FY2016
Feasibility Study of Joint Crediting Mechanism Project by City to City Collaboration

Project for Development of JCM Projects under City to City Collaboration between Batam City and City of Yokohama (Energy Saving Sector: BIFZA)

Report

March 2017

Nippon Koei Co., Ltd.
City of Yokohama (Y-PORT center)
iFORCOM Tokyo Co., Ltd.
FY2016
Feasibility Study of Joint Crediting Mechanism Project
by City to City Collaboration

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(Energy Saving Sector: BIFZA)

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# ABBREVIATION

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIFZA</td>
<td>Batam Indonesia Free Zone Authority</td>
</tr>
<tr>
<td>GHG</td>
<td>Greenhouse Gas</td>
</tr>
<tr>
<td>IGES</td>
<td>Institute for Global Environmental Strategies</td>
</tr>
<tr>
<td>INDC</td>
<td>Intended Nationally Determined Contributions</td>
</tr>
<tr>
<td>JCM</td>
<td>Joint Crediting Mechanism</td>
</tr>
</tbody>
</table>
CHAPTER 1 OVERVIEW OF THE PROJECT

1.1 PURPOSE OF THE PROJECT

Japan Government submitted INDCs (Intended Nationally Determined Contributions) to UNFCCC (United Nations Framework Convention on Climate Change) last year, and the target reduction of GHG (Green House Gases) emission, as a feasible target by energy mix, is 26.0% (approximately 1,042,000,000 t-CO$_2$), compared to the emission in FY 2013 (25.4% in FY 2005). The target year to achieve is FY 2030. Japan Government intends to count reduction of GHG emission with Joint Crediting Mechanism (JCM) as Japan’s reduction/sink. Japan Government introduce technologies, products, system, service and infrastructure that reduce GHG emission to developing countries, and will evaluate the reduction quantitatively for the counts. Japan must produce substantial JCM projects to achieve the reduction target using JCM.

Indonesian Government has promised to reduce 29% of GHG emission compared to Business as usual (BAU) according to their INDC, and in case JCM is introduced using international assistance, their target is 41% in the INDC. Therefore, Indonesia has strong expectation to implementation of JCM, which Indonesia and Japan signed for, taking account of the achievement of the target in the INDC.

Population in Batam city is about 1,200,000, and located in Riau Archipelago Province, distance to south coast of Singapore is about 20 km. The city is developing with Batam Island development agreement (1980) and economic cooperation agreement for development of the province (1990) through collaborative development with Singapore and Johor Province in Malaysia. However, thus, several problems such as solid waste disposal and sewage treatment has been appearing. Sufficient energy use is also an issue, while many factories has constructed mainly in industrial complexes, Batam city has designated as free trade zone. Batam city and Yokohama city have implemented technical cooperation since FY 2015, and as a 1st City-to-City Collaboration Project, FY 2015 JCM Project Formulation Study for Realizing Low Carbon Cities in Asia, Ministry of Environment, was implemented. The purpose of this project is to formulate JCM projects using information obtained during the survey, for reduction of GHG emission in Batam area.
1.2 PROJECT IMPLEMENTATION

Based on the preparatory study conducted in FY2015, the energy saving project to install air conditioning system with advanced technology at Hang Nadim International Airport has been formulated to apply to JCM Model Project in FY2016. The same advanced technology is planned to be introduced in a hospital (Otoria BATAM, one facility) and ferry terminals (six facilities including Sekupang) under Batam-Indonesia Free Zone Authority (BIFZA).

BIFZA succeeded its responsibility from its former organization, Batam Industrial Development Authority (BIDA) by Presidential Order No.41 in 1973 at the time of Batam area development. Since then, BIFZA has been the key authority responsible for the industry development of Batam for a long period.

The preliminary study for the above project has already been started. In this fiscal year, detailed survey was conducted including calculation of possible energy saving and estimation of project cost and recovery year. Based on the result, detailed discussion was held with partners toward application of JCM Model Project.

Survey items and survey methods to formulate JCM Model Project are as follows.

<table>
<thead>
<tr>
<th>#</th>
<th>Survey Item</th>
<th>Survey Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Consideration of JCM Project Formulation</td>
<td></td>
</tr>
</tbody>
</table>
| 1-1| Detail design and calculations of economic effects with introduction of Energy Solution | ・Discussion with BIFZA  
・Excision of solution cost estimation  
・Effectiveness survey of alternative fuel made from regenerated fuel oil in case it is used for newly introduced boiler  
・Survey of regenerated fuel oil market and multifaceted utilization method  
・Confirmation of disassemble cost of existing facilities and method |
| 1-2| Establishment of monitoring plan                                           | ・Explanation of monitoring method to BIFZA  
・Discussion with BIFZA and related people  
・Establishment of monitoring plan and cost estimation |
| 1-3| Confirmation of order and contract by Mega Green accompany the project implementation | ・Discussion of project formation with BIFZA  
・Confirmation of funding method by BIFZA  
・Confirmation of contract format by BIFZA, and so on |
| 1-4| Arrangement of detail condition in the consortium towards application to JCM Model Project | ・Explanation of JCM Model Project  
・Discussion of MOU for international consortium, and so on |
| 1-5| Estimation and planning for                                                | ・Collection of information about energy-saving potential |
| 1-6 | Confirmation of procedure to obtain environmental certificate | • Confirmation of certificate for project implementation and preparation to obtain  
• Survey for disposal or utilization of processed sludge |
| 1-7 | Confirmation regarding operating body and plan | • Selection of project participant who is in charge of O&M after commencement of the project, and discussion  
• Preparation of operation plan  
• Consideration of utilization of natural gas infrastructure  
• Consideration of synergy with material recycling |

2. Participation and presentation in related meetings

| 2-1 | Participation in high-level meeting (if necessary) (one person) | • If requested by Ministry of Environment Japan, project participants will participate and make a presentation in high-level meeting that would be held in Bangkok |
| 2-2 | Participation in COP22 (if necessary) (one person) | • If requested by Ministry of Environment Japan, project participants will participate and make a presentation in COP 22 to be held in Marrakech |

Source: Nippon Koei

1.3 BACKGROUND AND PRESENT CONDITION OF CITY-TO-CITY COLLABORATION

Batam City was one of priority areas at “17th economical cooperation and infrastructure strategy meeting on March 20, 2015 (the theme was Indonesia)”, and cooperation schemes
were discussed as pioneering cases, JCM Model Project by Ministry of Environment Japan and Private Sector Investment Finance by JICA. Batam City is now under the spotlight among Japanese companies that are interested in overseas operation.

In January 2011, Yokohama City launched Y-PORT Project, international technical cooperation project utilizing material and technology in Yokohama, which is core project for the policy, supporting overseas infrastructure business of enterprises in Yokohama, under “Midterm 4-year plan 2014-2017”, proceeding with overseas infrastructure business through public and private collaboration. In May 2015, Yokohama City established “Y-PORT Center” to advance public private collaboration as a platform to accelerate joint projects between enterprises in Yokohama and international organizations.

