City-to-City Collaboration
Toward Smart and Green Island of Batam

Development Cooperation Division, International Affairs Bureau
City of Yokohama
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Overview of Yokohama City

- International port city
  Opening of port of Yokohama in 1859
- Population: approx. 3.7 million
  Largest city in Japan
- GDP: approx. 12.7 trillion JPY
  (approx. 107 billion USD)
- 21 minutes from Haneda Airport (Tokyo)

External Recognition on Achievement by the City of Yokohama

LEE KUAN YEW WORLD CITY PRIZE

2014 SPECIAL MENTION: CITY OF YOKOHAMA

Yokohama’s International Development Cooperation – Y-PORT

Yokohama Partnership of Resources and Technologies

It is essential to provide not simple products but solutions through combining technologies and knowhow of the public and private sectors

Enhancement of international technical cooperation

Y-PORT Project

Support from central government

Technological capacities of firms in the city

Knowhow and technologies of the City of Yokohama

Lot with the City of Batam in May, 2015
City to City Collaboration in Batam

Letter of Intent on Technical Cooperation for Sustainable Urban Development Signed with the City of Batam, on 27th May, 2015 for 3 years

Contents of Agreement

1. The City of Yokohama will offer technical advice in promoting the eco-city development of the City of Batam.

2. The Parties will encourage participation of the private sector and academic organizations.

3. The Parties will take action to obtain cooperation of the governments of both countries and international organizations.

4. The Parties will mutually provide information essential to implementing the above collaboration effectively.

Flagship Projects by City to City Collaboration in Four Cities

- **Da Nang City, Vietnam**
  - Introduction of high efficiency pumps in the water purification plant by Yokohama Water Co., Ltd.

- **Cebu City, Philippines**
  - Energy-saving consulting services for factories, hotels and other buildings by Osami Co., Ltd.

- **Bangkok, Thailand**
  - Efficient sewage sludge dewatering process by Amcor INC.

- **Yokohama City**
  - Commercial plant for waste plastic recycling by GIUN Co., Ltd.

Framework of City-to-City Collaboration with Batam in this Year

Master Plans which the City of Yokohama has worked together with Four Cities under City-to-City collaboration

- **Bangkok, Thailand**
  - Bangkok Plan on Climate Change

- **Da Nang City, Vietnam**
  - Da Nang Urban Development Forum (Making Urban Development Action Plan)

- **Cebu City, Philippines**
  - Megacity Roadmap 2030

- **Batam City, Indonesia**
  - Project Mapping (planned) based on Batam Green Cities Program

Task Force

- **City of Batam**
  - City of Yokohama

Contribution to vitalize Batam Green Island
Inter-Relations of Six Pillar Sectors through Tripartite Collaboration among Batam City, BIFZA and Yokohama City

Project Mapping toward Batam Green Island

Main activities in FY2017
- JCM FS by MOEI (Incl. past years)
- Sustainability Evaluation (Waste Management) by METI
- Water Management FS by METI

Y-PORT CENTER – Knowledge hub for smart city management

Please visit our website:

Development Cooperation Division,
International Affairs Bureau
City of Yokohama, Japan
Email: ki-yport@city.yokohama.jp

Thank you for your attention
Progress of city-to-city collaboration and targets of the project this year

Project for Development of Low-carbon City through City-to-City Collaboration between Batam and Yokohama

October 5, 2017
SAITO Tetsuya
Nippon Koei Co., Ltd.

Objectives: city-to-city collaboration

- Our project aims to
  - promote JCM project formulation
  - support Green City Programme of Batam
- “Best available solutions for Batam” needs to be considered through collaboration.

Structure of the project

1. Summary: Objective and Structure
2. History: Milestones especially on FY2016
3. Six Pillars: Major sectors for collaboration
4. Target and Approach for FY2017
History: city-to-city collaboration

<table>
<thead>
<tr>
<th>Time</th>
<th>Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>May, 2015</td>
<td>Lol was signed between Mayor of Batam City and Mayor of the City of Yokohama</td>
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<tr>
<td>FY2015</td>
<td>Implemented 3 Feasibility Studies</td>
</tr>
<tr>
<td></td>
<td>- Sludge dehydrating FS</td>
</tr>
<tr>
<td></td>
<td>- Spent bleaching earth treatment and bio-fuel production FS</td>
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<tr>
<td></td>
<td>- Airport energy saving FS</td>
</tr>
<tr>
<td>Jan, 2016</td>
<td>Announced to establish the task force for city-to-city collaboration</td>
</tr>
<tr>
<td>FY2016</td>
<td>Implemented 4 Feasibility Studies</td>
</tr>
<tr>
<td></td>
<td>- F/S on Energy Saving Solutions</td>
</tr>
<tr>
<td></td>
<td>- Ferry terminals</td>
</tr>
<tr>
<td></td>
<td>- Hospitals</td>
</tr>
<tr>
<td></td>
<td>- Harris hotels</td>
</tr>
<tr>
<td></td>
<td>- F/S on High Efficiency Thermal Desorption Units</td>
</tr>
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<td>PT MEGA GREEN TECHNOLOGY</td>
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</table>

History: FY2016 Project (1)

<table>
<thead>
<tr>
<th>Time</th>
<th>Milestone</th>
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<tbody>
<tr>
<td>Jul, 2016</td>
<td>Kick-off meeting in Batam</td>
</tr>
<tr>
<td>Aug, 2016</td>
<td>Establishment of Taskforce for City-to-City Collaboration</td>
</tr>
<tr>
<td>Oct, 2016</td>
<td>Site tour in Japan</td>
</tr>
<tr>
<td></td>
<td>City-to-City Collaboration Seminar in Kitakyusyu</td>
</tr>
<tr>
<td>Nov, 2016</td>
<td>COP22 in Morocco</td>
</tr>
<tr>
<td></td>
<td>Batam Investment Seminar in Yokohama</td>
</tr>
</tbody>
</table>

History: FY2016 Project (2)

<table>
<thead>
<tr>
<th>Time</th>
<th>Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dec, 2016</td>
<td>Study on Project Map</td>
</tr>
<tr>
<td>Jan, 2017</td>
<td>Final seminar in Batam</td>
</tr>
<tr>
<td></td>
<td>City-to-City Collaboration Seminar in Tokyo with site visit</td>
</tr>
<tr>
<td>Feb, 2017</td>
<td>Finalization of project map (1st version) and F/S plan</td>
</tr>
<tr>
<td>Mar, 2017</td>
<td>Reporting</td>
</tr>
<tr>
<td>Apr-May, 2017</td>
<td>Application for Model Project 2017</td>
</tr>
</tbody>
</table>

Project Map
Six Pillars of City-to-City Collaboration toward Green and Smart Island, Batam

<table>
<thead>
<tr>
<th>6 Pillars</th>
<th>Reason of Setting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Planning</td>
<td>Mainstreaming of climate change mitigation and adaptation into master plans such as energy saving and water management including setting targets for CO2 emission reduction</td>
</tr>
<tr>
<td>Green Water</td>
<td>The bottleneck of environmental carrying capacity of Batam is water, which will be severe within 10 years. In near future, best-mix for rainwater, recycle water and desalination is inevitable.</td>
</tr>
<tr>
<td>Green Waste</td>
<td>Considering industrial waste as well as domestic waste, appropriate management of final disposal sites, development of incineration facility and industrial waste treatment facilities are needed.</td>
</tr>
<tr>
<td>Green Industry</td>
<td>With many industrial estates in Batam as the free trade zone, energy saving, management, peak-cut and sustainable production activities related to water and waste needs to be considered.</td>
</tr>
<tr>
<td>Green Building</td>
<td>More than 20 high-rise buildings are planned to be built in a few years. Concept of Green Building needs to be introduced as soon as possible.</td>
</tr>
<tr>
<td>Green Transporta-</td>
<td>Although smart transportation and public transportation is limited in</td>
</tr>
</tbody>
</table>
Targets and Approach for FY2017
“toward sustainable extension for all Batam”

- **Green Transportation**
  - Smart LED street light Project in Nagoya / Industrial Parks / Ports

- **Green Building**
  - Green Building Project for shopping mall / office building / residential building

- **Green Planning**
  - Standardization of Smart LED street lighting system
  - M/P on LED street light

- **Green Planning**
  - Drafting Mayor’s regulation for Green Building
  - Setting target to increase green buildings in Batam
PROVIDING OF RAW WATER

Source of raw water in Batam Area (Batam, Rempang and Galang Island):

1. Maximizing existing reservoirs/Dams;
2. Build of new reservoirs;
3. Recycling of domestic waste water;
4. Sea desalination (SWRO);
5. Supply from Bintan Island;
6. Supply from Lingga Island;
7. Supply from Kampar River;

1. WATER MANAGEMENT

RESERVOIRS in BATAM AREA

- Total Cap. In Batam Island 4,450 BCU;
- Total Cap. In Rempang, Galang, Galang Baru Island 1,251 BCU;
- Per Consumption : 2.2 Million people (now 2.3 Million);
- Future plan:
  - Sea R.C.T..
  - Bintan Bay
  - Sea Water Reverse Osmosis (SWRO) for Min Consumption:
    2,500,000 People

Water consumption 199 lt / day/kapita

- Dam = Built By BIFZA (except Dam Si Gong, built by Ministry of Public Work & Housing)
- Dam = Not Built
SCHEME OF PLATFORMING THE WATER CONSUMPTION IN BATAM AREA

CONNECTION & COVERAGE

Number of Connection & Coverage Area

PLANTS & RESERVOIRS

DAM DURIANGKANG PROBLEMS AS ONE OF THE LARGEST RAW WATER SOURCES IN BATAM (70%)

TECHNICAL DATA
District: Sei Beduk
Sub District: Muka Kuning, Tj. Piyu
Year of Development: 1990
Year of Operation: 2003
Catchment Area: 7,259.10 Ha
Height: 10 m
Length of Dam: 953 m
Puddle Area: 2,460 ha (2014)
Combined Capacity: 101.2 million m³ (2014)
Function: Raw Water 3,050 ltr / dt
Production Capacity: 2,200 + 375 + 50 ltr / sec
Type: Earthfill Dam
SOME OF SOLUTION

Development and Procurement Plans:

1. **Sediment Trap Development**: is a water structure that serves to precipitate incoming sediments with the aim of collecting and removing sand and mud particles.
2. **Installation of Trash Rack**: is one of the water buildings made of steel plate where its function is to filter garbage/debris carried by the flow of water to keep the channel/reservoir clean from waste.
3. **Application of Ecotech Garden Technology (EGT)**: one of the solutions to eliminate pollutants from the exhausts of Gray Water; and there is the possibility of a septic tank containing pollutants (BOD, COD, N, P, K Detergent) and Odor.
4. **Floating Barriers** Installation: Floating is made for containment and control of debris, plants and floating particles. Perfect for calm and moving water areas, this blast features top flotation, impermeable rack and lower beam to successfully control and hold the goods.
5. **Procurement of Harvester (water hyacinth cleaner)**: cleaning water hyacinth scattered in Duriangkang Reservoir by using water hyacinth cleaning machines.
6. **Control and Control of Illegal Buildings in Catchment Area (DTA) Duriangkang Reservoir**.

2. WASTE WATER MANAGEMENT

**STP EXISTING, BATAM CENTRE (Cap. 33 lt/sec)**
STP CONDITION:

1. Oxidation ditch (33 L/sec), STP area 2 Ha;
2. Collector pipe network 11,000 m + 4 pump house;
3. Current operating capacity ± 10% or 3.3 L / dt
   - From the existing pipeline (housing, offices)
   - From the truck septic (13 units)
4. Revitalization:
   - KemenPUbR project in 2012
   - Softloan Korea, construction started, August 2017 for 30 months

THE DEVELOPMENT OF WASTE WATER
**MASTER PLAN WWTP (INDII-AUSAID, 2011)**

- Build 7 integrated WWTP:
  1. Batam Centre
  2. Bengkong
  3. Tanjung Uma
  4. Sekupang
  5. Tembesi
  6. Telaga Punggur, dan
  7. Kabil

**Phase 1, BATAM CENTRE AREA**

**WWTP PLAN at BENGKONG**

(SOFT LOAN KOREA, for Batam Centre area)
- Capacity: 20,000 m³/day or 231 l/sec;
- 5 Pump Station;
- 114 Km of pipes and 11,000 house connections
- Construction 24 month, commissioning 6 month
- Budget: USD 43 Million

**STOCKYARD**
3. HAZARDOUS WASTE

Condition of Hazardous Waste Treatment Area (KPLI-B3)

1. BIFZA has a Hazardous Waste Treatment Area at Kabil (KPLI B3) 20 Ha and will be developed to 60 Ha;

2. There are 38 Tenant of Hazardous waste in Batam (As a Transporters, collectors, Processors and Users)
In 2016 there are 627 companies producing B3 waste, and of that amount about 40% are manufacturing & electronic companies; activities: assembly, manufactur, stamping, molding, electrogalvanizing, and others;

Potential Haz. Waste : electronic waste (cutting PCB, rejected goods), solvent, Flux, WWTP sludge, paint, expired material, florescens (Hg) lamp, contaminated waste.

