

THE ELIMINATION OF LEADED GASOLINE AS A NECESSITY

By Prof. Dr. Haryoto Kusnopranto

I. INTRODUCTION

Environment pollution is one of the important problems facing the world and Indonesia today. This problem has intensified with the succeeding years in line with the increase in economic development and the number of population as well as the urbanization level, especially in big cities.

One of the present environmental problems in big cities in Indonesia is air pollution, especially resulting from emission gas of motor vehicles, industrial activity, transportation, burning of wastes and household activities. From a research finding by JICA in cooperation with BAPEDAL for Jabotabek area, the emission burden resulting from moving as well as non-moving sources can be seen from the following table:

Table 1. Estimate of burden of gas emission according to its resources in Jabotabek area (1995)
(unit: ton/year)

Source	Types of activity	SOx	NOx	Dust particle	CO	HC
Non-movable	Industry	42697	36832	13581		
	Household	4220	4962	642		
Movable	Motorized vehicle	8142	98738	9563	564292	97971
	Ship	808	1960			
	Air plane	91	1026			
J u m l a h		55958	143518	23786	564292	97971

Source: The study on the Integrated Air Quality Management for Jakarta Metropolitan Area (JICA-BAPEDAL, 1997)

The contribution to air pollution by gas emission from motor vehicles from the use of fuel oil is the largest (49 percent) (Ekuwasbang, 1997). As we are all aware, up to now the use of fuel oil in Indonesia is still dominated by leaded gasoline, so that the bigger the energy consumption from leaded gasoline, the higher the level of Pb air pollution in the ambient air. This is because around 70% of Pb contained in fuel oil burnt in vehicle engines are emitted to the air. Pollutant emitted by motorized vehicles beside Pb is: CO, NOx, Hydrocarbon (HC) and dust particles, containing heavy metals, like Pb. Black smoke emitted by motor vehicles illustrates the seriousness of the emission produced by motorized vehicles.

II. Impact of Lead (Pb) on Health

Burning of fuel oil will continue to increase at a rate of 68% per year. Lead with neuro-toxic property entering human or animal body will accumulate so that its dangers on the body also increases. Research on Pb content in blood conducted among some residents in Jakarta in 1991 found considerably high level (30 microgram per deciliter) in some groups of people, especially among middle and lower classes who live near areas with high density of traffic. Similar researches by the Parahyangan University in Bandung found that the lead content in the blood of traffic police officers in Jakarta is the highest, followed by taxi drivers.

Agencies monitoring the quality of air in Jakarta found that lead (Pb) content has exceeded the maximum standard stipulated by WHO as well as that by the Ambient Air Quality Standard included in the Government Regulation No. 41 Year 1999 on Air Pollution Control. Another research showed that lead content in gasoline emitted to the air may result in the IQ reduction of Indonesian children, and may become a factor for coronary and other heart diseases among adults. As an illustration, an increase in lead content in blood of 10 microgram per deciliter may reduce 2.5 points in IQ value. It is estimated that Jakarta children lost 300,000 - 500,000 IQ points every year, and this figure continues to inflate with each passing year in line with the accumulation of lead (Pb) in the environment. It is almost certain that the worst impact of the presence of lead in gasoline is the destruction of the future generation of the Indonesians.

The impact on the reduction of people's health by leaded gasoline is the exorbitant medical cost borne by the society. According to a World Bank study, in 1990 alone this cost amounted to US\$ 62,400,000.

Table 2. Health Cost as a Result of Air Pollution by Lead (Pb)

No.	Impact on Health	Seriousness of Impact	Damage Value US\$/year
1.	Increase in the number of death in adults from Cardiovascular disease because of high Pb concentration	340 persons/year	25.2 million
2.	Hypertension cases (diastolic pressure) > 90 mmHg	84,000 persons/year	0.5 million
3.	Cases of coronary heart disease in adults	350 persons/year	0.4 million
4.	Lost of IQ in children	300,000 points/year	36.1 million
	T o t a l		62.4 million

III. TENDENCY OF LEADED GASOLINE UTILIZATION

Until nearly 1970, almost all gasoline used as fuel oil in motorize vehicles in the world has lead (Pb) content with varied concentration below 0.4 grams/liter. Since 1970s there has been a change from leaded gasoline to unleaded gasoline, due to concerns about the impact of lead on people's health. The conversion to unleaded gasoline had been facilitated by "catalytic converter" which functions to reduce carbon monoxide (CO), hydrocarbon (HC) and nitrogen oxide (NOx) emissions. Some countries have eliminated the use of leaded gasoline completely, including those registered in Table 3.

Table 3. Year of the Elimination of Leaded Gasoline in Some Countries

Country	Year of Leaded-Gasoline Elimination
Austria	1993
Germany	1996
Denmark	1995
Slovakia	1994
Japan	1980
Canada	1993
Sweden	1995
America	1996

Source: *Phasing Out of Leaded Gasoline. The Experience with Different Policy Approaches in Different Countries (UNEP-OECD, 1998).*

Given the evidence of harmful impacts of leaded gasoline, all advanced countries have eliminated its use, while medium income countries have started to phase it out as part of a program towards its complete elimination. Within ASEAN, Thailand introduced unleaded gasoline in 1991 and phased lead out completely by 1993. Brunei has utilized unleaded gasoline fully. Malaysia began to phase out leaded gasoline in 1990 and the Philippines started in 1997. Indonesia introduced unleaded gasoline on August 17, 1995, but its use has been limited and, at a 30 percent extra cost from leaded gasoline, it was not affordable to the general public. The small amount of unleaded gasoline supply has not been a meaningful contribution to reducing air pollution. The elimination of leaded gasoline has now been set for January 1, 2003, by the Ordinance of the Minister of Mines and Energy No. 1585.K/ 32/MPE/1999.

IV. POLICY RECOMMENDATION

The phasing out of leaded gasoline can no longer be delayed given its harmful effect on people's health and the huge medical costs that society must bear. A political will on the part of the government is crucial in this reform era to create more competitive climate and business opportunity (non monopoly) by giving more opportunity to the private sector to contribute in the supply of environment-friendly alternative forms of energy. Strategies must be formulated to achieve the goal of phasing out leaded gasoline, among others:

1. To market immediately unleaded gasoline in massive amount;
2. To make the price of unleaded gasoline cheaper. This will encourage motorists to participate in improving air quality without having to pay higher expenses;
3. To promote the use of gas fuel as cleaner alternative fuel
4. To compel that all new cars must be installed with catalytic converter.