kitakyushu's eco-town is a progressive example that has achieved resource circulation in an industrial park. As such, IRDA has a great interest in learning from Kitakyushu's experience and its know-how. In this sense, Kitakyushu can be considered as the

most suitable partnering local government in implementing this project. Moreover, Kitakyushu has a progressive local government in Japan in the area of energy recovery from waste as well, and as such IRDA is also hopeful for Kitakyushu's advice on power generation through waste.

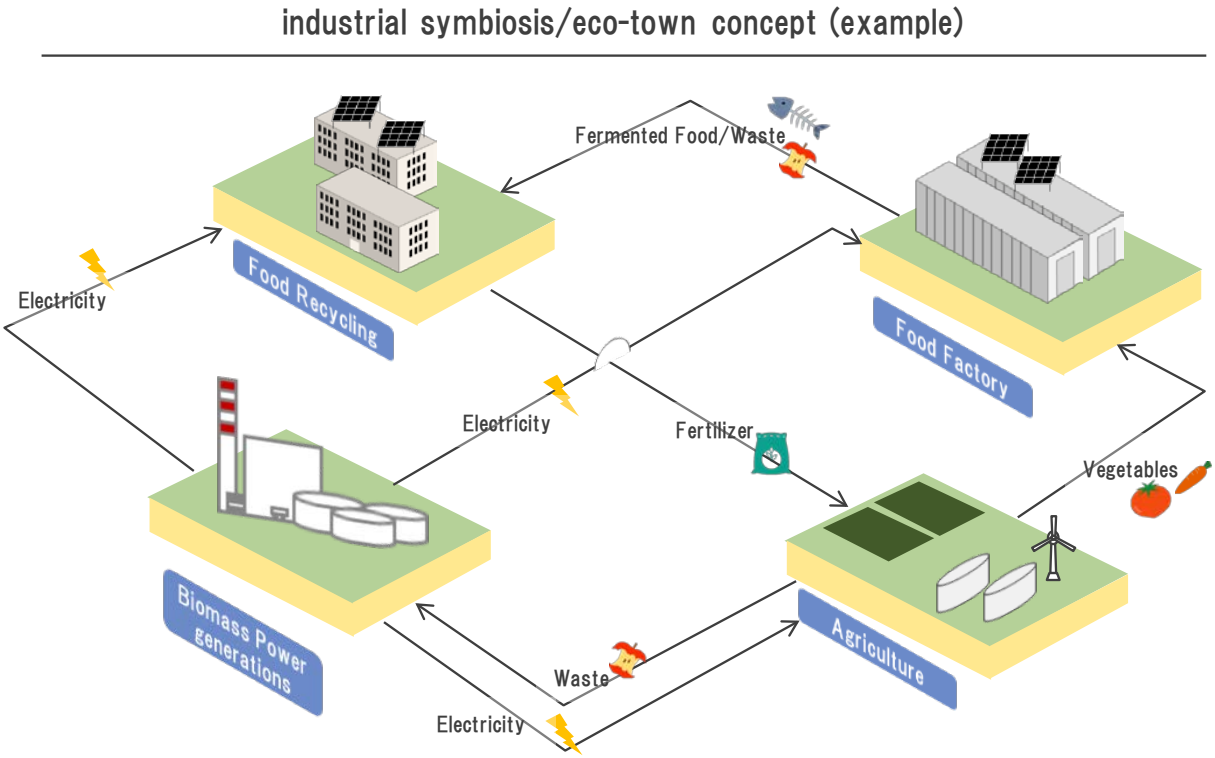


Figure 1: Image of the "Industrial Symbiosis/Eco-town" project[1]

[1] Prepared at NTT Data Institute of Management Consulting

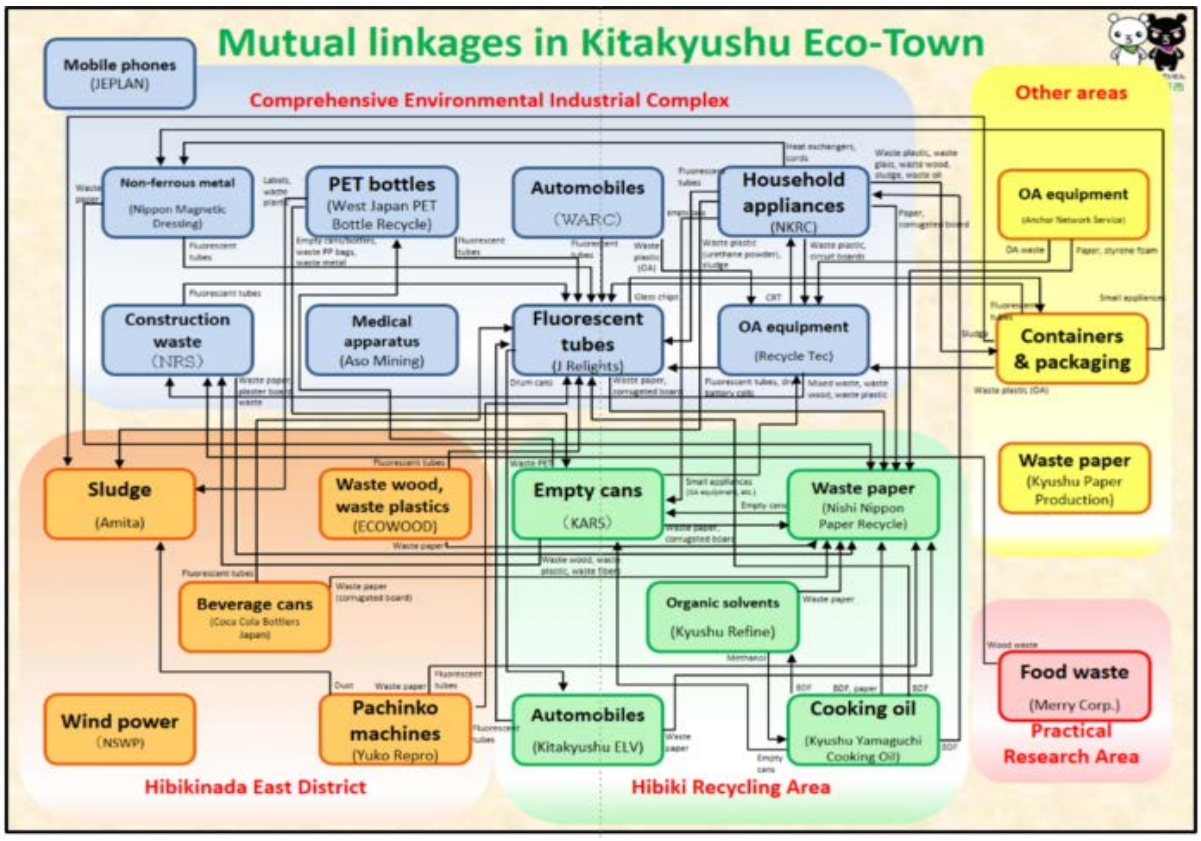


Figure 2: Framework of Eco-town in Kitakyushu[2]

(2) Action Plan

The 2020 action plan agreed with IRDA, which aims at launching a pilot project of the "Industrial Symbiosis/Eco-town" project starting in 2021, consists of the following five activities.

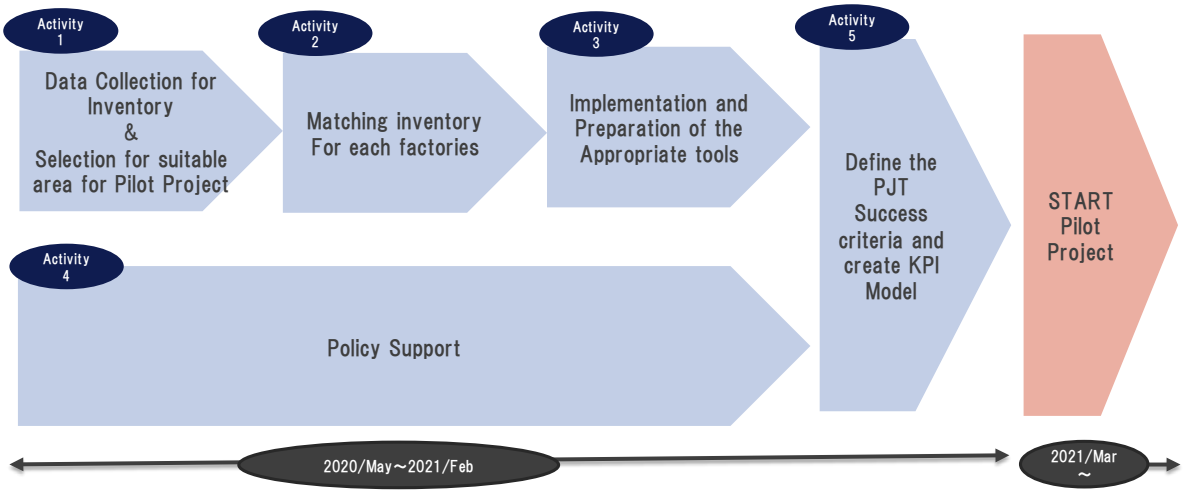


Figure 3: Activity overview of the "Industrial Symbiosis/Eco-town" project action plan[3]

[2] Prepared in Kitakyushu
[3] Prepared at NTT Data Institute of Management Consulting

(a) Activity 1: Data collection of discharged resources from each factory & selection of targeted area for the pilot project

With IRDA's cooperation, collect and compile the data of resources, such as waste discharged by the factories that are located within the potential targeted area for the pilot project. Narrow down the targeted area for the pilot project to one area, based on the amount of data collected and the level of cooperation and interest, etc. shown by the factories, etc.

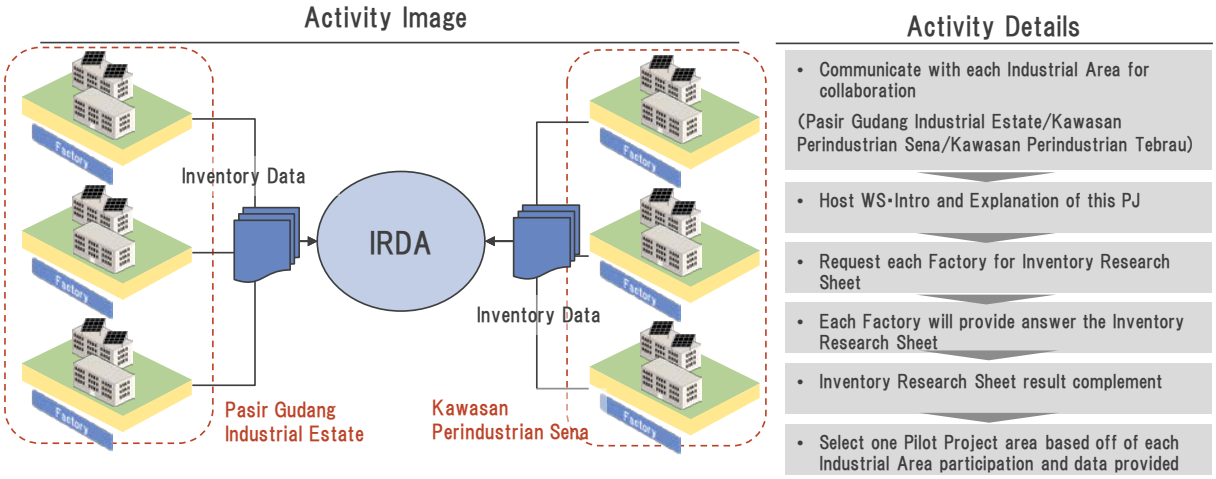
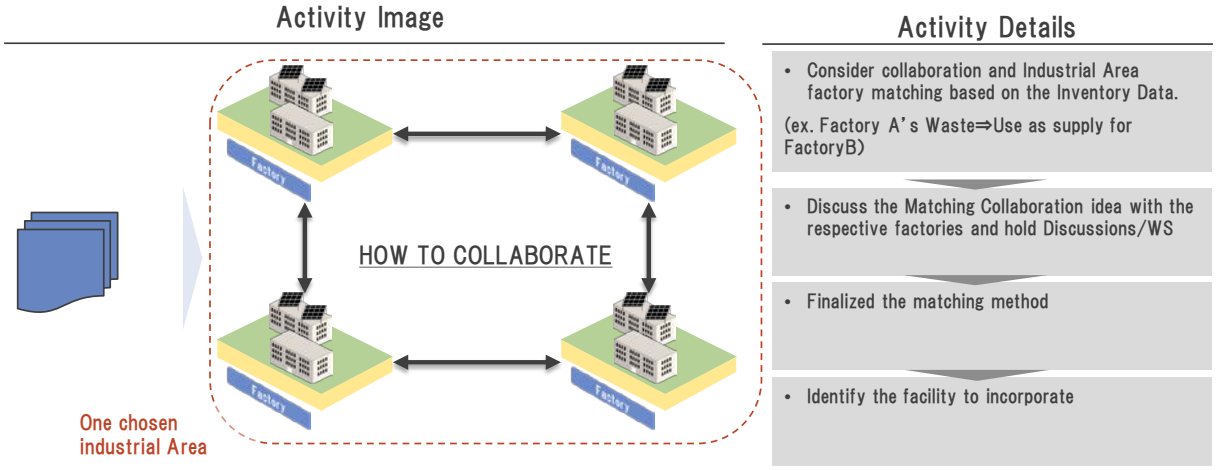


Figure 4: Details of Activity 1[4]

(b) Activity 2: Considerations for the matching methods between the factories

Considerations are taken over how resources should be circulated between the factories, based on the data of discharged resources from each factory, collected through Activity 1. This consideration will examine in detail the matching methods between factories utilizing Kitakyushu's know-how.



[4] Prepared at NTT Data Institute of Management Consulting

Figure 5: Details of Activity 2[5]

(c) Activity 3: Considerations for the introduction of equipment

Examine what machines/equipment to introduce, based on the matching method between the factories as discussed in Activity 2. Select appropriate suppliers from Japan and work to introduce the equipment into the targeted area. In introducing the equipment, take the following two patterns into account: (a) Introduction through utilization of subsidy such as JCM equipment subsidy; (b) B2B (introduction through private businesses without the use of subsidy).

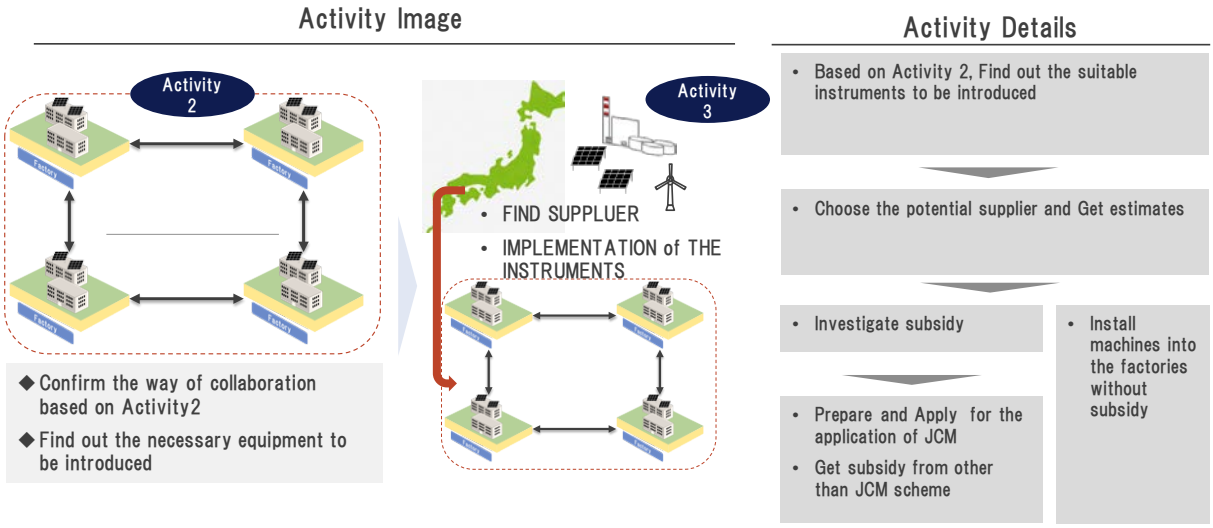


Figure 6: Details of Activity 3[6]

(d) Activity 4: Policy Support (Sharing Kitakyushu's Knowledge)

Kitakyushu will share with IRDA the policy measures, etc. applied in realizing the eco-town, and examine the most appropriate policy agenda for a smooth implementation of the "Industrial Symbiosis/Eco-town" project, which IRDA will then discuss with the Malaysian Government.

[5] Prepared at NTT Data Institute of Management Consulting
[6] Prepared at NTT Data Institute of Management Consulting

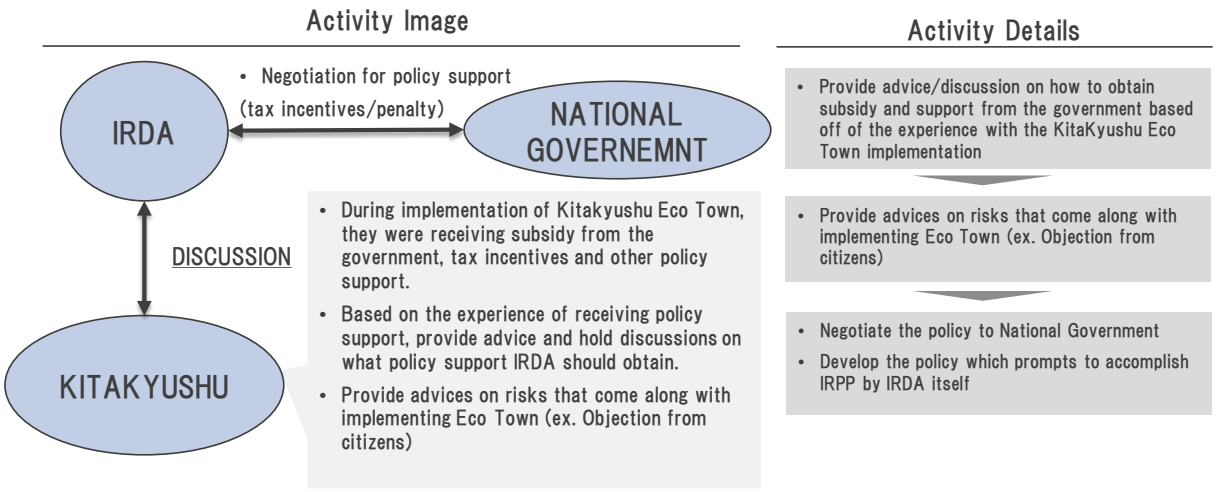


Figure 7: Details of Activity 4[7]

(e) Activity 5: Setting up a Key Performance Indicator (KPI) Model

Examine a KPI model (amount of CO2 reduced, cost-effectiveness, amount of waste reduced, etc.) for the pilot-project scheduled to be implemented in 2021.

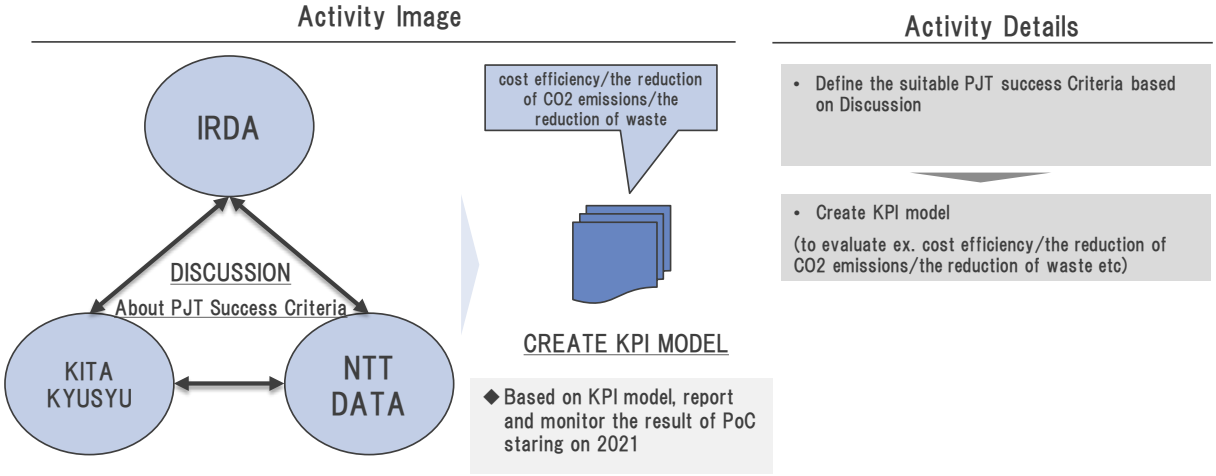


Figure 8: Details of Activity 5[8]

(3) IRDA's and Kitakyushu's intent regarding the action plan

IRDA has shown interest in collaborating with Kitakyushu to carry out activities aimed at realizing "Industrial Symbiosis", "Eco-town", and "Waste to Energy". IRDA has announced its intent to execute the "Industrial Symbiosis/Eco-town" project by preparing LOI (Letter Of Intent) (signed in the end of February, 2020).

[7] Prepared at NTT Data Institute of Management Consulting
[8] Prepared at NTT Data Institute of Management Consulting

2.4 Future Schedule

Based on the conclusion of LOI between IRDA and Kitakyushu, in the fiscal year of 2020 we plan to investigate the feasibility of the "Industrial Symbiosis/Eco-town" project according to the following schedule.

Schedule for Action of Indsutrial Symbiosis Pilot Project

◎ MainStakeholder

○ SubStakeholder

Actions			Respective Stakeholders				2020								2021		
No	Category	Tasks	IRDA	KITAKYUSYU	FACTORY	NTTDIOMC	MAY	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	Data Collection for Inventory&Selection for suitable area for Pilot Project	Communicate with each Industrial Area for collaboration	◎			○											
		Host WS･Intro and Explanation of this PJ	◎			○											
		Request each Factory for Inventory Research Sheet	◎			○											
		Each Factory will provide answer the Inventory Research Sheet			◎												
		Inventory Research Sheet result complement	◎			○											
		Select one Pilot Project area based off of each Industrial Area participation and data provided	◎			○											
2	Matching inventory For each factories	Consider collaboration and Industrial Area factory matching based on the Inventory Data.				◎											
		Discuss the Matching Collaboration idea with the respective factories and hold Discussions/WS	○		○	◎											
		Finalized the matching method	○		◎												
		Identify the facility to incorporate			○	◎											
3	Implementation and Preparation of the Appropriate tools	Based on Activity 2, Find out the suitable instruments to be introduced			○	◎											
		Choose the potential supplier and Get estimates		○		◎											
		Investigate subsidy				◎											
		Prepare and Apply for the application of JCM/Other Subsidy	○			◎											
		Install machines into the factories without subsidy	◎			○											
4	Policy Sipport	Provide advice/discussion on how to obtain subsidy and support from the government based off of the experience with the KitaKyushu Eco Town	○	◎													
		Provide advices on risks that come along with implementing Eco Town	○	◎													
		Negotiate the policy to National Government Develop the policy which prompts to accomplish IRPP by IRDA itself	◎														
5	Define the PJT Success criteria and create KPI Model	Define the suitable PJT success Criteria based on Discussion	○	○		◎											
		Create KPI model	○	○		◎											
PoC of ISPP			◎			○											

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Chapter 3: Follow-up Studies for Studies Conducted in FY 2015 and FY 2016

3.1 Project Overview

(1) Objectives

Follow-up studies were conducted on the potential projects discovered through the studies conducted in the projects "Foundation Building Project for Across-the-Board Expansion of Decarbonization Projects in Iskandar Malaysia (Kitakyushu-State of Johor Cooperation Project)" in FY 2015 and "Accelerate Low Carbonization Model Projects in Iskandar Development Area for Expansion of JCM (Kitakyushu-IRDA Cooperation Project)" in FY 2016. Some time has passed since the last studies. As such the activities were carried out under the assumption that there is a need to start anew from the investigation into current demands. The goal through the follow-up studies is to operationalize at least one JCM project in one or two years. At the same time, after realizing this operationalization, efforts will be made to roll out similar projects through actions such as bringing attention to these achievements.

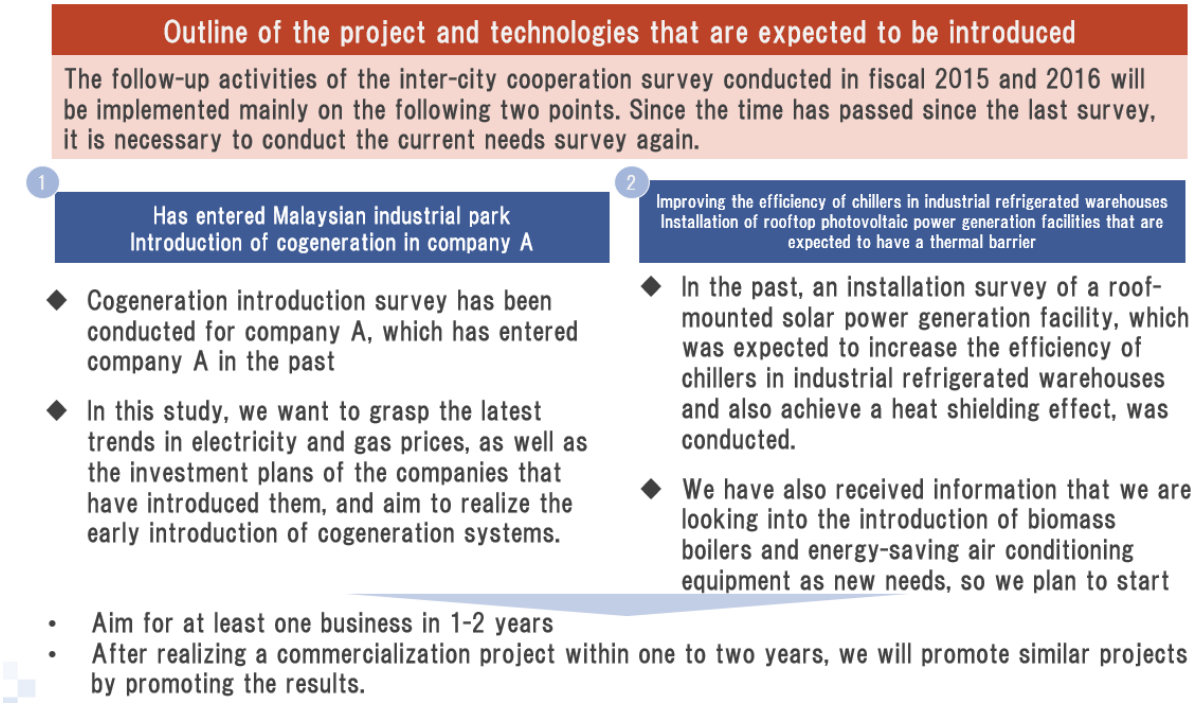

Figure 1: Outline of Activity 2[1]

Specifically, follow-up studies for the following two companies are conducted.

Company	Industry	Outline
Company A (Japanese)	Chemical manufacturing	· A study on the introduction of cogeneration has already been conducted in the past · The purpose of this review is to realize the early introduction of a cogeneration system by identifying the

[1] Prepared at NTT Data Institute of Management Consulting

		latest pricing trend of gas and electricity and the investment schedule, etc. of companies to which it is introduced.
Company B (Japanese)	Chemical manufacturing	· A study has already been conducted in the past on the installation of a rooftop photovoltaic power station, which was expected to increase the efficiency and insulation effects of chillers in industrial refrigerating storage · There is information that the company is currently considering the introduction, etc. of boilers and energy-saving air conditioning as their new demand. As such, the study is scheduled to begin anew with a close investigation of the current demands.

However, as for Company A, the interview revealed that immediate introduction of new equipment will be difficult due to the factory's operating schedule. As such, the target of the study for this activity will be only Company B.

(2) Examination Method

The examination was conducted through discussion with Company B, which is the target company of the study. Through a total of two meetings, current demands were identified and a close investigation carried out in preparation for the JCM equipment subsidy project application in the coming fiscal years.

No.	Date	Discussion Objectives
1st Session	September 18, 2019	· Investigation of current demands
2nd Session	February 14, 2020	· Closer review in preparation for JCM equipment subsidy application, based on the results of the first field study

3.2 Study Results

(1) Current Demands

Company B is a Japanese chemical factory with a site of about 30,500 m2. Boilers and cooling warehouses are used in the product manufacturing process.

The interviews revealed that Company B's current circumstances are as follows: there is a demand for replacement of a multitude of equipment due to the ageing of factory equipment; there is a demand for new equipment that is environmentally friendly, following the instruction by the parent company in Japan about the introduction of energy-saving machines that are environmentally friendly. Specifically, Company B is thinking about introducing the following 3 types of equipment ((a) steam boiler, (b) photovoltaic power station, (c) high-

efficiency chiller). Through this activity, a close examination was carried out by positioning the introduction of (a) steam boiler as being the highest priority for consideration, based on the urgency of introducing equipment and the high potential for the JCM equipment subsidy project.

(a) Steam boiler

In order to contribute to addressing the ageing of equipment and reducing environmental impact, the company is giving in-depth consideration to the replacement of the current diesel-run steam boilers with those using natural gas.

(b) Photovoltaic power station

The installation of a rooftop photovoltaic power station, which is expected to have positive insulation effects, is also under consideration in the company. However, application with a JCM equipment subsidy is unlikely since an application for tax incentives in Malaysia has already been made.

(c) High-efficiency chiller

In order to contribute to addressing the ageing of equipment and reducing environmental impact, the company has started considering the introduction of high-efficiency chillers. The urgency for introduction is low in comparison to steam boilers.

(2) Equipment to be Introduced

In order to reduce CO2 emissions from fuel conversion, a steam boiler company and company B examined the technology to be introduced. Based on the specifications and operation status of the equipment currently installed, the possibility of further energy savings due to equipment effects was examined.

(3) Amount of CO2 Reduction

Regarding CO2 reduction by introducing a steam boiler, Global Environment Centre Foundation has published a worksheet for calculating the CO2 reduction effect of cogeneration when applying for JCM equipment subsidy. The calculation sheet is shown below.

