

WHY LABELLING IS A GOOD MEASURE FOR CO₂ REDUCTION IN THE TRANSPORT SECTOR

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***Abstract:** From 15 April 2000 there will be an energy label on the windscreen on all new passenger cars in all salesrooms in Denmark. The implementation of car labelling is a process where the market is used to reach the targets for sustainable development. Besides that it represents a good example of sector integration. The main objective to be achieved by the label is to make consumers aware of fuel efficiency and to influence their purchasing decisions and thus increasing fuel efficiency and reducing average CO₂ emissions of new registered cars. The potential of the energy label lies in its interaction with other measures.*

The Framework

Saying farewell to the warmest century in modern history and welcoming a new challenging one, the prospects for CO₂ reduction in the transport sector are not promising. Transportation is the fastest growing source of greenhouse gas emissions in the European Union as well as in Denmark and it has proven to be the most difficult sector to control in the Danish efforts to reduce emissions of greenhouse gases.

Since 1990, it has been the government's objective that emissions of CO₂ in the transport sector should be stabilised at the 1988 level before 2005 and that emissions up to 2030 should be reduced by 25 percent. However, transport sector emissions of CO₂ and other greenhouse gasses are continuing to rise and are currently 14 percent higher than in 1990 and 18 percent higher than in 1988. One reason for this development is that the prerequisites in a number of significant areas have changed. For example, economic growth since 1993 has been far higher than during the latter part of the 1980s which has contributed to the growth tendencies in the transport sector. Another important reason is the lack of improvement in the energy efficiency as compared to the other sectors which was expected also to happen in the transport sector.

Against this background, the government has re-evaluated both targets and means. The overall target is now to break the curve in the development of CO₂ emissions in the transport sector. The continued rise in emissions has to be stopped and the government is disposed to take the necessary steps to ensure that the transport sector makes its reasonable and realistic contribution to total reductions. Concerning the measures there has been a shift towards more focus on the market; trying to influence consumers purchasing behaviour and to stimulate car producers to put more emphasis on fuel efficiency. This is where the energy label on new passenger cars fits in.

Implementing a Successful Energy Label

The Danish energy label which from 15 April 2000 will be on the windscreen of all new passenger cars in all salesrooms is a good example of a measure that gives clear and exact information to the consumers¹. The background for introducing the label is that consumer information is a part of the European Union (EU) as well as the Danish strategy to reduce CO₂ emissions from the transport sector. The main objectives to be achieved by the energy label are:

- Provide consumers with clear and exact information on fuel economy so they can make an well informed choice when they buy a new car.
- Make consumers aware of fuel efficiency and influence their behaviour so they make more fuel-efficient purchasing decisions and in this way increase fuel efficiency and reduce average CO₂ emissions of new registered cars.
- Influence car manufacturers to put more emphasis on energy efficiency in future production decisions.
- To enhance the effectiveness of fiscal measures.

The implementation of the label has been a long and not always smooth process which has involved all the important national organisations which had an interest in the label, e.g. consumer organisations, car importers and car sales organisations, tourist clubs, energy environmental council and so on.

The implementation of the energy label is also an example of sector integration² – not only in its substance but also from an organisational perspective; starting as an EU directive that the Danish Ministry of Environment and Energy was responsible to implement, ending as departmental order from the Ministry of Transport. Since the publication the Brundtland Commission report, *Our Common Future*, in 1987, Denmark's climate strategy has been developed interactively with other sectors, using the principle of sector integration in the striving for sustainable development.

Finally, the process has been a god example of how dialogue in international network – in this situation in the European Energy Network on Transport - can strengthen the outcome.

What we gained from this long process³ that lasted a year and a half was that it secured maximum possible support for the label and a solution that (hopefully) will work in practice. At the end of this text is shown a label with a Volkswagen Lupo as an example.

¹ Denmark is among the first countries in the European Union (EU) who implement the EU directive 1999/94/EF about consumer information on fuel economy and CO₂ emissions. The EU requirements on the label are exceeded in the Danish version to enhance the demand for efficient cars.

² I.e. integrating environmental considerations in decisions and administration within sectors such as transport, energy and agriculture.

³ The current energy label is a follow-up on an initiative implemented in 1997.

Label Contents

Consumer tests and market research⁴ show that in order to make sure that consumers get the message, the label has to be simple. Therefore the information on the label focus on:

- Fuel consumption and CO₂ emissions per kilometre (km) in absolute numbers.
- A fuel economy comparison; the specific cars energy efficiency is compared to the average of all the other cars (absolute comparison).
- Economy information; expenses for green owner tax per year (which depends on the cars energy efficiency) and fuel costs for 20,000 km. In this way the economic and the information measures interact; the consumer becomes aware of the costs implied by a more or less energy-efficient choice.
- Safety information; whether or not the specific car meet the European Union requirements for frontal and side collision.