In the above situation, Mayor of Batam City visited to Japan on May 27, 2015, and signed on MOU regarding technical cooperation with Yokohama City. Yokohama City and Batam City have following activities through “FY 2015 JCM Project Formulation Study for Realizing Low Carbon Cities in Asia” that is the 1st project of Y-PORT Center.

<table>
<thead>
<tr>
<th>Date</th>
<th>Project identification</th>
<th>FS</th>
<th>Place</th>
</tr>
</thead>
<tbody>
<tr>
<td>20-24/April/2015</td>
<td>Inception meeting</td>
<td>—</td>
<td>Batam</td>
</tr>
<tr>
<td>25-27/May/2015</td>
<td>Visit to Yokohama (Sign on MOU)</td>
<td>—</td>
<td>Yokohama</td>
</tr>
<tr>
<td>17-21/August/2015</td>
<td>Business matching</td>
<td>Inception meeting</td>
<td>Batam</td>
</tr>
<tr>
<td>19-23/October/2015</td>
<td><strong>JCM Workshop, Asia smart-city meeting, site inspection, etc.</strong></td>
<td></td>
<td>Yokohama</td>
</tr>
<tr>
<td>30/November-1/December/2015</td>
<td>Small scale workshop with companies that BIFZA selected</td>
<td>Follow up of the survey and opinion exchange</td>
<td>Batam</td>
</tr>
<tr>
<td>20/January/2016</td>
<td>Final debrief session (including enterprises)</td>
<td>Task force team consists of 4 entities (founding declaration)</td>
<td>Batam</td>
</tr>
</tbody>
</table>

Source: Nippon Koei

Director General of Environment Bureau of Batam City and Managing Director of Planning Coordination Bureau of BIFZA recommended establishing a special window at JCM workshop organized by the Ministry of Environment Japan in Yokohama City in October 2015. Then, establishment of a task force (described in the following table) that comprises
four entities (Batam City, BIFZA, Yokohama City and IGES) was approved. This project has planned to make further horizontal development as the 1st project that centers on the task force.

<table>
<thead>
<tr>
<th>Entity</th>
<th>Department</th>
</tr>
</thead>
<tbody>
<tr>
<td>Batam City</td>
<td>Environmental Impact Management Board</td>
</tr>
<tr>
<td></td>
<td>Development Planning Board</td>
</tr>
<tr>
<td></td>
<td>MSW Management Project</td>
</tr>
<tr>
<td>BIFZA</td>
<td>Deputy Chairman of Other Business Facilities</td>
</tr>
<tr>
<td></td>
<td>Directorate of Promotion and Public Relations</td>
</tr>
<tr>
<td></td>
<td>Bureau of Program Planning and Research &amp; Development</td>
</tr>
<tr>
<td>Yokohama City</td>
<td>Development Cooperation Division, International Affairs Bureau</td>
</tr>
<tr>
<td>IGES</td>
<td>Climate and Energy Area</td>
</tr>
</tbody>
</table>

Source: Nippon Koei
CHAPTER 2 SCHEDULE AND PROJECT IMPLEMENTATION FRAMEWORK

2.1 WORK SCHEDULE

Major activities of this project in this fiscal year is as follows.

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 2016</td>
<td>Kick off meeting at Ministry of Environment Japan</td>
</tr>
<tr>
<td>July 2016</td>
<td>Kick off meeting at Batam</td>
</tr>
<tr>
<td>Aug. 2016</td>
<td>Establishment of task force for City-to-City collaboration</td>
</tr>
<tr>
<td>Aug 2016</td>
<td>Progress debrief meeting at Ministry of Environment Japan</td>
</tr>
<tr>
<td>October 2016</td>
<td>Study tour in Japan</td>
</tr>
<tr>
<td></td>
<td>Seminar for City-to-City Collaboration Project in Kitakyusyu City</td>
</tr>
<tr>
<td>November 2016</td>
<td>Participation in COP22 (presentation by a staff of Yokohama City) in Marrakech, Morocco Batam investment seminar in Yokohama City</td>
</tr>
<tr>
<td>December 2016</td>
<td>Progress debrief meeting at Ministry of Environment Japan</td>
</tr>
<tr>
<td>December 2016</td>
<td>Discussion of project map</td>
</tr>
<tr>
<td>January 2017</td>
<td>Final seminar in Batam</td>
</tr>
<tr>
<td></td>
<td>City-to-City Collaboration Project seminar in Tokyo</td>
</tr>
<tr>
<td>February 2017</td>
<td>Completion of project map (1st draft)</td>
</tr>
<tr>
<td>March 2017</td>
<td>Final debrief meeting at Ministry of Environment Japan</td>
</tr>
<tr>
<td>March 2017</td>
<td>Proposal for City-to-City Collaboration Project in FY 2017</td>
</tr>
<tr>
<td>April-May 2017</td>
<td>Proposal for JCM Model Project in FY 2017</td>
</tr>
</tbody>
</table>

Source: Nippon Koei

Field trip, participation of meetings, and study tour in Japan has been carried out as follows.

<table>
<thead>
<tr>
<th>No</th>
<th>Title</th>
<th>Period</th>
<th>Work Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1st Field Trip</td>
<td>1-4/June/2016</td>
<td>Discussion with Batam City and BIFZA</td>
</tr>
</tbody>
</table>
| 2   | 2nd Field Trip | 12-16/July/2016 | Discussion with BIFZA  
<p>|     |             |                 | Kick of Seminar in Batam Island (14 July)             |
|     |             |                 | Courtesy call to Chief of BIFZA and Mayor of Batam City |
|     |             |                 | Discussion with Ferry Terminal Batam Center           |
|     |             |                 | Discussion with Ferry Terminal Sekupang               |
|     |             |                 | Discussion with Ferry Terminal Batam Harbour Bay      |</p>
<table>
<thead>
<tr>
<th>No</th>
<th>Title</th>
<th>Period</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>3rd Field Trip</td>
<td>10-25/August 2016</td>
<td>✷ Discussion with Ferry Terminal Telaga Punggur</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>✷ Discussion with Ferry Terminal Nongsa</td>
</tr>
<tr>
<td>4</td>
<td>4th Field Trip</td>
<td>21/Nov-10/Dec 2016</td>
<td>✷ Discussion with Ferry terminal Batam Center</td>
</tr>
<tr>
<td>5</td>
<td>5th Field Trip</td>
<td>18-20/January 2017</td>
<td>✷ Final seminar</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>✷ Discussion with BIFZA and Batam City</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>✷ Courtesy call to Chief of BIFZA and Mayor of Batam City</td>
</tr>
<tr>
<td>6</td>
<td>6th Field Trip</td>
<td>21-24/February 2017</td>
<td>✷ Report of FS result</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>✷ Discussion regarding green building</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>✷ Discussion with BIFZA and Batam City</td>
</tr>
</tbody>
</table>

