Final Report of Joint Meeting between the Automobile Evaluation Standards Subcommittee, Energy Efficiency Standards Subcommittee of the Advisory Committee for Natural Resources and Energy and the Automobile Fuel Efficiency Standards Subcommittee, Automobile Section, Land Transport Division of the Council for Transport Policy

December, 2011

The Automobile Evaluation Standard Subcommittee, Energy Efficiency Standards Subcommittee of the Advisory Committee for Natural Resources and Energy
and
The Automobile Fuel Efficiency Standards Subcommittee, Automobile Section, Land Transport Division of the Council for Transport Policy

Background and History of Fuel Efficiency Standards Newly Established

(1) Current situation of greenhouse gases and CO_2 emission originating from energy

The total greenhouse gas emission in FY2009 in Japan decreased as much as 5.6% compared with that of the previous fiscal year because, on one hand, the energy demand in each industrial sector continued to decrease in FY2009 due to the rapid economic downturn during the second half of that fiscal year caused by the financial crisis in the second half of FY2008 and, on the other hand, the intensity of power emission was improved, etc. As a result, the total greenhouse gas emission of that fiscal year was 4.1% lower than the level of the base year (FY1990) specified by the Kyoto Protocol.

Meanwhile, in case of the transport sector which accounts for approximately 20% of the total CO_2 emission in Japan, although the emission had tended to decrease in recent years, it increased 5.8% in FY2009 compared with the level of the base year. This is because, while the emission of freight vehicles decreased, that of passenger vehicles increased by 28.0% compared with the base year due to the expansion of traffic demand.

(2) History of automobile fuel efficiency standards

For automobiles, the fuel efficiency consumption standards using the Top Runner Method[1] were introduced in 1999 to promote energy conservation and reduce CO_2 emission based on the "Law concerning the Rational Use of Energy" (1979, Law No. 49) (hereinafter referred to as "Energy Conservation Law") for passenger vehicles with a capacity of 10 passengers or less and freight vehicles with a gross vehicle weight of 2.5 tons or less, followed by the fuel efficiency consumption standards for passenger vehicles using liquefied petroleum gas (hereinafter referred to as "LP gas passenger vehicles") introduced in 2003 setting FY2010 as its target fiscal year.

Furthermore, the fuel efficiency consumption standards for heavy-weight freight vehicles with a gross vehicle weight exceeding 3.5 tons and passenger vehicles with a capacity of exceeding 11 passengers or more (but limited to vehicles with a gross vehicle weight exceeding 3.5 tons) were introduced in 2006 and, for passenger vehicles with a capacity of 10 passengers or less and freight vehicles with a gross vehicle weight of 32.5 tons or less too, the fuel efficiency consumption standards were introduced in 2007 setting FY2015 as its target fiscal year.

Meanwhile, manufacturers and importers (hereinafter collectively referred to as "manufacturers, etc.") are required not to make the weighted harmonic average[2] of the fuel efficiency consumption values of vehicles they ship in relevant categories lower than the fuel efficiency consumption standard values pursuant to the Energy Conservation Law. If the fuel efficiency consumption standards are not met in the target fiscal year, admonition, publication, and order will be issued, depending on the efforts made by the manufacturer, etc. in question, and a fine (up to one million yen) will be imposed where an order has been violated.

(3) Consideration of new fuel efficiency standards

[1] A method to determine standard values based on the values of vehicles presently on the market that have the highest fuel efficiency performance, while taking into consideration future prospects of technological development

[2] The weighted harmonic average is the inverse of the weighted average of data's inverse. In other words, it is obtained by taking the inverse of data and calculating its weighted average, then taking the inverse of its value.

The fuel efficiency of automobiles has steadily been improved thanks to aggressive measures taken by automobile manufacturers and the effect of a preferential taxation system, etc. However, it is still necessary to further improve the fuel efficiency of automobiles in view of the significance of the transport sector (automobile sector) in energy policies and global warming countermeasures.

For this reason, in June 2010, the Ministry of Economy, Trade and Industry formed the "Automobile Evaluation Standards Subcommittee" under the Energy Efficiency Standards Subcommittee of its Advisory Committee for Natural Resources and Energy, while the Ministry of Land, Infrastructure and Transport formed the "Automobile Fuel Efficiency Standards Subcommittee" under the Automobile Transport Section (the name of this section was changed to "Automobile Section" in July, 2011), Land Transport Division of the Council for Transport Policy, for the purpose of conducting deliberation of the matters to be the evaluation standards for manufacturers, etc. (scope of target automobiles, target fiscal years, measurement methods for fuel efficiency, categories of fuel efficiency , fuel efficiency standard values, matters to be displayed, etc.) in the form of a joint meeting composed of members of both committees.

(4) Seeking public comments

In order to extensively hear comments from the public, comments were sought on the results of discussions which the joint meeting had been engaged in. This report was finally made after publicizing the interim report (draft), in consideration of these opinions thus collected (public comments). 42 valuable comments were received from 17 people and organizations.

Establishment of New Fuel Efficiency Standards

Discussions were held on those items on which manufacturers, etc. should base their evaluation on energy consumption efficiency (fuel efficiency) of passenger vehicles, and the interim report (draft) was made as follows.

1. Vehicles to be covered [See Attachment 1.]

The scope of passenger vehicles and freight vehicles currently designated as specified equipment by the Energy Conservation Law is those using gasoline, diesel oil or liquefied petroleum gas (hereinafter referred to as "LP gas") as fuel and received type designation (type-designated vehicles) under Article 75.1 of the Road Trucking Transport Act.

Of those, the target scope of new fuel efficiency standards shall be passenger vehicles with a capacity of 10 passengers or less, and passenger vehicles with a capacity of 11 passengers or more as well as with a gross vehicle weight of 3.5 tons or less, both of which use gasoline, diesel oil or LP gas as fuel.

2. Items on which manufacturers, etc. should base their evaluation

(1) Target fiscal year [See Attachment 2.]

The target fiscal year shall be FY2020, in consideration of the product development cycle of vehicles and the relation with the current fuel efficiency standards, and in order to secure an adequate development lead time, etc.

(2) Measurement method for energy consumption efficiency (fuel efficiency) [See Attachment 3.]

Energy consumption efficiency (fuel efficiency) shall be fuel efficiency value (km/L) which is an indicator widely recognized by automobile users as well as shall be the value measured by the Minister of Land, Infrastructure Transport and Tourism in designating vehicle types (inspection values).

For the measurement of energy consumption efficiency (fuel efficiency), JC08 mode method is adopted the same as the fuel efficiency standards of FY2015, using the combined value which weights the "cold mode" and the "hot mode" as 0.25:0.75.

(3) Vehicle weight categories [See Attachment 3.]

Basic categories are made by vehicle weight, and the following categories shall be used the same as the fuel efficiency standards of FY2015.

Vehicle weight (kg)	Equivalent inertia weight (kg)
740 or below	**800**
741 to 855	**910**
856 to 970	**1,020**
971 to 1,080	**1,130**
1,081 to 1,195	**1,250**
1,196 to 1,310	**1,360**
1,311 to 1,420	**1,470**
1,421 to 1,530	**1,590**
1,531 to 1,650	**1,700**
1,651 to 1,760	**1,810**
1,761 to 1,870	**1,930**
1,871 to 1,990	**2,040**
1,991 to 2,100	**2,150**
2,101 to 2,270	**2,270**
2,271 or above	**2,500**

(4) Fuel efficiency standard values and standard method

[Reference, see attachments 4 & 5.]

