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EUROPEAN CONFERENCE OF MINISTERS OF TRANSPORT
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Council of Ministers

MONITORING OF CO2 EMISSIONS FROM NEW CARS

This document is submitted to the Council of Ministers at its Session in Warsaw, for information and discussion.

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Or. Eng.

Ministers are asked to:

Note the report;

Agree to continue monitoring the CO₂ emissions of new passenger cars under the Joint Declaration with Industry until such time as the monitoring system under development by the European Commission is operational;

Request Deputies to:

- continue work under the Joint Declaration with Industry;
- report in 2000 on some of the policy issues arising from the monitoring of new passenger vehicles and on issues related to emissions of vehicles in use;
- and to report again on monitoring, if necessary, in 2001.

Background

In their 1995 Joint Declaration on reducing CO₂ emissions from passenger cars, ECMT agreed with the vehicle manufacturing industry, represented by ACEA and OICA, on a number of joint actions, including the establishment of a new car fuel consumption monitoring system.

After examining available options for establishing the most appropriate monitoring system, governments and industry agreed on a pragmatic and cost-effective approach, based on data from an existing high-quality industry source. In 1996, a first report under the Declaration was presented, covering monitoring data and analysis for the period 1980 to 1995.

Set out below is a further progress report, based on the same data source and covering, in particular, figures and developments for 1996 and 1997. The prior report mentioned the possibility of official EU data being provided within the context of the European Communities car CO₂ reduction strategy; such data will not be available before 2001.

As noted in the first report, data is affected by the change in the official test-cycle for fuel consumption. The impact of the change is significant from 1996 onwards. CO₂ emissions data is now being estimated in accordance with Directive 93/116/EC, which replaced the "old" Directive 80/1268/EEC. The "new" test cycle was implemented, in large part, as of 1.1.1997 and will remain applicable for the next few years. Amongst other changes, the "new" cycle includes for the first time a cold start period, and consequently higher fuel consumption/CO₂ emissions are recorded. In the prior report it was expected that the impact of the new cycle would be higher values for fuel consumption, of the order of 10%; other comparisons (by industry) indicate an increase of some 9% in average car CO₂ emissions. This latter figure has been used, where necessary, in the following analysis; this has enabled trends to be identified which would not be otherwise possible. It is important to realise that the change in Directive has created an "artificial" increase in recorded CO₂ emissions which is not reflected in the real world. In reality CO₂ emissions from new cars have altered little.

The present report covers 15 countries (Switzerland and Norway together with the countries of the European Union excepting Finland and Greece). The 1996 report covered the same set of countries, although trends in only 7 were analysed in detail. For the future, uniform monitoring of CO₂ emissions in

newer Member countries should be facilitated by recent activities carried out in the framework of the UN Economic Commission for Europe. Annexed to the 1958 Agreement on uniform technical requirements for wheeled vehicles is Regulation No. 101, which entered into force on 1 January 1997 for application in 29 Contracting Parties, including the European Community. This Regulation establishes a uniform manner to measure CO₂ emissions, although it does not prescribe any emissions limits. The test cycle adopted is identical to that prescribed by EU Directive 93/116/EC. A number of central and eastern European Member countries have expressed an interest in being included in any future monitoring exercise.

Recent Trends

The first ECMT monitoring report showed 1995 average fuel consumption of new cars in 15 European markets at 7.1 litres per 100km (measured according to the "old" 80/1268/EEC cycle). However, as noted above, from 1996/1997 and for future years official car CO₂ emissions will be compiled according to a new test cycle with, amongst other things, results being produced in terms of grams of CO₂ emissions per km. In order to allow a consistent interpretation of trends based on the "new" test cycle (93/116/EC), the above 1995 figure has been recalculated on the new basis.

