WtE Business in Bali, Indonesia

~ Inter-city cooperation seminar for realization of low-carbon society in Asia ~

Kentaro Oshima
International Cooperation Department for Waste Management, Clean Authority of TOKYO
Clean Authority of TOKYO is a special local public body established in order to jointly process its partial administration by more than 2 local public bodies stipulated in paragraph 2 of Article 284 of Local Autonomy Act.
Flow of Municipal Solid Waste Treatment in 23 Cities of Tokyo
(April 1st, 2000~)

<23 Cities>
Reduction of waste volume/
Promotion of recycling,
Collection/Transport of waste/
human waste, and Recovery/ Transport
of resources

<JFY2014>
Processing volume of waste
2,780,000t/year
(Total amount of combustible,
incombustible, and large-sized waste)

<Tokyo Metropolis>
Final disposal
of waste

<JFY2014>
Volume of final disposal (landfilling)
360,000t/year

<CAT23>
Intermediate treatment
of waste/human waste
Establishment of International Cooperation Department for Waste Management

April, 2011 Establishment of International Cooperation Department for Waste Management
May, 2012 Development of “Master Plan” for 10 years and “Individual Project Plan” for 3 years
June, 2013 Publication of “Tokyo Model”
April, 2015 Revision of “Individual Project Plan”

Deployment of
International Cooperation Business by CAT 23

◆ To offer technical guidance and know-how through personnel exchange on municipal solid waste management

◆ To participate/cooperate in/for projects related to public–private cooperative waste management such as FS business by state and government agencies. (Cooperation related to designing of waste treatment system and residents’ consensus building)

◆ To support building of plant construction plan and residents’ consensus for a partner country’s national government or local government.
Cooperation for FS support business, etc. by Japanese government agencies

**Russia:**
- OMOEJ “Integrated energy recovery business of municipal solid waste in Moscow Province, Russia” 【Managing company: Toyota Tsusho】(2016)
- OMOEJ “Research study business for bilateral cooperation on proper treatment of 3R and waste in Russia” 【Managing company: EX Research Institute Ltd.】(2015)
- OMOEJ “Promotion of overseas expansion business for Japan’s circulation industry and consigned project support for overseas’ CO2 reduction” 【Managing company: Toyota Tsusho】(2014)
- OMOLIT Joined to Japan Russia City Environmental Association by request of MOLIT.(2014)

**Kazakhstan:**

**Turkey:**
- OMETI/Agency for Natural Resources and Energy: ”Energy Supply and Demand Relaxation Type Infrastructure System Dissemination Promotion Business” 【Managing company: PwC】(2015)

**Vietnam:**
- OMETI:”A FS on an WtE Project” 【Managing company:JGC Corp.】(2011)

**Malaysia:**
- OJICA Grassroots Technical Cooperation Project (2016~2018)
- OMOEJ ”WtE Project in Bali Province” 【Managing company : JFE】(2016)
- OMOEJ ”Study on Bilateral Cooperation for 3R/Appropriate Treatment in Indonesia” (2014~2016)
- OMOEJ ”Circulation Industry Overseas Expansion Promotion Business” 【Managing company: JFE】(2016)

