COMMERCIAL VEHICLES AND CO_2

ACEA

ACEA POSITION

FUEL EFFICIENCY IS MARKET DRIVEN

Fuel efficiency is one of the most important competitive factors in developing and selling trucks and buses. Therefore, market forces ensure continuous progress in fuel economy and CO_2 emission reduction in the most efficient way.

Any product-oriented legal requirement regarding fuel efficiency and CO_2 emissions should aim to further strengthen these market forces.

To assist customers in their product selection, ACEA promotes the development of a tool to calculate the fuel efficiency of complete heavy-duty vehicles and vehicle combinations in grammes of fuel used and CO_2 generated per tonne-km, cubic meter-km or passenger-km of transported goods or persons, i.e. according to the "work done" principle, using computer simulation.

IN SHORT, ACEA SUPPORTS:

- Taking an integrated approach to further CO_2 emission reductions
- Developing a procedure for calculating the fuel efficiency of complete heavy-duty vehicles, to assist customers in their product selection
- Using cost-effectiveness as the basis for selecting policy measures for the different sectors in the economy
- Studying the inclusion of road freight transport into an international, non-sector specific emission trading scheme
- Pursuing globally harmonised policies for heavy-duty vehicles

INTRODUCTION

The transport sector is a focus point for CO_2-reduction policy around the globe because, despite significant technological advances, CO_2 emissions from this sector are still growing, mirroring a sturdy demand for transport and mobility, especially in the developing world. Economic activity and prosperity are both triggered by and triggering further demand for transportation of goods and people. Ensuring sustainable growth is, therefore, an important and complex challenge.

Overview of global CO_2 emissions

SOURCE: IPCC Fourth Assessment Report, WG III, 2007.

The EU has put in place a number of measures to reduce the CO_2 emissions from transportation. For example, aviation has recently been included in the EU ETS, and new car CO_2 tailpipe emissions have been set stringent limits in grammes per kilometre. In addition, proposals have been made to lower the greenhouse gas intensity of road fuel and to reduce CO_2 emissions from new light commercial vehicles, such as vans and transporters. CO_2-reduction measures for heavy-duty vehicles are on the horizon.

An integrated approach is fundamental to address CO_2 emissions from trucks and buses in the EU. With regard to vehicle technology, all cost-effective measures have already been used because fuel-efficiency has long been a key purchasing factor for transport operators. Market forces are constantly driving further technological advancement and European commercial vehicle manufacturers are world leaders in green and safe technologies.

Fleet renewal remains important to ensure that the benefits of technological innovations are reaped. In this regard, an agreed procedure for calculating fuel efficiency of trucks and buses could serve to set a verifiable benchmark for customers and operators and – hence – accommodate 'green' procurement. However, a focus on just vehicle technologies will not lead to achieving the overall CO_2 objectives.

Further CO_2 reductions from road freight transport must be achieved with a cost-efficient policy mix, including the further development of vehicle technologies, the deployment of alternative fuels and energies, improvements in infrastructure, logistics and transport management, as well as involving driver training and customer incentives.

TOWARDS MEANINGFUL AND FEASIBLE ACTIONS FOR FURTHER REDUCING CO_2 EMISSIONS FROM TRUCKS[1] AND BUSES

Fuel efficiency is market driven due to the impact of high fuel prices on Total Operating Costs.

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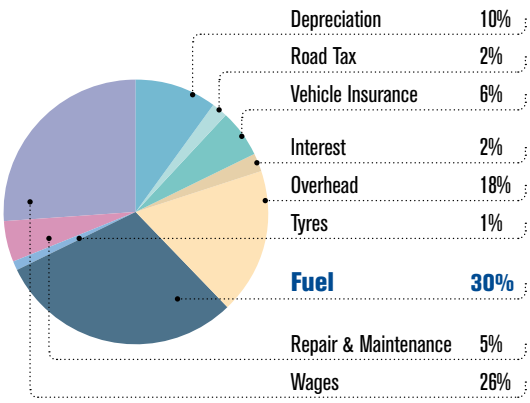
Total Operating Costs (TOC)

40-tonne Tractor – Semitrailer Combination



SOURCE IVECO

NO TRUCK IS LIKE ANOTHER

Any procedure for measuring CO_2 emissions of heavy-duty vehicles will have to meet the complexity arising from the wide variety of vehicles produced – with the end-product often being completed in specialised workshops.

A high share of heavy-duty vehicles are manufactured in a multi-stage process in which the vehicle manufacturer is only delivering a chassis-cab to an intermediate or a final stage manufacturer which completes the vehicle for its intended use and delivers the 'complete vehicle' to its customer.

