

**FUTURE POLICY FOR MOTOR VEHICLE
EXHAUST EMISSION REDUCTION
(FOURTH RECOMMENDATION)**

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THE CENTRAL ENVIRONMENT COUNCIL

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Akio Morishima
Chairperson,
The Central Environment
Council

To: Ms. Yoriko Kawaguchi
Director-General,
Environment Agency

Subject: **FUTURE POLICY FOR MOTOR VEHICLE EXHAUST
EMISSION REDUCTION (FOURTH RECOMMENDATION)**

The Central Environment Council has conducted studies and deliberated on "Future Policy for Motor Vehicle Exhaust Emission Reduction," concerning which, inquiry had been made to the said Council through Consultation No.31, dated May 21, 1996. The Council has reached the following conclusions and hereby reports them.

As regards Consultation No.31, dated May 21, 1996, "Future Policy for Motor Vehicle Exhaust Emission Reduction," the Central Environment Council made the interim recommendation on October 18, 1996, regarding countermeasures to be implemented urgently from the viewpoint of reducing hazardous air pollutants. Then, the Second Recommendation was compiled on November 21, 1997, which dealt mainly exhaust emission control measures for motor vehicles fueled by gasoline and liquefied petroleum gas (LPG) (hereinafter referred to as "gasoline-LPG motor vehicles") and special motor vehicles (referring to large-sized special motor vehicles and small-sized special motor vehicles provided for in the Road Vehicles Act. Hereinafter the same). Moreover, the Third Recommendation was compiled on December 14, 1998, which firstly ① called for the strengthening of exhaust emission standards for motor vehicles fueled by diesel fuel (hereinafter referred to as "diesel motor vehicles"), in which the exhaust emission standards be strengthened over a period from the year 2002 to the year 2004 with emphasis placed on the reduction of nitrogen oxides and particulate matter (hereinafter referred to as the diesel new short-term target) and further reduction of the new short-term target to its half level be achieved by the year 2007 as the target time (hereinafter referred to as the diesel new long-term target) and secondly ② set forth evaporative properties, etc. of test fuels concerning the reduction of fuel evaporative emissions for motor vehicles fueled by gasoline (hereinafter referred to as the "gasoline motor vehicles"). This time, the Experts Committee on Motor Vehicle Exhaust Emissions deliberated continuously the general policy for reduction of motor vehicle exhaust emissions. As a result, the Fourth Report was compiled by the Expert Committee on Motor Vehicle Exhaust Emissions, as shown in Attachment.

Upon receiving the aforementioned Fourth Report, the Air Quality Committee conducted deliberations and has decided to follow the Fourth Report by the Experts Committee on Motor Vehicle Exhaust Emissions as an effective way to promote future reduction in motor vehicle exhaust emissions. The Air Quality Committee has deemed it necessary to conduct the following measures enumerated below. ① Shortening of the time allowed for achievement of the new long-term target for diesel motor vehicles,

which was proposed in the Third Recommendation, as much as possible and as well as the reduction of the sulfur content of diesel fuel, and ② Shortening of the time allowed for achievement of the exhaust emission reduction target for special motor vehicles, which was proposed in the Second Recommendation, as much as possible, including the target for diesel smoke. Furthermore, the Air Quality Committee has concluded that it would be appropriate to deliberate continuously the general policy for reduction of motor vehicle exhaust emissions.

Hence, the Council has made the following recommendations.

1. Reduction Measures for Exhaust Emissions from Diesel Motor Vehicles

(1) Early achievement of diesel new long-term target

① Achievement time, etc.

With regard to the diesel new long-term target, which was to be achieved originally by the year 2007 as the target time, taking into consideration the fact that the development of the new after-treatment devices for exhaust gas has progressed rapidly, we have deemed it appropriate that this new long-term target be attained by the year 2005, by carrying out the design, development and preparation of production efficiently. At this point, it should be noted that it is required that the diesel new short-term target and diesel new long-term target are to be achieved over a relatively short period of time and the strengthening of exhaust emission standard of gasoline·LPG motor vehicles is scheduled at the same time. Therefore, the number of man-power will increase rapidly over a certain period. Consequently, it is anticipated a heavy burden will be imposed and type certification will be concentrated over a short period of time. Furthermore, if a new test procedure for exhaust emissions is set forth, a preparation period will be needed for its handling. Hence, care must be exercised to assure that the handling for the standards be conducted smoothly.

