

# Countermeasures on chemical substances in Japan by Air Pollution Control Law

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## Definition in Air Pollution Control Law

### **hazardous air pollutants**

- air pollutants which are liable to adversely affect human health through long-term exposure, other than soot and smoke and designated particulate

### **volatile organic compound**

- organic compounds in gas condition when they are exhausted in the atmosphere
- excluding materials that do not cause generation of suspended particulate matter and oxidant



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# History of air pollution problem

## Meiji era (1868-1912)

- smoke from factories in big cities became a problem, along with the modernization and the economic growth of industry

## Rapid economic growth period of 1950's -60's

- air pollution with Sulfur Oxides, Dust and Nitrogen Oxides by the combustion of the fuel has become a serious problem


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# History of air pollution problem


- “the Law Concerning Control on the Emission of Smoke and Soot” in 1962
- “the Basic Law for Environmental Pollution Control” in 1967
- “Air Pollution Control Law” in 1968
- 1970 Amendment to the “Air Pollution Control Law,” so-called “Pollution Diet”

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## **History of air pollution problem (concerning hazardous air pollutants)**

- **continuous monitoring**
    - asbestos since 1985
    - mercury since 1986
    - formaldehyde and dioxin since 1987
  - “air quality guideline value” and “the tentative measures guideline” were made on trichloroethylene and tetrachloroethylene in 1993
  - Consultation on “future direction of measures against hazardous air pollutants” to the Central Council for Environmental Pollution Control in Sep. 1995
  - the interim report by the Council in Jan. 1996
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## **Future direction of measures against hazardous air pollutants (the interim report)**

- some carcinogenic materials and other hazardous materials were detected in the air quality monitoring
  - long-term exposure to some of these materials can have carcinogenic effect
  - thus, countermeasures to decrease the health risk of hazardous air pollutants are necessary
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## Future direction of measures against hazardous air pollutants (the interim report)

### Future direction of emission control measures

- appropriate measures should be taken by classifying hazardous air pollutants into three categories according to the level of a health risk in Japan
- situation of a source and current technological level should be taken account in emission control measures

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## Future direction of measures against hazardous air pollutants (the interim report)

### Approach to setting of targeted level of environmental quality

- targeted level of environmental quality of a substance with a threshold value should be set based on the maximum nontoxic amount
- the level of a substance without a threshold should be set the level referring to the life-long risk level  $10^{-5}$ , etc.
- hazardous air pollutants, many of which don't have threshold value and have health risk through low-level long-term exposure, have different characters from traditional materials with environmental standards.

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## **1997 Amendment to the Air Pollution Control Law**

- **Amended based on the interim report by the Central Environmental Council in May 1996**
- **hazardous air pollutants measures were stipulated in this amendment.**



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## **List of hazardous air pollutants**

- **The Central Environmental Council made the second report on “Future direction of measures against hazardous air pollutants” in Oct. 1996.**
- **the list of the possible hazardous air pollutants and the list of “substances requiring priority action” were included in the report.**



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# List of hazardous air pollutants

## • tibia classification

- ranked as 1 or 2A by the International Agency for Research on Cancer (IARC)
- ranked as the first group or the second group A by Japan Society for Occupational Health (JSOH)
- ranked as A1 by American Conference of Industrial Hygienists (ACGIH)
- ranked as A or B1 by United States Environmental Protection Agency (EPA)

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# List of hazardous air pollutants

## • Air pollutants against which foreign governments or international organizations have some measures

- Pollutants which Germany targets in “the atmospheric quality management technology rule” (TA-Luft)
- Pollutants for which The Netherlands sets the emission standards.
- Pollutants for which the U.S. sets the emission standards by Clean Air Act
- Pollutants which WHO European secretariat targets in the revision of atmospheric quality guideline

## • Possible air pollutants which are regulated by other laws

- Poisonous and Deleterious Substances Control Law
- Law concerning the Evaluation of Chemical Substances and Regulation of Their Manufacture, etc.
- Industrial Safety and Health Law
- Water Pollution Control Law
- High Pressure Gas Safety Law

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## List of hazardous air pollutants

- Other possible hazardous air pollutants which can have human health effect through air pollution according to scientific knowledge
  - Pollutants which are classified into 2B or more by IARC, second group B or more by JSOH, A2 or more by ACGIH, and B2 or more by EPA, and which can cause air pollution problem
  - Pollutants for which local governments have emission control measures by ordinances.
  - Pollutants considered to be exhausted by cars.
  - Pollutants which can have human health effect through air pollution according to scientific knowledge as the result of “the comprehensive environmental safety survey of chemical substances” etc.

Selected 234 substances

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## List of hazardous air pollutants (extract )

	name of substance		name of substance
1	zinc and its compounds	11	xylenol
2	acrylamide	12	2,4-xylenol
3	acrylic acid	13	xylene
4	ethyl acrylate	14	quinoline
5	n-butyl acrylate	15	formic acid
6	methyl acrylate	16	methyl formate
7	acrylonitrile	17	cresol
8	acrolein	18	Chromium and its compounds
9	di(2-ethylhexyl)adipate	19	chlordanes
10	acetamide	20	chloroethane

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## Substances requiring priority action

Substances selected as high health risk substances from the list of hazardous air pollutants which meet the conditions as follows:

- Substances whose concentration exceeds the following value in ambient air or around factories
  - A. 1/10 of either of the following values
    - Atmospheric environmental standards in the Netherlands
    - The life-long risk level  $10^{-5}$  by carcinogenic evaluation of EPA
    - General ambient air quality guideline by WHO European secretariat
  - B. 1/1000 of permissible concentration by JSOH or ACGIH

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## Substances requiring priority action

● Substances classified as 1 by IARC and meet the conditions as follows:

- detected in the atmospheric environment
- there is a possibility of detection in the atmosphere due to production and use in Japan.