The current fuel efficiency standards are adopting a weight categorical standard achievement system, which requires achieving standard for each vehicle weight category. Meanwhile, the fuel efficiency of vehicles has been improved steadily so far, so, to further improve the fuel efficiency, technological advancement and accompanying cost rise are assumed. For this reason, for the fuel efficiency standards of FY2020, it was decided to adopt the method for obtaining corporate fuel efficiency standards (CAFE method) in which manufacturers, etc. can flexibly choose and concentrate technologies according to their technological level to generate high energy conservation effect as a whole.

To be specific, this method requires the harmonic average fuel efficiency values (CAFE value) of the vehicles shipped by manufacturers, etc. in the target fiscal year not to be lower than the values which weight-harmonically average the fuel efficiency target values set for each weight category with the number of vehicles actually shipped (CAFE standard values).

As regards gasoline passenger vehicles, diesel passenger vehicles and LP gas passenger vehicles, the fuel efficiency target values which are equivalent to each other in terms of energy equivalent (heat value equivalent) are applied, i.e. the fuel efficiency values (km/L) are used for gasoline passenger vehicles and the gasoline heat value equivalent fuel efficiency values (value dividing the fuel efficiency value (km/L) by 1.10 in case of diesel passenger vehicles and value dividing the fuel efficiency value (km/L) by 0.78 in case of LP gas passenger vehicles) are used for diesel passenger vehicles and LP gas passenger vehicles.

The target fuel efficiency values for each weight category are as follows.

Equivalent inertia weight (kg)	Vehicle weight (kg)	Target fuel efficiency value (km/L)
800	740 or below	**24.6**
910	741 to 855	**24.5**
1,020	856 to 970	**23.7**
1,130	971 to 1,080	**23.4**
1,250	1,081 to 1,195	**21.8**
1,360	1,196 to 1,310	**20.3**
1,470	1,311 to 1,420	**19.0**
1,590	1,421 to 1,530	**17.6**
1,700	1,531 to 1,650	**16.5**
1,810	1,651 to 1,760	**15.4**
1,930	1,761 to 1,870	**14.4**
2,040	1,871 to 1,990	**13.5**
2,150	1,991 to 2,100	**12.7**
2,270	2,101 to 2,270	**11.9**
2,500	2,271 or above	**10.6**

(5) Handling of electric vehicles and plug-in hybrid vehicles [See Attachment 6.]

As regards electric vehicles and plug-in hybrid vehicles, the inclusion of them shall be considered under certain restrictions when evaluating how standards are achieved.

(6) Display items [See Attachment 7.]

1) Items which manufacturers, etc. must indicate energy consumption efficiency (fuel efficiency) shall be as follows.
   - i) Vehicle name and type
   - ii) Engine type and total displacement
   - iii) Vehicle weight
   - iv) Transmission type and number of speeds
   - v) Fuel supply equipment type
   - vi) Main fuel efficiency improvement measures
   - vii) Energy consumption efficiency (fuel efficiency values expressed by a unit of km/L to one decimal place)
   - viii) Manufacturer name
   - ix) Maximum output and maximum torque of engine
   - x) Passenger capacity (applicable to passenger vehicles only)
   - xi) Type of fuel used

2) When indicating energy consumption efficiency (fuel efficiency) the compliance items to be followed by manufacturers, etc. are as follows.
   - Display items listed in 1) above shall be noted in the catalog of the vehicle concerned. Energy consumption efficiency (fuel efficiency) shall be displayed in a particularly visible manner, such as by use of underlines, larger typefaces, and letters of different colors.
   - In addition to vehicle name and type, vehicles on display shall have energy consumption efficiency (fuel efficiency) clearly posted at an easily viewable place.
   - As the fuel efficiency value listed in 1) vii) above varies depending on the using environment (weather, congestion, etc.), driving situation (sudden start, use of air conditioners, etc.) or maintenance (air pressure of tires, etc.), the statement to this effect must be indicated on catalogues or displays along with the fuel efficiency value.

3. Proposals for energy saving

Automobile fuel efficiency standards had been discussed at this joint meeting. In order to reduce automobile's energy consumption, however, it is important to not only focus on improving per-vehicle fuel efficiency performance, but also take various actions at the same time to improve the fuel efficiency of actual driving. For this reason, with the expectation that further actions will be made by all related parties, proposals are summarized as below.

(1) Government actions

1) In order to effectively popularize next generation vehicles and highly fuel-efficient vehicles, efforts shall be undertaken to provide support measures and education for popularization, etc. to promote user awareness and manufacturers' efforts to improve fuel efficiency.
2) In enforcing evaluation standards, manufacturers' energy conservation efforts, their approach to emission control regulatory measures, and other circumstances shall be taken into account. Also, attention shall be paid so that these activities are carried out consistently with activities aimed at achieving target standard values.
3) Even after these discussions, while paying close attention to the development of fuel efficiency improvement technologies, efforts shall be made to provide support required for developing and promoting them.
4) With the objective of improving fuel consumption efficiency in actual use, efforts shall be made to provide information necessary to promote the use of vehicles concerning reduction of environmental load (so-called "eco-driving") and facilitate smoother traffic flow.
5) In general, there is a trade-off between improving automobile fuel efficiency and reducing exhaust emission, depending on technologies used. When studying the future measures and policies relating to the vehicles covered here, it should be noted that these standard values were established, premising on the 2009 emission control (the post new long-term control).
6) Basing energy saving standards on the Top Runner Method is a very effective tool for achieving energy conservation in machinery and equipment. Efforts shall be made to seek deeper understanding and promote it internationally, where appropriate.

(2) Actions of manufacturers, etc.

1) It is desirable to advance technological development aimed at improving automobile fuel efficiency and to develop vehicles with excellent fuel efficiency performance.
2) In order to promote highly fuel-efficient vehicles, it is desirable to make effort to provide appropriate information that helps users to select such vehicles, and also desirable to do the same to enforce "eco-driving".
3) In order to promote "eco-driving", along with efforts to develop technologies and products that support "eco-driving", it is desirable to provide appropriate information about them.
4) Vehicle usages and usage environments vary from one user to another, and their impact to fuel efficiency performance in actual driving also varies depending on vehicles. If all of these effects are taken into consideration, it becomes technically very difficult to evaluate the performance of vehicles. Meanwhile, there are factors consumers are very interested in, such as air conditioners which greatly affect the fuel consumption or travel distance of electric vehicles. Therefore, while working with the government, manufacturers, etc. shall study the way to adequately provide information specifically needed by consumers including how to evaluate the performance.

(3) User actions

It is desirable to select highly fuel-efficient vehicles and make efforts for energy conservation through "eco-driving" as well as other proper and effective use of vehicles.

(4) Others

To improve energy efficiency and reduce CO_2 emission of the transport sector as a whole, besides making efforts for performance improvement and effective utilization of vehicles, comprehensive measures including fuel measures should also be implemented; thus, continued efforts of both the government and private sectors are required.

(Reference)

Evaluation of Future Fuel Efficiency Improvement Rate due to the New Fuel Efficiency Standards

The following tables show fuel efficiency improvement rate for the target fiscal year (FY2020), assuming that the new fuel efficiency standards are achieved.

In the case of passenger vehicles, fuel efficiency for the target fiscal year (FY2020) would improve by 24.1% over the actual levels of gasoline passenger vehicles in FY2009 and by 19.6% over the levels of existing fuel efficiency standards (FY2015 target).

