



COMMISSION OF THE EUROPEAN COMMUNITIES

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**COMMUNICATION FROM THE COMMISSION
TO THE COUNCIL AND THE EUROPEAN PARLIAMENT**

**Implementing the Community Strategy to Reduce CO₂ Emissions from Cars:
Fourth annual report on the effectiveness of the strategy
(Reporting year 2002)**

[SEC(2004) 140]

1. INTRODUCTION

The Community's strategy to reduce CO₂ emissions from passenger cars and improve fuel economy^{1,2} is based on the following three pillars:

- (1) Commitments of the automobile industry on fuel economy improvements, aiming at achieving an average specific³ CO₂ emission figure for new passenger cars of 140 g CO₂/km by 2008/9.
- (2) Fuel-economy labelling of cars⁴ which aims at ensuring that information relating to the fuel economy and CO₂ emissions of new passenger cars offered for sale or lease in the Community is made available to consumers, in order to enable consumers to make an informed choice.
- (3) The promotion of car fuel efficiency by fiscal measures.

Support is given to pre-competitive research activities through the Community Research Framework Programme, with the objective to contribute to the reduction of CO₂ through the development of advanced component, power train and vehicles technologies.

According to Article 9 of Decision 1753/2000/EC⁵ the Commission has to report annually on the effectiveness of the strategy⁶.

2. BRIEF OVERALL ASSESSMENT

In total, considering all measures, at EU and national level, the average specific CO₂ emission from passenger cars in the EU decreased in the period 1995 to 2002 from 186 g CO₂/km to 166 g CO₂/km^{7,8}. This corresponds to a reduction of 10.8 %. The Community's strategy to reduce CO₂ emissions from passenger cars and improve fuel economy aims at achieving an average specific CO₂ emission figure for passenger cars newly registered in the EU of 120 g CO₂/km by 2005, and by 2010 at the latest. This corresponds to a reduction of 35 %. As

1 COM (95)689 final

2 Council conclusions of 25.6.1996

3 The term "specific" is taken from the title of Decision 1753/2000/EC and is used in order to indicate that the CO₂ emissions are expressed in grams per kilometre

4 Directive 1999/94/EC relating to the availability of consumer information on fuel economy and CO₂ emissions in respect of the marketing of new passenger cars

5 Decision 1753/2000/EC of the European Parliament and of the Council establishing a scheme to monitor the average specific emissions of CO₂ from new passenger cars

6 Information concerning the Community strategy can also be found on the web site: http://europa.eu.int/comm/environment/co2/co2_home.htm

7 For the first time, official EU data is used in this Communication. The data are delivered by Member States under Decision 1753/2000/EC. Prior 2002 monitoring was based on data provided by the associations. As mentioned in the last Communication there are slight differences between these data sets. The average specific CO₂ emissions based on association data is 165 g CO₂/km

8 It should be mentioned that the CO₂ figures shown in this report show the effect of all CO₂ related measures taken in the Community. Article 10 of Decision 1753/2000/EC requires the Commission to report to Council and European Parliament by 2003/4 and 2008/9 about the reductions achieved by technical and by other measures. In 2002 the Commission launched a service contract in order to study this issue in greater detail. The results of this work will be part of the next year's Communication

already mentioned in the last report, it is unlikely that the Community target of 120 g CO₂/km will be reached as early as 2005.

To meet the Community target of 120 g CO₂/km in 2010 would require achieving an average annual reduction of 3.5 % at EU level. This is significantly higher than what has been achieved on average between 1995 and 2002 (about 1.5 %). It was anticipated that the reduction would increase over time but it is clear that additional efforts have to be made in order to meet the target by 2010. However, as far as the Commitments are concerned the intermediate target was reached early by both ACEA and JAMA and we therefore consider that these associations are on track to meet their long term targets.

3. PROGRESS MADE BY THE CAR INDUSTRY WITH REGARD TO THEIR RESPECTIVE COMMITMENT.

Commitments have been made by the European (European Automobile Manufacturers Association - ACEA⁹⁾¹⁰ the Japanese (Japan Automobile Manufacturers Association - JAMA¹¹) and Korean (Korea Automobile Manufacturers Association - KAMA¹²) automobile associations¹³. Table 1 shows the detailed list of the most important manufactures/affiliations/brands that have been allocated to the respective association for the monitoring figures shown in this report.

ACEA¹⁴	ALFA ROMEO, ALPINA, ASTON MARTIN, AUDI, BAYERISCHE MOTOREN WERKE, BENTLEY, CADILLAC, CHEVROLET, CHRYSLER, CITROEN, DAIMLER, FERRARI, FIAT, FORD, GENERAL MOTORS, JAGUAR, JEEP, LAMBORGHINI, LANCIA-AUTOBIANCHI, LAND-ROVER, MASERATI, MATRA, MCC (SMART), MERCEDES-BENZ, MINI, OPEL, PEUGEOT, PORSCHE, RENAULT, ROLLS-ROYCE, SAAB, SEAT, SKODA, VAUXHALL, VOLKSWAGEN, VOLVO
JAMA	DAIHATSU, HONDA, ISUZU, LEXUS, MAZDA, MITSUBISHI, NISSAN, SUBARU, SUZUKI, TOYOTA
KAMA	DAEWOO, HYUNDAI, KIA, SSANGYONG

Table 1: List of most important manufacturers/affiliations/brands that have been allocated to the respective association for the monitoring figures shown in this report.

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- 9 European car manufacturers in ACEA: BMW AG, DaimlerChrysler AG, Fiat S.p.A., Ford of Europe Inc., General Motors Europe AG, Dr. Ing. H.c.F. Porsche AG, PSA Peugeot Citroën, Renault SA, Volkswagen AG
- 10 COM (98) 495 final
- 11 Japanese car manufacturers in JAMA: Daihatsu, Fuji Heavy Industries (Subaru), Honda, Isuzu, Mazda, Nissan, Mitsubishi, Suzuki, Toyota
- 12 Korean car manufacturers in KAMA: GM Daewoo Auto and Technology Company, Hyundai Motor Company, Kia Motors Corporation, Renault Samsung Motor Company, and Ssangyong Motor Company
- 13 COM (99) 446 final
- 14 It should be noted that although Rover, including MG, is no longer a formal member of ACEA, it has been agreed between Rover, ACEA and the Commission to incorporate Rover/MG in ACEA figures

All three commitments constitute equivalent efforts, having the following main features:

- (1) The CO₂ emission objective: All commitments contain the same quantified CO₂ emission objective for the specific average of new passenger cars sold in the European Union, i.e. 140 g CO₂/km (to be achieved by 2008 by ACEA and 2009 by JAMA and KAMA).
- (2) Means of achievement: ACEA, JAMA and KAMA commit themselves to achieving the CO₂ target mainly by technological developments and related market changes.