In 2007 there were 76 shipyard companies; in 2016 there were 97 shipyard (shiprepair & shipbuilding);

Generally perform activities: blasting, painting, welding, hoarding, cleaning tanks;

Potential Waste B3: used sandblast, used batry, slop oil, sludge oil, Water Oil asbestos, used paint can, expired paint, contaminated waste.
1. Climate change is a strategic and development challenge facing Indonesia.
2. Indonesia emits significant levels of GHG and is highly vulnerable to climate change.

A 29% reduction in emissions by 2030 compared to business as usual, and will increase its reduction goal to 41%, conditional on support from international cooperation.
**IMPLEMENTATION RAN-GRK**

**1st phase:** Preparation to implement by ministries and national agencies

**2010-2012**

**2nd Phase:** Implementation of RAN-GRK and Monitoring, Evaluating, Reporting

**2013-2015**

**3rd Phase:** Change of Government and Climate Change became one of issues in National Medium Term Development Plan 2015-2019

**2015-2017**

**4th Phase:** RAN-GRK start to be verify

**2017-2019**

**5th Phase:** Mechanism for Monitoring, Evaluating, Reporting of RAN-GRK along with its verification

**2020**

**VISION**

“Batam a Peaceful, Competitive, Modern, Prosperous and Dignified Worlds City”

1. To promote good governance in Batam
2. To create faithful and competitive local human resource and prosperous society
3. To build Batam with environment-friendly design, modern infrastructure, and friendly green comfortable designed settlement based on national culture
4. To strengthen the industrial sector, services, trade, tourism, transshipment, marine and agriculture in supporting local economy
5. To strengthen community-based economy by small, medium entrepreneurship and cooperatives which are synergized with the domestic industry and market
6. To boost the development of hinterland areas to support the economy of Batam

**BATAM TOWARDS GREEN & SMART CITY**

**Additional attributes:**
- Green Air
- Green Industry

**Strategic Issues 2016-2021**

1. Economic growth
2. Education
3. Accessibility of health services
4. Tourism destination
5. Small and medium enterprises
6. Jobs
7. Sustainable Development
   - Contributes on MDGS and Post-2015 Development Agenda
   - Development with Smart and green city
8. MEA (Asean Economic Community)
9. Industry/ Manufacture
10. Science and Technology
11. Maritime
# BATAM CITY’S FOREST AREA

Refers to Minister of Forestry Decree Number 76/Menhut-II/2015

<table>
<thead>
<tr>
<th>FOREST ZONE</th>
<th>BATAM AREA (Ha)</th>
<th>%</th>
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</thead>
<tbody>
<tr>
<td>Watershed/ protected forest</td>
<td>20,943.56</td>
<td>20.35</td>
</tr>
<tr>
<td>Production forest</td>
<td>2,342.78</td>
<td>2.28</td>
</tr>
<tr>
<td>Forest zone can be converted</td>
<td>4,099.81</td>
<td>3.98</td>
</tr>
<tr>
<td>Limited Production Forest</td>
<td>9,268.70</td>
<td>9.00</td>
</tr>
<tr>
<td>Conservation Forest (TWA)</td>
<td>901.62</td>
<td>0.88</td>
</tr>
<tr>
<td>Conservation Forest/TB</td>
<td>10,170.37</td>
<td>9.88</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>47,726.86</strong></td>
<td><strong>46.37</strong></td>
</tr>
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## PROJECTS HAS BEEN CHOSEN

<table>
<thead>
<tr>
<th>PROJECTS</th>
<th>BATAM GREEN CITY</th>
</tr>
</thead>
</table>
| 1. Enhancement of Green Open Space Quality and Quantity | - Active Park in Urban Area  
- Green lane in the main roads  
- Green lane in secondary roads  
- Botanical garden | |
| 2. Reduction of Domestic Solid Waste Generation       | - Reduction of Domestic Solid Waste Generation  
- Reduction of Industrial Solid Waste Generation | |
| 3. Enhancement of Water Supply and Wastewater Management Performance | - Sanitary landfill  
- Bank sampah (garbage bank) | |
| 4. Development, Enhancement and Maintenance/Rehabilitation of Transportation Infrastructure | - Sludge Treatment Plant  
- Batam Centre WWTP | |
| 5. Development of WWTP to reduce domestic waste       | - Sludge Treatment Plant  
- Batam Centre WWTP | |
| 6. Enhancement of Right of Way (ROW) and Median of Road as Green Open Space | - Sludge Treatment Plant  
- Batam Centre WWTP | |
| 7. Management and Supervision of Mining, Electricity, Oil-Fuel and Gas | - Gas Power Plant (Panaram)  
- SPBG (Gas refilling station)  
- Gas pipeline distribution network  
- Solar Home System | |
| 8. Development, Quality Enhancement and Supervision of Building | - Gas Power Plant (Panaram and Tanjung Uncang)  
- SPBG (Gas refilling station natural gas for public transport and government vehicles)  
- Gas pipeline distribution network  
- Solar Home System | |
| 9. Additional Project: Start to Develop LED and Green Building | - Gas Power Plant (Panaram and Tanjung Uncang)  
- SPBG (Gas refilling station)  
- Gas pipeline distribution network | |

## BATAM GREEN CITY: PRIORITIZED PROGRAMS

<table>
<thead>
<tr>
<th>Rank</th>
<th>Score</th>
<th>Program No.</th>
<th>Program</th>
<th>Program Attribute</th>
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<tbody>
<tr>
<td>1</td>
<td>5.912</td>
<td>9</td>
<td>Spatial Planning and Control</td>
<td>Green Planning &amp; Design</td>
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<td>2</td>
<td>5.881</td>
<td>14</td>
<td>Enhancement of Environmental Degradation and Pollution Control</td>
<td>Green Water &amp; Waste</td>
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<tr>
<td>3</td>
<td>5.472</td>
<td>10</td>
<td>Management of Land Use</td>
<td>Green Planning &amp; Design</td>
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<tr>
<td>4</td>
<td>5.469</td>
<td>15</td>
<td>Enhancement of Environmental Protection and Management Infrastructure</td>
<td>Green Planning &amp; Design, Green Water &amp; Waste</td>
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<td>5</td>
<td>5.308</td>
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<td>Enhancement of Environmental Management and Natural Resources Conservation</td>
<td>Green Open Space</td>
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<tr>
<td>6</td>
<td>5.209</td>
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<td>Development, Maintenance, and Enhancement of Settlement and Housing Infrastructure</td>
<td>Green Planning &amp; Design, Green Building &amp; Community</td>
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<td>7</td>
<td>5.839</td>
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<td>Enhancement of Green Open Space Quality and Quantity</td>
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<td>8</td>
<td>5.828</td>
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<td>Development, Quality Enhancement and Supervision of Building</td>
<td>Green Building</td>
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<td>9</td>
<td>5.653</td>
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<td>Development, Enhancement and Maintenance/Rehabilitation of Transportation Infrastructure</td>
<td>Green Transportation</td>
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<td>10</td>
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<td>Enhancement of Water Supply and Wastewater Management Performance</td>
<td>Green Water</td>
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<td>11</td>
<td>5.675</td>
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<td>Enhancement of Community Transportation Service</td>
<td>Green Transportation</td>
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<td>12</td>
<td>5.468</td>
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<td>Management and Supervision of Mining, Electricity, Oil-Fuel and Gas</td>
<td>Green Energy</td>
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<td>13</td>
<td>5.425</td>
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<td>Enhancement of Drainage Network &amp; Flood Control</td>
<td>Green Water</td>
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<tr>
<td>14</td>
<td>5.352</td>
<td>5</td>
<td>Protection of water source areas and catchment areas</td>
<td>Green Water</td>
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<tr>
<td>15</td>
<td>5.292</td>
<td>1</td>
<td>Reduction of Domestic Solid Waste Generation</td>
<td>Green Waste</td>
</tr>
<tr>
<td>16</td>
<td>5.068</td>
<td>2</td>
<td>Reduction of Industrial Solid Waste Generation</td>
<td>Green Waste</td>
</tr>
<tr>
<td>17</td>
<td>5.061</td>
<td>6</td>
<td>Development of WWTP to reduce domestic waste</td>
<td>Green Water</td>
</tr>
</tbody>
</table>
| 18   | 4.999 | 3           | Enhancement of Right of Way (ROW) and Median of Road as Green Open Space | Green Open Space  
- Climate Change Mitigation & Adaptation  
- Solar Home System

### SHORT TERM

1. **GREENARY**
   - Active Park in Urban Area  
   - Green lane in the main roads  
   - Green lane in secondary roads  
   - Botanical garden

2. **TRANSPORTATION**
   - Walkways and Cycle lane in CBD and main urban area  
   - 6 corridor Semi-BRT  
   - Walkways and cycle lane in CBD and residential  
   - 10 corridor Semi-BRT  

3. **SOLID WASTE MANAGEMENT**
   - Sanitary landfill  
   - Bank sampah (garbage bank)

4. **WASTE WATER MANAGEMENT**
   - Sludge Treatment Plant  
   - Batam Centre WWTP

### MEDIUM TERM

5. **Drinking Water**
   - 6 reservoir  
   - Operating Tembesi Estuary Dam  
   - Development of Goring Estuary Dam  
   - Developing SWRO in Belakang Padang (Smal Island)

6. **ENERGY**
   - Gas Power Plant (Panaram)  
   - SPBG (Gas refilling station)  
   - Gas pipeline distribution network  
   - Solar Home System

7. **Green building (government building)**
   - Green building (government and public building)  
   - Green building (government public building and industry)
LED Street Light and Green Building

- **LED Street Light**
  - Clear concept/definition: saving, long life light, environmental friendly technology used, chiep etc..
  - Potential market in Batam >> 300,000 units
  - of those old-new protocol/main street, (public-private: office, hotel, apartment, supermall) street, house complex and industrial park street etc.

- **Green Building**
  - Clear concept/definition: saving (resources), environmental friendly technology, modern-natural, renewable, material used, cheap etc., not meaning of “green painting building”
  - of those old-new highrise building (public-private: office, hotel, apartment, supermall), house complex and industrial park etc.c.

BATAM CITY EXISTING CONDITION

- Existing forest/green space is remained 23% (KLHS-2016)
- It is far a way:
  - Should have been of 46% (Permen Ministry of Forest)
  - Original Batam city design of 60-70% (Mr. Habibie- former developer)
  - Our neighbor Singapore (City in the Forest/ Forest in the city concept)
- Existing installed capacity of water supply is remained 400 l/s (KLHS-2016) which is enough only for 50% of more than 25 new highrise buildings
- Existing environmental (land, water, air) damage is also reach to critical points
- Existing installed street light using conventional light type and constructed building using big amount of capital investment

BATAM CITY EFFORTS

- Welcome proposal from any institution/company in introducing of LED Street Light and Green Building:
  - Assessment/FS
  - Concept/model
  - Sharing experiences
  - Field testing equipment
  - Etc.
- For Green Building:
  - Asked the company who is proposed a new building (highrise or cluster/complex/park) during AMDAL (Environmental analysis Document Evaluation) processing:
    - Save the water by recycling
    - Save energy by using natural energy as well natural light
    - Sorting MSW/domestic waste etc.
  - Periodically done of reforest /replant in Batam island by involving of communities

BATAM NEED for LED STREET LIGHT and GREEN BUILDING

- Assessment of Existing condition of Street Light and Building
- Appropriate Model for LED Street Light and Green Building:
  - Old installed conventional Street Light and constructed Building
  - New street and building
  - Rules as law enforcement
  - Pilot project for both of LED and Green introducing in old and new type of Street Light and Building
  - Etc...
Green Electricity and Energy Saving leveraged by Renewable Energy Scheme

Environment Countermeasure Program
(Waste Treatment / Sludge Treatment / Air Pollution Problems etc.)