<Fuel efficiency improvement rate from actual levels in FY2009>

Vehicle type	FY2009 actual levels	FY2020 estimates	Fuel efficiency improvement rate from FY2009 actual levels
Passenger vehicles	16.3 (km/L)	20.3 (km/L)	24.1%

<Fuel efficiency improvement rate from the levels of existing fuel efficiency standards>

Vehicle type	Average level equivalent to FY2015 standards	FY2020 estimates	Fuel efficiency improvement rate from FY2015 standards
Passenger vehicles	17.0 (km/L)	20.3 (km/L)	19.6%

* The fuel efficiency values in the above tables are JC08 mode fuel efficiency values.
* Each fuel efficiency improvement rate is calculated on the assumption that the ratio of the number of vehicles shipped in each weight category in the target fiscal year (FY2020) is the same as that in FY2009.

Attachment 1

Vehicles to be Covered

1. Vehicles covered by this study

The scope of passenger vehicles and freight vehicles currently designated as specified equipment by the Energy Conservation Law is those using gasoline, diesel oil or LP gas as fuel and received type designation (type-designated vehicles) under Article 75.1 of the Road Trucking Transport Act.

Of those, the target scope of this new fuel efficiency standards shall be passenger vehicles with a capacity of 10 passengers or less, and passenger vehicles with a capacity of 11 passengers or more as well as with a gross vehicle weight of 3.5 tons or less, both of which use gasoline, diesel oil or LP gas as fuel.

The vehicles covered by specific control are as follows.

Table 1-1 Vehicles to be covered under the Energy Conservation Law (specified equipment) and new fuel efficiency standards

	Passenger capacity	Gross vehicle weight	Gasoline	Diesel oil	Liquefied petroleum gas	Other fuel
Passenger vehicle	10 or less		Type-designated vehicles	Type-designated vehicles	Type-designated vehicles	Not covered
	11 or more	3.5 tons or less	Type-designated vehicles	Type-designated vehicles		
		Over 3.5 tons		Type-designated vehicles and vehicle equipped with type-designated CO and other substances emission preventive device		
Freight vehicle		3.5 tons or less	Type-designated vehicles	Type-designated vehicles		
		Over 3.5 tons		Type-designated vehicles and vehicle equipped with type-designated CO and other substances emission preventive device		

* New fuel efficiency standards shall be established for the underlined.

2. Concept of vehicles to be covered by this study

(1) Handling of gasoline passenger vehicles and diesel passenger vehicles

Of gasoline passenger vehicles and diesel passenger vehicles, passenger vehicles with a capacity of 10 passengers or less and passenger vehicles with a capacity of 11 passengers or more and with a gross vehicle weight of 3.5 tons or less are covered by this study and other vehicles are to be studied based on improvement, etc. to be made in the future.

In case of small buses (i.e. passenger vehicles with a capacity of 11 passengers or more

and a gross vehicle weight of 3.5 tons or less), although their fuel efficiency standard values are now set differently from passenger vehicles with a capacity of 10 passengers or less, the new standard values shall be set together with passenger vehicles with a capacity of 10 passengers or less instead of setting them only for small buses, because vehicle models of small buses are not many so it is difficult to set standard values independently and the line-up of small buses is the extension of passenger vehicles with a capacity of 10 passengers or less and thus sharing common vehicle bodies and driving systems.

The reasons for having excluded some vehicles from the study of this joint meeting are as follows.

- In case of heavy vehicles (i.e. passenger vehicles with a capacity of 11 passengers or more and a gross vehicle weight of 3.5 tons or more and freight vehicles with a gross vehicle weight of 3.5 tons or more), careful study is needed because the regulation for NOx, etc. in their emission, which is closely related to the fuel efficiency improvement of vehicles, is likely to be strengthened and it is difficult to predict their fuel efficiency improvement because of the uncertainty in the enforcement of the regulation.
- In case of freight vehicles with a gross vehicle weight of 3.5 tons or less, there are some categories in which the result of FY2008 cannot meet the standards for FY2010; thus, it is difficult to specifically expect that the standards for FY2015 will be achieved.

(2) Handling of LP gas passenger vehicles

For the fuel efficiency standards of LP gas passenger vehicles, FY2010 standards (10.15 mode) have been set. To further promote the fuel consumption improvement of LP gas passenger vehicles even after FY2010, they shall be covered by new fuel consumption standards.

However, their standard values are to be set together with gasoline passenger vehicles, instead of setting them only for LP gas passenger vehicles, because vehicle models of LP gas passenger vehicles are not many so it is difficult to set standard values independently.

When doing this, if the standard values are applied merely using the fuel efficiency (km/L), they do not become the same energy consumption efficiency (fuel efficiency) because the unit heating value (MJ/L) of gasoline is different from that of LP gas. Therefore, the energy equivalent (heating value equivalent) of LP gas passenger vehicles shall be used, likewise for diesel passenger vehicles in the FY2015 standards.

(3) Handling of next generation vehicles

Of next generation vehicles, hybrid vehicles are to be included in the target scope likewise in FY2010 fuel efficiency standards and FY2015 fuel consumption standards.

Meanwhile, of other next generation vehicles, in case of electric vehicles and plug-in hybrid vehicles which started to sell in recent years, vehicle models are not many, the sales amount is still low and technological information for making standard values is not enough. Therefore, they are not controlled for now, but the inclusion of them is to be considered under some restrictions when evaluating achievement of standards for gasoline passenger vehicles, etc. (to be detailed in Attachment 6).

Attachment 2

Target Fiscal Year

1. Basic concept of target fiscal year

Target fiscal years are set at the interval of about 3 to 10 years considering product development periods of specified equipment, forecast of technological development, etc.

Based on this, to set a target fiscal year for passenger vehicles, it is appropriate to set an adequate lead time, considering a product development period necessary for achieving a target, a facility investment period, forecast of technological development in the future, etc.

2. Matters to be considered to set a target fiscal year

(1) Consistency with model change cycle

Generally, major fuel efficiency improvement is made at the time of a model change, and the cycle of automobile model change is usually said to be approximately 5 years. It is therefore appropriate, in principle, to set a lead time which enables each model to undergo a model change.

(2) Relation to current fuel efficiency standards

The target fiscal years for the fuel efficiency standards of existing passenger vehicles are set to be FY2010 and FY2015. Manufacturers, etc. of vehicles have pushed forward technological development for steady achievement of the existing fuel efficiency standards. It is thus appropriate to set the target fiscal year in a few years after FY2015, in consideration of the model change cycle as well as the time frame for technological development necessary for meeting the existing fuel efficiency standards.

(3) Target fiscal years

Based on the above, considering the relationship to the existing fuel efficiency standards and the product development cycle for automobiles from a base fiscal year, and allowing sufficient time for developing fuel efficiency improvement technologies, the target fiscal year is set to be FY2020, considering the period necessary for each vehicle model to implement model change after FY2015 which is the current target fiscal year.

Attachment 3

Method and Classification for Measuring Automobile Energy Consumption Efficiency (Fuel Efficiency)

1. Energy consumption efficiency

Energy consumption efficiency of the current fuel efficiency standards is the value expressing the travel distance per liter in kilo meters, so-called fuel efficiency (km/L)[3].

As this fuel efficiency is widely known among consumers as energy consumption efficiency, the fuel efficiency (km/L) shall be used as energy consumption efficiency in the FY2020 fuel efficiency standards too.

