Studi Kasus Energy Saving for Air-Conditioning at Shopping Mall
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About NTT FACILITIES
Company Profile

NTT FACILITIES provides Energy-Architecture-ICT combined services

Est. : December 1, 1992
Employees: 5,000
Revenue : 276 billion JPY

Regional Telephone Carriers
Long-distance International Carrier
Cellular phone Carrier
System Integrator

NTT EAST
NTT WEST
NTT Communications
dimension data
NTT docomo
NTT DATA
NTT FACILITIES
NTT COMWARE

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Effects of the **Total Power Reduction** campaign

- **reduction effects**
  - 1997 – 2012: 4.18 billion kWh
  - 2012: 0.93 billion kWh ($150 million cost reduction)

In recent years, we have achieved the suppression of the amount of power used by the TPR Campaign.

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**Total reduction effects (1998-2012)**

- 4.18 billion kWh

NTT FACILITIES has led NTT group’s effort for TPR.
Design achievement for Green Building

Design achievement of 30,000 buildings

- GRAND FRONT OSAKA / Commercial, Office, Hotel
- AKIHABARA UDX / Commercial, Office
- NTT DOCOMO Sumida / Commercial, Office
- NTT SHINAGAWA Bldg / Commercial, Office
- NTT CRED OKAYAMA / Commercial, Office
- KYOTO SHINPU-KAN / Commercial
- TORRADO MEJIRO / Commercial
- FUKAGAWA GATHARIA / Commercial, fitness
- TCINGTAO CITY DESIGN / China
- SAITAMA MEDIA WAVE / Telecom, Office
- NTT DOCOMO YOYOGI / Telecom, Office
- Asahi Broadcasting Corp Head-office / Office
- Tokyo International Airport Terminal2 / Airport

MAY.2016
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2 The stakeholder engagement process
1. Objective of the Kitakyushu Model

- Kitakyushu, which faced and overcame pollution for the first time in Asia, became a leading environmental city in Japan.
- Kitakyushu is developing the Kitakyushu Model (support tool) that systematically arranges information on the technologies and know-how of Kitakyushu from its experience in overcoming pollution to its quest as an environmental city.
- Kitakyushu is utilizing the Kitakyushu Model to promote the export of customized infrastructure packages to cities overseas, and grow together with Asia.

2. Applications of the Kitakyushu Model

- Support tool to examine future ideal city image and for cities to take appropriate measures and procedures to achieve this.
- Support tool to examine management systems for waste, energy, water and sewage services, and environmental protection.
- Support tool to develop sustainable master plans that integrates waste, energy, water and sewage services, and environmental protection.

Surabaya, Indonesia: 2nd largest city in Indonesia with a population of 3 million

<FY 2013-2015> Low Carbon City Planning Project in Surabaya, Indonesia

Target areas: Energy, waste management, transportation, water resources Participating Japanese companies: 13

Green Sister City agreement signed (Nov 2012)
History of Kitakyushu – Surabaya City-to-City Cooperation

**Key Points**
- **Energy**
  - Cogeneration and energy-saving project: Nippon Steel & Sumikin Engineering, other (2012.3~)
  - Waste power generation project: Hitachi Zosen, other (2014.6~)

- **Waste**
  - Waste treatment project: Nishihara Corporation (2012.12~)

- **Water resources**
  - Sewage system improvement project: Original Engineering Consultants, other (2012.12~)
  - Drinking water supply project in areas without electricity: Suido Kiko Kaisha, other (2011.11~)

**JICA Partnership Program (PPP, BOP, support for small- and mid-sized businesses)**

**New Growth Strategy (2009.12~)**

**Kitakyushu New Green Growth Strategy (2013.3)**

**Joint Statement on Strategic Environmental Partnership (2011.3)**

**Green Sister Cities agreement (2012.11)**

**Surabaya Vision Plan (2005-2025)**

**Surabaya Vision Plan (2005-2025)**

**Survey on Proper Treatment of Waste (FY 2002), JIBC**

**Cooperation Project on Composting of Kitchen Waste (FY 2004-2006), JFGE assistance project**

**F/S on the Production and Sale of Compost (FY 2007)**

**Improvement of wastewater treatment facilities (FY 2011-2013) JICA Grassroots Cooperation project**

**Improved decentralized wastewater treatment facilities (FY 2011-2013) JICA Grassroots Cooperation project**

**F/S on JCM Projects towards Environmentally Sustainable Cities in Asia : IGES, other (2013~)**

**Support for the development of master plans in each sector**

**Surabaya Vision Plan (2005-2025)**

**Mr. Satriyo Soesanto**

**Mr. Gin Ginjar**

**Energy**

**Waste**

**Water resources**

**Cooperation Framework**

- **Environmental Cooperation Network of Asian Cities (1997~)**

- **Kitakyushu Initiative Network (2000-2010)**

- **Human Resource Exchange**
  - Ir. Tri Rismaharini
    - Director, Cleaning & Parks Dep't. (DKP) (2005~)

- **Technology Transfer**
  - Cooperation Project on Composting of Kitchen Waste (FY 2004-2006), JFGE assistance project

- **Survey on Proper Treatment of Waste (FY 2002), JIBC**

- **F/S on the Production and Sale of Compost (FY 2007)**

- **Improvement of wastewater treatment facilities (FY 2011-2013) JICA Grassroots Cooperation project**

- **F/S on JCM Projects towards Environmentally Sustainable Cities in Asia : IGES, other (2013~)**