In addition, “estimated target ranges” are set for 2003/2004¹⁵. All associations have, as well, committed themselves to review in 2003 (ACEA and JAMA) or 2004 (KAMA) the potential for additional CO₂ reductions “...with a view to moving further towards the Community objective of 120 g CO₂/km by 2012”.

The commitments are subject to a thorough and transparent monitoring scheme. For this purpose an annual “Joint Report”, one with each of the associations, is drafted and agreed between the parties. They are published in parallel to this Communication as SEC papers.

For the first time official EU CO₂ monitoring data are used for calculating the 2002 figures¹⁶. In the past the associations have provided the underlying data.

The main findings for the reporting period 1995 to 2002 are:

- Taking official Member States’ data in 2002 the average specific CO₂ emissions of the fleets are 165 g/km for ACEA, 174 g/km for JAMA and 183 g/km for KAMA¹⁷. If ACEA’s figures were taken the average specific CO₂ emissions of this association was 163 g/km. (see Table 2).
- Compared to 1995 the average specific CO₂ emissions have been reduced by 10.8% for ACEA (12.1% if using ACEA figures), 11.2 % for JAMA and 7.1 % for KAMA.
- Compared to 2001 all three associations reduced the average specific CO₂ emissions of their cars registered for the first time on the EU market (ACEA by about 1.2 %¹⁸, JAMA by about 2.5 % and KAMA by about 1.8 %¹⁹). Since 1995 the fuel efficiency improvements for diesel passenger cars are clearly better compared with gasoline vehicles.

15 For ACEA 165 – 170 g CO₂/km in 2003; for JAMA 165 – 175 g CO₂ /km in 2003; for KAMA 165 – 170 g CO₂/km in 2004

16 Article 8 of Decision 1753/2000/EC requires that the monitoring system from the year 2003 onward shall serve as the basis for the voluntary obligations agreed between the Commission and the automobile industry

17 The question to what extend technological progress and related market changes, or other aspects like changes in consumer behaviour, e.g. due to taxation measures or car labelling, contributed to the observed reductions will be studied in 2004

18 This reduction figure is based on ACEA data for 2001 and 2002. If ACEA's data for 2001 and the official EU data for 2002 were taken there would be no reduction. However, it can be assumed that this is mainly caused by the change in the database. If official 2002 EU data and unofficial 2001 EU data are compared the reduction percentage is about the same as identified when using ACEA's figures

19 All 2001 and 2002 data are corrected by 0.7 % in order to take into account the change in the test cycle

- JAMA and ACEA show good progress, although ACEA's 2002 performance is lower than in the previous years. However, ACEA reached already in 2000 the intermediate target range envisaged for 2003, and is now at the very low end of this range. JAMA achieved in 2002 the upper end of the intermediate target range. Both associations can be considered to be on track.
- KAMA's progress is still unsatisfactory, although it has been catching up slightly in the last 2 years. There is a real risk that KAMA will not meet its 2004 intermediate target range of 165 to 170 g/km, seeing that only two years are left to close the gap of 13 g/km. This could affect the whole approach on CO₂²⁰. However, KAMA has reconfirmed its commitment to meet its targets.
- In order to meet the final target of 140 g/km additional efforts are necessary, as the average annual reduction rate of all three associations needs to be increased. On average the reduction rate must be around 2 %, or about 3.5 g/km per year 1995-2008/9. In the years remaining until 2008/9 the reduction rates must be on average 2.5 % for ACEA, 2.8% for JAMA and 3.4 % for KAMA. However, it was anticipated from the beginning that the average reduction rate would be higher in the later years (see Table 3).

20 It should be recalled that the Council invited the Commission "...to present immediately proposals, including legislative proposals, for consideration, should it become clear, on the basis of the monitoring and after consultation with the associations, that one or more of the associations would not honour the commitments made" (Council conclusions of October 1999)

ACEA	1995	1996	1997	1998	1999	2000	2001 (3)	2002 (3)	Change 95/02 [%] (4)
	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	
Petrol-fuelled vehicles	188	186	183	182	180	177	172	172/171(5)	-8.5/9.0%(6)
Diesel-fuelled vehicles	176	174	172	167	161	157	153	155/152(5)	-11.9/13.6%(6)
All fuels (1)	185	183	180	178	174	169	165	165/163(5)	-10.8/12.1(6)
JAMA (2)	1995	1996	1997	1998	1999	2000	2001 (3)	2002 (3)	Change 95/02 [%] (4)
	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	
Petrol-fuelled vehicles	191	187	184	184	181	177	174	172	-9.9%
Diesel-fuelled vehicles	239	235	222	221	221	213	198	180	-24.7%
All fuels (1)	196	193	188	189	187	183	178	174	-11.2%
KAMA (2)	1995	1996	1997	1998	1999	2000	2001 (3)	2002 (3)	Change 95/02 [%] (4)
	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	
Petrol-fuelled vehicles	195	197	201	198	189	185	179	178	-8.7%
Diesel-fuelled vehicles	309	274	246	248	253	245	234	203	-34.3%
All fuels (1)	197	199	203	202	194	191	187	183	-7.1%
EU-15 (2)	1995	1996	1997	1998	1999	2000	2001 (3)	2002 (3)	Change 95/02 [%] (4)
	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	CO ₂ (g/km)	
Petrol-fuelled vehicles	189	186	184	182	180	178	173	172	-9.0%
Diesel-fuelled vehicles	179	178	175	171	165	163	156	157	-12.3%
All fuels (1)	186	184	182	180	176	172	167	166	-10.8%

(1) Petrol and diesel-fuelled vehicles only, other fuels and statistically not identified vehicles are not expected to affect these averages significantly.