In the lower part of the label, it is explained that CO₂ emissions from cars contribute to global warming and that fuel consumption and CO₂ emissions also depend on driving style.

The Fuel Economy Comparison

The fuel economy comparison is made separately for petrol and diesel. This is due to the fact that a litre of diesel produces more CO₂ emissions than a litre of petrol, therefore the point of reference is CO₂ emissions per kilometre and not kilometre per litre of fuel. The solution is two separate scales and labels for diesel and petrol cars.

The fuel economy comparison is illustrated with the coloured energy arrows forming seven energy efficiency categories A to G, where the green A is given to the most energy efficient car. This layout is chosen because it is well known to the Danish consumer from the EU energy label on household appliances.

The seven A to G categories are adjustable - rather than fixed once and for all - and based on sold car types in 1998. This was done to make sure that all categories of cars exist on the market and to secure the effect of the label, thus avoiding a situation where all cars sold are A-cars! Therefore requirements to the different categories will need to be periodically tightened in relation to the technological development of the energy efficiency and the development of cars sold on the market. In the year-2000-version of the label the requirements to the different categories are as follows:

⁴ A Study for the Directorate General for Energy of the Commission of the European Communities *Labelling and its impacts on fuel efficiency and CO₂-reduction* performed under the co-ordination of the Austrian Energy Agency, March 1999.

Label Category	Fuel Economy for Petrol Cars (litre/100 km)	Fuel Economy for Diesel Cars (litre/100 km)
A	Below 5,5	Below 4,9
B	5,5 < litre/100 km ≤ 6,5	4,9 < litre/100 km ≤ 5,8
C	6,5 < litre/100 km ≤ 7,0	5,8 < litre/100 km ≤ 6,3
D	7,0 < litre/100 km ≤ 8,0	6,3 < litre/100 km ≤ 7,1
E	8,0 < litre/100 km ≤ 8,5	7,1 < litre/100 km ≤ 7,6
F	8,5 < litre/100 km ≤ 9,5	7,6 < litre/100 km ≤ 8,4
G	Above 9,5	Above 8,4

Relative or Absolute Comparison

In order to give the consumers the best information and possibility for a well informed choice, the label should contain a fuel economy comparison where the specific car's energy efficiency is compared to other cars'. But how do we make the best comparison?

In the European Energy Network on Transport there has been a debate whether the fuel economy comparison should be absolute – which the Danish label is an example of – or relative where the car is compared to an average of a certain class (for example categorised by weight) of cars. The relative comparison has the advantage that consumers often know, before they make a concrete purchase decision, which size of car they want. Therefore a fuel economy comparison with other cars that are about the same size can be effective to influence the consumer making the energy-efficient choice within the same class/group of cars.

Denmark has chosen an absolute comparison because especially from an environmental point of view it is a “real” expression of how energy-efficient the car is. Therefore, it also contains an incentive for downsizing. The current A-G scale also assures that cars of the same size fall into different energy-efficiency categories. In this way the Danish comparison contain some of the advantage connected to the relative comparison. Finally, in a relative comparison a car from one class can get an A and another car that in absolute terms is more energy-efficient only gets a D because the two cars belong to different classes. In this way the label loses value and credibility.

Will an Energy Label have any Effect on Energy Use and CO₂ Emissions?

The label is expected to be quite successful. Two ex-post evaluations are planned to be carried out, one in 2001 and another in 2002. But at this point of time, the optimism is rooted in the very promising experience with the energy label on household appliances. An evaluation of the first three years of the European Community's energy label on cold appliances show that in Denmark the label had an influence on 56% of the consumers and the purchase they had made⁵.

⁵ John Winward, Pernille Schiellerup and Brenda Boarman *Cool Labels the first three years of the European Energy Label*, a report to the European Commission, September 1998.

That influence can also be seen in the development of sold cold appliances according to the seven energy-efficiency categories A to G. The proportion of sales in the three most efficient categories is almost twice as high in 1998 as in 1994.

According to an ex-ante evaluation performed in 1999⁶ the impact of an energy label on the entire car fleet's fuel consumption and CO₂ emissions is estimated to a 4-5% reduction over a ten year period. This estimate is supported by a Danish ex-ante evaluation performed in December 1999, according to which fuel consumption accompanied by internal car size and price are the most important factors of the purchase decision⁷.

Introduction of the energy label on new cars will be accompanied by a publicity campaign (in electronic media as well as magazines, car journals and on the Internet). The aim of the campaign is to enhance the impact of the label through promoting the label to specific target groups and more widely to raise public awareness of the problem of energy efficiency and CO₂ emissions.

The label is also expected to have an effect through influence on the car manufacturers and car salesmen; bad ranking in the label categories could harm the competitiveness of the car.

But the label is not expected to have a revolutionary impact in itself; as illustrated below the potential of the label lie in the interaction with other measures.