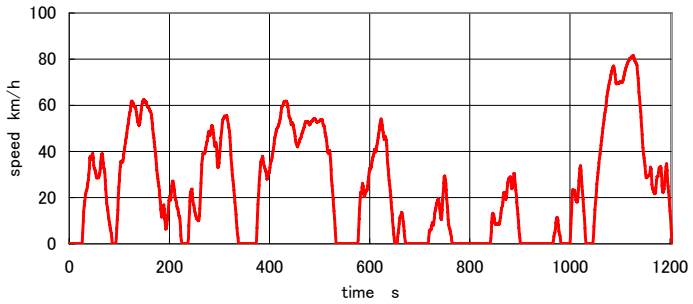
2. Measurement method and categories

In the FY2015 fuel efficiency standards, the values measured by the Minister of Land, Infrastructure and Transportation (examination values) are used to designate automobile types. Its measurement method is adopting JC08 mode and also adopting a fuel efficiency performance evaluation with combined values taking driving in the cold mode into consideration besides the driving in the hot mode, where the weighting factor is cold mode:hot mode = 0.25:0.75.

This measurement method is the same as that of exhaust emission and is consistent with international standards because the categories of the equivalent inertia weight (IW) are the same as ECE regulations[4], so JC08 mode continues to be used for the measurement method and categories of FY2020 fuel efficiency standards too.

Meanwhile, the WLTP (Worldwide Light-duty Test Procedure), i.e. internationally harmonized test method for the exhaust emission and fuel efficiency of passenger vehicles, etc., is being studied as the measurement method for passenger vehicles, etc. Once the WLTP is established, it is desirable to study anew to use it as the measurement method of fuel efficiency standards.

Figure 3-1 Driving mode (JC08 mode) of fuel efficiency measurement method for passenger vehicles and freight vehicles (gross vehicle weight 3.5 tons or less)



[3] The term "fuel efficiency" is used in this interim report (draft) to mean km/L which is widely known, although, in some cases, it may be used to mean fuel consumption efficiency (L/km) as the driving whose fuel consumption performance is excellent is expressed as "low fuel consumption".

[4] Regulations of UN Economic Commission for Europe

(Reference 3-1)

Calculation of Mode Fuel Efficiency Value

To calculate the JC08 mode fuel efficiency value, the weighting factor is made to be the travel ratio which is the same as that in the exhaust emissions measurement method, and, as shown in the following formula, the JC08 mode fuel efficiency value of cold start and the JC08 mode fuel efficiency value of hot start are weight-harmonically averaged by respective travel ratio.

$$E = \frac{1}{\left(\frac{0.25}{E_{JC08C}} + \frac{0.75}{E_{JC08H}} \right)}$$

E: JC08 mode fuel efficiency value (km/L)

E_{JC08C}: JC08 mode fuel efficiency value of cold start (km/L)

E_{JC08H}: JC08 mode fuel efficiency value of hot start (km/L)

(Reference 3-2)

Table 3-1 Equivalent inertia weight categories

IW categories of ECE regulations

Weight of vehicle under test (kg)	IW (kg)
480 or below	**455**
481 to 540	**510**
541 to 595	**570**
596 to 650	**625**
651 to 710	**680**
711 to 765	**740**
766 to 850	**800**
851 to 965	**910**
966 to 1080	**1020**
1081 to 1190	**1130**
1191 to 1305	**1250**
1306 to 1420	**1360**
1421 to 1530	**1470**
1531 to 1640	**1590**
1641 to 1760	**1700**
1761 to 1870	**1810**
1871 to 1980	**1930**
1981 to 2100	**2040**
2101 to 2210	**2150**
2211 to 2380	**2270**
2381 to 2610	2270
2611 or above	2270

IW categories of JC08 mode

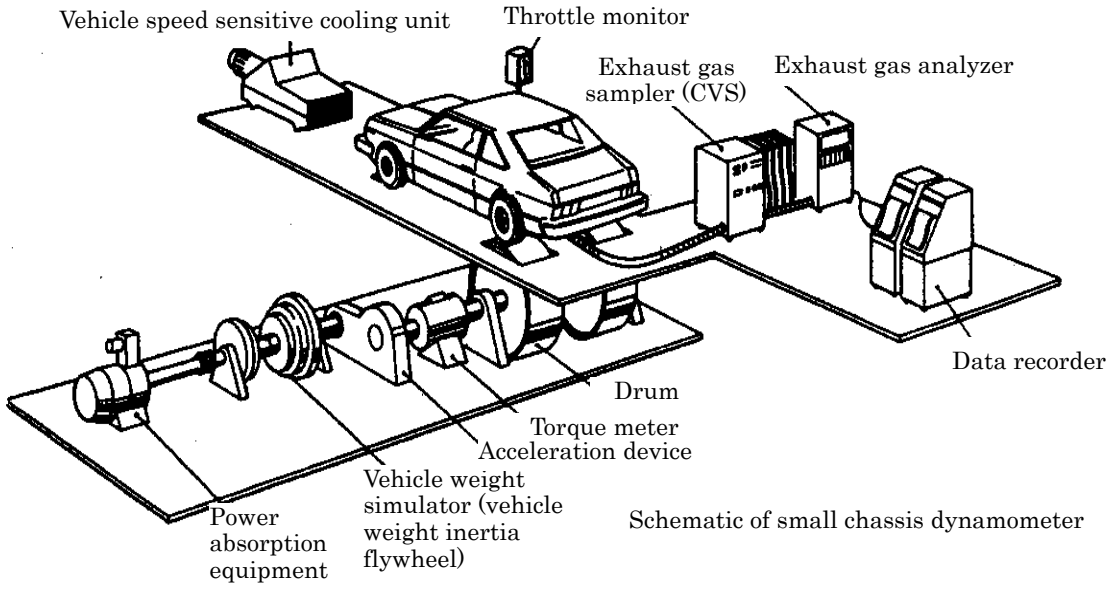
Weight of vehicle under test (kg)	IW (kg)
480 or below	**455**
481 to 540	**510**
541 to 595	**570**
596 to 650	**625**
651 to 710	**680**
711 to 765	**740**
766 to 850	**800**
851 to 965	**910**
966 to 1080	**1020**
1081 to 1190	**1130**
1191 to 1305	**1250**
1306 to 1420	**1360**
1421 to 1530	**1470**
1531 to 1640	**1590**
1641 to 1760	**1700**
1761 to 1870	**1810**
1871 to 1980	**1930**
1981 to 2100	**2040**
2101 to 2210	**2150**
2211 to 2380	**2270**
2381 to 2625	**2500**
2626 to 2875	**2750**
2876 to 3250	**3000**
3251 to 3750	**3500**

- In the IW categories under the ECE regulations, weight of vehicle under test is vehicle weight (fuel 90%, spare tire and tools included) + 100 kg.
- In the JC08 mode IW categories, weight of vehicle under test is vehicle weight (fuel 100% included) + 110 kg.

(Reference 3-3)

Equivalent Inertia Weight

When measuring exhaust emissions and fuel efficiency in a test room, a chassis dynamometer is used to reproduce an actual on-road driving, and a flywheel is used to recreate inertia caused by vehicle weight. The flywheel used has several weight settings depending on the weight range of vehicle under test. The set weight of the flywheel is called equivalent inertia weight.



Schematic of small chassis dynamometer

(Reference 3-4)

Categories under the Exhaust Gas Emission Regulations for Passenger Vehicles, etc.