Source: Nippon Koei

Table 2-3: Schedule of Study Tour in Japan

<table>
<thead>
<tr>
<th>No</th>
<th>Title</th>
<th>Period</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1st Study Tour</td>
<td>17-21/October 2016</td>
<td>✷ Discussion with Yokohama City</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>✷ Site observation of facilities of Finetech Co., Ltd.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>✷ Site observation of technology introduction facilities of iFORCOM Tokyo Co., Ltd</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>✷ Participation in City-to-City collaboration seminar</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>✷ Site observation of low carbon technology and project in Kitakyusyu City</td>
</tr>
<tr>
<td>2</td>
<td>2nd Study Tour</td>
<td>22-24/January 2017</td>
<td>✷ Site observation of technology introduction facilities of iFORCOM Tokyo Co., Ltd</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>✷ Discussion with Yokohama City</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>✷ Site observation of enterprises in Yokohama City</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>✷ Participation in City-to-City collaboration seminar</td>
</tr>
</tbody>
</table>

Source: Nippon Koei

Table 2-4: Participation in International Session

<table>
<thead>
<tr>
<th>No</th>
<th>Title</th>
<th>Period</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Participation in COP</td>
<td>8/November 2016</td>
<td>Participation in COP (Marrakech)</td>
</tr>
</tbody>
</table>

Source: Nippon Koei
2.2 PROJECT IMPLEMENTATION FRAMEWORK

Project implementation framework is as follows.

Source: Nippon Koei

Figure 2-1: Project Implementation Framework
CHAPTER 3 FEASIBILITY STUDY OF JCM PROJECT

3.1 OUTLINE OF FACILITIES FOR INTRODUCTION OF ENERGY SOLUTION, AND CALCULATION OF ECONOMIC EFFECT

1. Design in the energy saving facilities to facilities of the central air conditioning and the operative improvement consulting introduction

I. Targets
   Ferry Terminal Sekupang

II. Energy saving equipment design
   a) Hearing survey was conducted for following items and possibility of facility improvement was examined.
      - Number of Chillers (operating number)
      - Operating time of Chillers
      - Capacity of Chillers
      - Number of Circulating Pump (operating number)
      - Operating time of Circulating Pump
      - Capacity of Circulating Pump

   b) Inverter control of circulating pump (cooling pump)
      Inverter control is usually set year around, but to control in terms of operation improvement, it is recommended that control values are adapted with the fluctuation of temperature in rainy season, dry season, weekdays and weekend.

   c) Remote control system of inverter
      Values mentioned above can be controlled from Japan, and in case the inverter would not be controlled on site, it will be able to control from Japan.

III. Operative improvement
      Air conditioning method that doesn’t impair the effect with low energy consumption, environmental improvement to reduce energy consumption, improvement of operation procedure, among those, an optimized method will be recommended to realize energy
saving that doesn’t make negative impact to productivity and structure.

2. Design in the energy saving facilities to facilities of the separate type and the operative improvement consulting introduction

I. Targets
   Ferry Terminal Batam Center
   Ferry Terminal Harbour Bay
   Ferry Terminal Nongsa

II. Suggestion for Energy saving facilities
   a) Possibility of facility improvement was examined with hearing survey of following items.
      Air conditioning system
      Number and capacity of outdoor unit
      Introduction of inverter
   b) Cyclic control of compressor of outdoor unit
      A system to turn off the compressor of outdoor unit except at rising.
      It is usually able to control twice in 30 minutes, for 3-5 minutes each time.
      Rise/down schedule is recommended per the fluctuation of temperature, to control from the viewpoint of operation improvement.
      Indoor condition survey and operation test are quite important as room temperature rise might happen with halt of outdoor unit.
   c) Remote operation system of Cyclic control
      Above set values can be controlled from Japan, and in case it could not be controlled on site, it will be able to control from Japan.

![BeLinks cloud system for energy saving](source)

Source: iFORCOM Tokyo

**Figure 3-1: Remote operation system of Cyclic control**
III. Operative improvement
Air conditioning control method that doesn’t impair the effect with low energy consumption, environmental improvement to reduce energy consumption, improvement of operation procedure, among those, an optimized method will be recommended to realize energy saving that doesn’t make negative impact to productivity and structure.

IV. Consulting design for operative improvement
   a) Site survey
      Hearing survey of following items was conducted to examine operation improvement.
      Number of outdoor units (actually operating unit)
      Operating time of outdoor units
      Capacity of outdoor units
      Indoor temperature
      Indoor illuminance

   b) Tuning and shortening of rise/down time
      Following operations are likely to be improved taking account of indoor temperature.
      Shortening operation time of outdoor units
      Control the number of outdoor units
      Making a rule to set indoor temperature
      Maintenance of indoor temperature by the control of intake and exhaust (reduction of load of outdoor unit compressor)
3. Economic Effects
   I. Ferry Terminal Nongsa

   **Reduction potential and power trend**

   ![Graph showing reduction potential and power trend]

<table>
<thead>
<tr>
<th>Reduction amount</th>
<th>Estimation conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>15,836 kWh/year</td>
<td>Calculated using the reduction coefficient of Japan</td>
</tr>
<tr>
<td>9,000 kWh/year</td>
<td>The safety factor of the reduction coefficient it was 20%</td>
</tr>
<tr>
<td>0 kWh/year</td>
<td>Energy charge “ID 800”</td>
</tr>
<tr>
<td></td>
<td>Operation is calculated as those that are used as well for two years.</td>
</tr>
</tbody>
</table>

   Total 24,836 kWh

   Reduction amount/year \( \equiv \) IDR 19,904,779

   Source: iFORCOM Tokyo

   **Figure 3-2: Reduction potential and power trend**

3.2 MONITORING PLAN

1. Central air conditioning type

   Measurement function
   a) Real time measurement

   Measurement and display of electricity data every 10 minutes are executed.
   Importance of real time measurement is appeared to improve operation.

   Because it is possible to confirm the result promptly from air conditioning control method
   that doesn’t impair the effect with low energy consumption, environmental improvement to
   reduce energy consumption, and improvement of operation procedure.

   b) Remote monitoring

   Monitoring situation can be controlled from Japan, and it is possible to confirm from Japan
whether operation improvement is implemented.

c) Analysis function

Several analyses will be implemented from electric power data at every 10 minutes. Representative displays are as follows.

![Source: iFORCOM Tokyo](image)

**Figure 3-3: Graph (one day)**

![Source: iFORCOM Tokyo](image)

**Figure 3-4: Graph (one week)**

![Source: iFORCOM Tokyo](image)

**Figure 3-5: Graph (one month)**
2. Separate type (EHP)
   a) Real time measurement
   Measurement and display of electricity data every 10 minutes are executed. Importance of real time measurement is appeared to improve operation. Because it is possible to confirm the result promptly from air conditioning control method that doesn’t impair the effect with low energy consumption, environmental improvement to reduce energy consumption, and improvement of operation procedure.

   b) Remote monitoring
   Monitoring situation can be controlled from Japan, and it is possible to confirm from Japan whether operation improvement is implemented.

   c) Analysis function
   Several analyses will be implemented from electric power data at every 10 minutes Representative displays are as follows.