Consumer Information as Part of a Strategy

Combined with green taxes and the European agreement with the automotive industry on improvement of energy efficiency, consumer information about the energy consumption of cars is a central measure in the Danish strategy for limiting CO₂ emissions in the transport sector. The idea is that these measures can raise the energy efficiency of cars. In the last 15 years there have only been a slight development in energy efficiency for new cars (8% over the whole period). This is in contrast to what we have seen in other sectors and products like household appliances.

The energy label on new passenger cars is the central measure in the effort to increase consumer information and make consumers aware of fuel efficiency. *The product circle* (which is illustrated at the last page) is a good conceptual framework for understanding the process in which the energy label, together with the other described measures, is expected to influence the fleet of cars:

⁶ A Study for the Directorate General for Energy of the Commission of the European Communities *Labelling and its impacts on fuel efficiency and CO₂-reduction* performed under the co-ordination of the Austrian Energy Agency, March 1999, p. 9.

⁷ Danish Energy Agency, March 2000.

Re Buying

Influencing consumer behaviour is primarily done through information and economic measures:

1. The consumers are presented with concrete comparable information on the energy label.
2. A fuel economy guide, i.e. a pamphlet listing official fuel consumption data and CO₂ emissions, for each new passenger car is in all salesrooms and on the Internet.
3. Posters at the point of sale with the classification of all models available from the dealer.
4. Campaigns trying to enhance the impact of the label by promoting the label to specific target groups and more widely to raise public awareness of the problem of energy efficiency and CO₂ emissions.
5. The green owner's tax; an annual tax that depends on the car's energy efficiency.
6. The registration tax; a tax - where the consumer pay 105 % of the first 50.800 DKK of the car value⁸ and 180 % of the car value above 50.800 DKK - on every new passenger car for first licensing. This has limited the car stock in Denmark but it has also been difficult to sell newly developed energy-efficient cars, because they have a higher price (due to high development costs). Therefore, the Danish Government decided to make a tax reduction for very energy-efficient cars (that is for gasoline cars driving more than 25 km/l and diesel cars driving more than 28,1 km/l) which came into force 1 January 2000. Unfortunately, the tax reduction is probably still too low to make it a realistic alternative to ordinary cars.

Re Use

Influencing the car use is also done through taxes and information:

1. Taxes on petrol and diesel fuel increase the consumers' focus on buying a more efficient car and influence the amount of driving.
2. The Government is right now preparing an ecodriving campaign on how the driving style can help increase fuel efficiency. Research suggests that up to 15% fuel savings can be achieved through driver training and the use of simple on-board instruments such as ecometers.

⁸ Including car price and value added tax.

Re Product Development

Besides the indirect pressure on the car manufactures to produce more energy-efficient cars derived from the “buying” and “use” measures, voluntary agreement and programs for research and development are also used:

1. In 1998 the European Union and the European automotive industry, represented by ACEA, made a voluntary agreement to reduce CO₂ emissions from new passenger cars with 25% by the year 2008, mainly through technological improvements to raise energy efficiency.
2. Energy Research and Development Programme is a Government research programme which follows the general lines of energy policy, supporting also R&D for energy and CO₂ reduction in the transport sector.

Re Marketing

The measures in this area are used in a more diffuse and indirectly way:

1. The voluntary agreement between the European Union and ACEA also influences marketing because fulfilment of the agreement depends on the average level of CO₂ emissions for all new cars sold. In this way the car dealers in EU will have an incentive to promote energy-efficient cars⁹.
2. Training of sales personnel to present the energy label to the consumer is intended to be an element in a forthcoming campaign.

The logic in the product circle is that through a purposive action to promote energy-efficient consumer behaviour, e.g. by implementing the energy label, a stronger demand for energy-efficient products is created and thereby a greater incentive to further develop and promote energy-efficient products. Hopefully, this will mean that energy-efficient products will be cheaper and a good constructive circle is created! This development has happened on the market for cool appliances¹⁰.