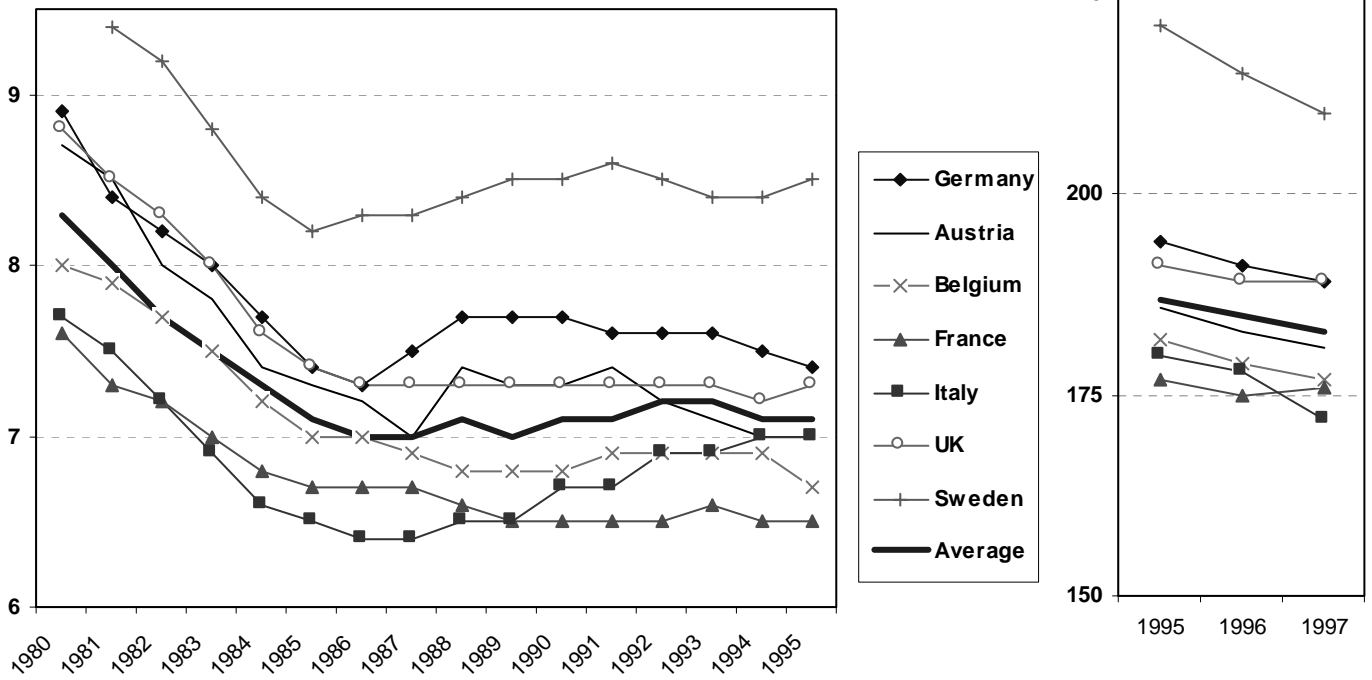
The need to make this adjustment was, of course, anticipated in the prior monitoring report; and the conversion indicates that in 1995 the average fuel consumption of new cars in the 15 European markets was 187g CO₂ per km. This figure forms the basis for the following review of more recent trends. Because of the progressive phase-in of the application of the new test procedure some similar calculations have also been needed to obtain consistent data for 1996 and 1997.

As can be seen in the table below, from a 1995 base of 187g CO₂ per km, average European new car CO₂ emissions reduced to 184g/km in 1996, and to 183g/km in 1997 -- with falls occurring in all countries. Thus over the 1995 to 1997 period new car CO₂ emissions in Europe as a whole maintained the steady and continuous path of reduction evident since 1992. Of course over the longer term, new car fuel efficiency has shown major improvement. In the past, as now, reductions in actual consumption have been partially offset by the requirements of automotive regulations (emissions, safety, noise) and consumer demands (quality, comfort).

Weighted Average Fuel Consumption and CO₂ Emissions, All New Cars

Test cycle - 80/1268/EEC
(Litres / 100 km)

Test cycle - 93/116/EC
(Grams CO₂/km)



Note: Weighted average for 7 countries (1995-187g/km; 1996-185g/km; 1997-183g/km)
Source: ACEA/OICA, 1999.