As regards the regulations controlling emission of passenger vehicles, etc. covered by this FY2020 fuel efficiency standards, the "Notice of the safety standard details for road transport vehicles (Notice No. 619 of the Ministry of Land, Infrastructure and Transport, July, 2002)" (hereinafter referred to as the "Detail Notice") prescribes exhaust gas emission control values for each fuel category (gasoline or LPG/diesel oil) classified by vehicle type (i through iv below).

i) Ordinary vehicles, compact vehicles, or mini vehicles of 10 or less passenger capacity that are exclusively for passenger use
ii) Ordinary vehicles or compact vehicles with a gross vehicle weight of 1.7 tons or less that exclude i) above
iii) Ordinary vehicles or compact vehicles with a gross vehicle weight of 3.5 tons or less that exclude i) and ii) above
iv) Mini vehicles excluding i) above

Under each category, in accordance with the Attachment 42: "Exhaust Emission Measurement Methods for Light-/Medium-weight Vehicles" of the Detail Notice, equivalent inertia weight (IW) is set depending on the vehicle weight, and exhaust emission is measured on a chassis dynamometer.

Attachment 4

System of Standards

1. Evaluation method of achieving fuel efficiency standards

(1) System of standards by weight category

Under the existing system of standards by weight category, the standards are set for each weight category taking into consideration the technological improvement expected to be made by a target fiscal year on the basis of the best fuel efficiency performance of automobile (top runner) of the category, and manufacturers, etc. are required to have the fuel efficiency values in each weight category (weighted harmonic average) of their products meet the relevant standard values.

The intention of setting a standard value for each weight category is to encourage the maximum effort to improve the fuel efficiency of all types of automobiles considering the fact that purposes of consumers for using cars are diverse, that there are needs for various car types, and that technologies adopted by cars are different depending on the car type. In this case, vehicle weight is used as an index of categorization because it is closely related to fuel efficiency performance from the technological point of view as well as reflecting a general automobile ranks.

(2) System of average fuel efficiency standard by corporation (CAFE method: Corporate Average Fuel Efficiency method)

In the U.S. and EU, the corporate average fuel efficiency method (CAFE method) has been adopted, though the calculation methods for standard values are different.[5] This method requires the weighted average fuel efficiency value of the vehicles shipped by a company not to be lower than the standard value determined by the sales composition of the company.

With CAFE method, it can be accepted as an effective option to improve fuel efficiency that manufacturers choose specific car types or advanced technologies and concentrate their investment on it while taking advantage of their own technological feature. In other words, it allows manufacturers to cover technologies of the area which they are not good at by means of advancing the technologies they are good at. Thus, this is the method which can correspond to the sophistication and diversification of recent fuel efficiency improvement technologies.

Besides, in case of CAFE method, the evaluation is simply made by only judging if a company has achieved the standard or not, so the result is more directly linked to the corporate image of consumers than it is with conventional methods. Therefore, each company actively tries to improve CAFE value, and as a result it is expected to progress the improvement of fuel efficiency as a whole.

Meanwhile, the notice concerning the fuel efficiency standard achieved, which is currently being used for the taxation system, etc. (FY----- standard + -----% achieving vehicle), has an advantage that it provides general users with understandable information. Therefore, when adopting CAFE method, a fuel efficiency target value should be set along

[5] To calculate a standard value of each company, there are two methods, i.e. EU method which determines the standard value with average vehicle weight and US method which determines manufacturer's standard value by weight-averaging a standard value corresponding to the foot print of each vehicle (wheel base x tread) with sales ratio.

for each weight category as a performance index of individual vehicle.

(3) System of standards in FY2020 fuel efficiency standard

Based on the concept mentioned above, the corporate average fuel efficiency method (CAFE method) shall be adopted. With which, higher energy saving result can be expected as a result of flexible implementation of selection and concentration by each manufacturer based on their own technological feature, while technologies are increasingly advanced and become expensive accordingly.

Specifically, first a fuel efficiency target value is set for each category, and then it requires that the weighted harmonic average fuel efficiency value (CAFE value) of each company in a target fiscal year should not be lower than the value (CAFE standard value) obtained by weight-harmonically averaging the fuel efficiency target value with actual shipment value of each company in the target fiscal year.

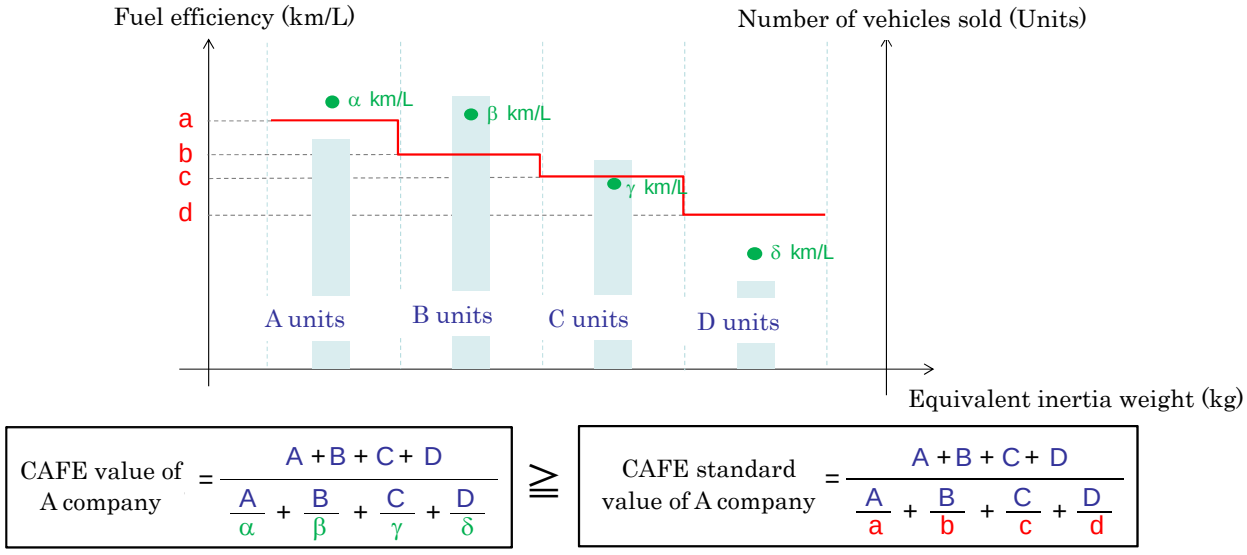


Figure 4-1 Image of Corporate Average Fuel Efficiency method

(4) Handling of diesel passenger vehicles and LP gas passenger vehicles

As regards diesel passenger vehicles and LP gas passenger vehicles, the evaluation is made together with gasoline passenger vehicles, and the achievement made for the fuel efficiency target value under CAFE method will be judged. When doing this, the evaluation is made by the energy equivalent (heating value equivalent) considering the difference of the unit heating value among fuel types. To be specific, fuel efficiency value shall be used for the evaluation of gasoline passenger vehicles, and gasoline heating value equivalent of fuel efficiency value shall be used for the evaluation of diesel passenger vehicles and LP gas passenger vehicles (the value dividing fuel efficiency value (km/L) with 1.10 for diesel passenger vehicles and the value dividing fuel efficiency value (km/L) with 0.78 for LP gas passenger vehicles).

Attachment 5

Fuel Efficiency Standards

1. Basic concept of fuel efficiency standards

Based on the concept of the Top Runner Method under the Energy Conservation Law, fuel efficiency target values for each category shall be determined by considering the performance of vehicles whose fuel efficiency performance is the best of all the vehicles currently in the market (hereinafter, referred to as "top runner vehicles") and prospect of technological development in the future, etc. ("Basic concept concerning preparation and revision of evaluation standards for manufacturers, etc. to improve performance of specified equipment", revision made by the 10th Energy Efficiency Standards Subcommittee of the Advisory Committee for Natural Resources and Energy).