Disaster Management Program
(Smart City Infra Development in conjunction with Renewable Energy Scheme)

Urban Traffic Control Scheme

Smart/Renewable Energy
Smart/Green Living/Working Place
Smart/Green Infrastructure
Smart Traffic & Transportation
Smart Urban Grid

Smart/Green Infrastructure: (Energy)

Phase approaching Project

Generation 1
- Energy-saving A/C System Project, supporting Eco-Airport Plan (IFORCOM)

Generation 2
- Energy-saving Ferry terminal Project
- Energy-saving Hospital Project

Where we are

The 1st Track Project

Smart/Green Infrastructure: (Wastewater)

Phase approaching Project

Generation 1
- Septage Pre-treatment for improving IPAL of Batam Centre with dehydrator “SPATON” (JUSTEC)

Generation 2
- Improving IPAL of Hang Nadim Airport for Eco-Airport
- Expanding to other IPALs

Where we are

Smart/Green Infrastructure: Industry

Phase approaching Project

Generation 1:
- Microbubble Flocculation Tank and “Volute” Dewatering Equipment, for PT. Desa Air Cargo (AMCON)

Generation 2
- High-efficiency Wastewater Treatment Project for Industrial Complexes, such as BATAMINDO, Panbil and Kabil

Where we are
Phase approaching Project

Generation 1:
- Roof-top PV System with Demand Control Implementation Project (FINETECH)

Generation 2:
- Waste-to-Energy (Edible-oil Refinery) Project (FINETECH)
- PV System with Advanced Demand Control Implementation Project

Generation 3:
- Add-on Biomass (Waste)-based Power Generator with Advanced Demand Control Implementation Project

Thank You
JCM Feasibility Study Kick-off Meeting
“Green Island BATAM”
(Creating Projects for Low-Carbon Technology)
October 10, 2017, Batam, Indonesia

Going for Green
www.finetech.co.jp

New Business Entity in collaboration with Yokohama City

"New Business Entity" established
Yokohama Urban Solution Alliance

FINETECH Co., Ltd
as the Board Member Company
of YUSA
Under the Y-PORT initiative

- Wider Scope of Global Sustainable Growth Scheme
- ADB’s Development Fund
- GCF (Green Climate Fund)
- GPSC (Global Platform for Sustainable City)

Smart Green Park (Trademark of FINETECH)

FINETECH: Head Office / Labo / Plant / Subsidy

Head Office (Laboratory; Tokyo Institute of Technology)
W-105 Tokyo Institute of Technology YVP
4259-3, Nagatsuta-cho, Midori-ku, Yokohama, Kanagawa,
Japan 229-8510
TEL: 81-45/309/7901 FAX: 81-45/309/7902
WEB: www.finetech.co.jp

Kita-kanto Green Plant

Tokyo Office

Fukushima Renewable Energy Co., Ltd
Kenjiro Incubation center-3
1-1 Tamuramachi Tokuusada aza
Nakahara-ku, Koriyama-shi, Fukushima, Japan
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2965 Onma-tcho, Ashikaga-shi,
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Capacity Building Activities: OFFICIAL SITE VISIT
By BATAM CITY Government / BIFZA Authorities

FINETECH received the BATAM Delegation at the “FINETECH’s SMART GREEN PARK” in 2015 and 2016.

Smart Green Park

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Green Island BATAM Conceptual Mapping through JCM-FS

Phase 1 / 2015 ➔ Phase 2 / 2016 ➔ Phase 3 / 2017

- Areas of Critical to Improvement and Development are Identified.
- Project Candidates are defined and shortlisted.
- Projects are consolidated into the created project mapping.

Explore Technology Implementation Opportunities

- LED Street Lights
- LED Industry Areas
- LED Port Areas
- Smart Monitoring & Controlling System
- PV Solar System
- Other opportunities

F/S Project Overview: LED Street Lights

- Scope of Study to introduce follows;
  - Installation of the state-of-the-art Smart LED Street Lights manufactured by Japanese Technology, replacing from the existing conventional lights.
  - Installation of Smart Monitoring and Controlling System to maximize efficiency of LED Street Lights capability in accordance with the surrounding circumstances.

- Targeted Sites

Starting from City Central (Nagoya)
Major Industrial Park Areas
Major Port Areas

- Key Features of Technologies
  - Remote Monitoring Technology to minimize man-power maintenance for individual street light.
  - Alarming Function to detect failures, such as LED lamp damages, cable damages, electric leakage etc.
  - Various Key Energy Index Measurements of Illuminance, Voltage Value, Current Value, Energy Consumption Level.
  - Remote Controlling Technology to command Dimming and On & Off for Individual LED Street Light.

FINETECH Co., Ltd. All Rights Reserved, Copyright ©
Strong Effect of LED Street Lights Installation

- 70% Energy Saving compared with conventional High Pressure Sodium
- Man-power Maintenance Reduction by Smart Monitoring & Controlling
- Further More Energy Consumption Reduction with PV Solar System

Significant CO2 Emission Reduction / Significant OPEX Cost Reduction

LED Floodlight for Harbor by Stanley Electric Co., Ltd

- Unique Feature of Stanley's LED floodlights for Port Facility
- The world first ClassNK certified LED for Port Facilities!

The impetus behind the development of Type Certification of LED floodlights for Port Facilities was two-fold; aiding the further development of innovative technologies in order to provide the maritime industry with eco-efficient solutions, while ensuring the safety of any new projects. Based on its extensive experience in certifying products, materials and equipment for marine use, these guidelines set out the high levels of durability and safety essential for LED floodlights.

- Product
  - Dimensions: 485mm x 451mm x 262mm
  - Power Consumption: 340W
  - Luminous Flux: 39,000lm
  - Luminous efficacy: 111lm/W

- Installed Example
  - Destination: Belgium
  - Terminal type: RORO Terminal
  - Start-up date: November 2016
  - LED Lightings numbers: 120 pcs

Image of LED Floodlight for Harbor in Batam

- Installation for Batam Port

APPENDIX

APPENDIX
Green Island BATAM Conceptual Mapping

- Phase 1 / 2015
- Phase 2 / 2016
- Phase 3 / 2017

Areas of Critical to Improvement and Development are Identified.
- Project Candidates are defined and shortlisted.
- Projects are consolidated into the created project mapping.

- Green Transportation
- Green Building
- Green Industry
- Green Waste
- Green Water
- Green Planning

![Map of Green Island BATAM Conceptual Mapping](image)

Where we are:
- Explore Technology Implementation Opportunities
- Spent Bleaching Earth Safety Treatment for Palm Oil Manufacturing
- Reuse & Resale and Safety Disposal

For Safety Disposal of Spent Bleaching Earth

- For safety disposal of Spent Bleaching Earth at the Palm Oil factory, we will collaborate with manufactures and transporters to find out solution in comply with B3 Hazardous Waste Management.
- Under the strict operation of B3 management, FINETECH will try to find out opportunities of Waste-to-Material Technology Implementation focusing on Spent Bleaching Earth emitted from Palm Oil Refinery Factories.
- Applying our technology of the "Super-heated Steam" to Spent Bleaching Earth with high oil content, oil essences could be separated and recovered for safety disposal of Spent Bleaching earth waste.

![Diagram of Spent Bleaching Earth Safety Treatment](image)

FINETECH

Going for Green
the way we work...

www.finetech.co.jp
Company Profile

1.1 Company Name

- Company name: iFORCOM Co.,Ltd
- Address: Kagawa building, 1326 Nakano, Midori-ku, Sagamihara-shi, Kanagawa 252-0157, Japan
- Telephone: +81-42-784-5700
- Fax: +81-42-784-5540
- Establishment: October 1985
- Representative: Hiroshi Kagawa (Representative director)
- Capital: ¥100,000,000
- Employees: 350 persons (group whole)

1.2 History

- 2017: FS3 for JCM project
  - Shopping Mall, Office Building
- 2016: FS2 for JCM project
  - Hotel, Hospital, Ferry Terminal
- 2015: FS1 for JCM project
  - Hang Nadim Airport
  - Start business in Indonesia
- 2014: Seminar in the whole Japan
  - Electricity bill soaring
- 2013: Consulting for Gas, Water
- 2012: Great East Japan Earthquake
- 2011: Conclusion of the Kyoto Protocol Operational Improvement Consulting
  - [ECO-KAIZEN Ver.4]
- 2008: Revision of Electricity Business Law Contract Improvement Consulting
- 1996:
3.2 Feasibility Study (FS)

FS 1 2015
- Energy-saving A/C System Project, supporting Eco-Airport Plan
  JCM project application ⇒ adopted
  It is canceled because there is a plan to expand the airport

FS 2 2016
- Energy-saving Ferry terminal Project
- Energy-saving Hospital Project
- Energy-saving Hotel Project
  JCM project application
  It does not continue to JCM project because the scale is small

FS 3 2017
- Green Building for Shopping mall, Office Building
  It is expected to be a JCM project

4. Our Solutions

4.1 Definition

① Monitoring System
To set up equipment for monitoring the electricity usage.

② Equipment Improvement
It established the inverter to the pump (motor) that comes with chiller, cooling water pumps, AHU to control the output.
Check the operational status, it can also be carried schedule operation.

③ Operational Improvement
Check the usage of existing facilities, and by optimizing the operation method to reduce power consumption and achieve energy saving, saving CO2.
- Investigation in detail for the usage of office equipment, air conditioning (air conditioning related such as chiller, air handling units)
- Research and analysis for the optimal use development
- Rules formulated on how to use, documenting
4.2 Monitoring System

- 4 main graph (daily, weekly, monthly, yearly) + 8 graph analysis
- Visualization of waste and uneven!

Various management functions, support the power saving by using the communication tool!

4.3 Equipment Improvement

4.4 Operational Improvement

4.4 Track Record

Japan

Indonesia

Philippines
5 Schedule

Shopping Mall
Office Building

Provide data 2017
LOI 2018
International Consortium

Proposal
Survey in site
Explaination
FS Report
Submit JCM application
Proposal start
JCM application accepted

6 Project Map

Equipment Improvement

+ Operational Improvement

① One Facility

② Region

③ Batam Island

Contribution to revitalize a “Smart Green Island” in Batam

Thanks for listening
Green Building solution
AGC
Asahi Glass Co., Ltd.

AGC Affiliates in 30 Countries; Group Employees: ~ 51,000

AGC Group Business Overview

AGC (Net sales JPY 1,2826 billion (FY2016))

Glass (53%)
- Flat Glass
- Low-e glass
- Fabricated glass for architectural (Heat Insulating/Shielding glass, Disaster-resistant /security glass, Fire-resistant glass)
- Polished wired glass
- Interior / Decorative glass

Electronics (20%)
- Display
- Glass substrate for display devices
- Speciality glass for display applications
- Glass for Solar Power System
- Electron: Materials
- Semiconductors process materials
- Optoelectronics materials
- Lighting glass products
- Laboratory glass

Chemicals (25%)
- Chlor-alkali & Urethane
- Raw materials for vinyl chloride polymer
- Caustic soda
- Urethane
- Fluoro-chemicals & speciality chemicals
- Fluorinated resins
- Water and oil repellents
- Pharmaceutical and agrochemical inermediates
- Iodine-related materials

Ceramics/Other (2%)
- Ceramic products
- Refrigeration Engineering

AGC Development in South East Asia Since 1963

Thailand
AGC Flat Glass (Thailand) Public Co., Ltd. 1963
AGC Chemicals (Thailand) Co., Ltd. 1964
AGC Automotive (Thailand) Co., Ltd. 1974
AGC Techno Glass (Thailand) Co., Ltd. 1995
AGC Micro Glass (Thailand) Co., Ltd. 2006
AGC Technology Solutions (Thailand) Co., Ltd. 2006
AGC Matesi (Thailand) Co., Ltd. 2011
Acquisition of Verphi [to be completed to 18] 2011

Vietnam
AGC Chemicals (Vietnam) Co., Ltd. 2014

Singapore
AGC Asia Pacific Pte. Ltd. 2013
AGC Singapore Services Pte. Ltd. 1985
AGC Ceramics Singapore Pte. Ltd. 2013
AAP Application Development Centre 2016

Philippines
AGC Flat Glass Philippines, Inc. 1968
AGC Automotive Philippines, Inc. 2003

Indonesia
PT Asahi Glass Indah Tbk. 1997
PT Asahi Industries Chemical 1986
PT IMI Kasei Glass Indonesia 1991

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AGC Business Domains & Market Segments

3 Business Domains are categorized into 10 market segments. AGC develops products by bringing together the technologies that AGC has cultivated since its establishment in 1907.

AGC, an everyday essential part of our world

AGC Solutions for Green Building & Construction

AGC Glass Products

AGC Low-E glass

This Low-E double glazing glass is coated with a special metallic film to reduce thermal emissivity. It blocks the inflow of solar radiation heat, thus increasing cooling efficiency, and blocks the outflow of heater radiation heat during the winter, thus increasing heating efficiency. AGC has a range of soft coated and hard coated glasses with varied properties.
**AGC Low-E glass**

- **Allison Tower, Jakarta**

**AGC Glass Integrated Photovoltaics – Sunjoule, Sudare**

Sunjoule is a laminated safety glass building material with embedded solar cells. The shape and size of each module can be customized to match creative architectural designs. The thickness of the glass can also be customized accordingly to meet wind load pressures, making it suitable for Building Integrated Applications.

Utilizing AGC’s coated glass technology, Sunjoule is now available with Low-E coating and can be laminated or double glazed, offering energy efficient glass modules that can harvest clean and green solar renewable energy.

**AGC Heat Reflective Paint – Bonnflon** (Lumiflon based coating)

Bonnflon™ Sunbarrier, is a solar-heat-reflective fluorinated-resin-based paint which is a combination of pigments that reflect infrared rays and a fluorinated resin coating. Bonnflon™ Sunbarrier, has a high reflectance rate of infrared rays. This prevents the heat from penetrating the building.