**Indonesia:**
- OMETI:”A FS on an WtE Project” 【Managing company:JGC Corp.】(2011)

**Brasil:**
- OMETI:”Infrastructure System Export Promotion Study Business” 【Managing company: Hitachi Zosen】(2012)

• “In order to support overseas expansion of whole waste management and intermediate treatment technology, CAT23 provided waste management technology knowhow carried out in Tokyo. Support for waste characteristics survey/advise to local officials.
<table>
<thead>
<tr>
<th>Country</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>○JASE-W “Working Group for WtE” Dispatch of Lecturer (Nov. 2014)</td>
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<td></td>
<td>○ JETRO “Guangdong Life Waste Separation/Treatment Seminar” Dispatch of Lecturer (Nov., 2013)</td>
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<td></td>
<td>○ Tokyo Metropolis “Technical Exchange/Technical Cooperation in Beijing” Dispatch of Lecturer (Sept., 2011)</td>
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<tr>
<td><strong>Brazil</strong></td>
<td>○ METI/HDIA “Training for Infrastructure Business Overseas Expansion Suprt” Dispatch of Lecturer (Oct., 2013)</td>
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<tr>
<td><strong>Thailand</strong></td>
<td>○ MOEJ “Integrated Intermediate Treatment Facility Installation Project in Bangkok” Dispatch of Lecturer (Mar., 2013)</td>
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<td>○ JETRO &amp; Ministry of Energy of Thailand “Joint Seminar” (Mar., 2016)</td>
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<tr>
<td><strong>Indonesia</strong></td>
<td>○ MOEJ “Study Business on Bilateral Cooperation” Dispatch of Lecturer (Sept., 2015)</td>
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<td>○ MOEJ “Study Business on Waste Management by Municipality Cooperation” Dispatch of Lecturer (Dec., 2014)</td>
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<td></td>
<td>○ MOEJ “The 5th Asia 3R Promotion Forum” Dispatch of Lecturer 【Co–held by : UNCRD】 (Feb., 2014)</td>
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</table>
Acception of Overseas Trainees to Japan

**Thailand:**
- Ministry of Natural Resources & Environment of Thailand: "Training of Waste Management for Thailand" (Nov., 2015) 
- Supported by: ERIA

**UAE:**
- JICA: "Waste Management in Abu Dhabi" (May, 2014)

**Russia:**
- MOEJ: "Technical Cooperation Business to Russia (Recycling, life waste treatment system)" (Sept., 2012)

**Palestine:**
- JICA: "Waste Management in Tokyo" (July, 2016)

**Japan:**
- Tokyo Metropolis, "Asian Network of Major Cities 21" Dispatch of Lecturer (Feb., 2014)
- Japan Society of Material Cycles and Waste Management, International Committee "The 12th Expert Meeting on SWAPI" (Feb., 2013)

**Malaysia:**
- JICA: "Japan/Malaysia Economic Cooperation Training (EPP Training)" (2012~2014)

**Indonesia:**
- MOEJ “Circulation Industry Overseas Expansion Business Promotion Business” 【Managing company : Japan Environmentak Sanitation Center】 (Feb., 2016)

**Vietnam:**
- Acception of Overseas student internship (Okayama Univ.) (Nov., 2015)
- NEDO “Training on Industrial Waste to Energy Technology in Vietnam” (Nov., 2013)

**Saudi Arabia:**

**Indonesia:**
- MOEJ “Circulation Industry Overseas Expansion Business Promotion Business” 【Managing company : Japan Environmentak Sanitation Center】 (Feb., 2016)
Participants in 2015

201 Application
4,236 Participants

<Key Dignitaries>
Feb. • Mr. D.V. Manturov, Minister of Industry and Trade; Ambassador to Japan
Mar. • Mr. Taur Matan Ruak, President of Democratic of Republic of Timor-Leste
Apr. • Mr. Jining Chen, Minister Environmental Protection of People’s Republic of China
Jul. • Mr. Al-A’raj, Minister Local Gov. of Palestine
Acception of Plant Tours by Major Overseas Dignitaries

**Russia:**
- Minister of Industry and Trade of Russia: Ariake Incineration Plant (Feb., 2016)
- Director of Welfare Bureau for Housing Public Service in Moscow: Nerima Incineration Plant (Oct., 2015)
- Deputy Director of Bureau for Natural Resources Environmental Protection in Moscow: Chuo Incineration Plant (Oct., 2014)
- Governor of Tomsk State: Minato Incineration Plant (June, 2015)

**China:**
- Ministry of Environmental Protection: Ota Incineration Plant (Apr., 2016)

**East Timor:**
- President of East Timor: Shinagawa Incineration Plant (Mar., 2016)

**Malaysia:**
- Minister of Housing Authority: Chuo Incineration Plant (Mar., 2011)

**Russia:**
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**Malaysia:**
- Minister of Housing Authority: Chuo Incineration Plant (Mar., 2011)