2019-2021JCM設備補助CO2排出削減量計算（蒸気ボイラー）

※高地（標高1500mで海面気圧と比較し約85%の気圧）の場合は平地（カタログ値）のボイラー効率ではなく、実力値の提示と計算を行うこと。（標高1000m以下はカタログ値でOK）

事業名					
実施サイト	住所				
	緯度		経度		
	標高	(m)			記入
ボイラー負荷の対象					自動計算

（1）蒸気負荷

	1月	2月	3月	4月	5月	6月	7月	8月	9月	10月	11月	12月	
必要蒸発量(t/h)													
蒸気圧(MPa)													
蒸気の比エンタルピー(kJ/kg)													
給水温度(℃)													
給水の比エンタルピー(kJ/kg)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
ボイラー必要熱出力 (MJ/h)	0	0	0	0	0	0	0	0	0	0	0	0	
1日稼働時間(h/日)													
月の稼働日数(日/月)													年間熱出力(MJ/年)
月の必要熱出力 (MJ/月)	0	0	0	0	0	0	0	0	0	0	0	0	0

（2）リファレンスボイラーのエネルギー消費量

リファレンスとなるボイラーの仕様	メーカー				
	品 番				
	定格蒸発能力(t/h)	(t/h)	燃料種		
	ボイラー効率(%)	(%)	燃料低位発熱量		
	定格消費電力(kW)	(kW)	出典		
	台 数				

	1月	2月	3月	4月	5月	6月	7月	8月	9月	10月	11月	12月	年間合計	
月平均燃料消費量	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	L
月平均消費電力量(MWh/月)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	MWh

※便宜上 消費電力量は（必要蒸発量/定格蒸発能力）×定格消費電力×稼働時間で計算。

（3）プロジェクト機のエネルギー消費量

プロジェクトで導入するボイラーの仕様	メーカー				
	品 番				
	定格蒸発能力(t/h)	(t/h)	燃料種		
	ボイラー効率(%)	(%)	燃料低位発熱量		
	定格消費電力(kW)	(kW)	出典		
	台 数				

	1月	2月	3月	4月	5月	6月	7月	8月	9月	10月	11月	12月	年間合計	
月平均燃料消費量	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	Nm3
月平均消費電力量(MWh/月)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	MWh

※便宜上 消費電力量は（必要蒸発量/定格蒸発能力）×定格消費電力×稼働時間で計算。

●CO2排出削減量(平均的負荷の年における)

Q CO2排出削減量 ton-CO2/年 #DIV/0!

Q=Ry-Py

Ry リファレンスCO2排出量 ton-CO2/年

Py プロジェクトCO2排出量 ton-CO2/年

●リファレンスCO2排出量の計算

※ 発熱量単位及び消費量単位に注意願います。 1GJ=0.28MWh 1Gcal=1.163MWh

Ry＝RQfy×furf+RQey×gef ton-CO2/年 #DIV/0!

RQfy リファレンスの場合の年間燃料消費量 /年 #DIV/0!

furf 燃料のCO2排出係数 ton-CO2/ 0 出典：

RQey リファレンスの場合の年間消費電力量 MWh/年 #DIV/0!

gef グリッド電力のCO2排出係数 ton-CO2/MWh 出典：

●プロジェクトCO2排出量の計算

※ 発熱量単位及び消費量単位に注意願います。 1GJ=0.28MWh 1Gcal=1.163MWh

Py＝PQfy×fupf+PQey×gef ton-CO2/年 #DIV/0!

PQfy プロジェクトの場合の年間燃料消費量 /年 単位記入 #DIV/0!

fupf 燃料のCO2排出係数 ton-CO2/ 0 出典：

PQey プロジェクトの場合の年間消費電力量 MWh/年 #DIV/0!

gef グリッド電力のCO2排出係数 ton-CO2/MWh 出典：

◎CO2排出削減量（負荷の変動を考慮）

※上記までの記載計算事項は法定耐用年数の間の代表年の（平均的な）値とします。
法定耐用年数の間に生産量等＝蒸気負荷が大きく変動し、CO2排出削減量も変動する場合は、年度毎に蒸気負荷（＝年間必要熱出力）からCO2排出削減量を算出すること。
下記のCO2排出削減量は（1）で算出したCO2排出削減量×（年間必要熱出力÷年間熱出力）で算出しています。

法定耐用年数		年												
年														合計
年間必要熱出力(MJ/年)														
CO2排出削減量(ton-CO2/年)	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!	

#DIV/0! ton-CO2/年

※この値を実施計画書に記載

① Parameters to be set in advance before applying for project registration

The data and parameters determined in advance are under study as follows.

Parameters	Data description	Exhibit
gef	CO2 emission factor of power consumption 0.6700 [tCO2 / MWh]	From IGES_GRID_EF_v.10.7 Average of CDM in Malaysia
furf	CO2 emission factor when using light oil 2.6190 [tCO2 / Nm3]	Provided by the operator
fupf	CO2 emission factor when using natural gas 2.2185 [tCO2 / Nm3]	Provided by the operator

② Calculation of reference emissions

The concept of setting reference emissions is considered as follows.

Fuel consumption for boiler steam generation (light oil)… ①
Power consumption required for boiler control (purchase from grid power)… ②
Reference emission = ① + ②

③ Calculation of project emissions

The concept regarding the setting of project emissions is considered as follows.

Fuel consumption for boiler steam generation (natural gas)… ①
Power consumption required for boiler control (purchase from grid power)… ②
Project emissions = ① + ②

④ CO2 reduction effect when realizing this project

The required amount of steam is about 8 t / h, so the reference emission and project emission are calculated as follows.

item	amount	unit
Annual fuel consumption	4,446,544	Nm3
Annual power consumption	696,96	MWh
Annual CO2 reduction	2,202	tCO2 / year
Legal compliance years	9	Year
Total CO2 reduction	19,818	tCO2

(4) Calculation of Cost-Effectiveness

Currently, the estimate is being estimated by the operator. The study will continue, including economics, and the aim is to apply as soon as the JCM between Malaysia and Japan has been signed.

(5) Implementation system

In implementing the JCM business, the project implementation system is assumed to be as follows. As for the representative operator, it is highly likely that Company B's Japanese headquarters will play a role.

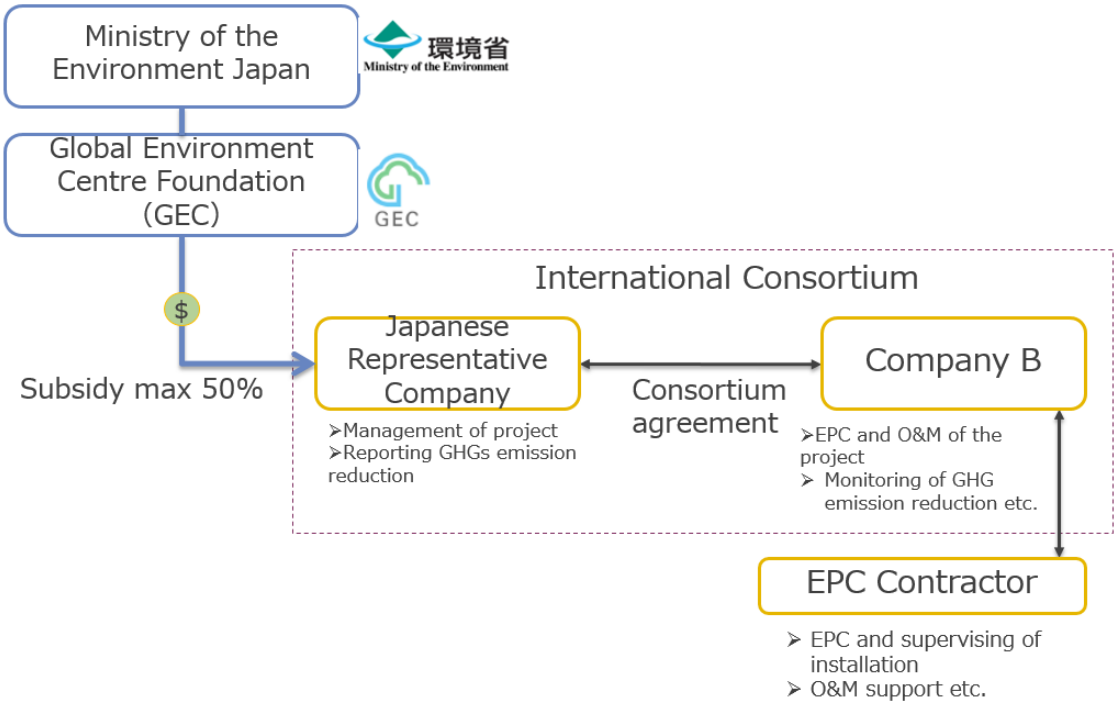

Figure 2: Organization at Implementation Phase

(6) Confirmation of financing method, confirmation of ordering and contract method

① Fund financing method

Company B clarifies the intention to invest from its own resources at the time of project implementation.

② Order / contract method

Since Company B is a private company, it is basically possible to place orders on a voluntary contract.

(7) Issues in implementation of JCM

① Trends relating to the JCM signature of the Malaysian government

As of the end of 2016, the JCM system was not signed with the Malaysian government. Although efforts have been made for signing, including the implementation of a pilot project to introduce solar panels to the roof of Kuala Lumpur's office building from FY 2014, it seems that the attitude of the Malaysian government has not been changing at this time.

By acquiring equipment financing support, in order to promote the introduction of low-carbon technologies that are not readily disseminated in the normal business case (BaU) and make CO2 reduced by technology introduction Japan credit, this project aims to realize JCM implementation. The inter-government continued encouragement for JCM signature is anticipated.

② How to supply natural gas

As a method of supplying natural gas to Company B, (1) direct supply by pipeline and (2) processing into LNG is assumed. However, there is also a problem in direct supply through pipelines and processing into LNG, so Company B considers not only natural gas but also the possibility of using biomass in addition to the scope of the study and will consider future studies. There is an intention to continue.

- Direct supply in pipeline

  Company B is located in a corner of an industrial park operated by another company (Company X). Although there is a natural gas plumbing facility in the industrial park, it is difficult for Company B to use it at present because it is installed at a location away from Company B. Therefore, it is assumed that it is necessary to install new pipes in the industrial park. However, it is necessary to obtain permission from Company X to install new natural gas pipes, Construction is required.

- Supply after processing into LNG

  Interviews have revealed that there is currently no private LNG supply service in Malaysia.

3.3 Future Schedule

Once the JCM is signed between Japan and Malaysia, the challenges (3.2 Study Results (6) Challenges) will be examined in detail in the coming years so that application for the JCM equipment subsidy project can be made.

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Chapter 4: Investigations to Identify Waste Heat Recovery Power Generation Projects, etc. that Have Potential

4.1 Project Overview

(1) Objectives

A study targeting Japanese and local companies in Malaysia including the Iskandar development area was conducted in pursuit of discovering potential projects that could be eligible for the JCM equipment subsidy project. Specifically, the study mainly targeted (a) Japanese companies that were expected to have ageing problems in the factories, and (b) local cement factories.

Malaysia was one of the earliest countries that made headway in industrialization in Asia, and it is said that there are over 250 industrial groups across the country. Going through development since the 1970s, many industrial parks already have a history of 20, 30 years or more. As such, following the ageing of factories, high level of demand for the replacement of equipment is expected by the factories. Moreover, a demand for the introduction of equipment is expected, since there has been no progress yet in the introduction of waste heat recovery power generation systems in Malaysia's cement factories.

The goal is to operationalize, in one to three years, at least one potential project from those discovered through this activity. After realizing the operationalization of the potential projects, efforts will be made to roll out similar projects by bringing attention to these achievements.

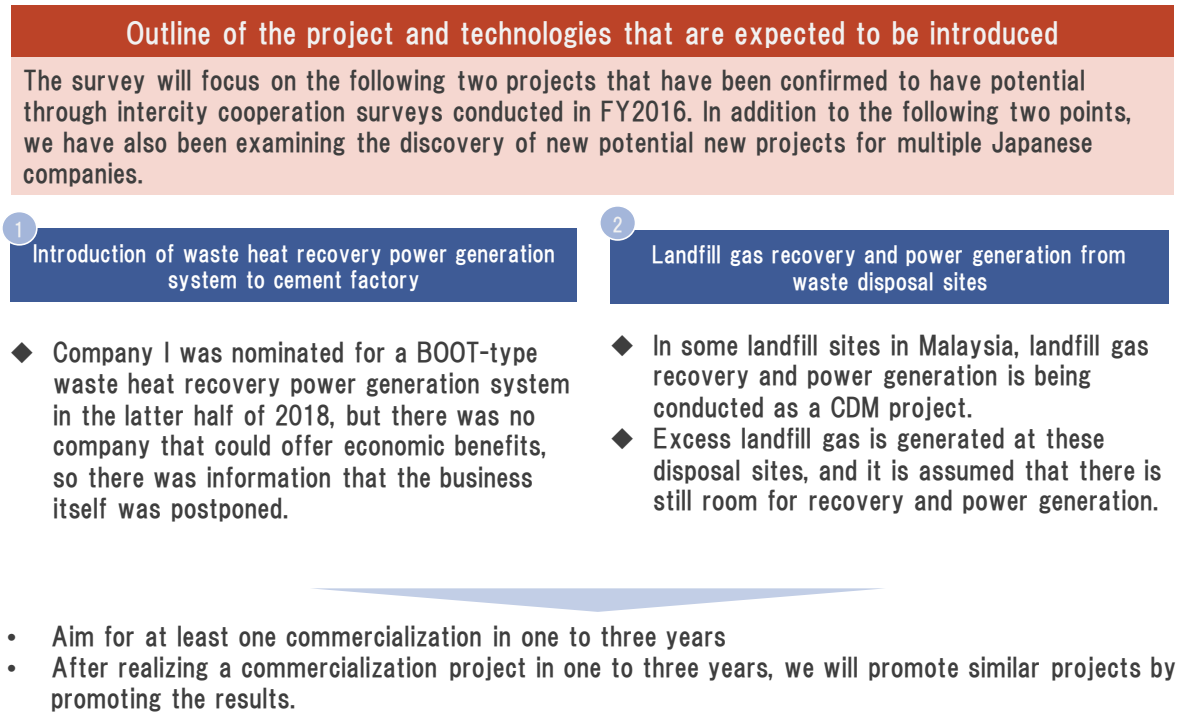

Figure 1: Outline of Activity 3[1]

[1] Prepared at NTT Data Institute of Management Consulting

(2) Examination Method

A discussion was held with 10 companies including Japanese and local companies through a total of three field studies. Moreover, efforts to gain further recognition for the JCM equipment subsidy project were made by organizing workshops about it, aimed at the local cement association and Japanese companies.

Date	Company Name	Industry	Visit Location
August 20, 2019	Company C (Japanese)	Chemical manufacturing	Malaysia/Johor Bahru/East Gate Development District
August 21, 2019	Company D (Japanese)	Mechanical manufacturing	Malaysia/Johor Bahru/Senai Skudai District
	Company E (Japanese)	Advertising/marketing	Malaysia/Johor Bahru
	Organization A	General incorporated foundation	Singapore
August 22, 2019	Company F (Japanese)	Recycling service	Malaysia/Kuala Lumpur
	Company G (local)	Real estate investment, development, etc.	Malaysia/Kuala Lumpur
	Company H (Japanese)	Trading Company	Malaysia/Kuala Lumpur
August 23, 2019	Company I (local)	Cement manufacturing	Malaysia/Subang Jaya
September 18, 2019	Company J (Japanese)	Chemical manufacturing	Malaysia/Johor Bahru/East Gate Development District
	Company D (Japanese)	Mechanical manufacturing	Malaysia/Johor Bahru/Senai Skudai District
September 19, 2019	Speaker for JCM aimed at cement associations	Local cement company	Malaysia/Petaling Jaya
	Company K (Japanese)	Heavy electrical plant manufacturing	Malaysia/Selangor
February 12, 2019	Company K (Japanese)	Heavy electrical plant manufacturing	Malaysia/Selangor
February 13, 2019	Company L (Japanese)	Manufacturing	Malaysia/Johor Bahru/East Gate Development District
February	Company D	Mechanical	Malaysia/Johor Bahru/Senai

14, 2019	(Japanese)	manufacturing	Skudai District
	Company J (Japanese)	Manufacturing	Malaysia/Johor Bahru/East Gate Development District
	Speaker for JCM aimed at Japanese companies	Japanese companies in manufacturing and other industries	Malaysia/Johor Bahru/East Gate Development District

Following discussions with several companies, the target of this activity was narrowed down to Company D, a precision manufacturing company from whom a solid demand for the introduction of equipment was revealed at an early stage of the field study. Based on this, a close investigation was conducted to discover potential projects.

No.	Date	Discussion Objectives
1st Session	August 21, 2019	· Investigation of current demands (gathering information/factory tour)
2nd Session	September 18, 2019	· Gathering information about the demand for equipment introduction, accompanied by the vendors of Kitakyushu's businesses.
3rd Session	February 14, 2019	· Estimation of the amount of CO2 to be curbed and discussion about the application system, etc.

4.2 Study Results

(1) Current Demands

The majority of the Japanese companies in the Johor Bahru region are those that came into the area in the 1980s, and their facilities are ageing. Moreover, in many cases these companies are instructed by their parent companies in Japan to contribute to the reduction of environmental impact as a business, which reveals a demand for the introduction of new environmentally friendly equipment. Specifically, these demands include the introduction of photovoltaic power stations, high-efficiency chillers, and boilers. The Japanese companies have shown strong interest in the introduction of equipment through the JCM equipment subsidy project, and the demand for it is expected to be extremely high in Malaysia. Moreover, there is a high demand for the introduction of waste heat recovery equipment, etc. by the local companies including the cement industry, which have intention to give positive consideration to the utilization of a JCM equipment subsidy.

With regards to Company D, 30 years or so have passed since its factory was established in Malaysia, and the stagnation of productivity caused by the ageing of the equipment throughout the factory has been an issue. In particular, there is an immediate demand for the replacement of the vacuum cleaning and drying equipment, which is used in cleaning the oil of the

manufactured precision parts. The company is hoping for an immediate application as soon as the JCM is signed between Japan and Malaysia. Replacement of equipment was also likely in the compressor, which is the greatest consumer of the factory's electricity and requires improvement of efficiency following the ageing of equipment.

(2) Equipment to be Introduced

In order to reduce CO2 emissions by improving the efficiency of equipment (energy saving), vacuum cleaner / dryer manufacturers (hereinafter referred to as company Y) and company D in Kitakyushu City have evaluated the feasibility of the technology to be introduced. Based on the specifications and operation status of the equipment currently installed and used, we examined the possibility of energy saving by updating equipment.

In this study, the possibility of making a project possible by conducting a cost evaluation, etc., when introducing the `` 3 tank fully automatic vacuum washer / dryer " or `` 4 tank fully automatic vacuum washer / dryer " provided by company Y to company D investigated.

(3) Amount of CO2 Reduction

① In case of 3 tank fully automatic vacuum washer / dryer

(Setting conditions for factory operation)

item	Set value	unit	source
Factory operation days	265	Day / year	Provided by the operator
Factory operating hours	16	Hours / day	Provided by the operator
Number of baskets processed daily	200	Basket / day	Provided by the operator

(Comparison of equipment processing capacity)

Facility	processing power	source
Conventional cleaning equipment	1 basket in 5 minutes	Provided by the operator
Cleaning equipment to be introduced	2 baskets in 5 minutes	Provided by the operator
Power consumption (cleaning equipment)	48kW	Provided by the operator

(Calculation of reference emissions)

The concept of setting reference emissions is considered as follows.

Number of baskets processed per day * Processing capacity of conventional cleaning equipment * Electricity consumption * Factory operation days * CO2 emission coefficient of power consumption

(Calculation of project emissions)

The concept regarding the setting of project emissions is considered as follows.

Number of baskets processed per day * Processing capacity of introduced cleaning equipment * Power consumption * Factory operation days * CO2 emission factor of power consumption

(CO2 reduction effect when realizing this project)

The reference emission and project emission are calculated as follows.

item	amount	unit
Annual power consumption	106,000	kWh
Annual CO2 reduction	73,564	kgCO2 / year
Court years	8	Year
Total CO2 reduction	588.512	tCO2

② In case of 4 tank fully automatic vacuum washer / dryer

(Setting conditions for factory operation)

item	Set value	unit	source
Factory operation days	265	Day / year	Provided by the operator
Factory operating hours	16	Hours / day	Provided by the operator
Number of baskets processed daily	200	Basket / day	Provided by the operator

(Comparison of equipment processing capacity)

Facility	processing power	source
Conventional cleaning equipment	1 basket in 5 minutes	Provided by the operator
Cleaning equipment to be introduced	2 baskets in 3 minutes	Provided by the operator
Power consumption (cleaning equipment)	54kW	Provided by the operator

(Calculation of reference emissions)

The concept of setting reference emissions is considered as follows.

Number of baskets processed per day * Processing capacity of conventional cleaning equipment * Electricity consumption * Factory operation days * CO2 emission coefficient of power consumption

(Calculation of project emissions)

The concept regarding the setting of project emissions is considered as follows.

Number of baskets processed per day * Processing capacity of introduced cleaning equipment * Power consumption * Factory operation days * CO2 emission factor of power consumption

(CO2 reduction effect when realizing this project)

The reference emission and project emission are calculated as follows.

item	amount	unit
Annual power consumption	140,450	kWh
Annual CO2 reduction	97,472	kgCO2 / year
Court years	8	Year
Total CO2 reduction	779.776	tCO2

(4) Calculation of Cost-Effectiveness

The JCM equipment subsidy (expected value) calculated from the annual CO2 emission reduction amount and the product of the expected cost-effectiveness of the JCM equipment subsidy and 4,000 yen / ton-CO2 is shown below.

① In the case of a 3-tank fully automatic vacuum washer / dryer

Initial investment

= Total cost of introducing 3 tanks fully automatic vacuum washer / dryer = approx. 34,600,000 yen

Cost-effectiveness

= 588.512 ton-CO2 / 8 years × 4,000 yen / ton-CO2

= 2,354,048 yen (6.8% of initial investment amount)

② For a 4-tank fully automatic vacuum washer / dryer

Initial investment

= Total cost of installing 4 tanks fully automatic vacuum washer / dryer = approx. 41,360,000 yen

Cost-effectiveness

= 779.776 ton-CO2 / 8 years × 4,000 yen / ton-CO2

= 3,119,104 yen (7.5% of initial investment amount)

(5) Implementation system

In implementing the JCM business, the project implementation system is assumed to be as follows. As for the representative operator, it is highly likely that Company B's Japanese headquarters will play a role.

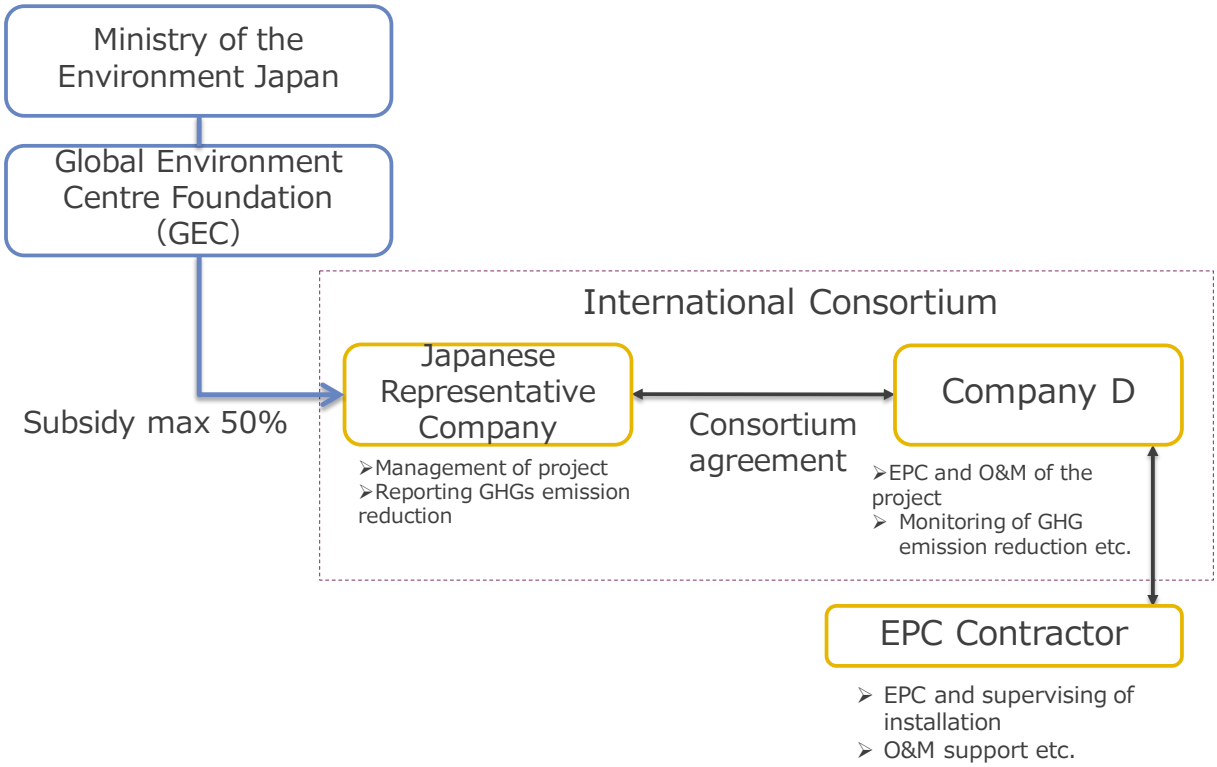

Figure 2: Organization at Implementation Phase

(6) Confirmation of financing method, confirmation of ordering and contract method

① Fund financing method

Company D clarifies the intention to invest from its own resources at the time of project implementation.

② Order / contract method

Since Company D is a private company, it is basically possible to place orders on a voluntary contract.

(7) Issues in implementation of JCM

① Trends relating to the JCM signature of the Malaysian government

Although many companies are interested in JCM equipment subsidies, as described in Chapter 3, applications will depend on trends in JCM signatures. In addition, on February 24, 2020, the current Prime Minister, Mahathir, has decided to resign, and it is expected that the attitude toward the signature of the Malaysian government will become increasingly unreadable.

② Small project size

Although Company D is ambitious to replace equipment using JCM, the size of the project is small as shown by the economic effect, and it turned out that it is unlikely that a JCM project using only a vacuum cleaner alone would be possible did. For this reason, the size of the project is to be expanded by the following two methods ((1) Conversion of company D into an eco-factory (2) Possibility of introducing equipment integrated with other factories), and the direction to continue studying in the future.

1. Making company D an eco-factory

   In Company D, even compressors that consume the most power in factories are required to be more efficient due to aging equipment. For this reason, in addition to the vacuum cleaner, replacement of equipment such as compressors, which require higher efficiency, is expected to increase CO2 emission reduction by replacing the equipment in the same manner as the vacuum cleaner.

2. Possibility of introducing equipment integrated with other factories

   Like company D, the company needs to introduce equipment using JCM equipment subsidies, but the size of the project is small, making it difficult to create a project on its own. Interviews have shown that there are multiple factories in the country. For example, company J (Japanese company) is interested in introducing solar power and heat transfer boilers with JCM equipment subsidies.

Examine the possibility of introducing similar equipment in other factories in the vicinity, and if there is a possibility, integrate it and try to introduce it, and expect to reduce the cost of procured equipment (scale advantage) and increase CO2 emission reduction. Is assumed to be possible.

4.3 Organization of Workshops

As part of local workshops, briefing sessions were held regarding the JCM equipment subsidy project, aimed at (a) local cement companies, and (b) Japanese companies.

(1) Workshop at the Cement & Concrete Association of Malaysia

In September 19, 2019, a workshop was held by NTT Data Institute of Management Consulting, regarding the JCM equipment subsidy project aimed at the local cement companies in Malaysia. As there is no progress regarding the introduction of waste heat recovery equipment in cement factories in Malaysia, multiple companies enquired after the workshop about specific JCM projects.

Figure 1: Scene from the workshop (a)

(2) Workshops organized for Japanese companies

On February 14, 2020, NTT Data Institute of Management Consulting held a workshop regarding the JCM equipment subsidy project at Nikin-kai, which is an organization created by parties involved in Japanese companies, whose goal is to improve business environment and living conditions. The JCM equipment subsidy project gained further recognition, as about 15 Japanese manufacturing companies attended.

Figure 2: Scene from the workshop (b)

4.4 Future Schedule

Once the JCM is signed between Japan and Malaysia, the challenges (4.2 Field Study (5) Challenges) will be examined in the coming years so that application for the JCM equipment subsidy project can be made.

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Chapter 5: City-to-City Collaboration Workshop

5.1 City-to-City Collaboration Workshop

(1) Background

Some of the participants and invitees at the City-to-City Collaboration Workshop (Seminar on City-to-City Collaboration) sponsored by the MOE who are affiliated with Kitakyushu were invited to the city to accompany others during the training program conducted there.

(2) Workshop schedule

In Kitakyushu: January 14 and 15, 2020

In Tokyo: January 16 and 17, 2020

(3) Details

The meeting minutes recorded during participation in the Kitakyushu and Tokyo workshops are included below.

(Memo 1)

JCM Seminar on City-to-City Collaboration - Kitakyushu Observation

Date: January 14 and 15, 2020
Location: Kitakyushu
Participants: Abe

Two days before and the day before the Seminar on City-to-City Collaboration for Zero-Carbon Society sponsored by the MOE and held at the Shinagawa Prince Hotel in Tokyo on January 16 and 17, 2020 some of the workshop invitees who are affiliated with Kitakyushu were invited to the city. Once there, they were provided with an explanation of Kitakyushu's history in dealing with environmental problems, the current state of Eco-Town, activities in Eco-Town, and given the opportunity to observe new test projects toward becoming a hydrogen (H) energy based society. NTT Data Institute of Management Consulting, who are involved in the 2019 City-to-City Collaboration project at each city also participated in the observation. Details of the observation are as follows.

Participants in the Kitakyushu observation are shown in Table 4-1 and the schedule is shown in Table 4-2. The five participants from Davao, Philippines were unable to make it to the observation due to planes being grounded from the January 12 volcanic eruption in the Philippines. Two participants in charge of eco-industrial park conception at the Vietnamese Ministry of Planning and Investment (MPI), which is the central ministry came to Kitakyushu, and five people came from Hai Phong, the sister city to Kitakyushu for a total of seven participants from Vietnam. This stems from Kitakyushu's support for eco-industrial park conception, with one industrial park that requested a model business being located in Hai Phong. Two participants came from the Iskandar Regional Development Agency (IRDA) in Malaysia, and two from the Alliance Stars Group in Yangon, Myanmar, with a total of 11 people joining in the observation.

As shown in Table 4-2, right after late night flights arrived from their respective countries at Fukuoka Airport on the morning of January 14, arriving participants traveled to Kitakyushu by chartered bus, left their luggage at the hotel, had lunch, and began the training program. After listening to an overview of Kitakyushu at Eco-Town Center, the participants observed operations at a home appliance recycling plant and office equipment (mainly copiers) recycling plant in Eco-Town, returned to the hotel for

a short time, then attended a welcome party.

On January 15, participants visited the Kitakyushu Environment Museum, learning about the history of environmental improvement efforts in Kitakyushu as well as current initiatives, then later touring a facility where testing of hydrogen energy usage is under way. After lunch, the participants took a tour of Kitakyushu, finally heading to Tokyo at night.