(2) For 2002 data from Member States is taken. For the 'change 95/02' the 95 data from the associations and the 2002 data from the Member States are taken. New passenger cars put on the EU market by manufacturers not covered by the Commitments would not influence the EU average significantly.

(3) The figures for 2001 and 2002 are corrected by 0.7 % for the change in driving cycle.

(4) Percentages are calculated from unrounded CO₂ figures; for 2002 data from Member States is taken.

(5) The first figure is based one data from Member States; the second figure is based on data from ACEA.

(6) The first figure is based on 2002 data from Member States and 1995 data from ACEA; the second figure is based solely on data from ACEA.

Table 2: Average specific CO₂ emissions of new passenger cars per fuel type, for each association and the European Union

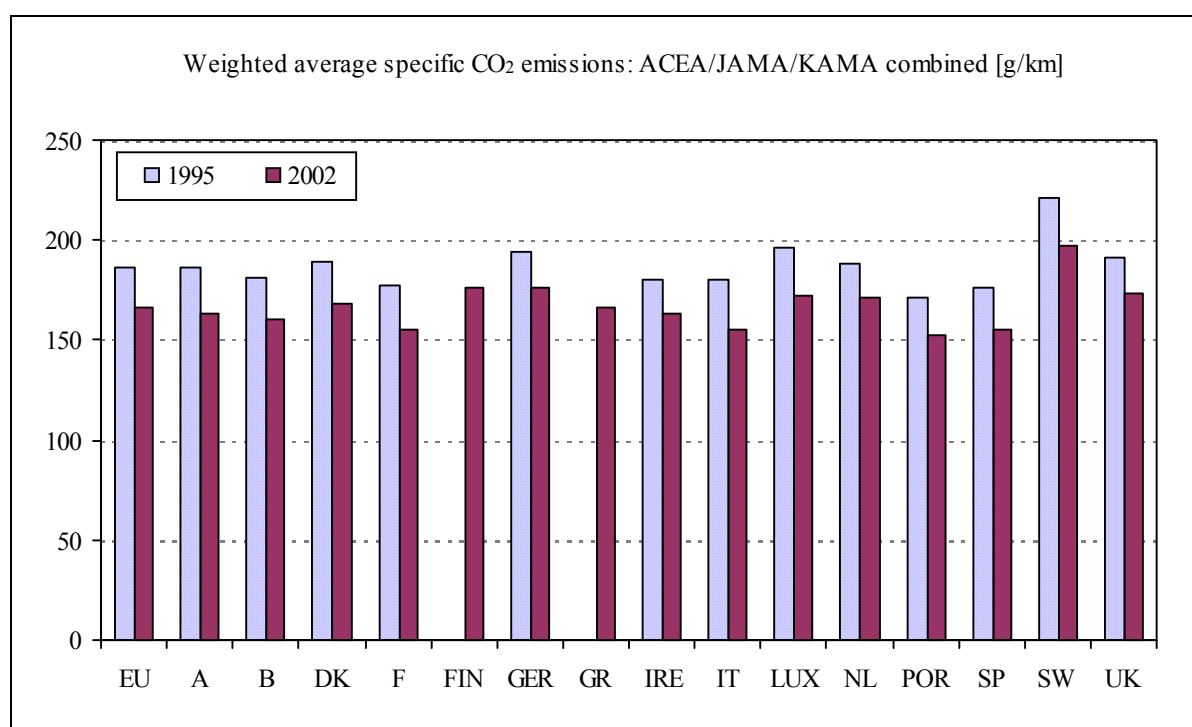
The overall average CO₂ emissions of new passenger cars registered in 2002 was lower in all Member States than 1995 and the years in between (see Figure 1). However, it should be mentioned that the reduction rates differ somewhat from country to country²¹.

	1995	2002	140g/km Target : gap (% from 2002)	140g/km Target : gap (g/km from 2002)	140g/km Target : gap (% from 2002)	140g/km Target : gap (g/km from 2002)
	CO ₂ (g/km)	CO ₂ (g/km)	Total	Total	Per annum	Per annum
ACEA All fuels*	185	165/163	15,2%/13,9%	25/23	2,5%/2,3%	4,2/3,8
JAMA all fuels**	196	174	19,5%	34	2,8%	4,9
KAMA all fuels**	197	183	23,5%	43	3,4%	6,1

* First figure is based on Member States' data; second figure is based on ACEA's figure

**Based on Member States' data

Table 3: Meeting the 140g/km target in 2008/2009



1995 data as delivered by the associations; for 2002 the official EU data are displayed

2002 data are corrected by 0.7 % for cycle change adjustment

Figure 1: Average Specific CO₂ emissions of new passenger cars in the EU and in Member States in 1995 and 2002 (weighted averages based on the data for diesel and gasoline vehicles)²²

21 No figure can be given for Greece and Finland for 1995 since data are not available

All associations increased further the share of diesel cars in their respective sales within the reporting period (see Table 4). This was predicted for the short-term. For the 2008/9 target it was understood that the associations would not meet it by a simple increase in the diesel share only, but by technological developments and market changes linked to these developments.²³ In this respect it is important to note that the Council invited the Commission “...to make continued efforts to significantly reduce nano-particulate emissions, and in particular devise a new measuring procedure for private cars, light duty vehicles and heavy duty vehicles taking into account the results of recent studies into the health effects of nano-particulate emissions...”²⁴. Recently the Commission started work on EURO 5 emission limit values to be applicable around the year 2010. It can be expected that, inter alia, the limits for particle emissions and other gaseous pollutants will be tightened. In parallel an increasing number of manufacturers have declared that they intend to equip their diesel passenger cars with a particle filter. Moreover, in the past, ACEA raised uncertainties associated with the introduction of gasoline direct injection technology. This technology was supposed to break the strong trend towards diesel powered passenger cars. These developments must be considered when looking at a further "dieselisation" of the EU passenger car fleet.

