

7.2 Transitions in Countermeasures to Air Pollution

7.2.1 Introduction

Methods to prevent air pollution include;

- (1) Separation of damaged areas and pollution sources. (aim at reduction by widening the distance)
- (2) Heighten ventilation pipes and chimneys to avoid high concentrations on ground level.
- (3) Attachment of dust collecting equipments and toxic gas treatment equipments. (automobiles: three way catalytic converter)
- (4) Change over to better quality fuel. (automobiles: low-pollution vehicles) as well as many other measures.

To take these countermeasures into definite action, the following should be implemented.

- (1) Conclude agreements (agreement on environmental pollution control, etc.) with stated goals and detailed measures.
- (2) Set and enforce limits through laws, ordinances, etc.
- (3) Create standards of guidance, guideline and guideline principle, set and enforce numerical targets. Along with other possibilities, significant results could be effected by a combination of measures.

7.2.2 Examples of instruction and agreements

In 1951, the Ube City Assembly gathered representatives from business, the assembly itself and academia and created a mayoral advisory organ entitled the "Smoke and Soot Prevention Committee". Under the leadership of this committee, despite the fact that coal usage rose over 79% between 1951 (monthly consumption of 85,600 t) and 1962 (monthly consumption of 153,600 t), the amount of soot and dust decreased by one third from 55.9 t per month per km to 18 t per month per km. (The city utilizes nearly 40 dust collecting equipments and uses the soot and dust to make cement admixture which has been sold over the past ten years for a total of nine hundred million yen.) The Ube measure is referred to as the "Ube Method". There are many other examples of methods through which large scale pollution-causing businesses and local government entered into agreements.

7.2.3 Gradual introduction of restrictions and results.

(1) Measures against soot and dust

When in 1932 the "Osaka Smoke and Soot Prevention Act", which restricted black smoke concentration to under Ringelman's levels 3, was promulgated it was the beginning of the introduction of restrictive measures to control air pollution. The measures adopted in this plan were to burn anthracite coal and nurture boiler engineers. Progress was curtailed by the war, etc., thereafter. After WW II, in 1955, the "Tokyo Metropolitan Soot Prevention Ordinance" was established and restrictions based on Ringelman's smoke chart were begun. Further, in 1962, the government set the "Smoke and Soot Regulation law" which introduced regulations limiting mass concentration of soot and dust emissions based on the Ringelman's smoke chart and the definitions of JISZ8808.

Based on these measures, restrictions on soot and dust were implemented in Tokyo, Kawasaki, Osaka, Kita-Kyushu, etc. However, air pollution caused by sulfur oxides continued unabated and the addition of pollution from auto exhaust gases, etc., made the situation more complicated and grave.

(2) General measures against air pollution

In order to prevent such air pollution, the "Air Pollution Control Law" was enacted in 1968 and restrictions on sulfur oxides were introduced. Also, in 1970, new types of air pollution problems including photo-chemical smog and pollution from lead as well as that from auto exhaust gas, hydrocarbon species and other hazardous substances (Cd, Cl, HCl, F, HF, Pb, NOx, etc.) inspired the setting of restrictions on these substances as well. Also, materials resulting from synthesis, resolution and other chemical treatment methods that could adversely affect the health of human beings and the environment (ammonia, etc., 26 different types) were tagged "specified substances" and measures in case of accidents were made compulsory. Additionally, structure, use and management standards were introduced for the particulate dust due to the pulverization or crushing, sorting, and accumulation, etc., of materials. Later, in 1974, the "Areawide Total Pollutant Load Control for Sulfur Oxides", and in 1986, the "Areawide Total Pollutant Load Control for Nitrogen Oxides" were designated to and enacted in each area. Also, in December of 1989, the asbestos emission restriction was introduced. Table 7.2.1 lists the various restriction measures, etc., included in the Air Pollution Control Law. In May of 1996, benzene, trichloroethylene, and tetrachloroethylene were made specified substances and came under restrictions.