1. Trucks and Buses in this paper refer to N2/M2 (>3.5t GVW) and N3/M3 vehicle categories

THE PRINCIPLE OF 'WORK DONE'

Policy makers should also take into account the wide variety in vehicle usage. Apart from its shape and configuration, the vehicle's purpose and usage are decisive for the actual CO_2 emissions in practice.

Therefore, measuring CO_2 emissions of complete heavy-duty vehicles is only feasible on the basis of standardised test procedures that reflect actual operating conditions.

Such test procedures must be capable to deal with the large variety in trucks on the roads. And they have to be standardised to ensure that everyone is using the same procedure for verifying if a product complies with legal requirements.

ACEA promotes to calculate the fuel efficiency of complete heavy-duty vehicles and vehicle combinations in grammes of fuel used and CO_2 generated per tonne-km, cubic metre-km or passenger-km of transported goods or persons, i.e. according to the "work done" principle, using computer simulation.

HOW TO GRASP REALITY?

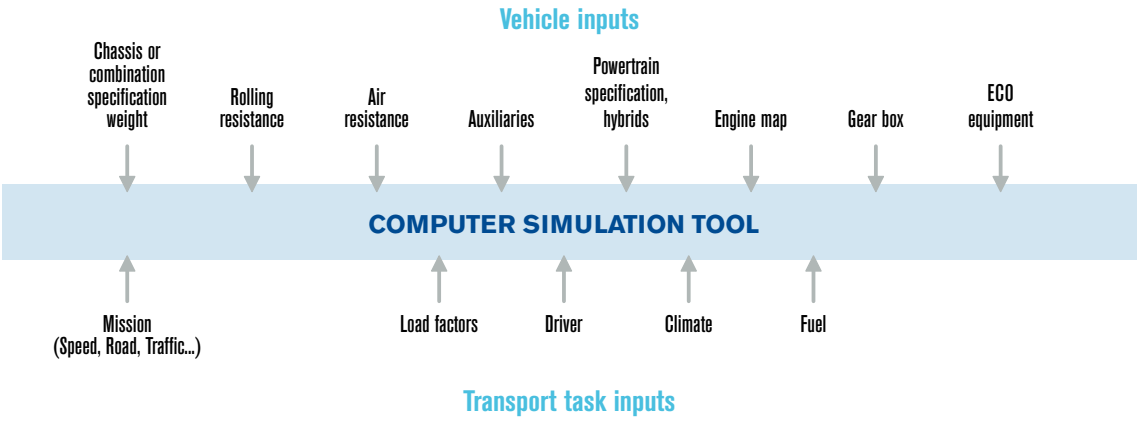
The most realistic and applicable approach to calculate fuel consumption and CO_2 emissions of heavy-duty vehicles is to use a computer simulation methodology that can deal with the huge number of vehicle configurations and missions, and can process a vehicle's CO_2 emissions on the basis of its final configuration, purpose and 'work done'.

Why a computer simulation tool?

The advantage of using simulation, rather than a test-based approach, is that a large number of vehicle types can efficiently be evaluated in many different transport missions. Even with a simulation-based approach, actual tests will remain necessary for validation purposes but the number of tests and thereby time and costs can be reduced substantially.

The end result of this approach is a tool for fuel-efficiency estimation of different heavy commercial vehicle applications. The tool should be available (with exception of proprietary data) to customers, vehicle manufacturers, trailer and equipment manufacturers, authorities, researchers etc.

ACEA offers its cooperation and expertise to develop an officially recognised simulation tool for the calculation of fuel efficiency.



TRUCKS ARE GLOBAL PRODUCTS

Any regulatory approach on heavy-duty vehicles and fuel efficiency and CO_2 performance should be considered on a worldwide basis as heavy-duty vehicles are global products and each category is produced in relative low volumes. Manufacturers are, therefore, highly dependent on economy of scale.

ACEA believes that there is real potential to agree on a common approach for the EU, USA, Japan, China and other regions considering today's strong global support for fuel consumption and CO_2 emission reduction.

ACEA urges the EU to take the lead and drive a worldwide harmonised process toward the integrated approach and the use of a simulation tool for manufacturer declaration on fuel efficiency.

Harmonising regulation

The United Nations Economic Commission for Europe (UNECE) 1998 Global agreement has initiated global harmonisation activities regarding vehicle regulations. The UNECE world forum for harmonisation of vehicle regulations (WP29) and its working party on pollution and energy (GRPE) have developed a number of regulations including the worldwide harmonised heavy-duty certification procedure (WHDC).