The ACEA figures given in this Communication include Rover/MG. However, since Rover/MG - which was initially covered by the Commitment as part of BMW- is no longer an ACEA member, ACEA has stated that the association cannot take any responsibility for Rovers CO₂ achievements up to 2008.

This is the first time that a change in membership has occurred. The Commission will make every effort to ensure that changes in the membership will neither have negative repercussions on the integrity of the Commitments nor on the level playing field.

22 EU 1995 does not include data for Greece or Finland because of insufficiency of available data. For 2002 these two Member States are included

23 The three “Joint Reports” do not address this complex question of market changes further

24 Council conclusion of 18/19.12.2000

									Change '95-02' (2)
ACEA	1995	1996	1997	1998	1999	2000	2001	2002 (4)	
Gasoline	73.4%	72.9%	73.1%	70.3%	65.8%	60.9%	58.2%	56.3%	-17.1
Diesel	24.0%	24.3%	24.3%	27.0%	31.0%	35.8%	39.4%	43.6%	19.6
All fuels	10 241 651	10 811 011	11 226 009	11 935 533	12 518 260	12 217 744	12 552 498	11 649 782	13.8%
JAMA	1995	1996	1997	1998	1999	2000	2001	2002 (4)	Change '95-02' (2)
Gasoline	82.1%	82.1%	83.2%	81.6%	80.4%	80.8%	79.1%	77.3%	-4.8
Diesel	9.5%	10.4%	11.2%	13.1%	14.9%	16.5%	17.4%	22.6%	13.1
All fuels	1 233 975	1 342 144	1 510 818	1 666 816	1 716 048	1 667 987	1 520 643	1 501 937	21.7%
KAMA	1995	1996	1997	1998	1999	2000	2001	2002 (4)	Change '95-02' (2)
Gasoline	87.9%	87.6%	89.2%	85.9%	81.9%	80.9%	85.2%	77.8%	-10.1
Diesel	1.6%	1.8%	2.3%	6.1%	7.4%	8.3%	13.9%	22.0%	20.4
All fuels	169 060	236 454	275 453	373 230	463 724	491 244	396 792	325 436	92.5%
EU-15 (1)	1995	1996	1997	1998	1999	2000	2001	2002 (4)	Change '95-02' (2)
Gasoline	74.5%	74.2%	74.6%	72.1%	68.0%	63.9%	61.2%	59.2%	-15.3
Diesel	22.2%	22.4%	22.3%	24.7%	28.4%	32.6%	36.4%	40.7%	18.5
All fuels (3)(5)	11 644 686	12 389 609	13 012 280	13 975 579	14 698 032	14 376 975	14 469 933	13 477 155	15.7%

(1) New passenger cars put on the EU market by manufacturers that are not covered by the commitments do not affect the numbers significantly

(2) The change over the period 1995 to 2002 for gasoline and diesel driven cars represents the change in the absolute share of each fuel type of total registrations. The change for the total cars is the growth or drop in absolute new registrations. The change in total cars represents the growth in the EU-15 new registrations over the period

(3) Totals include statistically unidentified vehicles and vehicles using 'other fuel' types

(4) For 2002 the data provided by Member States is taken

(5) The total registration figure given in the table for 2002 is based on Member States data. They exclude a number of vehicles, e.g. those to which no CO₂ value could be associated. The total registrations reported by the associations are about 500.000 vehicles higher. This has no significant impact on the displayed petrol/diesel share

Table 4: Trends in composition of new cars registered on the market, for each association and the EU

As already mentioned all associations declared in their respective commitment that they would meet the final target by mainly technological developments and market changes linked to these developments. Such developments contributed indeed to the reductions achieved so far (mainly the introduction of High Speed Direct Injection Diesel (HDI) engines and to less extent by the introduction of Gasoline Direct Injection (GDI) engines, Continuously Variable Transmission, (CVT), Variable Valve Lift (VVL), as well as other technical improvements, and Alternative Fuelled Vehicles (AFVs) as well as Dual Fuelled Vehicles (DFV)). Since the year 2000 ACEA and – to a lesser extent - JAMA introduced passenger cars emitting 120 g CO₂/km or less (meeting one of the commitments). ACEA reached over 580 000 and JAMA about 44 000 registrations of such cars in 2002. KAMA is still to introduce such models on the market.

With regard to the assumptions underlying the commitments the associations continue to draw attention to a number of issues they consider as negative for CO₂ reduction measures (see Joint Reports). Among other issues mentioned already in the past, ACEA drew attention to the difficult economic situation of the car industry. The Commission shares the view raised by ACEA that the economic situation in Europe has been rather sluggish lately and that this might have an impact on the financial performance on the auto industry and on consumers. If these conditions continue over a longer period it may affect industry's possibilities to get new technology to market. However, ACEA confirmed that the currently experienced economic situation will not change its Commitment to reach its CO₂ target in 2008.

Apart from the work on fiscal measures (see chapter VI), the 2003 review (2004 for KAMA) will be of major importance for the further development of the Community strategy. Presently there are no legal requirements which oblige industry to reach 120 g CO₂/km by 2012 or any other date but according to the text of the Commitments, as well as the Commission's Recommendations, ACEA and JAMA shall in 2003 *"... review the potential for additional CO₂ reduction, with a view to moving further towards the Community's objective of 120 g CO₂/km by 2012"*. Informal consultation between ACEA and the Commission and JAMA and the Commission started in September 2003. Both, ACEA and JAMA have declared their intention to present the result of their respective review by December 2003 at the latest. Irrespective of the outcome of the review mentioned above, in the monitoring year 2003 (2004 for KAMA) comparisons between actual achievement and "estimated target ranges"²⁵ will be carried out, as a part of the "Major Review". This "Major Review" will address, in addition, questions related to the assumptions of the Commitments. In addition, as requested by Article 10 of Decision 1753/2000, the Communications for the intermediate target year (monitoring year 2003 for ACEA and JAMA, and 2004 for KAMA) will address questions related to the reasons for the observed reductions. It has to be thoroughly assessed whether the reductions registered are due to technical measures taken by the manufacturers, or due to changes in consumer behaviour.