Therefore, it is appropriate to determine the value considering factors such as fuel efficiency improvement to be made by technological development until FY2020, while taking the fuel efficiency performance of top runner vehicles of each weight category as a base.

2. Matters to be considered to set standard values for fuel efficiency improvement technologies, etc.

(1) Selection of top runner vehicles

Passenger vehicles, the fuel efficiency performance of which is the best of all passenger vehicles being marketed in FY2009 except for special vehicles, are selected as top runner vehicles.

When selecting the top runner vehicles, the following matters should be considered.

1) MT vehicles and diesel passenger vehicles are considered as special vehicles and excluded from the selection of top runner vehicles. As regards hybrid vehicles, although they were treated as special vehicles because their sales ratio was small when making the current FY2015 fuel efficiency standards, they are no longer treated as special vehicles in FY2020 fuel efficiency standards because the market share of hybrid vehicles has substantially risen recently.
2) Since the measurement method of JC08 mode is adopted, the passenger vehicles whose JC08 mode fuel efficiency value is the highest in each category as of the end of FY2009 are selected as top runner vehicles.

(2) Estimated evaluation of fuel efficiency improvement technologies, etc.

a) Evaluation of fuel efficiency improvement factors

This joint meeting conducted hearing from manufacturers, etc. and collected various kinds of information including their business strategies, such as the status quo and prospect of the development of various fuel efficiency improvement technologies and the prospect of those technologies to spread in consideration of consumers' level of acceptance for cost etc.

Referring to this information, as for each of fuel efficiency improvement factors including engine improvement, reduction of auxiliary equipment loss, improvement of driving system, etc. as listed in Table 5-1, its fuel efficiency improvement ratio and penetration ratio in the future (FY 2020) were reviewed from the technical point of view to estimate the degree of fuel efficiency improvement from top runner vehicles.

The fuel efficiency improvement factors which are specifically reviewed and their fuel efficiency improvement ratio are listed in Table 5-1 below. As regards the fuel efficiency improvement ratio, average ratios are listed because the following matters

needs to be concerned.

1) Fuel efficiency improvement ratio of each fuel consumption improvement technology is affected by the vehicle type and weight category.
2) Fuel efficiency improvement ratio is affected by a redundant relationship with other technologies introduced.

Table 5-1 Fuel efficiency improvement factors and fuel efficiency improvement ratios

Fuel efficiency improvement factors		Fuel efficiency improvement ratios
Engine improvement	Further reduction of friction	1%
	4 valves	1%
	2 valves + 2 point ignition	2%
	Variable valve system	1 to 6%
	Solenoid valve system	10%
	Direct-injection engine	2 to 10%
	Variable cylinder	7%
	Miller cycle	6%
	High volume EGR (exhaust gas recirculation)	2%
	Heat management (reduction of cooling loss, recovery of discharge heat, etc.)	2%
	Variable compression ratio	10%
	Supercharged downsizing	8%
Reduction of auxiliary equipment loss	Electric power steering	2%
	Electrically-powered (electric wiper, etc.)	1%
	Charge control	0.5%
Driving system improvement	Idle-neutral control	1%
	AT (automatic transmission) with muliple gears	2%
	Expansion of AT's lock-up area	2%
	CVT (continuously variable transmission)	7%
	AMT (automatic manual transmission) DCT (dual clutch transmission)	9%
	MT (manual transmission)	9%
Reduction of driving resistance	Further reduction of rolling resistance	1%
	Further improvement of air drag	1%
Others	Idling stop (except for hybrid vehicles)	7%
	Diesel vehicles	20%
	Idling stop + energy regeneration (except for hybrid vehicles)	10%

b) Evaluation of fuel efficiency influence factors

In general, fuel efficiency tends to deteriorate as engine's thermal efficiency decreases as a result of strengthened exhaust emission control or as vehicle weight increases following safety regulations, so it is necessary to study the influence of these factors when making fuel efficiency standards.

However, as the enhancement of exhaust emission control or safety regulations which may significantly affect the fuel efficiency is not planned for now, these fuel efficiency influence factors shall be excluded from the review this time.

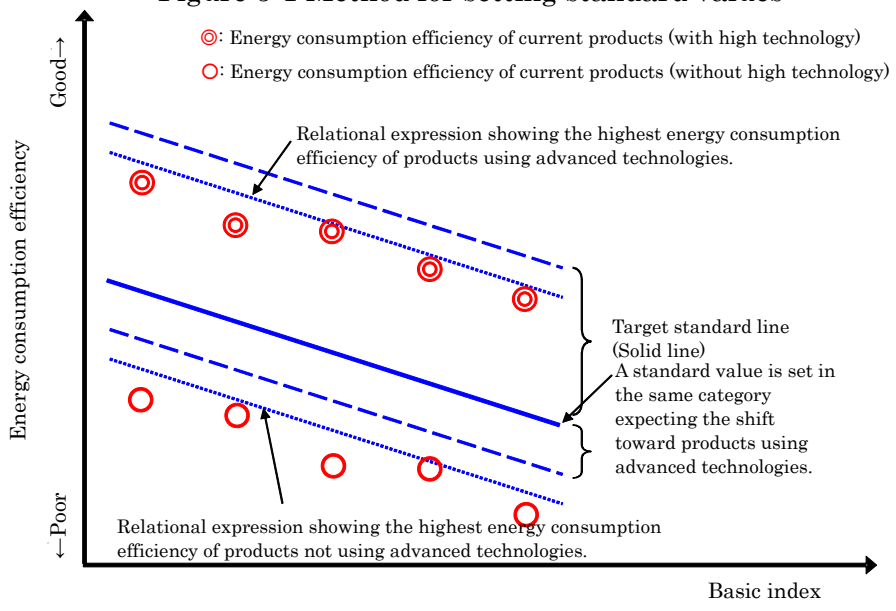
(3) Approach to hybrid vehicles

In the "basic concept concerning preparation and revision of evaluation standards for manufacturers, etc. to improve performance of specified equipment (concept of the top-runner program)", it is said that "as regards products which use advanced energy saving technology and, therefore, are expensive but highly energy efficient, although it is possible to classify them independently, it is desirable to address them in the same categories of others as much as possible so that manufacturers, etc. can actively sell products with excellent energy consumption efficiency".

It is also said that "if standard values are made only considering products which are expensive but highly energy efficient, consumers may be forced to buy economically-unmatching expensive products in the name of energy conservation, so standard values should be developed while paying attention to this aspect".

In other words, this concept introduces an approach that provides an incentive for manufacturers, etc. to sell products using advanced technologies into the concept of top runner standard by means of setting a standard value for a unified category with an expectation of future shift to such products.

Figure 5-1 Method for setting standard values



Therefore, as for FY2020 fuel efficiency standards, based on the fuel efficiency performance of top runner vehicles of both conventional vehicles and hybrid vehicles, the target candidate values taking into consideration the fuel efficiency improvement, etc. made by technologies expected to be developed by FY2020 are proportionally adjusted with the estimated penetration ratio of hybrid vehicles (ratio of hybrid vehicles in the number of new vehicles shipped) in FY2020. Then, the obtained values are taken as fuel efficiency target values for each category.

