

DEPLOYMENT STRATEGIES FOR CLEAN AND FUEL EFFICIENT VEHICLES: EFFECTIVENESS OF INFORMATION AND SENSITIZATION IN INFLUENCING PURCHASE BEHAVIOUR

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ABSTRACT

Consumer information on the environmental performance of passenger cars is an important element in the European Strategy to lower CO₂-emissions from passenger cars in particular and road transport in general. In the paper, the implementation of the Directive on consumer information on fuel consumption and CO₂-emissions of new passenger cars is analysed in several member states. Recommendations on the improvement of the scheme for increasing the impact are given. In an analysis of the evolution of CO₂-emissions of new passenger cars in the EU-15 it is investigated if there are indications for a possible impact of the consumer information. An in depth analysis of the evolution of the fleet of newly registered cars in Belgium gives more background on market trends that influence the average CO₂-emissions of new passenger cars. Conclusions on the use of consumer information and necessary measures to further support the decrease of the CO₂-emissions of new car registrations are given.

INTRODUCTION

In the evolution of the emission of greenhouse gases, the greenhouse gas emissions of transport remain a big concern and a drastic reduction does not seem to happen. Between 1990 and 2001 greenhouse gas emissions in the EU decreased in most sectors (industry, energy supply, agriculture, waste management). Emissions from transport showed an increase of 21 % in the same period. Emissions from transport are projected to increase by 34 % from 1990 levels by 2010 in the 'with existing domestic measures' projections [1].

The policy of the European Union to reduce CO₂-emissions of road traffic focusses on three objectives: increase the efficiency and lower fuel consumption of road vehicles, promote a shift from road transport to more efficient transport modes (rail, waterborne transport) and enhance the substitution of fossil fuels to alternative motor fuels [2].

To increase the efficiency and lower the fuel consumption of road vehicles, most important policy lies in the decrease of the CO₂-emissions of new passenger cars. This policy of the EC has three pillars [3]:

- Voluntary agreement with the car industry to reduce the average specific CO₂-emission of new passenger cars;
- Consumer information on fuel consumption and CO₂-emissions of new passenger cars;
- Fiscal framework to promote energy efficient cars.

To monitor the evolution of the CO₂-emissions of new passenger cars, the EC has established a monitoring procedure in which Member States have to report annually on the CO₂-emissions of newly registered cars [4].

This paper deals with the implementation and the effectiveness of the second pillar of the strategy to reduce specific CO₂-emissions of new passenger cars, the compulsory consumer information on fuel consumption and CO₂-emissions of new passenger cars. In the paper, the implementation of the Directive in the Member States of the EU-15 is evaluated and the effectiveness of consumer information in influencing purchase behaviour and thus lowering the average CO₂-emissions of new passenger cars is investigated. The effectiveness of the information in Belgium is looked at in detail.

CONSUMER INFORMATION SCHEME

In 1999, 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 was published [5]. It establishes a scheme for providing information to consumers on fuel consumption and related CO₂-emission of new passenger cars when the purchase decision is taken. It consists of four elements: a CO₂-label that has to be present on all new passenger cars displayed at any point of sale, a poster that has to be present in the showroom with all models displayed in the showroom and their fuel consumption, the compulsory insert of information on fuel consumption and CO₂-emission in all printed commercial material related to specific car models (recently broadened to commercial material on internet [6]) and the annual publication of a fuel consumption guide which contains all car models sold on the national market with the figures of fuel consumption and CO₂-emissions.

In the implementation, minimum requirements were set for the four elements of the Directive but Member States had the possibility to install stricter requirements. Most striking difference on the implementation is the compulsory lay out of the CO₂-label which has to contain minimum figures on fuel consumption and CO₂-emission of the respective car. In most countries, additional information with a comparison of the fuel consumption of the car to the average consumption of all cars of the same fuel type (absolute comparison) or similar cars (relative comparison) by means of a colour code is given. In Figure 1 and Figure 2 two label formats are shown: a label with minimal requirements implemented in Finland and a label with relative colour scale of comparison implemented in the Netherlands.

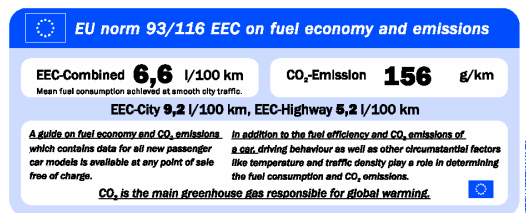


Figure 1: CO₂-label in Finland



Figure 2: CO₂-label in the Netherlands

Member States had to implement the Directive in national legislation by the end of 2000 which meant that the scheme had to be operational by the beginning of 2001. Mid 2004, the implementation is done in most member states of the EU-15. An overview of the implementation process in the member states with main parameters on the implementation process is given in Table 1.