25 For ACEA 165 – 170 g CO₂/km in 2003; for JAMA 165 – 175 g CO₂/km in 2003; for KAMA 165 – 170 g CO₂/km in 2004

4. IMPLEMENTATION OF DECISION 1753/2000/EC

The so-called "Monitoring" Decision came into force on 30 August 2000. The data collected under this Decision have, for the first time, been used in 2002 as official data for the monitoring of the voluntary commitments by the automobile industry to reduce emissions of CO₂ from passenger cars. All Member States delivered data for 2002, although some were quite late.

In order to identify and solve potential problems associated with the implementation of the Decision the Commission - in application of Articles 3 and 6 of the Decision - established an expert group in 2001. To support the group the Commission launched a study aiming at improving the data transfer and identifying potential data inconsistencies. The group has met four times and made progress on a number of methodological and data transfer issues.

The first two deliveries by Member States (2000 and 2001) were mainly used to compare the data with those submitted by the car manufacturers' associations joint monitoring reports. It should be recalled that the associations in their reports have used CO₂ statistics supplied by the AAA (Association Auxiliaire de L'Automobile - ACEA and KAMA) or by Marketing Systems (JAMA).

However, with official EU data becoming available, a discontinuity from the past data series exists and because of underlying differences (see below) it is not correct to simply adjoin official data for most recent years, onto the associations' historical data.

The main dimensions of this discontinuity are:

Country Coverage: The EU data for 2002 covers 15 Member States. Whereas, ACEA's and, apart from 2001, KAMA's CO₂ data has never included Greece, and has not until recently included Finland; JAMA's data cover all Member States.

Methodology Differences: AAA and Marketing Systems link registrations to their own, highly analysed, vehicle specification information bank, which is then used for all Member States' registrations. For EU data, each Member State has its own vehicle specification set, to which it links its national registrations; national variations in these vehicle specifications exist. This could cause small differences in the overall results as well as in some of the more detailed trend analysis data.

Registration Data Differences: The official EU data seems to miss a sizeable percentage of new car sales. In 2002, the difference is about 500 000 vehicles (equal to 4 % of total registrations)²⁶. It should also be noted that EU data disregards car registrations with no CO₂ data provided, whereas if no CO₂ information was available in the case of association data, and the data provider were unable to close the data gaps with the help of their own data, any such vehicles would be included under an "unknown" category.

Grey Area Problem: ACEA believes that some Member States register vehicles in accordance with the fiscal regime (commercial or private vehicle), not in accordance with M1/N1 category definitions. This issue needs to be studied further.

26 It should be noted that such a difference does not automatically lead to differences in the calculated CO₂ averages. This would be only the case if the characteristics of the missing data deviate systematically from the characteristics of the total fleet

Data Scope: The official EU data covers - as laid down in the Commitment - the CO₂ emissions of cars using all fuels, including AFVs. The associations' CO₂ data has consistently been on the basis of petrol and diesel cars²⁷.

Currently the variance between EU and association data in terms of the overall average CO₂ figure is only a little more than 1% for ACEA and about 0.1 % for JAMA²⁸. The Commission invited the car manufacturers' associations to clarify some of these issues by establishing direct contacts between their data providers and the responsible national organisations. Some work on comparability of data was done on 2002/2003 but only little progress could be made for cost reasons and for reasons of commercial confidentiality claimed by the data providers. The work on data quality will be continued and it is expected that over the long-term data differences should narrow.

5. IMPLEMENTATION OF DIRECTIVE 1999/94/EC

The “Labelling” Directive was adopted on 13 December 1999; the implementation by Member States was required by 18 January 2001. By the end of October 2003 all Member States but Germany had implemented the Directive. Under Article 226 EC, the Commission has brought the case to the Court of Justice which has delivered its ruling on 24/09/2003²⁹.

In 2003 Annex III of the Directive has been amended³⁰ and the Commission published a Recommendation with regard to "other media"³¹.

The Commission now awaits Member States' reports under Article 9 - which are due by 31 December 2003³² - in order to study the need for further steps, e.g. how to address best the other issues still to be solved as mentioned in Article 9.

27 It should be mentioned that the number of AFV was so small in the past, and still is, that these vehicles are negligible for the calculated CO₂ average

28 KAMA did not collect own data for the monitoring in 2002

29 C-74/02

30 O.J. L 186/34 of 25.07.2003

31 O.J. L 82/33 of 29.03.2003

32 Article 9 of Directive 1999/94/EC reads: “Any amendments which are necessary in order to adapt the Annexes to this Directive shall be adopted by the Commission in accordance with the procedure set out in Article 10 and following consultation with consumer organisations and other interested parties. In order to assist this adaptation process, each Member State shall transmit to the Commission, by 31 December 2003, a report on the effectiveness of the provisions of this Directive, covering the period from 18 January 2001 until 31 December 2002. The format of this report shall be established in accordance with the procedure set out in Article 10 not later than 18 January 2001. Furthermore, the Commission shall, in accordance with the procedure laid down in Article 10, take measures aiming at:

- (a) further specifying the format of the label referred to in Article 3 by amending Annex I;
- (b) further specifying the requirements concerning the guide referred to in Article 4 with a view to classifying new car models thus enabling a listing of the models according to CO₂ emissions and fuel consumption in specified classes including a class for a listing of the most fuel efficient new car models;
- (c) establishing recommendations in order to enable the application of the principles of the provisions on promotional literature referred to in the first paragraph of Article 6 to other media and material.”

Proposals for the amendment of the Directive, if necessary, could most likely not be made before 2005, coming into force most likely not before 2006/2007

6. WORK ON FISCAL MEASURES

6.1. Vehicle related work

In 2002 the Commission published the results of its work on fiscal framework measures³³. Focusing on registration (RT) and annual circulation taxes (ACT) the Commission concluded that:

- Fiscal measures are an important complementary instrument to support the realisation of the EU-target of 120 g CO₂/km for new cars by 2005, and 2010 at the latest, and to contribute to the accomplishment of the EU engagements under the Kyoto Protocol;
- National vehicle taxes should establish a more direct relation between tax level and the CO₂ performance of each new passenger car. Vehicle tax differentiation has been identified as an important parameter for improving the average fuel consumption of newly registered cars. Existing vehicle taxes should be replaced by taxes fully based on CO₂ emissions or, a CO₂ sensitive element should be added to existing RT and ACT. Add-on elements would also allow taking into account other national environmental objectives, e.g., the early introduction of EURO 4 standards.

