

Reducing CO₂ Emissions from heavy duty vehicles

Jacques Marmy, Head of Technical Affairs, International Road Transport Union (IRU)

By focusing on reducing its toxic emissions for several decades, the road transport sector has dramatically improved its environmental performance through innovative technologies and at-source measures. Clean trucks operating today – Euro V norm – emit 97% less CO₂, 81% less HC, 86% less NO_x and 97% less particulates than Euro 0 trucks from 1990. Euro VI trucks additionally reduced NO_x by 80% and particulate matters by 66% compared to the Euro V norm.

Without exaggeration, the road transport sector is no longer a polluter and exhaust emissions are sometimes even cleaner than the air taken into engines.

The substantial investments that the road transport sector has made in the latest technology have also significantly increased fuel efficiency and, as a result, fuel consumption between 1970 and 2005 has dropped from 50 litres/100km to 32 litres/100km, leading to a direct drop of CO₂ emissions. Clearly, vehicle fuel consumption is still steadily diminishing, but some observers think that the rate of improvement is not drastic enough. This is certainly because they fail to take into consideration general features and, more importantly, the increase in gross weight vehicles and payload over the years.

Payload maximisation has been and will continue to be critically important to profit-conscious transport operators. This steady rise in weight is the result of numerous demands – from both legislative bodies and consumers – with regards to safety, pollution reduction, soundproofing, comfort, quality and so on.

However, the globalisation process, together with the vast differences between liberalised economies, has led to a dramatic increase in trade and transport and consequently to an increase in fuel use and therefore CO₂ emissions. This increase in CO₂ emissions is exacerbated by traffic congestion due to inadequate infrastructure.

Considering the direct link between fuel consumption and CO₂ emissions and the fact that road transport has no economically viable alternative to fossil fuel, it becomes clear that CO₂ emissions are one of the last remaining emission challenges for the road transport industry.

IRU Strategy

Bearing this in mind, the IRU, and thus the road transport industry, has therefore adopted the so-called 30-by-30 Resolution which was also supported by the UNECE Working Party 29, focusing on:

- Investments in innovative engines and latest vehicle technology, which can contribute to a reduction in fuel consumption and consequently in CO₂ emissions of more than 10%,
- Driver training, as provided by the IRU Academy and others, which can reduce fuel consumption and consequently CO₂ emissions by up to 10%,

- Innovative logistic concepts, such as intelligent transport systems (ITS) and optimised weights and dimensions of heavy commercial vehicles, which can equally reduce fuel consumption and CO₂ emissions by more than 10%.

Global strategies and policies

Global strategies and policies to reduce toxic emissions should focus on CO₂ emissions' calculation and assessment, infrastructure availability and resources (i.e. alternative fuels). As a start, a simulation-based system should be created and take into consideration the balance between the fuel used versus the work done to indicate:

- Grams of fuel per ton-km, or m³-km of goods or by passenger-km
- Grams of CO₂ per ton-km, m³-km of goods or by passenger-km

Practical solutions

There is also still room for further improvement of technologies. Society and the transport industry need to widen the scope from engine technology and emissions, to improve the use of vehicles, to increase the gross vehicle weight, payload and dimension, to enhance logistics and the use of telematics (ITS).

Outstanding engine technological advances have been made in recent years and have also drastically reduced emissions. This has been achieved through more torque at low rpm, which means a more pleasant ride, with engine power always used at the right torque window.

Among other practical solutions to be implemented by the entire industry, the European Modular Concept (EMS) would be an efficient solution as it would contribute to efficiently diminishing the transport costs of any co-modality transport, such as rail/road or Ro-Ro transport.

Aerodynamic results would also be a positive contributor to reduce the CO₂ emissions of road transport units, but this would also generate additional loss of cargo weights in the global picture, which would not be a problem for long- or medium-range distances, but could be a challenge for short distance transport operators, where the benefits cannot be really measured. The work on aerodynamics needs to be linked with "at source measures", alternative design and/or materials in order to reduce the tare weight, which would increase operational efficiency and diminish fuel consumption and emissions.

Manufacturers would also need to change their manufacturing approach and techniques, and transport operators should correctly educate their drivers in order to make optimal use of their tools of work. Flow control techniques and aerodynamic developments can change the image of the road transport industry sector in the future.

The entire industry definitely needs to demonstrate that it is moving the right direction and should work closely with manufacturers and authorities to show its proactive vision.

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