*Note) Source: iFORCOM Tokyo (all figures)
FY2016 Feasibility Study of Joint Crediting Mechanism Project by City to City Collaboration
Project for Development of JCM Projects under City to City Collaboration between Batam City and City of Yokohama
(Energy Saving Sector: BIFZA)
Report

Figure 3-8: Graph (one day)

Figure 3-9: Graph (one week)

Figure 3-10: Graph (one month)
3.3 CONFIRMATION OF PROCEDURE FOR CONTACT WITH LOCAL CONTRACTOR

BIFZA

According to the Presidential Order No. 41 (1973), BIFZA had played a key role in industrial development, as Batam Industrial Development Authority: BIDA during Batam development period.

June 25, 2006, Indonesian Government and Singapore Government signed on “Special Economic Area Cooperation Agreement in Batam, Bintan and Karimun Islands”, agreeing that both countries would cooperate to establish Special Economic Zones: SEZs. Both countries established industrialization area in the islands, and designated Free Trade Zone: FTZ in August 2007. BIDA that was organization under the President restructured the organization in 2009, similar development organizations were established in Bintan and Karimun Islands, and the three organizations were placed under Riau Islands. BIDA that targeted only Batam area changed the name to Batam-Indonesia Free Zone Authority: BIFZA.
Thus, BIFZA that is reliable in the structure and finance is adequate as the stakeholder (counterpart) of the project. Furthermore, the chief of BIFZA has made high evaluation to the performance of City-to-City Collaboration between Batam and Yokohama. The chief has interest to the energy saving project at Hang Nadim airport, and as its horizontal development, the chief is cooperative this survey that targets to the other facilities under BIFZA.

<table>
<thead>
<tr>
<th>No</th>
<th>Ferry Terminal</th>
<th>Management</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ferry Terminal Sekupang</td>
<td>Private</td>
</tr>
<tr>
<td>2</td>
<td>Ferry Terminal Batam Center</td>
<td>Private</td>
</tr>
<tr>
<td>3</td>
<td>Ferry Terminal Telaga Punggur</td>
<td>BIFZA</td>
</tr>
<tr>
<td>4</td>
<td>Ferry Terminal Harbour Bay</td>
<td>Private</td>
</tr>
<tr>
<td>5</td>
<td>Ferry Terminal Marina City</td>
<td>Private</td>
</tr>
<tr>
<td>6</td>
<td>Ferry Terminal Nongsa</td>
<td>Private</td>
</tr>
<tr>
<td>7</td>
<td>Rumah Sakit Otorita Batam</td>
<td>BIFZA</td>
</tr>
</tbody>
</table>

Source: iFORCOM Tokyo

1. **Ferry Terminal Sekupang**

Ferry Terminal Sekupang located at JL RE Martadinata, Kepulauan Riau 29433, Indonesia is operated by PT Indodharma Corpora. PT Indodharma Corpora was established in Jakarta in 1997 along with developments of economy sector and rising industries. PT Indodharma Corpora supports utility, port, inter modal logistic and export services, and experienced experts are working for the enterprise.

Contact person

- Person in charge: Julmarly
  Position: General Manager
- Person in charge: Jhonson Gultom
  Position: Chief Engineering

2. **Ferry Terminal Batam Center**

Ferry Terminal Batam Center located at Jalan Engku Putri (Batam Center), Kelurahan Teluk Tering, Batam Kota, Batam 29461 Indonesia is operated by PT Indodharma Corpora.

Contact person
3. **Ferry Terminal Telaga Punggur**
Ferry Terminal Telaga Punggur located at Jalan Patimura (Telaga Punggur), Batam, Kepulauan Riau, Indonesia is under construction by BIFZA.

4. **Ferry Terminal Harbour Bay**
Ferry Terminal Harbour Bay located at Jalan Duyung, Kelurahan Sei Jodoh, Batu Ampar, Batam 29453 Indonesia is operated by PT Citra Tritunas

Contact person
- Person in charge : Sugiarto
  Position : Director
- Person in charge : Budi
  Position : Chief Engineering

5. **Ferry Terminal Marina City**
Ferry Terminal Marina City is located at Tj. Riau, Marina City, Sekupang, Kota Batam, Kepulauan Riau, Indonesia

6. **Ferry Terminal Nongsa**
Ferry Terminal Nongsa located at Jl. Hang Lekiu, Sambau, Batam, Kota Batam, Kepulauan Riau 29465, Indonesia is operated by Nongsa Terminal Bahari

Contact person
- Person in charge : Muhammad Ghazali Malik
  Position : Director

7. **Rumah Sakit Otorita Batam**
Rumah Sakit Otorita Batam is a national general hospital located at Dr. Cipto Mangunkusumo, Sekupang, Batam, Kepulauan Riau. This hospital established in 1971, and 1st hospital in Batam. According to the Ministerial order 437/MENKES/SK/V/2002, this
hospital is Type-B, and it has social provider license by Ministerial order YM.02.04.2.2.098 in June 22, 2002. Currently the hospital is expanding based on their masterplan. When they spend their budget, they need to make tenders as it is national general hospital. They are considering if they can join the Hang Nadim airport project, JCM project by BIFZA.

Contact person
- Person in charge: dr. Zul Indra, MM
  Position: Director
- Person in charge: Feri Nawa Pamungkas, SE., MARS
  Position: Deputy General Director and Finance

3.4 CORDINATION FOR DETAILED CONDITIONS OF CONSORTIUM FOR JCM MODEL PROJECT

International consortium to apply to JCM Model Project will be formulated with each ferry terminal. Hence, the number of consortium is the number of ferry terminal that may participate in the project. Assumed consortiums are as follows.

3.5 ASSESSMENT AND PLAN FOR INTRODUCING ENERGY SAVING SOLUTIONS IN INDONESIA

Needs of energy saving and potential of solution introduction were surveyed. There are potential CO₂ reductions about target ferry terminals as the regulation of air conditioner is directly corresponding to energy use. On the other hand, it is difficult to make JCM project as each scale is small. If it is possible to apply some candidates together, the project would be attractive and able to formulate JCM project.

Compared to the CO₂ reduction with facility improvement, the reduction amount of operation improvement and control of each site is small, but the method is applicable to any types of business. Therefore, with integrated approach that intergrades enterprise group, industrial complex, and local government, project size would expand, and emission reduction would largely decrease. Such energy management makes large scale energy saving, and suit to green island framework of Batam City. Therefore, formulation of JCM project could be accelerated.
It is, from now on, necessary to deem the scale and timeline, to aim to formulate attractive JCM projects, not with each enterprise but with industry and association, and to expand project scale with horizontal development for the efficient implementation of emission reduction.