Details of activities are shown below.

Table 4-1 Kitakyushu Observation Participant List

Member list of JCM Workshop Partcipants

As of 7-JAN-2020

		Name	Organization	Position
1	Vietnam	Mr.Vu Quoc Huy	Ministry of Planning and Investment , Department of Economic Zone Management	Deputy Director General
2	Vietnam	Ms.Vuong Thi Minh Hieu	Ministry of Planning and Investment , Department of Economic Zone Management	Official
3	Vietnam	Ms.Nguyen Thi Bich Dung	People's Committee of Hai Phong City, Department of Foreign Affairs	Duputy Director
4	Vietnam	Mr. Pham Hong Ha	People's Committee of Hai Phong City, Department of Home Affairs	Vice Director
5	Vietnam	Mr. Nguyen Van Khoi	People's Committee of Vinh Bao District (Hai Phong City)	Vice Chairman
6	Vietnam	Mr. Hoang Trung Hieu	People's Committee of Do Son District (Hai Phong City)	Vice Chairman
7	Vietnam	Mr. Tran Minh Tan	People's Committee of Hai Phong City, Department of Public Security	Official
8	Malaysia	Ms. Norfiza binti Bashfari	People Management, Iskandar Regional Development Authority (IRDA)	Vice President
9	Malaysia	Ms. Wan Hezlin Enis binti Wan Ismail	People Management, Iskandar Regional Development Authority (IRDA)	Vice President
10	Myanmar	Mr. KIM Hyun Woo (Mike)	Alliance Stars Group	Manager
11	Myanmar	Ms.Daw San San Aye	Alliance Stars Group	Deputy Manager
12	Philippines	Mr. Sebastian Zimmerman Duterte	Davao City (City Councilor of Davao)	Vice Mayor
13	Philippines	Mr. J. Melchor JR. Bumpus Quitain	City Councilor of Davao	City councilor
14	Philippines	Ms. Diana Ann Welborn Quitain	City Councilor of Davao	Cheaf of Stuff
15	Philippines	Mr. Vince Jul O. Malicay	Office of Vice Mayor of Davao	Technical Adviser for Special Concerns or Executive Assistant of Vice Mayor Duterte
16	Philippines	Mr. Lawrence Alcazaren Zamora	Office of Vice Mayor of Davao	Security Officer, Presidential Security Group
17	Philippines	Mr. Kenny June B. Roma	Office of Vice Mayor of Davao	Security Officer, Presidential Security Group
18	Philippines	Mr. Ryan M. Monreal	Office of Vice Mayor of Davao	Security Officer, Presidential Security Group

Table 4-2 Kitakyushu Observation Schedule

Day1 14-January		
07:30 08:10 08:10		Vietnam group arrival (VN356) Myanmar group arrival (TG648) Malaysia group arrival (SQ656)
09:00	11:00	Move to Hotel (Nishitetsu-inn Kokura) by chartered bus
11:00		Check-in and Lunch *Only keep baggage (not stay at room)
13:00		Departure from Hotel to Kitakyushu Eco-Town
13:30	16:15	Kitakyushu Eco-Town (guidance, recycle factories of home appliance and OA equipment)
16:15		Move to Hotel
18:15		Departure from Hotel to Welcome party on foot
18:30	20:30	Welcome Party
Day 2 15-Janurary		
08:50		Meet up Hotel lobby after check-out *Do not leave baggage with the hotel.
09:00		Move to Kitakyushu Environmental Museum
09:30	10:30	Kitakyushu Environmental Museum
10:30	12:00	Kitakyushu Smart community (Hydrogen Town Demonstration test)
12:00		Move to Kokura
12:30	13:30	Lunch
13:30	14:40	Kokura Castle etc
14:40		Move to Kitakyushu AP
16:20	17:50	Kitakyushu AP – Tokyo Haneda AP (SFJ86)
17:50		Move to Hotel (Shinagawa Price Hotel) by chartered bus

<u>January 14</u>

(1) Eco-Town Center (13:30 - 14:00)

At Eco-Town Center in the Hibikinada area of Wakamatsu ward in Kitakyushu, participants listened to an explanation of Kitakyushu's history, a summary and features of the Hibikinada Marine Industrial Park, and the Kitakyushu Eco-Town Plan from the staff at the Center.

Ever since Yawata Steel Works was established in Kitakyushu in 1901, the city has developed into a manufacturing town. Various world-famous companies make their home

here, such as Nippon Steel, Yaskawa Electric, which manufactures industrial robots, and TOTO, which produces toilets and washbasin systems. For 20 years starting in the 1960s, the city experienced problems with pollution, spending nearly 800 billion yen, turning it into the advanced Eco-Town of today.

	
Explaining at Eco-Town Center 1	Explaining at Eco-Town Center 2

After learning about the background of Eco-Town in a classroom-style setting, the participants listened to an explanation on the steel, plastic, and fiber recycling programs in the town using Eco-Town Center facilities.

	
Explaining recycling of old clothes and fibers	Explaining the Comprehensive Environment Industrial Complex

	
Explaining urban mining	Group representing Hai Phong

(2) Nishinihon Kaden Recycle Corporation (14:15 - 15:00)

Nishinihon Kaden Recycle Corporation is a company that runs a home appliance recycling project in the Kitakyushu Eco-Town Comprehensive Environment Industrial Complex based on Home Appliance Recycling Law. They accept and recycle four types of home appliances including LCD/CRT TVs, washing machines/dryers, refrigerators, and air conditioners. With a processing capacity of 282 tons per day (1 million units per year at standard weight conversion), they are the largest-scale recycling plant in Western Japan.

First, company employees provided an explanation about the company, then the participants watched a video presentation explaining the recycling process for each appliance at the plant. The TV recycling process is shown in Figure 4-1, washing machine process in Figure 4-2, refrigerator process in Figure 4-3, and air conditioning process in Figure 4-4.

After watching the video, they took part in a tour of the plant that followed a tour course. The tour course allowed participants to see part of each recycling process as explained in Figures 4-1 to 4-4. Photos were prohibited during the tour.

Explaining the recycling company	Explaining the recycling processes

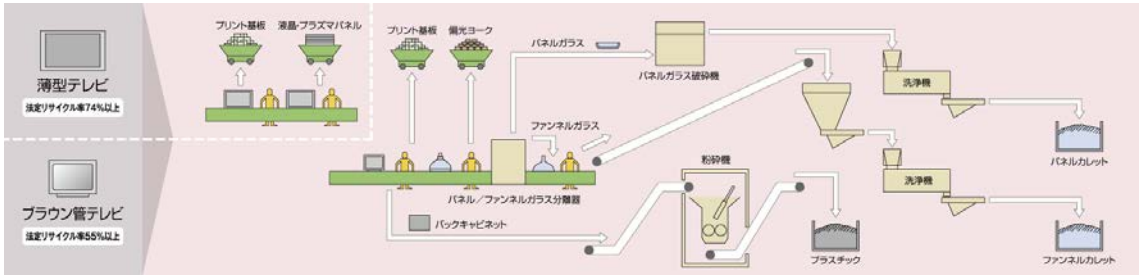


Figure 4-1 Recycling process for flat screen and CRT televisions

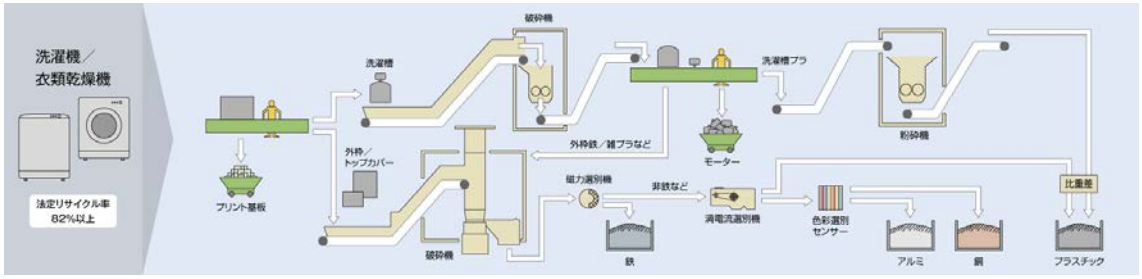


Figure 4-2 Recycling process for washing machines and clothing dryers

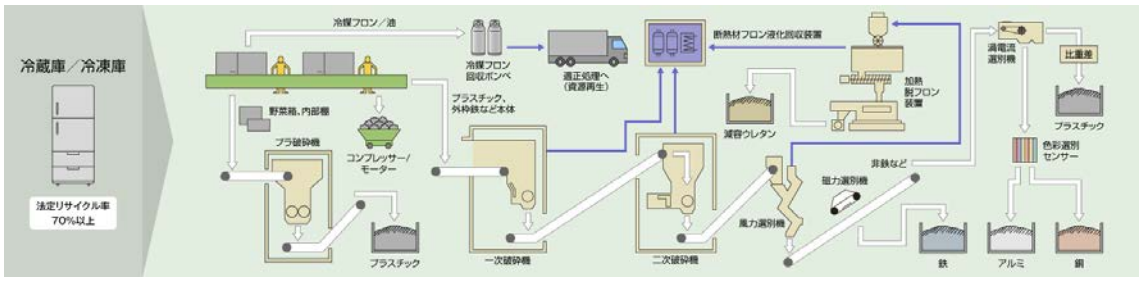


Figure 4-3 Recycling process for refrigerators

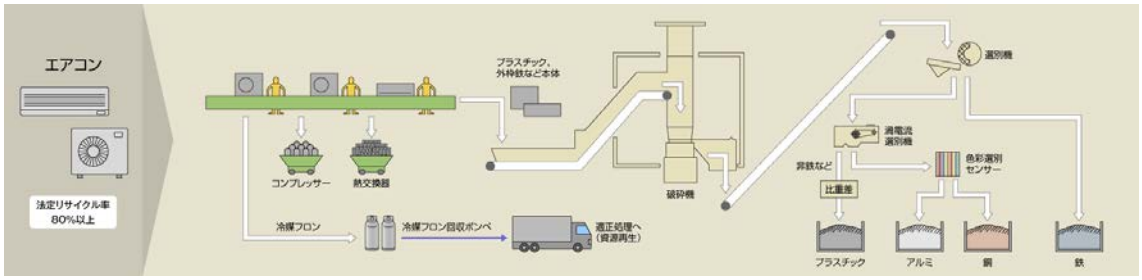


Figure 4-4 Recycling process for air conditioners

(3) Recycle Tech Corporation (15:15 - 16:00)

Recycle Tech Corporation is a business that mainly handles recycling of office

equipment, and is funded by the Shinryo Corporation which mainly handles industrial waste processing and recycling, and the Ricoh Co., Ltd. Their office equipment recycling process is shown in Figure 4-5.

After watching a video explaining the company and their recycling process, participants received an explanation on recycling showing actual dismantled office equipment samples, as well as a briefing on photovoltaic panel (PV panel) recycling efforts which was launched in recent years. Later they toured the recycling plant with participants asking questions about how the massive rows of copiers are managed. The staff explained that each copier was assigned a bar code upon arrival, helping to properly identify each copier and which step of the process it is currently in.

	
Company and recycling process explanation 1	Company and recycling process explanation 2

	
Office equipment recycling process explanation	PV panel recycling process explanation

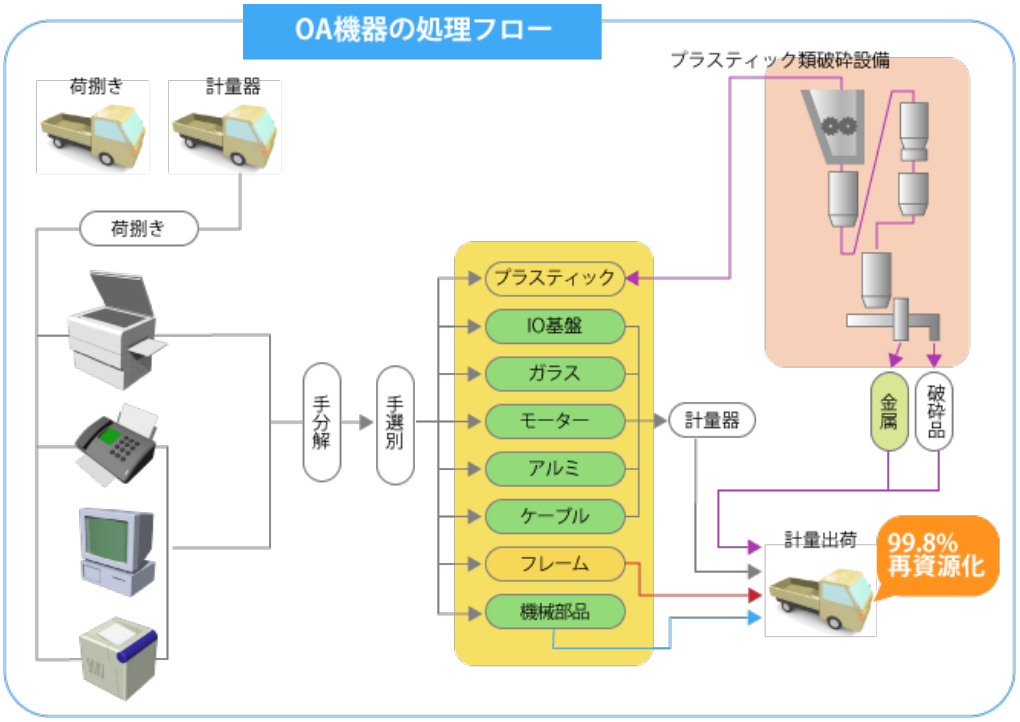


Figure 4-5 Office equipment recycling process

After a tour of the Recycle Tech Corporation office equipment recycling plant, the remaining time was used to show participants the wind power generation facilities at the industrial park. Participants stayed on the bus during the observation due to the rainy weather, however, Eco-Town Center employees talked about the wind power generation facilities on land and the offshore floating facilities, as well as future plans for offshore wind power initiatives.

Hibikinada Marine Industrial Park coastal wind

power generation facilities
(On clear days you can see the floating offshore wind turbines)

January 15

(1) Kitakyushu Environment Museum (9:30 - 10:30)

The Environment Museum cooperates with various institutions and groups in an effort to achieve an environmentally-friendly and sustainable society, such as schools, corporations, citizens, citizens' groups, and the government. It serves as a base for collaborative efforts in Kitakyushu's goal of becoming the environment capital of the world, providing a comprehensive place where citizens can gather together and learn about the environment.

After listening to an explanation on Kitakyushu's geographical location and background at the Environment Museum, the participants heard about how the environment was sacrificed to develop into a manufacturing town, and the severe situation it faced in the 1960s. At that time, efforts to solve environmental pollution began mainly thanks to the mothers of elementary school children in the area. People from the sciences and government then joined in, taking over 20 years and massive sums of money to revitalize the environment resulting in the Eco-Town of today that the world can be proud of.

Later, participants listened to an explanation of the Environment Museum and how it serves as a base for SDGs such as learning and gathering together, and about efforts toward becoming a resource recycling society. Participants were highly interested in the transformation of Kitakyushu, engaging in an active discussion on how it changed, what the role of the government was at that time, and how funds were used to solve problems.

	
In front of the Environment Museum -	Geographical explanation of Kitakyushu

Meeting the director	

	
Environmental pollution in the 1960s	Efforts to solve environmental problems

	
Development of knowledge gained in solving environmental problems	SDG initiatives

	
Resource and waste recycling	End of the Environment Museum tour

(2) Kitakyushu Smart Community (10:30 - 12:00)

In order for Kitakyushu to become a hydrogen energy based city, there are three efforts under way. (1) Testing and promotional activities at Kitakyushu Hydrogen Town in the Higashida area, (2) Creation of a carbon dioxide-free hydrogen production and supply depot in the Hibikinada area, and (3) Popularization of fuel cell vehicles and hydrogen stations across the entire city.

In the Environment Museum conference room, participants listened to a summary of efforts to transform Kitakyushu into a hydrogen energy based city, then heard an explanation of fuel cell construction (Figure 4-6) which is a technology required to achieve this goal, fuel cell vehicles (Figure 4-7), and a hydrogen transportation test project (Figure 4-8). Later they visited the neighboring Higashida area to view fuel cell vehicles, hydrogen-powered house, hydrogen transportation facilities, and hydrogen leak detection equipment. Participants showed great interest in the fuel cell vehicle.

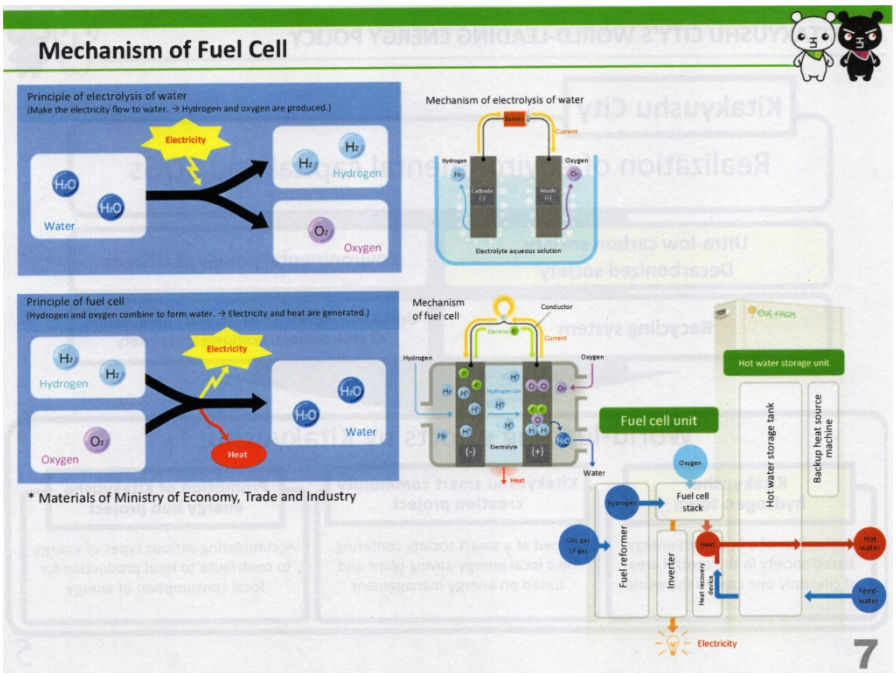
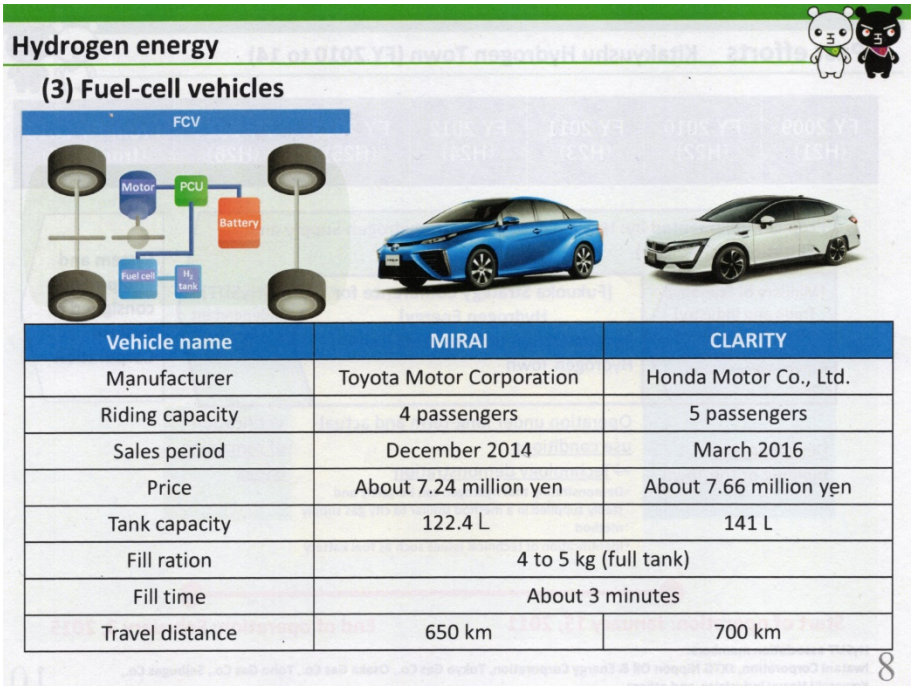


Figure 4-6 Fuel cell principles



Vehicle name	MIRAI	CLARITY
Manufacturer	Toyota Motor Corporation	Honda Motor Co., Ltd.
Riding capacity	4 passengers	5 passengers
Sales period	December 2014	March 2016
Price	About 7.24 million yen	About 7.66 million yen
Tank capacity	122.4 L	141 L
Fill ration	4 to 5 kg (full tank)	
Fill time	About 3 minutes	
Travel distance	650 km	700 km

Figure 4-7 Fuel cell vehicle (Toyota MIRAI and Honda CLARITY)

Figure 4-8 Hydrogen transportation test project

	
Lecture on efforts to achieve a hydrogen energy based city	Fuel cell vehicle (CLARITY) 1
	
Fuel cell vehicle (CLARITY) 2	Fuel cell house
	
Hydrogen usage test facilities explanation 1	Hydrogen usage test facilities explanation 2

	
Hydrogen transportation pipe	Hydrogen leak sensor (Left closed at all times)

JCM Seminar on City-to-City Collaboration

January 16 and 17, 2020
Venue: Shinagawa Prince Hotel Main Tower,
International Convention Center Pamir
Participants: Kobayashi, Yamakawa

We participated in the Seminar on City-to-City Collaboration for Zero-Carbon Society, organized by the Ministry of the Environment (MOE), held on January 16 and 17, 2020, in Tokyo. On the morning of the 16th, a closed seminar was held, followed by a site visit in Tokyo in the afternoon. On the morning of 17th, a closed seminar was held, followed by a open seminar in the afternoon.

■ **January 16 Morning Closed Seminar Program**

Time	Presentation
09:00-09:30	Opening remarks & Presentation titled: Domestic and international trends for creating a zero-carbon society Mr. Kotaro Kawamata, Director, Environmental Strategy Division, Minister's Secretariat, MOEJ
	Recent development of City-to-City Collaboration Projects & Points for next fiscal year Ms. Mahoyo Yamamoto, MOEJ
09:30-10:15	**I. Projects in Viet Nam** 1. Ho Chi Minh – Osaka Mr. Masaru Ishikawa Manager, Environmental Science & Engineering Dept., Nippon Koei Co., Ltd. 2. Hai Phong – Kitakyushu Mr. Yuichi Abe Associate Partner, Socio & Eco Strategic Consulting Unit, NTT Data Institute of Management Consulting, Inc. 3. Can Tho - Hiroshima Prefecture Mr. Kazuki Matsubara Senior Managerial Staff, Foreign Business Division, Commerce, Industry and Labor Bureau, Hiroshima Prefectural Government **II. Projects in the Philippines** 4. Davao – Kitakyushu Ms. Emiko Murakami, Director of Business Promotion, Kitakyushu Asian Center for Low Carbon Society, City of Kitakyushu 5. Quezon – Osaka Mr. Motofumi Suzuki Senior Advisor, Oriental Consultants, Co., Ltd. **III. Projects in Malaysia** 6. Kuala Lumpur – Tokyo Metropolitan Government Dr. Junichi Fujino Programme Director, City Taskforce, IGES 7. Iskandar – Kitakyushu Mr. Motoshi Muraoka Partner, Socio & Eco Strategic Consulting Unit, NTT Data Institute of Management Consulting, Inc. Q&A
10:15-10:25	Break

10:25-11:05	**IV. Projects in Myanmar** 8. Hlegu Township, Yangon Region – Kitakyushu Mr. Motoshi Muraoka Partner, Socio & Eco Strategic Consulting Unit, NTT Data Institute of Management Consulting, Inc. 9. Yangon – Kawasaki Mr. Takahiro Fukahori Manager, International Economic Affairs Office, Economic and Labor Affairs Bureau, Kawasaki City 10. Sagaing Region - Fukushima 11. Ayeyarwady Region- Fukushima Mr. Koji Kojima Research Director, Environmental and Energy Research Division, Mitsubishi Research Institute Inc. Mr. Naoki Kato Manager, Environment Division, Environment Department, Fukushima City **V. Projects in Thailand** 12. Laem Chabang Port, Bangkok Port – Yokohama Mr. Kousuke Shibasaki Deputy General Manager, Engineering Department, Yokohama Port Corporation 13. Eastern Economic Corridor – Osaka Mr. Masaru Ishikawa Manager, Environmental Science & Engineering Dept., Nippon Koei Co., Ltd. Q&A
11:05-11:15	Break
11:15-11:55	**VI. Projects in Indonesia** 14. Semarang – Toyama 15. Bali – Toyama Mr. Keiichi Kobayashi Section Chief, International Cooperation Section Environmental Policy Div., Toyama City Ms. Aki Baba Associate Senior Staff, Environmental Science & Engineering Dept., Nippon Koei Co., Ltd. 16. Jakarta - Kawasaki 17. Rokan Hulu, Riau Province – Kawasaki Mr. Takahiro Fukahori Manager, International Economic Affairs Office, Economic and Labor Affairs Bureau, Kawasaki City Q&A
11:55-12:00	Administrative announcement (IGES), End of session

(Note) The order of presentations may be changed.

- 09:00 Opening remarks & Presentation titled: Domestic and international trends for creating a zero-carbon society - (15 min): Mr. Kotaro Kawamata, Director, Environmental Strategy Division, Minister's Secretariat, MOE
  - ✧ City-to-city collaboration is one important means of achieving the goals of the Paris Agreement, and we would like to continue actively engaging in it in the future.
  - ✧ Ten Asian countries, 32 cities and 14 local governments have participated so far in city-to-city collaboration. 120 persons from six Asian countries, 17 cities, and eight local governments participated in this city-to-city collaboration seminar. This year, self-funded participation was also higher than the average year.

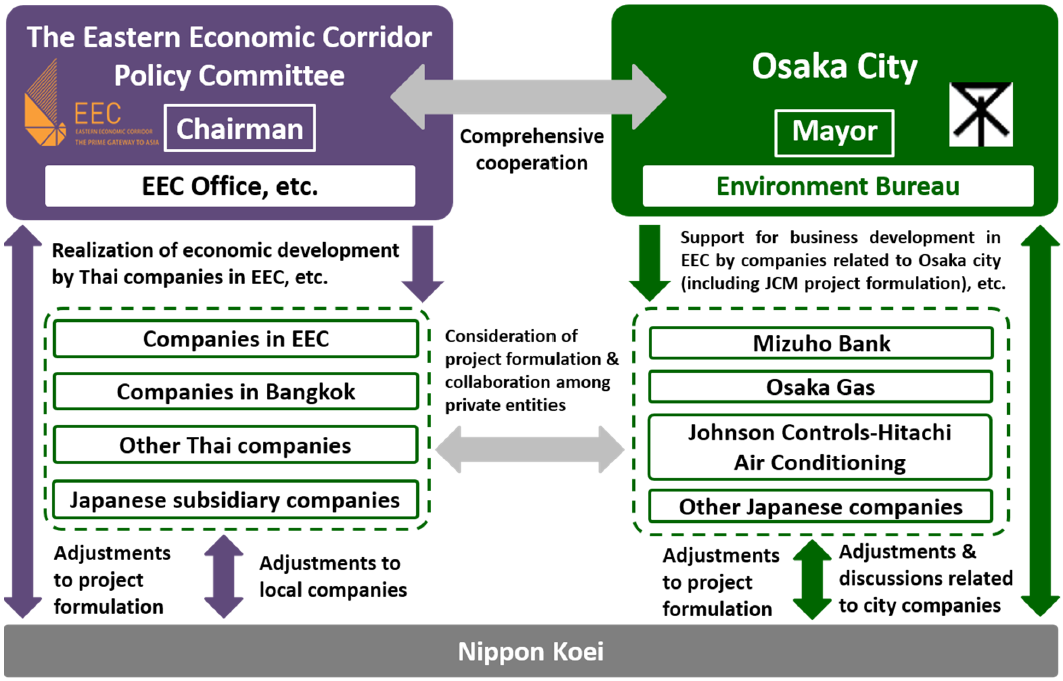
- ✧ The latest trend in decarbonization in Japan is that the number of local governments declaring that they aim to decarbonize is on the rise. The main causes of this include the devastating impact of the natural disasters this year and the growing call for local governments to decarbonize by Minister of Environment Koizumi after he took office in September. As a result, currently, 33 local governments have declared that they will be zero carbon cities. For example, Nagano Prefecture, which was severely damaged by typhoons this year, made a decarbonization declaration this year.
- ✧ For future international development, we plan to consider the holding of a "Zero Carbon City International Forum" in cooperation with local governments that have declared that they will become zero carbon cities.
- ✧ It is difficult for Japan as a whole to immediately realize decarbonization; however, we will make use of frameworks such as city-to-city collaboration projects and JCM equipment subsidies to proactively work toward decarbonization.

- 09:15 Recent development of City-to-City Collaboration Projects & Points for next fiscal (15 minutes):
  Ms. Mahoyo Yamamoto, International Cooperation / Environmental Infrastructure Office, Global Environment Bureau, International Strategy Division, MOE
  - ✧ As for the granted requests for this year, 10 out of 21 primary applications were granted and 7 out of 9 secondary applications were granted. The contents of the proposals for the secondary applications are a refinement of the contents of the successful bids in primary applications, and we are very satisfied with the results.
  - ✧ The change for this year's applications is that the project period has been changed to a maximum of three years. The reason for the change is that it is difficult to formulate a JCM equipment subsidy project in a single fiscal year, and it is necessary to work on designing systems, etc., over the course of several years. With the project period having been set to three years, this year, the contents of activities of 11 projects will be premised on plan formulation. It should be noted that although the proposals are for a three-year implementation plan, contracts will remain single-year contracts.
  - ✧ Although the naming has changed from low carbon to decarbonization, we recognize that decarbonization is something that is difficult to realize

immediately. We hope that next year's city-to-city collaboration projects will work with a view to achieving a zero-carbon society by 2050.