The European Parliament reacted positively to the Communication³⁴. The Council started discussions in May 2003; they are still not finalised.

6.2. Fuel related work

Although currently not directly related to the Community Strategy to reduce CO₂ emissions from cars it might be of interest to take note of Directive 2003/96/EC which the Council adopted in October 2003. This Directive is restructuring the Community framework for the taxation of energy products and electricity. It established higher or introduces new minimum levels of taxation for a number of energy products and provides incentives for the promotion of the use of more environmentally friendly energy products. In the long run this work could gain importance for the CO₂ and cars strategy, e.g. if more cars switched to electricity or hydrogen as an energy source.

7. OTHER RELATED MEASURES

The Environment Council conclusions of 10 October 2000 requested the Commission to study emission reduction measures on light commercial vehicles (LCV, in technical terms equal to

33 COM(2002)431 final

34 Report A5-0265/2003, adopted by the EP on 6 November 2003

category N1 vehicles³⁵) and mobile air conditioning systems used in passenger cars³⁶. In the following the state-of-play of the work is presented.

7.1. LIGHT COMMERCIAL VEHICLES

Light commercial vehicles are the third largest category of on-road CO₂ emitters after passenger cars (PC) and heavy-duty vehicles (HDV). In the year 2000 LCV accounted for about 13 % of total on-road CO₂ emissions, emitting about 90 Mt CO₂. On current trends, it is predicted that these emissions will increase both in absolute and relative terms in the coming decade³⁷.

Standardised rules and procedures for the measurement of CO₂ emissions are a prerequisite for studying, developing and implementing emission reduction policy options for LCV. For this reason, the Commission adopted in 2001 a proposal concerning the measurement of CO₂ emissions and fuel consumption of light commercial vehicles³⁸. Under this proposal fuel consumption and CO₂ emissions for these vehicles would be determined, for type approval purposes, more or less in the same way as for M1 (passenger) vehicles. In September 2002, this proposal passed the 1st reading in the European Parliament and the Council's Common Position was adopted September 2003. The European Parliament is likely to accept the Common Position in December 2003 in which case the act would be deemed to be adopted in accordance with the Common Position.

The amendments made to the Commission's proposal by the two institutions are significant in so far as they propose to set a later date for the implementation of mandatory CO₂ and fuel consumption measurements: 2009, compared to the 2007 in the Commission's proposal. Full information on class I vehicles, including multi-stage vehicles, would be required from 1.1.2007 onwards. Full information on classes II and III vehicles, including multi-stage vehicles, would be required from 1.1.2009. The information on measured consumption and CO₂ figures of registered N1 vehicles as such would be available one year later, i.e. 2008 for class I vehicles and 2010 for classes II and III vehicles.

35 N1 vehicles are defined as vehicles used for the carriage of goods and having a mass not exceeding 3.5 tonnes

36 The Environment Council of 10 October 2000 concluded, that
"In the field of transport policy, the Council requests the Commission to study and prepare measures in the following areas, taking into account the rate of increase in emissions from the transport sector, as well as the need to reflect the social and environmental costs for each mode of transport, as also outlined in the report to the European Council of Helsinki:
- reduction of CO₂ emissions from vehicles, in particular to reduce CO₂ emissions from light duty vehicles
- reduction of all greenhouse gas (GHG) from air conditioning in vehicles"

37 Year 2000 figures. Passenger cars account for about 420 Mt and heavy duty vehicles, including buses for about 200 Mt. For details, see European Environment Agency: National and central estimates for air emissions from road transport. Technical Report 74

38 Proposal for a Directive of the European Parliament and the Council amending Council Directives 70/156/EC and 80/1268/EEC as regards the measurement of carbon dioxide emissions and the fuel consumption of N1 vehicles. COM(2001)543 final

The Council and European Parliament also incorporated possibilities to group vehicles together into families. This grouping - in conjunction with the "6% derogation" rule³⁹ - has unclear repercussions on the accuracy of the CO₂ and fuel consumption values finally reported for a particular vehicle type or version or variant. Therefore, one amendment requests the Commission to study the repercussions of the "grouping together" concept as well as of some of the other incorporated amendments within two years of the entry into force of the Directive, with the aim to present, if appropriate, measures for the adaptation of the Directive to technical progress.

The Commission has recently carried out an initial study on options for CO₂ emission reduction and policy development for LCV - covering the period 2005 to 2015 - with close stakeholder involvement. The results of this study are now available⁴⁰. The main conclusions are:

The N1 market: Around 20 million N1 light commercial vehicles are estimated to be on the market. There has been a steady growth of newly registered N1s from just above 1 million in 1995 to over 1.5 million in 2000. ACEA has a market share of around 90% of N1 vehicles, JAMA about 6-8%, and KAMA holds most of the remaining 2-4%. Diesel engines dominate the majority of the N1 vehicle market with around 95% penetration of new sales.

Expected future market trends: Sales of N1 vehicles in the EU are expected to grow by 2% annually. The future shares of the subclasses remain uncertain. A continuation of the trend seen 1995 to 2000 would further increase the share of classes II and III.

Development of CO₂ emissions: As CO₂ emissions of N1 vehicles are not yet included in the EU test procedures, no reliable base data exists. Therefore - according to the study - only a few estimates are available from a broad range of sources. The estimates suggest that the specific CO₂ emissions of new N1 vehicles in recent years have been decreasing. In this respect it should be noted that the AUTO OIL II scenarios⁴¹ predict an annual reduction of the specific CO₂ emissions of N1 vehicles of about 1.2 %. At the time the figure was approved by the car industry, and can be taken presently as the best indicator of expectations about future technology development. In comparison, the required annual CO₂ reduction figure for passenger cars under the CO₂ Commitments is about 1.9 %. As far as future CO₂ emissions are concerned, estimates show that - in a business as usual scenario, and keeping the market shares of the three subclasses constant - the emissions of new N1 vehicles are likely to increase from about 9500 Kt in 2005 to 11500 Kt in 2015.

