Feasibility Study for assisting ports in Thailand to reduce CO2 Emission and to become Smart City
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. 20 minutes from Haneda Airport (Tokyo)
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

MOU with JICA
MOU with ADB
MoU with BMA in Oct, 2013
City-to-city collaboration with Y-PORT project
Master Plans which the City of Yokohama has worked together with Four Cities under City-to-City collaboration

Bangkok, Thailand
- Bangkok Master Plan on Climate Change

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

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

Cebu City, Philippines
- Mega Cebu Roadmap 2050

Yokohama City

**JICA Report**
“Technical cooperation project on the Bangkok master plan on climate change 2013-2023 in the Kingdom of Thailand”
(1) http://libopac.jica.go.jp/images/report/P1000025878.html
(2) http://libopac.jica.go.jp/images/report/P1000025879.html

**JICA Report**
“Data collection survey on sustainable and integrated urban development in Danang final report”

**JICA Report**
“The Roadmap study for sustainable urban development in Metro Cebu final report”
Flagship Projects by City to City Collaboration in Four Cities

Bangkok, Thailand
- Rooftop solar power system and advanced EMS for power supply in Factory by Finetech CO. Ltd.

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

Cebu City, Philippines
- Efficient dewatering process of septage sludge by Amcon INC.

Batam City, Indonesia
- Energy Saving for Air-Conditioning Utility System in the airport terminal by iForcom Tokyo Co., Ltd.
- Waste plastic recycling by Mansei Recycling Systems Co., Ltd.

<Contents of Agreement>

1. The City of Yokohama will offer technical advice in promoting sustainable urban development of Bangkok in the area such as energy management, public transportation, solid waste and waste water management, etc.

2. The Parties will encourage participation of the private sector, academic institutions, and local communities which have expertise and knowledge on low carbon society development to achieve the above mentioned objective.

3. The Parties will call for support of Central Governments of both sides and international organizations in pursuing appropriate assistance to implement technical cooperation.

4. The Parties will share and exchange information which is essential to implement the above collaboration effectively.
Collaboration with BMA

- Signing MOU for technical Cooperation
- Supporting for formulating master plan “Bangkok Master Plan on Climate Change 2013-2023 (MP)” ●
- Feasibility Study for JCM project for implementing MP ★
- Co-hosting business matching in Bangkok ★
- Arranging site visit in Yokohama ★ ●

★: JCM project ●: JICA project

Thailand

Japan (MOEJ, JICA etc.)

ADB, WB, JBIC, etc.

BMA

City of Yokohama

Thailand-based Companies

Yokohama-based Companies

Y-PORT

Rooftop solar power system and advanced EMS for power supply in Factory by Finetech CO. Ltd. ★
Collaboration ② Partnership between PAT and City of Yokohama

MOU between the Port Authority Thailand and the City of Yokohama (2014-2019) 
(for promoting Partnership btw PAT & COY)

① Both parties agree to exchange information on issues regarding;
- Mutual support on port management
- Global trade,
- Maritime trend
- Introduction of IT
- Environmental measures, etc.

② Both parties agree to assist each other in exploring the local and regional market, by facilitating and promoting cooperation with potential local partners/customers.

JCM Feasibility Study by Yokohama Port Corporation, Green Pacific and Overseas Environmental Cooperation Center in cooperation with PAT, based on the partnership between PAT and COY (2016)
Port and Harbor Act was revised in March 2011, where The Port of Yokohama was designated as a Strategic International Port.

### Strategic International Port
Hubs of a marine cargo transportation network of long distance, international maritime container transport which have high function of connecting the said network of international marine cargo transportation with domestic one, and require marked enhancement of its international competitiveness.

- Keihin Port (Ports of Yokohama, Kawasaki and Tokyo),
- Hanshin Port (Osaka Port, Port of Kobe)

### International Hub Port
Ports other than Strategic International Ports which serve as hubs of international marine cargo transportation.

- Muroran, Tomakomai, Sendai Shiogama, Chiba, Niigata
- Fushiki-Toyama, Shimizu, Nagoya, Yokkaichi, Sakaisenboku
- Himeji, Wakayamashimotsu, Mizushima, Hiroshima
- Tokuyamakudamatsu, Shimonoseki, Kitakyushu, Hakata

### Major port
Ports other than Strategic International Ports or International Hub-Ports which have great importance to the national interest including those that serve as hubs of a maritime transport network.

### Minor port
Ports other than Strategic International Ports or major ports.

<table>
<thead>
<tr>
<th>Category</th>
<th>Number</th>
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<td>Strategic International Port</td>
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<td>Keihin Port (Ports of Yokohama, Kawasaki and Tokyo), Hanshin Port (Osaka Port, Port of Kobe)</td>
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<td>International Hub Port</td>
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<td>Muroran, Tomakomai, Sendai Shiogama, Chiba, Niigata, Fushiki-Toyama, Shimizu, Nagoya, Yokkaichi, Sakaisenboku, Himeji, Wakayamashimotsu, Mizushima, Hiroshima, Tokuyamakudamatsu, Shimonoseki, Kitakyushu, Hakata</td>
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<tr>
<td>Major port</td>
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<td>Ports other than those described above</td>
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<tr>
<td>Minor port</td>
<td>808</td>
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</tbody>
</table>
Efforts for Low-carbon Port in the Port of Yokohama