3.6 CONFIRMATION OF CONTRACT WITH EQUIPMENT MANUFACTURES AND SYSTEM DEVELOPER

Through the study, providers of the equipment and systems (3 companies in Japan) agreed to provide their technologies for the JCM project in Indonesia.
CHAPTER 4 HARMONIZATION OF JCM MODEL PROJECT AND THE MASTER PLAN OF BIFZA/BATAM CITY

4.1 FORMULATION OF TASK FORCE

“JCM Project Formulation Study through City-to-City Collaboration between Batam City and Yokohama City” funded by the Ministry of Japan has been conducted since FY 2015, and to firmly advance the project formulation, a task force was established this year. The purpose is to produce a sustainable urban development in Batam City, and the members are Yokohama City, Batam City, and stakeholders of City-to-City collaboration.

Major role of the task force are as follows.

(i) Regarding activities under JCM, all solutions of issues and support are implemented.

(ii) Not only JCM, priority projects are identified based on the expertise of urban development and advanced environmental technology of enterprises of Yokohama City. Using those, City-to-City collaboration is proceeded with in a wide range of areas, e.g. project map making to visualize smart green island concept in Batam City.

Responsible organization of the task force is as follows.

(a) Batam side

(i) Batam City:
   Environmental Control Board

(ii) BIFZA:
   Deputy Chairman of Other Business Facilities

(b) Yokohama side

(i) Yokohama City (Y-PORT center):
   - International Cooperation Department, International Bureau

(ii) IGES (Y-PORT center):
   - Climate change and energy division

During implementation period of the JCM study, related people agreed that Nippon Koei would be secretariat of the task force. The secretariat of the task force supports that members
of the task force would make good communication and they could advance the study without any delay.

4.2 STUDY OF MASTER PLANS OF BIFZA AND BATAM CITY

In this project, the project maps were developed to arrange the orientations of city-to-city collaboration between Batam and Yokohama. The flow is shown below. At first, the master plans of BIFZA and Batam City were collected and studied.

![Flow of Project Map Development](image)

Source: Nippon Koei

**Figure 4-1: Flow of Project Map Development**

Summary of the master plans studied are shown as below.

<table>
<thead>
<tr>
<th>Master Plans</th>
<th>Outlines of Master Plan</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RPJMD</strong></td>
<td>Midterm (5 year) development plan of Batam City, whose target period is 2016-2020. It was revised after the new Mayor was appointed in 2016. Following 6 missions are addressed in the plan. 1. Good Governance 2. Human Resource Development 3. City with Comfort 4. Strengthening and diversifying industry 5. Community development 6. Rural area development</td>
<td>Plans mostly covers the activities funded by the city’s budget</td>
</tr>
<tr>
<td><strong>Green City Program</strong></td>
<td>Batam City is preparing Green City Program with the support of ADB. Target year is 2050. 3 pillars of the program consist of 1. Safe and comfortable city 2. Green city which is resilient to climate change and disasters 3. Smart city which has competitiveness and technologies</td>
<td>To be finalized soon</td>
</tr>
</tbody>
</table>
### Green City Action Plan

<table>
<thead>
<tr>
<th>Green City Action Plan</th>
<th>Detail action plan based on Green City Program</th>
<th>Everything are not yet budgeted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Priority program: 19, Selected projects: 9</td>
<td>To promote industry and business, following 5 strategies are raised. 1. Improvement of investment and business environment, 2. Improvement of integrated promotion system, 3. Development and improvement of infrastructure, 4. Regulation and institution, and 5. Improvement and development of human resources.</td>
<td></td>
</tr>
</tbody>
</table>

### BIFZA Development Strategy


Source: summary of each plan by Nippon Koei

### 4.3 PROJECT MAP

In this project, the objectives of project maps are arranged as below.

1. A Tool to build mutual understanding on the direction of city-to-city collaboration between Batam and Yokohama
   - Needs of Batam towards green city
   - Green technologies and partners of Yokohama

2. A tool enabling to invite outside support more smoothly, such as from Government of Japan (MoE, METI, JICA, etc.), Government of Indonesia (APBN, etc.), development banks and private investors

The expected activities and technologies in need in Batam are summarized as below and information was disseminated through the public information system of City of Yokohama (ex. Y-Port Newsletter and related seminar) and seminars conducted by the project.
Since RPJMD (midterm development plan of Batam City) summarizes mostly the plans which can be implemented by city budget (APBD) and administration of Batam island is unique in the sense that not only City Government but BIFZA holds the authority to promote infrastructure development, the project arranges the concept of green island under city-to-city collaboration from following 6 core aspects through the discussion with Batam side.

### Table 4-3: 6 Core Aspects of Green Development

<table>
<thead>
<tr>
<th>Core Aspects</th>
<th>Reason of setting the aspect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Planning</td>
<td>Followings are in need by the government officials:</td>
</tr>
<tr>
<td></td>
<td>- Mainstreaming of climate change mitigation and adaptation is required for master plans such as spatial plan, energy saving plan and water resource management plan</td>
</tr>
<tr>
<td></td>
<td>- Setting GHG reduction target</td>
</tr>
<tr>
<td>Green Water</td>
<td>Water is considered to be in shortage within 10 years and the bottleneck of carrying capacity of Batam Island is studied to be the water issue (without countermeasures, population of 1.7 million is</td>
</tr>
</tbody>
</table>
the maximum allowable population who can live in Batam island sustainably. In the near future, best mix of rainwater, recycled water and desalination water is needed to be achieved.

**Green Waste**

The population is in the increasing trend and industrial waste is also significant from industrial parks, thus the appropriate management of the final disposal site, introduction of waste to energy plant, and development of industrial waste treatment plant are required.

**Green Industry**

There are many industrial parks since Batam is Free Trade Zone, thus the improvement is needed for energy saving in industry, energy management with peak cut technology, sustainable production (such as water and waste) etc.

**Green Building**

More than 25 high buildings (20-40 stories) are planned to be constructed within several years in Batam and introduction of green building concept is needed soon.

**Green Transportation**

Though public and smart transport is limited in Batam, introduction of LED streetlight, BRT and LRT are planned and low carbon development in the transportation sector is expected.

Source: Nippon Koei

Following is the arranged information in accordance with the 6 core aspects. Details are in Attachment 6.

### Table 4-4: Project Map

#### Tables of the Project Map (As of 2 March 2017)

<table>
<thead>
<tr>
<th></th>
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</tr>
</tbody>
</table>

Source: Nippon Koei
For some sectors, visualized project maps are prepared. Examples are shown below.