AVERAGE FUEL CONSUMPTION/CO2 EMISSIONS OF NEW CARS WEIGHTED BY REGISTRATIONS

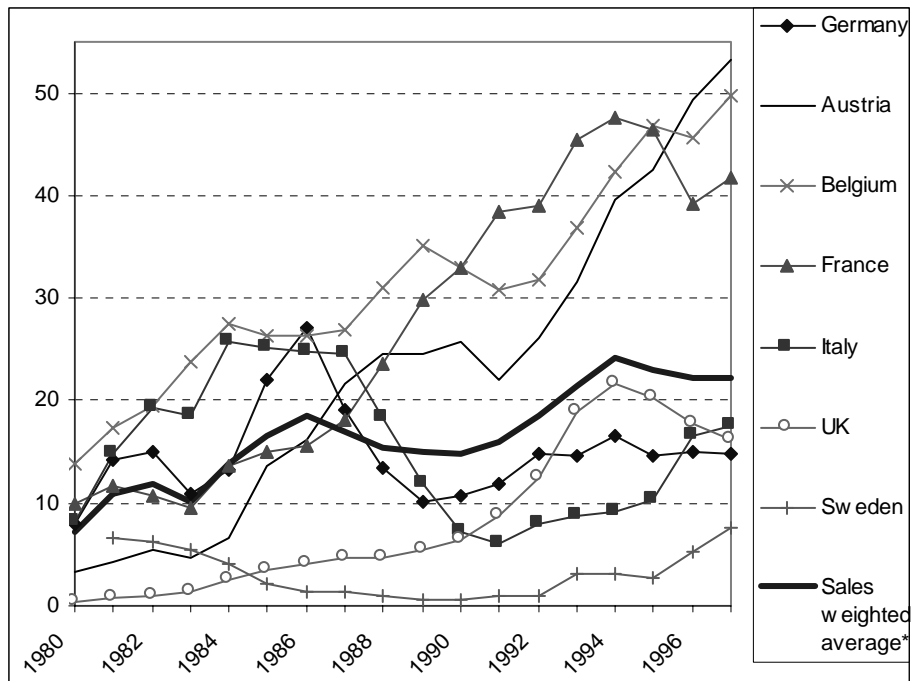
Directive:	80/1268		93/116	93/116	93/116
Year:	1995		1995	1996	1997
	Lit./100km		CO2 g/km	CO2 g/km	CO2 g/km
	*				
Austria	6.98		186	183	181
Belgium	6.72		182	179	177
Denmark	7.23		188	185	185
Finland	-		-	-	-
France	6.52		177	175	176
Germany	7.42		194	191	189
Greece	-		-	-	-
Ireland	6.85		179	177	174
Italy	6.97		180	178	172
Luxembourg	7.38		197	192	191
Netherlands	7.15		188	185	184
Norway	7.56		196	191	192
Portugal	6.62		171	168	165
Spain	6.64		177	175	174
Sweden	8.52		221	215	210
Switzerland	8.30		216	212	211
UK	7.26		191	189	189
Weighted Average	7.10		187	184	183

* from prior report

The reduction in new car CO2 emissions can also be viewed in the context of developments in the physical characteristics of cars sold in Europe. Set-out below are recent new car developments in terms of dieselisation, average cylinder capacity and power; key trends are:

