Air Pollution Control Measures by Kawasaki City

November 10, 2016 Air Quality Section,

Environmental Protection Bureau, Kawasaki City



Today's Agenda

Overview of Kawasaki City

Air Pollution Control Measures by Kawasaki City

- **O Pollution Issues Kawasaki City Has Faced**
- O Current Air Quality (Concentrations of air pollutants)

O Activities for Air-environmental Measures

- Regulation and Site Inspection for Factories and Plants
- Automatic Air Monitoring System for Emission Sources



Overview of Kawasaki City



3

Overview of Kawasaki City

Area: 144 km²

KAWASAKI CITY

- Population: 1.47 million people (8th largest in Japan) (as of Mar. 1, 2016)
- Number of households: 680 thousand households (as of Mar. 1, 2016)
- City's gross product: About 5.1 trillion yen (FY2013)
- Key industries: Manufacturing industries (steel, precision machinery, and petro-chemistry)
- Growth industries: Information and telecommunications, environment, welfare, and life science

Convenient Location (in the capital sphere)

Good access to public transportation(roads, railways, airways, etc.)



- 15 minutes to Haneda Airport
- 18 minutes to Tokyo Station
- 10 minutes to Yokohama Station



Many plants are located in the sea-side district.



Air Pollution Control Measures by Kawasaki City OPollution Issues Kawasaki City Has Faced





Pollution Issues Kawasaki City Has Faced

5

In the era of rapid economic growth in Japan (from the 1960's to the 1970's), Kawasaki played the role of an engine of the economic growth as the center of the Keihin industrial area, but caused rapid environmental deterioration such as air pollution and water pollution at the same time.

Year	Events
1950's	 The industrial area was developed. Agricultural crops were damaged by air pollution.
1960's	 Industrial complexes were built in the industrial area. Air pollution caused by sulfur oxides occurred.
1970's	 Photochemical smog was observed for the first time in the city. Several thousand citizens were officially certified as patients of a pollution disease.













Picture: sea-side area in 1960s



Air Pollution Control Measures by Kawasaki City

Current Air Quality
 (concentrations of air pollutants)



7



10,000

Current Air Quality (Changes in Sulfur Dioxide Concentration)







Current Air Quality (Changes in Nitrogen Oxide Concentration)



KAWASAKI CITY

Current Air Quality (Changes in Nitrogen Oxide Emissions)





AWASAKI CITY

Current Air Quality

(Changes in Suspended Particulate Matter Concentration)









Current Air Quality (Changes in Dust Emissions)





Air Pollution Control Measures by Kawasaki City

O Activities for Air-environmental Measures

- Regulation and Site Inspection for Factories and Plants (i.e. Factories)
- Automatic Air Monitoring System for Emission Sources





Regulation for Factories

O Number of factories installed with smoke and soot (i.e. smoke) emission facilities Factories : 478, Facilities :1642 (at March 2015) O Controlled substances SOx, NOx, Smoke, HCI, etc. ○ Control methods Concentration control (emission concentration of outlets of each facility : general standard, particular standard, stricter standard) Total amount control (total amount of emission from all factories of the specified district) Facility control (mechanics of facilities and pollution control facilities) ○ Valid regulations Air Pollution Control Law Kawasaki City Ordinance for Protection of Living Environment with Pollution Control, etc. 17

Report on Installation of Smoke Emission Facilities (at installation and modification)

To examine the contents of the report, which is submitted on valid of the law and the city ordinance, at the installation and the modification of the smoke emission facilities, such as boiler, etc., which discharge air pollutants.

Valid : Air Pollution Control Law, Article 6, 7, 8 Kawasaki City Ordinance, Article 17, 18, 19, 22, 24

O Reporting Items based on the Law

1. Name or denomination and address, in case of corporation, representatives

- 2. Denomination and address of the factory
- 3. Type of the smoke emission facilities
- 4. Mechanics of the smoke emission facilities
- 5. Usage method of the smoke emission facilities
- 6. Treatment process of smoke

Reporting related to the air pollution

AWASAKI CITY

(1) Reporting based on the Law (March 2015)

Smoke Emission Facilities

No. of reported Factories : 478

No. of reported Facilities : 1642

(smoke emission facility : facilities which discharge SOx and harmful substances and are larger than fixed scale specified by the Law ; classified into 33 kinds such as boiler, gas turbine, waste incineration furnace, etc.)

General Dust Emission Facilities

No. of reported Factories : 42

No. of reported Facilities : 863

(general dust : substances which are emitted and scatter by crushing and heaping of the materials ; general dust emission facilities : crusher and facilities at heaping vard, etc.)

(2) Assigned Factories and Permitted Facilities by the Ordinance (FY 2014)

No. of assigned Factories at the beginning of FY2014 : 2912

No. of permitted Facilities : 18

No. of reporting of disuse and cancel of permission : 21

No. of assigned Factories at the end of FY 2014 : 2908



Field Investigation such as On-site Inspection etc.