Regarding estimated penetration rate of hybrid vehicles which is used as a premise for setting the fuel efficiency target value for each category, this joint meeting set it as 18% based on the actual sales in the past and referring to the hearing from manufacturers, etc. Each manufacturer, etc. finally only have to achieve the fuel efficiency standard according to its business strategy or technological strategy. Each manufacturer, etc. or the market as a whole is not required to achieve the foregoing estimated penetration rate, but the fuel efficiency target value for each category which is developed on the premise of it should be set at the level which manufacturers, etc. can achieve on their own responsibilities if they make the maximum effort.

(4) Securing consistency between categories (smoothing)

The technological estimates, obtained by estimating and evaluating fuel efficiency improvement technologies based on the top-runner vehicle (fuel efficiency value obtained from adding improvement achieved by fuel efficiency improvement technologies possibly introduced by FY2020 onto that of top-runner vehicles as of FY2009), have low continuity over weight categories thus show inconsistency in some parts, depending on the fuel efficiency performance of top-runner vehicles in each category.

Therefore, it is appropriate to perform smoothing (leveling correction) so that a fuel efficiency standard for each category is properly set in relation to vehicle weight, and set the fuel efficiency target value for each category based on the value after the smoothing.

(5) Approach to encourage further fuel efficiency improvement of heavy vehicles

In addition to the introduction of CAFE method, it is necessary to deal with issues and concerns such as deterioration of fuel efficiency due to increasing vehicle weight for additional accessories or insufficient evaluation of the effort for lighter vehicle weight. As a method of doing it, it is possible to introduce a system which requires heavier vehicles to make further effort for fuel efficiency improvement. However, in case that the required level is too high to be achieved technically, vehicles may become smaller rather than lighter, likely to result in a mismatch with consumer needs. Thus, it also needs to be concerned.

Considering these issues, this joint meeting studied a technically feasible scope including, for example, active introduction of high-grade and advanced lighter materials. In conclusion, to incorporate this approach, additional efficiency improvement is required for values calculated up to (4) in stages from the category of average weight. As for the heaviest category, it is set as the level requiring additional 10% improvement.

3. Setting of fuel efficiency target value for each category

Table 5-2 shows the fuel efficiency target values for each category for FY2020.

Assuming these fuel efficiency target values for each category is achieved, the estimated fuel efficiency value in the target fiscal year (FY2020) which is a weighted-harmonic average

of the entire passenger vehicles will be 20.3km/L (24.1% improvement from FY2009).

In this time of developing fuel efficiency standard values, due to the adoption of CAFE method, manufacturers, etc. are allowed to have flexibility in selection and concentration of operating resources for achieving targets when determining if the target is achieved. At the same time, other approaches, such as to promote further fuel efficiency improvement in heavier vehicles are also introduced. As a result, the fuel efficiency target value for each category is set at the level higher than one used to.

To be more specific, even now when the fuel efficiency has already been substantially improved, the above-mentioned improvement ratio estimated when developing FY2020 standards is exceeding the one for FY2010 standards (22.8% improvement from FY1995) and FY2015 standards (23.5% improvement from FY2004).

Table 5-2 Fuel efficiency target values of each category for FY2020

Equivalent inertia weight (kg)	Vehicle weight (kg)	Fuel efficiency target value (km/L)
800	740 or below	**24.6**
910	741 to 855	**24.5**
1020	856 to 970	**23.7**
1130	971 to 1,080	**23.4**
1250	1,081 to 1,195	**21.8**
1360	1,196 to 1,310	**20.3**
1470	1,311 to 1,420	**19.0**
1590	1,421 to 1,530	**17.6**
1700	1,531 to 1,650	**16.5**
1810	1,651 to 1,760	**15.4**
1930	1,761 to 1,870	**14.4**
2040	1,871 to 1,990	**13.5**
2150	1,991 to 2,100	**12.7**
2270	2,101 to 2,270	**11.9**
2500	2,271 or above	**10.6**

Attachment 6

Handling of Electric Vehicles and Plug-in Hybrid Vehicles

1. Status quo of electric vehicles and plug-in hybrid vehicles

As regards electric vehicles and plug-in hybrid vehicles (limited to passenger vehicles, hereinafter referred to as "electric vehicles, etc."), sales of electric vehicles for general consumers started last year, and currently 2 electric vehicle models have received type approval and are on sale. As regards plug-in hybrid vehicles, sale of 1 model has been also started for business use. Furthermore, several manufacturers in and out of Japan have announced their electric vehicle sales plans for years around 2012. As seen above, activities for full-scale popularization of these vehicles are on the move.

Still, the number of electric vehicles, etc. sold in FY2009 with type approval was approximately 1,700 vehicles and its ratio in entire passenger vehicles is currently below 0.1%.

2. Handling of electric vehicles and plug-in hybrid vehicles

(1) Handling of electric vehicles and plug-in hybrid vehicles

Currently, only 1 to 2 vehicle models are on sale so far respectively and each sales volume ratio is below 0.1%; therefore, the prospect of technological development needed for establishing standards as well as of their penetration is not clear. If standard values are set under the current situation where information is not enough, its level may be inappropriate, impose unnecessary restrictions on the technology development for electric vehicles, etc. to be made in the future and negatively affect the advancement of technologies in the future.

Therefore, as regards electric vehicles, etc., they shall not to be designated as specified products covered by the regulation under the Energy Conservation Law, as a result standard values are not set for these vehicles.

However, the function of electric vehicles, etc., i.e. to travel on roads and carry people and cargos, is the same as gasoline passenger vehicles, diesel passenger vehicles and LP gas passenger vehicles (hereinafter referred to as "gasoline passenger vehicles, etc."[6] including hybrid vehicles) and they compete with each other in the market. Also, manufacturers who make electric vehicles, etc. are almost the same as those who make gasoline passenger vehicles, etc.

Under such circumstances, to promote energy conservation of gasoline passenger vehicles, etc. and electric vehicles, etc. as automobiles as a whole, it is necessary to correctly evaluate the efforts of manufacturers, etc. to introduce electric vehicles, etc. when

[6] Gasoline passenger vehicles, diesel passenger vehicles and LP gas passenger vehicles including hybrid vehicles

evaluating the achievement made for fuel efficiency standards of gasoline passenger vehicles, etc.

(2) Specific evaluation of introduction of electric vehicles and plug-in hybrid vehicles

For the reasons mentioned above, when evaluating the achievement made toward fuel efficiency standards of gasoline passenger vehicles, etc., the performance and the number of vehicles shipped of electric vehicles, etc. shall be coupled with in the evaluation.

To be more specific, as regards the fuel efficiency standards of FY2020, the achievement toward the standards is evaluated by the value which is obtained from weight-harmonically averaging gasoline usage converted from energy consumption of electric vehicles based on its heat value[7] (using 3.6 MJ/kWh as electric heating value and 32.9 MJ/L as gasoline's lower heating value) and fuel consumption of gasoline passenger vehicles, etc. with the number of vehicles shipped respectively (for plug-in hybrid vehicles too, the value combining a value converted likewise from power consumption and a fuel consumption value shall be used).

In this connection, when calculating power efficiency of electric vehicles, etc., the following matters should be considered.

1) When diesel passenger vehicles and LP gas passenger vehicles are evaluated together with gasoline passenger vehicles, energy conversion (heat value conversion) was adopted taking into consideration the fact that the unit heat values are different depending on fuel types.
2) When evaluating the fuel efficiency of gasoline passenger vehicles, etc., evaluation of energy efficiency value after supplying fuel to vehicles, the performance of which can be improved under the responsibility of manufacturers, etc., (i.e. "Tank to Wheel" evaluation) was adopted, instead of evaluating energy efficiency covering the process of fuel purification and transportation (i.e. "Well to Wheel" evaluation).