ACEA supports this global regulatory approach for policy measures affecting the commercial vehicle industry and proposes to expand the activities to:

- Certification of hybrid powertrains with respect to air quality emissions
- Methodology to evaluate CO_2 emissions of complete heavy-duty vehicles
- Fuel efficiency mapping of engines including impact of hybrid solutions
- Development of test procedure on air and rolling resistance

Introducing regulatory constraints regarding CO_2 from complete heavy-duty vehicles are a challenge considering their multi-stage manufacturing and their wide variety of specifications and missions

- Responsibility for compliance should only be put on the party in control of the regulated property
- Compliance should be verifiable through standardised and accurate procedures
- Legal requirements, to be effective, must be closely aligned with real-life conditions which include final vehicle configuration and usage

The specificities of trucks and buses

Trucks and buses are production and service tools

Trucks and buses are **fundamentally different from passenger cars**, which are consumer goods. In the case of trucks and buses, fuel efficiency is ensured by business operation, because fuel cost forms a significant part of the overall operational costs.

Given the competition between transport service providers for goods and people, strong economical incentives already exist for fuel efficiency improvement through market forces.

Logistics management for CO_2 efficiency

The differences in fuel efficiency of the engine per category of heavy-duty vehicles are very small because competition allows only the most efficient vehicles to enter the market.

However, differences in usage patterns have a large effect on fuel efficiency. This means that **proper logistics management is a key factor for overall fuel and CO_2 efficiency** per tonne-km, cubic meter-km of transported goods or per passenger-km.

Transport efficiency is also: picking the most appropriate vehicle for the job

GCW/GVW* tonne	Load Capacity tonne	Distance km	tonnekm	l/1000tonnekm at 100% utilisation	normal utilisation	l/1000tonnekm considering normal utilisation
LONG DISTANCE						
26	17	100	1700	14.7	70%	21.0
40	25	100	2500	12.8	70%	18.3
60	40	100	4000	10.8	70%	15.4
URBAN DISTRIBUTION						
3.5	1.5	100	150	80.0	45%	177.8
7.5	4	100	400	37.5	45%	83.3
12	7.2	100	720	26.4	45%	58.6
18	11	100	1100	20.0	45%	44.4

SOURCE VOLVO

*Gross Combination Weight (Long Distance) / Gross Vehicle Weight (Urban Distribution)

Trucks and buses are custom-made

Trucks and buses are custom-made on an individual basis, often in a multi-stage process, and adjusted to the individual needs concerning load, driving patterns etc. Therefore, in the whole European HDV fleet, there is an enormous variety of different vehicle design parameters and payloads that have significant impact on fuel efficiency and CO_2 emissions.

This characteristic of commercial vehicles must be considered in policy making.

Professional drivers hold the wheel

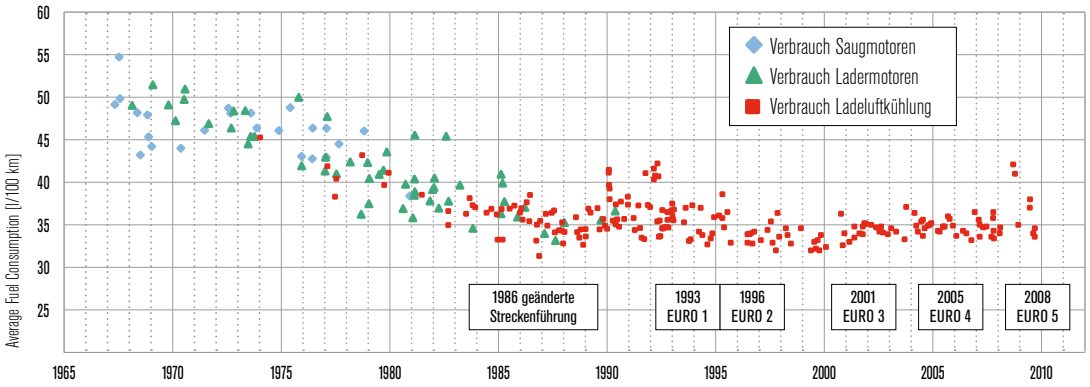
Professional drivers of trucks and buses are very aware of driving styles and devices that optimise fuel consumption and **are sensitive to any measure and device able to facilitate a driving style to improve fuel efficiency.**

Vehicle technology has delivered positive results

Commercial vehicles – a benchmark for fuel efficiency

Trucks contribute around 6% to global CO_2 emissions which is a significant issue. At the same time, modern trucks are the benchmark for fuel efficiency thanks to technologies like common rail injection, automated gearboxes, turbo charging and intercooling. A 40-tonne truck built today burns around a third less fuel than one made in the 1970s. Per tonne transported, this corresponds to a fuel consumption of just one litre of diesel per 100 tonnekm, and significant CO_2 savings. Today's buses are also leading the way with average fuel consumption per bus-passenger that can challenge the performance of many a trip by train. Further improvements in fuel efficiency remain a prime priority for Europe's manufacturers.