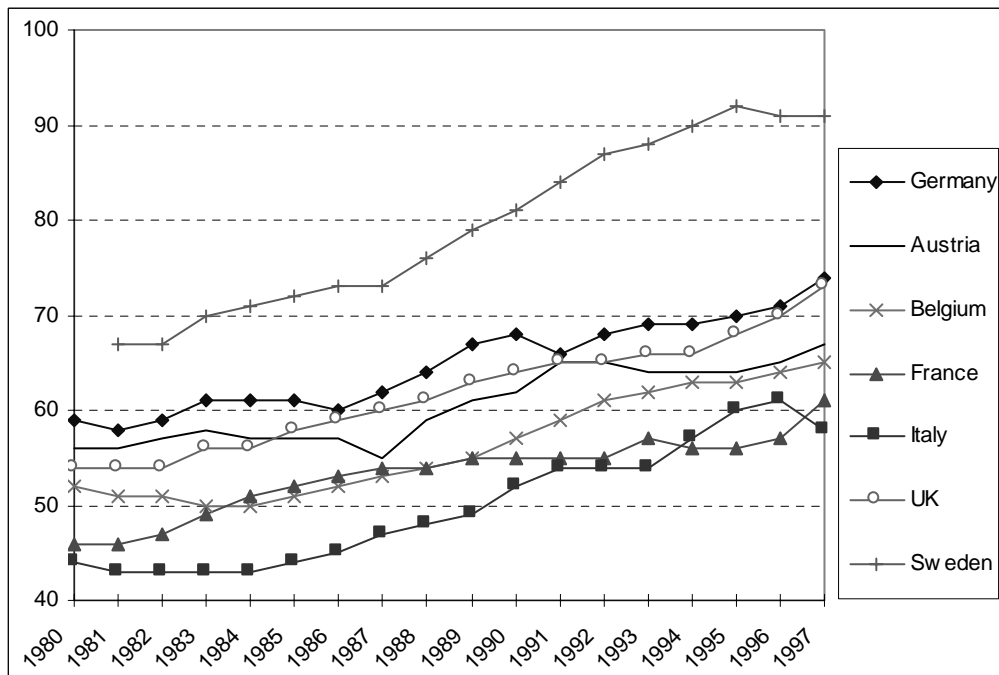
- **diesel penetration** in Europe has remained stable for quite a number of years now, at around the 22% mark. However dieselisation varies considerably across Europe with certain countries at diesel shares above 40% (such as: Austria, Belgium, Spain and France), and other countries with very low diesel penetration (such as: Denmark, Norway, Sweden and Switzerland).
- **average cylinder capacity and power** of car engines varies considerably from one country to another – reflecting the differing economic and geographic conditions in the various markets. Over the 1995 to 1997 period, these two parameters have grown slightly; however in 1997 car cylinder capacity showed a decline on its 1996 level.

Penetration of Diesel Cars (% of new sales)



Note: *All Europe for which data recorded (8 countries in 1980, 16 countries from 1995).
 Source: ACEA/OICA, 1999.

Sales Weighted Average Power (kW)



Source: ACEA/OICA, 1999.