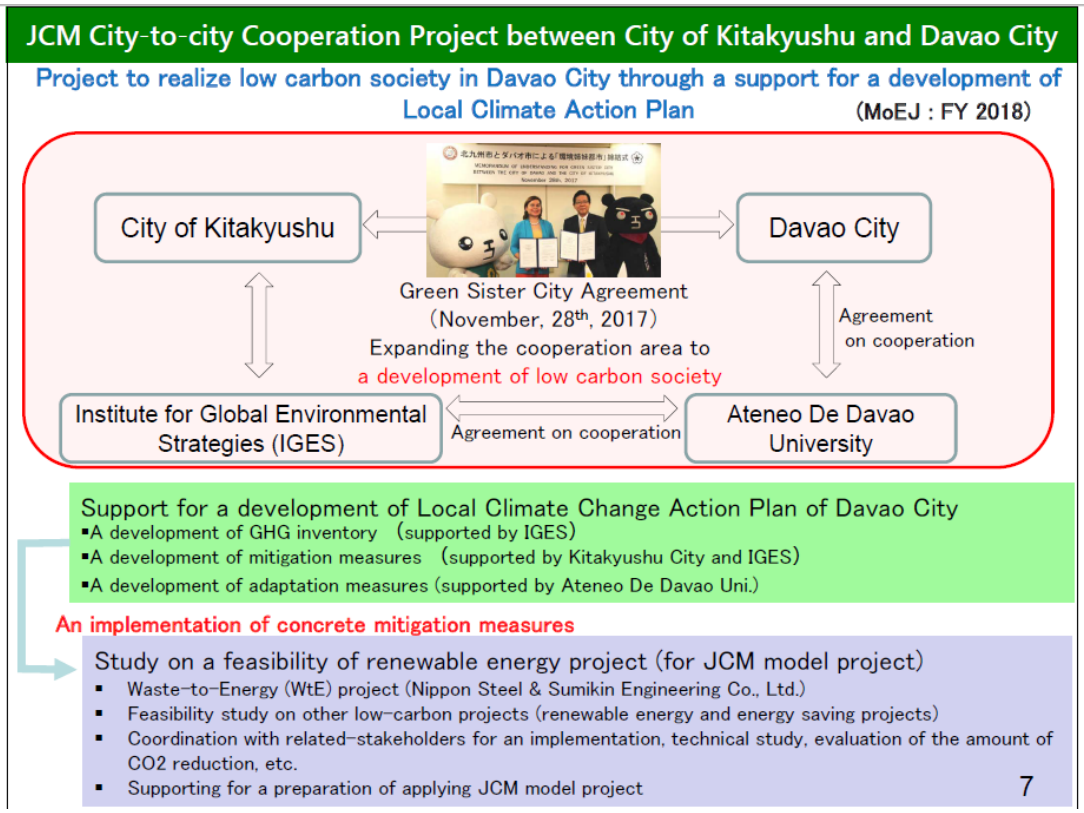
- ✧ The call for applications for next year's city-to-city collaborations is expected to start around late March.

- Introduction of projects in Vietnam
  - ➢ Ho Chi Minh - Osaka City Project (5 min): Mr. Masaru Ishikawa, Manager, Environmental Science & Engineering Dept., Nippon Koei Co., Ltd.
    - ✧ Osaka City is sharing its accumulated knowledge of climate change mitigation measures, adaptation measures, and administrative management with Ho Chi Minh City.
    - ✧ The project formulation activities include consideration of the introduction of energy-saving air-conditioners, gas boiler fuel conversion and photovoltaic power generation systems.
    - ✧ There are currently no particular issues, and both Ho Chi Minh City and Osaka City are very positive. As for activities for the next fiscal year and beyond, we would like to continue with the policy dialogue that has been implemented through city-to-city collaboration. Specifically, we will work on a policy dialogue on the proactive introduction of low-carbon technologies in Ho Chi Minh City. We will also continue to focus on project formulation. In addition, we also plan to work on project formation in public works. The industry is focusing its attention on the beverage industry and the energy-intensive cement industry.
    - ✧ The project structure is as shown below.



- Hai Phong - Kitakyushu City Project (5 min): Mr. Yuichi Abe, Associate Partner, Socio & Eco Strategic Consulting Unit, NTT Data Institute of Management Consulting, Inc.
  - ✧ In terms of activities, we are looking into the feasibility of introducing the following equipment for two steel companies with electric furnaces and the tenant companies of the Nam Cau Kien Industrial Park, which have the highest energy consumption.
    - (a) High efficiency blowers + high voltage inverters
    - (b) High efficiency pumps + high voltage inverters
- Can Tho - Hiroshima Prefecture Project (5 min): Mr. Kazuki Matsubara, Senior Managerial Staff, Foreign Business Division, Commerce, Industry and Labor Bureau, Hiroshima Prefectural Government
  - ✧ Rice cultivation is thriving in the city of Can Tho, and there is a demand for using the rice husks discharged from the rice mills. In this project, the rice husks discharged from the rice milling process are compressed into solid blocks, which will then be used as fuel to generate electricity through gasification, thereby providing 100% of the electricity used at the rice mill.
  - ✧ At present, rice mills are purchasing electricity from the Southern Power Corporation via the grid; however, replacing it with biomass power will contribute to reducing greenhouse gases.

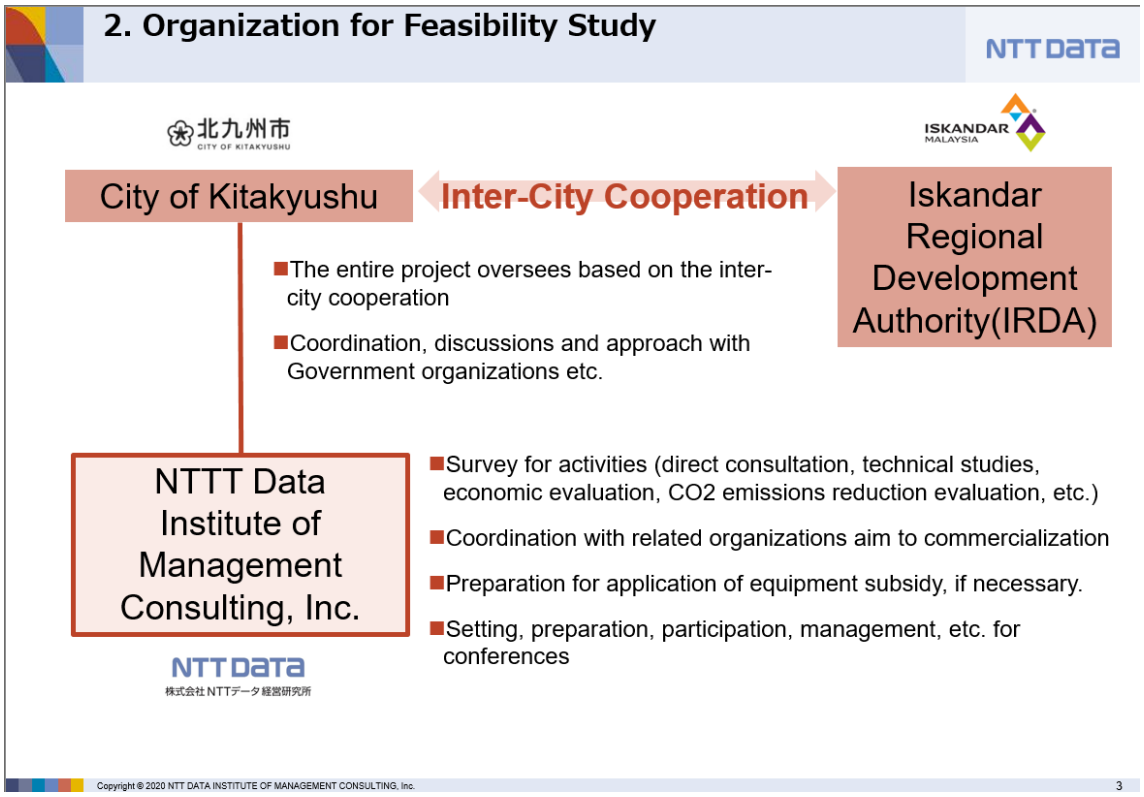
- Introduction of projects in the Philippines
  - Davao - Kitakyushu City Project (5 min): Ms. Emiko Murakami, Director of Business Promotion, Kitakyushu Asian Center for Low Carbon Society, MOE, City of Kitakyushu
    - ✧ The collaboration between Davao City and Kitakyushu City began when Kitakyushu City was consulted regarding the problem of waste by Davao City, via the Consulate-General, and technical cooperation was implemented.
    - ✧ JICA projects and city-to-city collaboration projects are being used to support Davao City.
    - ✧ With the issue of waste, it is not a problem that can be solved just by installing equipment and facilities locally, and continuity will be lost unless capacity is developed in the field through support for collection and transportation and human resource development. To this end, we will continue to focus on capacity building through JICA projects, while formulating JCM projects through city-to-city collaboration projects.
    - ✧ The project structure is as shown below.



- Quezon - Osaka City Project (5 min): Mr. Motofumi Suzuki, Senior Advisor, Oriental Consultants, Co., Ltd.
  - There are three main activities in this project.
    (a) Introduction of energy-saving equipment in Quezon City after the renewal of air conditioning systems
    (b) Investigation of CFC recovery and destruction and consideration of countermeasures
    (c) Support of capacity building
  - We expect the following three outputs from this year's activities.
    (a) Investigation of applicability of a JCM equipment subsidy for air conditioning energy saving
    (b) Confirmation of the current status of fluorocarbon collection, recovery and destruction in the Philippines (Manila)
    (c) Gathering of fluorocarbon information

- Introduction of projects in Malaysia
  - Kuala Lumpur - Tokyo Metropolitan Government Project (5 min): Dr. Junichi Fujino, Program Director, City Taskforce, IGES
    - The Kuala Lumpur Government and the Tokyo Metropolitan Government are supporting the development of a policy framework for building energy efficiency through city-to-city collaboration projects.
    - The Tokyo to Kuala Lumpur Low Carbon System (T2KLLCS) seminar was held in Kuala Lumpur on August 23, 2019. Scenes from the event are shown below.

- Iskandar - Kitakyushu City Project (5 min): Mr. Motoshi Muraoka, Partner, Socio & Eco Strategic Consulting Unit, NTT Data Institute of Management Consulting, Inc.
  - The Iskandar Regional Development Authority and Kitakyushu City also engaged in city-to-city collaboration in 2015 and 2016.
  - In this city-to-city collaboration project, the following three main activities are being considered.
    (a) Review of action plans based on the already formulated blueprint for low-carbon societies
    (b) Follow-up surveys of the surveys that were conducted in 2015 and 2016
    (c) Investigations to identify waste heat recovery power generation projects that have potential
  - As a result of this year's efforts, we formulated an action plan for the building of industrial symbiosis in collaboration with the Iskandar Regional Development Authority, and identified several potential projects for JCM equipment subsidy applications.
  - The implementation system is as follows.



- Introduction of projects in Myanmar
  - ➢ Hlegu Township, Yangon Region - Kitakyushu City Project (5 min): Mr. Motoshi Muraoka, Partner, Socio & Eco Strategic Consulting Unit, NTT Data Institute of Management Consulting, Inc.
    - ✧ This project is a derivative project of the FY2018 Kitakyushu City - Mandalay City city-to-city collaboration study project.
    - ✧ Specifically, it will aim to realize a low-carbon project (realization of an eco green city) in a smart-city development project within the Hlegu township in the Yangon Region.
    - ✧ The introduction of cogeneration equipment, chillers, and photovoltaic power generation systems will be examined. The equipment to be considered for introduction at each facility is as follows.

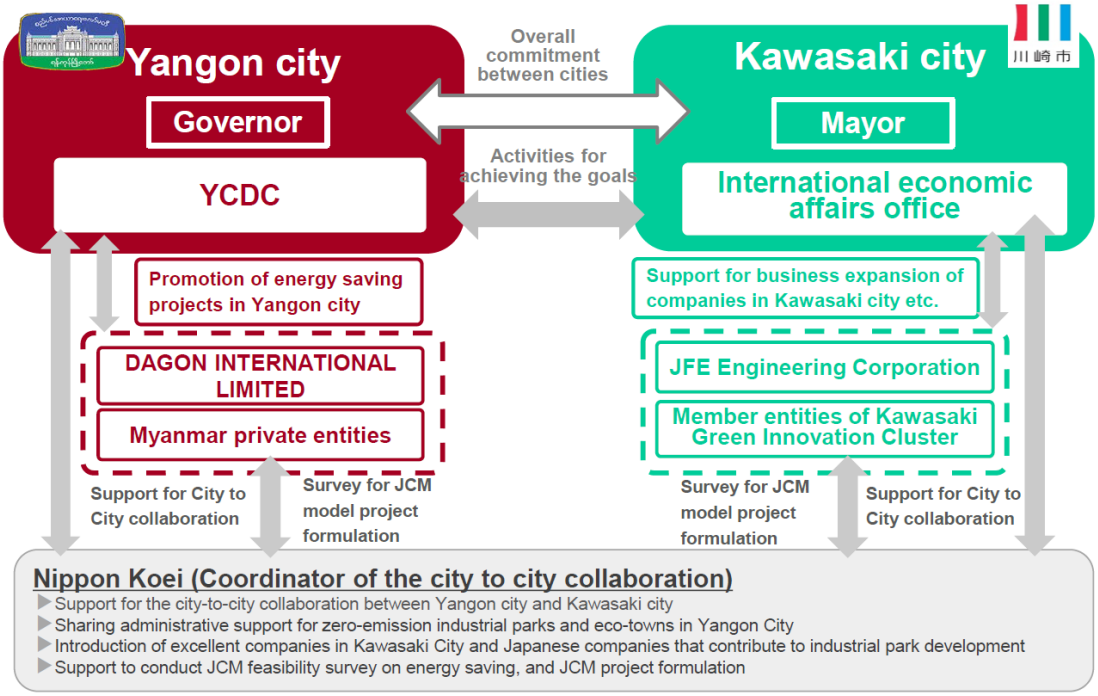
1.Background
About Eco Green City

- ◆ Approximately 1,453 acres of land will be developed in three phases over the 15 years from 2019 to 2034.
- ◆ As a more specific project, local power company Golden Green Energy will introduce a 30MW solar power facility.

Planned construction facilities	Assumed introduction technology
Water and sewage treatment plant	• High efficiency water treatment technology • inverter
Commercial facility (outlet mall, Movie theater)	• Cogeneration equipment • Chiller equipment • Solar power, battery
Agripark (Experience farms, farms, etc.)	• Biomass power generation • Solar power
Hospitals, hotels, museums, etc.	• Cogeneration equipment • Solar power, battery
School	• Solar power, battery
Public housing (Low-income and public servant housing)	• Solar power, battery

- ➢ Yangon - Kawasaki City Project (5 min): Mr. Takahiro Fukahori, Manager, International Economic Affairs Office, Economic and Labor Affairs Bureau, Kawasaki City
  - ✧ An exchange of opinions between Yangon City and Kawasaki City will be conducted to address the environmental issues that Yangon City faces. We will also share the know-how of the SDGs of both cities in order to achieve the sustainable development of both cities. We will also conduct a feasibility study for a JCM equipment subsidy application.
  - ✧ The implementation system is as follows.

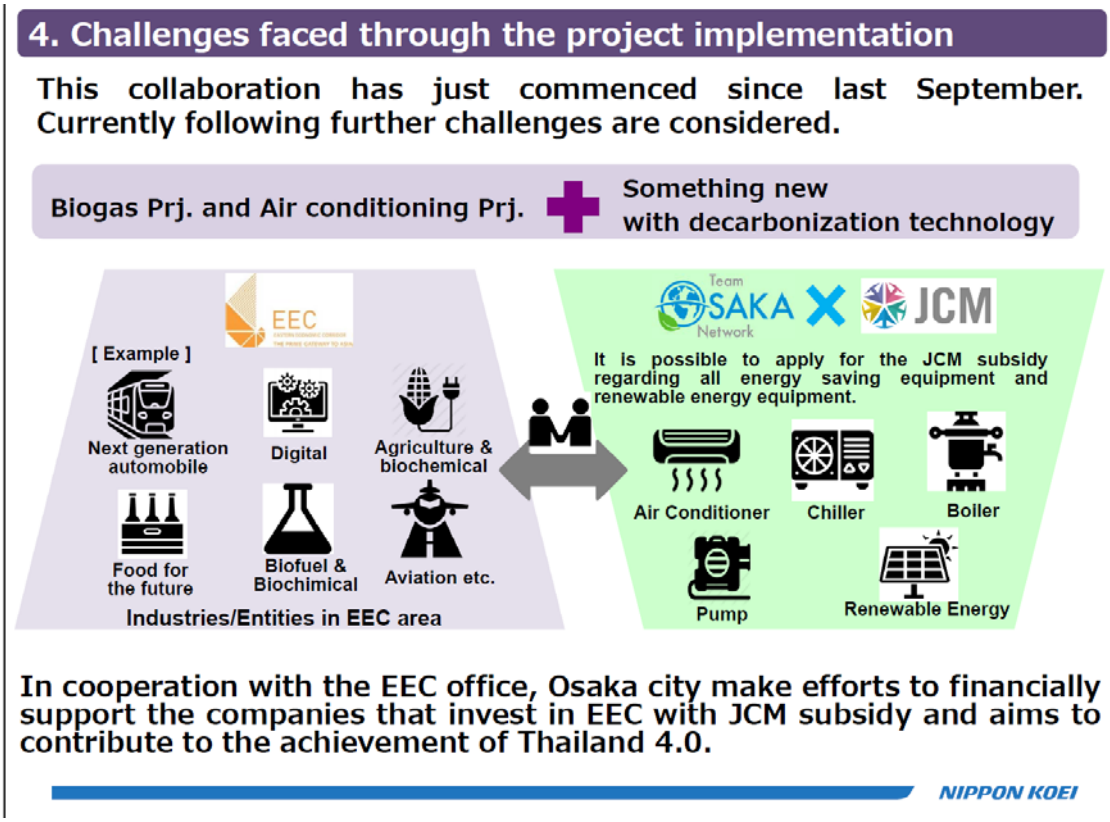
3：Each Actor's role in the project implementation



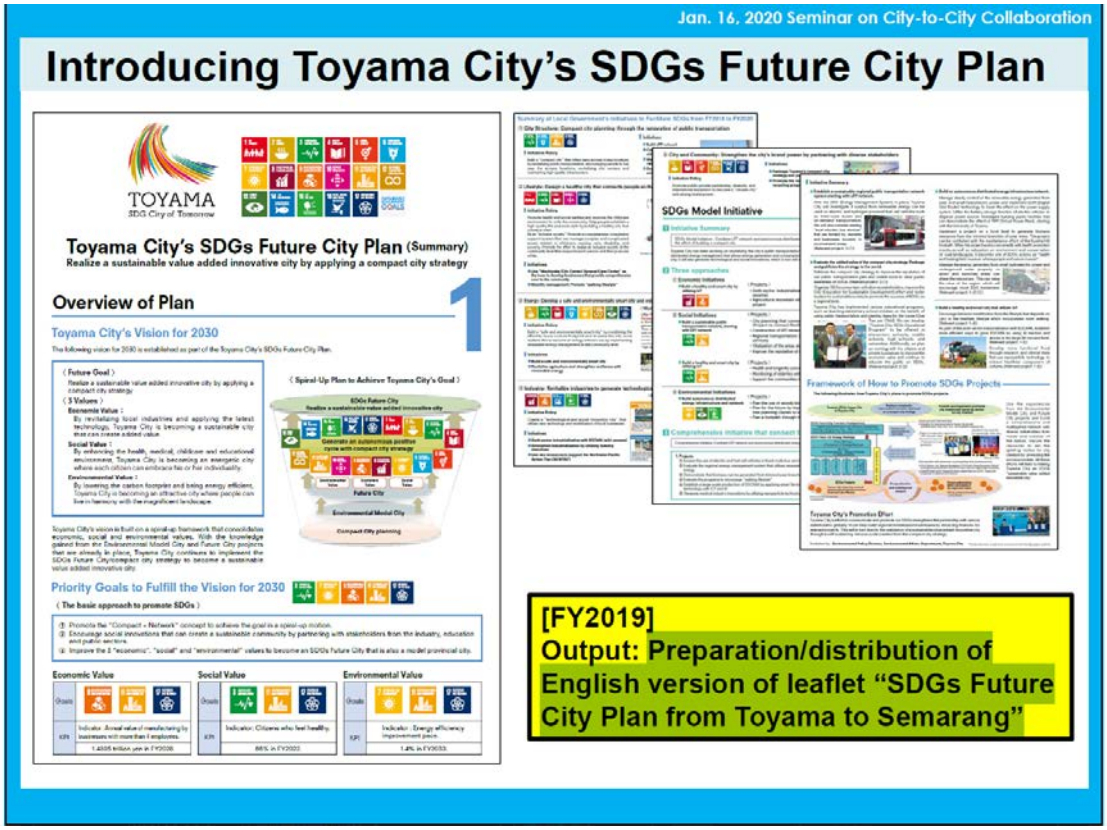
- Sagaing Region - Fukushima City Project (5 min): Mr. Koji Kojima, Research Director, Environmental and Energy Research Division, Mitsubishi Research Institute, Inc.
  - ✧ Through this project, we will consider a phased roll-out method for the rice-husk power generation system, the separation of municipal solid waste, and the appropriate treatment system in the region, aiming to support the establishment of a waste treatment system (master-plan formulation, proposal of related systems, awareness raising, etc.) and the construction of a low-carbon waste treatment system that takes advantage of local characteristics, in order to realize a low-carbon, sustainable regional city.
  - ✧ Several workshops and site visits are being conducted. Scenes from the workshops and site visits are shown below.

- Ayeyarwady Region - Fukushima City Project (5 min): Mr. Naoki Kato, Manager, Environment Division, Environment Department, Fukushima City
  - Through this project, discussions will be held regarding the promotion of environmental education at local elementary schools and the issue of waste treatment at final disposal sites. We are also focusing on collaborations with multiple cities.

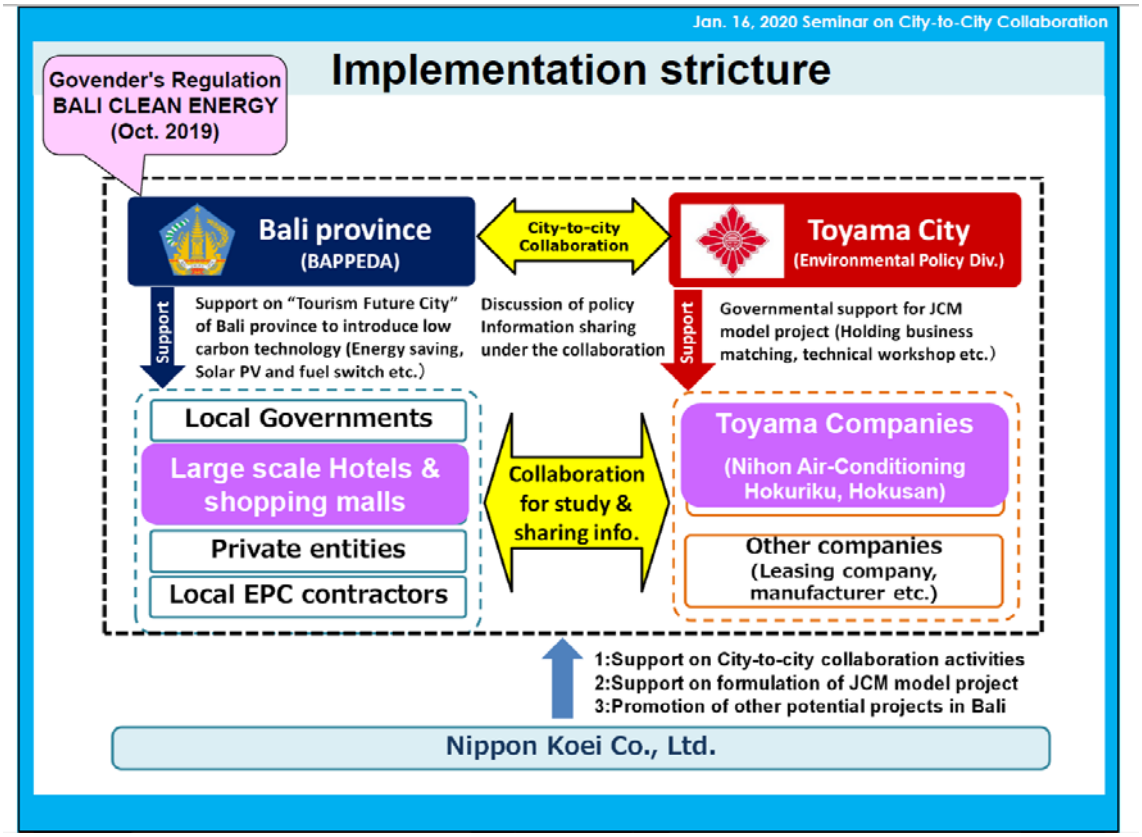
- Introduction of projects in Thailand
  - Laem Chabang Port, Bangkok Port - Yokohama City Project (5 min): Mr. Kousuke Shibasaki, Deputy General Manager, Engineering Department, Yokohama Port Corporation
    - Yokohama Port Corporation is an organization that carries out the construction and maintenance of Yokohama Port. In recent years, in consideration of environmental issues, they are making efforts to reduce the port's carbon dioxide (CO2) emissions.
    - With regard to environmental initiatives, Yokohama City has been engaged in city-to-city collaboration projects with Laem Chabang Port and Bangkok Port (including surrounding areas) since 2015. This year, we aim to reduce carbon emissions by supporting the efficient operation of railway terminals and coastal terminals at Laem Chabang Port and supporting the promotion of modal shifts in wide area logistics.
  - Thai Eastern Economic Corridor - Osaka City Project (5 min): Mr. Masaru Ishikawa, Manager, Environmental Science & Engineering Dept., Nippon Koei Co., Ltd.
    - In this project, a JCM project will be formulated within the jurisdiction of the Eastern Economic Corridor (EEC) of Thailand. Specifically, in addition to examining the introduction of biogas equipment and energy-saving equipment such as air conditioning, we will look into the introduction of renewable energy equipment.



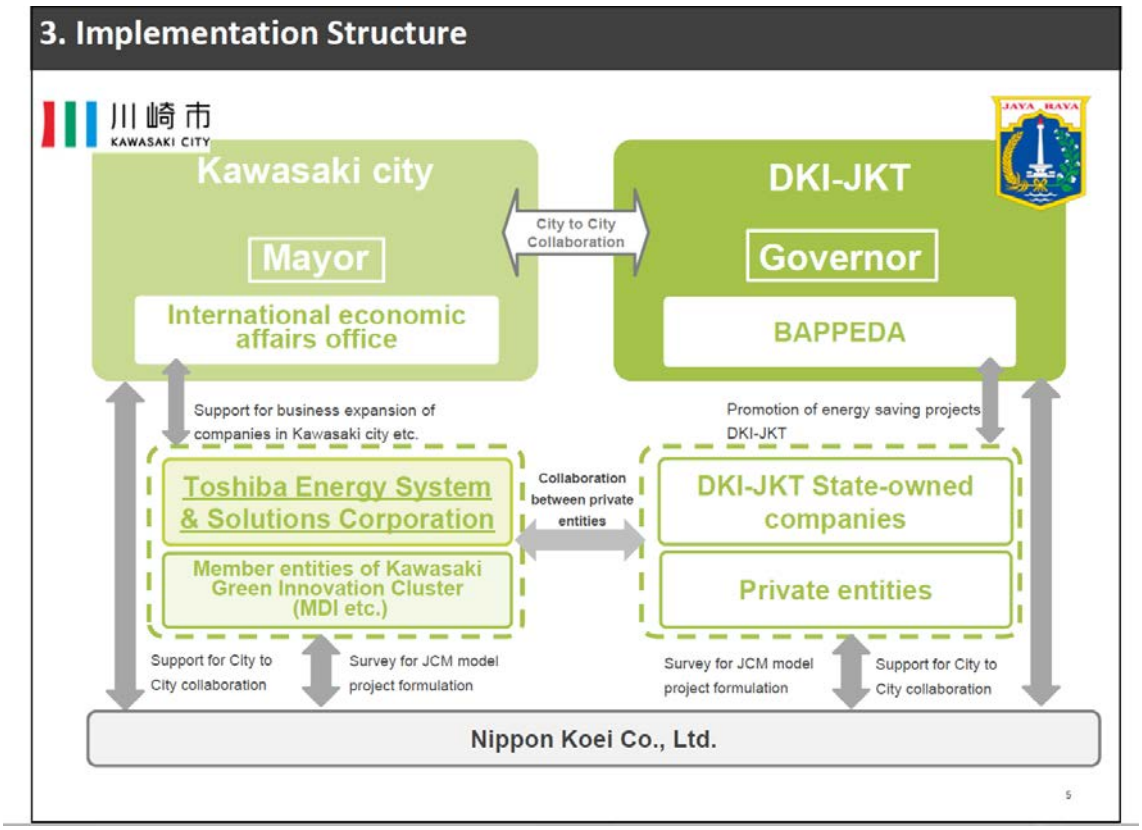
- Introduction of projects in Indonesia
  - Semarang - Toyama City Project (5 min): Mr. Keiichi Kobayashi, Section Chief, International Cooperation Section, Environmental Policy Div., MOE, Toyama City
    - In this project, specifically, the introduction of the following three types of equipment will be considered for promoting clean energy in Semarang City.
      (a) Renewable energy (photovoltaic and biomass power generation)
      (b) Energy-saving equipment (high-efficiency chillers and boilers, etc.)
      (c) Switching energy to natural gas (CNG)
    - We are also working on creating an English version of the SDGs city plan leaflet. An image of the leaflet is shown below.



- Bali - Toyama City Project (5 min): Ms. Aki Baba, Environmental Science & Engineering Dept., International Consulting, Nippon Koei Co., Ltd.
  - ✧ Toyama City, an environmental future city, will support Bali in creating a low-carbon and leading tourism city (tourism future city) based on its knowledge and track record on environmental policies and project formation.
  - ✧ Under the city-to-city collaboration between the two cities, Toyama-based companies with excellent low-carbon technologies (energy saving, renewable energy, fuel conversion, etc.) will specifically conduct the following activities to solve Bali's problems.
    (a) Introduction of energy-saving and renewable energy to large-scale tourist facilities such as hotels
    (b) Implementation of JCM project formation by introducing fuel conversion technology in the transportation sector
  - ✧ The implementation system is as follows.



- Jakarta - Kawasaki City Project (5 min): Mr. Takahiro Fukahori, Manager, International Economic Affairs Office, Economic and Labor Affairs Bureau, Kawasaki City
  - The goal of Kawasaki City and Jakarta City is to achieve sustainable green innovation. In order to achieve this goal, the project will specifically implement the following activities.
    (a) JCM equipment project formation (introduction of energy-saving equipment & introduction of renewable energy equipment)
    (b) Exchange of views on SDGs and holding of workshops
  - The implementation system is as follows.



- Rokan Hulu, Riau Province - Kawasaki City Project (5 min): Mr. Takahiro Fukahori, Manager, International Economic Affairs Office, Economic and Labor Affairs Bureau, Kawasaki City
  - The target of Rokan Hulu, Riau Province and Kawasaki City is the realization of a circular economy in the Riau Region - the world's largest palm oil producer.
  - We will consider introducing technology to supply electricity and steam, which are essential for palm oil production, by utilizing the palm empty fruit bunches (EFB) owned by the city-based enterprise group.