	Operational since	Label format	Internet database	Additional
A	03/2001	AC	X	
B	01/2001	AC	X	
D	03/2000	AC	X	Taxation
FI	12/2000	Minimal	X	
FR	12/2002	Not issued	X	
G	-	Not issued	-	
H	01/2002	AC	-	
IR	07/2001	Not issued	X	
IT	-	Not issued	-	
LU	04/2001	Minimal	-	
NL	11/2000	RC	X	Taxation*
P	11/2001	AC	X	
ES	08/2002	Minimal**	X	
S	12/1996	AC	X	
UK	11/2001	Minimal	X	Taxation

Table 1: overview of implementation of directive consumer information in EU-15 (AC: absolute comparison, RC = relative comparison)

Source: internal CLASE report 'labelling directive status June 2004'

From Table 1 it can be learnt that the information scheme in most member states is established, except for the countries where car industry is an important sector (France: no full implementation yet, Germany and Italy still in process of implementation). In most member states, the label contains more information then required, mostly an absolute comparison of

the fuel consumption of the car compared to all cars of the same fuel type. The only country where relative information is given are the Netherlands, in Spain (**) there exists a voluntary label with relative comparison but the official label only has to fulfil minimal requirements. Most countries maintain a supporting internet database with the information that is published in the printed fuel consumption guide but which is updated more regularly. In Denmark and the UK, car taxation is based on fuel consumption which is indicated on the label. In the Netherlands (*), a subsidy was given for cars with an A or B label (relative fuel efficient cars) but this subsidy only existed for two years.

In the next chapter it is investigated how the aspects of the implementation have a relation with the impact of the information on influencing consumer behaviour.

IMPACT ANALYSIS

In the EU funded CLASE project, a European Study is going on on the evaluation of the effectiveness of the consumer information on the purchase behaviour. In five selected countries (Austria, Belgium, Denmark, Portugal, Spain) a market research is done to assess the compliance with the elements of the directive, the involvement of the dealers, the awareness of the consumers and impact on purchase behaviour. This information is compared to the available information that is provided by the member states following compulsory reporting which was due in december 2003. The European Study is based on qualitative information of eight member states. The main results on the compliance of the different elements are summarised in Table 2.

	B	NL	UK	P	DE	FI	A	E
Label compliance ¹	71%	98%	Varies	85%	37%	51%	100%	28%
Guide compliance available ²	25%	20%	Varies	84%	53%	n.a.	High	6%
Guide compliance hand out ³	7%	Low	Varies	44%	39%	n.a.	High	6%
Poster compliance ⁴	25%	n.a.	Varies	80%	4%	30%	100%	39%
Promotional material compliance ⁵	85%	n.a.	Varies	high	76%	100%	66%	77%

Table 2: compliance of consumer information in selected member states

¹ Label compliance = % of showrooms where label correctly displayed at majority (80% or more) of displayed cars

² Guide compliance available = % of showrooms where guide was present in the showroom

³ Guide compliance hand out = % of showrooms where guide was visible and handed out to the consumer

⁴ Poster compliance = % of showrooms where poster was compliant to requirements and visibly present in showroom

⁵ Promotional material compliance = % of advertisements in magazines which contained compulsory information

On the compliance with the materials, it can be concluded that the elements of the directive are reasonably well present in most countries, except for the guide. The dealers cooperation in distributing the guide and giving information from the label to the consumers is very low in all countries. The knowledge of the dealers and consumers on the elements and the purpose (link with greenhouse effect) is poor. Consumers are positive towards the information and awareness is raising, but only in Denmark a shift to more fuel efficient cars based on the information received on the label was stated by the consumers. The fact that in Denmark car taxation is based on fuel consumption and that the tax class is indicated on the label has an important role in this impact. In the UK, the fuel consumption guide had most impact on the purchase behaviour since it has a long tradition and is well known by the consumers. An interesting effect that was seen in several member states was that if the label is especially promoted as environmental information (CO₂-label) instead of cost information (fuel consumption label), it might have the adverse affect, namely that because of the low importance of environmental performance of cars in the purchase decision, consumers will explicitly neglect the information as having no added value to the purchase decision at all.

MONITORING THE CAR INDUSTRY AGREEMENT

The main pillar of the EU strategy to reduce CO₂ emissions of new passenger cars is the voluntary agreement between the EC and the automotive industry to improve fuel economy of new passenger cars. The first objective is to reduce the average specific CO₂ emission with 25% in 2008 compared to 1995, i.e. an average specific CO₂ emission from 186 g/km in 1995 to 140 g/km in 2008, an average annual reduction of 1.65%. The second objective is to introduce cars on the market by 2000 that emit less than 120 g/km CO₂. The third one is to evaluate the evolution in 2003 and increase the reduction with the target of an average specific CO₂ emission of 120 g/km by 2012.