With regard to specific target values of the diesel

new long-term target, which was proposed in the Third Recommendation and was believed to be approximately half of the diesel new short-term target, we have deemed it proper to decide them by the end of fiscal year 2001 as the target time, taking into account the trend of the future technical development and, if the current test procedure is to be reviewed, based on the revised test procedure. When determining these target values, taking into consideration the risk assessment results of diesel exhaust particles (DEP), it is necessary to study that the target value of particulate matter (PM) be further reduced to a point below its half level of the new short-term target.

Moreover, in respect to the Japan Automobile Manufacturers Association's voluntary marketing of motor vehicles whose PM emission amount is reduced to a level of the diesel new long-term target, it is desirable that this marketing be carried out properly so that their effects may be obtained fully.

② Review of exhaust emission test procedure

As regards the exhaust emission test procedure, it is necessary to conduct the required surveys, including the actual running mode survey. Based on the survey results, study shall be made as soon as possible as to the review of the test procedure, including its necessity. When reviewing, it is imperative to ensure that the actual running modes in the large city areas in Japan be reflected fully on the revised test procedure. Furthermore, in view of the fact that international standard harmonization works on the exhaust emission test procedures for large-sized motor vehicles are progressing internationally, it is imperative to attain international harmonization whenever possible, as long as the environmental preservation in Japan is not hampered.

When reviewing the test procedures, it is necessary to advance the research and study regarding the measurement procedures that make it possible to properly conduct exhaust emission reduction during cold start period. In particular, in the case of large-sized motor vehicles, it is necessary to advance the research and study regarding the

introduction of the transient mode test procedure and the measurement method of particulate matter under such conditions. In addition, it is advisable to study the introduction of standards for nonmethane hydrocarbons or nonmethane organic gases (referring to those components in which oxygen-containing organic components, such as ketone and aldehydes, are added to nonmethane hydrocarbons), including the necessity of its introduction. Moreover, it is advisable to study the policy for the smoke measurement method and smoke control standard.

(2) Fuel quality measures

① Target value for permissible limit

In order to make the most of the very promising exhaust gas after-treatment devices necessary for attaining the diesel new long-term target, it is a requisite that the sulfur content of diesel fuel be reduced. However, the 0.005 mass percent (hereinafter referred to as "the 50ppm") level seems to be the technical limit, when taking into consideration the current situation. Hence, for the time being, it is appropriate to set the target value for permissible limit of sulfur content of diesel fuel to 50ppm.

Furthermore, in addition to the reduction of sulfate, in order to obtain the full function of the nitrogen oxidization reduction catalysts, which are one of the promising exhaust gas after-treatment devices, it is desirable that the sulfur content of diesel fuel be further reduced in the future. Moreover, it is advisable to develop catalysts which are less likely to be poisoned by the sulfur content of diesel fuel. In addition, as for other fuel properties, such as the aromatic compound content rate and distillation properties, it is necessary to continue study as to their quantitative exhaust emission reduction effects.

② Achievement time, etc.

With regard to the target value for permissible limit of the sulfur content of diesel fuel of 50ppm, it is proper to achieve it by the end of the year 2004 by carrying out effectively the design of facilities

and modification works, etc. on the part of fuel producers.

Furthermore, in respect to the partial supply of diesel fuel with low-sulfur content at the same time as the marketing of motor vehicles whose PM emission amount is reduced to a level of the diesel new long-term target, which is expressed voluntarily by the Petroleum Association of Japan, it is desirable that the supply system be adequately prepared and the actual sulfur content of diesel fuel supplied to the market be reduced to the best possible extent.

2. Reduction Measures for Exhaust Emissions from Special Diesel Motor Vehicles

(1) Early achievement of exhaust emission reduction target

With regard to the exhaust emission reduction target for special diesel motor vehicles which was to be achieved by the year 2004 according to the Second Recommendation, in view of the fact that the practicable technologies can be expected earlier than expected, it is proper to achieve it by the year 2003 by carrying out effectively the design, development, preparation of production, etc., besides improvements in exhaust emission measuring equipment, etc.