- Q&A
  - What are the merits of engaging in city-to-city collaboration in collaboration with multiple local governments?
    - When collaborating with multiple cities, it is possible to make use of the experiences with cities previously collaborated with.
    - If implemented in multiple cities, the possibility of horizontal development of the project can be explored.
- 11:55 Administrative announcement (IGES), End of session

■ **January 16 Afternoon site visit Tokyo, Japan**

Objectives	To promote understanding, including low-carbon technology and operation, through site visits.	
Sites to be visited	Group 1	Group 2
	Shinagawa Incineration Plant (13:30-16:00)	Tokyo Gas - Gas Science Museum What is gas (13:30-16:45)

■ **Photos**

	
Kitakyushu City's presentation at closed seminar	Hai Phong City project presentation at closed seminar
	
Iskandar project presentation at closed seminar	Yangon project presentation at closed seminar

■ January 17 Morning Closed Seminar Program

Closed Seminar: Exchange of views on decarbonized and sustainable city development

Time	Session
09:00-09:10	Orientation IGES Mr. Shiko Hayashi
09:10-10:00	Group A: Cities committing to master plan and energy saving project development ✧ Ho Chi Minh ✧ Quezon ✧ Kuala Lumpur ✧ Semarang ✧ Jakarta
10:00-10:10	Break
10:10-10:50	Group B: Cities promoting low-carbon cities such as industrial parks and smart cities ✧ Hai Phong ✧ MPI ✧ Hlegu (Yangon Region) ✧ Yangon
10:50-11:00	Break
11:00-11:40	Group C: Cities promoting low-carbon cities through improving waste management and introduction of biomass power plants ✧ Can Tho ✧ Sagaing ✧ Ayeyarwady
11:40-11:55	Reflection & Closing remarks MOEJ
11:55-12:00	Administrative announcement (IGES), End of session

- Three framing questions for discussion

1. The benefits of participating in the city-to-city collaboration project
2. Keys for promoting low-carbon, decarbonized and sustainable city development
3. The kind of role local governments should play in realizing a sustainable city and the necessary support

[Group A: Ho Chi Minh, Quezon, Kuala Lumpur, Semarang, Jakarta]

- Regarding Question 1 (The benefits of participating in the city-to-city collaboration project)
  - (Ho Chi Minh) The government will formulate a plan for a low-carbon society and realize low-cost development including PPP. Energy costs for companies will be reduced. It will be the most important capacity building.
  - (Quezon) Collaboration with Osaka City is important in realizing our vision. We concluded an MOU in 2018, and the advantage is that we were able to obtain information on low-carbon technologies. We are grateful that we are able to

learn about the activities of other cities through the exchange of information at conferences.

- (Kuala Lumpur) Our project is being implemented in collaboration with Tokyo. By having Tokyo share its successful and unsuccessful cases, we are able to consider initiatives to achieve the goal of reducing CO2 emissions by 2030. Comprehensive initiatives have been implemented through city-to-city collaboration.
- (Semarang) We have been engaging in city-to-city collaboration since 2017. The direct benefits are the transfer of knowledge and technology. Toyama City is a compact city and we learn a lot from its commitment to sustainable development.
- (Jakarta) The advantage is that we can check the progress of other cities and countries towards becoming low carbon.
- (IGES) We would like to hear KL's case studies and specific examples of comprehensive initiatives.
- (Kuala Lumpur) Usually, low carbon initiatives often focus on specific expertise. On the other hand, collaboration with Tokyo has led to the development of staff capabilities as well as technical topics.

・ Regarding Question 2 (Keys for promoting low-carbon, decarbonized and sustainable city development)

- (Ho Chi Minh) Ho Chi Minh is engaging in several initiatives. It is important to raise the awareness of local governments and private companies.
- (Quezon) It is important for all stakeholders to understand the importance of decarbonization and to implement multi-stakeholder initiatives.
- (Kuala Lumpur) Leadership and commitment are important. Next is the transfer of knowledge and technology.
- (Semarang) Commitment is extremely important. Furthermore, it is important to realize action in pilot projects and present the actual results and benefits to local government heads.
- (Jakarta) Providing stakeholders with incentives is key. In addition to technical and financial incentives, it is important to make it easier to obtain permits from the government.
- (IGES) Regarding multi-stakeholder involvement, what measures are there to encourage involvement?
- (Quezon) We are building relationships by visiting to all stakeholders directly. With regard to the relationship with C40 (Cities Climate Leadership Group), we

are currently having them formulate an action plan (benefits and stakeholder involvement in mitigation, adaptation and environmental policies).

- Regarding question 3 (The kind of role local governments should play in realizing a sustainable city and the necessary support)
  - (Ho Chi Minh) We want to create a stable environment that will enable companies to grow. We will introduce energy saving and renewable energy based on city-to-city collaboration. Financial support for feasibility studies is important. For JCM, it is important to be able to introduce new technologies with equipment subsidy.
  - (Quezon) The government stands at the forefront of mitigating and adapting to climate change. We are formulating an environmental law and creating a framework that can be extended to other local governments. We have created a new department for human resource development, but support, such as the sharing of know-how, is important.
  - (Kuala Lumpur) The role that cities should play is to set an example. If city hall becomes low-carbon first, citizens can use it as a model to imitate at home. We want Japan to share its experiences. In addition, funding is needed.
  - (Semarang) Policy support from the Government is needed. In Indonesia, local government efforts require the support of the central government. G2G discussions are also taking place with Japan. Action is taken at the administrative level. Furthermore, JCM equipment subsidies can also be implemented between private companies, but a wider player approach is required.
  - (IGES) How does Team Osaka's proposal differ from proposals from individual enterprises?
  - (Ho Chi Minh) The proposals are backed up by experience.

[Group B: Hai Phong, Ministry of Planning and Investment of Vietnam, Hlegu (Yangon Region), Yangon]

- Regarding Question 1 (The benefits of participating in the city-to-city collaboration program)
  - (Hai Phong) We are progress from feasibility study to pilot project in collaboration with Kitakyushu City.
  - (Ministry of Planning and Investment of Vietnam) City-to-city collaboration is helping us to realize Vietnam's national strategy of green growth. It is also

contributing to the achievement of SDGs and the development of the environment and society. Due to the similarity of the characteristics of the cities that are collaborating, as we hear of success cases, there is increasing interest in industrial parks and state governments.

- (Hlegu, Yangon Region) Myanmar has great interest in projects that contribute to city development. City-to-city collaboration programs can contribute to the achievement of low-carbon goals and provide an appropriate direction for development. Public and private involvement is required. Project finance is also important.
- (Yangon) We have concluded an MOU with Kawasaki City. It has led to collaboration with energy-saving technology and more. Another advantage is we have been able to exchange information.

・ Regarding Question 2 (Keys for promoting low-carbon, decarbonized and sustainable city development)

- (Hai Phong) Most important of all is to include decarbonization in the master plan for city development. And to also inform the citizens through it. Cooperation with the Government is also important. Confirmation of laws and provision of incentives. Ultimately, the whole of society needs to get involved. It is important to expand to involvement of local governments and citizens and international support. While it was necessary to set development goals in order to make the industrial park eco-friendly, with the support from Kitakyushu City, the management of the industrial park went smoothly.
- (Ministry of Planning and Investment of Vietnam) There are three important points. (a) Strategy and planning at the national level are important. Strategies are also being adopted at the local government level. Policy concerning SDGs is under review. A policy for eco-industrial parks was also formulated in 2019. On the other hand, it cannot be said that the legal framework has been sufficiently developed. Regulations on waste power generation are insufficient. (b) A consistent action plan is important. We want to work with the cooperation of an experienced country. (c) Support from overseas. It is important to obtain technical and financial support from the World Bank, IMF, UNIDO and JICA.
- (Hlegu, Yangon Region) (a) Improvement of the environmental awareness of citizens. Granting educational programs from the time of elementary school. (b) Realizing city-to-city collaboration. (c) Building various finance models.

- Regarding question 3 (The kind of role local governments should play in realizing a sustainable city and the necessary support)
  - (Hai Phong) The key point is that local governments make their own city development plans. In addition, it is important that plans are reviewed. There are proposals from international organizations, and we hope that there are initiatives that will lead to their realization.
  - (Ministry of Planning and Investment of Vietnam) Cities implement solutions for low-carbon societies. Strengthening international cooperation and sharing experiences is very important. Furthermore, dialogue with partner countries is important.
  - (Hlegu, Yangon Region) Building a finance model is important. Most projects are carried out by the private sector, but many of them face financial challenges. Myanmar has also received support from the likes of the ODA and the World Bank, and financial support is of the utmost importance.
  - (Yangon) The sharing of knowledge is important for its role in realizing a low-carbon society. We would like to create a database on air pollution and waste separation.

[Group C: Can Tho]

- Regarding Question 1 (The benefits of participating in the city-to-city collaboration program)
  - (Can Tho) We implemented several initiatives related to GHG reduction, with the cooperation of Japan. We obtained a lot of knowledge through the city-to-city collaboration project. Through the sharing of skills and experiences, participation in training programs, inspections, and tours, we gained the know-how to realize the project.
  - (Sagaing Region) The advantage of participating in a city-to-city collaboration project is that it can raise awareness of low-carbon societies, and that the framework can be deployed horizontally in other areas.
  - (Ayeyarwady Region) The advantage of participating in a city-to-city collaboration project is that we can obtain many opportunities from the program. We can learn about sustainable development with low carbon technologies, infrastructure and mitigation measures.

- Regarding Question 2 (Keys for promoting low-carbon, decarbonized and sustainable city development)
  - (Can Tho) Multi-stakeholder participation is a major premise. Municipal government leadership, consensus with the local community, and the coordination of local and central governments are important. In addition, it is necessary to secure a budget for technology introduction. As for international cooperation, we want you to share your success stories.
  - (Sagaing Region) Systematic planning and the establishment of a circular economy are important. Cooperation between government and citizens is important.
  - (Ayeyarwady Region) For decarbonization and sustainable city development, dialogue and projects with companies for low-carbon initiatives are required.

- Regarding question 3 (The kind of role local governments should play in realizing a sustainable city and the necessary support)
  - (Can Tho) It is important to realize the plans of the municipal government. It is important for the city to coordinate for the participation of multi-stakeholders. Financial support is necessary.
  - (Sagaing Region) It is important to formulate a waste-management policy.
  - (Ayeyarwady Region) It is important that cities strengthen their partnerships. Frameworks such as PPP is also important.

- Comments from Ms. Yamamoto of the MOE
  - Thank you all for your cooperation, including your stories about zero carbon cities.
  - I realize that there is no single solution, and you are each working on a variety of initiatives. I understand that everyone is advancing their initiative with an awareness of being a leader.
  - There were many mentions of finance. I myself felt that there was a financing problem when I participated in COP25, so I want to work to resolve it.
  - I understand that there is a need for mutual understanding of city-to-city collaboration. In addition to this event, we are holding medium-sized seminars and workshops. Last year there was a move to newly adopt Hiroshima Prefecture through a workshop. Next month, a seminar will also be held in Yokkaichi City, Mie Prefecture. New cities will be prioritized; however, I would like you to raise your hands.

■ January 17 Afternoon Open Seminar Program

Time	Session
14:00-14:10	Opening remarks Tomohiro Kondo Director General, Global Environment Bureau, MOEJ
14:10-14:30	Recent development of intl. env. cooperation Ryuzo Sugimoto Director, International Cooperation and Sustainable Infrastructure Office, MOEJ
14:30-14:50	Recent development of intl. urban development cooperation Masahiro Ito Director, International Affairs Office, City Bureau, MLIT
14:50-15:10	Actions for realizing the Thailand 4.0 Muk Sibunruang Executive Director, Investment Strategy and Promotion Division, Eastern Economic Corridor (EEC) Office of Thailand
15:10-15:30	Break
15:30-17:00	Panel discussion on matching for intercity collaboration & project development Panelists: Ryuzo Sugimoto Director, International Cooperation and Sustainable Infrastructure Office, MOEJ Masahiro Ito Director, International Affairs Office, City Bureau, MLIT Muk Sibunruang Executive Director, Investment Strategy and Promotion Division, EEC Office of Thailand Makoto Mihara Manager for International Cooperation, Environmental Policy Division, Environment Bureau, City of Osaka Melchor Quitain City Councilor of Davao City, the Philippines Norfiza Bashfari Vice President, People Management, Iskandar Regional Development Authority (IRDA) Emiko Murakami Director of Business Promotion, Kitakyushu Asian Center for Low Carbon Society, City of Kitakyushu Facilitator: Hideyuki Mori Executive Director, IGES Q&A using interactive tool "Sli.do" Closing Remarks

- 14:00 Opening remarks from organizer, Mr. Tomohiro Kondo, Director General, Global Environment Bureau, MOE
  - The Paris Agreement has started. Municipal and local governments are key players, as efforts lead by non-governmental organizations, including local governments, are encouraged. City-to-city collaboration is very important. This year, 17 projects were adopted.
  - With regard to the latest trends in decarbonization in Japan, typhoons and floods damaged the country in 2019. Nagano Prefecture was one of the worst affected areas, but Nagano Prefecture has formulated its plans having been affected by climate change. With regard to CO2 emission reduction, 33 local governments have stated that they are aiming to have net zero emissions.
  - As for future international development, a forum is scheduled to be held, for sharing and communicating zero carbon city declarations, gathering together the heads of cities advocating reduction of CO2 emissions in Japan and overseas. The targets will be higher than ever before, so a more proactive commitment will be required. We have established various menus, such as creating scenarios using AI and financial support utilizing JCM, so please make use of them.

- 14:10 Domestic and overseas moves to build a zero-carbon society
  - Latest trends in environmental infrastructure export strategies
    Mr. Ryuzo Sugimoto Director, International Cooperation / Environmental Infrastructure Office, Global Environment Bureau, International Strategy Division, MOE
    - Japan's initiatives are being disseminated at COP25.
    - 32 local governments in 10 countries are involved in city-to-city collaboration projects.
    - At COP25, the minister actively discussed the matter of Article 6 of the Paris Agreement. Although no agreement was reached, a course was set for an agreement at COP26.
    - Introduction of JCM success stories.
      - Transformer introduction project in Vietnam and Laos: Initially it was introduced only in Vietnam, but has been extended to Laos with the cooperation of manufacturers.
      - The project to introduce LED street lights in Siem Reap, Thailand, and Phnom Penh, Cambodia, and the project to introduce high-efficiency water

pumps in Danang, Vietnam, got started because there were subsidies available, but they are cases where the benefits were understood, and their introduction advanced on a business basis.

- With the renewable energy project in the Philippines, the region was able to benefit from energy costs no longer flowing out of the region.

- Latest trends in city infrastructure export strategies

  Mr. Masahiro Ito, Director, International Affairs Office, City Bureau, MLIT

  - With regard to the Japanese and overseas markets, the Japanese market is shrinking due to population decline. On the other hand, markets outside Japan (Asia region) are expected to expand.
  - Japan's advantage is smart cities (Initiatives across multiple fields, such as environment, energy, transportation, medical and health). Transit-oriented development (TOD), such as "Kashiwanoha" along the Tsukuba Express line, is important. It also contributes to achieving SDGs.
  - The "Japan-ASEAN Smart City Network High-Level Meeting" was held to expand the opportunity for case introductions to ASEAN. A public-private conference has been established.
  - JASCA was established, and a system for building smart cities in the ASEAN region was created. Of the 21 JOIN-funded projects, nine were related to city development. We are examining ways to support energy, water supply, data analysis, and other items that are associated with urban development in the future. We are also working to be able to assist smaller-scale development projects.
  - Outside Japan, we have begun to pay attention to collaboration between local governments.

- Actions for realizing Thailand 4.0

  Ms. Muk Sibunruang, Executive Director, Investment Strategy and Promotion Division, EEC Office of Thailand

- The EEC includes the Chachoengsao, Chon Buri and Rayong provinces.
- The expressway from Bangkok to Rayong will be extended. Laem Chabang Port and Map Ta Phut Port will be updated. In addition to these infrastructure improvements, we will finance investments in specific industries. We will start with an investment of THB 1.7 trillion in areas such as tourism, medical service provision and demand-driven education.

- 15:30 Panel discussion on matching for city-to-city collaboration & project formulation

[How to build relationships of trust between cities]

- (Osaka) City-to-city collaboration projects also involve human relationships, and stakeholder collaboration and communication are important. The decision-makers of the other party are often quite senior, and movements may need to span long periods. It is important to build trust by taking into account the circumstances regarding that point.
- (Kitakyushu) In addition to going to the field surveys, we also used JICA's invitation project to have them visit Kitakyushu City and they gained experience and we deepened mutual understanding. It is important to note that the month in which the fiscal year starts and ends varies from country to country.

[Collaboration with private companies]

- (Osaka) The cooperation of private companies is essential. Local governments provide policy support, and this includes examples of businesses that are reducing CO2 emissions. We do various searches for companies that have solutions and carry out matching. It is important to make a master plan from the upstream and take a bottom-down approach.
- (Kitakyushu) Kitakyushu City matches small and medium-sized enterprises in the city with companies that have seeds. IRDA (Iskandar Regional Development Agency) in Malaysia and Hai Phong City in Vietnam have been working from upstream. The LED introduction project in Davao, Philippines, has also progressed from the top down.

[Expectations for city-to-city collaboration projects]

- (Thai EEC) More than 50% of the EEC has been developed by Japanese investment. We learn a lot about foreign direct investment, especially with regard to transport infrastructure. If we can make a successful case of the EEC, we would like to expand further.
- (Malaysia IRDA) We are very pleased to be working with Japan. IRDA is promoting initiatives such as the Eco-Life Challenge, in collaboration with Toyama, for micro-hydroelectric power generation, and Kyoto and Tokyo. While there are differences in language, we do not feel that it is an obstacle. We collaborate with Japan with mutual respect. In addition to providing us a package

of support, from feasibility studies to actual project implementation, they also carrying out capacity building. The fact that there are models that have been proven in Japan has led to the motivation that IRDA can do the same.

[How private companies can participate]

- (Osaka) Team Osaka has exceeded 100 members. We currently, exchange information through issuing newsletters and holding meetings and international conferences.
- (Kitakyushu) Basically, we are advancing projects together with local companies in the city. Businesses that wish to collaborate with us in the future should set up a branch office in Kitakyushu City. The city also has its own subsidy system for small and medium-sized enterprises. Activities in collaboration with the city have also served as PR for companies to secure human resources.

[Areas we want local governments to work on]

- (MOE) We feel that the trends have changed from seven years ago when JCM first started. We feel that the Paris Agreement in 2015 and the formulation of the SDGs marked a major turning point, but we also feel that the roles and effects of local governments and cities have clearly expanded. SDGs have been localized and, the goal of sustainability has been set in all cities. We would like them to start with communication between people, then move on to the transfer of systems and plans and the realization of projects. We feel that the significance of city-to-city collaboration lies in planning and creating ongoing, sustainable projects.

[Comment from MLIT]

- There are two points. The first is that, with regard to decarbonization, many contributions can be made if it can be tied to city development. Since licensing in the partner country is a particular bottleneck in the project, we hope that Japan local governments can cooperate to solve the problem. The second is that, there is an expectation that cooperation from the upstream process of city development and the creation of a master plan is possible. We believe that know-how regarding the creation of smart cities based on Japan's high dependency on public transportation can contribute internationally.

[What do you think about the package projects? Expectations for Japanese companies]

- (Malaysia IRDA) It is important to look at all areas in a similar way. We believe that having a master plan for the IRDA as a whole will accelerate achievement of goals towards zero carbon.
- (Thai EEC) The biggest goal is to attract companies. If we can also able to decarbonize it would be extremely good. There are also plans for smart cities in the EEC. We also hope for education that will deepen the understanding of Industry 4.0. Furthermore, since agriculture is thriving in Rayong Province, there could be potential in the agricultural field and in biomass utilization.

[Comment from the MOE]

- (MOE) Given the longevity of urban infrastructure, the infrastructure we will invest in from now will be in use in 2050. We think that it is important to incorporate those value that can be demonstrated even in such a case. We should question whether technology is moving towards decarbonization or becoming a debt for the future, and help steer it in the direction of decarbonization and provide support for investment. We also feel the importance of networking. When matching needs with seeds, we think that it is better to connect many-to-many rather than one-to-one.

[Characteristics of Japanese companies overseas entities would like to collaborate with]

- (Thai EEC) Is it a business operator with the technology targeted by the Thai side? People are also important.
- (Malaysia IRDA) Whether or not it is fit for business purposes is important.

[Difference in sense of speed between local governments]

- (Osaka) It appears that Japan is said to be slower moving, but I believe it is important to maintain close communication and achieve tangible results.
- (Kitakyushu) In our case, we are pushing the other side to keep up. I hope we can collaborate well.

[The key to project success]

- (Malaysia IRDA) All members involved in the project are enthusiastic.

Appendix_a_kickoffmtg

環境省　地球環境局
国際連携課　国際協力・環境インフラ戦略室　御中

NTT DATA
Trusted Global Innovator

令和元年度　低炭素社会実現のための都市間連携事業委託業務
イスカンダル地域における低炭素化促進事業
（北九州市ーイスカンダル開発地域連携事業）
キックオフミーティング資料

2019年8月19日
NTTデータ経営研究所
社会環境戦略コンサルティングユニット

目次

NTT DATA

1. 事業概要
1.1. 都市間連携の概要と本年度の目標（提案資料より抜粋）

目指している低炭素社会の姿：2010年を基準としてGHGsを2025年までに58%削減を達成

- イスカンダル・マレーシアはジョホール南部の主要回廊地域に位置し、面積2217km²、人口約1.95百万人のマレーシア第二の経済都市である。北九州市はイスカンダル地域開発庁（IRDA）と連携し2015年、2016年の都市間連携事業などを連携関係を構築してきた。
- IRDAは国際研究チームの協力をえて、2012年に「低炭素社会ブループリント」を策定しており、同計画には、目標達成のために3つのテーマと12の活動が定められており、これまで45件のプログラムを展開する活動が実施されている。
- 今後の活動として、政権交代（2018年）の影響を踏まえるとともに、目標達成を見据えた現実的なアクションプランの策定が必要である。また、実現に至っていないプロジェクトも調査対象とすることで、早期のJCM適用プロジェクト発掘につなげることを目指す。

2014年 低炭素社会のノウハウ共有
- 日本企業が有する低炭素技術の紹介
- JCMの紹介　等

2015年 アジアの低炭素社会実現のためのJCM案件形成可能性調査事業委託業務
- 平成27年度「イスカンダル地域における低炭素化プロジェクトの面的拡大のための基盤構築調査事業（北九州市―ジョホール市連携事業）」

2016年低炭素社会実現のための都市間連携に基づくJCM案件形成可能性調査事業
- 平成28年度「JCM推進に向けたイスカンダル・モデルプロジェクト推進事業（北九州市－IRDA連携事業）」

北九州市 ⇔ 協力関係 LOU ⇔ IRDA（イスカンダル地域開発庁）

蓄積したノウハウの提供

令和元年度低炭素社会実現のための都市間連携事業委託業務

活動1 策定済みの低炭素社会ブループリントを踏まえたアクションプランの検討

北九州市が有する計画策定から個別の具体的な取組みまでをマスタープラン的な形で取りまとめるノウハウを活用し、既存の低炭素社会ブループリントをベースとしたアクションプランの策定を実施する。

活動2 2015、2016年度に実施した調査のフォローアップ調査

2015、2016年度に実施した都市間連携調査のフォローアップ活動を実施する。具体的には、以下の候補案件のフォローアップ調査を実施し、1~2年間で最低1件を事業化し、類似案件の横展開を目指す。

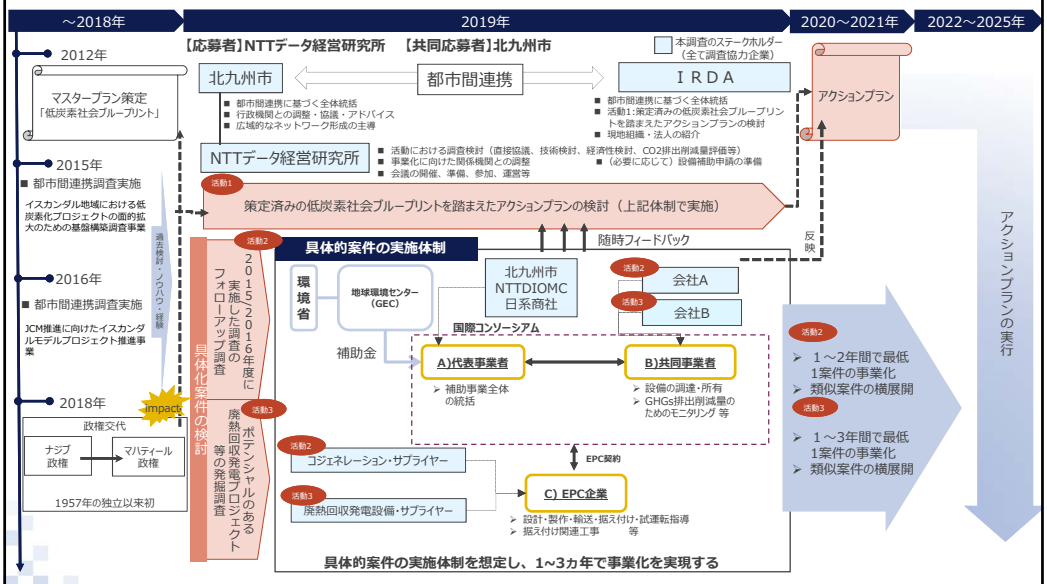
- 候補案件1:マレーシアの工業団地に進出している会社Aにおけるコジェネレーション導入
- 候補案件2:工業用冷蔵倉庫のチラーの高効率化と遮熱効果も期待した屋根置き太陽光発電設備の設置

活動3 ポテンシャルのある廃熱回収発電プロジェクト等の発掘調査

2016年度に実施した都市間連携調査等でポテンシャルがあることを確認している以下の候補案件の調査を実施する。1~3年間で最低1件を事業化し、類似案件の横展開を目指す。

- 候補案件1:セメント工場への廃熱回収発電システムの導入
- 候補案件2:廃棄物処分場からのランドフィルガス回収発電事業

1. 事業概要
1.2. PJ全体像　体制図（提案資料より抜粋）



2. 想定しているプロジェクト概要
2.0.【ご参考】全体像

想定している活動内容は以下の3点。アクションプランの検討支援、2015、2016年度に実施した調査のフォローアップ調査及びポテンシャルPJの発掘調査を実施予定。

活動全体像（事業概要より抜粋、再掲）

活動1
策定済みの低炭素社会ブループリントを踏まえたアクションプランの検討

- 北九州市が有する計画策定から個別の具体的な取組みまでをマスタープラン的な形で取りまとめるノウハウを活用し、既存の低炭素社会ブループリントをベースとしたアクションプランの策定を実施する。

活動2
2015、2016年度に実施した調査のフォローアップ調査

- 2015、2016年度に実施した都市間連携調査のフォローアップ活動を実施する。具体的には、以下の候補案件のフォローアップ調査を実施し、1~2年間で最低1件を事業化し、類似案件の横展開を目指す。
  - 候補案件1:マレーシアの工業団地に進出している会社Aにおけるコジェネレーション導入
  - 候補案件2:工業用冷蔵倉庫のチラーの高効率化と遮熱効果も期待した屋根置き太陽光発電設備の設置

活動3
ポテンシャルのある廃熱回収発電プロジェクト等の発掘調査

- 2016年度に実施した都市間連携調査等でポテンシャルがあることを確認している以下の候補案件の調査を実施する。1~3年間で最低1件を事業化し、類似案件の横展開を目指す。
  - 候補案件1:セメント工場への廃熱回収発電システムの導入
  - 候補案件2:廃棄物処分場からのランドフィルガス回収発電事業

2. 想定しているプロジェクト概要
2.1. 活動1:策定済みの低炭素社会ブループリントを踏まえたアクションプランの検討～概要～

プロジェクトの概要

北九州市のノウハウ（計画策定から個別の具体的な取組みまでをマスタープラン的な形で取りまとめ）を活用し、既存の低炭素社会ブループリントをベースとしたアクションプランを策定支援を実施

	現状調査	アクションプラン ドラフト作成	アクションプラン ドラフトブラッシュアップ
実施内容	• 机上調査やヒアリングを通して低炭素社会ブループリント策定後の現状調査を実施 • 現在のブループリントは前政権時代に策定されたものであるため、政権交代後の影響等をポイントにIRDA政府とヒアリング実施予定	• IRDA政府とのディスカッションをふまえ、既存の低炭素社会ブループリントをベースとしたIRDAのアクションプランドラフトを作成予定 • 北九州市が有する「計画策定から個別の具体的な取組みまでをマスタープラン的な形で取りまとめるノウハウ」を活用	• 複数回のディスカッションを実施し、作成したアクションプランのドラフトをブラッシュアップする想定 • 同時並行で実施される活動2、3で発掘予定の案件をアクションプラン内に組み込む想定
アウトプット	現状の状況取り纏め	アクションプランドラフトVer.1	アクションプランドラフトVer.n

2. 想定しているプロジェクト概要
2.1. 活動1:策定済みの低炭素社会ブループリントを踏まえたアクションプランの検討～体制～

■「計画策定から個別の具体的な取組みまでをマスタープラン的な形で取りまとめるノウハウ」の提供
■ アクションプランドラフト作成

■ 必要情報、資料等の提供
■ ヒアリングやディスカッションにおける意見提供

北九州市 ⟷ **都市間連携** ⟷ **IRDA**

■ 都市間連携に基づく全体統括
■ 行政機関との調整・協議・アドバイス
■ 現地組織・法人の紹介

NTTデータ経営研究所

■ 活動における調査検討(直接協議等)
■ アクションプランドラフト作成支援
■ 関係機関との調整
■ 会議の開催、準備、参加、運営等

2. 想定しているプロジェクト概要
2.1. 活動1:策定済みの低炭素社会ブループリントを踏まえたアクションプランの検討～課題～

課題一覧

No.	調査で解決したい課題	獲得目標(いつまでに)	担当	相手方	調査の内容
1	IRDAとの直接協議	IRDAと低炭素ブループリント策定後の現状やニーズ、意向等をヒアリング。(9月まで)	NTT、北九州市	IRDA	IRDA側に連絡を取り、現在の状況をヒアリングし、アクションプランドラフト作成支援における意向を確認する。
2	アクションプランドラフトに関する意見交換	IRDAとアクションプランドラフトを基に意見交換。(11月まで)	NTT、北九州市	IRDA	IRDA側とアクションプランドラフトに関して、現状の情勢やニーズ、意向等をディスカッションする。
3	アクションプランドラフトの作成、アップデート	IRDAとの意見交換を基にドラフトを作成、アップデートを実施(2月まで)	NTT、北九州市	IRDA	IRDA側と意見交換を基にアクションプランドラフトをアップデートする。