To monitor the evolution, the EC published the monitoring Decision 1753/2000/EC that obliges the member states to make a yearly report on the average specific CO₂ emissions of newly registered passenger cars. The calculation of the specific CO₂ emission has to be based on vehicle specific data. This implies that the highest level of detail has to be used: a car of a specific make, model, variant can have different versions with different technical characteristics (eg. power, automatic transmission, weight) thus have a different CO₂ emission. Since 2001, all member states reported the specific CO₂-emission of new car registrations.

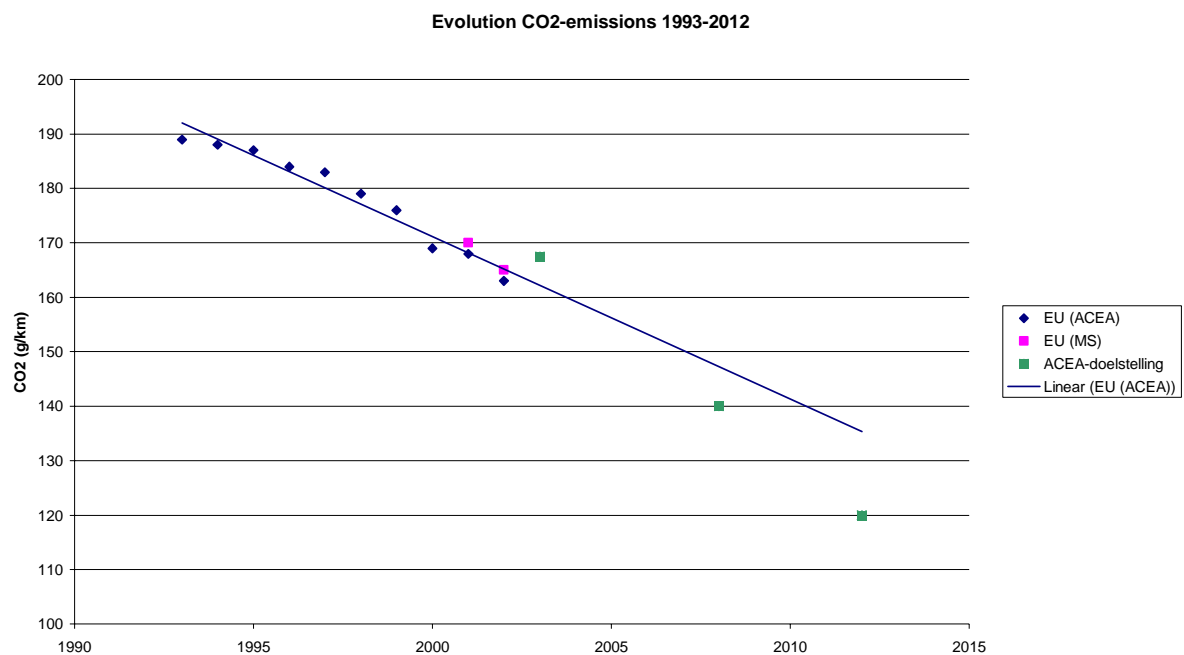


Figure 3 shows the evolution of the CO₂-emissions of new passenger cars in the EU-15 and indicated the targets of the agreement with the automotive industry (indicative target 2003, official target 2008, possible target 2012). In 2001 and 2002, the figures which are delivered by the member states are given in comparison with the figures of the car industry.