Furthermore, in respect to the introduction of exhaust emission standards for special motor vehicles according to the engine-base exhaust emission test procedures, it is desirable to institute as soon as possible a type approval system which can be used by engine manufacturers themselves in their application, while paying due attention to the existing systems. Since it is anticipated that type certification will be concentrated over a short period of time, care must be exercised to assure that the handling for the standards be conducted smoothly.

(2) Measures for diesel smoke

① Exhaust emission test procedure

As regards the exhaust emission test procedure for diesel smoke among PM, for the time being, along with the achievement time of exhaust emission reduction target in the year 2003, it is advisable to adopt the JCMAS T-004 test procedure for smoke, which is the diesel smoke measuring method concerned with type approval for exhaust emission control type construction machinery for works directly supervised by the Ministry of Construction.

Moreover, while paying close attention to the international trend concerning the smoke measuring methods in the future, it is necessary to continue study to find out proper test procedures, along with study of diesel smoke measuring methods for general diesel motor vehicles.

② Present target value for permissible limit and achievement time

The target value for permissible limit of smoke emitted from special diesel motor vehicles is 40%. It is proper to attain this target value for permissible limit at the same time as the introduction of the standard in the year 2003.

It should be noted that the aforementioned target value for permissible limit is the reduction target to be achieved for the time being. Therefore, it is imperative to review the exhaust emission reduction target, as required, while paying close attention to the development situation, etc. of the exhaust emission reduction technologies in the future.

3. Future Policy for Motor Vehicle Exhaust Emission Reduction

(1) Study subjects in the future

We at the Council are scheduled to continue studying the following subjects enumerated below, including those described in Sections 1 and 2 above.

- ① With regard to the specific target values, etc. for the diesel new long-term target, they shall be set at the earliest possible time, while paying close attention to the complying situation of the diesel new short-term target, the potential of progress of technical development, various test results and effects of various measures. At that time, based on the risk evaluation of DEP, study shall be made so that the target values be set in such a way that a higher priority be placed on PM. The target values shall be set based on the revised exhaust emission test procedure. Furthermore, study shall be conducted on reduction of exhaust emissions during cold start period. In addition, as for a sophisticated OBD system that monitors deterioration in performance of the exhaust after-treatment devices, study shall be made as to the necessity of its introduction.
- ② In respect to the specific target values, achievement time, etc. for the gasoline new long-term target, they shall be set at the earliest possible time, while paying close attention to the complying situation of the standards that are to be enforced over a period from the year 2000 to 2002 according to the Second Recommendation, the potential of progress of technical development, various test results and effects of various measures. As for the quality of fuel and lubrication oil, under concerted cooperation of the government, auto manufacturers, fuel producers, etc., it is necessary to continue further studies, based on the study results of reduction effects of exhaust emissions by various combinations of exhaust emission control technologies for motor vehicles and improvements in fuel properties. Based on these results, study shall be made as to the future policy for measures for properties of fuel and lubrication oil that are necessary for achievement of the gasoline new long-term target. At that time, the target values shall be set based on the revised test procedure, if the test procedure is to be reviewed. Moreover, study shall be conducted on the revision of fuel evaporative emission test procedure.
- ③ As regards the exhaust emission test procedures for diesel motor vehicles and gasoline·LPG motor vehicles, it is necessary to conduct the required

surveys, including the actual running mode survey. Based on the survey results, study shall be made as soon as possible as to the review of the test procedure, including its necessity.