2. 想定しているプロジェクト概要
2.2. 活動2:2015、2016年度に実施した調査のフォローアップ調査～概要～

プロジェクトの概要、および、導入を想定している技術

2015、2016年度に実施した実施した都市間連携調査のフォローアップ活動を主に以下2点を中心に実施する。前回の調査より時間が経過しているため、まずは現状のニーズ調査から改めて実施が必要。

1 マレーシアの工業団地に進出している会社Aにおけるコジェネレーション導入

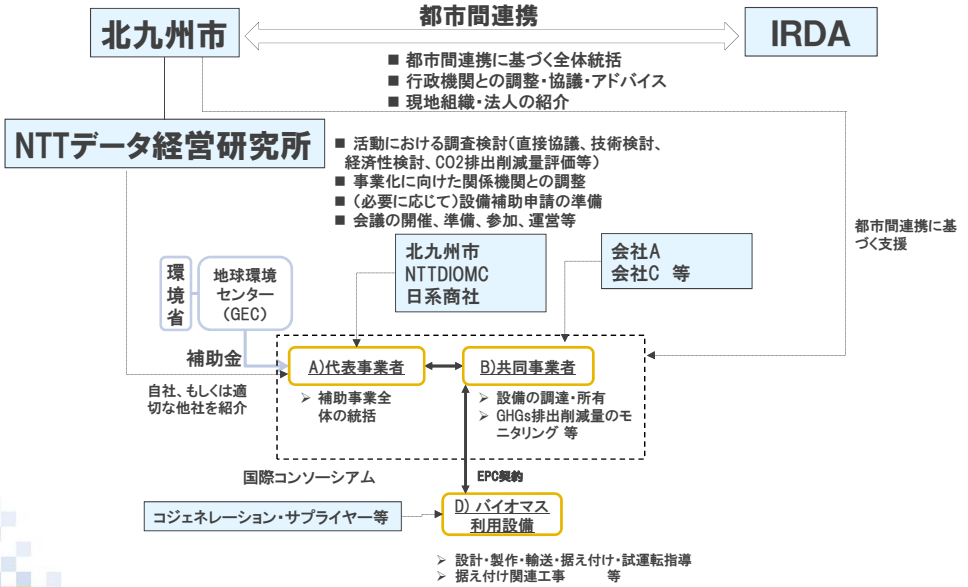
- 過去にマレーシアの工業団地に進出している会社Aにおけるコジェネレーション導入調査を実施済み
- 今回の検討では、最新の電力価格やガス価格の動向を把握するとともに、導入企業の投資予定等を把握し、早期のコジェネレーションシステムの導入を実現することを目指したい

2 工業用冷蔵倉庫のチラーの高効率化と遮熱効果も期待した屋根置き太陽光発電設備の設置

- 過去に工業用冷蔵倉庫のチラーの高効率化と遮熱効果も期待した屋根置き太陽光発電設備の設置調査を実施済み
- 現状新たなニーズとして、バイオマスボイラー、省エネ空調設備の導入等も視野にいれているとの情報も入手しているため、改めて現状のニーズの深堀調査から開始予定。

- 1～2年間で最低限1件の事業化を目指す
- 1～2年間で事業化案件を実現した後は、その成果をアピールすることにより、類似案件の横展開を図る

2. 想定しているプロジェクト概要
2.2.活動2:2015、2016年度に実施した調査のフォローアップ調査～体制～



2. 想定しているプロジェクト概要
2.2.活動2:2015、2016年度に実施した調査のフォローアップ調査～課題～

課題一覧

No.	調査で解決したい課題	獲得目標(いつまでに)	担当	相手方	調査の内容
1	現地企業との直接協議	JCM事業実施の候補となる企業に連絡を取り、JCM案件形成の可能性調査の継続の合意を図る。(8月まで)	NTT	現地企業	会社Aや会社B等に連絡を取り、JCM制度を改めて説明し、JCM事業参画への意思を確認する。
2	最新ニーズに基づいたコジェネシステム等の検討	要求仕様をもとに、ベンダー等と機器検討をする。(11月まで)	NTT、現地企業	ベンダー等	最新ニーズを基に検討した機器仕様をベースに、ベンダー等に仕様を満たす機器のスペックを確認する。
3	設備導入にかかる経済性検討	設備導入による省エネに伴い、投資回収期間等の条件が許容範囲であることを確認する(2月まで)	NTT	現地企業、ベンダー等	ベンダー等から得た見積もりおよび性能をもとに、投資回収期間の算定を行う。
4	CO2削減効果算出方法、モニタリング方法に関する検討	設備導入によるCO2排出削減量の算出を行う(2月まで)	NTT	ベンダー等	ベンダー等から得た性能と、既存の承認済みMRV 方法論をもとに、CO2排出削減量の計算を行う。
5	現地制度などの確認	案件化に影響を及ぼす現地制度等の有無の確認 (2月まで)	NTT、北九州市	IRDA側	案件化に影響を及ぼす現地法制度等があるかどうか、IRDA側と確認する。

2. 想定しているプロジェクト概要
2.3. 活動3:ポテンシャルのある廃熱回収発電プロジェクト等の発掘調査～概要～

プロジェクトの概要、および、導入を想定している技術

2016年度に実施した都市間連携調査等でポテンシャルがあることを確認している以下2点の事業を中心に調査予定。以下2点以外に、化学工場やスプリング製造工場等のアポイントメントも獲得済。新たな可能性のある新規プロジェクトの発掘検討を実施。

1 セメント工場への廃熱回収発電システムの導入

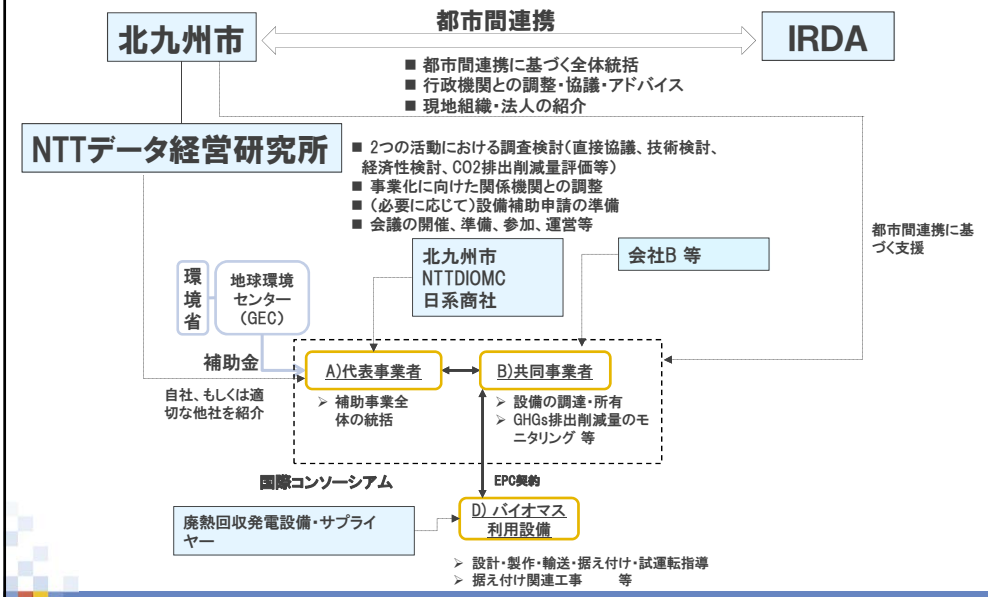
- ◆ 会社Bが2018年後半にBOOT型廃熱回収発電システムで指名入札したものの、経済的メリットを提示できる企業が存在しなかったことから、事業そのものが延期との情報あり。

2 廃棄物処分場からのランドフィルガス回収発電事業

- ◆ マレーシアの最終処分場ではランドフィルガスの回収発電事業がCDM事業として行われている例あり。
- ◆ これらの処分場では余剰のランドフィルガスが発生しており、さらに回収発電を行う余地があると想定。

- 1～3年間で最低限1件の事業化を目指す
- 1～3年間で事業化案件を実現した後は、その成果をアピールすることにより、類似案件の横展開を図る

2. 想定しているプロジェクト概要
2.3. 活動3:ポテンシャルのある廃熱回収発電プロジェクト等の発掘調査～体制～



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2. 想定しているプロジェクト概要
2.3. 活動3:ポテンシャルのある廃熱回収発電プロジェクト等の発掘調査～課題～

課題一覧

No.0	調査で解決したい課題	獲得目標(いつまでに)	担当	相手方	調査の内容
1	ポテンシャルのある民間企業との直接協議(新規開拓)	JCM事業実施の候補となる企業に連絡を取り、JCM案件紹介及びニーズを探る。イスカンダル地域のみではなく、KL地域における企業へも直接協議を実施(10月まで)	NTT	現地企業	ポテンシャルのある民間企業に連絡を取り、JCM制度を説明し、JCM事業参画への意思を確認する。
2	関心を踏まえた技術・システム検討	要求仕様をもとに、ベンダー等と機器検討をする。(12月まで)	NTT、現地企業	ベンダー等	ニーズを基に検討した機器仕様をベースに、ベンダー等に仕様を満たす機器のスペックを確認する。
3	設備導入にかかる経済性検討	設備導入による省エネに伴い、投資回収期間等の条件が許容範囲であることを確認する(2月まで)	NTT	現地企業、ベンダー等	ベンダー等から得た見積もりおよび性能をもとに、投資回収期間の算定を行う
4	CO2削減効果算出方法、モニタリング方法に関する検討	設備導入によるCO2排出削減量の算出を行う(2月まで)	NTT	ベンダー等	ベンダー等から得た性能と、既存の承認済みMRV 方法論をもとに、CO2排出削減量の計算を行う。
5	現地制度などの確認	案件化に影響を及ぼす現地制度等の有無の確認 (2月まで)	NTT、北九州市	IRDA側	案件化に影響を及ぼす現地法制度等があるかどうか、IRDA側と確認する。

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3. スケジュール
3.1. 年間スケジュール

年間のスケジュールは以下の通り。契約遅延につき、現地渡航を3回ほどにさせていただきたい。

活動項目	2019年						2020 年	
	7月	8月	9月	10月	11月	12月	1月	2月
活動1：策定済みの低炭素社会ブループリントを踏まえたアクションプランの検討		☆現地キックオフ →	IRDAキックオフ →	アクションプランドラフトに関する意見交換 →		アクションプランドラフト作成 →		
活動2：2015、2016年度に実施した調査のフォローアップ調査		☆現地キックオフ → ニーズを有する日系企業等との協議		最新ニーズに基づいたコジェネシステム等の検討 →			経済性検討およびCO2削減効果検討 →	
活動3：ポテンシャルのある廃熱回収発電プロジェクト等の発掘調査		☆現地キックオフ → ポテンシャルのある民間企業との直接協議、JCMの紹介・関心把握 →			関心を踏まえた技術システム検討 →		経済性検討およびCO2削減効果検討 →	
○ 現地調査		●		●		●		
○ 環境省との打ち合わせ		●キックオフ		●中間報告会			●最終報告会	
○ 報告書の作成		●契約						●最終版

3. スケジュール
3.2. 3ヵ年計画

～2018年	2019～2021年(3ヵ年)	2022～2025年
■ 都市間連携調査実施（2015年&2016年）		■ アクションプランの遂行 ■ 発掘案件の横展開

活動計画	2019年度(1カ年目：本事業)				2020年（2カ年目）	2021年（3カ年目）
	4～6月	7～9月	10～12月	1～3月		
活動1：策定済みの低炭素社会ブループリントを踏まえたアクションプランの検討		☆現地キックオフ → アクションプラン草案に関する意見交換 → IRDAキックオフ	アクションプランドラフト作成 → 具体案件の反映	アクションプランドラフトブラッシュアップ →	アクションプラン遂行・ブラッシュアップ →	
活動2：2015、2016年度に実施した調査のフォローアップ調査		☆現地キックオフ → ニーズを有する日系企業等とのコジェネシステム等の検討	最新ニーズに基づいた協議 →	経済性検討およびCO2削減効果検討 →	JCM設備補助事業への応募支援 → ●応募	●応募 → 類似事業の横展開活動 →
					（※設備補助事業への応募は前後する可能性あり）	
活動3：ポテンシャルのある廃熱回収発電プロジェクト等の発掘調査		☆現地キックオフ → ポテンシャルのある民間企業との直接協議 JCMの紹介・関心把握	関心を踏まえた技術・システム検討 →	経済性検討およびCO2削減効果検討 →	JCM設備補助事業への応募支援 → ●応募	類似事業の横展開活動 →
					（※設備補助事業への応募は前後する可能性あり）	
現地調査		☆	☆	☆		
報告書の作成 御省との打合せ		●契約 → ●キックオフ	月次報告 → ●中間打合せ	●報告書提出 ●最終打合せ	（※打合せは、必要に応じて追加）	

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月次報告書(令和元年７月)

業　務　名	令和元年度低炭素社会実現のための都市間連携事業委託業務 （イスカンダル地域における低炭素化促進事業(北九州市－イスカンダル開発地域連携事業)
受　託　者	株式会社　NTTデータ経営研究所　(共同事業者　北九州市)
期　　間	令和元年7月23日(火)～令和元年7月31日（水)

【実績概要】

① 第1回現地調査を8月に実施予定。出張にむけて、訪問先とのアポイント調整、通訳手配等を実施した。

② 環境省様とのキックオフミーティングを8月に開催予定。キックオフミーティングに向けて、関係者打ち合わせならびに資料の準備

【打合せ・現地渡航等】

① 第1回現地調査を8月19日の週で調整中。

② 環境省様キックオフ会を8月19日に実施予定。

以上

月次報告書(令和元年 8 月)

業　務　名	令和元年度低炭素社会実現のための都市間連携事業委託業務 （イスカンダル地域における低炭素化促進事業(北九州市－イスカンダル開発地域連携事業)
受　託　者	株式会社　NTTデータ経営研究所　（共同事業者　北九州市）
期　　間	令和元年8月1日（木)～令和元年8月30日（金)

【実績概要】

① 環境省様とのキックオフミーティングを8月19日に開催。キックオフミーティング用の資料を作成の上、本PJの概要やスケジュール、目標に関して共有した。

② 第1回現地調査を8月19日～8月23日に実施。IRDAとのキックオフミーティング、および案件発掘のために民間企業約10社様とのミーティングを実施した。

【打合せ・現地渡航等】

① 第1回現地調査を8月19日～8月23日で実施。

② 環境省様キックオフ会を8月19日に実施。

以上

月次報告書(令和元年 9 月)

業　務　名	令和元年度低炭素社会実現のための都市間連携事業委託業務 （イスカンダル地域における低炭素化促進事業(北九州市－イスカンダル開発地域連携事業)
受　託　者	株式会社　NTTデータ経営研究所　（共同事業者　北九州市）
期　　間	令和元年9月2日（月)～令和元年9月30日（月）

【実績概要】

① 第2回現地調査を9月17日～9月20日に実施。IRDAとアクションプランに関するディスカッションを実施、および案件発掘のために民間企業約3社様とのミーティングを実施した。うち民間企業1社に関しては、ポテンシャルサプライヤーを北九州市より同行いただき、具体的な設備導入に向けてディスカッションを実施した。

② 9月19日にマレーシアセメント協会にて、JCMに関するワークショップを実施した。ワークショップ後、複数社からJCMにお問い合わせを頂いた。

【打合せ・現地渡航等】

① 第2回現地調査を9月17日～9月20日で実施。

② 9月19日にマレーシアセメント協会にてJCMに関するワークショップを開催

以上

月次報告書(令和元年 10 月)

業　務　名	令和元年度低炭素社会実現のための都市間連携事業委託業務 （イスカンダル地域における低炭素化促進事業(北九州市－イスカンダル開発地域連携事業)
受　託　者	株式会社　NTTデータ経営研究所　(共同事業者　北九州市)
期　　間	令和元年10月2日（水)～令和元年10月31日（木)

【実績概要】

① 第1回、第2回の現地調査の現地調査結果を纏めた。また、現地調査の結果を踏まて、アクションプランの検討および案件発掘のための深堀検討を実施した。

【打合せ・現地渡航等】

① 次回現地調査を調整中

月次報告書(令和元年 11 月)

業　務　名	令和元年度低炭素社会実現のための都市間連携事業委託業務 （イスカンダル地域における低炭素化促進事業(北九州市－イスカンダル開発地域連携事業)
受　託　者	株式会社　NTTデータ経営研究所　(共同事業者　北九州市)
期　　間	令和元年11月1日（金)～令和元年11月29日（金)

【実績概要】

① 第1回、第2回の現地調査の現地調査結果を纏めた。また、現地調査の結果を踏まて、アクションプランの検討および案件発掘のための深堀検討を実施した。

② 環境省様との進捗報告用の資料作成を実施した。

【打合せ・現地渡航等】

① 次回現地調査を調整中

月次報告書(令和元年 12 月)

業　務　名	令和元年度低炭素社会実現のための都市間連携事業委託業務 （イスカンダル地域における低炭素化促進事業(北九州市－イスカンダル開発地域連携事業)
受　託　者	株式会社　NTTデータ経営研究所　（共同事業者　北九州市）
期　　間	令和元年12月2日（月)～令和元年12月27日（金)

【実績概要】

① 環境省様との進捗報告会を12月24日に開催。第1回及び第2回の現地調査の結果を踏まえた進捗報告を実施した。

② 第3回現地調査を2月に実施予定。出張にむけて、訪問先とのアポイント調整を実施した。

③ 12月17日に環境省様の清算業務説明会に参加

【打合せ・現地渡航等】

① 環境省様進捗報告会を 12 月 24 日に実施。

② 12 月 17 日に環境省様の清算業務説明会に参加

③ 第3回現地調査を2月に調整中

月次報告書(令和２年１月)

業　務　名	令和元年度低炭素社会実現のための都市間連携事業委託業務 （イスカンダル地域における低炭素化促進事業(北九州市－イスカンダル開発地域連携事業)
受　託　者	株式会社　NTTデータ経営研究所　（共同事業者　北九州市）
期　　間	令和2年1月6日（月)～令和2年1月31日（金)

【実績概要】

① 第3回現地調査を2月12日～2月15日に実施予定。出張にむけて、訪問先とのアポイント調整、車の手配を実施した。

② IRDAとのディスカッションに向けて、アクションプラン（ドラフト）及びWBSの作成を実施した。

【打合せ・現地渡航等】

① 第3回現地調査を2月12日～2月15日に調整中

② 現地日系企業の団体「二金会」にてJCMワークショップの開催を2月14日に調整中

月次報告書(令和２年２月)

業　務　名	令和元年度低炭素社会実現のための都市間連携事業委託業務 （イスカンダル地域における低炭素化促進事業(北九州市－イスカンダル開発地域連携事業)
受　託　者	株式会社　NTTデータ経営研究所　（共同事業者　北九州市）
期　　間	令和2年2月3日（月)～令和2年2月28日（金)

【実績概要】

① 第3回現地調査を2月12日～2月15日に実施。IRDAとアクションプラン（ドラフト）に関してディスカッションを実施、および民間企業とJCM申請に向けて深堀検討を実施した。

② 現地日系企業の団体「二金会」にてJCMワークショップの開催を2月14日に実施した。約15社の日系企業様が参加した。

③ 最終報告書の作成及び報告を実施した。

【打合せ・現地渡航等】

① 第3回現地調査を2月12日～2月15日に実施

② 現地日系企業の団体「二金会」にてJCMワークショップの開催を2月14日に実施

③ 環境省様と最終報告会を2月28日に実施

Appendix_c_Kitakyushu Eco-town

北九州市の環境産業推進政策
《北九州エコタウン事業》


＜ｴｺﾀｳﾝｾﾝﾀｰ＞


＜実証研究ｴﾘｱ＞


＜総合環境ｺﾝﾋﾞﾅｰﾄ＞


＜西日本ﾍﾟｯﾄﾎﾞﾄﾙﾘｻｲｸﾙ㈱＞
※ｴｺﾀｳﾝ企業

北九州市 環境局 環境国際経済部

アジア低炭素化センター

アジアに近く自然豊かなものづくりの街

人口：940,978人(2019年6月)
面積：487.88Km2
GDP：3兆6872億円(2015年)

豊かな自然やブランド食材


カルスト台地・平尾台


若松北海岸


合馬のたけのこ


関門海峡たこ


小倉牛


豊前海一粒かき


若松特選トマト

北九州地域の代表的企業


日本製鉄


安川電機


TOTO


三菱ケミカル


トヨタ自動車
日産自動車


三菱マテリアル

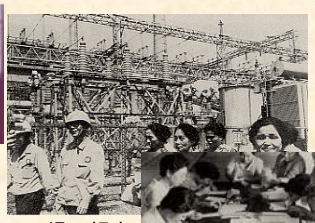
北九州市の公害克服

1960年頃

1980年代後半～現在

公害克服にむけた関係者の取り組み

映画の自主制作



工場の視察

行政や企業への要請はがき

市民

パートナーシップ

企業

自治体

大学教授を招いた学習会

公害防止協定締結

省エネ型生産工程や公害防止設備の導入

環境モニタリング、
下水道整備、洞海湾の浚渫

北九州エコタウン事業の背景

■1901年　官営八幡製鐵所の開設
以後100年の間、「ものづくり」の街として発展

■60年代　激甚な公害を経験、
市民・企業・行政が一体となって克服

■80年代～　環境国際協力の推進

・広大な土地（2,000ha）
・最終処分場の整備
・産業集積地・大消費地に近接
・物流インフラの整備

技術・人材・ノウハウ
産業インフラ

市民・企業・行政の
ネットワーク

響灘地区の優位性

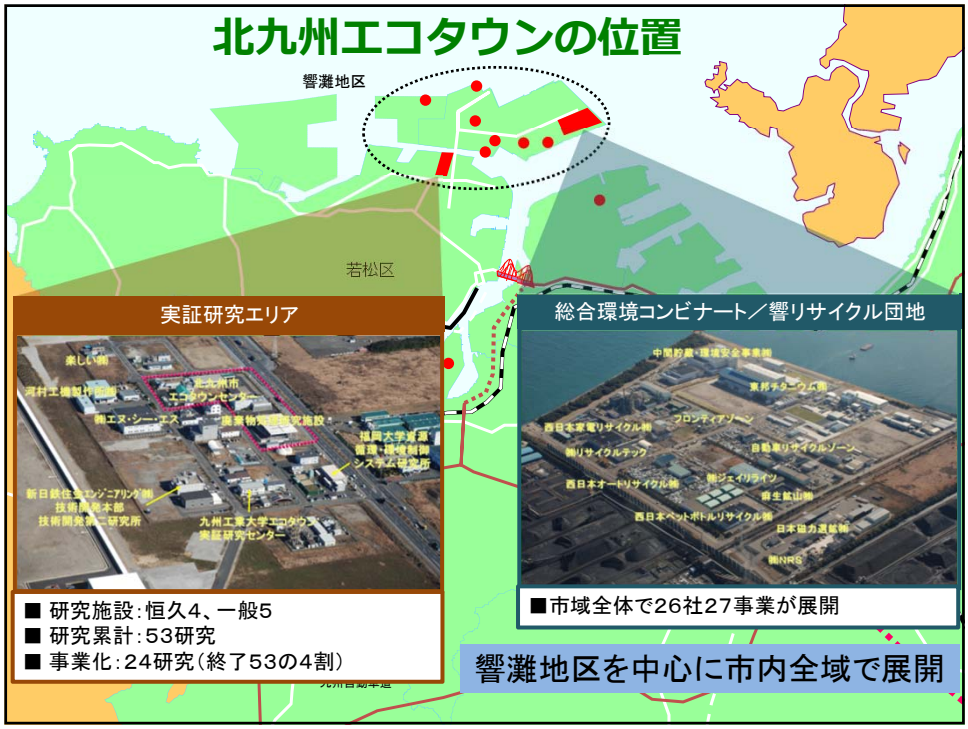
「資源循環型社会」の到来

地域資源を活かした地域戦略プラン

北九州エコタウン事業

《環境保全と産業振興の両立》

北九州エコタウンの位置



北九州エコタウン事業

循環型社会の実現に向けた取組み・環境保全と産業振興に貢献

実証研究エリア

■福岡大学
　資源循環・環境制御システム研究所
■九州工業大学
　エコタウン実証研究センター
■新日鉄住金エンジニアリング㈱
　技術本部技術開発第二研究所
■各分野での実証研究
　・処分場管理技術
　・処理困難物の適正処理技術
　・廃棄物の再資源化技術
■北九州市エコタウンセンター　　ほか

総合環境コンビナート・響リサイクル団地

■総合環境コンビナート
　・ペットボトル　・OA機器　・自動車　・家電
　・蛍光管　・医療用具　・建設混合廃棄物
　・非鉄金属　・小型家電
■響リサイクル団地（中小・ベンチャー企業）
　・自動車　・食用油　・古紙　・有機溶剤　・空き缶
■響灘東部地区、その他の地区
　・パチンコ　・廃木材、廃プラスチック
　・飲料容器　・自動販売機　・汚泥、金属
　・超硬合金　・携帯電話　・OA機器
　・古紙　・都市鉱山　・食品廃棄物
　・風力発電事業（2）

北九州市の環境産業振興戦略

～基礎研究から技術・実証研究、事業化に至るまでを総合的に展開～

－教育・基礎研究－

●環境政策理念の確立
●基礎研究・人材育成
●産学連携拠点

＜北九州学術研究都市＞

■ 大学
●北九州市立大学　国際環境工学部
　大学院国際環境工学研究科
●九州工業大学 大学院
　生命体工学研究科
●早稲田大学 大学院
　情報生産システム研究科
●福岡大学大学院工学研究科

■ 研究機関等
●早稲田大学情報生産システム
　研究センター
●福岡県リサイクル総合研究事業化
　センター
●北九州市立大学　環境技術研究所
●九州工業大学 イノベーション推進機構
　産学連携・URA領域 若松分室
●産業技術総合研究所　　ほか

－技術・実証研究－

●実証研究支援
●地元企業のインキュベート

＜実証・研究エリア＞

■大学
●福岡大学
　資源循環・環境制御システム研究所
●九州工業大学
　エコタウン実証研究センター

■企業
●新日鉄住金エンジニアリング(株)
　技術本部技術開発第二研究所

■各分野での実証研究
●処分場管理技術
●処理困難物の適正処理技術
●廃棄物の再資源化技術

■中核支援施設
●北九州市エコタウンセンター
　ほか

－事業化－

●リサイクル事業・環境ビジネス展開
●中小・ベンチャー事業の支援

＜総合環境コンビナート＞

■リサイクル工場の集積
●ペットボトル ●OA機器 ●医療用具
●自動車 ●蛍光管 ●家電 ●非鉄金属
●建設混合廃棄物 ●小型家電

＜響リサイクル団地＞

■地元中小・ベンチャー
●食用油 ●有機溶剤 ●古紙 ●空き缶
■自動車解体・中古部品業者の高度化

＜響灘東部地区＞

■リサイクル工場
●パチンコ ●廃木材・廃プラスチック
●飲料容器・自動販売機 ●汚泥金属等
●超硬合金 ●携帯電話
■風力発電(2)

＜その他の地区＞

■リサイクル・リユース工場
●OA機器・古紙 ●都市鉱山 ●食廃

北九州エコタウン事業の特徴①

1　リサイクル事業成立のための社会システムの確立

行政（支援）

入口

リサイクル資源の集まる仕組みづくり

・法整備・運用　・広域回収ルートの確保等

企業

ワンストップサービスの提供

環境産業推進課

・諸手続きの迅速化
・技術開発の支援
・補助金・融資制度
・市民説明　など

リサイクル事業

行政（支援）

出口

リサイクル製品の健全な市場の確立

・グリーン購入

2　基礎研究・技術開発・事業化に至る『総合的展開』

教育・基礎研究

＜北九州学術研究都市＞

基礎研究、人材育成、産学連携

技術・実証研究

＜実証研究エリア＞

実証研究支援、地元企業のインキュベート

事業化

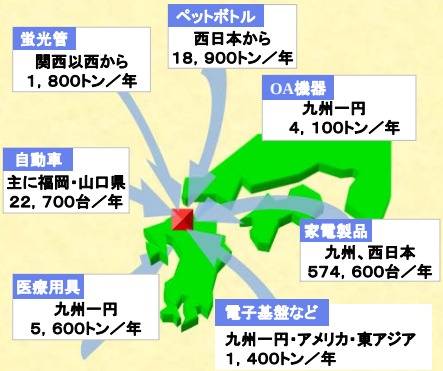
＜総合環境コンビナート、響リサイクル団地＞

リサイクル事業、環境ビジネス展開、
中小・ベンチャー事業の支援

各段階に応じた支援

北九州エコタウン事業の特徴②

3　廃棄物の広域的な受入



事業内容や施設規模に応じた
適切な量の廃棄物の確保

従来の価値観の転換

・リサイクル業＝　資源循環ビジネス
・対象廃棄物　＝　原材料（循環資源）

4　情報公開と環境学習の拠点

工場見学

エコタウンセンター

・視察・見学者の対応　・市民の環境学習の場
・研究活動支援　・技術・製品の展示
・エコタウンに関する情報の開示

リスクコミュニケーション

相互の理解を深め、リスクの回避、低減を図る。

市民の不安感、不信感、不快感の払拭

市民の理解と信頼

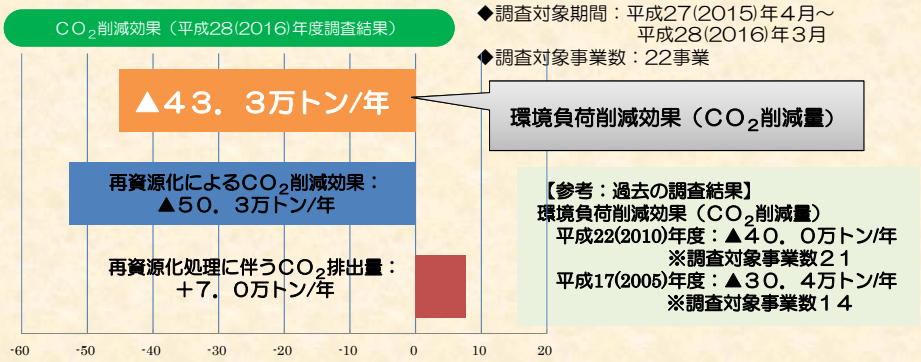
エコタウン・次世代エネルギーパーク

環境学習の拠点

北九州エコタウンの成果（2018.3月時点）

3倍超の経済効果！

■直接投資額　累計 780億円 （国・県・市 203億円＝全体の26%）
■雇用数　1，046人
■認知度　H9(1997年)環境白書、H14(2002年)～小中学校教科書への掲載
■見学者数　年間約10万人・累計164万人
※ 社会科見学や修学旅行のほか、 海外（中国、韓国、東南アジアほか）からの見学者も