**Figure 4-2: Project Map: Green Water**

Source: Nippon Koei

**Figure 4-3: Project Map: Green Industry**

Source: Nippon Koei
4.4 INVITATION TO JAPAN (CITY OF YOKOHAMA, JCM SEMINAR(KITA-KYUSYU), BIFZA INVESTMENT SEMINAR, JCM SEMINAR (TOKYO))

[Invitation to Yokohama City, JCM seminar (Kitakyuusyu City)]
The Study invited staff from BIFZA and Batam City respectively, when JCM seminar organized by the Ministry of Environment Japan was held in Kitakyuusyu City on 20th and 21st October 2016, the period of their trip was from 17th - 21st October 2016. They observed energy saving technology in a factory of iForcom Tokyo and Smart Green Park of Finetech that these companies participate in the Study in this Fiscal Year. They discussed on the progress, issues, and countermeasures of the project at the sites from 17th – 19th October. In JCM seminar, they presented regarding the project and observed facilities of low carbon technologies in Kitakyuusyu.

<Invitation and observation of facilities in Yokohama>
FY2016 Feasibility Study of Joint Crediting Mechanism Project by City to City Collaboration
Project for Development of JCM Projects under City to City Collaboration between Batam City and City of Yokohama
(Energy Saving Sector: BIFZA)

Report

Smart Green Park of Finetech

Shiroyama Industry that use energy saving system of iFORCOM Tokyo

Source: Nippon Koei

<JCM seminar in Kitakyuuusyu City>

Presentation by Mr. Azril, Batam City

Presentation by Mr. Okuno, Yokohama City

Source: Nippon Koei
<Facilities of low carbon technology in Kitakyusyu City>

Environmental Museum  
Next-generation energy park (wind power energy)

Next-generation energy park (EV bus)  
Kougasaki factory

Source: Nippon Koei

[BIFZA investment seminar (City of Yokohama)]
On 25th of November 2016, the seminar of Investment in Batam Free Zone was held by BIFZA in City of Yokohama.

<table>
<thead>
<tr>
<th>Time</th>
<th>Program</th>
<th>Speaker</th>
</tr>
</thead>
</table>
| 14:00-14:10| Opening remarks                                   | Mr. Ben Perkasa DRAJAT  
(Deputy Chief of Mission, Indonesian Embassy in Tokyo) |
| 14:10-14:50| The latest situation of investment in Indonesia   | Mr. Saribua Siahaan  
(Representative, Tokyo Office, Indonesia Investment Coordinating Board (BKPM)) |
| 14:50-15:30| Batam Free Zone                                   | Mr. Gusmardi  
(Batam Free Zone Authority, Deputy)                   |
### Programme

<table>
<thead>
<tr>
<th>Date/ Time</th>
<th>Site</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>22/ January/ 2017</td>
<td>Hotel New Akao</td>
<td>Explanation on invertor that is used in the hotel (iFORCOM Tokyo plans to install the same type of invertor into Hang Nadim Airport in Batam city.)</td>
</tr>
<tr>
<td>24/ January/ 2017</td>
<td>MOEJ</td>
<td>Discussion JCM model project in FY2016 in Hang Nadim Airport</td>
</tr>
</tbody>
</table>
| 13:30～16:30     | JFE Kankyo                 | Inspection of waste disposal treatment plant  
1. Introduction of JFE kankyo  
2. Recycle plant for wasted fluorescent tube  
3. Recycle plant for plastic material  
4. The latest incineration facilities of the industrial waste  
5. Discussion of potential for developing business in Batam |

Source: Nippon Koei
<Observation at JFE Environment>

Explanation of JFE Environment

Recycling factory of Fluorescent light

Plastic recycling factory

Group Photo

Source: Nippon Koei

4.5 SEMINAR (KICK-OFF SEMINAR, FINAL SEMINAR)

[Kick-off seminar]
Kick-off seminar was held in July 2016

Agenda:
- Date: July 14, 2016
- Time: 13:00 to 16:00, to be determined
- Venue: Harris Hotel in Batam

<table>
<thead>
<tr>
<th>Time</th>
<th>Program</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>13:00-13:05</td>
<td>Introduction of participants</td>
<td>MC</td>
</tr>
<tr>
<td>13:05-13:15</td>
<td>Opening remarks</td>
<td>Batam city</td>
</tr>
<tr>
<td>13:25-13:45</td>
<td>Opening remarks</td>
<td>City of Yokohama</td>
</tr>
<tr>
<td>Time</td>
<td>Activity</td>
<td>Organizer</td>
</tr>
<tr>
<td>-----------------</td>
<td>--------------------------------------------------------------------------</td>
<td>----------------------</td>
</tr>
<tr>
<td>13:45-14:00</td>
<td>Current situation of JCM in Indonesia (tentative)</td>
<td>Indonesia JCM secretariat</td>
</tr>
<tr>
<td>14:00-14:15</td>
<td>Key note – Master plan</td>
<td>Batam city</td>
</tr>
<tr>
<td>14:15-14:30</td>
<td>Key note – Waste to energy</td>
<td>Batam city</td>
</tr>
<tr>
<td>14:30-14:45</td>
<td>Key note – TBD</td>
<td>BIFZA</td>
</tr>
<tr>
<td>14:45-15:00</td>
<td>Tea break</td>
<td>---</td>
</tr>
<tr>
<td>15:00-15:15</td>
<td>JCM project formulation study</td>
<td>iFORCOM etc.</td>
</tr>
<tr>
<td>15:15-15:30</td>
<td>JCM project formulation study</td>
<td>Finetech etc.</td>
</tr>
<tr>
<td>15:30-15:40</td>
<td>Way forward in 2016</td>
<td>Nippon Koei</td>
</tr>
<tr>
<td>15:40-15:45</td>
<td>Announcement of new member of “Task force for the city-to-city collaboration between Batam and Yokohama”</td>
<td>---</td>
</tr>
<tr>
<td>15:45-15:55</td>
<td>Closing remarks</td>
<td>Batam city</td>
</tr>
<tr>
<td>15:55</td>
<td>Close</td>
<td>---</td>
</tr>
</tbody>
</table>

Source: Nippon Koei

<Kick-off seminar>

**Venue**

**Opening remarks by Mr. Dendi**

**Key note by Mr. Azril**

**Key note by Mr. Binsar**
On 18th of January 2017, the final seminar was conducted and on 19th site tour in the Batam city was held inviting Japanese companies.

Overall Agenda (18th and 19th January):

<table>
<thead>
<tr>
<th>Date</th>
<th>Time</th>
<th>Program</th>
<th>Venue</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 Jan (Wed)</td>
<td>AM</td>
<td><strong>Site tour</strong>: Visit potential project sites in Batam by Japanese companies with technologies (Sewage, water recycling, desalination, LED streetlight with Wi-Fi, waste management (municipal solid waste and industrial waste), airport expansion)</td>
<td>Sites in Batam island</td>
</tr>
<tr>
<td></td>
<td>PM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19 Jan (Thu)</td>
<td>AM</td>
<td><strong>Final Seminar</strong></td>
<td>Harris hotel Batam center</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Courtesey call</strong> on Chairman of BIFZA</td>
<td>Offices of BIFZA and Batam City</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Courtesey call</strong> on Mayor of Batam City</td>
<td></td>
</tr>
</tbody>
</table>

Source: Nippon Koei
The site tour was conducted for the following agenda.