Table 7.2.1 Air Pollution Control Law restriction measures

Restricted substance	Substance example	Form at occurrence source	Facility	Restriction standards	Restriction measures, etc.	
Smoke and dust	Sulfur Oxides	SO ₂ , SO _x	material combustion	smoke and soot emitting facilities	Smoke and soot emission standards (restrictions on amount, K level method by area, restriction standard on total emission)	order for improvement, direct penalties, etc.
	Soot and dust	soot, etc.	same as above	same as above	same as above (concentration restrictions based on facility type and size)	same as above
	Hazardous substances	NOx, Cd, Pb, HF, Cl ₂ , HCl, etc.	material combustion, synthesis, decomposition, pressurization, etc.	same as above	same as above (concentration restrictions based on type of material and facility type. General restriction standards are in place for NOx.)	same as above
	Designated hazardous substances	(not yet designated)	material combustion	same as above	same as above (amount restrictions, K level method)	same as above
Dust	Designated dust	asbestos	dissection, cutting, grinding, etc.	specified dust emitting facilities	restriction standards (concentration restrictions, site limits)	order for improvement
	Common dust	cement dust, coal dust, steel dust, etc.	material pulverization, sorting, accumulation, etc.	common dust emitting facilities	structure, use and management standards	order to meet standards
Automobile exhaust gases	CO, HC, Pb, NOx, etc.	running of automobiles	specified automobiles	approval limitations (consideration of security standards)	traffic regulations, order for maintenance, etc., (according to other laws)	
Designated materials	C ₆ H ₅ OH (phenol), C ₅ H ₅ N (pyridine), etc.	accidents occurring during material synthesis and other chemical treatment	treatment methods specified facilities (not designated by government ordinance)	none	orders to take measures in case of accident	

(3) Results of measures against air pollution

- A. Fig.7.2.1 presents the results of the stationary emission source measures enacted by Tokyo (sulfur dioxide, suspended dust).
- B. Fig.7.2.2 presents the results of the auto exhaust gas restrictions (Carbon Monoxide).