Driving forces in the market: According to manufacturers the priorities of customers when buying N1 vehicles are in the following order: cost of ownership, functionality,

39 According to point 11.1 of Annex I to the draft amendment the type-approval can be extended to vehicles from the same type or from a different type differing with regard to the characteristics reference mass, maximum authorised mass, overall gear ratios and engine equipment and accessories, if the CO₂ emissions measured by the technical service do not exceed by more than 6 % for vehicles of category N1 the type-approval value

40 "Preparation of measures to reduce CO₂ emissions from N1 vehicles", study carried out by RAND Europe, Institut für das Kraftfahrtwesen Aachen, Transport&Mobility Leuven

41 COM(2002)626 final

robustness, safety and dynamics. Since incremental savings due to improved fuel-efficiency are a relatively small part of the total costs of ownership, they are not likely to play the major role in decision making, neither for customers nor for manufacturers.

Technology options: A large number of currently available technologies have been identified which could reduce fuel consumption and CO₂ emissions of N1 vehicles - see Table 5. While the figures on CO₂ savings are considered as quite reliable, the cost estimates are less certain. They are based on a literature review of costs for the end-consumer. It is realistic to assume that the actual costs for the manufacturers are significantly lower. As a rule, it is estimated that the production costs are by a factor of 2 to 3 lower than the prices for the end consumer. However, the actual costs for the end-consumer are ultimately a question of competition and marketing so it is an important factor for the manufacturers.

<u>Technology Option</u>	<u>CO₂ Saving</u>	<u>Estimated Cost, Expressed in Consumer Price</u>
■ Engine		
■ Injection system	- 15% to - 20%	+ 700€ to + 1000€
■ Valve gear	- 10% to - 15%	+ 250€
■ Exhaust control systems	+ 2%	+ 100€ to 3.500€
■ Turbo-charging, down -sizing	- 25% (class 1)	+ 20% engine cost
■ Hybrid	- 11% to - 20%	+ 2500€ to + 7000€
■ Fuel		
■ Alternative Fuels	- 10% to - 19%	+ 1500€
■ Energy Management		
■ Accessories	- 1% to - 2%	+ 50€
■ Starter/generator	- 6% to - 30%	+ 1000€
■ Drive Train		
■ Transmission concept	- 3% to - 18%	+ 260€ to + 900€
■ Drive train automation	- 3% to - 15%	+ 100€
■ Body / Chassis		
■ Optimisation of aerodynamics	- 4%	+ 1500€
■ Optimisation of rolling resistance	- 2%	+ 100€
■ Lightweight design	- 4% to - 7%	+ 1600€

Table 5: Possible CO₂ savings in 2010 and estimated technology costs, expressed in consumer prices

Scenario calculations: Based on the identified technology options and costs, the study developed two scenarios, a realistic one and an optimal one, in order to assess

the future evolution of CO₂ emissions and associated specific costs⁴². Table 6 shows the results of these investigations. If the realistic technology options were applied for all cars sold in 2005, CO₂ emissions would be reduced by 6.7 % from 9550 Kt to 8910 Kt. If the optimal technology options were applied the reduction would be 13.3 %. In 2010 the figures are 11.3 % and 23.1 % respectively for the two options. In 2015 the figures are 22.8 % and 28.5 %. All these reduction figures are in relation to the business-as-usual scenario. It should be mentioned that the annual reductions assumed for the 'realistic scenario' are very close to the reduction rate incorporated in AUTO OIL II. That means they are in line with the future technology expectations of the AUTO OIL II expert groups.

Constant market scenario		2005	2010	2015
Baseline	Total CO ₂ of new LCV (Kt)	9,550	9,818	11,463**
"Realistic scenario"	Total CO ₂ of new LCV (Kt)	8,910	8,704	8,848
	Abatement costs (EURO/ton)*	-18	5	14
"Optimal scenario"	Total CO ₂ of new LCV (Kt)	8,280	7,558	8,196
	Abatement costs (EURO/ton)*	-8	54	52

* The abatement costs include investment costs (see Table 5) and fuel savings, taking into account estimated future fuel prices

** Please note: the increase of emissions from 2010 to 2015 is due to the expected increase in the number of new N1 vehicles within this period of time

Table 6: CO₂ emissions and annualised specific abatement costs in 2005, 2010 and 2015 for two scenarios, taking into account investment costs and fuel savings

Cost-effectiveness considerations: According to this study an analysis of the two technology options shows that figures for cost-effectiveness range between a saving of 18 EURO per tonne abated, up to a cost of about 54 EURO/tonne abated, depending on the scenario. Table 6 sets this out in more detail, based on the costs for consumers shown in Table 5. For comparison a benchmark figure between 20 and 50 EURO/tonne is mentioned in the European Climate Change Programme as an

42 The study group estimated the base case CO₂ emission for years 2005, 2010 and 2015 using the TREMOVE model. They first estimated the total and new N1 fleet numbers, then the CO₂ emissions for new vehicles by class. With this as a basis the technology options were evaluated. The base case for CO₂ emission is based on extrapolating the current fleet and current technologies. The average kilometres driven are estimated to go up only slightly from 19,738 in year 2000 to 20,016 km by 2015. Finally, CO₂ emissions reductions associated with different scenario settings were calculated

indicator of cost efficiency^{43,44}.

The specific costs depend, inter alia, on the vehicle class. Most cost efficient are measures implemented in class I vehicles, followed by the combination of technologies applied in both classes I and II. For some of the scenarios - in particular for the more demanding measures for the sub classes II and III, envisaged to be taken in 2010 and 2015 - the costs would be slightly above the 50 EURO/tonne cut.

The work on N1 vehicles is inconclusive and has not yet been finalised. It is therefore too early to present final policy options.

Nevertheless, in the light of the findings up to now the Commission is considering measures. Among these are:

- the introduction of labelling requirements similar to those which have been introduced for M1 vehicles (see Directive 1999/94/EC),
- the monitoring of emission trends for N1 vehicles (see Decision 1753/2000/EC),
- CO₂ emission reduction measures for N1 vehicles

The timing of implementation of these measures will depend on the outcome of discussions at Council and European Parliament level on the proposed amendments to Directive 80/1268/EEC and the results of additional studies to be carried out in the coming years.