- The tour aims to give prospective business partner, which are Japanese companies with high-end environmental technologies opportunities to see potential project sites.
- It also aims to introduce Japanese technologies which help issues of Batam city to the Batam side
- It discusses with Batam side about necessary data collection and actual needs considering future project.

Several Japanese companies such as Stanley Electric Co., Ltd, AGC, Kashima corporation, and Finetech co., Ltd joined the site tour. Those companies have high technologies such as LED light, solar PV system, heat shield paint, sewage disposal, oil sludge treatment, and Advance Energy Management System (AEMS). Staffs from BIFZA and Batam city joined the tour and discussed for development policy of Batam city.

Schedule for site tour is indicated in the following table.

<table>
<thead>
<tr>
<th>Time</th>
<th>Site</th>
<th>Technology</th>
<th>contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>08:30~10:00</td>
<td>Waste Water Treatment Plant in Batam Centre</td>
<td>Waste water</td>
<td>treatment</td>
</tr>
<tr>
<td>10:30~12:00</td>
<td>Dinas PU Kota Batam</td>
<td>LED streetlight</td>
<td></td>
</tr>
<tr>
<td>12:30~13:30</td>
<td>Lunch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>14:00~14:30</td>
<td>Garbage Collection site</td>
<td>Waste disposal</td>
<td>treatment</td>
</tr>
<tr>
<td>15:00~16:30</td>
<td>Hang Nadim International Airport</td>
<td>Heat insulating</td>
<td>coating structure 、AEMS</td>
</tr>
</tbody>
</table>

Source: Nippon Koei

Approximately 70 participants from BIFZA, Batam city, Yokohama city, and Japanese companies attended the final seminar on 19th. In the seminar, the result of the feasibility study was reported. Also, Japanese companies presented their technology and actual cases in the world.

Detail agenda for Final Seminar on 19th January 2017

<table>
<thead>
<tr>
<th>Time</th>
<th>Program</th>
<th>Speaker</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:40-9:00</td>
<td>Registration</td>
<td>---</td>
</tr>
<tr>
<td>9:00-9:05</td>
<td>Introduction of participants</td>
<td>Mr. Amir Rusli (MC)</td>
</tr>
<tr>
<td>Time</td>
<td>Session</td>
<td>Speaker(s)</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------------------------------------------------</td>
<td>-----------------------------------------</td>
</tr>
<tr>
<td>9:05-9:15</td>
<td>Opening remarks</td>
<td>Dr. Ir. Purba Robert Sianipar (BIFZA)</td>
</tr>
<tr>
<td>9:15-9:25</td>
<td>Opening remarks Batam city</td>
<td>Batam city</td>
</tr>
<tr>
<td>9:25-9:45</td>
<td>Presentation on City to City Collaboration/City of Yokohama</td>
<td>Mr. Toru Hashimoto</td>
</tr>
<tr>
<td>9:45-9:55</td>
<td>Overall progress of the study/Nippon Koei</td>
<td>Mr. SAITO Tetsuya</td>
</tr>
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<td>9:55-10:15</td>
<td>Result of JCM project formulation study/ iFORCOM</td>
<td>Mr. Erwin Avianto</td>
</tr>
<tr>
<td>10:15-10:35</td>
<td>Result of JCM project formulation study/ Finetech</td>
<td>Mr. Motoyuki Okada Mr. Kikuo Sagawa</td>
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<tr>
<td>10:35-10:50</td>
<td>Tea break</td>
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</tr>
<tr>
<td>10:50-11:00</td>
<td>Introduction of green technologies/ Hitachi, Ltd.</td>
<td>Mr. Katsumi Shida</td>
</tr>
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<td>11:00-11:10</td>
<td>Introduction of green technologies/ AGC Asahi Glass Co., Ltd.</td>
<td>Mr. LIM Yew Meng</td>
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<td>11:10-11:20</td>
<td>Introduction of green technologies/ Kajima Corporation</td>
<td>Mr. Ryohei Tsukada</td>
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<td>11:20-11:30</td>
<td>Explanation of relevant technologies of 3 or 4 companies</td>
<td>Nippon Koei Co., Ltd</td>
</tr>
<tr>
<td>11:30-12:20</td>
<td>Panel session on Project Map</td>
<td>BIFZA, Batam City, City of Yokohama, Nippon Koei, iFORCOM, Finetech</td>
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<td>12:20-12:30</td>
<td>Implementation of JCM Project in Indonesia/ Indonesia JCM secretariat</td>
<td>Mr. Dicky Edwin Hindarto</td>
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<td>12:30-12:35</td>
<td>Closing remarks</td>
<td>BIFZA</td>
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<td>12:35-12:40</td>
<td>Closing remarks</td>
<td>Batam city</td>
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<td>12:40-12:50</td>
<td>Way forward to Activities in 2016/ City of Yokohama</td>
<td>Mr. Toru Hashimoto</td>
</tr>
<tr>
<td>12:50-</td>
<td>Lunch</td>
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</tr>
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</table>

Source: Nippon Koei
Site tour and final seminar

- Site Tour (WWTP)
- Site Tour (group photo)
- Site Tour (LED streetlight)
- Site Tour (Waste Disposal)
- Site Tour (Hang Nadim Airport)
- Final seminar: Opening remarks by Mr. Dendi (Batam City)
Closing remarks by Mr. Robert (BIFZA)

Closing remarks by Mr. Hashimoto (City of Yokohama)

Source: Nippon Koei
CHAPTER 5 ATTENDANCE TO INTERNATIONAL CONFERENCE

5.1 PARTICIPANTION IN COP22

Yokohama city staff, Mr. Nakamura attended to COP22 which was held in Marrakech from 8<sup>th</sup> to 18<sup>th</sup> of November in 2016. The project for city to city collaboration between Batam city and Yokohama city was presented at Japan pavilion on 8<sup>th</sup> as one of the event of JCM seminar.

The main points of the presentation were summarized in the following.

- Overview and history of development of Yokohama city
- Activities aiming for reduction of GHG emission by Yokohama city such as private and public collaboration by YSCP and YSBA and action plan
- Feasibility study for JCM project by city to city collaboration such as B to B and B to G projects in Batam city

In the panel discussion after the presentation, the following issues were discussed.

- Merits for project formulation under city to city collaboration compared to project formulation without such scheme
- Making consensus in the city as well as the external entities for local government’s international cooperation
- Issues for conducting feasibility study by city to city collaboration from the view point of under policy

< COP22 >

Japan pavilion at COP22
Panel discussion
FY2016 Feasibility Study of Joint Crediting Mechanism Project by City to City Collaboration
Project for Development of JCM Projects under City to City Collaboration between Batam City and City of Yokohama
(Energy Saving Sector: BIFZA)

Booth at Japan pavilion

PR by Yokohama city

COP22 venue

COP22 venue

Source: City of Yokohama
CHAPTER 6 ISSUES AND FUTURE PLANS

6.1 ISSUES

Through this project, especially through the development of project map, various kinds of needs of Batam are confirmed and arranged. These needs are related to low carbon development and climate change mitigation and adaptation, however, there are many of them being difficult to be solved with JCM projects considering the cost effectiveness on GHG reduction from energy sources.