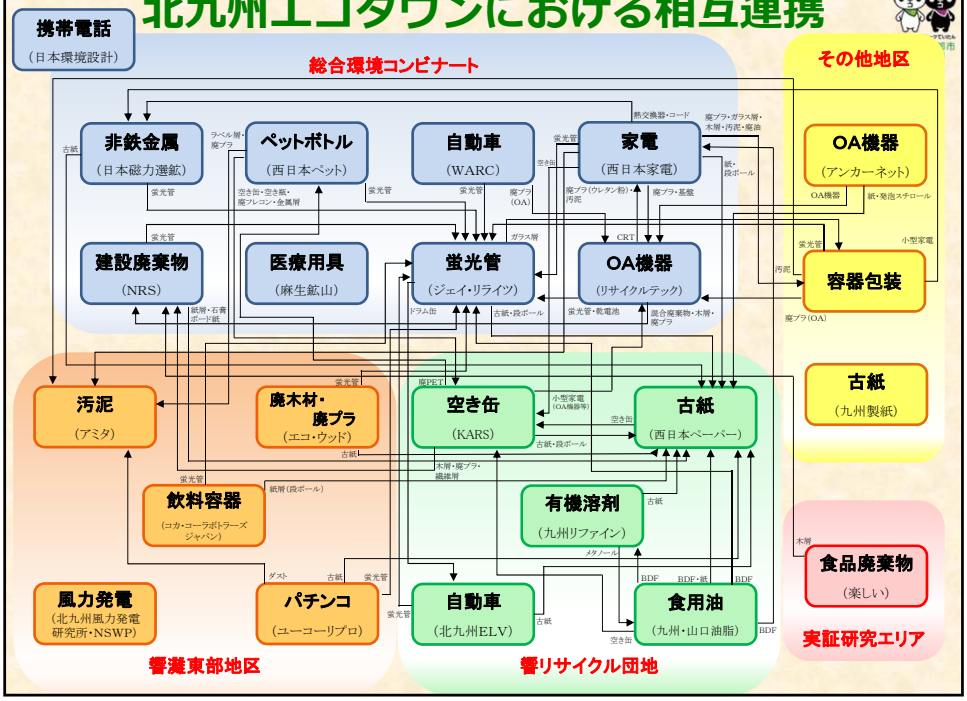


◆調査対象期間：平成27(2015)年4月～平成28(2016)年3月
◆調査対象事業数：22事業

環境負荷削減効果（CO_2削減量）

【参考：過去の調査結果】
環境負荷削減効果（CO_2削減量）
平成22(2010)年度：▲40．0万トン/年
※調査対象事業数21
平成17(2005)年度：▲30．4万トン/年
※調査対象事業数14

北九州エコタウンにおける相互連携



次世代資源リサイクル拠点の形成

太陽光発電（PV)パネル

・2040年頃に、産廃最終処分量の6%を占めるPVパネルのリユース・リサイクル事業
・汎用性（結晶Si、薄膜Si、CIS系に対応）と高いリサイクル率（95%）を兼ねる技術を確立
・ガラス、アルミ、プラスチック、結晶Si、銅・ハンダ等の金属類を回収

実施主体：新菱
《NEDO、環境省、経産省助成活用》

炭素繊維強化プラスチック(CFRP)

・航空機産業や自動車産業等での用途拡大中のCFRPを熱分解し、再生
・リサイクル率95%（樹脂熱分解時の廃熱利用含む）
・課題である再生炭素繊維（CF）の用途開発中
・共用設備（共用炉）によるPVパネルとCFRPリサイクルの早期事業化を検討中

実施主体：日本磁力選鉱
《環境省助成活用》

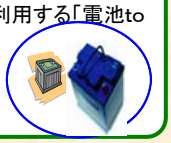
再生ポリエステル

・「服から服をつくる技術」
・衣料品の60%を占めるポリエステル繊維を化学処理し、ポリエステル繊維の原料となる再生樹脂を製造
・混紡衣料やボタン、ファスナーが付属する衣料品も可能

実施主体：日本環境設計
《NEDO助成活用》

リチウムイオン電池

・小型家電、携帯電話の廃二次電池をリサイクルし、特殊鋼の原料として再資源化。
・将来的には、電気自動車用 リチウムイオン電池への対象拡大や、コバルトやニッケルを回収し、蓄電池の電極材として再利用する「電池to電池」リサイクルを目指す。



実施主体：日本磁力選鉱
《環境省助成活用》

技術開発・高度化への補助金

北九州市 環境未来技術開発助成

■財源　北九州市環境未来税（産業廃棄物の埋立てに対する独自課税）

■2018年実績　約4，500万円 ⇒ 8事業者に交付
（1件　1，500万円以内）

〇対象分野　・廃棄物処理・リサイクル技術
・環境保全技術　・環境に配慮した製品開発技術　など

◎重点分野
① 希少金属・資源のリサイクル
② 新エネルギー・省エネルギー・工場廃熱等の未利用エネルギー
③ 水素エネルギーの導入普及
④ バイオマスの活用
⑤ プラスチック関連分野（2019年度より追加）

【成　果】
〇事業化率（2017年まで）35%　（一般的な事業化水準10%を大幅に上回る）
〇助成額（2003～2017年）13.1億円 ⇒ 売上高 198億円・新規雇用110人

■エコタウン事業の発展に寄与
〇エコタウン企業の事業拡大
廃木材・プラ建材リサイクル、食品リサイクル、超硬合金リサイクルなど
〇新たなリサイクルビジネス
小型電子機器リサイクル、古着リサイクル

北九州エコプレミアム

■事業概要

環境への負荷が低いことを新しい付加価値として捉えた製品や技術、産業活動を「北九州エコプレミアム」として選定。選定された製品・サービスは、北九州市がPRを支援する。

■選定商品・サービス

・エコプロダクツ　170件
・エコサービス　　42件
合計：212件　（2018年まで）

選定製品・サービス

■選定のメリット

・エコプレミアム選定書発行
・エコプレミアム専用カタログ発行
・エコタウンセンター常設展示
・環境見本市「エコテクノ」出展
など

エコタウンセンター常設展示

アジア低炭素化センター

2008年 北九州市が環境モデル都市に選定

～2050年までにCO2排出量を200%削減～

（2005年をベースに50%を市内、150%を海外で実現）

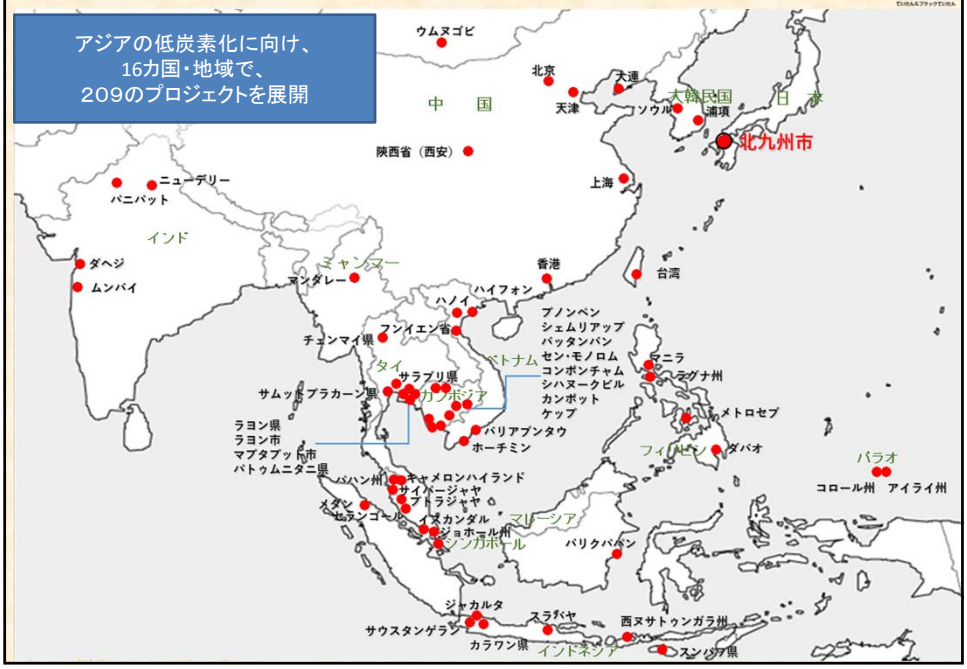
2010年6月　アジア低炭素化センター開設

公害克服やものづくりの過程で生まれてきた環境技術や
これまでの国際協力で構築してきた都市間ネットワークの活用

北九州市、日本の環境技術を集約し、
環境ビジネスの手法で、アジアの低炭素化を推進

世界をリードする北九州市の環境技術

アジアの低炭素化に向け、
16カ国・地域で、
209のプロジェクトを展開



世界各国の要人も北九州市を訪問

北九州市での取組みが国際的にも注目されている

習近平／中国国家主席
（2009年12月）

「北九州市は環境保護と先進的技術の発展において豊富な経験を有している。これは中国の現実に当てはめながら、お手本として真剣に学ぶに値するものである。」

人民日報（2009年12月17日付）

アミターブ・カント／インドDMIC開発公社
CEO（2010年2月）

「まちづくりの視点からの開発が重要であり、北九州市のエコタウンなど社会システムと環境技術が結び付いた開発を進めたい」

アーコム／タイ国家経済社会開発委員会
長官（2013年10月）

「公害問題を早くから克服し、環境ビジネスの発展に力を入れている北九州市に学びたい」

The Daily NNA
（2013年10月25日付）

OECDから「SDGsモデル都市」に選定

2018年4月、北九州市は、経済協力開発機構（OECD)から、SDGsに積極的に取り組む世界のモデル都市として、アジア地域で初めて選定。

北九州市に対する国際的評価

1985　OECDの「環境状況報告書」で表記
“Gray city to green city”(灰色のまちから緑のまちへ)

1990　国連環境計画（UNEP）から受賞
「グローバル500」（日本自治体初）

1992　リオデジャネイロ・地球サミット（環境と開発に関する国際連合会議）で受賞
「国連地方自治体表彰」（世界12都市）

2000　国連アジア太平洋経済社会委員会（ESCAP）の環境大臣会議で採択
「クリーンな環境のための北九州イニシアティブ」

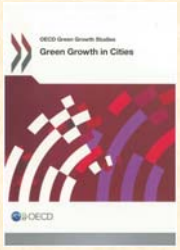
2002　ヨハネスブルグ・地球サミットで受賞（世界で2件）
「地球サミット2002持続可能な開発表彰」

2011　OECDの「グリーン成長モデル都市」に選定

2013　OECDが北九州レポートを全世界に発信

2016　G7北九州エネルギー大臣会合で採択
「エネルギー安全保障のための北九州イニシアティブ」

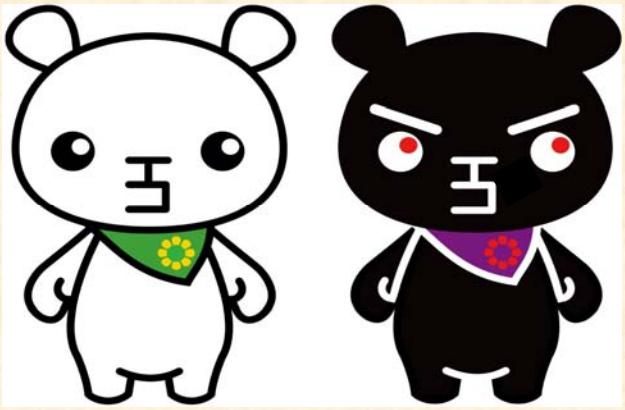
2018　OECD「SDGs推進に向けたモデル都市」選定



グリーン成長レポート（2011）

「SDGsモデル都市」選定(2018)

ご清聴ありがとうございました



Appendix_d_IRDA Discussion Paper

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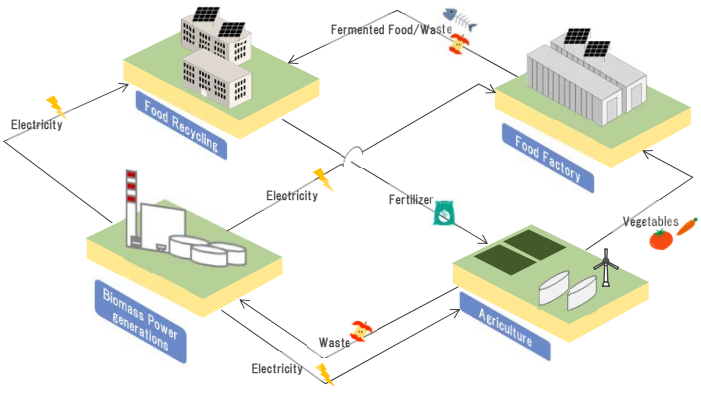
Eco-town～Industrial symbiosis～

2019/09/18
NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, INC.

Eco-town～Industrial symbiosis～

An industrial symbiosis in different industries can share and reuse resources to create shared value.

Example of Eco-town(industrial symbiosis)



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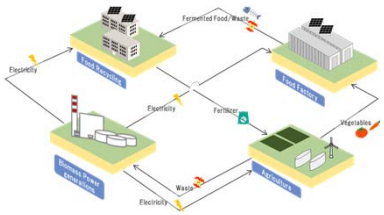
Steps to build Eco-town～Industrial symbiosis～

Two steps, 1. Building Information linkage platform 2. Introduction of facilities, may be needed to achieve an industrial symbiosis.

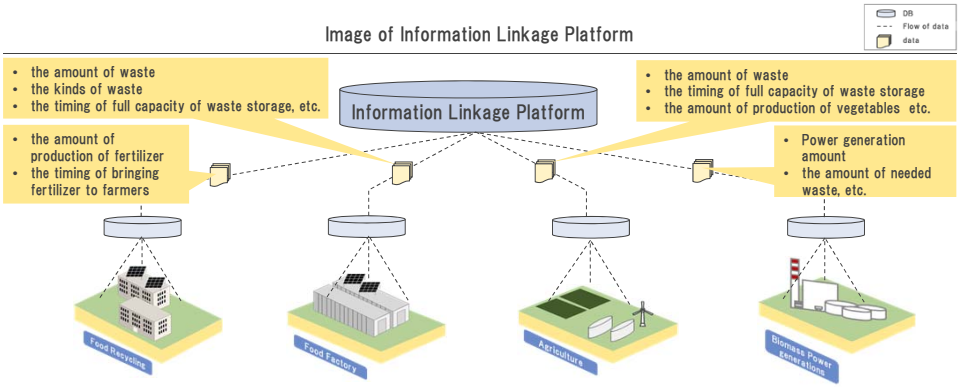
Steps build Eco-town(industrial symbiosis)		To-Be(Eco-Town/Industrial symbiosis)
Step 1 Information Linkage Platform	• In order to achieve the effective transactions among each industries, information linkage infrastructure need to be built.	
Step 2 Facilities	• Extra facilities, equipment and transportations will be needed to start the new transitions. • ex. Processing machines, Storage system, etc. • Introduction of facilities can be subsided under JCM.	

- 2 steps(1. Building Information linkage platform 2. Introduction of facilities) will be needed.
- First of all, Information linkage infrastructure states to be implemented.

Steps1:Information Linkage Platform

Information from each partners is centralized and managed under Information Linkage Platform to share and reuse resources.

Image of Information Linkage Platform



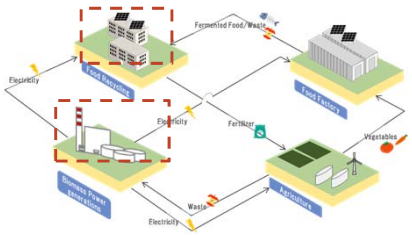
- Information from each companies is collected and managed under information Linkage Platform.
- The centralized information systems can contributed to minimizing the leakage and waste in the loops.

Steps2:Facilities

After step 1, facilities which may be needed will be finalized. Those facilities can be installed with subsidy under JCM.

Image of installing facilities

- Biomass Boiler system
- Compost system
- Energy saving storage system etc..



Joint Crediting Mechanism

- Scope of the financing: facilities, equipment, vehicles, etc. which reduce CO2 from fossil fuel combustion as well as construction cost for installing those facilities, etc.
- Eligible Projects : starting installation after the adoption of the financing and finishing installation within three years.

The budget for projects starting from FY 2019 is 9.9 billion JPY (90 mm USD) in total by FY2021.

(1 USD = 100 JPY)

Government of Japan

※Includes collaboration with projects supported by JICA and other governmental-affiliated financial institute.

Finance part of an investment cost (less than half)

Conduct MRV and expected to deliver at least half of JCM credits issued

International consortiums (which include Japanese entities)

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Agenda

1. The “GOAL” of this discussion
2. IRDA’s goals and current status
3. IRDA’s next activities
4. Actions Plan for Industrial Symbiosis Pilot Project
5. Schedule for Actions Plan

1. the “GOAL” of this discussion

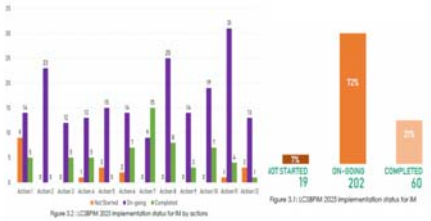
The goal of this discussion is to have the same understanding of the detailed action plan items in accomplishing the Industrial Symbiosis Pilot Project(ISPP).

The goal of this discussion	What we request to you
1. Review the schedule and the tasks of the respective stakeholders of ISPP, and fix the action plan. 2. In order to obtain the appropriate capital to execute each action plan, utilize the agreed action plan(what we discuss today) as the base in requesting subsidy from MOE. 3. The agreement of the Action Plan is a key factor in increasing the possibility of securing the necessary subsidy from the MOE	1. First, it is important to have the same understanding of the prerequisite and background of the Industrial symbiosis Pilot Project 2. Get feedback from the respective members upon reviewing the schedule and the tasks of the respective stakeholders of ISPP.

2. Iskandar’s “Goal” vs “Current Status”

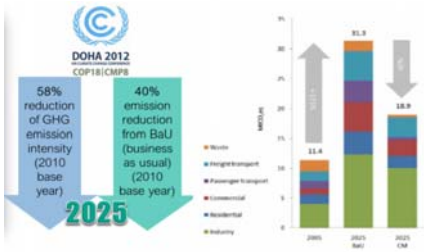
Compared to the Goal, the current Status of the Low Carbon Society Blueprint is on schedule. In order to actualize this goal, IRDA is considering new PJTs post 2020.

Current Status(2019/August)



In 2018(According to the previous discussion)
- 65 programs implemented.
- 12.9% GHG intensity reduction in 2017.

Goals for 2025
(according to Low Carbon Blueprint)



- 12 Actions grouped in 3 parts: Green Economy, Green Community, and Green Environment = 281 programs
- GOALS: to reduce Iskandar Malaysia’s GHG intensity emission by 50% by 2025

3. About Iskandar's Prospective Projects

By planning the action plans for the Industrial Symbiosis-Pilot Project now, the overall project will be more smooth in the next FY (2020 May)

OK, what's next? Wishlist

1. Industry Symbiosis- Pilot Project
   ie. greening industry
2. Eco-town concept

Currently approved PJTs by the National Government

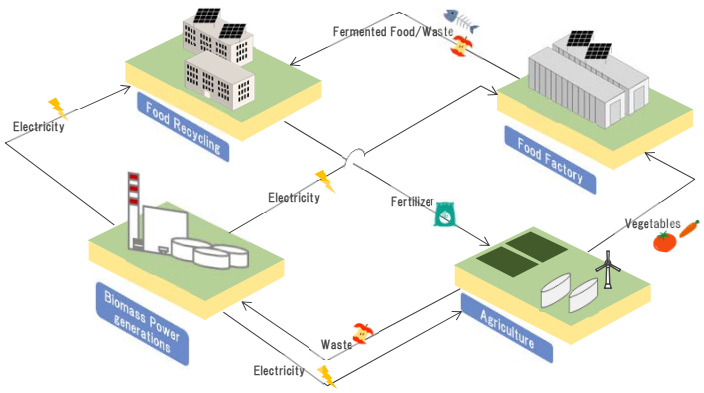
3. Green Port policy
4. Green Energy projects
   - Supplier of Cogeneration system
   - Waste Heat Recovery Power Generation
5. JCM- CASBEE Centre
   - Carbon trading framework /study

- IRDA wants to prioritize ISPP and Eco-town Concept.
- In Japan, IS is within the Eco Town
- Kitakyushu is a prime Municipal partner as it is currently incorporating IS in it's Eco town
- In order for IRDA to implement the Kitakyushu Eco Town model, the Action Plan for IS needs to be set and ready to be incorporated by May 2020.

4. Industrial symbiosis concept

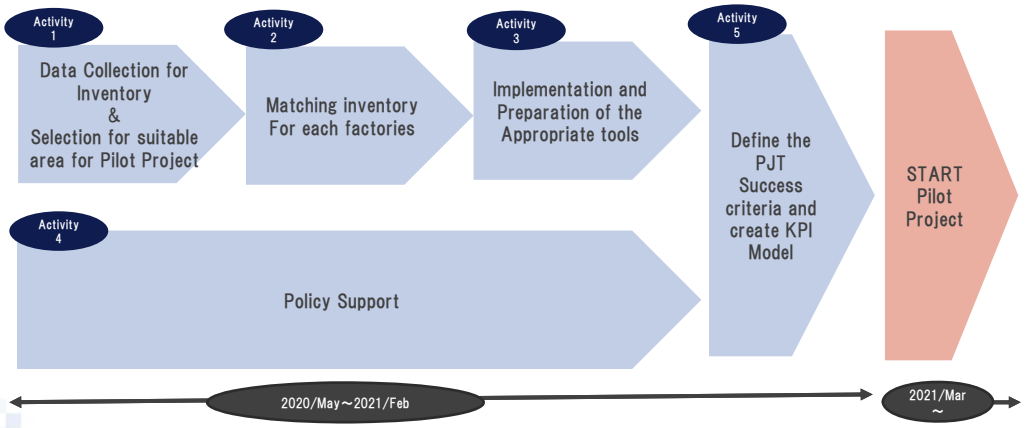
Based on what we discussed in the previous meeting, the concept of Industrial Symbiosis is below. Any opinions about this?

industrial symbiosis(Example)



5. Actions for Pilot Project of Industrial Symbiosis

Below 5 Activities are the necessary detailed action items.
In 2020, initiate below 5 actions, and initiate PoC of ISPP in 2021.



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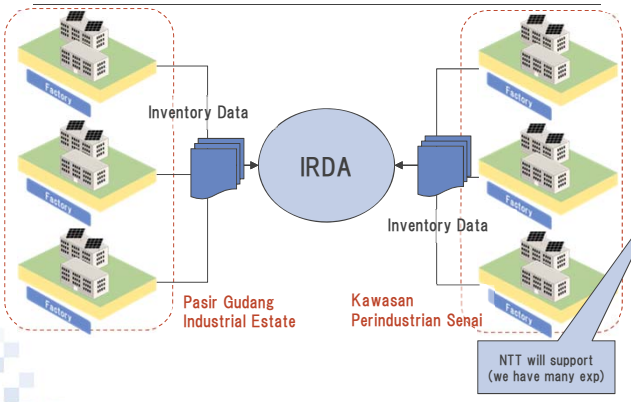
5. Actions for Pilot Project of Industrial Symbiosis
Activity1: Data Collection for Inventory & Selection for suitable area for Pilot Project

Collect data of Inventory from each factory and Choose one suitable pilot area for Industrial Symbiosis

Main Stakeholder
IRDA / Kitakyushu / NTTDIOMC / Factories

Activity Image



Activity Details

Any other areas we need to consider??

- Communicate with each Industrial Area for collaboration
  (Pasir Gudang Industrial Estate/Kawasan Perindustrian Senai/Kawasan Perindustrian Tebrau)
- Host WS・Intro and Explanation of this PJ
- Request each Factory for Inventory Research Sheet
- Each Factory will provide answer the Inventory Research Sheet
- Inventory Research Sheet result complement
- Select one Pilot Project area based off of each Industrial Area participation and data provided

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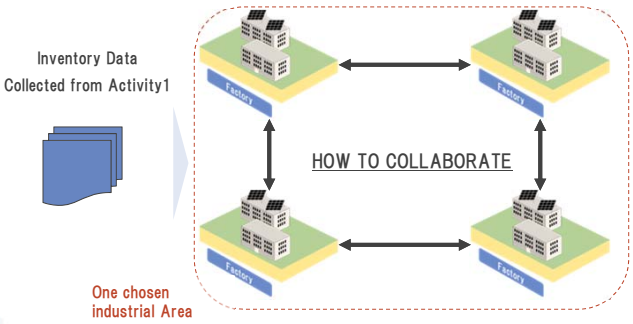
5. Actions for Pilot Project of Industrial Symbiosis
Activity2:Matching inventory For each factories

Based on the collected inventory data, match and consider the collaboration of each factories

Main Stakeholder
IRDA / Kitakyushu / NTTDIOMC / Factories

Activity Image



Activity Details

- Consider collaboration and Industrial Area factory matching based on the Inventory Data.
  (ex. Factory A's Waste⇒Use as supply for Factory B)
- Discuss the Matching Collaboration idea with the respective factories and hold Discussions/WS
- Finalized the matching method
- Identify the facility to incorporate

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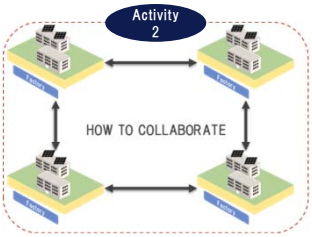
5. Actions for Pilot Project of Industrial Symbiosis
Activity3: Implementation and Preparation of the Appropriate tools

Choose the suitable supplier of instruments and Install the necessary instruments/tools
(with subsidy ver/without subsidy ver)

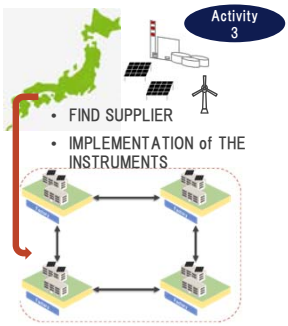
Main Stakeholder
IRDA / Kitakyushu / NTTDIOMC / Factories

Activity Image



◆Confirm the way of collaboration based on Activity2

◆Find out the necessary equipment to be introduced



Activity Details

- Based on Activity 2, Find out the suitable instruments to be introduced
- Choose the potential supplier and Get estimates
- Investigate subsidy
- Prepare and Apply for the application of JCM
- Get subsidy from other than JCM scheme
- Install machines into the factories without subsidy

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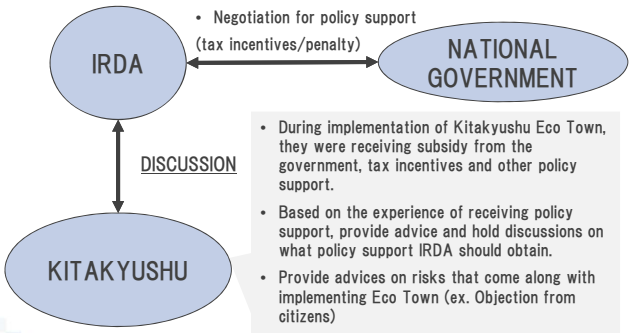
5. Actions for Pilot Project of Industrial Symbiosis
Activity4: Policy Support

Discuss how Kitakyushu obtained support with IRDA, and identify necessary Policy Support to actualize IS

Main Stakeholder
IRDA / Kitakyushu / NTTDIOMC / Factories

Activity Image



- During implementation of Kitakyushu Eco Town, they were receiving subsidy from the government, tax incentives and other policy support.
- Based on the experience of receiving policy support, provide advice and hold discussions on what policy support IRDA should obtain.
- Provide advices on risks that come along with implementing Eco Town (ex. Objection from citizens)

Activity Details

- Provide advice/discussion on how to obtain subsidy and support from the government based off of the experience with the Kitakyushu Eco Town implementation
- Provide advices on risks that come along with implementing Eco Town (ex. Objection from citizens)
- Negotiate the policy to National Government
- Develop the policy which prompts to accomplish IRPP by IRDA itself

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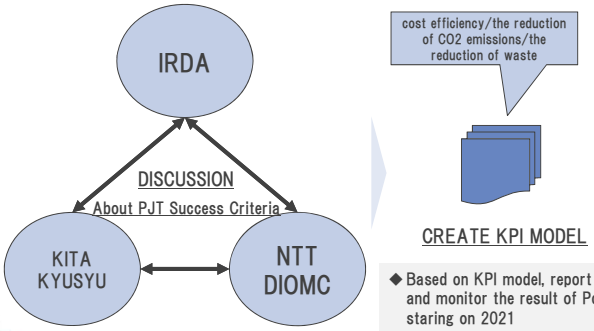
5. Actions for Pilot Project of Industrial Symbiosis
Activity5: Define the PJT Success criteria and create KPI Model

In order to monitor and report PoC results of ISPP, set KPI

Main Stakeholder
IRDA / Kitakyushu / NTTDIOMC / Factories

Activity Image



CREATE KPI MODEL

◆ Based on KPI model, report and monitor the result of PoC staring on 2021

Activity Details

- Define the suitable PJT success Criteria based on Discussion
- Create KPI model
(to evaluate ex. cost efficiency/the reduction of CO2 emissions/the reduction of waste etc)

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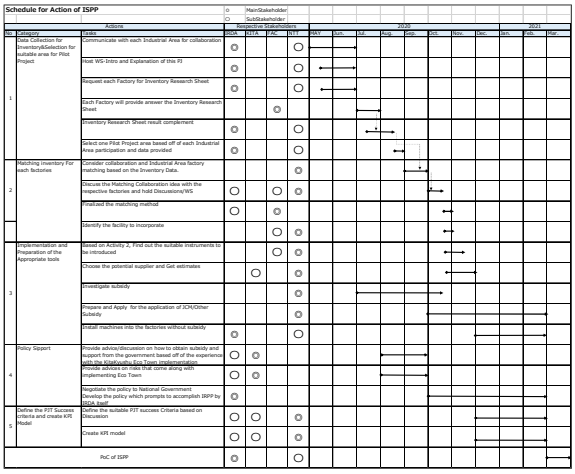
6. Schedule for Action Plan

Discuss about the schedule and the tasks of respective stakeholder based on excel.