**Policies**

- **New Growth Strategy (2009.12~)**

- **Kitakyushu New Green Growth Strategy (2013.3)**

- **Joint Statement on Strategic Environmental Partnership (2011.3)**

**Human Resource Exchange**

- **Ir. Tri Rismaharini**
  - Director, Cleaning & Parks Dep't. (DKP) (2005~)
  - Director, Development and Planning Agency (BAPPEKO) (2008~)
  - Mayor of Surabaya (2011~)

- **Reduction of CO₂ emissions by 150% in the Asian region (2050) (Eco-Model City Action Plan (2009.3))**

**Training**

- Training for Surabaya city staff: CLAIR project

- Organization of trainings: JICA trainings, CLAIR projects, city projects, IGES projects (2006~2011)

**Surabaya History**

- **Survey on Proper Treatment of Waste (FY 2002), JIBC**

- **Cooperation Project on Composting of Kitchen Waste (FY 2004-2006), JFGE assistance project**

- **F/S on the Production and Sale of Compost (FY 2007)**

- **Improvement of wastewater treatment facilities (FY 2011-2013) JICA Grassroots Cooperation project**

- **F/S on JCM Projects towards Environmentally Sustainable Cities in Asia : IGES, other (2013~)**

**Support for the development of master plans in each sector**

**Surabaya Vision Plan (2005-2025)**

**Mr. Satriyo Soesanto (2014)**

**Mr. Gin Ginjar (2012)**
Transition of JCM Feasibility Study in Surabaya

**FY2013**
- Energy sector: 63,000t-CO$_2$/yr
- Transportation sector: 1,000t-CO$_2$/yr
- Solid waste sector: 72,000t-CO$_2$/yr
- Water resource sector: 15,000t-CO$_2$/yr

**FY2014**
- Energy sector
- Solid waste sector

**FY2015**
- Energy sector
- Solid waste sector

**Prioritization**
(feasibility & cost-effectiveness)

**Application & Expansion**
(feasibility study → model project)
City-to-City collaboration JCM

Inter-governmental (G-to-G)

Inter-city (City to City)

Surabaya

Kitakyushu

Indonesia

Japan

International Consortium (B-to-B)

PT. Pakuwon Jati Tbk.

EPC Company

Funding

Building Owner

NTT FACILITIES
Project Outline
The project aims to reduce electricity consumption in the shopping mall through introducing advanced & efficient Japanese centrifugal Chiller system. The project is to replace existing central cooling system with high efficient centrifugal chiller with capacity of 966TR x 4 units and 569TR x 1 unit in Pakuwon’s shopping mall, Tunjungan Plaza, as well as to replace existing 8 cooling towers with efficient Japanese models.

The GHG emission reductions are calculated based on the estimated electricity consumptions based on the conservatively estimated COP of a reference cooling system and a project COP of the centrifugal chiller as well as the grid emission factor.

Outline of GHG Mitigation Activity

Expected GHG Emission Reductions

996tCO₂/year
The GHG emission reductions are calculated based on the estimated electricity consumptions based on the conservatively estimated COP of a reference cooling system and a project COP of the centrifugal chiller as well as the grid emission factor.

More than 30% Energy Saving
Project Scope and Schedule

**Scope**

More than 30% Energy Saving

Centrifugal Chillers: 569TR x 1 unit, 966TR x 4 units
Cooling Towers: 3,200kW x 8 units

**Schedule**

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**MRV Methodology PDD (Plan)**

| Proposing MRV Methodology | | | | | | | | | | | | | | |
| Establishment of MRV Methodology, PDD(TBC) | | | | | | | | | | | | | | |
| Monitoring | | | | | | | | | | | | | | |
Way forward
Surabaya City enforced Green Building Awareness Award as part of their measurements to spread buildings being conscious of energy efficiency, etc. We have been discussing JCM FS based on this effort.

**GREEN BUILDING AWARENESS AWARD**

**SURABAYA**

**Livable & Sustainable City**

**Green City Master Plan**

1. **GREEN PLANNING AND DESIGN**
   - Spatial planning which maintain 30% area of Green Open Space from the total area of Surabaya.

2. **GREEN OPEN SPACE**
   - Expansion and optimization of Green Open Space.

3. **GREEN BUILDING**
   - The determination of green building development policy and infrastructure, the enforcement of Green Building Award.

4. **GREEN TRANSPORT**
   - Application Planning of Rapid Mass Transportation in form of Monorail and Tram, provision of non-motorized vehicle network.

5. **GREEN COMMUNITY**
   - Training of facilitators and env cadres, conducting Merdeka dari Sampah (Free from Waste) & Surabaya Green and Clean Event.

6. **GREEN WASTE**
   - Development of recycle and compost center, development of Benowo Disposal Area by using "waste to energy" technology.

7. **GREEN WATER**
   - Development of clean water network and potable water, wastewater network management and urban domestic waste.

8. **GREEN ENERGY**
   - Development of all energy such as solar cell on public infrastructure, development of cogeneration power source in the industry.

Source: City of Surabaya
Further development

1. **Expansion to other private buildings**
   Propose to other potential buildings which is owned by the developer based on this successful model project.

2. **Cooperation with GBAA**
   GBAA has been led by BAPPEKO so far, after FY2016, however, the initiative of GBAA will move to Cipta Karya and they will newly develop Green Building Regulation. It is expected that the needs of JCM subsidy for facilities will be increasing under this regulation because this may ask in the future all the buildings of new construction satisfied the energy saving requirements, etc.

[Diagram showing the process of planning, design, building permit, and certification, along with green building regulation and advanced low carbon technologies, leading to GHG emission reduction.]
Terima kasih atas perhatian Anda.