**Guinea:**
- Assistant Secretary of Ministry of State for Foreign Affairs and Guinian Abroad: Shin-koto Incineration Plant (Oct., 2011)

**Turkey:**
- Minister of Environment Urban Planning: Chuo Incineration Plant (May, 2012)

**Ukraine:**
- Minister of Environment, Natural Resources: Chuo Incineration Plant (June, 2013)

**Palestine:**
- Secretary of Palestinian Authority Agency: Sumida Incineration Plant (July, 2016)

**Turkmenistan:**
- Minister of Public Works: Chuo Incineration Plant (Feb., 2015)

**Sri Lanka:**
- Minister of Environment: Shinagawa Incineration Plant (Nov., 2014)

**Kenya:**
- Deputy Prime Minister/Minister of Local Autonomy: Chuo Incineration Plant (Oct., 2011)

**Indonesia:**
- Minister of Environment of Indonesia: Chuo Incineration Plant (May, 2012)
- Governor of Jakarta Capital City of Indonesia: Minato Incineration Plant (Nov., 2013)
- Director General of Waste Management, Ministry of Environment and Forestry of Indonesia: Nerima Incineration Plant (Apr., 2016)

**Peru:**
- Minister of Environment: Ariake Incineration Plant (Sept., 2014)

**Brunei:**
- Minister of Energy: Chuo Incineration Plant (May, 2013)

**Vietnam:**
- Minister of Natural Resources & Environment: Chuo Incineration Plant (Oct., 2013)
- Vice Minister of Construction: Setagaya Incineration Plant (Oct., 2014)

**Ukraine:**
- Minister of Environment, Natural Resources: Chuo Incineration Plant (June, 2013)

**Palestine:**
- Secretary of Palestinian Authority Agency: Sumida Incineration Plant (July, 2016)

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**Peru:**
- Minister of Environment: Ariake Incineration Plant (Sept., 2014)
Current Status of Waste in Bali, Indonesia

Back ground of MOEJ’s Proposal “Consignment of FS on development of JCM project based on inter-city cooperation to realize low-carbon society JFY2017”

- Appropriate treatment of waste by Sarbagita Public Union is a pressing issue, which contains 4 municipalities such as Denpasar City, Badung Regency, Tabanan Regency, Gianyar Regency in Bali, Indonesia.

- TPA Suwung Final Disposal Site located in Denpasar Capital City has its crunching service life within 5 years, while economic growth in Bali is remarkably increasing, and its total volume of municipal solid waste is expanding according to rapid growth of economy and population.

- CAT23 is cooperating with JFE Engineering Corp. a proposing company, in evaluation of FS for the project on the assumption of introduction of WtE facilities in Sarbagita Public Union in Bali to realize a low-carbon society.
International Cooperation Business in the past

Opportunity of cooperation business between Sarbagita Public Union and CAT23

- JFY2014, under MOEJ’s “Japan’s circular industry overseas expansion industrialization promotion business: Environmental basic study on WtE in Sarbagita Large Region, Bali, Indonesia” (Proposing company: JEF Engineering Corp.), CAT23 introduced waste management in Tokyo and provided advise on waste composition study.

- In January, 2015, under MOEJ’s “Japan’s circular industry overseas expansion industrialization promotion training” (Consignee: Japan Environmental Sanitation Center), CAT23 invited Director of Denpasar Sanitation Department and Union President of Sarbagita Public Union, as key persons in the business, to Japan for a plant observation tour at Meguro Incineration Plant.

- Waste composition study
- Meguro Incineration Plant
### Implementation system in the Project

#### Bali, Indonesia (Denpasar City)

**Proposing company**
- JFE Engineering Corporation
  - Explanation of outline of FS
  - Overall management

**Investor for (Promising) SPV**
- Japanese trading company
- Indonesian company

**EPC partner**
- Indonesian engineering company

**Co-applicant**
- Clean Authority of TOKYO
  - Explanation of operation knowhow of waste processing facility and maintenance technology, etc.

