Situation and Monitoring system of Air pollution in the Republic of Korea

2022. 8.

KOICA
Korea International Cooperation Agency
1  Air pollution Situation
2  Ordinance of Air pollution
3  Air pollution Monitoring system
Concentration of major air pollutant

- **SO\textsubscript{2}** (sulfur oxide): Steady decline from ’89 to recently, 0.003ppm in ’20 (0.001ppm lower than the previous year)

- **NO\textsubscript{2}** (nitrogen oxide): Repeatedly increased and decreased, 0.016ppm in ’20 (decreasing trend since ’14)
Air pollution in the Republic of Korea

**Concentration of major air pollutant**

- $O_3$(ozone): Steady increase, 0.030ppm in ’20 (same as the previous year)

- CO(carbon monoxide): Steady decline, 0.4ppm in ’20 (0.1ppm lower than the previous year)
Air pollution in the Republic of Korea

**Concentration of major air pollutant**

- **PM\textsubscript{10}** (coarse particulate matter): Gradually decreasing since ’95, 33\(\mu\text{g}/\text{m}^3\) in ’20 (lower than the previous year)

- **PM\textsubscript{2.5}** (fine particulate matter): 19\(\mu\text{g}/\text{m}^3\) in ’20 (lower than the previous year)
Clean Air Conservation ACT

**Definitions of air pollutants (Article 2)**

- Air pollutants
  : particulate, CO, NH$_3$, NOx, SOx, etc.
- Air pollutants subject to watch for hazard
  : HCl, HF, NH$_3$, CO, etc.
- Specific hazardous air pollutant
  : HCl, HF, etc.

**Constant measurement (Article 3)**

- Installing measuring networks and constantly measuring the air pollution levels, etc., in order to ascertain the actual conditions of air pollution nationwide
- Establishing and operating a computer network capable of electronically processing the measurement results for easy access to the information on air pollution levels

**Prediction and Announcement of air pollutant levels (Article 7-2)**

- Prediction of air pollution levels and announcement of the result thereof in order to minimize the impacts of air pollution on public health and property, the growth and development of animals and plants, or industrial activities
Clean Air Conservation ACT

**Regulation of total quantity (Article 22)**
- A zone which he or she deems likely to pose a serious harm to the health and property of the residents, the birth and breeding of animals and plants because of exceeding the Environmental Quality Standards of air pollution condition
- A zone densely crowded with places of business within a special measures area

**Installation of measuring devices (Article 32)**
- Installation of measuring devices in each business entity for proper operation of air pollutant emission facilities and prevention facilities
- Compliance with the operation and management standards for measuring devices to maintain the reliability and accuracy of the results measured by such devices

**Installation and operation of computer networks for management of information on exhaust emission from motor vehicles (Article 54)**
- Establishing and operating a computer network linked to an electronic data processing system to collect and manage data on exhaust emissions from motor vehicle
Operation of National Air Quality Monitoring Network

Measuring ambient air quality and provision of measured data for healthier life of people

- Collecting air quality information by national ambient air quality network
  ① Measured information from approximately 600 nationwide monitoring station
  ② Providing measured value and grade (SO₂, CO, NO₂, O₃, PM₁₀, PM₂.₅) of each station by every 1 hour

- Providing real time data through ambient air quality monitoring system, Airkorea
  ① Airkorea homepage : Real time air quality, forecasting, alarming and statistics available
  ② Mobile app. : Accessing air quality information on the move by using ‘our village air quality App’

<table>
<thead>
<tr>
<th>National Local ambient network &amp; meteorological Admin.</th>
<th>National air monitoring information system</th>
<th>Real time ambient quality monitoring system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production of air quality data</td>
<td>Collection of confirmation statistics process</td>
<td>Utilization of distribution</td>
</tr>
</tbody>
</table>
Operation of National Air Quality Monitoring Network

Air quality monitoring station

Real time air quality (Airkorea)

Air quality alarming (Airkorea)
Operating the air pollutant emission-cap management system

- Regulation of the air pollution by allocating the maximum quantity of air pollutants to be emitted in the designated year in the place of business
  ① Allocation excess: Levy of emission-cap excess charge and allocation reduction of the following year
  ② Allocation observance: Transfer of unused emission between places of business with allocation banking

- Target item: NOx, SOx, dust(TSP)

- Emission-cap management system
  ① Data collection and analysis from direct monitoring devices of the business place in real time
  ② Emission calculation and verification
  ③ Allowance, issue, recall for allocation
  ④ Allocation transfer (trade)
  ⑤ Calculation of the emission-cap excess charge
Operation of Air Pollutant Emission-Cap Regulation

- Issuance of a permit (allocation registration)
- Emission management (air pollution preventive Facility installation and etc.)
- Emission report (monthly)
- Emission verification
- Transfer of allocation

Management structure

- Allocation observance
  - Increase in allocation for the following year
- Allocation excess
  - Levying emission-cap excess charge, Reduction in allocation for the following year

Emission-cap management system homepage
Measurement and Management of air pollutants emitted from stack in real time for improvement of the local air environment

- Purpose of CleanSYS
  1. Promotion of science-based environmental administration by using automatic stack measuring devices and monitoring system
  2. Improvement of the local air environment through the prevention of pollutant emission in the stack

- Target facilities: Power plant, boiler, incinerator and large scale pollutant emission facility

- Monitoring items
  1. Pollutant items: Dust, SOx, NOx, HCl, HF, NH₃, CO
  2. Non-pollutant items: Flow, temperature, O₂

- Operation of CleanSYS
  1. Alerting and Warning system: Informing source operators and local governments about approach or excess of emission limit value
  2. Remote check: Check reliability of on-site measuring device remotely injecting sample test gas into the measuring device automatically
Stack Tele-Monitoring System (CleanSYS)

CleanSYS system chart
Vehicle Emission Integrated Management System

Management of all information regarding vehicle emission gas

- Management of vehicle gas emission
  ① Vehicle certification test
  ② Omission of certification
  ③ Regular and spot vehicle monitoring
  ④ Vehicle company facility monitoring

- Management of on-road vehicle gas emission
  ① Result of close inspection
  ② Remote sensing device for on-road vehicle
  ③ Professional maintenance
  ④ Vehicle inspection

- Management of emission reduction program
  ① Budget management of emission reduction program
  ② Registration and management of emission reducer
  ③ Follow-up inspection and maintenance of emission reducer
  ④ Early scrapping old vehicle

- Vehicle emission grade
  ① Vehicle emission grade management
  ② Integrated operation restriction data management
Vehicle Emission Integrated Management System

System configuration

Internet homepage (mecar)
Thank You for listening.

Email : ysshin22@koica.go.kr