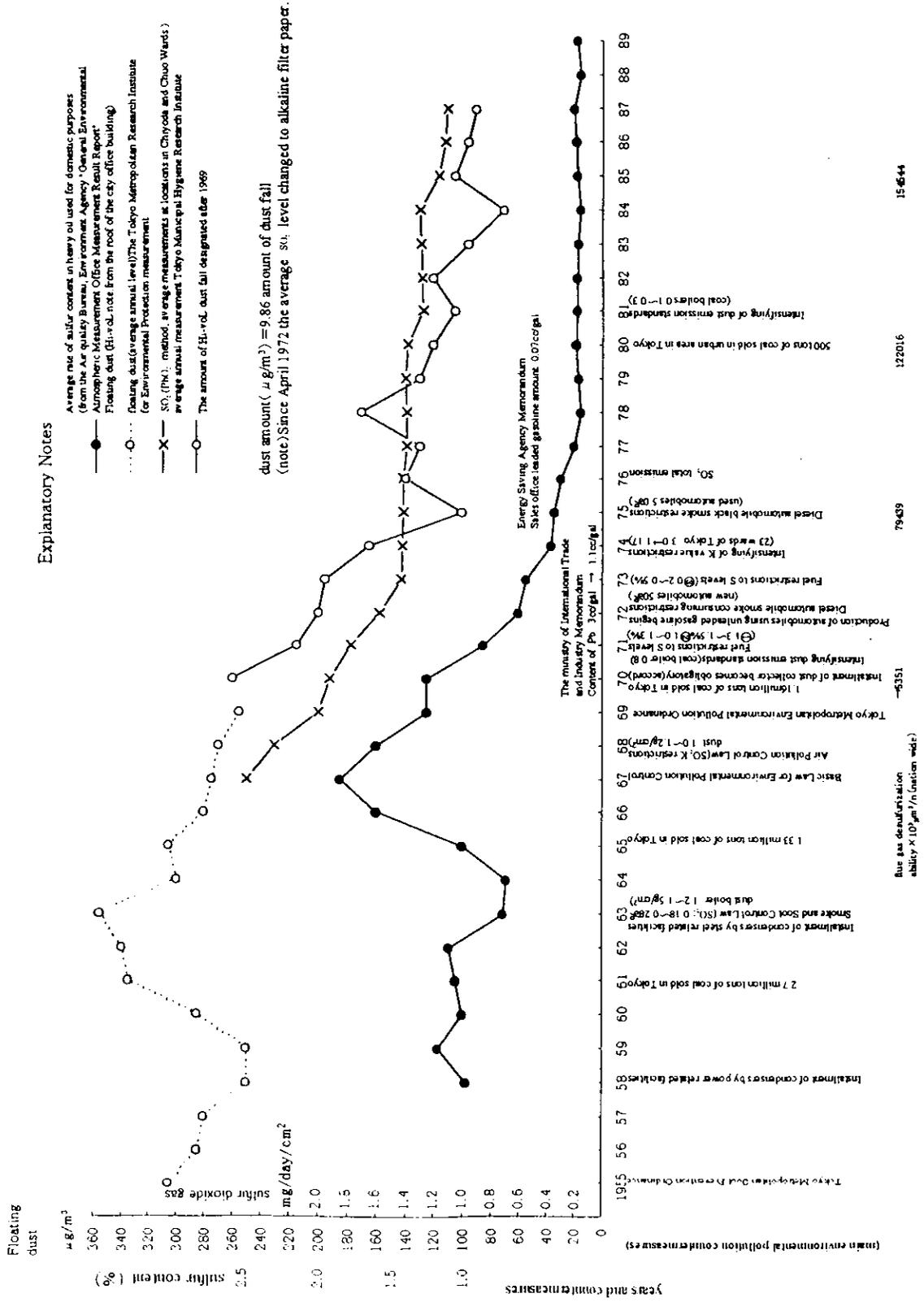


Fig. 7.2.1 Conditions of air pollution in cities over the past 35

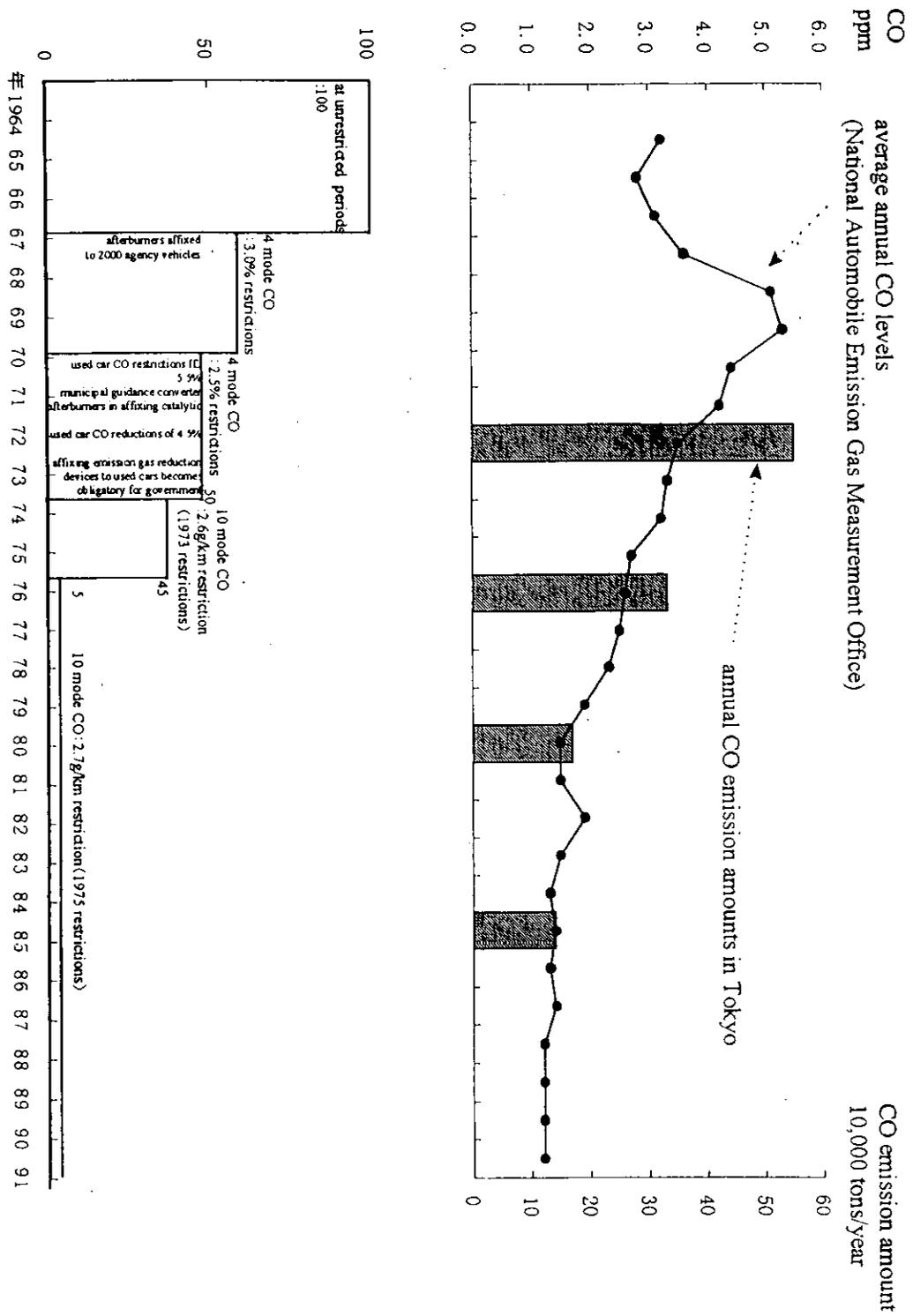


Fig. 7.2.2 Changes in the average annual CO levels and automobile