Average Fuel Consumption (Gross Vehicle Weight 38/40 t)



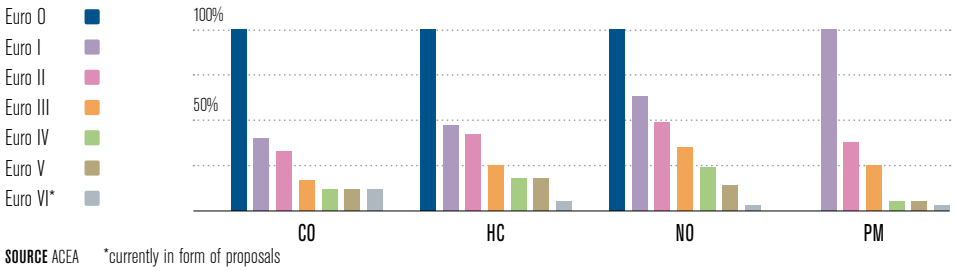
SOURCE LASTAUTO OMNIBUS TESTREPORTS 1967-2009 Status 10/2009

This development has been achieved together with a dramatic reduction of NOx and PM, which requires measures that are in conflict with fuel efficiency improvements.

Air quality pollutants: slashed

Aside from CO_2 and fuel economy improvements, modern trucks emit a fraction of air quality pollutants compared to their predecessors. In fact, latest Euro V models produce around a tenth of the emissions of a 1980s equivalent. Truck NOx emissions have been cut by 86% compared to levels in the 1990s. Particulate emissions are down by 95%. In Europe, the result has been an overall 60% reduction in particulate matter from trucks, despite a 60% increase in 'work done' or freight transport measured in tonnekilometres.

Development of Exhaust Gas Emissions for Heavy Commercial Vehicles



SOURCE ACEA *currently in form of proposals

An integrated approach to CO_2 emission reduction

Vehicle innovation is only one of many jigsaw puzzle pieces forming the integrated approach that is necessary to improve fuel efficiency of road transport:

Alternative fuels
Alternative fuels can have substantial potential to reduce CO_2 provided they are produced in a sustainable way. A CO_2-based taxation of all fuels, reflecting their global warming potential, can provide effective long-term incentives for an increased market penetration of these fuels.

Driver behaviour
Manufacturers support "eco-driving" through driver training and by off-board and on-board technical solutions (as for example "smart shifting"). Both have substantial potential to reduce fuel consumption and CO_2 emissions.

Longer/Heavier vehicle combinations
The wider deployment of longer and heavier vehicle combinations will reduce fuel consumption and CO_2 emissions from road freight transport.

Logistics management
Logistics management plays an important role to reduce fuel consumption and CO_2 emissions by avoiding unnecessary or sub-optimal trips. Restrictive cabotage rules are detrimental to logistic management.

Infrastructure
Congestion and unnecessary stops increase fuel consumption and CO_2 emissions of trucks and buses. Improving traffic flow is a key element in achieving CO_2 emission cuts in road transport.

ITS
Intelligent traffic management systems allow a better utilisation of the existing physical infrastructure, thus reducing fuel consumption and CO_2 emissions.

Emission trading scheme
ACEA supports exploring the inclusion of road freight transport into an international, non-sector specific emission trading scheme, such as the EU ETS.
Initial studies indicate that a focus on the proper selection and efficient use of heavy duty vehicles is a cost-effective way to reduce CO_2 in the road freight sector.

Market incentives
CO_2-based taxation can provide an important market driver for customers to buy fuel-efficient vehicles, in particular when harmonised across the EU.
CO_2-based tax on vehicle fuels, reflecting their global warming potential, is likely to achieve similar results as an inclusion of road transport into EU ETS.

Public procurement
- Green public procurement initiatives risk having limited effects as they are based on the assumption that public entities can all afford vehicles' newest generation
- With a very old fleet (in some EU Member States highest proportion of vehicles under category Euro III) initiatives should aim at incentivising the renewal of the very old existing public fleets, before promoting procurement of vehicles that only a few local authorities can afford

Economic importance

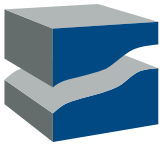
Keeping Society Moving

The truck industry plays a key role in the European economy. Around 2.6 million commercial vehicles are made every year, generating a turnover of nearly €70 billion. A quarter of a million skilled staff are employed in their manufacture.

Three quarters of a million more Europeans depend on the industry for their jobs, including parts suppliers, distributors, dealers and those providing after-sales care. A further 2.6 million, employed in the €250 billion-a-year haulage industry, complete the picture.

Employment commercial vehicle industry

EUROPEAN AUTOMOBILE MANUFACTURERS ASSOCIATION



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