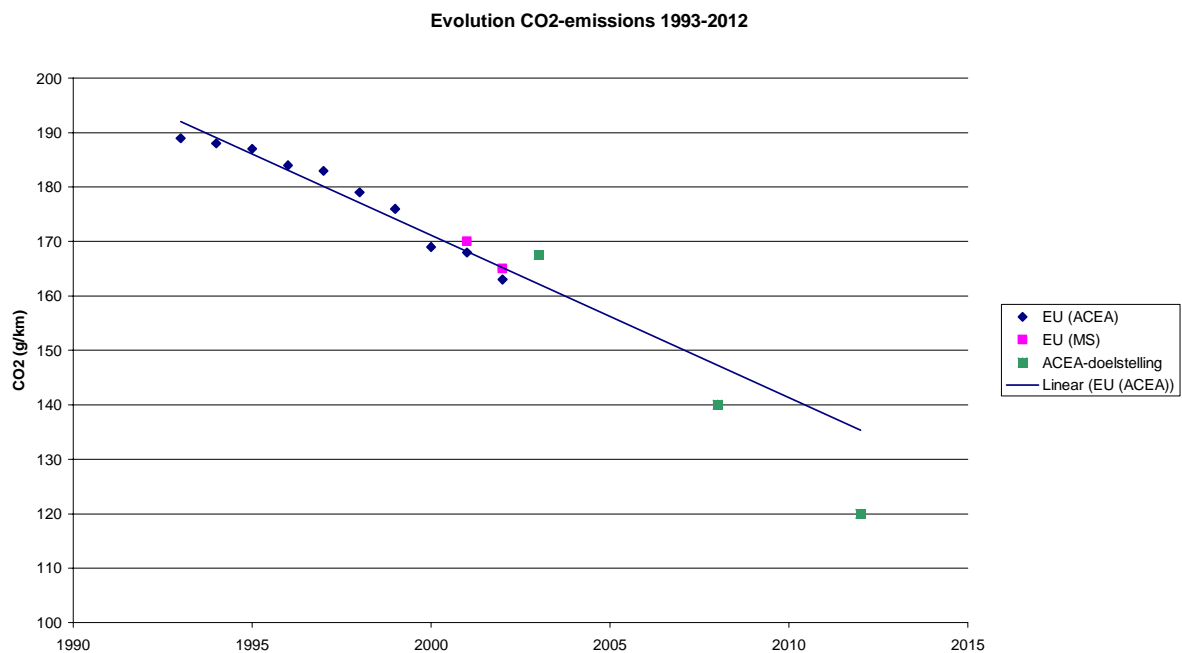


Figure 3: evolution CO₂-emissions EU-15 since 1993.

The average decrease of CO₂-emissions of new passenger cars is 1.39% every year. From 2001 to 2002, the decrease was 2.9%. It is impossible to analyse to what extent the consumer information has a role in this larger decrease. An important element in the average decrease of the CO₂-emissions is the higher share of diesel cars sold in the European car fleet. In 1995, diesel cars had a share of approximately 20% in the new car sales which increased drastically to 43% in 2002. Based on a linear regression of the CO₂-emission since 1993, it can be concluded that a larger annual decrease of CO₂-emissions will be necessary to achieve the voluntary targets the car industry agreed with the EC.

An in depth analysis of the evolution of CO₂-emissions in Belgium gives a clearer idea on the trends in new car sales that influence the average CO₂-emissions.

BELGIAN CASE

In a summary of the evolution of CO₂-emissions from 2000 until 2003 and the main vehicle parameters of the average petrol and diesel car is given.

		2000	2001	2002	2003	00-03 [%]
CO ₂ -emission	g/km	171	169	167	158	-7.6
Petrol / Diesel Share		45/55	38/62	37/63	32/68	
Fuel consumption	l/100km					
Petrol		7.2	7.2	7.0	7.0	-2.8
Diesel		5.9	5.9	5.9	5.8	-1.7
Cylinder capacity	cc					
Petrol		1489	1500	1455	1485	+0.3
Diesel		1934	1926	1903	1895	+2.0
Power	kW					
Petrol		68.2	69	67.9	69.5	+1.9
Diesel		72.2	72.4	77.1	77.0	+4.8
Weight	kg					
Petrol		1115	1123	1044	1205	+8.0
Diesel		1364	1362	1307	1470	+7.7

Table 3: evolution average new registered cars in Belgium

From the analysis of these figures can be concluded that an annual decrease of 1.9% of the average CO₂-emission is achieved since 2000, but that this decrease is almost completely achieved by the increasing share of diesel cars in new car registrations (55% in 2000 compared to 68% in 2003). The average fuel consumption (and thus CO₂-emission) of a petrol or diesel car is more or less constant for the observed period. Technological improvements on car engines which increase the efficiency and could lower fuel consumption, are used to increase the power of vehicles (especially diesel cars) and for the propulsion of more heavier cars (weight increase of approximately 8%).

CONCLUSION

Consumer information has an important role in the EU strategy on influencing purchase behaviour towards more fuel efficient cars with the purpose of lowering CO₂-emissions of new cars. The implementation in the member states since 2001 is established and the awareness of elements of the information is limited but a potential for increase can be seen in countries where the elements are implemented since several years.

The impact of the information is hard to assess. An analysis of the figures of the evolution of the CO₂-figures shows a larger decrease from 2001 to 2002 but it cannot be concluded that a shift towards more fuel efficient cars is provoked by the consumer information or that this is the result of a pure technological evolution with no shifts in purchase behaviour. An analysis from the Belgian new car registrations shows trends that increase the average fuel consumption by increased power and weight, which are compensated through a huge increase of the share of diesel cars in the car fleet.

Consumer information will always be an important element on influencing purchase behaviour of clean and fuel efficient vehicles and has to be supported further. A harmonisation of the labelling scheme with qualitative information could be very useful in this respect. Support of technological improvements and measures with a higher impact on

purchase behaviour (price instruments such as car taxation) will remain essential to counterbalance the information that is provided in marketing campaigns by the car industry itself.

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