Ministry of Transport

The Danish Eco-Combi Trial

Eco-Combis in Denmark 2008 – 2011 and beyond

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DANISH PRESIDENCY
OF THE COUNCIL OF THE
EUROPEAN UNION 2012

Udgivet af: Ministry of Transport
Frederiksholms Kanal 27
DK-1220 København K
Udarbejdet af: Transportministeriet
ISBN, trykt version: 978-87-91013-75-1
ISBN, netdokument: 978-87-91013-76-8
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Tryk: Rosendahls · Schultz Grafisk a/s
Oplag: 500

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Introduction

A Danish trial with larger road trains, the so-called Eco-Combis, started on November 24, 2008. Now, a little more than three years later, the trial has proven to be very successful.

The Danish trial so far clearly indicates that two Eco-Combis do in fact substitute three regular road trains.

This is important as it is the main reason why this particular mode of transport holds great potential, including reduced cost of transport and reduced carbon emissions.

On the other hand, the use of Eco-Combis also raises some important questions regarding road safety, wear and tear on infrastructure and environmental issues.

With these, and more, theoretical considerations in mind, the aim of the Danish trial has been to gather and asses concrete experiences and data from daily use of Eco-Combis.

The trial has been monitored closely and a report by The Danish Road Directorate on the results so far is now ready. An English version of the report will be available on the website of The Danish Road Directorate (www.trafikken.dk).

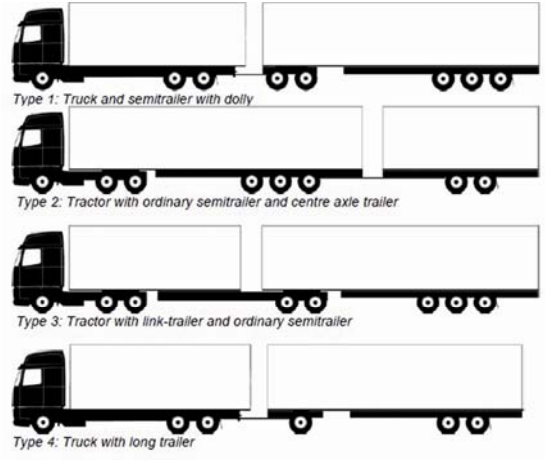
What is an Eco-Combi?

An Eco-Combi is basically a road train that is longer and may be heavier than the standards laid down in EU Directive 96/53/EC on weight and dimensions.

Eco-Combis consists of vehicles (or modules), each in conformity with Directive 96/53/EC, making them easy to integrate in inter-modal transport.

In the Danish trial, Eco-Combis may be up to 25,25 meters long and have a maximum total weight of 60 tonnes. There are approximately 450 Eco-Combis on Danish roads, and the number is constantly growing.

As illustrated, four different types of Eco-Combis can be used in the Danish trial. Types 1 (“dolly”) and 3 (link-trailer) are by far the most popular in a Danish context.



The Trial Road Network

As of July 2011, approximately 1700 km of the Danish road network is part of the Eco-Combi trial – the presently included road network is shown on the map.

The trial road network now includes about 90 freight destinations, linking a wide range of transport hubs, like harbours, transport centres and individual companies.

An important feature of the Danish Eco-Combi trial is that the trial road network is open to all freight carriers that may benefit from using Eco-Combis. No applications are needed, making it a flexible and efficient system.

The Enterprise Programme

An important aspect of the Danish Eco-Combi trial is the close involvement of private companies and local municipalities. This is referred to as the “Enterprise Programme”.

Following the first government financed stages of the Danish trial, it was made possible in 2009 for individual companies to finance new connecting roads to the trial road network.

This ensures that new Eco-Combi routes emerge where they are most needed.

The companies are often backed financially by local municipalities, making the Enterprise Programme a very positive display of public and private collaboration.

The programme is so far a great success and about 50 individual companies have been connected to the trial road network by using this possibility.

A possible result of the Enterprise Programme is that freight companies are now often able to transport their goods directly to their preferred destination – business to business – without making a time-consuming stop at a transport centre.

This is backed by an observed decline in the part of all shifts from regular trucks and road trains to Eco-Combis and vice-versa made at transport centres.

Photo: Per Daugaard

Larger Vehicle Combinations – Longer Distances

Due to their larger load capacity, but still flexible use, Eco-Combis are ideal for long distance freight transport.

The survey of the transport patterns of Eco-Combis during the trial period clearly shows that they are, in fact, primarily used on long distance trips of 200 km or more.

Especially the east-west bound freight transport between major transport hubs of Zealand and Jutland are often carried out by Eco-Combis.