Measures concerning CO₂ emission reductions from light commercial vehicles can only be considered when we have comprehensive and reliable emission data, measured in accordance with the proposal concerning the measurement of CO₂ emissions and fuel consumption of light commercial vehicles.

To attain more information on the issues mentioned above the Commission decided to launch a follow-up study focussing on

- i measuring, in accordance with the amended Directive 80/1268/EEC, the fuel consumption and the CO₂ emissions of a representative number of light commercial vehicles,
- ii addressing the questions listed by Council and the European Parliament in Article 3⁴⁵ of the amended Directive 80/1268/EEC, as applicable to category N1 vehicles, and

43 A common feature of the different ECCP working groups was the identification of a criterion “below 20€/t CO₂eq” and “below 50€/t CO₂eq.” as a benchmark to evaluate the cost-effectiveness of each potential measure. However, it should be mentioned that the ECCP cost criterion is only used for measures for the first commitment period. For technology to be introduced in 2015 future costs-efficiency assessments might come to different conclusions

44 ECCP report of March 2003. However, the 20 to 50 EURO/tonne should not be regarded as a strict cut-off point but, taking into account the uncertainties related to the specific implementation, gives a general indication of the cost-effectiveness of a certain measure, while other considerations (for instance benefits related to security of supply, related to other environmental issues or in the longer term,) need to be taken into account as well. Other common criteria for the cross-sectoral assessment and comparison of measures were the time frame for implementation and the impact on other policy areas, see Second ECCP Progress Report: "Can we meet our Kyoto targets?"

- iii developing further the evaluation of policy options for reducing emissions from this category or its subclasses, including Candidate Countries.

The result of this study will be available by the end of 2004.

7.2. MOBILE AIR CONDITIONING

The Commission started work on mobile air conditioning focusing on possible options to (i) measure and, if possible, reduce the additional fuel consumption and related CO₂ emissions, and (ii) to reduce emissions of the coolant (HFC-134a). Both activities are part of the European Climate Change Programme⁴⁶. The results of the work on the coolant are presented elsewhere⁴⁷.

With regard to fuel consumption there is growing evidence that the use of air conditioning systems in passenger cars could add significantly to CO₂ emissions. This is a source not covered by the existing legislation on fuel consumption and CO₂ emission measurements and therefore not covered by the Commitments of the car industry⁴⁸. Estimates show that the additional emissions are in the range of 3 to 8 %⁴⁹. Moreover, there seems to be a potential to reduce the impact on fuel consumption of the use of the equipment by about 50 %.

Again, a prerequisite for studying the impact of the use of air conditioning systems are reliable test procedures. Therefore the Commission aims at finalising the work as quickly as possible, while striving to establish internationally harmonised test procedures, where appropriate.

8. CONCLUSIONS

The Community's strategy to reduce CO₂ emissions from passenger cars and improve fuel economy aims at achieving an average specific CO₂ emission figure for passenger cars newly registered in the Community of 120 g CO₂/km by 2005, and by 2010 at the latest. The specific CO₂/km value achieved in the calendar year 2002 was 166 g CO₂/km⁵⁰, compared to

45 This new draft Article requests the Commission, not later than two years after the entry into force of this Directive, to:

- a) present a study on the possibilities to obtain representative CO₂ emissions and fuel consumption data for completed multi-stage vehicles and vehicles whose emissions are measured according to Directive 88/77/EEC in order to take into account the "cost-efficiency" aspects of these measurements
- b) present an evaluation of the vehicle family concept introduced in this Directive
- c) if appropriate, present draft measures on the adaptation of this Directive to technical progress to the Committee established by Art. 13 of Directive 70/156/EEC

46 COM(2001)580 final

47 COM (2003)492 final

48 The Commitments specify that new car CO₂ emissions will be measured according to Directive 93/116/EC, which is the basis on which the targets were established. This test does not include the use of mobile air conditioning. In any case changes of the test procedure, as happened last time with Directive 99/100/EC, need to be taken into account in the monitoring of the CO₂ Commitments by correcting the measured CO₂ emissions in order to bring them into line with the 93/116/EC procedure. The last correction made is the 0.7 % adjustment mentioned in the footnote of Table 2

49 "Options to reduce Greenhouse Gas Emissions due to Mobile Air Conditioning" Summary of discussions of the 'MAC Summit' held in Brussels on 10/11/ February 2003.
(see <http://europa.eu.int/comm/environment/air/mac2003/pdf/macsummitdiscussion.pdf>)

50 Figure based on official EU data

186 g CO₂/km in 1995, the reference year of the Community strategy. While it is unlikely that the 120 g CO₂/km target would be met as early as 2005, it remains realistic to meet the objective by 2010 if the necessary measures are taken and all efforts are made. It is important that ACEA and JAMA achieved early their intermediate target set for 2003.

It seems clear that to achieve the overall target the implementation of all three pillars of the strategy will be necessary. The recently published Communication of the Commission on passenger car taxation presents, inter alia, options for taxation schemes that can support the Community Strategy to reduce CO₂ emission. In addition the results of the 2003⁵¹ review of the potential for additional CO₂ reductions by the manufacturers' associations with a view to moving further towards the Community's objective of 120 g CO₂/km by 2012 will be of great importance.

The implementation of the commitments by the car industry shows good progress. However, in order to meet the final target of the Commitments (140 g CO₂/km) all three associations have to increase their efforts to a greater or lesser extent. Based on the Joint Reports the Commission has no reason to believe that ACEA and JAMA would not live up to its respective commitment. With regard to KAMA there is valid reason to be concerned. Additional and significant efforts will be necessary by KAMA if it is to meet its intermediate target for 2004. This has been emphasised to KAMA and it has reiterated its determination to achieve the targets to which it has committed.

The implementation of Directive 1999/94 and Decision 1753/2000 made good progress and is nearly complete.

The Commission is continuing its work concerning CO₂ emissions from light commercial vehicles and started to work on CO₂ emissions due to the use of mobile air conditioning.

51 2003 for ACEA and JAMA, 2004 for KAMA