

Special Measures for Metropolitan Air Quality Improvement

20. Dec. 2004

Ministry of Environment of Korea (www.me.go.kr)

<http://bluesky21.me.go.kr>

푸른하늘 21
www.bluesky21.me.go.kr

CONTENTS

- . Air Quality Status in Metropolitan Area
- . Major Causes of Air Pollution
- . Special Measures for Air Quality Improvement

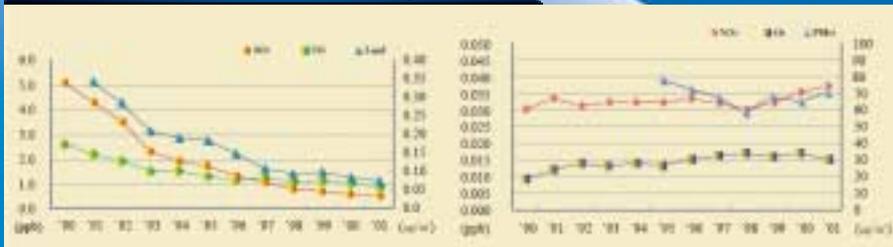
. Current Air Quality Status in Seoul Metropolitan Area

. Current Air Quality Status in Seoul Metropolitan Area

Air Quality Condition

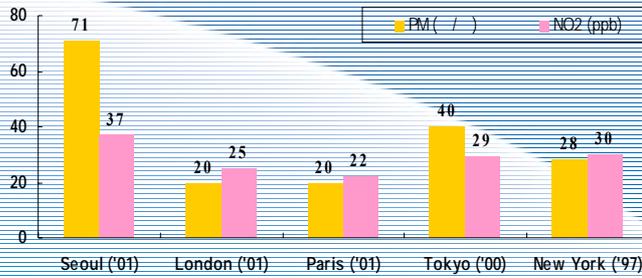
- SO₂ and CO concentrations mark below the Air Quality Standards
- Steady increase in PM₁₀ concentration due to rising vehicle emissions and dust & sandstorms (DSS) transporting from China
- Steady increase in NO₂ and O₃ also caused by vehicle emissions

Trends in Air Pollutant Levels in Metropolitan Area



. Current Air Quality Condition in the Metropolitan Area

Air Pollution Level Compared to Other Major Cities of the World



" The Worst Level among OECD Countries "

- 1.7~3.5 times higher in PM
- 1.7 times higher in NO₂

. Current Air Quality Condition in the Metropolitan Area

Air Quality Status in the MTA and Other Areas

Category	NO ₂ (ppm)	Number of O ₃ Warning	PM ₁₀ (/)
Metropolitan Area (Seoul)	31(37)	24(5) times	67(71)
Other Areas	22	5 times	53

Serious Health Problems

- Increasing number of deaths caused by PM pollution
2000: 1,940 persons 2020: 4,000 persons
- Cerebral Infarction caused by air pollution may have aggravated the death rate by 6 %
- The early death rate caused by air pollution records 3 times higher than the rate caused by traffic accidents

. Major Causes of Air Pollution

II. Major Causes of Air Pollution

Soaring Emission Sources in a Small Land Area

- Population Density (468 persons/km²) records the 3rd in the world and the 1st among OECD countries
USA: 29 persons/km², France: 107 persons/km², Japan: 335 persons/km²
- 2-10 times higher air pollutants emission per unit area than the average amount of OECD countries

Rapidly Increasing Number of Cars

- 93 times increase from the 1970's level
'70yr: 0.13M '80yr: 0.53M '90yr: 3.40M '00yr: 12.05M
- Increasing emissions by urban mobile sources
'85yr: 25% '00yr: 80% (Ratio of Air Pollution Sources)

II. Major Causes of Air Pollution

Rapid Increase in Energy Consumption

- 9 times increase from the 1970's level

Energy Consumption (million ton)	'70	'80	'90	'99
	26	44	93	181

- Energy Consumption Rate Economic Growth Rate

Low Usage of Public Transportation

- During rush hours, public transportation usage rate in metropolitan appears to be lower than that of other major cities globally

Subway Usage Rate	Seoul	Tokyo	London	Paris
	35%	92%	75%	68%

Special Measures for Metropolitan Air Quality Management (Blue Sky 21)

1. Special Act on Seoul Metropolitan Air Quality Improvement
2. Control Measures for On-Road Mobile Sources
3. Air Pollution Control in Industrial Sectors
4. Other Control Measures

III. Special Measures for Metropolitan Air quality Improvement

1. Special Act on Seoul Metropolitan Air Quality Improvement

Purpose

“To develop an institutional framework for the effective Implementation of special measures for air quality improvement in Seoul and its vicinities”

Legislation Process

- Required Over 100 consultation meetings
- Task Force Team: consisting of government bodies (MOE, MOCIE, MOCT, MPB, MOFE and OPC), industries, experts and civil groups

Entry into Effect

- The Special Act takes effect starting in January 2005
- Total Air Pollution Load Management System (Cap & Trade Program) for the industry sector takes effects from July 2007