### Outline of Projects

<table>
<thead>
<tr>
<th>Order form</th>
<th>PPP (Consignment of private sector for waste processing business operation)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Furnace type</td>
<td>Stoker</td>
</tr>
<tr>
<td>Capacity</td>
<td>1,000 t/day (or 800 t/day)</td>
</tr>
<tr>
<td>Power generated</td>
<td>17.4MW (Assumption)</td>
</tr>
<tr>
<td>Sales amount of electricity</td>
<td>13MW (Assumption)</td>
</tr>
<tr>
<td>Construction period</td>
<td>3.5 years (plant makers’ standard)</td>
</tr>
</tbody>
</table>
### Challenges related to construction/operation

<table>
<thead>
<tr>
<th>Challenges found in Indonesia</th>
<th>Partner country’s municipality</th>
<th>Cooperation/support measures (Proposed)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Item</strong></td>
<td><strong>Contents</strong></td>
<td><strong>Sarbagita Public Union</strong></td>
</tr>
<tr>
<td><strong>Appropriate method</strong></td>
<td>No result of introduction of WtE facilities, to select contractors by only prices. Also, of capacity to make tender documents, (including selection of appropriate WtE technology).</td>
<td>In case of selecting a contractor only prices, facilities with low operational / safety ratio may constructed.</td>
</tr>
<tr>
<td><strong>Selection of appropriate WtE technology</strong></td>
<td>No result of introduction of WtE facilities, knowledge to judge which technology is appropriate among diverse WtE methods.</td>
<td>Overseas companies with plasma gasification etc.</td>
</tr>
<tr>
<td><strong>Risk burden BOT business</strong></td>
<td>In case of BOT form, no appropriate risk allocation between business practitioner (municipality) and business participant sector.</td>
<td>Many cases of large risk burden private sector can be seen.</td>
</tr>
<tr>
<td><strong>Handling of regulations on ash</strong></td>
<td>No legislation on treatment methods of bottom ash. Particularly fly ash contents metal, which may fall under toxic waste</td>
<td>If ash becomes toxic waste is treated only in Bogor City, Indonesia, and transport cost boosts.</td>
</tr>
</tbody>
</table>
## Challenges related to finance

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<th>Partner country’s municipality</th>
<th>Cooperation/support measures (Proposed)</th>
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<td><strong>Subsidy</strong></td>
<td>Sarbagita Public Union</td>
<td>Municipality</td>
</tr>
<tr>
<td>Frame of financial support established by Government of Indonesia (VGF) is formed, but achievement record.</td>
<td>Use of VGF is financially introduced cases by using subsidy for forming a recycling-oriented society,</td>
<td>Supports a partner country’s municipality for procedures, etc. using knowhow of Japanese trading companies.</td>
</tr>
<tr>
<td><strong>Government guarantee</strong></td>
<td>Japanese companies need the guarantees.</td>
<td>Japanese trading companies need the guarantees.</td>
</tr>
<tr>
<td>A public guarantee institute established, but no record. (Government guarantee criteria of evaluation for finance lenders such as JICA, etc. and bidding by private sector.)</td>
<td>• Guarantee of waste nature and volume</td>
<td>• Guarantee of waste nature and volume</td>
</tr>
<tr>
<td></td>
<td>• Guarantee of payment for waste processing cost</td>
<td>• Guarantee of payment for waste processing cost</td>
</tr>
<tr>
<td></td>
<td>• Guarantee of selling off of power</td>
<td>• Guarantee of selling off of power</td>
</tr>
<tr>
<td><strong>Waste processing cost</strong></td>
<td>Under review of affordability to presented amount upon the final report result on this FS.</td>
<td>Proposes the following by establishing waste processing and necessity waste processing cost.</td>
</tr>
<tr>
<td>WtE is in high public nature and requires tax burden such as processing cost, but described same as power generation and strongly recognized only by power sale revenues.</td>
<td></td>
<td>• Establishment of public health</td>
</tr>
<tr>
<td></td>
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<td>• Mitigation of cost</td>
</tr>
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<td></td>
<td></td>
<td>• Extension of the service of landfill site</td>
</tr>
</tbody>
</table>
Thank you very much / Terima Kasih