(3) Minimum requirements to be satisfied by gasoline passenger vehicles, etc.

The development and production of conventional vehicles[8] are conducted as common and basic activities of manufacturers, etc. Meanwhile, the development and production of hybrid vehicles or electric vehicles, etc. are being conducted according to business strategy of each manufacturer, etc. making the use of their own technological strength.

In order to improve the fuel efficiency of gasoline passenger vehicles, etc., while securing the flexibility of activities made by manufacturers, etc., it should be required that the fuel efficiency level of gasoline passenger vehicles, etc. without counting electric vehicles, etc. is at least above the level of the target candidate value of conventional vehicles (fuel efficiency value of top-runners among conventional vehicles plus consideration of technological improvement, etc.).

To be more specific, based on the sales composite of the base year (FY2009), according to the ratio between the whole company's weighted harmonic average fuel efficiency value calculated from the fuel efficiency target value for each category of FY2020 and the whole company's weighted harmonic average fuel efficiency value calculated from the target candidate value of conventional vehicles, it is set as a requirement that the CAFE value of gasoline passenger vehicles, etc. of manufacturers, etc. must be more than the value which

[7] Inverse value (km/kWh) of JC08 mode AC energy consumption ratio (kWh/km)
[8] Gasoline passenger vehicles, diesel passenger vehicles and LP gas passenger vehicles excluding hybrid vehicles

multiplies the CAFE standard value by 0.9.

<Requirement for counting electric vehicles, etc.>
(CAFE value of each manufacturer, etc.) ≥ (CAFE standard value of each manufacturer, etc.) x 0.9

In this connection, above mentioned evaluation for manufacturers, etc. made with counting electric vehicles, etc. is for determining whether the standard has been achieved or not; on the other hand, the CAFE value of manufacturers, etc. is the value calculated from the fuel efficiency value of gasoline passenger vehicles, etc.

(4) Handling of electric vehicles and plug-in hybrid vehicles to be introduced in the future

As mentioned above, it is not appropriate to set standard values for electric vehicles, etc. now, but efforts shall be made to organize an environment where the energy consumption efficiency (fuel efficiency) of electric vehicles, etc. will be improved in the future by setting standard values. To be more specific, from 2012 onward when electric vehicles are widely spread and the environment is established in which information on technology development or penetration prospect can be obtained, as a result of active sales due to increasing model types of electric vehicles, it is appropriate to revisit the opportunity to designate them as specified equipment and to develop standards for them, including the way to evaluate them together with gasoline passenger vehicles.

Attachment 7

Display Items

1. Display items, etc.

The purpose of the display system is to promote fuel-efficient vehicles by helping automobile users, at the time of purchase, easily identify energy consumption efficiency (fuel efficiency) to choose such vehicles. Therefore, it is appropriate to display fuel efficiency values in an easily visible manner along with those items closely related to fuel efficiency performance.

(1) Display items

It is appropriate to designate the items i) through xi) below as display items, as in the case of display items used under existing fuel efficiency standards and fuel efficiency standards for heavy vehicles.

i) Vehicle name and type
ii) Engine type and total displacement
iii) Vehicle weight
iv) Transmission type and number of speeds
v) Fuel supply equipment type
vi) Main fuel efficiency improvement measures
vii) Energy consumption efficiency (fuel efficiency values expressed by a unit of km/L to one decimal place)
viii) Manufacturer name
ix) Maximum output and maximum torque of engine
x) Passenger capacity (applicable to passenger vehicles only)
xi) Type of fuel used

(2) Compliance items

It is appropriate to designate the followings as compliance items, as in the case of compliance items under existing fuel efficiency standards.

- Display items listed in (1) above shall be noted in the catalog of the vehicle concerned. Energy consumption efficiency (fuel efficiency) shall be displayed in a particularly visible manner, such as by use of underlines, larger typefaces, and letters of different colors.
- In addition to vehicle name and type, vehicles on display shall have energy consumption efficiency (fuel efficiency) clearly posted at an easily viewable place.
- As the fuel efficiency value listed in (1) vii) above varies depending on the using environment (weather, congestion, etc.), driving situation (sudden start, use of air conditioners, etc.) or maintenance (air pressure of tires, etc.), the statement to this effect must be indicated on catalogues or displays along with the fuel efficiency value.

(3) Others

Under the existing display system, the items in (1) above must be noted in the catalog of each vehicle to encourage automobile users to purchase fuel-efficient vehicles. Fuel efficiency values displayed in vehicle catalogs are measured under the prescribed uniform driving conditions to enable users to compare and evaluate fuel efficiency performance when they choose vehicles. Meanwhile, as the number of models of diesel passenger vehicles has increased in recent years, it is also requested to indicate the type of fuel used to provide consumers with accurate information on fuel efficiency.

Besides, it is expected that such information on fuel efficiency values enhances the concern of consumers for fuel efficiency performance. Therefore, the information must be provided through various means such as attaching stickers displaying fuel efficiency performance to vehicle bodies or making fuel efficiency values known through advertisement, etc. instead of putting the display on catalogs only.

Attachment 8

History of Joint Meetings between
the Automobile Evaluation Standards Subcommittee, Energy Efficiency Standards Subcommittee of the Advisory Committee for Natural Resources and Energy and the Automobile Fuel Efficiency Standards Subcommittee, Automobile Section, Land Transport Division of the Council for Transport Policy

First meeting (June 28, 2010)
- Opening joint meetings to the public
- Current status of passenger vehicles, etc.
- Main issues to be discussed

Second meeting (September 13, 2010)
- Hearing from vehicle manufacturers associations, vehicle importers associations, etc.

Third meeting (October 28, 2010)
- Target fiscal year
- Scope of vehicles to be covered
- Concept of the Top Runner
- Regulation system, etc.

Fourth meeting (January 5, 2011)
- Scope of vehicles to be covered
- Provision of information to users, such as fuel efficiency indication method

Fifth meeting (June 24, 2011)
- Fuel efficiency values

Sixth meeting (August 11, 2011)
- Interim report (draft)

Seventh meeting (October 20, 2011)
- Opinions on interim report (draft) , and final report (draft)

Attachment 9

Committee Member List of Joint Meetings between
the Automobile Evaluation Standards Subcommittee, Energy Efficiency Standards Subcommittee of the Advisory Committee for Natural Resources and Energy and the Automobile Fuel Efficiency Standards Subcommittee, Automobile Section, Land Transport Division of the Council for Transport Policy

(Honorifics omitted and in Japanese alphabetical order.)

Chairman	Yasuhiro Daisho	Professor, Graduate School of Environment and Energy Engineering, Waseda University
Vice-chairman	Hisashi Ishitani	Professor Emeritus, The University of Tokyo
Members	Hiroko Kiba	Newscaster, Specially Appointed Professor, Chiba University
	Yuichi Goto	Manager, Environment Research Department, National Traffic Safety and Environment Laboratory (Independent Administrative Institution)
	Toshio Kobayashi	Professor Emeritus, The University of Tokyo
	Masahiro Shioji	Professor, Graduate School of Energy Science, Kyoto University
	Takemi Chikahisa	Professor, Faculty of Engineering, Hokkaido University
	Akihiko Nakaya	Motor Journalist
	Yoshitsugu Hayashi	Professor, Graduate School of Environmental Studies, Nagoya University
	Ryuji Matsuhashi	Professor, School of Engineering, The University of Tokyo