III. Special Measures for Metropolitan Air quality Improvement

1. Special Act on Seoul Metropolitan Air Quality Improvement

Summary of the Special Act

	2001	2014
Improvement Target	<ul style="list-style-type: none"> • PM (71 /) • NO₂ (37ppb) 	<ul style="list-style-type: none"> • 40 / • 22ppb
Control Measures	<ul style="list-style-type: none"> • Concentration Control • Support of LEVs Supply 	<ul style="list-style-type: none"> • Total Air Pollution Load Management System • Emission Trading System • Mandatory LEVs Purchasing
Investment	<ul style="list-style-type: none"> • US\$ 78 million (2003) 	<ul style="list-style-type: none"> • US\$ 5.4 billion (for 10 yrs.)

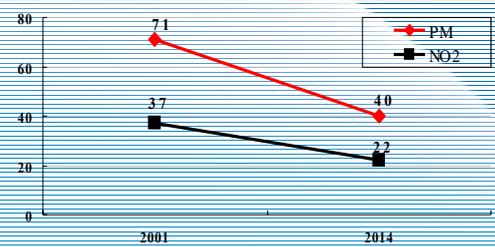
III. Special Measures for Metropolitan Air quality Improvement

Special Act on Seoul Metropolitan Air Quality Improvement

A 10-year Framework Plan for Air Quality Improvement

Length of Implementation	10 Years (includes 5-year Implementation Plan by Local Gov.)
Subjected Areas	Seoul Metropolitan Air Quality Management District (SMAQMD)
Subjected Air Pollutant	PM 10, NOx, SOx, VOCs

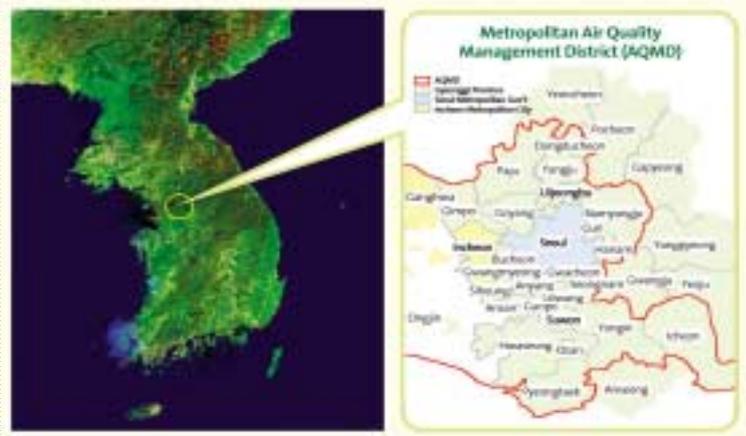
TARGET:



III. Special Measures for Metropolitan Air quality Improvement

Special Act on Seoul Metropolitan Air Quality Improvement

SMAQMD



Special Act on Seoul Metropolitan Air Quality Improvement

Total Air Pollution Load Management System

- Estimation of the Environmental Carrying Capacity for SMAQMD
- Allocation of the allowable emission loads to the Local Governments on the basis of the carrying capacity
- Local Governments to overlook emission sources (facilities, mobile and etc) and comply with the emission cap
 - Cap and Trade Program for point sources
 - Supply of LEVs
 - Control measures for mobile pollution sources
 - VOCs reduction in paints

Special Act on Seoul Metropolitan Air Quality Improvement

Control Measures for Newly Manufactured Vehicles

- Measures for LEVs (Low Emission Vehicles) Supply
 - Automakers selling more than 3,000 vehicles/yr in Seoul MTA are required to supply LEVs beyond a fixed rate
 - Economic Incentives given to manufacturers and buyers of LEVs
- Mandatory LEVs Purchasing
 - Government bodies and Public institutions that have at least 10 vehicles in the metropolitan area required to purchase a certain portion of newly purchased vehicles with LEVs

Special Act on Seoul Metropolitan Air Quality Improvement

Control Measures for On-Road Vehicles

- **Special Control Measures for Diesel Vehicle Emission**

- Those who fail to comply with the emission standards required to install diesel particulate filter (DPF) or diesel oxidation catalyst (DOC), or to retrofit with "cleaner engines".

** Diesel Vehicle exhaust emissions account for 100% of PM and 75% of NOx Discharged by cars in Seoul MTA

- **Vehicle Inspection System**

- Extended subjects of vehicle inspection program
large vehicles (wt. \geq 5.5 ton): a load test

	2002	2004	2006
Vehicle Age	12 yrs.	7 yrs.	4 yrs.