DIESELISATION

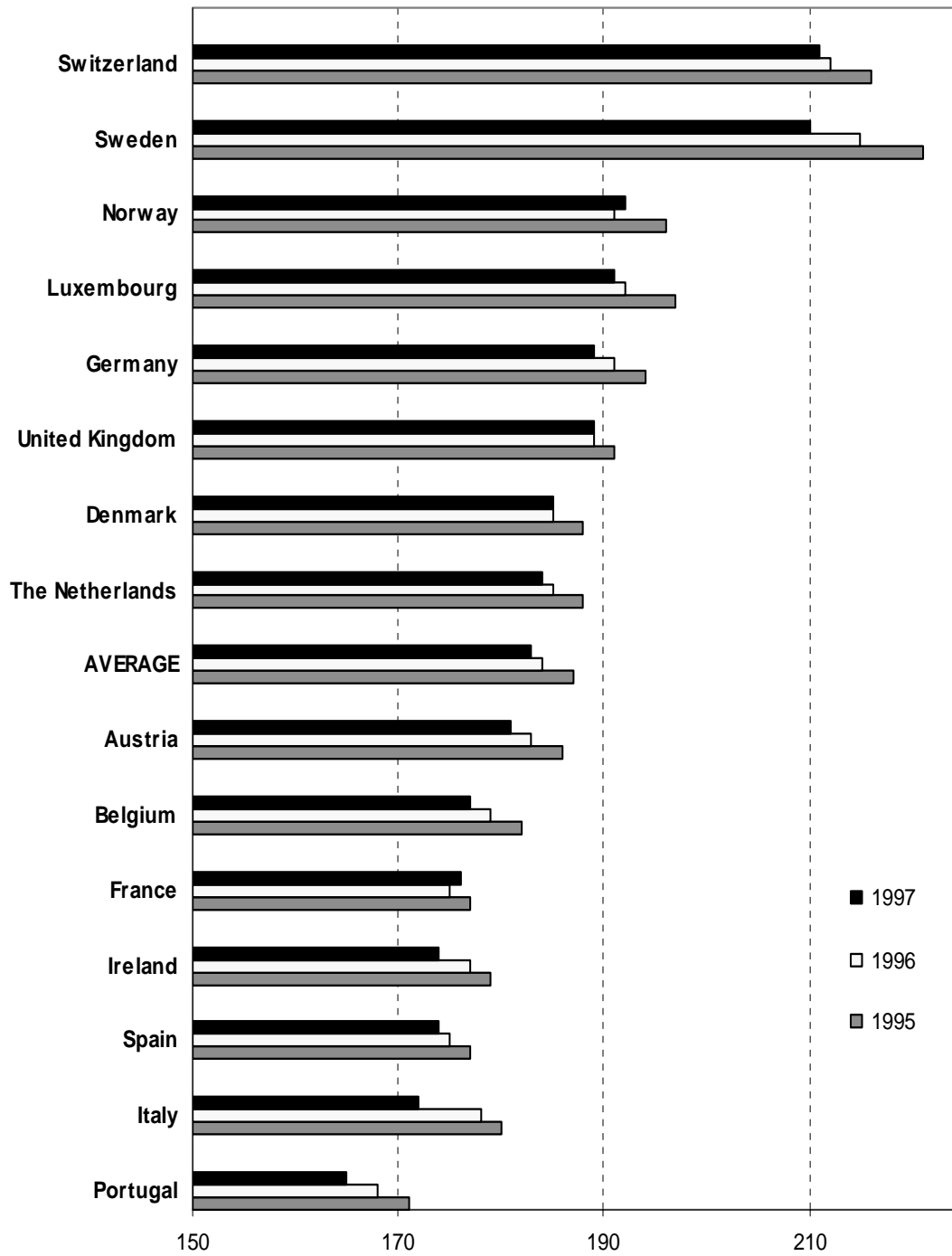
	Diesel Market Share		
	1995	1996	1997
	%	%	%
Austria	42.6	49.4	53.3
Belgium	46.8	45.7	49.8
Denmark	2.9	2.9	3.0
Finland	6.9	13.5	14.6
France	46.5	39.2	41.8
Germany	14.6	15.0	14.9
Greece	-	-	-
Ireland	15.9	13.3	11.3
Italy	10.5	16.5	17.5
Luxembourg	28.6	32.4	35.2
Netherlands	13.8	15.3	17.1
Norway	6.1	7.2	6.2
Portugal	10.6	12.6	16.9
Spain	33.6	37.5	42.2
Sweden	2.8	5.2	7.6
Switzerland	4.3	4.7	5.1
UK	20.2	17.8	16.1
Weighted Average	22.1	22.3	22.3

AVERAGE CYLINDER CAPACITY AND POWER

	Av. Cylinder capacity			Average Power		
	1995	1996	1997	1995	1996	1997
	Cc	cc	cc	KW	KW	kW
Austria	1750	1771	1797	64	65	67
Belgium	1745	1734	1739	63	64	65
Denmark	1613	1626	1643	67	69	71
Finland	-	-	-	-	-	-
France	1635	1601	1653	56	57	61
Germany	1744	1755	1760	70	71	74
Greece	-	-	-	-	-	-
Ireland	1504	1466	1458	58	58	58
Italy	1456	1493	1431	60	61	58
Lux-bourg	1863	1870	1883	75	76	79
Netherlands	1641	1643	1661	65	66	68
Norway	-	-	-	-	-	-
Portugal	1328	1347	1372	51	53	56
Spain	1621	1640	1670	58	60	61
Sweden	2046	2003	1959	92	91	91
Switzerland	1954	1948	1952	87	88	90
UK	1678	1690	1709	68	70	73
Weighted Average	1659	1665	1662	65	66	68

Average CO₂ Emissions of New Passenger Cars Weighted by Registrations

(grams CO₂/km measured according to norm 93/166/EC)



Source: ACEA/OICA, 1999.