- Bonnflon™ Sunbarrier reflects four times more solar heat than a normal fluorinated resin based paint of the same colour.
- The surface temperature of sections of a building rooftop painted with Bonnflon™ Sunbarrier were 12 degrees Celsius lower than unpainted sections.

**Return Energy through use of GIPV**
AGC Lumiflon based Coating on Aluminium / ACP

Jotun Powder Coating “Corro-Coat Durassol”
Mitsubishi Plastics “Alpicon”
Dulux Powder Coating “Fluorcoat FE”
Akzo Powder Coatings “Interpon D-3000”

World Trade Center II
Bahrain World Trade Center
Deolitte Center
Pearl River Tower

AGC Flexible Façade Solution - ETFE Film

- 2 Layered Cushion for Facade
- Clear / Printed Film available
- LED Illumination that can change colour by electrical control
- Chemical resistance
- Easy to Clean
- Printable
- Proven reliability

“Tough Coore”® is a ceramic product for heat-shielding road-surface. It consists of very hard pigments of alumina-zirconia eutectics combined with heat-shielding binder for application on road surface. “Tough Bahn”, colored aggregate, developed to prevent slippage of vehicles on the road and make the division of lanes clear, is also widely used.

Industry certification is an important benchmarking tool, ensuring that the performance of AGC’s products commensurate with both local and global standards. Over the years, the AGC group has amassed many forms of certification for its products and manufacturing standards.

2017 Singapore BCA - SGBC Sustainability Leadership Award in Green Building Product Category.
AGC is also the regional partner of the Asia Pacific regional network of the World Green Building council.

OTTV = α((1-WWR)*Uw)*TDeq) + (WWR*UF*ΔT) + (WWR*SC*CF)

Building Type: Commercial
Floor area: 20,000 sqm

- α = 0.89 (assumption of red bricks)
- WWR (Window to Wall Ratio) = 0.44
- U Wall = 2.11 w/m².K (wall spanned) system
- TDeq = 10 K
- U Fenestration = U Value glass (by assumption, actual value)
- ΔT = Temperature difference between outdoor and indoor = 5K
- SC = Shading coefficient of glass (actual value)
- CF = Solar correction factor (average value, 147 w/m²)

Note: The above calculation is a rough estimation for simulation purposes. In actual situation, there are more factors that will affect the calculation. Example, building orientation, window frame performance, etc. Please contact your M&E consultant to provide a better simulation.
Current Updates on JCM Implementation in Indonesia

INDONESIA JCM SECRETARIAT

Joint Crediting Mechanism (JCM)

The Joint Crediting Mechanism as a G-to-G scheme which encourages private sector organizations to invest in Low Carbon Development activities in Indonesia through incentive from the Government of Japan.

- JCM Cooperation between Government Indonesia and Japan was signed in 2013
- Indonesia JCM Secretariat was established in 2014
- In 2016, the first JCM credit was issued in Indonesia and in the world
- JCM cooperation is not only conducted by Japan and Indonesia, but also with other 17 developing countries.

Outline of The Presentation

Brief Concept of JCM
JCM Financing Scheme
JCM Project Implementation
City-to-City Implementation

Basic Concept of JCM

Japan

- Leading low carbon technologies, etc., and implementation of mitigation actions
- Used to achieve Japan’s emission reduction target

Indonesia

- JCM PROJECTS
- MRV
- GHG emission reductions/ removal

The Objective of JCM

- Facilitate 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.
- Evaluate contributions to GHG emission reductions/removals from developed countries in a quantitative manner, through mitigation actions implemented in developing countries and use these emission reductions or removals to achieve emission reduction targets of the developed countries.
- Contribute to the ultimate objective of the UNFCCC by facilitating global actions for emission reductions or removals
**The JCM Cooperation Scheme**

**Feasibility Study**

*Per 2016, 112 feasibility studies have been conducted;

**Institutions Related with JCM**

**JCM Project Cycle**
Financing Scheme

**Model Project**
Subsidized by MOEJ  Investment by Participants

| 50% | 50% |

Total Cost of the installation

**Demonstration Project**
Subsidized by METI  Investment by Participants

| Up to more than 50% |

Total investment is discussed and negotiated with METI.

**ADB Trust Fund – JFJCM**

- MOEJ Contribution
- JFJCM Credits
- ADB

- Additional costs with adoption of advanced low-carbon technologies
- Mitigation through conventional technologies (Selection from pipeline projects)
- Project
- SGR Emission Reduction

**JCM Projects in Indonesia**

- **25 Model Projects**
  - 11 are on-going projects
  - 14 projects are completed
  - 7 projects are registered (2 of which are already conducted its credit sharing mechanism)

- **3 Demonstration Projects**
  - 3 are on-going projects

- **1 LULUCF Project**
  - On going project*

Total Investment of JCM Implementation in Indonesia

1. **Grant for Feasibility Study**
   - 10 mio US$

2. **Total investment of Projects Implementation**
   - 150 Mio US$

- Study and Partnership with several institutions in Japan and Indonesia
- 37 Mio US$ of Government of Japan subsidy
- 113 Mio US$ of Project Participants investment

Power Generation by Waste-heat Recovery in Cement Factory

- **32 MW Waste Heat Recovery Power Generation at Cement Factory**
  - A factory units at PT Semen Indonesia in Tuban are able to capture its flue gases emission which is a hot 400 degree celsius air to be used as boiler to generate electricity.
  - This system enables to reduce electricity consumption up to 25% of the total electricity required in the factory.

Expected carbon emission reduction 322,000 ton CO$_2$/year

PT. Semen Indonesia di Tuban, Jawa Timur
**Power Generation by Waste-heat Recovery in Cement Factory**

**Installation of Solar Power System and Storage Battery to Commercial Facilities**

- **AEON MALL INDONESIA**
- **ITOCU CORPORATION**

Expected carbon emission reduction 549 ton CO2/year


Aeon Mall, Jakarta Garden City, Cakung Jakarta Timur

**Installation of Solar Power System and Storage Battery to Commercial Facilities**

**Solar PV Power Plant Project in Jakabaring Sport City**

- **PDPDE SUMATERA SELATAN**
- **SHARP CORPORATION**

Expected Carbon Emission Reduction 1.303 ton CO2/year

This solar power installed in Jakabaring sport center is able to generate electricity of 1.6 MW. This project is prepared for the electricity supply in Asian Games 2018 and promotes green sport event in South Sumatera. The project is expected to be completed in January 2018.

Stadion Jakabaring, Palembang South Sumatera
Installation of Gas Co-generation System for Automobile Manufacturing Plant

8 MW cogeneration system at PT. Toyota Motor Indonesia. This cogeneration system is able to deliver 30% of the total factory electricity demand and also replaces the needs of utilising the other two boilers.

Expected Carbon Emission reduction 20.310 ton CO₂/year

Installation of Gas Co-generation System for Automobile Manufacturing Plant

Energy Saving for Air-Conditioning at Shopping Mall with High Efficiency Centrifugal Chiller

NTT Facilities dan PT. Pakuwon Jati Tbk, worked together to implement a highly efficient chiller (centrifugal chiller). This chiller is able to reduce electricity usage of 1.136 MW/year. This chiller is utilised for the shopping center air-conditioner operational usage.

Expected carbon emission reduction 966 ton CO₂/year
City-to City Cooperation

Semarang and Toyama Upcoming Studies
• The upcoming studies are going to be implemented in Semarang. These studies focus on these scope such as:

Transportation

Renewable Energy

Energy Efficiency

Conversion of existing BRT to CNG Fuel bus

Biomass, Small Hydro, and Solar PV Power Generation

Air Conditioning, Co-Generation, Boiler

Thank you! Terima kasih!

Our website: http://jcm.ekon.go.id
Contact us at secretariat@jcmindonesia.com
Sekretariat JCM Indonesia
Gedung Kementerian Koordinator Bidang Perekonomian Lt 2
Jl. Medan Merdeka Barat 7, Jakarta 10110
Introduction

Background of the development of CASBEE Yokohama (2005)

- Emission from buildings (heat, GHG, water, noise & vibration etc.) from construction to demolition is a burden on the environment of vicinity, city and whole world.
- In order to secure comfortable living environment for citizen, it is necessary to consider environmental impacts of large scale buildings
- Enforcement of Kyoto Protocol

※2002 June Ratification of Kyoto Protocol
2005 Feb Entry into force of Kyoto Protocol

To mitigate environmental burden, the regulation launched in on April 2005

Objectives

- Mitigating energy consumption and environmental burden from buildings
- Promoting dissemination of buildings with low environmental burden, high environmental quality and long operating life
- Promoting activities for green city and landscape
- Promoting development and dissemination of technology for environment-conscious building
- Promoting understanding of environment-conscious building performance

Promoting efforts with CASBEE Yokohama for environment-conscious building

Citizen
PR
Developer
Publication
Yokohama City
CASBEE Yokohama
1. Introduction

<Setting the building size to be reported>

◆ At first (2005)
  New buildings with total floor area of 5,000 m² or more are mandatorily reported

◆ Currently
  • Mandatory reporting for building with total floor area of over 2,000 m² (since 2010)
  • Voluntary reporting system for buildings with total floor area of less than 2,000 m² (since 2012)

◆ Mitigating environmental loads of each building by considering built environment efficiency at the designing phase

2. CASBEE Yokohama

Owner
Preparation of a built environmental efficiency plan and notification of the plan to the city

City
Publication of the assessment result of the built environment efficiency plan and the outline of architectural planning through the Internet

Promotion of the development of buildings with high comprehensive environmental efficiency

◆ Operation of reporting and certification systems

2-① Reporting System

<① Reporting system>

◆ The number of voluntary reporting is increasing
◆ The rate of A rank is increasing

<table>
<thead>
<tr>
<th>Size</th>
<th>(Total) 2005~2016</th>
<th>Rank</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,000m²≥ (Mandatory)</td>
<td>1471</td>
<td>S Excellent ★★★★★</td>
<td>3.0%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A Very good ★★★☆☆</td>
<td>43.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>B+ Good ★★★☆☆</td>
<td>34.7%</td>
</tr>
<tr>
<td>2,000m²&lt; (Voluntary)</td>
<td>410</td>
<td>B Fairly poor ★★☆☆</td>
<td>18.6%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>C Poor ★☆☆☆</td>
<td>0.4%</td>
</tr>
<tr>
<td>Total</td>
<td>1881</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2-① Reporting System

<Incentive to obtain high rank in CASBEE Yokohama>

◆ Requires A rank and higher with corresponding other regulations
  • Approval of floor area ratio
  • Approval of re-development
  • Subsidy

◆ Incentive to housing loan
Collaborates with financial institutions (6 institutions) which agree with the purpose of this system
  → A or S (5 institutions), B+ or above (1 institution) of the evaluation of detached house or condominiums
  ◆ (Some house builder builds only houses with A or above in CASBEE Yokohama)
2-① Reporting System

<Setting the environment conscious standard for local government buildings in Yokohama>
A or S for buildings with over 300m², S for buildings with over 10,000 m²

Minami Ward Consolidated office

- Energy efficient and environment-conscious consolidated office
- Circulator air conditioning system
- Environmental Information display

2-② Assessment system

<Reconstruction of 4 categories into Qualities and Loads>

4 major categories (comprise about 80 subcategories)

1. Energy consumption
2. Resource cycling
3. Regional environment
4. Indoor environment

Reconstruction of the categories into Qualities and Loads

Q1: Indoor environment
Q2: Service performance
Q3: Outdoor environment (inside premises)
L1: Energy
L2: Resources and materials
L3: Environment outside premises

Q: Environmental qualities of a building
L: Environmental loads of a building

BEE = Built Environment Efficiency

100

Q: Environmental qualities of a building
L: Environmental loads of a building

BEE = 3.0
BEE = 1.5
BEE = 1.0

Relation between BEE and rates

BEE > 3.0 and Q > 50: S: Excellent
1.5 ≤ BEE < 3.0: A: Very Good
1.0 ≤ BEE < 1.5: B+: Good
0.5 ≤ BEE < 1.0: B: Fairly Poor
BEE < 0.5: C: Poor

2-② Assessment system

<Qualities and Loads>

Inside a boundary

Efficiency is assessed by environmental qualities in a building.

Virtual boundary

Resource consumption, CO₂ emission, exhaust, noise, waste heat, drainage, etc.

Outside a boundary

Efficiency is assessed by external environmental loads of a building.

Source: IBEC (The Institute for Building Environment and Energy Conservation)
2-2 Assessment system

<Characteristics of CASBEE-Yokohama>

- Partial edit of CASBEE for the exclusive use of Yokohama City
- Introduction of 4 priority aspects related to environmental efforts promoted by the city

1. Energy saving performance of buildings
   Considering its high increase rate of greenhouse gas emissions from residential and service sectors, Yokohama City promotes the reduction in energy consumption in buildings which has been the major cause of such a high increase rate.

2. Healthy and comfortable working and living environments
   The city promotes the efforts which contribute to community development enabling citizens to live long comfortable lives.

