Environment Policies of Kitakyushu City for a Sustainable Society

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City of Kitakyushu

Location of Kitakyushu

Area: 485.25 km²
Population: 997 thousand
(as of Sept. 1, 2005)
Kitakyushu’s Industries Led to Modernization in Japan

Yawata Steel Mill began operation in 1901

Kitakyushu Industrial Area in 1950s

“Machines working with growling sound, blast furnaces smelting and brightening up a night sky, and everything are vivid and vital. Yawata is called the capital of steel.”

《Osaka Printing Corp. in 1961》
(Presented by Prof. Takeuchi, Tokyo University)
Air Pollution and Water Contamination

- Stacks emitting smoke
- Dust-fall on roof-top
- Wastewater Discharged into the Dokai Bay

Anti-pollution Movements by Stakeholders

- Partnership
  - Citizens
  - Industries
  - Public Administration
- Study with scholars
- Company watching
- Anti-pollution equipment
- Sewage treatment and monitoring facility
## Major Factors for and Characteristics of Industrial Pollution Control Practice in Japan

### Effective Education System
- Providing human resources to each sector

### Policy Responses
- When authorized, change quickly

### Restrictive measures
- At national level

### Supportive measures
- At local level

### Nature-respect Mentality

### Industrial Authority
- Integrating environmental factors into industrial policy
- Public financing (PCSC, JDB, JASMEC, etc.)
- Preferential tax measures (national/local tax)
- Support for technology development
- Utility cost policy (water, energy)
- Information dissemination
- Industrial location measures
- Service provider development

### Environment Authority
- Basic Law for Environmental Pollution Control
- Environmental standard (air, water, etc.)
- Emission/effluent standard (minimum, phased control)
- Legal provisions for each field
- Decentralization of implementation power
- Health damage compensation

### Enterprises
- Promotion of productivity movements
- Process renovation, energy saving, resource recovery (CP)
- Pollution abatement equipments (EP)
- Building in-house organization
- Pollution control manager system
- Highly capable in-house engineers
- Awareness of social responsibility

### Local Autonomies
- High administrative capacity
- Local ordinance on pollution control
- Voluntary agreement (based on scientific data)
- Regional plan on pollution control
- Monitoring system, on-the-spot inspection
- Supervision and guidance to enterprises
- Disclosure of information
- Dispute settlement

### 1960s
- Major Factors for and Characteristics of Industrial Pollution Control Practice in Japan
  - Harmonization with sound economic growth
  - Centralization of power
  - Post-facto countermeasures

### Today
- Major Factors in Getting Pollution under Control
  - Intervention by central/local governments
  - Multi-stakeholder engagement
  - Corporate social responsibility

### Socioeconomic Factors Why Pollution Occurred
1. Too overcrowded land
2. Heavy chemical industrialization
3. Without internalizing external diseconomies

### Features of Initial Response Period (1960s)
1. Harmonization with sound economic growth
2. Centralization of power
3. Post-facto countermeasures

### Characteristics of Industrial Pollution Control in Japan
1. Non-economical approach
2. Direct restriction
3. Focus on specific substances as heavy metals
4. Local initiatives

### Nature-respect Mentality
- Integrating environmental factors into industrial policy
- Public financing (PCSC, JDB, JASMEC, etc.)
- Preferential tax measures (national/local tax)
- Support for technology development
- Utility cost policy (water, energy)
- Information dissemination
- Industrial location measures
- Service provider development
Cleaner Production (CP)

Change: from end of pipe technology (EP) to environmentally sound production technology with low emission (CP)

(Case-1) SOx reduction in a steel works in Kitakyushu

<table>
<thead>
<tr>
<th>Year</th>
<th>SOx Emission (ton/y)</th>
<th>Measures</th>
<th>Reduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970</td>
<td>27,575</td>
<td>fuel conversion, 42% energy/material saving, 32%</td>
<td></td>
</tr>
<tr>
<td>1990</td>
<td>607</td>
<td>EP equipments, 25%</td>
<td></td>
</tr>
</tbody>
</table>

Achievements in Greening Production Process

Emission ratio per electric power generation (1980)

<table>
<thead>
<tr>
<th>Country</th>
<th>SOx (g/Kwh)</th>
<th>NOx (g/Kwh)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Japan</td>
<td>1.0</td>
<td>0.69</td>
</tr>
<tr>
<td>Ave. of 5 adv.</td>
<td>8.0</td>
<td>3.5</td>
</tr>
</tbody>
</table>

Energy consumption per unit GDP

<table>
<thead>
<tr>
<th>Year</th>
<th>Japan</th>
<th>USA</th>
<th>Germany</th>
<th>China</th>
<th>TOE/million US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>105</td>
<td>380</td>
<td>197</td>
<td>2,558</td>
<td></td>
</tr>
<tr>
<td>2001</td>
<td>92</td>
<td>253</td>
<td>130</td>
<td>827</td>
<td></td>
</tr>
</tbody>
</table>
From “Sea of Death” to International Environmental Leadership