On –site Inspection at Factories

To confirm the actual facilities and conditions Valid : Law, Article 26 City Ordinance, Article 129

- + Implementation of measurement of smoke (volume, temperature, and velocity of discharged gas, and air pollutants such as soot, SOx, NOx, HCI, etc. in gas)
- + Confirmation of Emission Gas Treatment Facilities, etc.
- + Confirmation of Storage of the Measuring Records
- + Etc.



Measuring of Smoke 🥪 🤌





			Number of cases
	On-site inspection	Hearing on report	Instructions for improvement etc.
Regulations on air pollutants	72	55	1
Regulations on dust	31	0	5
Odor	45	0	2
Outdoor incineration	37	0	0
Water quality	351	750	15
Noise/vibration (including noise from restaurants)	155	0	155
Scattering of asbestos	924	0	533
Soil/groundwater	72	22	0
Subsidence	15	202	0
Chemical substances	9	244	0
Automobiles	22	5	0
Total	1733	1278	711

On-site inspection includes smoke and water quality measurement, and verification of contents of notification, storage and control of records, and handling of complaints.

Source: Overview of Operations by Environmental Protection Bureau of Kawasaki City



Activities for Air-environmental Measures (Agreement between City and Companies)

O Conclusion of Pollution Control Agreement

- O Kawasaki City and 37 large companies in city, holding 39 factories, concluded the Air Pollution Control Agreement to promote the environmental improvement measures of the factories, etc., in 1970. Further more, in 1972, eight more companies, holding eight factories, concluded it.
- O The contents of the agreement:

Reporting, etc. of the drawing up of the air pollution control plan, the countermeasure for emergency of air pollution, the amount of fuel use, its sulfur contents, etc.

O Monitoring with telemeter on emission sources

- O In 1972, Kawasaki City enforced the monitoring of SOx with the installation of the emission sources telemeters at 42 large factories, excluding five factories of which the amount of SOx was under 5 m³N/h.
- O Telemeter monitoring for NOx started in 1979.
- O At present, City continues the telemeter monitoring at 12 factories for SOx and 23 factories for NOx.

Activities for Air-environmental Measures (Automatic Air Monitoring System)

AWASAKI CITY

KAWASAKI CITY



* Cost for measurement in plants is borne by companies. Telemeter devices are installed by Kawasaki City, and data lines in plants are laid by companies.

Activities for Air-environmental Measures (Enforcement of Regulation and Introduction of Total Amount Control)

Drawing up and Enforcement of "Kawasaki City Ordinance for Pollution Control" in 1972

City adopted the idea that to reduce the amount of pollutants was the fundamental to improve air environment and introduced, as a pioneer in Japan, the Total Amount Control System which controlled the total amount of SOx discharged from the factories.

Setting of "Total Amount Control System"

OTo set the independent environmental target value in order to protect the health of citizen and preserve the living environment

OTo set the permissive total amount of discharge in every specified district in accordance with the pollutant load in city in order to keep the target

OTo establish the discharge standard of the air pollutants from the factories to keep the permissive total amount of discharge in the district

OIn establishment of the discharge standard, City utilized the estimation method of the environmental density with the air diffusion simulation which calculated with the emission source data such as location, discharge volume, etc. and a meteorological model in order to ensure the scientific validation.

OThis system was designated as "Kawasaki Method" and played a role of the pioneer for the pollution control measures of the national and the other local governments as a progenitor of the total amount control system.

OApplication of the total amount system for SOx and smoke in 1974, for NOx in 1978

OSince 2000, comprehensive total amount control standard was applied for SPM in stead of smoke. 24



Results of Environmental Measures by Kawasaki City (Airspace above the Sea-side District)





Air photograph of the sea-side district (1966)

Air photograph of the sea-side district (2010)





System for Operations of Environmental Policy Department and Kawasaki Environment Research Institute, Environmental Protection Bureau, Kawasaki City

Sections related to Environmental Policy Department, Environmental Protection Bureau, Kawasaki City (as of April 1, 2016)

Environmental Protection — Bureau	General Administration Department		
	Global Environment and Sustainability Office		
	Environmental Impact Assessment Office		
	Environmental Policy Department	Environmental Management Section : (15 personnel)	Official permission and financing, coordination for pollution control, and environmental information system Chemical substances and radiation
		Air Quality Section : Environmental (30 personnel) Traffic-environm	air, air at source plants, odor, asbestos, and noise and vibration nental control
		Water Quality Section : Environmenta (15 personnel)	I water quality, water quality at source plants, soil environment, and soil
	Public Waste Management Department		
Environmental Facilities Department			
	Kawasaki Environment Research Institute	Project Promotion Section : Environr (15 personnel) and pror	nental education, international expansion and environmental technology information, notion of international collaboration and research
		Urban Environment Section : Urban (5 personnel)	environment research, and research with industry-academia-government-citizen collaboration
		Environmental Risk Assessment Section (14 personnel)	In : Environmental risk assessment, research on environmental chemicals, and biological survey and research
		Regional Environment and Pollution Me (14 personnel)	onitoring Section : Atmospheric research, water environment research, and environmental pollution monitoring
			* The numbers of personnel count part-time workers.