3. Consideration for disaster prevention
   The city promotes the efforts to encourage disaster preparedness for earthquakes among citizens.

4. Contribution to regional and community development
   Based on the unique urban design which has been promoted centering on the inner-city district, the city continues promoting the efforts to realize green communities utilizing the historical and natural significance of the city.

2-3 Publication of assessment results

<Assessment sheet for an entire building>

Comprehensive assessment result
LCCO₂ assessment result

Energy reduction rate
Scores of the efforts for priority items on 5-point scale

Assessment results for Q and L

2-4 Indication of built environment performance

- Mandatory indication of assessment results on sales and rental advertising

Information provision to consumers through the visualization of environmental performance

Whether or not photovoltaic power generation and solar thermal utilization systems are installed

Comprehensive assessment (5-scale assessment)

Energy consumption reduction rate

Assessment of the efforts for priority items (5-scale assessment)

2-5 Certification system and examples

<Outline of certification system>

- Started in April 2006 as a voluntary system
- Promoting CSR (Corporate Social Responsibility)
- The city certificate buildings based on the assessment of academic experts (free of charge)

/Public relation of certified buildings by Yokohama City>

- Press release of certification by the city
- Certification ceremony (from head of housing and architecture bureau)
- Publication of assessment results and project outline on homepage of Yokohama City
- Interview by trade magazine and publication on newspaper
Outline of environment-friendly approaches

In the building, natural energy has been proactively utilized for ventilation and daylighting, and the thermal loads have been curbed by utilizing high heat insulating double glass and louver for curtain walls. Also, a walkway network penetrating the building is connected to the pedestrian deck so as to make the building as a gateway to the Minato Mirai 21 district from the east exit of Yokohama Station.

Taking advantage of its location next to Yokohama Museum of Art, public arts are arranged at several places in a verdant square in the premises. Illuminated with LED lumps at night, these public arts contribute to creating artistic and cultural atmosphere of the Minato Mirai district. Also, horizontal louver and sunlight guiding type automatically controlled blinds are installed in the building to save energy and reduce thermal load.
Overview of Yokohama City

- International port city
- Opening of port of Yokohama in 1859
- Population: approx. 3.7 million
- Largest city in Japan
- GDP: approx. 12.7 trillion JPY (approx. 107 billion USD)
- 21 minutes from Haneda Airport (Tokyo)

External Recognition on Achievement by the City of Yokohama

Lee Kuan Yew World City Prize

2014 SPECIAL MENTION: CITY OF YOKOHAMA

Yokohama’s International Development Cooperation – Y-PORT

Partnership of Resources and Technologies

It is essential to provide not simple products but solutions through combining technologies and knowhow of the public and private sectors

Enhancement of international technical cooperation
Letter of Intent on Technical Cooperation for Sustainable Urban Development Signed with the City of Batam, on 27th May, 2015 for 3 years

Contents of Agreement

1. The City of Yokohama will offer technical advice in promoting the eco-city development of the City of Batam.

2. The Parties will encourage participation of the private sector and academic organizations.

3. The Parties will take action to obtain cooperation of the governments of both countries and international organizations.

4. The Parties will mutually provide information essential to implementing the above collaboration effectively.
Project Mapping toward Batam Green Island

**Green Planning**

**Green Building**

**Green Industry**

**Green Waste**

**Green Water**

**Green Transportation**

Main activities in FY2017

- JCM FS by MOEJ (Incl. past years)
- Sustainability Evaluation (Waste Management)/Recycling of bleaching earth of palm by METI by METI
- Water Management FS by METI

---

Y-PORT CENTER – Knowledge hub for smart city management

Please visit our web site:

Development Cooperation Division,
International Affairs Bureau,
City of Yokohama, Japan
Email: ki-yport@city.yokohama.jp

Thank you for your attention
# Overall Progress of the Project

## Project for Development of Low-carbon City through City-to-City Collaboration between Batam and Yokohama

January 25, 2018  
SAITO Tetsuya  
Nippon Koei Co., Ltd.

### Objectives: city-to-city collaboration

- **Our project aims to**
  - promote JCM project formulation
  - support Green City Programme of Batam
- "Best available solutions for Batam" needs to be considered through collaboration.

### Structure of the project

**BIFZA**  
Batam city  
The City of Yokohama

**Support on JCM project formulation etc.**

**Indonesian counterpart**

**Matching for project formulation**

<table>
<thead>
<tr>
<th>BIFZA</th>
<th>Batam City</th>
<th>City-to-city collaboration</th>
<th>The City of Yokohama</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ministry of Environment**  
Indonesia JCM Secretariat

**Support on JCM project formulation etc.**

# Green + Smart Batam Model

<table>
<thead>
<tr>
<th>BIFZA</th>
<th>Batam City</th>
<th>Green Building</th>
<th>Finetech</th>
<th>AGC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NIPPON KOEI**

**CLIMATE**

<table>
<thead>
<tr>
<th>2019 City-to-city collaboration</th>
<th>2020 City-to-city collaboration</th>
<th>2022 City-to-city collaboration</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Green Planning</em></td>
<td>Initiation of city-to-city collaboration</td>
<td>Deepening of city-to-city collaboration</td>
<td>Implementation of project under collaboration</td>
</tr>
<tr>
<td><em>Green Water</em></td>
<td>Support of water treatment project</td>
<td>Support of water treatment project</td>
<td>Support of water treatment project</td>
</tr>
<tr>
<td><em>Green Waste</em></td>
<td>Support of waste management project</td>
<td>Support of waste management project</td>
<td>Support of waste management project</td>
</tr>
<tr>
<td><em>Green Industry</em></td>
<td>Support of industrial projects</td>
<td>Support of industrial projects</td>
<td>Support of industrial projects</td>
</tr>
<tr>
<td><em>Green Building</em></td>
<td>Support of green building projects</td>
<td>Support of green building projects</td>
<td>Support of green building projects</td>
</tr>
<tr>
<td><em>Green Transportation</em></td>
<td>Support of green transportation projects</td>
<td>Support of green transportation projects</td>
<td>Support of green transportation projects</td>
</tr>
</tbody>
</table>
Targets and Approach for FY2017
“toward sustainable extension for all Batam”

- **Green Transportation**
  - Smart LED street light Project in Nagoya / Industrial Parks / Ports

- **Green Building**
  - Green Building Project for shopping mall / office building / residential building

- **Green Planning**
  - Standardization of Smart LED street lighting system
  - M/P on LED street light
  - Drafting Mayor’s regulation for Green Building
  - Setting target to increase green buildings in Batam

---

**Major events**

<table>
<thead>
<tr>
<th>Month</th>
<th>Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct, 2017</td>
<td>Kick-off meeting in Batam</td>
</tr>
<tr>
<td>Nov, 2017</td>
<td>Field works in Batam</td>
</tr>
<tr>
<td>Dec, 2017</td>
<td>Site tour in Japan for water management sector Field works in Batam</td>
</tr>
<tr>
<td>Jan, 2018</td>
<td>Final workshop in Batam</td>
</tr>
</tbody>
</table>

**Major events (plans)**

<table>
<thead>
<tr>
<th>Month</th>
<th>Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan, 2018</td>
<td>City-to-City Collaboration Seminar in Tokyo (30 Jan)</td>
</tr>
<tr>
<td>Feb, 2018</td>
<td>Discussion on Green Building regulation Seminar &amp; site tour in Japan organized by the University of Tokyo</td>
</tr>
<tr>
<td>Mar, 2018</td>
<td>Reporting for FY2017 Application for City-to-city collaboration project in FY2018</td>
</tr>
<tr>
<td>Apr-May, 2018</td>
<td>Application for Model Project in FY2018</td>
</tr>
</tbody>
</table>

---

*Field Survey (Nov 2017)*

*Kick-off Seminar (Oct 2017)*

*Batamindo (Nov 2017)*

*Courtesy call on International Affairs Bureau of Yokohama City (Dec 2017)*
Achievements

Green Transportation
- Smart LED street light Project in Nagoya / Industrial Parks / Ports
- Smart LED street light and PV Project in Industrial Park

Green Planning
- Standardization of Smart LED street lighting system
- M/P on LED street light
- Communicating with Japanese expert organization which is starting standardization in the central level in Indonesia
- Compiling the learnings in (1) port application and (2) highway application.

Achievements

Green Building
- Green Building Project for shopping mall / office building / residential building

Green Planning
- Drafting Mayor’s regulation for Green Building
- Setting target to increase green buildings in Batam
- Initial draft items for the regulation is prepared
- Launch forum to discuss green building regulation in Batam (proposal)

The Way Forward

(1) Implementasi, implementasi, implementasi!
- Two JCM proposals
- B to B
- Other funding sources

(2) Maximize effective collaboration
- Support from BIFZA & Pemko (regulations + standardization)
- In harmony with “Smart City Assessment” initiative
- Being sensitive to global trend toward SGDs, ESG and CSR
- Applicability of JCM city-to-city collaboration
  - GHG reduction from fossil fuel
- Other funding sources
“Smart & Green Island of BATAM”
Result of Feasibility Study for Introduction of LED Street Lightning and PV Solar in Industrial Park
Final Workshop in BATAM / 2018

Going for Green
Finetech
www.finetech.co.jp

JCM/F5S Findings of Smart & Green Opportunities in Batam

JCM Opportunities through the Survey in FY 2015-16 in Kabil

Key Opportunity #1: PV Solar Power Generation
- PV Solar Farm System with Advanced Energy Management System for Utilization of Energy Supply at the Industrial Zone

Key Opportunity #2: Oil Sludge Treatment
- Replacement for High Efficiency Equipment of Oil Sludge Treatment Process in the Waste Management Industry

Key Opportunity #3: Spent Bleaching Earth Treatment
- Utilization of palm oil refinery process in which residue oil are extracted from spent bleaching earth in the Palm Oil Refinery Industry

Green Island BATAM Conceptual Mapping through JCM-F5S

Phase 1 / 2015
- Areas of Critical to Improvement and Development are Identified
- Project Candidates are defined and shortlisted
- Projects are consolidated into the created project mapping

Phase 2 / 2016

Phase 3 / 2017-2018
- Explore Technology Implementation Opportunities
  - LED Industrial Areas
  - LED Street Lights
  - Smart Monitoring & Controlling System
  - PV Solar Power Generation System

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F/S Project Overview: LED Street Lights

- Scope of Study to Introduce follows:
  - Installation of the state-of-the-art Smart LED Street Lights manufactured by Japanese Firm of High Technology
  - Installation of Smart Monitoring and Controlling System to maximize efficiency of LED Street Lights
  - Installation of Innovative PV Solar Power Generation System to maximize efficiency of Energy Usage

Targeted Sites
- Major Industrial Park Areas

Introduction of Key Technologies

- Key Features of Technologies
  - The-state-of-art of the LED with Remote Monitoring Technology to minimize man-power maintenance for individual street light.
  - Alarming Function to detect failures, such as LED lamp damages, cable damages, electric leakage etc.
  - Various Key Energy Index Measurements of Illuminance, Voltage Value, Current Value, Energy Consumption Level.
  - Remote Controlling Technology to command On & Off for Individual LED Street Light.

Target (Planned)
- LED Installation (Planned): Approx. 600 – 800 units
- PV Solar Installation (Planned): Central Power Generation Facility Area Capacity = 1MW (Rooftop + Ground)

Installation of LED Street Lights and Control & Monitoring System
- 70% Energy Saving compared with conventional High Pressure Sodium
- Man-power Maintenance Reduction by Smart Monitoring & Controlling
- Further More Energy Consumption Reduction with more active controlling

Significant CO2 Emission Reduction / Significant OPEX Cost Reduction
Installation of PV Solar with Smart Tracking System

- Power Generation increases by 30%-40%
- More Solar Radiation
- Shorter Payback Period (Initial Cost < Profit Gain)

Significant CO2 Emission Reduction / High Cost Efficiency

Installation of PV Solar with Smart Tracking System...cont’d

- Synergetic Power Generation Impact with Ground-installation
- More Solar Radiation
- Shorter Payback Period (Initial Cost < Profit Gain)

Significant CO2 Emission Reduction / High Cost Efficiency
1. Company Profile

1.1 Company Name

- Company name: iFORCOM Co., Ltd.
- Address: 3-29-11, Tsuruyacho, Kanagawa-ku, Yokohama-shi, Kanagawa 221-0835, Japan
- Telephone: +81-45-412-3010
- Fax: +81-45-412-3002
- Establishment: October 1985
- Representative: Hiroshi Kagawa
- Capital: ¥100,000,000
- Employees: 350 persons (group whole)

Representative office in Indonesia
EightyEighty @ Kasablanka Office Tower, 18th floor, Kota Kasablanka, Jl. Casablanca kav. 88 Jakarta 12870

2. City to City Collaboration

2.1 Scheme
2.2 Feasibility Study (FS)

3. Our Solutions

3.1 Definition
3.2 Monitoring System
3.3 Equipment Improvement
3.4 Operational Improvement
3.5 Track Record

4. Schedule

5. Project Map

Agenda

1. Company Profile
   1.1 Company Name
   1.2 History

2. City to City Collaboration
   2.1 Scheme
   2.2 Feasibility Study (FS)

3. Our Solutions
   3.1 Definition
   3.2 Monitoring System
   3.3 Equipment Improvement
   3.4 Operational Improvement
   3.5 Track Record

4. Schedule

5. Project Map

Efforts to reduce energy costs

1.1 Company Name

Consulting by IoT and AI
[ECO-KAIZEN System]
Consulting for Heat
Consulting for Gas, Water
Seminar in the whole Japan
Electricity bill soaring
[ECO-KAIZEN Ver.4]
Great East Japan Earthquake
Conclusion of the Kyoto Protocol
Operational Improvement Consulting
[ECO-KAIZEN Ver.1]
Revision of Electricity Business Law
Contract Improvement Consulting

2017
Feasibility Study 3
Shopping Mall, Office Building

2016
Feasibility Study 2
Hotel, Hospital, Ferry Terminal

2015
Feasibility Study 1
Hang Nadim Airport
Start business in Indonesia

2014

2013

2012

2011

2005

1996

Representative office in Indonesia
EightyEighty @ Kasablanka Office Tower, 18th floor, Kota Kasablanka, Jl. Casablanca kav. 88 Jakarta 12870
2. City to City Collaboration

Letter of Intent on technical cooperation (27th May 2015)

Contribution to revitalize a “Smart Green Island” in Batam

3. Our Solutions

3.1 Definition

1. Monitoring System
   To set up equipment for monitoring the electricity usage.

2. Equipment Improvement
   It established the inverter to the pump (motor) that comes with chiller, cooling water pumps, cold water pumps, AHU to control the output.
   Check the operational status, it can also be carried out schedule operation.