- ④ As for diesel motor vehicles, study shall be conducted to determine a new reduction target, as required, while paying close attention to the complying situation of the diesel new long-term target, the potential of progress of technical development, various test results and effects of various measures. As for the quality of fuel and lubrication oil, under concerted cooperation of the government, auto manufacturers, fuel producers, etc., it is necessary to continue further studies about reduction effects of exhaust emissions by various combinations of exhaust emission control technologies for motor vehicles and improvements in fuel properties. Based on results of these studies, study shall be made for the future policy for measures for properties of fuel and lubrication oil that are necessary for achievement of the new reduction target.
- ⑤ As for two-wheeled motor vehicles, study shall be conducted to determine a new reduction target, as required, while paying close attention to the complying situation of the standard enforced according to the Interim Recommendation, the potential of progress of technical development, various test results and effects of various measures. At this time, study shall be made for the introduction of a fuel evaporative emission control standard and review of the cold start requirements, etc.
- ⑥ Of special diesel motor vehicles, with regard to those with a rated output of 19 kW or more, but of less than 560 kW, study shall be conducted to determine a new reduction target, as required, while paying close attention to the complying situation of the standard to be enforced according to this Recommendation, the potential of progress of technical development, various test results and effects of various measures, and taking into consideration the trend of foreign countries.
- ⑦ Of special diesel motor vehicles, as regards those with a rated output of less than 19 kW, and in excess of 560 kW, for which at present no exhaust emission reduction targets have been set forth, and as well

as gasoline·LPG special motor vehicles, study shall be made as to the introduction of exhaust emission control standards, as required, while paying close attention to the air pollution situation, the trend of emission contributing ratios, the development situation of exhaust emission reduction technologies, and so forth.

When conducting the studies of the aforementioned subjects and enforcing the measures concerned, as pointed out in the Third Recommendation, in view of the fact that motor vehicles are commodities that can be distributed internationally and that have many common elements at home and abroad in the field of exhaust emission reduction measures, it is imperative to attain international harmonization whenever possible, as long as the environmental preservation in Japan is not hampered.

(2) Other Related Measures, etc.

It is desirable that the following related measures enumerated below, such as promotion of total measures for motor vehicle exhaust emission reduction, be carried out as measures supplement to those described in this Recommendation.

(Promotion of total measures for motor vehicle exhaust emission reduction)

With regard to promotion of total measures for motor vehicle exhaust emission reduction, it is necessary to implement effective measures totally and systematically, based on a recommendation to be compiled by the Central Environment Council in the year 2000, taking into consideration the deliberations conducted by the joint committee of the Air Quality Committee and Traffic Environmental Pollution Committee. Specifically speaking, it is necessary to add PM into among items subjected to statutory regulations by amending the "Law Concerning Special Measures for Total Emission Reduction of Nitrogen Oxides from Automobiles in Designated Areas" (the so-called Automobile NOx Control Law) promulgated in the year 1992. Furthermore, it is

necessary to totally advance measures, such as the strengthening of control of vehicle category, the furtherance of motor vehicle exhaust emission control measures concerned with business operators, the promotion of dissemination of low-emission vehicles.

(Promotion of dissemination of low-emission vehicles)

In respect to low-emission vehicles, it is necessary to continually advance the existing measures and to promote the creation of a social environment that will induce advancement of dissemination of low-pollution vehicles. Furthermore, as for trucks and buses with a gross vehicle weight in excess of 3500 kg, they were included in applicable motor vehicles in March, 2000 by amending the "Technical Guidance to Exhaust Emissions of Low-Emission Vehicles. etc." according to the Third Recommendation. Based on this Technical Guidance, it is necessary to advance the dissemination and promotion of motor vehicles with less exhaust emissions.

(Exhaust emission reduction measures for in-use motor vehicles)

As regards measures for in-use diesel motor vehicles, in order to realize the proposals made in the Interim Review by the Investigation Committee for Control Technology for Diesel-Powered Motor Vehicles, it is necessary to study a specific policy method as soon as possible.

As pointed out in the Second and Third Recommendations, with regard to the whole in-use motor vehicles including gasoline·LPG motor vehicles and diesel motor vehicles, it is of great importance to continue maintaining satisfactory exhaust emission control performance at the in-use stage through various means, such as encouragement of strict enforcement of check and maintenance for motor vehicles and the assurance of proper functioning of the exhaust emission control devices at times of motor vehicle inspections according to the Road Vehicles Act or spot-inspections on the street.

Moreover, it is recommended to study the

introduction of a spot-surveillance for the purpose of assessing the situation of maintaining performance of exhaust emission control devices at the normal in-use stage as well as necessity of the introduction.

(Voluntary tackling by related industries)

The Japan Automobile Manufacturers Association and Petroleum Association of Japan have expressed their intention to start voluntary marketing over a period of the year 2003 to 2004 of motor vehicles whose PM emission is reduced to the diesel new long-term target level and at the same time the partial supply of diesel fuel having a low sulfur content. It is strongly urged that such tackling by the related industries be carried out steadily.