Vision of the Port of Yokohama

1 Port with international Competitiveness
- Planning public pier
- Planning port transport facilities
- Initiatives to realize a strategic international container port

2 Port for residents to socialize and relax
- Planning passenger cruise terminals
- Redeveloping Yamashita Pier
- Creating vibrant atmospheres in the coastal area

3 Port considering security, safety and environmental protection
- Countermeasure facilities against large-scale earthquakes
- Environmental protection
- Planning “Smart” Port

Environmental Protection “Smart” Port in the Port of Yokohama

- Energy Efficient Lightings
- Hydrogen Energy Supply System

Japan’s First LNG Bunkering Hub

- (left; on-going Truck to Ship / right; image in 2020)

Solar Power Generation

- (left; on-going Truck to Ship / right; image in 2020)
**Strategy of Port Authority of Thailand**

**Vision of PAT**

- **Hub of ASEAN**
- **Strengthen port role**
- **Modern**

**PAT Environmental Plan “Green Port” < 5-year plan for 2015-2019 >**

- To reduce CO2 emissions by 10% in 2019 compared with in 2013

- To install energy-saving cargo handling machines in ports under the PAT

- Bus-bar electrification
- Overhead electrification
- Cable-reel electrification

- 84 units of Wind turbine
- Generate electric power at 10 kilowatt/hr

**Vision of PAT Map**

- Chiang Saen Port
- Chiang Khong Port
- Bangkok Port
- Ranong Port
- Laem Chabang Port

**Map of Thailand and neighboring countries**
Partnership between PAT and City of Yokohama

Jul.2013 Visit PAT to promote public relation activity for port and harbor customers in Thailand (Port and Harbor Bureau, City of Yokohama)

Apr.2014 Signing the MOU in Yokohama, Japan btw Port Authority of Thailand and City of Yokohama (delegates from PAT, Bangkok Port and Laem Chabang Port)

Aug. 2014 Site Visit to the Port of Yokohama (delegates from Laem Chabang Port)

Jan. 2015 Signing the Letter of Intend in Bangkok, Thailand under the MOU btw PAT and COY

Jan. 2015 Seminar on Trend of Trade btw Thailand–Japan and Port’s Readiness for Changes in PAT

Jul. 2015 Visit PAT to introduce the city to city collaboration btw BMA and COY, including the JCM (International Affairs Bureau (Y–PORT))

Oct. 2015 Visit and ask the opinion to the PAT about the JCM program (Yokohama Port Corporation)

Nov. 2015 Site Visit to the Port of Yokohama (delegates from PAT, Bangkok Port and Laem Chabang Port)

Oct. 2016 the JCM Feasibility Study by YPC, GP, OECC–Feb.2017 in cooperation with PAT, based on the partnership btw PAT and COY

Feb. 2017 Site Visit to the Port of Yokohama (delegates from PAT, Bangkok Port and Laem Chabang Port)
Technical Cooperation with BMA, Port Authority and Private Companies
In Bangkok and surrounding areas

“Private Companies”
Factory, Industrial Park, Building etc.

Collaboration with “BMA”
Waste, Wastewater, Transportation, ...

Collaboration with “PAT”
Bangkok Port
Laem Chabang Port
Others

Areas for this survey

Bangkok
“Holistic Approach for the whole city”
PAT’s “Green Port Project”
Term (2015 ~ 2019)

**Scope of the feasibility study**

### Phase 1 (2015~2019)
- **Bangkok Port**
  1. PV Panels on CFS roof
  2. Indoor LED lightings in CFS
  3. Electric Forklifts in CFS
  4. Hybrid RTGs
  5. LED yard lightings for container yard

### Phase 2 (2020~2024)
- **Bangkok Port and Laem Chabang Port**
  6. LED road lightings in LC Port
  7. Hybrid cargo handling equipment in Lat Krabang ICD
  8. High efficiency transformers to substations in BKK Port
  9. Shore connection system in BKK and LC Port
  10. Hybrid tugboats

### Phase 3 (2025~2029)
- Long term study for the future (e.g.)
  - Carbon reduction at local ports under PAT control
  - Reducing carbon through cooperation with terminal operators of LC Port
  - Introduction of hydrogen technology

<Participants of the F/S>

- **Collaborator**
  - City of Yokohama

- **Representative entity**
  - YPC

- **Counterpart in the host country**
  - PAT

- **Overseas Environmental Cooperation Center**
  - Green Pacific
The EMS of Bangkok Port proposed by YPC aims to realize **sustainable port management** by the following measures.

1) Introducing devices to utilize renewable energy (PV) and energy-saving equipment such as LED lightings.
2) Combine current power supply from electric company, existing generator with renewable energy for **making electric system of Bangkok port more stable with lower cost and less CO2 emission**.
Summary for the JCM FS

Important Point < 1 >
☑ Collaboration among port authorities in addition to city-to-city collaboration
☑ The successful experience of JCM project in Bangkok Port spreads to other ports operated by PAT

Important Point < 2 >
☑ “Green Port” 5-years plan for 2015-2019, formulated by the PAT as a green-conscious organization, including the budget plan
☑ To utilize JCM scheme continuously and comprehensively

Important Point < 3 >
☑ Utilizing the technical expertise and experience of the Port of Yokohama