3. Operational Improvement
   Check the usage of existing facilities, and by optimizing the operation method to reduce power consumption and achieve energy saving, saving CO2.
   - Investigation in detail for the usage of office equipment, air conditioning (air conditioning related such as chiller, air handling units)
   - Research and analysis for the optimal use development
   - Rules formulated on how to use, documenting

2.2 Feasibility Study (FS)

FS 1 2015
- Energy-saving A/C System Project, supporting Eco-Airport Plan
  JCM project application ⇒ adopted
  It is canceled because there is a plan to expand the airport.
  Reduction = 1,278,026 kWh (8%)

FS 2 2016
- Energy-saving Ferry terminal Project
- Energy-saving Hospital Project
- Energy-saving Hotel Project
  JCM project application
  It does not continue to JCM project because the scale is small.
  Reduction = 318,444 (16%)

FS 3 2017
- Green Building for Shopping mall, Office Building
  It is expected to be a JCM project.
  Reduction = 1,238,354 (15%)

3.2 Monitoring System

4 main graph (daily, weekly, monthly, yearly) + 8 graph analysis
Visualization of waste and uneven!

Various management functions, support the power saving by using the communication tool!
3.3 Equipment Improvement

- Existing power panel
- New power panel
- New wiring
- PLC control computer
- Inverter
- Existing secondary pump
- Existing primary pump
- Hot and cold water header (forward)
- Hot and cold water header (backward)
- Hot and cold water forward piping
- Hot and cold water back piping
- Existing heat source machine

After the implementation of this project, it is not to be removed but only by disconnecting construction.

3.4 Operational Improvement

Regularization

- Kickoff meeting
- We provide document-writing support throughout the curriculum period.
- Electric Cost Reduction Seminar
- Creating rules for operational improvements through cooperation between employees and experts, as well as providing assistance on establishing an energy conservation system.
- Program Planning Eco-work
- Compiling information such as the target electric cost reduction, identified relevant equipment, and summary of countermeasures for peak periods, etc. on an illustrative report.

3.5 Track Record

- Japan
- Philippines
- Indonesia

Others:
- more than 2500 facilities

4. Schedule

- Shopping Mall
- Office Building

<table>
<thead>
<tr>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct</td>
<td>Nov</td>
</tr>
<tr>
<td>Mar</td>
<td>Apr</td>
</tr>
<tr>
<td>May</td>
<td>Jun</td>
</tr>
<tr>
<td>Jul</td>
<td>Aug</td>
</tr>
</tbody>
</table>

- Provide data
- Proposal
- Survey in site
- FS Report
- International Consortium
- LOI
- Proposal start
- JCM application accepted
- iFORCOM
Project Map

1. Equipment Improvement
   + Operational Improvement

2. Industrial Improvement

3. Contribution to revitalize a “Smart Green Island” in Batam

Thanks for listening
GARUDA SMART CITY FRAMEWORK & INDONESIA SMART CITY RATING 2017 RESULT FOR BATAM

Prof. Suhono Harso Supangkat

Batam, 25th January 2018

AGENDA

SMART CITY IN GENERAL

GARUDA SMART CITY FRAMEWORK (GSCF)

INDONESIA SMART CITY RATING 2017 REVIEW

SMART CITY LIVING LAB

CLOSING REMARKS

GLOBAL CITY PROBLEM

- In 2008, global urban population exceeded the rural population for the first time (Seto et al., 2008)
- This urbanization trend leads to the increase of energy demands, waste and water services in and around the cities and also calls for more environmental care (Nevens et al., 2013)

INDONESIA CITY PROBLEM

- The urban population (53.3 per cent) exceeded the rural population in 2015 (bps.go.id)
- Urbanization causes large land conversion from agricultural areas into industrial estates or from water conservation areas to roads, creating an environment problem (Firman, 2000)
- Urban problems such as waste treatment, clean water, poverty, corruption, criminality, lack of green space

A system of physical structure, living entities, interaction, and information

City as a system become more and more complicated

Growing of living entities (human) is very fast, interaction and flow of information exploded and the limitation of physical structure cannot support all the needs
GLOBAL GOALS FOR SUSTAINABLE DEVELOPMENT

United Nation, in 2015 has agree on the Global goals labelled SDG’s the Sustainable Development Goals to replace the Millennium Development Goals agreed in 2000.

The 17 goals and 169 targets cover areas like poverty, public health, the environment, education and justice.

Effort to achieve the SDGs target must go hand-in-hand with a plan that builds economic growth and addresses a range of social needs including health, education, climate change and inequality.

THE GLOBAL GOALS

For Sustainable Development

#GLOBALGOALS

MOTIVATION

- Complexity of city problem is growing fast.
- In most cases, capacity of conventional solution cannot fulfill the capacity demand of city problem.
- City need innovative solution that provide higher capacity of solution.
- ICT (Information System and Technology) is potential enabler that enable innovative and effective solution and create high capacity of solution.
- But, it should be noted that Smart City is not equal to ICT city or digital city.

WHAT IS SMART CITY

Kota yang dapat mengolah berbagai sumberdayanya secara efektif dan efisien untuk menyelesaikan berbagai tantangan kota menggunakan solusi inovatif, terintegrasi, dan berkelanjutan untuk menyediakan infrastruktur dan memberikan layanan- layanan kota yang dapat meningkatkan kualitas hidup warganya.

Smart City is a city that can utilize its resources effectively and efficiently to solve any city challenges using innovative, integrated, and sustainable solution by providing infrastructures and deliver city services to improve Quality of Life.

SMART SOLUTION CHARACTERISTICS

New ideas of solutions that utilize resources more efficient and more effective and provide high capacity of solutions.

Solutions should be integrated between government institution as well as between government and non-government, vertical, also horizontal.

Integration cover: Business Process, Data, Application, IT infrastructure, and non-IT Infrastructure.

Solution should be designed to be sustained for long time.
CONNECTION BETWEEN MANY PLANS

GARUDA SMART CITY FRAMEWORK (GSCF)

CONNECTION BETWEEN GSCF AND (REAL) SMART CITY

SMART CITY MODEL
SERVICE VIEW
MAIN INDICATOR

- There are two main indicators for measuring Smart City:
  - Quality of Life Indicators.
    - This indicator measures the final results of the various efforts that are expected to ultimately improve the quality of life.
  - Smart City Development Maturity Level Indicators.
    - This indicator measures the extent to which the maturity level of the city (the city government and its other stakeholders) in an effective, efficient, integrated, sustainable, and scalable to generate services that can improve the quality of life of its citizens.

SMART CITY MEASUREMENT

Each Dimension / Eub field in G6CF2.0 has a list of indicators with assessment metrics. This mapping is done through an independent evaluation by the city government and direct visits to the municipality as well as through community surveys (n = 400) in selected cities.

Maturity Rating = \[
\frac{\text{Sum of Indicators Value}}{\text{Total Maximum Value} \times \text{Weight}}
\]
SMART CITY VIEW (QOL AND SMART WAY)

INDONESIAN CITY READINESS MAPPING TO SMART CITY

From the measurement results, there is no city that reaches the ideal smart city condition. Some cities have entered the initial integration level. Most cities are still building in scattered and in the starting phase (initiative).

MEASUREMENT INDICATORS MAPPING

Based on the results of the mapping conducted, the City Development and Management Process through innovative means as well as the readiness in terms of integration has become a handicap.

AVERAGE ACHIEVEMENT FOR 31 CITIES

<table>
<thead>
<tr>
<th>Bidang</th>
<th>Rata-rata</th>
</tr>
</thead>
<tbody>
<tr>
<td>Education</td>
<td>71.4%</td>
</tr>
<tr>
<td>Industry &amp; Tourism</td>
<td>53.68%</td>
</tr>
<tr>
<td>Safety &amp; Security</td>
<td>53.74%</td>
</tr>
<tr>
<td>Health</td>
<td>69.11%</td>
</tr>
<tr>
<td>Public Services</td>
<td>59.62%</td>
</tr>
<tr>
<td>Community</td>
<td>54.31%</td>
</tr>
<tr>
<td>Transportation &amp; Mobility</td>
<td>62.59%</td>
</tr>
<tr>
<td>Energy</td>
<td>46.40%</td>
</tr>
<tr>
<td>Spatial Management</td>
<td>61.98%</td>
</tr>
<tr>
<td>Environment</td>
<td>60.99%</td>
</tr>
</tbody>
</table>
LIST OF DIMENSIONS AND INDICATORS

Energy
- The availability of reduction in non-renewable energy consumption
- Level of biogas production
- Rate of behavioral change in the use of new energy carried by urban households
- The use of solar energy and wind energy as energy sources
- Use of waste and plastic recycling in the transport system
- People who use ICT for energy and natural resource management activities
- The level of internet usage for information provision and management of energy and natural resources
- Availability of data in energy and natural resources sector
- Capability in accessing digital data
- The rate of electric power consumed per year
- Natural gas and oil produced
- The rate of natural gas and oil sold

Spatial Management
- Compliancy of urban space planning with the spatial regulations
- Compliancy of land use plan with TOD (transit-oriented development)
- Conformity of urban planning with the face of the city
- Planning of green open space
- The area of agriculture, plantation, forestry and fishery (existing condition)
- The availability of financing cooperation and partnership in the planning, development, improvement (management) of city infrastructure
- The sufficiency of budget in managing the structure and pattern of urban space
- The availability of government policies related to smart city and urban sustainable development
- The availability of data for spatial sector

Environment
- The condition of air quality
- The condition of water quality
- Control of the city air quality
- Control of water quality
- Control of garbage
- Utilization of water supply
- Availability of control system utilization and improvement of the quality of water, air and urban waste
- The electric power sold per year
- Levels of environmental pollution
- The presence of a fuel utilization per day
- Contamination of water quality, waste and urban air pollution

LIST OF DIMENSIONS AND INDICATORS

CITY DEVELOPMENT AND MANAGEMENT
- Management, Integration, and Sustainability
- Digital Government
- Strategy and Plan

DIGITAL GOVERNMENT READINESS
- ICT Development Plan
- Quality of ICT implementation for internal city administration
- The existence of City Government Enterprise Architecture
- Percentage of OPDs utilizing ICT for Community Services
- Percentage of OPD connected to WAN / LAN
- Data Center presence in City Government
- Adequacy of ICT Resources in City Government

KESIAPAN INTEGRASI (INTEGRATION READINESS)
- Planning Mechanism
- Operational Mechanism
- Monitoring and Evaluation Mechanism
- Change Management Mechanism
- Inter-sectoral integration
- Program / Innovation Sustainability Strategy

BATAM CITY

Batam City’s economy is sustained by a variety of driving sectors including communications, industry, shipping, trading and other services that are the result of consumption of both the local population of Batam and export commodities.