Special Act on Seoul Metropolitan Air Quality Improvement

Cap and Trade Program for Industry Sector

- **Introducing the Cap and Trade Program**

- Subjected Pollutants: NOx, SOx, TSP
- Type 1 Industry: Starting in Jul. 2007, Type 2 Industry: Starting in Jul. 2009
Implementation timeline was decided upon the emission discharge amount in each industrial site

- **Method of Emission Monitoring**

- Smoke Stack Telemetry Monitoring System (TMS)

- **Introduction of Cap and Trade Program to minimize emissions reduction cost**

2. Control Measures for On-Road Mobile Sources

CNG Bus Supply Program

- Mandatory Purchasing of CNG Buses
- Expanded Supply of CNG Buses in Major Cities

< The Target of CNG Bus Supply >

	Total	~ 2004	2005 2007
CNG Bus	20,000	7,400	12,600
Fuel Station	400	183	217

- Dissemination of CNG Vehicles
 - Garbage trucks (80), Gas company vehicles (100), Commuting buses for environmentally friendly companies

Control Measures for On-Road Mobile Sources

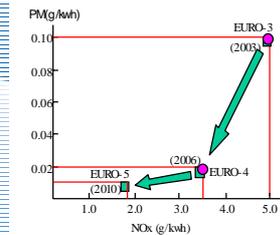
CNG Bus Supply Program

- Wider Installation of CNG Fueling Station
 - Loosening restrictions for the installation of CNG fueling stations
 - Installation of fueling equipment suitable for a small garage
- Increasing Awareness on the safety of CNG
 - Public Information activities through various media
 - Academic conference and exhibitions on CNG bus

Control Measures for On-Road Mobile Sources

Low Emissions of Manufacturing Vehicles

- Strengthening the emission standard on diesel vehicles in accordance with the EU standard



- Diesel Vehicles Control (by vehicle type)

- Replacement of metropolitan buses to CNG buses
- Engine replacements for medium & small-size vehicles
- Passenger cars: Standards will be developed with considerations on air pollution status, fuel prices and others

Control Measures for On-Road Mobile Sources

Low Emissions of Manufacturing Vehicles

- Restriction on Vehicle Engine Idling in Terminal, Garage, Parking lot, etc
- Promotion of Detailed Inspection System across the Capital Region
 - Failure rate : 12% (existing method) ➔ 35% (new inspection-system)
- Stronger Enforcement of Emission Testing
 - Expanded number of vehicles subjected to the emission testing
 - More stringent inspection on vehicles with high failure rate

Control Measures for On-Road Mobile Sources

Fuel Restrictions

- **Strengthening Standard on Fuel Quality**
 - Petrol: S Contents 130 → 30 ppm
 - Benzene 1.5 → 0.8%
 - Light Oil: S Contents 430 → 30ppm
 - New standards on Polycyclic Aromatic (8%)
- **Promotion of Bio-Diesel Supply**
 - Technology verification and establishment of quality standards
 - Creating a market for Bio-Diesel, and consideration of economic incentives

3. Air Pollution Control in Industrial Sectors

Strengthening Emissions Standard

- Differentiated enforcement of emissions standard according to the local air quality conditions

Emission Charge System

- **SO_x, PM₁₀**: Those who discharge less than 30% of the allowed amount are exempted from the General Charge, and additional charges are imposed on those who exceed the standard
- **NH₃, HF, HCl, Odor, etc (10 pollutants)**: Emission Charges are imposed on those who exceed the standard
- **Consideration of a New Emission Charge System**
 - Decrease in the number of pollutants subjected to emission charge
 - Integrated charge system that solely considers the amount of emission discharge, instead of enforcing both general and additional charges

III. Special Measures for Metropolitan Air quality Improvement

Air Pollution Control in Industrial Sectors

Environmental Management Guideline by Sector

- The Guideline will introduce: Special features of facilities, Pollution Reduction Equipments, Equipment Management Methods, etc.

VOCs Reduction

- Making efforts to develop standards on VOCs Contents targeting paint and ink products
- Signing of the Agreement on Voluntary VOCs Reduction

III. Special Measures for Metropolitan Air quality Improvement

4. Other Control Measures

Control Plans for Severely Polluted Areas

- **Special Control Area**
 - Includes Industry Complexes; Stringent VOCs Control
 - ** *Ulsan, Onsan, Mipo and Yecheon*
- **Air Pollution Control Area**
 - Areas where air pollution level exceeds the environmental carrying capacity as well as the areas that require special attention
 - Capital Region (Seoul, Incheon and Gyeonggi), Busan, Daegu, Gwangyang*

4. Other Control Measures

Expanded Use of Low-Sulfur and Clean Fuels

- Promotion of Low Sulfur Fuel

- Mandatory use of ultra-low sulfur fuel (S contents $\leq 0.3\%$) from July '01
7 cities: Seoul, Busan, Daegu, Incheon, Ulsan, Suwon, Ansan
- Daejeon, Gwangju and others (71 cities/district): S Contents $\leq 0.5\%$
- Other Area: S Contents $\leq 1.0\%$

- Air Pollution Control Area: Restriction on the use of solid fuels

- Apartments and power plants in the capital region are required to adopt clean fuels like LNG

Thank You!

Mr. PARK Kwang Suk

Director,
Regional Air Quality Management Division
Ministry of Environment of Korea(www.me.go.kr)

Tel.: 2-21107926
E-mail.: kspark@me.go.kr

<http://bluesky21.me.go.kr>