Technologies and human resources accumulated through Pollution abatement

Trainees accepted: 148 countries 4,360 pns (1980~2005)
Experts dispatched: 34 countries 135 pns (1978~2005)

Cooperation with Dalian, China

<table>
<thead>
<tr>
<th>Year</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979</td>
<td>Friendship-City concluded by Kitakyushu and Dalian</td>
</tr>
<tr>
<td>1993</td>
<td>Technical Exchange Seminar held in Dalian</td>
</tr>
<tr>
<td>1993</td>
<td>“Environment-Specific Zone” proposed to Chinese government by KITA</td>
</tr>
<tr>
<td>1994</td>
<td>“Dalian Environmental Demonstration Zone Project” authorized as an important policy by Chinese government</td>
</tr>
<tr>
<td>1996</td>
<td>Demonstration Zone Project decided as an ODA project, and Environmental Exchange Seminar was held</td>
</tr>
<tr>
<td>1996~2000</td>
<td>Study on the Demonstration Zone Project conducted</td>
</tr>
<tr>
<td>2000~</td>
<td>Transfer of CP technologies (8.5 billion yen in total) Includes: electric furnace (1.84 billion), cement-mill (1.38 billion), process improvement at a dye-production plant (1.52 billion), etc.</td>
</tr>
</tbody>
</table>
Environmental Improvement in Dalian, China

<table>
<thead>
<tr>
<th>Year</th>
<th>1990</th>
<th>2001</th>
<th>Improvement of Ambient Air Quality</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOx</td>
<td>0.090</td>
<td>0.031</td>
<td>(1/3) the Global 500 Award</td>
</tr>
<tr>
<td>TSP</td>
<td>0.245</td>
<td>0.123</td>
<td>(1/2) by UNEP in June 2001</td>
</tr>
<tr>
<td>CO</td>
<td>1.94</td>
<td>0.59</td>
<td>(1/3)</td>
</tr>
</tbody>
</table>

Dalian was given the Global 500 Award by UNEP in June 2001.

Promotion of Environmental Cooperation

Through City-to-City Network


Environmental Cooperation Network of Asian Cities (1997)
City-to-City Cooperation in South-East Asia

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>Environmental Cooperation Network of Asian Cities established</td>
</tr>
<tr>
<td>1997-2001</td>
<td>Seminar on CP Technologies for Small Enterprises held in Ho Chi Minh, Vietnam</td>
</tr>
<tr>
<td>2001-2004</td>
<td>River Environmental Improvement Project conducted in Semarang, Indonesia</td>
</tr>
<tr>
<td>2000</td>
<td>Cooperation for regional environmental improvement in Cebu, the Philippines, focusing on introduction of CP technologies</td>
</tr>
<tr>
<td>2002</td>
<td>Study on appropriate waste management system conducted in Surabaya, Indonesia and Chongqing, China</td>
</tr>
<tr>
<td>2003</td>
<td>Cooperation for regional environmental improvement in Cebu, the Philippines, focusing on domestic wastewater treatment</td>
</tr>
<tr>
<td>2004~</td>
<td>Garbage composting project conducted in Surabaya, Indonesia</td>
</tr>
</tbody>
</table>

River Beautification Model Project in Semarang, Indonesia

A river in Semarang has been polluted by many Tofu industries. KITA Environmental Cooperation Center was asked to cooperate in recovering environmental quality in the river. The Project was conducted by many stake-holders, including universities, NGOs, private industries and public administration.

A river polluted by waste water from a Tofu industry

Technical guidance at a Tofu plant in Semarang, Indonesia

Guidance on monitoring technologies in Cebu, the Philippines

Technical instruction at a Tofu industry
WASTE, A Serious Problem in Surabaya And A Compost Project

Waste dumping
Garbage depot

Waste analysis

Compost center

Expansion of Kitakyushu-Based Composting

- Expansion plan of Surabaya City
  - About 12,000 households as of July, 2007
  - To be expanded to 200 thousand for next 4 years (equivalent to 1/3 of all households)
  - To be disseminated in Medan, Den Pasar, etc
  - Transferred to Bangkok through a distance learning seminar in 2005
  - Experiment began in Bangkok in 2006

Dissemination activities in Surabaya
“Keep market clean” by KITA/ECC
Kitakyushu Initiative Network

Inter-city network: established by UNs
Chronology:
2000 "Kitakyushu Initiative" was conceived at MCED4 based upon the achievements of Kitakyushu's pollution control practice and international cooperation
2001 Kitakyushu Initiative Network established
Activities: Pilot projects, thematic seminars, collection and analysis of member's best practices, etc.
Field: Air pollution, water quality management, solid waste management (including 3R)
Secretariat: IGES Kitakyushu Office
Evaluation: Evaluated at MCED5 in Seoul, Korea in 2005, and continuation was declared by ministers