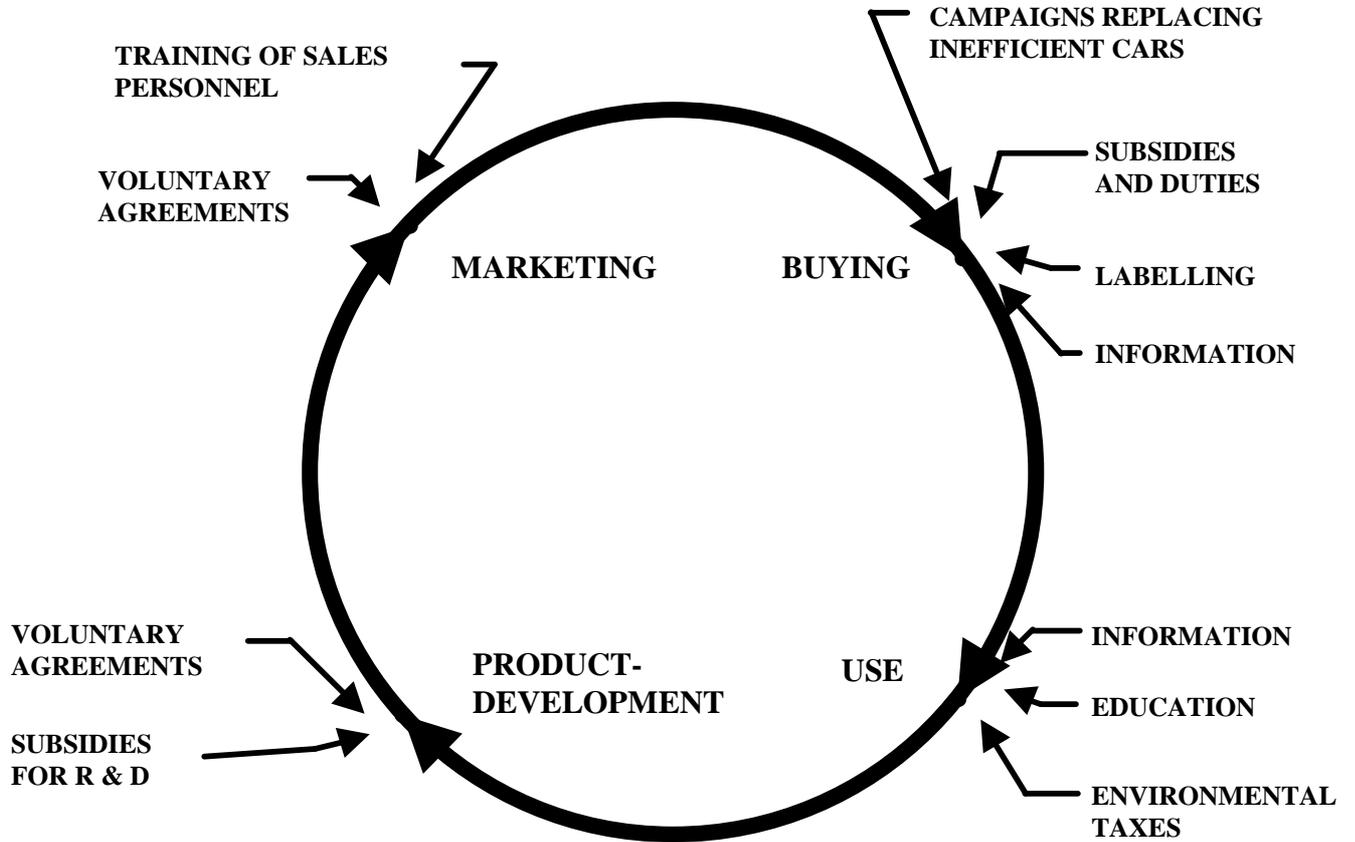
But it is also evident that to create this good circle, energy labelling cannot stand alone. Only a complete set of measures can help reduce CO₂ emissions from passenger cars. At the same time, it is also important to have in mind - when targeting energy-efficiency objectives - not to counteract the reduction of noxious emissions or the increase in safety and reliability of passenger cars.

It should also be realised that a growing sale of passenger cars jeopardises the reductions in CO₂ emissions from the transport sector. All the measures in the product circle should therefore be accompanied by incentives to avoid or decrease traffic needs - through spatial planning and intelligent measures for mobility management - and promote other modes of transport such as park and ride, bike and ride, public transport and the use of bicycle.

⁹ However the Danish car market accounts only for a very small share of the total European car market, so the Danish car buyers will not influence the European average very much.

¹⁰ *Hårde hvidevarer statistik udviklingstendenser og nøgletal*, 4. kvartal 1999, DEFU, March 2000.

THE PRODUCT CIRCLE



Energy

Volkswagen

Lupo 1,2 TDI (3-Liter)

Diesel



Low consumption



High consumption



Fuel economy, km per liter

33,0

CO₂-emmission, gram per km

81

Economy information

Green tax DKK/year

140

Fuel cost for 20.000 km

4.240

Safety information

Meet 2003 EU-requirements, frontal collision

Yes

Meet 2003 EU-requirements, side collision

Yes

A guide on fuel economy and CO₂ emissions which contains data for all new passenger car models is available at any point of sale free of charge.

In addition to the fuel efficiency of a car, driving behavior also play a role in determining a car's fuel consumption and CO₂ emissions. CO₂ is the main greenhouse gas responsible for global warming.

Energy consumption for airconditioning etc. is not included in the information on fuel economy.

Exhaust gas from diesel cars that doesn't have particulate filter is suspected to cause more healt damage than exhaust gas from petrol cars.