(Sharing increased costs, etc.)

As the exhaust emission reduction measures are progressed according to this Recommendation, it will be anticipated that motor vehicle prices, fuel price, engine durability, fuel consumption, maintenance costs, and so forth will be affected. However, it is necessary to share them appropriately on the parts of motor vehicle manufacturers, fuel producers and users of motor vehicles as the costs arising from use of these motor vehicles.

In addition, it is imperative to pay consideration to aids in those aspects of financial and taxation systems that will make it easier to enforce switching to those motor vehicles complying with the latest standards or smooth advancement of fuel quality improvements.

(Survey of actual emission situation of uncontrolled emission sources and measures thereof)

As regards various emission sources that have not been controlled yet, it is necessary to advance the study of necessity of survey of their actual emission situation and measures thereof. At the same

time, it is vital to study the policy for systems for implementing such measures.

(Measures for global warming, etc.)

With regard to the environmental measures for motor vehicle themselves, it is mandatory to advance the technical development which makes it possible to realize both the low-emission technology and the fuel economy technology at the same time.

Moreover, of the greenhouse gases emitted from motor vehicles, as for the methane and dinitrogen oxide other than carbon dioxide, it is urged strongly to curb their emissions by grasping their actual emission state and clarifying their forming mechanism from now on, while carrying out investigations and studies of their emission reduction technology, etc. in combination with the emission reduction of nitrogen oxides, hydrocarbons, and so forth.

(Measures for hazardous air pollutants)

In order to grasp the whole picture of amounts of hazardous air pollutants emitted from various generating sources into the environment, as for hazardous air pollutants discharged from motor vehicles, it is advisable to prepare basis for assessing emission amounts from motor vehicles by promoting the development of measurement methods, by improving the measurement accuracy and by establishing emission factors through accumulation of data. Then, based on the acquired data, it is desirable to implement the required measures.

In this case, it is necessary to endeavor to evaluate how the engine combustion technology, exhaust gas after-treatment technology, such as catalysts, qualities of fuel and lubrication oil, etc. affect amounts of hazardous air pollutants emitted from motor vehicles.

(Furtherance of projection of effects and measurement of effects)

In line with progress of the unit measures and

total exhaust emission measures, it becomes more important in planning and enforcing the required measures to accurately project the effects of these measures and to perform the measurement of effects by means of high-precision monitoring. To this end, it is advisable to improve evaluation systems for effects of various measures in improving air quality, the development of projection methods and effects of road-side measures.

(Reference)

GLOSSARY

DEP (Diesel Exhaust Particles)

"DEP" refers to particulate matters emitted from diesel-powered motor vehicles. From the standpoint of masses, most particles have a diameter ranging from 0.1 to 0.3 μm . On the other hand, from the viewpoint of number of particles, most particles have a diameter ranging from 0.005 to 0.05 μm .

LPG (Liquefied Petroleum Gas)

"LPG" refers to a mixture of propane, butane, etc., which has been liquefied under a pressurized condition at a normal temperature.

OBD System (On-Board Diagnostic System)

"OBD system" refers to an on-board diagnostic system that monitors whether any abnormality is taking place or not.

PM (Particulate Matter)

"PM" emitted from motor vehicles can be divided mainly into black smoke, sulfate and SOF [Soluble Organic Fraction].

Sulfate refers to collectively sulfuric compounds which are formed when the sulfur content in the fuel is oxidized. These compounds are produced in a great quantity during engine heavy operations or when there exists a catalyst with a strong oxidizing action.

"SOF" refers to an organic component which can be extracted by a solvent at a relatively low boiling point. Specifically speaking, this term refers to unburnt components of diesel fuels or lubrication oils.

SPM (Suspended Particulate Matter)

Of particulate matter (PM) suspended in the atmosphere, this SPM refers to collectively particles with a diameter of 10 μm or less. The environmental quality standards have been set forth for this SPM. The SPM is composed of the primary particulates directly emitted from a generating source and the secondary

particulates which are formed by the discharged gaseous substances through reaction or condensation.