In the application of smart city, Batam City uses applications for financial and monitoring activities, tax and PBB applications, media center, as well as setting traffic light with ATCS in control room to unravel congestion.
**BATAM CITY**

**MEASUREMENT RESULT FOR SPECIAL CATEGORY**

<table>
<thead>
<tr>
<th>Kriteria</th>
<th>31 Cities Average</th>
<th>Large Cities Average</th>
<th>BATAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smart City Maturity (Overall)</td>
<td>49.8%</td>
<td>53.2%</td>
<td>64.7%</td>
</tr>
<tr>
<td>Development and Management of the City</td>
<td>43.8%</td>
<td>50.1%</td>
<td>33.4%</td>
</tr>
<tr>
<td>Digital Government</td>
<td>52.4%</td>
<td>59.2%</td>
<td>44.3%</td>
</tr>
<tr>
<td>Integration Readiness</td>
<td>35.4%</td>
<td>40.3%</td>
<td>20.0%</td>
</tr>
<tr>
<td>Infrastructure Readiness</td>
<td>61.2%</td>
<td>59.0%</td>
<td>70.5%</td>
</tr>
<tr>
<td>Innovation Ecosystem</td>
<td>57.7%</td>
<td>57.0%</td>
<td>58.5%</td>
</tr>
<tr>
<td>Competitive Ecosystem</td>
<td>53.3%</td>
<td>51.1%</td>
<td>70.7%</td>
</tr>
<tr>
<td>Financial Technology</td>
<td>34.9%</td>
<td>32.7%</td>
<td>30.9%</td>
</tr>
</tbody>
</table>

*Notes: Above Average, Below Average*

26/03/2018

**BATAM CITY MAPPING**

**END RESULT: 44.7%**

**MATURITY LEVEL: SCATTERED**

26/03/2018

**SMART CITY LIVING LAB**

By Smart City and Community Innovation Center

26/03/2018

**SCCIC (Smart City & Community Innovation Center)** is a Research Community in ITB that have strong motivation to find systematic solution for any city problem or city challenges (can expanded to village, province, nation, or others) and at the same time produce scientific publication as our contribution to scientific world.

**GOALS**

Propose smart solution for city, village, province, nation by creating: Model, Architecture, Method, Framework, Solution, Proposed Regulation, etc

**ACTIVITY**

OUR APPROACH FOR CO-CREATION PROCESS

- Involving Heterogeneous Smart City Stakeholders through:
  - Co-definition, Co-experience and Co-Elevation

RESEARCH AND INNOVATION PROGRAM

OPEN INNOVATION LAB

Open Innovation Lab is a program to understand (sense) the real problem of city or community then to discuss multidisciplinary in this lab and finally proposing a solution with industry and community.

PERSUASIVE TECHNOLOGY

Definition
- Technology that is designed to change attitudes or behaviors of the users through persuasion and social influence, but not through coercion (Fogg, 2002)
INNOVATION FOCUS ON SMART CITY AND COMMUNITY

City and Community Problems

Open Innovation Lab.

Smart City and Community Solutions

GOVERNANCE  SECURITY  ENVIRONMENT
ECONOMY  EDUCATION  TRANSPORTATION
TECHNOLOGY  HEALTH  NATIONAL RESOURCES
SME  PUBLIC SERVICE  ENERGY

SMART CITY LIVING OPEN INNOVATION LAB

SMART CITY LIVING LAB

CLOSING REMARK
KEY CHALLENGES AND OPPORTUNITIES

• Building understanding and collaboration between relevant stakeholders. City must be ready to cope with change better through the development of services based on the Smart City concept.

• Policies and regulations are an important issue in the development of Smart City, but currently lags behind technological developments.

• One of the biggest challenges is to integrate all solutions.

• The importance of educating the public on how smart city solutions will affect the process of life and how the right decision is the key to success in the future.
GREEN BUILDING CONCEPT
Sebuah upaya untuk membuat lingkungan semakin sehat, nyaman dan berkelanjutan

Surendro | Green Building Council Indonesia
Batam, 25 Januari 2018

Outline:
Introduction of GBC Indonesia
Why Green Building?
Concept of Green Building

Emerging Member of World Green Building Council
Appropriate Site Development
Energy Efficiency and Conservation
Water Conservation
Material Resource and Cycle
Indoor Health and Comfort
Building Environment Management

Energy Efficiency
Water Efficiency
Embodied Energy from Building Material

Certified 1.6 M sqm (GFA)
Saving
Energy 132,027,793 kWh/thn
Water 1,207,674 m³/thn
CO₂ Reduction 117,636 ton/thn
DKI Jakarta
Governor Regulation No. 38 / 2012
Green Building

Mandatory for certain building size
- Offies, Malls & Apartments: > 50,000 square meter
- Education Facilities: > 10,000 square meter

After 3 years of implementation:
- 260 buildings > 15 mil sqm
- Saving energy: 853.914 MWh/year
- Cost saving USD 68.3 mil/year
- CO2 reduction: 605.4 oz/year

Data source: [https://greenbuilding.jakarta.go.id/](https://greenbuilding.jakarta.go.id/) → design base of NB and self-declare of EB

---

JAKARTA
GREEN BUILDING

Komitmen 30:30<
Jakarta sebagai Center of Excellence Bangunan Gedung Hijau

Pada tahun 2030, Jakarta telah menetapkan visi untuk mengurangi 30% konsumsi energi, 30% emissi CO2 dan 30% konsumsi air (Komitmen 30:30:30). Tantangan lebih lanjut dalam Grand Design Implementasi Bangunan Gedung Hijau

[lebih lanjut](https://greenbuilding.jakarta.go.id/)

---

Bandung City
Mayor Regulation No. 1023 / 2016
Green Building

Hemat Air, Hemat Listrik
Sirkulasi dan Kualitas Udara Yang Baik

Mempersiapkan Ruang Terbuka Hijau
Pengelolaan Sampah Yang Baik
Penanganan Limbah Yang Baik

Untuk mendapatkan izin membangun bangunan (IMB) dari Dinas Tata Ruang (Ontario), bangunan di antaranya harus...
Negara berkembang di Asia dan Afrika adalah yang paling bertanggung jawab dalam pertumbuhan populasi dunia saat ini hingga tahun 2050.

Tata kota yang kurang terencana dengan baik tidak dapat mengakomodir kebutuhan masyarakat yang tinggal di dalamnya.

Traffic getting worse!!!

Storm Water

40% evapotranspiration
10% runoff
25% shallow infiltration
25% deep infiltration
Natural Ground Cover
75%-100% Impervious Surface

30% evapotranspiration
55% runoff
10% shallow infiltration
5% deep infiltration

Building consumes

39% World’s energy
12% World’s water

Producing
25% Waste
35% Greenhouse gas emission

Zero Net

2020 Sehat
What is GREEN BUILDING?

Green building (also known as green construction or sustainable building) refers to both a structure and the use of processes that are environmentally responsible and resource-efficient throughout a building's lifecycle: from siting to design, construction, operation, maintenance, renovation, and demolition. (https://en.wikipedia.org/wiki/Green_building)

Green Building = Perfora Bangunan

Bangunan yang Terukur | If we can measure it, we can manage it

Green Building Philosophy

Healthy + Environment + Built Environment = Economic value
TEPAT GUNA LAHAN

Mengembangkan area hijau bangunan

Sediakan fasilitas untuk pengendara sepeda dan pengguna transportasi lainnya

Menciptakan iklim mikro pada lingkungan bangunan
Mempertimbangkan dampak dari lahan terbangun terhadap air limbahan dan infrastruktur drainase

EFISIENSI DAN KONSERVASI ENERGI

Passive Design

Penggunaan peralatan hemat energi

Memaksimalkan pencahayaan alami
Menggunakan energi terbarukan

KONSERVASI AIR

Peralatan hemat air dengan menggunakan menggunakan sensor

Tanaman yang membutuhkan sedikit air atau wild plant
Air daur ulang dan sumber air alternatif

SUMBER DAN SIKLUS MATERIAL

Material yang diproses dengan cara yang ramah lingkungan dan dari sumber yang berkelanjutan

Pilih material prefab karena ringan dan memiliki sedikit limbah
Mengurangi limbah dan memaksimalkan penggunaan kembali

Gunakan material lokal

KESEHATAN DAN KENYAMANAN DALAM RUANG

Kenyamanan visual, suhu udara, dan kebisingan
Memastikan kualitas udara
dalam ruang dengan
memakai material interior
yang bebas dari racun

Menyediakan akses
pandangan ke luar sambil
menjaga kenyamanan
visual dan termal

MANAJEMEN LINGKUNGAN
BANGUNAN

Manajemen sampah dan
limbah lainnya
Perawatan semua peralatan untuk menjaga efisiensinya

Selalu lakukan pencatatan, karena Green Building adalah bangunan yang terukur

Assessment for neighborhood and district scale
- Can be used for housing, CBD, industrial district, either for small scale or large scale
- Assessment available for design stage and existing stage

Land Ecological Enhancement
- Movement and Connectivity
- Water Management and Conservation
- Solid Waste and Material
- Community Wellbeing Strategy
- Building and Energy
- Innovation and Future Development

Terima Kasih
Objectives: city-to-city collaboration

- Our project aims to
  - promote JCM project formulation
  - support Green City Programme of Batam
- "Best available solutions for Batam" needs to be considered through collaboration.

Support of Green City Policy of Batam by Introduction of Smart LED Street Lighting System and Green Buildings

January 30, 2018
SAITO Tetsuya
Nippon Koei Co., Ltd.

6 pillars for city-to-city collaboration

Green Planning

Green Water

Green Waste

Green Industry

Green Building

Green Transportation

Support of project formulation etc.

Indonesian counterpart entities

Matching for project formulation
Targets and Approach for FY2017
“toward sustainable extension for all Batam”

Green Transportation
- Smart LED street light Project in Nagoya / Industrial Parks / Ports

Green Planning
- Standardization of Smart LED street lighting system

Green Building
- Green Building Project for shopping mall / office building / residential building

Green Planning
- Drafting Mayor’s regulation for Green Building
- Setting target to increase green buildings in Batam

Achievement (Smart LED+PV)

Green Transportation
- Smart LED street light Project in Nagoya / Industrial Parks / Ports
- Smart LED street light and PV Project in Industrial Park

Green Planning
- Standardization of Smart LED street lighting system
- Communicating with Japanese expert organization which is starting standardization in the central level in Indonesia
- Compiling the learnings in (1) port application and (2) highway application.

Major events

<table>
<thead>
<tr>
<th>Month</th>
<th>Milestone</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oct, 2017</td>
<td>Kick-off meeting in Batam</td>
</tr>
<tr>
<td>Nov, 2017</td>
<td>Field works in Batam</td>
</tr>
<tr>
<td>Dec, 2017</td>
<td>Site tour in Japan for water management sector Field works in Batam</td>
</tr>
<tr>
<td>Jan, 2018</td>
<td>Final workshop in Batam</td>
</tr>
</tbody>
</table>

F/S Result (Smart LED+PV)

<table>
<thead>
<tr>
<th>Items</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Title</td>
<td>Smart LED street lighting and PV Project in Industrial Park</td>
</tr>
<tr>
<td>Japanese side</td>
<td>Finetech Co., Ltd.</td>
</tr>
<tr>
<td>Indonesian side</td>
<td>One of the biggest industrial parks in Batam</td>
</tr>
<tr>
<td>Leading low-carbon technologies</td>
<td>- LED street light with smart control - PV with sun-tracking system</td>
</tr>
<tr>
<td>Potential emission reduction</td>
<td>Approx. 2,080 tCO2/year (LED 1,120 + PV 960)</td>
</tr>
</tbody>
</table>
**Achievement (Green Building)**

- **Green Building Project for shopping mall / office building / residential building**
- **Green Building Project for shopping mall**

**Green Planning**

- Drafting Mayor’s regulation for Green Building
- Setting target to increase green buildings in Batam
- **Initial draft items for the regulation is prepared**
- **Launch forum** to discuss green building regulation in Batam (in Feb 2018)
- Sharing **Yokohama’s experiences and know-how**

**F/S Result (Green Building)**

<table>
<thead>
<tr>
<th>Items</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Title</td>
<td>Energy Saving for Air-conditioning Utility System in Shopping Mall by High-efficiency Control Equipment</td>
</tr>
<tr>
<td>Japanese side</td>
<td>iForcom Co., Ltd.</td>
</tr>
<tr>
<td>Indonesian side</td>
<td>One of the biggest shopping malls in Batam</td>
</tr>
</tbody>
</table>
| Leading low-carbon          | - Monitoring and visualization system  
| technologies               | - Equipment and operational improvement                                    |
| Potential emission reduction| Approx. 1,150 tCO2/year                                                     |