Schedule for Action of ISPP

○ MainStakeholder
◎ SubStakeholder

No	Category	Actions / Tasks	Respective Stakeholders: BIDA	KITA	PAC	NTT	2020 MAY	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	2021 Jan.	Feb.	Mar.
1	Data Collection for Inventory&Selection for suitable area for Pilot Project	Communicate with each Industrial Area for collaboration	◎			○											
		Host WS-Intro and Explanation of this PJ	◎			○											
		Request each Factory for Inventory Research Sheet	◎			○											
		Each Factory will provide answer the Inventory Research Sheet			◎												
		Inventory Research Sheet result complement	◎			○											
		Select one Pilot Project area based off of each Industrial Area participation and data provided	◎			○											
2	Matching Inventory For each factories	Consider collaboration and Industrial Area factory matching based on the Inventory Data.				◎											
		Discuss the Matching Collaboration idea with the respective factories and hold Discussions/WS	○		○	◎											
		Finalized the matching method	○		◎												
		Identify the facility to incorporate			○	◎											
3	Implementation and Preparation of the Appropriate tools	Based on Activity 2, Find out the suitable instruments to be introduced			○	◎											
		Choose the potential supplier and Get estimates		○		◎											
		Investigate subsidy				◎											
		Prepare and Apply for the application of JCM/Other Subsidy				◎											
		Install machines into the factories without subsidy	◎			○											
4	Policy Sipport	Provide advise/discussion on how to obtain subsidy and support from the government based off of the experience with the Kitakyushu Eco Town implementation	○	◎													
		Provide advices on risks that come along with implementing Eco Town	○	◎													
		Negotiate the policy to National Government	◎														
		Develop the policy which prompts to accomplish IRPP by BIDA itself															
5	Define the PJT Success criteria and create KPI Model	Define the suitable PJT success Criteria based on Discussion	○	○		◎											
		Create KPI model	○	○		◎											
	PoC of ISPP		◎			○											

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Agenda

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1. Introduction of JCM
2. Introduction of JCM Survey Program
3. Our Experience of JCM Related Project
4. JCM Survey Program in 2019
5. Schedule in 2019

1. Introduction of JCM

1-1. Basic Concept of the JCM (Joint Crediting Mechanism)

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- Facilitating diffusion of leading low carbon technologies, products, systems, services and infrastructure as well as implementation of mitigation actions, and contributing to sustainable development of developing countries;
- Appropriately evaluating contributions from Japan to GHG)emission reductions or removals in a quantitative manner, and use them to achieve Japan's emission reduction target;
- Contributing to the ultimate objective of the UNFCCC by facilitating global actions for GHG emission reductions or removals

Source: Ministry of Environment, Japan

1-2. JCM Partner Countries

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- Japan has held consultations for the JCM with developing countries since 2011 and has established the JCM with Mongolia, Bangladesh, Ethiopia, Kenya, Maldives, Viet Nam, Lao PDR, Indonesia, Costa Rica, Palau, Cambodia, Mexico, Saudi Arabia, Chile, Myanmar, Thailand and the Philippines.

Source: Ministry of Environment, Japan

1-3. JCM Subsidy Program

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The budget for projects starting from FY 2019 is 9.9 billion JPY (90 mm USD) in total by FY2021.

(1 USD = 100 JPY)

※Includes collaboration with projects supported by JICA and other governmental-affiliated financial institute.

Government of Japan

Finance part of an investment cost (**less than half**)

Conduct MRV and expected to deliver at least half of JCM credits issued

International consortiums
(which include Japanese entities)

- Scope of the financing: facilities, equipment, vehicles, etc. which reduce CO2 from fossil fuel combustion as well as construction cost for installing those facilities, etc.
- Eligible Projects : starting installation after the adoption of the financing and finishing installation within three years.

Source: Ministry of Environment, Japan

1-4. Organization at Implementation Phase

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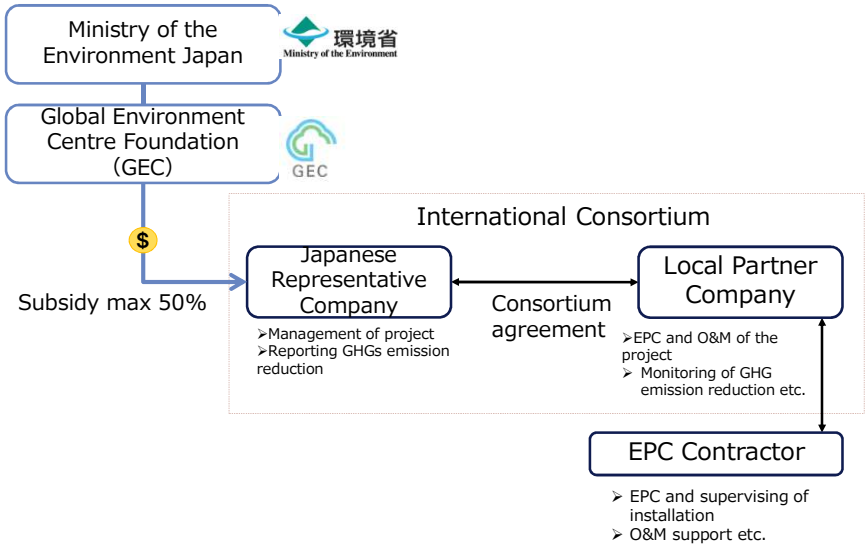
Required organization scheme for JCM subsidy application



1-5. Overview of Financing Program

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Overview of Financing Programme for JCM Model Project in FY2018

Budget	JPY6.9 billion (Approx. USD69million)
Executing Entity	International Consortium that consists of a Japanese entity and a JCM partner-country entity(ies)
Implementation Period	From FY2018 to FY2020 (max. 3 years)
Scope of Financing	Facilities, equipment, vehicles, etc. which reduce CO2 from fossil fuel combustion as well as construction cost for installing those facilities, etc.
Eligible Projects	Start installation after the Contract of Finance is concluded and finish installation within 3 years.
Maximum percentage of Financial Support	Maximum of 50% and reduce the percentage according to the number of already selected project(s) using a similar technology in each partner country.
Cost-effectiveness	Cost-effectiveness of GHG emission reductions is expected to be JPY4,000/tCO2 or better. ※If the number of PV projects in a partner country are 5 or more, cost-effectiveness is expected to be JPY3,000/tCO2 or better.

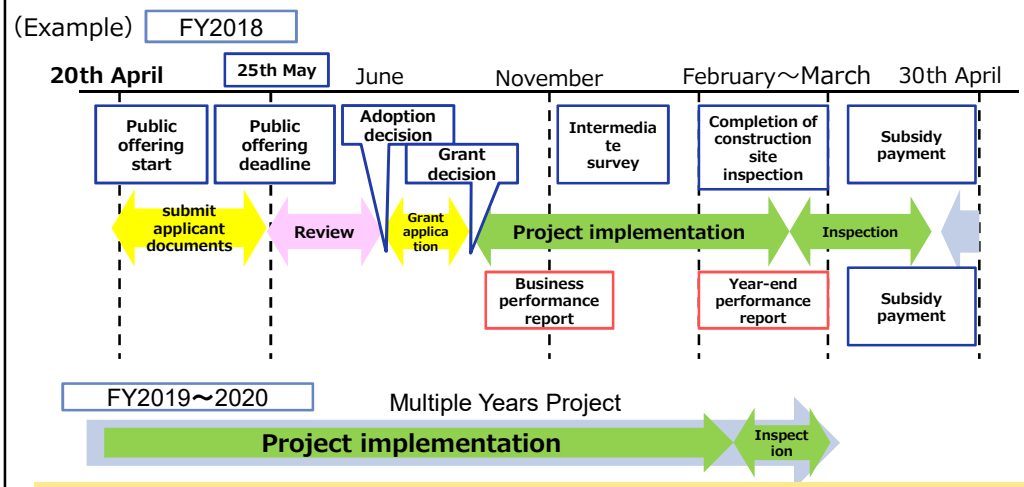
Financial support per project
From ¥50million to ¥2billion (approx.)

Cumulative Number of JCM Model Projects

*up to preliminary selection in FY2018 (terminated projects are not included)

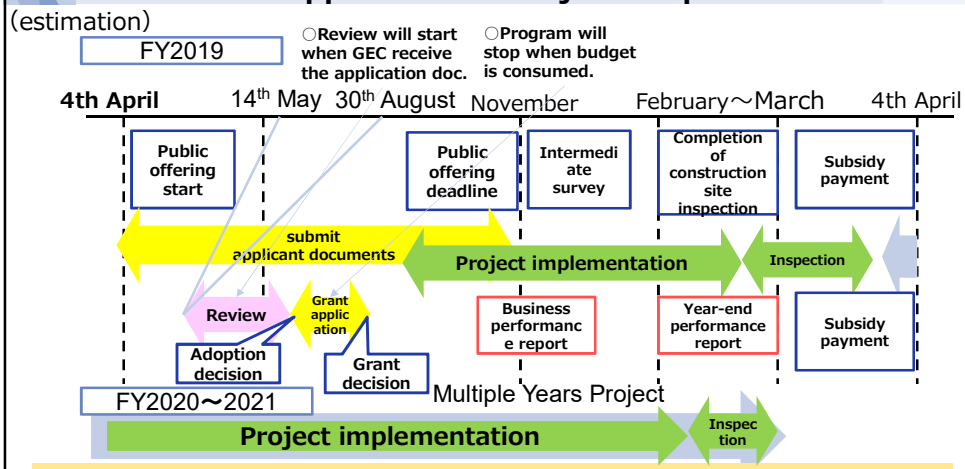
Number of JCM Model Projects by Sector

1-6. Schedule from Application to Project Implementation



- Grant application is needed from the adoption unofficial **within 3 months**.
- pay estimate to the end of each FY year, the settlement payment in the final year

1-7 JCM Subsidy Project
Schedule of Application to Project Implementation



- Grant application is needed from the adoption unofficial **within 3 months**.
- pay estimate to the end of each FY year, the settlement payment in the final year

Public offering start approx. Beginning of April and finished around the end of November, 2019.

1-8 JCM Subsidy Detail of Cost-effectiveness and Payback Period

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Points of Attention Regarding Application for JCM Subsidy

- **Subsidy rate changes depending on the contents of the project and country.**

Adoption number of similar technology in the country to implement the project	0 (first case)	From 1 to 3	Over 4
Subsidy late	Maximum 50 %	Maximum 40%	Maximum 30%

- **There are 2 Check points to get subsidy**

1. Cost-effectiveness for subsidy vs amount of reduced CO2

【New Criteria from FY2017】

Regardless of the amount of subsidy,

Cost effectiveness should be less than **4000JPY/t-CO2**

(approx. 35USD/t-CO2)

3000JPY/t-CO2
for PV in Thailand and Mongolia

2. Payback period

- **Payback period should be longer than three years.**

1-9. JCM Subsidy Program by MOEJ (FY2013-2018)

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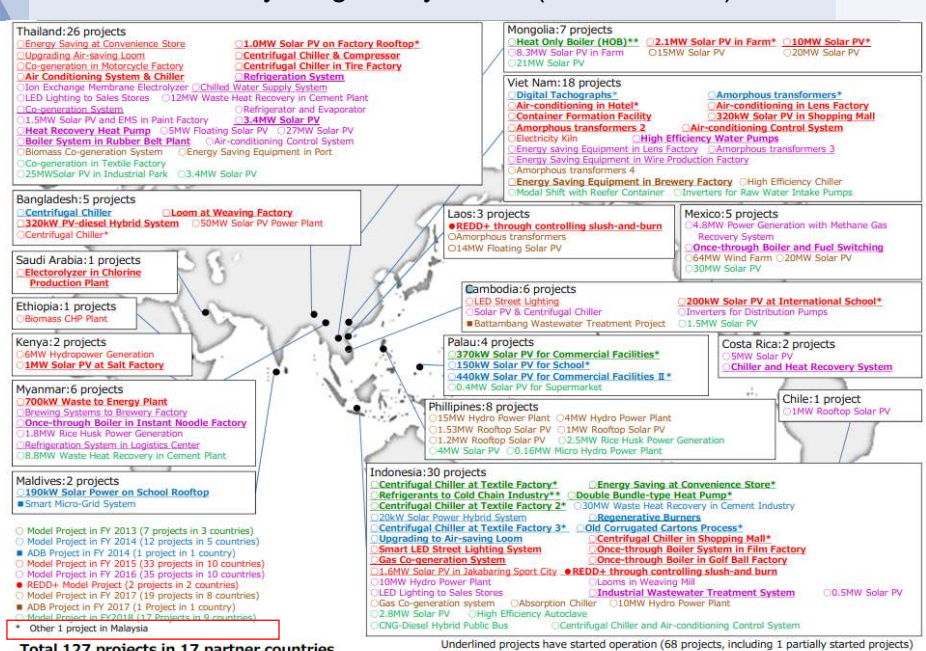

Source:JCM Home Page

2. Introduction of JCM Survey Program

2-1. Overview of JCM FS program (City to City collaboration)

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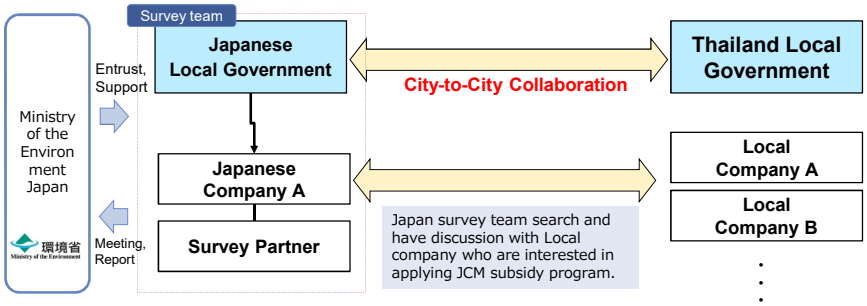
- JCM feasibility study program is conducted based on City-to-City Collaboration between Japanese Local government and Local government (or public agency) in Partner Country.

Overview of JCM Feasibility Study



Study Theme

Renewable Energy	Energy Saving	Waste Management
Solar Power, Wind, Hydro Power, Biomass	High Efficiency •Chiller Unit •Room air-conditioner •Boiler •Heat recovery system … etc.	•Waste power generation •Residual Diesel Fuel from waste •Composting system … etc.

3. Our Experience of JCM Related Project

3-1. Introduction of NTT DIOMC

NTT DATA

Corporate outline

Name	NTT DATA INSTITUTE OF MANAGEMENT CONSULTING,Inc.
Date of Establishment	April 12, 1991
Shareholder	NTT DATA Corporation 100%
Capital	¥450 million
Head Office	NAGATACHO OFFICE JA KYOSAI Bldg, 10th Fl., 7-9,Hirakawacho 2-chome, Chiyoda-ku, Tokyo 102-0093, Japan TEL: +81-3-3221-7011(main number) FAX: +81-3-3221-7022 AKASAKA OFFICE AKASAKA K-TOWER 8th Fl., 2-7, Motoakasaka 1-chome, Minato-ku, Tokyo 107-0051, Japan TEL: +81-3-3221-7011(main number) FAX: +81-3-3479-9010
Office	Singapore Office 10 Hoe Chiang Road #16-01 Keppel Towers Singapore 089315 Bangkok Office ASEAN Business Sector 6th Floor, Column Tower, 199 Ratchadapisek Road, Klongtoey, Bangkok 10110, Thailand
URL	https://www.nttdata-strategy.com/english/

Society, Environment and Energy

The environmental and energy sectors continue to be the scene of dynamic developments exemplified by the revision of energy policy, approaches to global warming, and recycling of dwindling resources. They also hold much promise for industrial activity. We promote client approaches through activities including support for smart community development, assistance with export of infrastructural elements, and creation of new business by private-sector consortiums.

- Development of environmental business and environmental management
- Social and environmental communication
- Building of recycling-oriented social systems
- Measures to mitigate global warming
- New energy and energy conservation
- Systems for assurance of safety/security and management of chemical substances
- Smart communities
- Infrastructural export

3-2.Experience of JCM related Projects (1/2) ◆Industrial Sector

NO	Outline of Activity	Purpose	Phase
1	Installation of Co-generation System into the Factory and Industrial Estate (Indonesia, Vietnam)	Reduce CO2 Emission & Energy Cost	Study
2	Installation of Economizer for the Existing Boiler in Factory (Malaysia)	Reduce CO2 Emission & Energy Cost	Study
3	Installation of Exhaust Heat Recovery & Electricity Generation System into the Existing Cement Factory (Vietnam and Thailand)	Reduce CO2 Emission & Energy Cost	Study, Implementation
4	Replacement or Installation of Saving Energy Type of Electrical Furnace into Casting Companies (Vietnam)	Reduce CO2 Emission & Energy Cost	Implementation
5	Installation of Electricity Generation System using Rice Husk (Indonesia)	Reduce CO2 Emission & Energy Cost	Study
6	Installation of Solar Electricity Generation System on the Roof of the Existing Cold Storage Warehouse (Malaysia)	Reduce CO2 Emission & Energy Cost	Study
7	Replacement of Existing Lighting System into LED Lighting System (Indonesia)	Reduce CO2 Emission & Energy Cost	Implementation
8	Changing Fuel Type from Oil to Natural Gas in a Factory (Malaysia)	Reduce CO2 Emission & Energy Cost	Study
9	Installation of Mini-hydro Electricity Generation System in Isolated Area (Kenya and Ethiopia)	Reduce CO2 Emission & Energy Cost	Implementation
10	Installation of Mega Solar Electricity Generation System (Costa Rica)	Reduce CO2 Emission & Energy Security Increase	Implementation
11	Installation of Landfill Gas Recovery & Electricity Generation System (Mexico)	Reduce CO2 Emission & Energy Cost	Implementation
12	Introduction of Biomass Boiler to Chemical Factory(Viet Nam)	Reduce CO2 Emission & Energy Cost	Implementation

3-2. Experience of JCM related Projects(2/2)

◆Commercial Sector

NO	Outline of Activity	Purpose	Phase
1	Replacement or Installation of Saving Energy Type of Chiller or Air-conditioning System into Hotel, Commercial Building and Shopping Mall (Indonesia, Vietnam, Cambodia, Costa Rica)	Reduce CO2 Emission & Energy Cost	Implementation
2	Installation of Mini Co-generation System into Hotel (Indonesia)	Reduce CO2 Emission & Energy Cost	Study
3	Replacement of Refrigerated Show Case into Saving Energy Type (Vietnam)	Reduce CO2 Emission & Energy Cost	Study
4	Replacement of Air-conditioning System, Lighting System and Refrigerated Show Case of Convenience Store into Saving Energy Type (Vietnam, Thailand)	Reduce CO2 Emission & Energy Cost	Implementation
5	Installation of Solar Electricity Generation System on the Roof of the New Building (Malaysia, Thailand), Hospital (Cambodia) , Shopping Mall (Vietnam) and university (Chile)	Reduce CO2 Emission & Energy Cost	Implementation, Study
6	Introduction of EV Bus & Solar Electricity Generation System with Funding Mechanism in an Isolated Island (Vietnam)	Keep Environment and Reduce CO2 Emission	Study
7	Installation of Solar System & Saving Energy Equipments into the Existing School, Building and Hotel, using Environmental Fund & ESCO + Leasing System (Costa Rica)	Reduce CO2 Emission & Energy Cost	Study

3-3. Introduction of Our Project 1.

NTT DATA

Introduction of 8.8MW Power Generation System by Waste Heat Recovery for Cement Plant

Representative Participant

Global Engineering Co., Ltd.

Partner Participant： Shwe Taung Cement Company Limited

Host Country	Myanmar
Year	2018
Type	JCM Model Project
Sector	Renewable Energy

Outline of GHG Mitigation Activity

Status：Installing　JCM Project Cycle：Not registered

Shwe Taung Cement installs a waste heat recovery power generation (WHRPG) system for their cement factory located in Mandalay, which produces 1,500 ton/day of clinker from the existing line and 4,000 ton/day from a new line. This project contributes to mitigating power shortage in Myanmar, and to the CO2 emission reduction by reducing the consumption of natural gas that is a major source of energy in the country.
This WHRPG system consists of an air quenching cooler (AQC) boiler and a latest preheater (PH) boiler which recovers waste heat and converts into power more efficiently.
All the electricity generated from the project is self-consumed at the factory.

3-3. Introduction of Our Project 2.

NTT DATA

2MW Solar Power and 4MWh Storage Battery Project in San Pedro de Atacama City

Representative Participant

Liberal Solution Co., Ltd.

Partner Participant： MGM Innova Capital Chile SpA

Host Country	Chile
Year	2018
Type	JCM Model Project
Sector	Renewable Energy

Expected GHG Emission Reductions

Status：Installing　JCM Project Cycle：Not registered

2,352 tCO2/year

Emission reduction　ERp = REp − PEp　*PEp =0　= Rep

REp = Reference emissions　= [Estimated annual energy generation] x [Emission factor of grid electricity]

= 4,413MWh/year x 0.533 tCO2/MWh

=2,352 tCO2/year

PEp = Project emissions=0

Site of JCM Project

3-3. Introduction of Our Project 3.

NTT DATA

Introduction of 1MW Solar Power System and High Efficiency Centrifugal Chiller in Large Shopping Mall

Representative Participant

AEON MALL Co., Ltd.

Partner Participant： AEONMALL (CAMBODIA)CO., LTD.

Host Country	Cambodia
Year	2016
Type	JCM Model Project
Sector	Energy Efficiency Improvement Renewable Energy

Outline of GHG Mitigation Activity

Status：Active　JCM Project Cycle：Not registered

This project reduces electric power consumption of a new large shopping mall by introducing 1MW-class photovoltaic generation equipment(PV) and high-efficient chiller.

The electricity generated by the PV replaces grid power, resulting in the GHG emission reduction, along with the energy-saving effect by the chiller.

3-3. Introduction of Our Project 4.

NTT DATA

Introduction of High Efficiency Air-conditioning system in hotel (Vietnam, 2015)

MODEL Introduction of High Efficiency Air-conditioning in Hotel

PP(Japan): NTT DATA INSTITUTE OF MANAGEMENT CONSULTING, Inc.
PP(Vietnam): Peace Real Estate Investment Company Limited

Expected GHG Emission Reductions

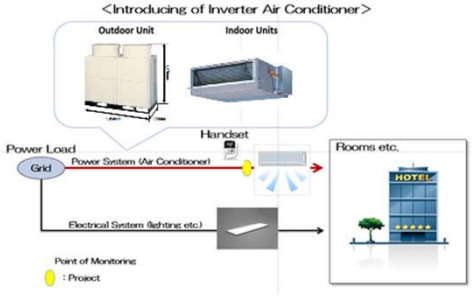
826 tCO_2/ year

Calculated based on the electricity consumptions of non-inverter air conditioner and project air-conditioner as well as grid emission factor in Vietnam (3,412tCO_2/year - 2,586tCO_2/year = 826tCO_2/year).

Outline of GHG Mitigation Activity

While non-inverter air conditioner with poor energy efficiency is popular in hotels in Vietnam, this project is intended to achieve the energy saving as a whole with the introduction of high efficiency air-conditioning system, which is introduced to the new Novotel Suites in Hanoi (total floor area of about 29,000㎡, 17 floors above ground, two floors underground, 200 rooms), and achieves GHG emission reductions from reducing power consumption with introduction of high efficiency air-conditioning.
(Equipment performance : COP 4.53, 73.0kW x 1set, COP4.09, 90kW x 12set, COP4.05, 95.0kW x 2set, COP3.29, 109kW x 1set, COP3.27. 125kW x 1set)

<Introducing of Inverter Air Conditioner>



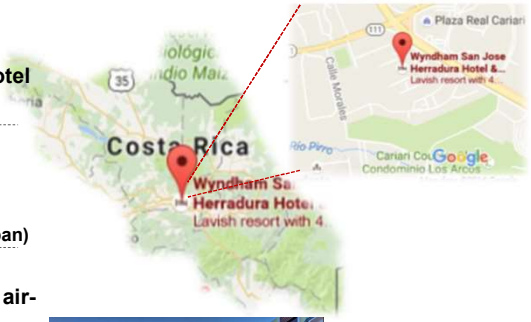
Source：JCM HP

3-3. Introduction of Our Project 5.

NTT DATA

Introduction of the High Efficiency Chiller and the Exhaust Heat Recovery System

Place	**Wyndham San Jose Herradura Hotel (San Jose, Costa Rica)**
Adapted Technology	**1.High Efficiency Chiller (Daikin, Japan)** **2. Exhaust Heat Recovery system Templifier (water heater)(Daikin, Japan)**
Outline of Project	This project aims to improve the energy efficiency of a luxury hotel's **air-conditioning system & hot water supply system** by replacing the existing centrifugal chiller with a high efficiency chiller and existing heavy oil boilers with a water heater utilizing the waste heat from the chiller.



Nos. Room : 229
Floor : 4

4. JCM Survey Program in 2019

4. JCM Survey Program in 2019 ~City of Kitakyushu-IRDA Cooperation Project
Project Overview

Visons for Low Carbon Society: 58% emission reduction from by 2025 using 2010 as base year

- Iskandar Malaysia, in Johor Malaysia, is the second economic city. (Land Area: 2217km^2,Population:about 1.95 million people)
- City of Kitakyushu has been cooperated with Iskandar Regional Development Authority to conduct projects in 2015 and 2016.
- IRDA launched the master plan, Low Carbon Society Blueprint for Iskandar Malaysia 2015, which identifies 3 them and 12 activities to achieve the goal. Forty five programs has been conducted so far.
- Action plan needs to be developed to ensure the goal success considering about the influence of regime change. Furthermore, the activities which has not been integrated yet will be focused on the scope in this project.

Provide Accumulated Know-Hows about Low Carbon Society in 2014
- Introduce low carbon technology which Japanese companies hold
- Introduce Joint Crediting Mechanism to UTM, etc.

Kitakyushu-IRDA Cooperation Project in 2015
- Survey project for expansion of low carbonization project in Iskandar in 2015

Kitakyushu-IRDA Cooperation Project in 2016
- Project to accelerate low carbonization model projects in Iskandar Development Area for Expansion of JCM (Kitakyushu-IRDA Cooperation Project)

City of Kitakyushu ⟷ Cooperative Agreement / LOU ⟷ **IRDA (Iskandar Regional Development Authority)**

Provide Accumulated Know-Hows

Kitakyushu-IRDA Cooperation Project in 2019

Activity 1: Development of an Action Plan based on the master plan

City of Kitakyushu, which has knowledge and experience about the development of a master plan organizing key components of projects, creates an Action Plan based on Low Carbon Society Blueprint for Iskandar Malaysia 2025(Figure1).

Action plan will identify each action steps to achieve the appropriate goal by 2025.

Figure1

Activity 2: Follow-up based on the surveys in 2015 and 2016

Follow-up investigation based on the survey projects in 2015 and 2016 is held. The The following activities are some of expected projects. At least one activity will be implemented as JCM project in 1-2 years. Furthermore, the experience and knowledge will be transferred from the similar potential project to the next.

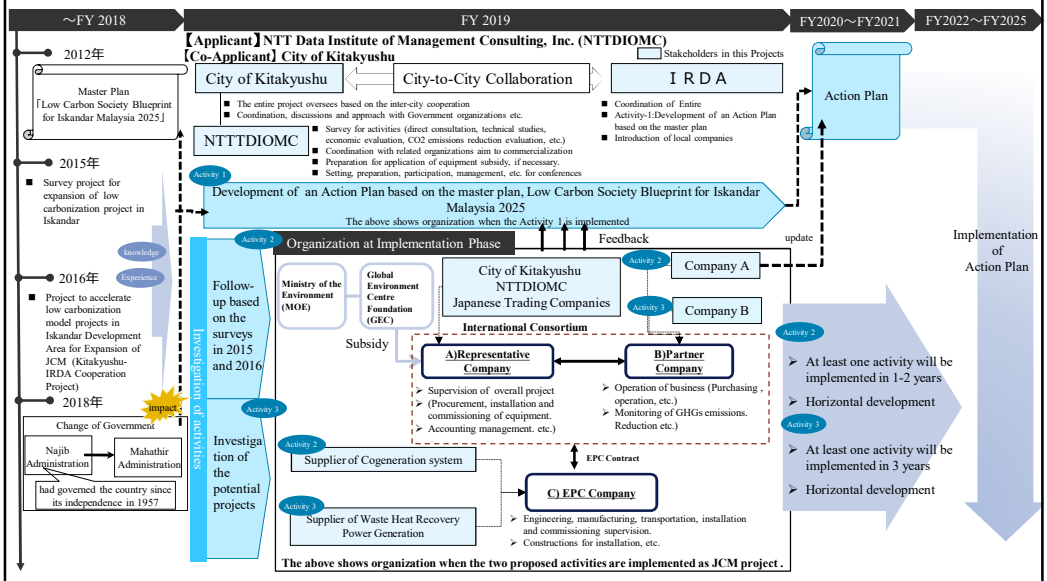
- Expected Project1:Introduction of cogeneration system to Company A in the industrial zone
- Expected Project2:Introduction of roof solar panels

Activity 3: Investigation of the potential projects
(ex. Implementation of Waste Heat Recovery Power Generation

The following activities which are assumed to have potential as JCM projects based on the activity hold in 2016 are investigated. At least one activity will be implemented as JCM project in 1-3 years. Furthermore, the experience and knowledge will be transferred from the similar potential project to the next.

- Expected Project1:Introduction of waste heat recovery power generation system to cement factories
- Expected Project2:Introduction of Waste Heat Recovery System

4. JCM Survey Program in 2019 ~City of Kitakyushu-IRDA Cooperation Project
Summary of Stakeholders and Project Overviews

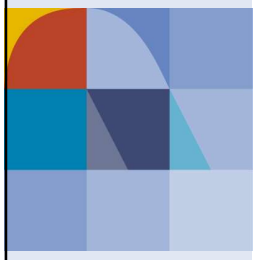


5. JCM Survey Program in 2019

5. Schedule in 2019

NTT DATA

Activity	FY 2019						FY 2020	
	7月	8月	9月	10月	11月	12月	1月	2月
Activity 1 Development of an Action Plan based on the master plan		☆ Kick Off MTG (with Local Government)	→	2nd Filed Survey ・Discuss about Action Plan Draft	→	3rd Filed Survey ・Develop Action Plan Draft	→	
Activity 2 Follow-up based on the surveys in 2015 and 2016		☆ Kick Off MTG	1st Filed Survey ・Discuss about follow-up based with potential companies →		2nd Filed Survey ・Discuss about the latest needs of system with the potential companies →		3rd Filed Survey ・Discuss JCM formulation with Candidate entering to smart city (Technical, economical, CO2 reduction, etc..) →	
Activity 3 Investigation of the potential projects		☆ Kick Off MTG	1st /2nd Filed Survey ・ Introduce about JCM scheme and discuss about the potential with companies →			3rd Filed Survey ・ Discuss about the needs of system with the potential companies →		
○ Filed Study		●		●		●		
○ Meeting with MOE		● Kick-off		● Middle Meeting			● Final Meeting	
○ Final Reporting								● Submit



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