Not only the feasibility studies of individual projects, but also the support from City of Yokohama regarding policy planning and target setting toward Batam administrations under the umbrella of city-to-city collaboration is needed as well. Thus, it is even clearer now that promotion of city-to-city collaboration should not be limited to the project development and participation in seminars but transferring administrative knowledge, methodologies and experiences of City of Yokohama as experienced local government toward Batam is required.

More concretely, these are pointed out from Batam side.

1. BIFZA requested City of Yokohama to sign officially for the collaboration.
2. Not only the technologies of companies in Yokohama, administrative capacity of City of Yokohama is expected to be transferred.
   1. Setting energy saving / GHG reduction target
   2. Promotion of green building
   3. Green land use planning
3. Comprehensive support for water sector both in planning and implementation, and participation for waste sector projects
4. Pilot projects in industrial parks

Source: Nippon Koei

Figure 6-1: 2017/1/19: Courtesy call to the chairman of BIFZA (BIFZA suggested the more officialized collaboration with City of Yokohama)
6.2 FUTURE PLANS

Based on the issues identified as above, it was agreed by Batam side and City of Yokohama to find the best available solutions for Batam not by copying the experience and regulations of Yokohama, but by developing the most appropriate system through discussions in city-to-city collaboration.

![Image of City-to-City Collaboration between Batam and Yokohama]

Source: Nippon Koei

**Figure6-2: Image of City-to-City Collaboration between Batam and Yokohama**

From April 2017, based on the result of these F/S, following three JCM model projects are under development to be proposed. The ideas are already explained to Batam side and confirmed this orientation.

| Table 6-1: JCM Model Projects to be proposed in FY2017 |
|-------------|-----------------|-----------------|-----------------|
| 1) iForcom | Energy saving of Hang Nadim Airport | 40 | 585 |
| 2) iForcom | Energy saving of Haris Hotels/18 hotels | 100 | 2,368 |
| 3) Finetech | Thermal desorption unit + PV(2MW) | 700-800 | 12,000 |

Source: Nippon Koei

*Emission reduction is under review

For FY 2017, both Batam side and City of Yokohama showed strong interest in continuing this city-to-city collaboration scheme and considering the preparation of several proposals. Followings are the key points for developing F/S idea in FY2017 through the experiences of this project.

1. Proposal of rules, regulations and/or institutions
   (I) Introduction of green building concept
      In the center of Batam, many high buildings are planned to be constructed. Considering the urgent needs of water and energy conservation, green buildings are highly expected.
Department of Environment of Batam City and JCM secretariat of Indonesia mentions that Batam needs the regulations on green buildings like Jakarta and Bandung and support from City of Yokohama through city-to-city collaboration is important to introduce systems to promote green buildings in Batam.

(II) Setting emission reduction target
Government of Indonesia commits the GHG emission reduction to the international society following Paris agreement. Currently, GHG emission reduction action plan is under development in the central and provincial level in Indonesia, but not in the city and regency level. Through city-to-city collaboration it is expected that Batam city becomes one of the pioneer local government body to set such target.

(III) Incentives and drivers for better spatial management, permissions for construction and energy saving
It is necessary to issue Mayor’s decree in line with promoting system for green building. Sharing experience and advice from City of Yokohama would be beneficial for drafting such decrees.

2. Matching with the needs of Batam side
(I) Reference to the project map
It is good to utilize the project map developed by this project since it is prepared to share the common understanding on the orientation of city-to-city collaboration and to mobilize outside finance. It is also important to continue updating this project maps.

(II) Green building
As above, green building initiative especially regarding energy and water conservation needs to be promoted soonest.

Source: Nippon Koei based on the presentation material of City of Yokohama
Figure 6-3: Yokohama’s experience in Green Building

<table>
<thead>
<tr>
<th>Category</th>
<th>Preyarat</th>
<th>Kredit</th>
<th>Bonus</th>
<th>Jumlah Tokoh Ulur</th>
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<tr>
<td>Appropriate Site Development</td>
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<td>26</td>
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<td>Water Conservation</td>
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<td>Material Resource and Cycle</td>
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<td>17</td>
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<tr>
<td>Indoor Health and Comfort</td>
<td>1</td>
<td>8</td>
<td></td>
<td>22</td>
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<tr>
<td>Building and Environment Management</td>
<td>1</td>
<td>5</td>
<td></td>
<td>11</td>
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<tr>
<td>Jumlah Kriteria dan Tokoh Ulur</td>
<td>10</td>
<td>41</td>
<td>3</td>
<td>121</td>
</tr>
</tbody>
</table>

Through the discussion with GBCI, we would like to propose following approaches:

- We want to develop
  1. best available solutions in terms of effect and cost
  2. standardization of green building which is suitable for Batam
- For example in Batam, we consider (1) energy efficiency and conservation and (2) water conservation are very important

Source: Nippon Koei based on the document of GBCI

Figure 6-4: Green building concepts of GBCI

(III) Water sector

Considering high needs from Batam side, initially the application of JCM is required to be studied. Additionally, it is required to explore the potential supporting scheme and finance other than JCM.

Source: Nippon Koei

Figure 6-5: Project Map: Green Water (Re)

(IV) Support of Industrial Park
Batam side requires the implementation of symbolic project and expects the pilot project with large scale industrial parks in Batam. It is also noted that the large industrial parks can be good partner organization for development of JCM Model Project.

3. Priority in potential collaboration with Industrial Parks
   (I) JCM projects with B to B concept
       When infrastructure project is developed with JCM, Batam island is so big that the target should be limited and pilot project approach should work better. “Industrial park” is good as a unit to implement JCM projects in the perspective of the scale, and B to B approach would be more smooth to formulate JCM projects, and industrial parks are better in financial terms compared with the individual companies.

4. Project development considering the characteristic of city-to-city collaboration
   (I) JCM projects with B to G concept
       Besides the discussion above, it is needed to explore the potential of B to G project to maximize the merit of city-to-city collaboration. Especially, JCM project for Hang Nadim airport is highly prioritized to be successful so that other B to G projects can be promoted.

Finally, implementation structure for potential F/S is shown below. By cooperation with Green Building Council Indonesia (GBCI), a NGO which promotes green building concepts in Indonesia, it is enabled to establish green building promotion system such as local regulations. It is finally to standardize the green building concepts for each building type in
Batam island.

GBCI employs 6 criteria (site development, energy saving, water conservation, construction material, internal environment, and environmental management) to assess buildings, and among 6 criteria, energy and water conservation is the most important. The project members already agree to propose two F/S regarding this theme to localize GBCI’s initiative in Batam.

**Figure 6-7:** Concept of F/S in FY2017: Standardization of Green Building