**Selected 22 substances**

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## List of Substances requiring priority action

name of substance		name of substance	
1	acrylonitrile	12	tetrachloroethylene
2	acetaldehyde	13	trichloroethylene
3	vinyl chloride monomer	14	nickel compound
4	chloroform	15	arsenic and its inorganic compound
5	chloromethyl methyl ether	16	1,3-butadiene
6	ethylene oxide	17	beryllium and its compound
7	1,2-dichloroethane	18	benzene
8	dichloromethane	19	benzo(a)pyrene
9	mercury and its compound	20	formaldehyde
10	talc(containing asbestiform fibres)	21	manganese and its compound
11	dioxins	22	chromium(VI) compound

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## Substances requiring priority action

The second report also said that

- the voluntary action to reduce emission, as well as investigation of hazardousness, atmospheric concentration and pollution source of those substances should be promoted.

**Concerning dioxin, a special law (Law Concerning Special Measures against Dioxins) was enacted in 1999 to execute measures for comprehensive environmental pollution control including the water quality management.**

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## Environmental standards for hazardous air pollutants

substance	standards
benzene	annual mean value is 0.003mg/m <sup>3</sup> or less
trichloroethylene	annual mean value is 0.2mg/m <sup>3</sup> or less
tetrachloroethylene	annual mean value is 0.2mg/m <sup>3</sup> or less
dichloromethane	annual mean value is 0.15mg/m <sup>3</sup> or less

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## guideline value for hazardous air pollutants

substance	standards
acrylonitrile	annual mean value is 2 $\mu$ g/m <sup>3</sup> or less
vinyl chloride monomer	annual mean value is 10 $\mu$ g/m <sup>3</sup> or less
mercury and its compound	annual mean value is 0.04 $\mu$ gHg/m <sup>3</sup> or less
nickel compound	annual mean value is 0.025 $\mu$ gNi/m <sup>3</sup> or less

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# Enforcement of hazardous air pollutants measures

## Measures for designated substances based on Air Pollution Control Law

- benzene, trichloroethylene, and tetrachloroethylene are stipulated as designated substances for which emission control should be immediately established to prevent human health damage
- 11 kinds of facilities, such as dry facilities that evaporate benzene, trichloroethylene and tetrachloroethylene and coke ovens, were specified as designated substance emission facility.
- emission standards were set depending on the kinds of designated substances and facilities.

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# Enforcement of hazardous air pollutants measures

## Voluntary action by the industrial sector

- Environment Agency and the Ministry of International Trade and Industry jointly made a guideline for voluntary action by entrepreneurs (Sep. 1998)
- The industrial sector was requested to promote voluntary management of 12 kinds of hazardous air pollutants which are produced or imported in large quantities, grasped the condition in ambient air, and obtained sufficient evidence of long-term toxicity
- 77 entrepreneur groups set voluntary action plans (from 1997 to 99) aiming at 35% emission reduction from 1995. As a result, 40% reduction rate, which was more than the original target, was achieved.

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## **Enforcement of hazardous air pollutants measures**

### **Voluntary action by the industrial sector**

- The ministries revised the guideline in Jun. 2001, and requested further voluntary action.
- 74 entrepreneur groups set voluntary action plans for the second term, aiming at 40% emission reduction from 1999, and the target was again achieved.

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## **Enforcement of hazardous air pollutants measures**

### **Voluntary action by the industrial sector**

**In Jun. 2005, “The Expert Committee of the Council on hazardous air pollutants emission control” evaluated as follows:**

- Reduction effort should be made by individual business entity under each responsibility, not by industry groups as up to now.
- Also, reduction effort should be made on a community basis under public (local governments)-private partnership.

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# VOC Regulation

- ❁ **VOC**

- is generic name of organic compounds that become gas in the atmosphere
- includes various materials such as toluene, xylene, ethyl acetate and so on
- is one of causative agents of suspended particulate matter (SPM) and photochemical oxidant (Ox)

- ❁ **2004 Amendment to the Air Pollution Control Law stipulates**

- \* Legal emission regulations

To reliably and fairly reduce the emissions. To be applied to the facilities with large emissions of VOCs

- \* Voluntary efforts

To flexibly respond based on the ingenious ideas of enterprises. To be applied to all VOCs sources but legally regulated ones.

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# VOC Regulation

- ❁ **VOC reduction target**

- \* Target year: FY 2010

- \* Reduction quantity: To be reduced by 30% from the present level (FY2000)

- ❁ Although VOCs include some hazardous air pollutants, measures for VOCs and measures for hazardous air pollutants exist respectively. This is because the purposes of regulation on VOCs and regulation on hazardous air pollutants are different.

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# VOC Regulation (Outline of the Amended Law )

## Guideline for policies

Effective emission control should be pursued by adequately combining VOCs emission regulations and voluntary efforts (the policy best mix).

## Facilities to be covered by the regulations

The facilities to be covered by the regulations are the facilities installed in factories and other business locations, the control of which is especially required since they emit large quantities of VOCs.

## Emission regulations

- The facilities to be covered by the regulations should be reported to the governors of prefectural governments.
- The emission concentrations at discharge ports should conform to the regulatory standard values.
- Emission concentrations should be measured.

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# Air pollution monitoring of hazardous air pollutants

- began in 1997, in accordance with “the guideline for hazardous air pollutants monitoring” and “manual for monitoring method of hazardous air pollutants” published by MOE in Feb. 1997
- the monitoring is carried out at monitoring points of general environment, vicinity of stationary pollution sources and roadside, by constant sampling (24 hour) once a month.
- The result is evaluated as annual average data.
- The result is available on MOE homepage.

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**Thank you for giving this  
opportunity of presentation!**