Based on figures for the recent past and current developments, the momentum of CO₂ reduction appears to be building. Evidence of the European industry's interest in delivering fuel efficiency improvement was highlighted in the prior report, and this has been reinforced by ACEA's (the European Manufacturers Association) commitment on CO₂ emissions reduction (see below). The EU Council approved this voluntary commitment in October 1998, with an environmental agreement between ACEA and the Commission being finalised in early 1999 [99/125/EC]. The agreement is at the heart of the Community's overall strategy on CO₂ emissions from cars, and it is estimated that ACEA's commitment will contribute more than 15% of the total CO₂ savings required from the EU under the Kyoto Protocol.

ACEA's Commitments

ACEA's collective commitments are extremely ambitious, both technically and economically, and go far beyond any "business as usual" scenario; they demonstrate the seriousness with which the European industry takes its environmental responsibilities, and the gathering pace of activity. Specifically, ACEA has committed itself to:

- bring to the market individual car models with CO₂ emissions of 120 g/km or less by 2000;
- achieve an average CO₂ emission figure of 140 g/km by 2008 for all its new cars sold in the EU -- this translates into an average CO₂ reduction of 25% compared to 1995;
- an estimated target range of 165–170 g/km in 2003 -- a 9-11% reduction compared to 1995;
- review in 2003 the potential for additional improvements with a view to moving the new car fleet average further towards 120 g/km by 2012;
- a joint ACEA/Commission monitoring of all the relevant factors related to the commitments.

It is to be noted that the profile of CO₂ emissions reduction is not expected to be linear; the pace will be relatively slow initially, and gather momentum later. The profile will notably depend on the timing of availability of improved quality fuels on the market as well as on the lead-time for new technologies and products, and their market penetration.

Key Contributions to Future CO₂ Improvements

The European automotive industry has made its CO₂ commitment, and manufacturers are now continuing to gear massive research and product and process development towards attaining the 140g/km target by 2008. Climate change is, of course, a worldwide challenge, to which all involved need to contribute in a "joint endeavour"; this approach was well recognised within the 1995 ECMT/industry Joint Declaration on reducing car CO₂ emissions. It can be envisaged that key contributions to future car-related CO₂ improvements should include those coming from:

- **Improved Fuel Quality:** There is need for the full market availability of fuels of sufficient quality to enable the application of the new technologies needed for the industry to achieve its CO₂ commitments. Specifically, the oil industry needs to initiate soon the comprehensive introduction of environmentally-friendly fuels; in particular, gasoline and diesel with maximum sulphur contents of 30ppm or less.

- **Focussed Automotive R&D programme:** In view of the long-term dimension of climate change, the development of new breakthrough technologies will be essential. To support this process the industry has formulated a joint CO₂ R&D programme, with wide participation across the whole of the sector's research base. There is now a need for active support and co-operation from European Community and national research programmes, and for automotive R&D to be accorded its own Key Action in future European Community Framework Programmes.

- **Unhampered Diffusion of Car CO₂-efficient Technologies:** European car manufacturers have high expectations for certain technologies, particularly CO₂-efficient direct injection gasoline and diesel technologies. The unhampered diffusion of car CO₂ efficient technologies into the marketplace, via competition between manufacturers, is essential. More generally, the industry strongly believes its efforts would now benefit from a stable, predictable external environment, substantially free from additional CO₂ measures that affect new cars, or from automotive regulations with "mutually exclusive" demands. Such policies could severely disrupt the industry's demanding tasks of developing a range of cars which meet customers' needs, and which also meet its CO₂ commitments.

- **Promotion of Fleet and Non-Product Measures:** To encourage an ethos of support and "joint endeavour" for CO₂ reduction widely amongst Europe's populous, and to achieve short term improvements, a series of broader policy options should be pursued. Examples of such initiatives might include: incentives for fleet renewal; encouragement for correct vehicle maintenance; driver education and training schemes; telematics and infrastructure optimisation; and better integrated land use and transport planning.