**Way Forward**

<table>
<thead>
<tr>
<th>Sector under city to city collaboration</th>
<th>2013 City to city collaboration</th>
<th>2014 City to city collaboration</th>
<th>2015 City to city collaboration</th>
<th>2016 City to city collaboration</th>
<th>2017 City to city collaboration</th>
<th>2018 City to city collaboration</th>
<th>Future</th>
</tr>
</thead>
<tbody>
<tr>
<td>Green Planning</td>
<td>Information collection through collaborative framework</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Development of creative and collaborative framework for Future vision as green city</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Target setting for low carbon footprint</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Implementation of green building</td>
<td>-</td>
<td>-</td>
<td>-</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Support of development in green building</td>
<td>-</td>
<td>-</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>Extension to other cities as Yokohama model</td>
<td>-</td>
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<td>-</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

| Green Water                          | Step-by-step water treatment                                           | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Water management PS                                                    | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Waste treatment project                                                | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Desalination of seawater PS                                            | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Desalination of seawater PS                                            | -                                    | -                                    | -                                    | -                                    | -                                    |        |

| Green Waste                           | Resource recycling and flux prediction                                 | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Thermal Desorption Unit project (thermoelectric)                       | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Sustainability evaluation, Waste Management                           | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Desalination of seawater PS                                            | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Desalination of seawater PS                                            | -                                    | -                                    | -                                    | -                                    | -                                    |        |

| Green Industry                        | Solar PV system in industrial parks (progress approval)               | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Solar PV system in industrial parks (progress approval)               | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Solar PV system in industrial parks (progress approval)               | -                                    | -                                    | -                                    | -                                    | -                                    |        |

| Green Building                        | Airport energy saving PS                                               | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Airport energy saving PS                                               | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Airport energy saving PS                                               | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Ferry terminal PS                                                      | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Ferry terminal PS                                                      | -                                    | -                                    | -                                    | -                                    | -                                    |        |

| Green Transportation                  | Green Building PS                                                      | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Green Building PS                                                      | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Green Building (office building and shopping mall)                     | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Green Building (office building and shopping mall)                     | -                                    | -                                    | -                                    | -                                    | -                                    |        |
|                                        | Green Building (office building and shopping mall)                     | -                                    | -                                    | -                                    | -                                    | -                                    |        |

**Site survey: Chiller**

**Site survey: Ambient air**
Yokohama’s Initiatives for the Promotion of International Technical Cooperation

Y-PORT CENTER – Knowledge hub for smart city management

Reinforcement of Y-PORT Center, opened in 2015, as a platform for Y-PORT project

- Issues indicated by private companies, March 2016
  - Reinforcement of personnel specialized in exporting infrastructure development
  - Securing personnel to provide consistent support for long-term infrastructure business development
  - Providing flexible and dynamic support for project development

[Measures for reinforcement]

#1 Opening Y-PORT Center Public-Private Partnership Office in July 2017

#2 Supporting overseas infrastructure business development by specialized-personnel, from October 2017
  - Locating personnel specialized in exporting infrastructure development through outsourcing at the Y-PORT Center Public-Private Partnership Office

#3 Consistent support from planning to developing business, from July 2017
  - Relocating 5 city-employees to support exporting infrastructure development to the Y-PORT Center Public-Private Partnership Office

YUSA: YOKOHAMA URBAN SOLUTION ALLIANCE

Private sector alliance established in July 2017 mainly by Yokohama-based companies to develop more infrastructure business and to cope with urban issues in the emerging economies, in accordance with the reinforcement of Y-PORT Center by the City of Yokohama

Establishing YUSA, not to lose business opportunities

- Feature of YUSA 1: Pack of private companies
  - To provide solution as a package for urban issues in the emerging economies by various companies with various technologies

- Feature of YUSA 2: Private sector alliance with legal personality
  - To be an independent subject to make contracts with various partners such as overseas cities, companies, and international donors

- Feature of YUSA 3: Sharing basic ideas on exporting infrastructure business development with the City of Yokohama
  - To make it easy to understand the reason to collaborate with the City of Yokohama, by sharing basic ideas of Y-PORT project to cope with urban issues in emerging economies and to provide infrastructure business opportunities, and also by signing MoU for collaboration with the City of Yokohama
YUSA (YOKOHAMA URBAN SOLUTION ALLIANCE)

- In July 2017, YUSA and the City of Yokohama signed an MoU to collaborate for developing Y-PORT project by utilizing each strength
- In August 2017, YUSA located in Y-PORT Center Public-Private Partnership Office
- Number of members as of December 2017:
  - Member: 10
  - Associate member: 12
  - Supporting member: 3

Future development

- [Component 1] Further collaboration with local governments in emerging economies
- [Component 2] Supporting SME for developing overseas business
- [Component 3] Arranging international platform

[Key words]
- Stronger consulting services
- Interactive innovation by figuring out needs on development through communication from the first planning phase
- Working further in line with national policy
- Further collaboration with MDB

Collaboration with private companies in Thailand #1

- Ministry of Energy Thailand and AMATA started collaboration for Eastern Economic Corridor initiative
  - Request from Ministry of Energy: converting industrial estate into smart one
  - Request from AMATA: converting AMATA Nakorn into smart city, mainly by smart infrastructure, and introducing state-of-the-art technologies from Yokohama-based companies to build smart cities for expansion in Vietnam, Myanmar Lao and Cambodia

<Future Development>
- Sharing experience and expertise on smart city by City of Yokohama through YUSA
  - Study by YUSA: finding needs and site visit
  - Holding seminars to share suggestion from YUSA and vision of AMATA
- Aiming to develop concrete projects from FY2018 on, and taking disseminating smart technologies and infrastructure technologies to other ASEAN countries into account in the long term

Future development

- [Component 1] Further collaboration with local governments in emerging economies
  - Developing firm mutual trust with local government through long-term collaboration
  - Not sectorial but integrated interactive dialog, such as the Danang Urban Development Forum

- [Component 2] Supporting SME for developing overseas business
  - Intensive and continuous support for companies for project development such as business seminar, business matching, feasibility studies and pilot projects
  - Developing “Solution Package” integrated with each companies’ technologies
  - Exporting appropriate products and technologies by picking up developing needs precisely

- [Component 3] Arranging international platform
  - Developing knowledge-platform by collaboration with WB and ADB, such as expansion of Asia Smart City Conference
  - Inviting international conferences to Yokohama, and participation to major international conferences such as COP23 and WUF9
  - Encouraging international organization to relocate in Yokohama
Thank you for your attention

Development Cooperation Division,
International Affairs Bureau
City of Yokohama, Japan
Email: ki-yport@city.yokohama.jp
Seminar:
City-to-City Collaboration Projects for Low Carbon City Development in Asia

Japan, January 30th 2018
Hirakawacho, Chiyoda-ku, Tokyo

FORTHCOMING INFRASTRUCTURE PROJECTS

Vision/Strategy/Master Plan for Low Carbon City (or Green City) Development

What does BIFZA have?
Vision/Strategy/Master Plan for Low Carbon City (or Green City)
Development:

- The development planning of public transportation in Batam
- The improvement of waste management in Batam in order to maintain water supply continuity
- The implementation of Green Building Concept in BIFZA’s New Hospital Building

Measures/Actions Taken for Low Carbon City Development

What does BIFZA plan?

The Development Planning Of Public Transportation: Batam Light Rail Transit (LRT)

- All of the feasibility study phases already done
- Current state: looking for investors to implement

The Development of Sewerage System In Batam Island

- 7 locations of WWTP in Batam:
  1. BATAM CENTRE
  2. Bengkong
  3. Tanjung Uma
  4. Sekupang
  5. Tembesi
  6. Telaga Punggur, dan
  7. Kabil
The Improvement Planning of Dams Maintenance In Batam

- **Purpose:** In order to maintain water supply continuity
- **Development and Procurement Plans:**
  - Sediment Trap Development: is a water structure that serves to precipitate incoming sediments with the aim of collecting and removing sand and mud particles.
  - Installation of Trash Rack: is one of the water buildings made of steel parts where its function is to filter garbage/debris carried by the flow of water to keep the channel/reservoir clean from waste.
  - Application of Ecostech Garden Technology (EGT): one of the solutions to eliminate pollutants from the effluents of Gray Water, and there is the possibility of a septic tank containing pollutants (BOD, COD, N, P, X Detergent) and Glibor.
  - Floating Barrier Installation: floating is made for containment and control of debris, plants and floating particles. Perfect for calm and moving water areas, this blast features top/rotation, impermeable neck and lower beam to successfully control and hold the goods.
  - Procurement of Harvester (water hyacinth cleaner), clearing water hyacinths scattered in Durangkang Reservoir by using water hyacinth cleaning machine.
  - Control and Control of Illegal Buildings in Catchment Area (DUA) Durangkang Reservoir.
Development Planning of Hazardous Waste Treatment Area

Consist of 2 phase of development planning:

The Implementation of Green Building Concept in BIFZA’s New Hospital Building

- What has the new hospital building already have?
  - Sewage Treatment Plant (STP)
  - Recycling water from waste water
  - Using façade material for reduce heat

- What does the new hospital want to develop?
  - Utilization of inverter technology for air conditioner system
  - Utilization of LED lamp in hospital building
  - Utilization of PV system for street light energy source

How The City-To-City Collaboration Project Contributes To Your City’s Development

What does BIFZA hope?
PILOT PROJECT PLANNING

Pilot Project related to:
- Water recycling
- Energy efficiency
- Solid waste handling, etc.

Implementation on: 2018

Implemented by:
- Nippon Koei
- BIFZA
- Batam City

Participants:
- Industrial area (5)
- Hotel (5)
- Mall (5)
- Hospital and Sea Port (5)

General Description:
Socialization → Sign of MoU (as Top Management Commitment) → Survey → DED → Implementation → Monitoring

Financing:
- Nippon Koei

Thank You
Overview of Yokohama City

- International port city
- Opening of port of Yokohama in 1859
- Population: approx. 3.7 million
- Largest city in Japan
- GDP: approx. 12.7 trillion JPY (approx. 107 billion USD)
- 21 minutes from Haneda Airport (Tokyo)

City-to-City Collaboration
Toward Smart and Green Island of Batam

Introduction of Batam City

- Population: 1.2 million
- Industry Oriented Island as a Free Trade Zone operated by the Batam Indonesia Free Zone Authority (BIFZA)
- More than Twenty Industrial zones where Japanese enterprises locate their factories.
- Essential needs for efficient waste supply, water/solid waste management, energy management, public transportation system in order to accommodate increasing population

Letter of Intent on Technical Cooperation for Sustainable Urban Development Signed with the City of Batam, on 27th May, 2015 for 3 years

Contents of Agreement

1. The City of Yokohama will offer technical advice in promoting the eco-city development of the City of Batam.

2. The Parties will encourage participation of the private sector and academic organizations.

3. The Parties will take action to obtain cooperation of the governments of both countries and international organizations.

4. The Parties will mutually provide information essential to implementing the above collaboration effectively.
Framework of City-to-City Collaboration with Batam in this Year

Government of Indonesia  Bilateral Relationship  Government of Japan

Development Assistance Organization such as ADB and JICA

Cooperative agreement between the cities

Task Force

Private and academic sector

City of Batam

City of Yokohama

Private and academic sector

Green Planning

Green Water

Green Waste

Green Industry

Green Building

Green Transportation

Sustainability Evaluation (Waste Management) by METI

Recycling of bleaching earth of palm by METI

Water Management FS by METI

JCM FSs by MOEI

NIPPON KOEI

Finetech

AGC

STANLEY

YOKOHAMA URBAN SOLUTION ALLIANCE

NIPPON KOEI

by METI

YOKOHAMA WATER

CONTRIBUTION TO VITALIZE BATAM GREEN ISLAND

Thank you for your attention
### Assessment Items of Green Building Regulations in Indonesia

#### Phase 1: Site Management

<table>
<thead>
<tr>
<th>Categories of Targets</th>
<th>Sub-Categories</th>
<th>New Building</th>
<th>New Building / Extension</th>
<th>New Building</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Site Management</strong></td>
<td>a. Orientation of building</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
</tr>
<tr>
<td></td>
<td>b. Site processing including accessibility</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
</tr>
<tr>
<td></td>
<td>c. Management of contaminated land of hazardous and toxic materials</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
</tr>
<tr>
<td></td>
<td>d. Pedestrian lane</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
</tr>
<tr>
<td></td>
<td>e. Management of waste</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
</tr>
<tr>
<td></td>
<td>f. Parking area</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
</tr>
<tr>
<td></td>
<td>g. Outdoor lighting system</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
</tr>
<tr>
<td></td>
<td>h. Construction of building</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
<td>1-e. Supporting facilities (pedestrian, bicycle parking area, park)</td>
</tr>
</tbody>
</table>

#### Phase 2: Energy Efficiency

<table>
<thead>
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<th>Categories of Targets</th>
<th>Sub-Categories</th>
<th>New Building</th>
<th>New Building / Extension</th>
<th>New Building</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>e. Indoor transportation system</td>
<td>1. Site Management</td>
<td>1. Site Management</td>
<td>1. Site Management</td>
</tr>
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</table>

#### Phase 3: Efficiency of Water Use

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#### Phase 4: Indoor Air Quality

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#### Phase 5: Environmentally Friendly Materials

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<td>c. Controlling the use of hazardous materials</td>
<td>4. Indoor air quality</td>
<td>4. Indoor air quality</td>
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#### Phase 6: Waste Management

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#### Phase 7: Wastewater Management

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#### Phase 8: Green Construction Process

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#### Phase 9: Practices of Green Behavior

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#### Phase 10: Green Supply Chain

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