While 200 km or more may be a considerable distance in Denmark, it might not be quite so impressive on a European level.

This is a main reason why the Danish government would like to see Eco-Combis used more widely in international transport.

It is important to note, however, that there are still aspects of the use of Eco-Combis that need to be investigated further.

For this reason, the Danish Government supports the use of Eco-Combis in cross-border transport between countries of *mutual agreement* and on *suitable roads*.

The Use of Eco-Combis

Figures show that Eco-Combis are mainly used for transporting relatively light, individual goods (e.g. flowers, certain types of food) which covers more than 60 percent of total transported goods by these longer vehicle combinations.

By comparison this type of goods only made up about 10 percent of the total goods transported by regular trucks and road trains.

This might not be particularly surprising as this type of goods takes up a relatively large amount of space, thus utilizing the Eco-Combis' additional square meters.

From 2009 to 2010 the Eco-Combis' share of total goods transported on road, measured in tonne-kilometers, almost doubled from 1,9 to 3,6 percent.

A very positive finding in the evaluation by The Danish Road Directorate is that Eco-Combis seem to have an equal or better use of load-capacity than regular trucks.

This is important as the advantages of Eco-Combis are only fully realized if their larger load-capacity is actually utilized.

Further, the average total weight of Eco-Combis on Danish roads is about 40 tonnes (a weight of up to 60 tonnes is allowed) with an average axle load of about 6 tonnes.

As a result, Eco-Combis do not seem to have a significant effect on wear-and-tear on roads in Denmark.

Investing in Eco-Combis

Approximately 125 mill. DKK (17 mill. EUR) have been invested in road infrastructure in order to allow Eco-Combis to drive safely on the designated road network.

It is estimated that these investments will generate an additional annual expense for infrastructure maintenance of about 1,3 million DKK (less than 0.2 mill. EUR).

On the positive side, the use of Eco-Combis, compared to regular road trains, results in savings on cost of transport of approximately 3 DKK (0.40 EUR) per vehicle-km. This is provided that they carry out the same amount of transport work, measured in tonne-km. Again, this is a consequence of two Eco-Combis substituting three regular road trains.

A cost-benefit analysis has been carried out for the three years 2009 – 2011 , revealing a gain of 1,10 DKK per invested 1 DKK.

Due to this relatively short period of time of depreciation of infrastructure costs, a prognosis has been carried out for the year 2016. This shows a return on investments of 2,60 DKK per invested 1 DKK.

The positive results of the analyses can mainly be ascribed to the savings on transport costs and, to a lesser extend, the reduced carbon emissions associated with the use of Eco-Combis.

Safety Matters

Eco-Combis in Denmark are primarily allowed on larger roads such as motorways and other main corridors. In addition, there are connecting roads where necessary in order to get the Eco-Combis to their final destination.

As a result, a survey in the Danish trial shows that few cyclists have actually encountered an Eco-Combi.

The survey further shows that other road users generally do not perceive Eco-Combis as more dangerous than other types of lorries and a majority actually believe there may be safety benefits to gain from using Eco-Combis.

According to official registration, Eco-Combis have been involved in a total of four accidents in 2009 and 2010. As one accident is one too many, this is something to be taken very seriously. The figures also indicate, though, that the number of accidents per kilometre is lower for Eco-Combis in the trial than for other heavy vehicles on Danish roads.

The 150 cross-sections and roundabouts, rebuilt to allow Eco-Combis to pass, have seen a decline in the number of accidents for all road-users of more than a third. This is a slightly smaller reduction when compared to similar locations on the general road network.

Some of these these figures certainly warrant further investigation.

Environmental Effects

Interestingly, three quarters of the respondents in a survey carried out as part of the evaluation believe that Eco-Combis may hold environmental benefits.

In agreement with the survey, it is estimated that the introduction of Eco-Combis in Denmark have resulted in a reduction of CO2 emissions of approximately 2000 tonnes, equal to emissions produced by 200 people.

This positive figure is of course fairly marginal, when compared to total emissions from road transport. This is due to the still relatively small number of Eco-Combis on Danish roads.

However, calculations show that there is a potential 15 percent reduction of CO2 emissions in situations where two Eco-Combis can replace three regular road trains.

This means that as still more Eco-Combis are integrated into the Danish transport system, the overall environmental effect will increase accordingly.

Regarding traffic noise, the effect of Eco-Combis is very limited, and estimated as unnoticeable to the human ear.

Photo: Henrik Ludvigsen

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ISBN 978-87-91013-75-1