Profile of Kitakyushu Eco-Town Project

Background
1901 Government-run Yawata Steel Mill began operation
- Has grown up to be a material-production base for 100 years
1960s Faced serious environmental pollution
- Experience of getting pollution under control by multi-stakeholder engagement "Kitakyushu Method"
1980s - International environmental cooperation has been conducted

Progress of Eco-Town Project (as of April 2006)
- Facilities on practical research: 17
- Industrial plants under operation: 25
- Employee: about 1,200 pns including part-time workers
- Visitor: about 490,000 pns (1998-2006.3)
- Project results to date

Total investment: about 52.3 billion yen
(City: 5.9 billion, National: 10.6 billion, Private sector: 35.8 billion)
Employee: about 1,200 pns including part-time workers
Visitor: about 490,000 pns (1998-2006.3)

Eco-Town Project (Phase-I: 1997–; Phase-II: 2002–)
Mutual Collaboration in Kitakyushu Eco-Town

- Comprehensive Environmental/Industrial Complex
- Electricity, Wood, Waste of paper & wood, Fluorescent lights, OA machinery
- Used plastic, Paper Mill, Paper Reuse, Fluorescent lights, CRT, Glass waste, Used paper, Styrene foam
- OA machinery, Electric appliances, Used plastic, Paper Reuse, Paper Mill, Fluorescent lights
- Core Recovery Facility/Melting furnace

Integrated Melting Furnace

- Power supply: About 4,500kw
- Treatment of Leavings: Integrated Melting Furnace
- Industrial Waste such as shredded waste and CFC, etc.

Kitakyushu Eco-town Power Receiving Association

- Resource Recovery of Slag and Metal
- Integrated Melting Furnace: Capacity 320 t/Day, Output 14,000kw (*Self-Using: 3,300kw)
- Power supply PC Board, Treatment Facility

Hibiki Recycling Complex

- Second phase project area
- Wind Power Plant: Cardboard, Styrene foam, Used paper
- Toner cartridges, Office paper, Used plastics
- Second phase project area
- Power supply: About 4,500kw

Practical Research Area

- Steel scrap, Fueals, Used plastics, Paper Mill, Paper Reuse
- Fluorescent lights, CRT, Glass waste, Used paper, Styrene foam
**CO₂ reduction in Kitakyushu Eco-town**

~Quantified by Life Cycle Assessment (LCA)~

- **Fuel**: 1,500 t
- **Electricity**: 16,000 MWh
- **Raw Materials**: 53
- **Recycled Materials**: 77,000 t
  - **Outside the City**: 70,000 t
  - **Inside the City**: 6,000 t
- **Water**: 21,000 t
- **Evaporate**: 9,000 t
- **Sewage discharge**: 12,000 t
- **Refuse**: 7,000 t
- **Recycle**: 70,000 t
  - **Outside the City**: 70,000 t
  - **Inside the City**: 0 t
- **Refuse**: 7,000 t

**Recycling Projects**
- PET bottles
- Automobile, Office automation equipment
- Home electric appliance
- Fluorescent tube, Medical waste
- Waste paper, Cooking oil, Detergent & organic solvent
- Waste wood/Plastic, Printer toner, etc.

**Recycled Materials**: 77,000 t
  - **Outside the City**: 70,000 t
  - **Inside the City**: 6,000 t

**Sewage discharge**: 12,000 t

**CO₂ Reduction**:
- **CO₂ Emission**: 11,000 t
- **CO₂ Reduction**: 11,000 t

**Efforts on the CO₂ Emission Reduction**

- **CO₂ Emission**: 23,000 t
- **CO₂ Reduction**: 175,000 t

**Nanohana (field mustard) Project**

- **Nanohana cultivation**
- **Seed-harvesting and Oil-extraction**
- **Collection of used cooking-oil**
  - Reusing as BDF (Bio Derived Fuel)
- Conducted by citizens, then linked with Environment Education “Material cycle and renewable energy utilization.”

**BDF are used for garbage**
- Collection trucks and companies in Eco-town
- Turned into BDF by a company in Eco-town

**Cultivated by citizens/NPO**
- around eco-town/fallow field, etc.

**Conducted by citizens**
- and NPOs

45 Collecting stations in the city

Source: Kokoku-Nanohana Project

*World Capital of Sustainable Development*
Kitakyushu City Won the 1st Prize in 2006 Environment Capital Contest

Organizer:
All Japan Network of Environment Capital Contest (consisted of 11 NGOs

"Environment Capital" of Japan: selected from the view of NPOs having initiated environmental movements
Participated by: 74 municipalities across Japan

World Capital of Sustainable Development

Thanks for Your Attention

Creation of a city with true wealth and prosperity, to be inherited by future generation