

Heavy-duty vehicles

Carbon dioxide emissions from Europe's heavy-duty vehicles



What is the environmental impact of Europe's reliance on heavy duty vehicles (HDVs)? In the EU-28, HDVs are currently responsible for 27 % of road transport carbon dioxide (CO₂) emissions. Since 1990 these emissions have increased by 25 % and, in the absence of new policies, they are projected to further increase. However, society is also greatly reliant on HDVs; they transport people and goods, connect people and industries, and contribute to Europe's societal and economic development. This briefing discusses the HDV sector and its impact on CO₂ emissions, and looks at Europe's next steps towards reducing CO₂ emissions from HDVs.

- Annual registrations of new trucks increased in the EU-28 from some 262 000 in 2010 to around 380 000 in 2016. New registrations are projected to further increase by approximately 46 % by 2030, compared with 2016.
- HDVs are responsible for around one quarter of CO₂ emissions from the transport sector and almost 5 % of total EU-28 GHG emissions.
- The largest national contributors to HDV CO₂ emissions are, by size, Germany, France, the United Kingdom, Italy, Spain and Poland, because they have the largest HDV fleets. CO₂ emissions from these countries comprise more than two thirds of total HDV CO₂ emissions.
- In order to monitor emissions in the EU-28, manufacturers will have to calculate the fuel consumption and CO₂ emissions of new HDVs as of 1 January 2019.
- The European Commission has proposed that, as of 2020, emissions data is collected annually via a new monitoring and reporting scheme. In addition, a second proposal setting future HDV CO₂ emission standards is expected later in 2018.

The HDV sector comprises a mixture of different types of trucks, buses and coaches. These include vehicles used for the transport of goods exceeding 3.5 tonnes (trucks), as well as those used for passenger transport that have more than eight seats (buses and coaches). The sector is characterised by many different vehicle categories, technologies, sizes and weights as HDVs are typically customised for specific clients and uses. It is this range of different vehicle combinations

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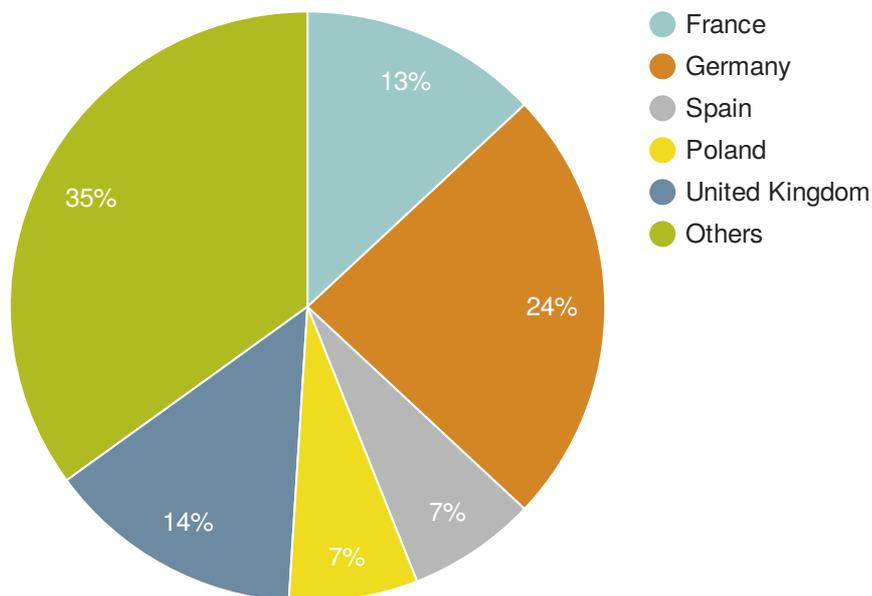
that makes the reliable and cost effective estimation of important environmental parameters such as fuel consumption and CO₂ emissions difficult.

Europe's HDV market

There are around 7 million trucks operating in the EU-28. Since 2010, the fleet of trucks has increased by less than 2 % per year. This partially reflects a relatively stable freight transport demand in the EU-28 over the same period (see the EEA's TERM013 transport indicator). The largest truck fleet is found in Poland, followed by Italy and Germany (Figure 1).

Annual registrations of new trucks in the EU-28 went up from 262 000 in 2010 to around 380 000 in 2016, representing a 45 % increase. Sales in Germany, the United Kingdom and France dominate, accounting for more than 50 % of all new registrations. New registrations are projected to increase to more than half a million vehicles by 2030. The largest increase is projected to occur in Italy, followed by Germany and Poland.

Figure 1. Estimates of new truck registrations by Member State, 2016



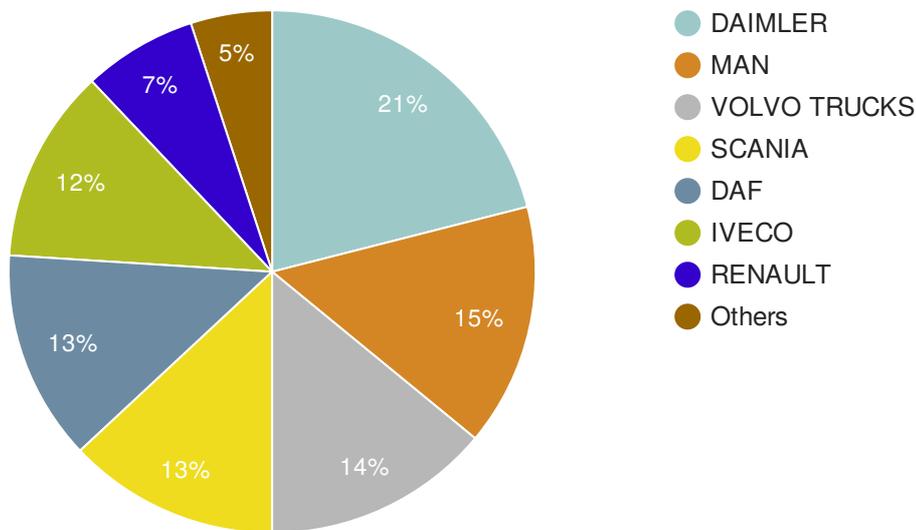
Data sources: ACEA. [Motor vehicle registrations in the EU](#)

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The European truck market is dominated by just six manufacturers: Daimler Trucks, MAN Truck and Bus, Volvo Trucks, Scania, DAF (Paccar Group) and Iveco (Figure 2). Together, these six manufacturers represent 88 % of the overall EU-28 market share. Since 2010, Volvo Trucks and Scania have experienced the biggest increase in new registrations, with a growth in market share of 4 % each.

Figure 2. Market share of truck manufacturers in EU and EFTA countries, 2016



Data sources: ACEA. New registrations in European Union and EFTA

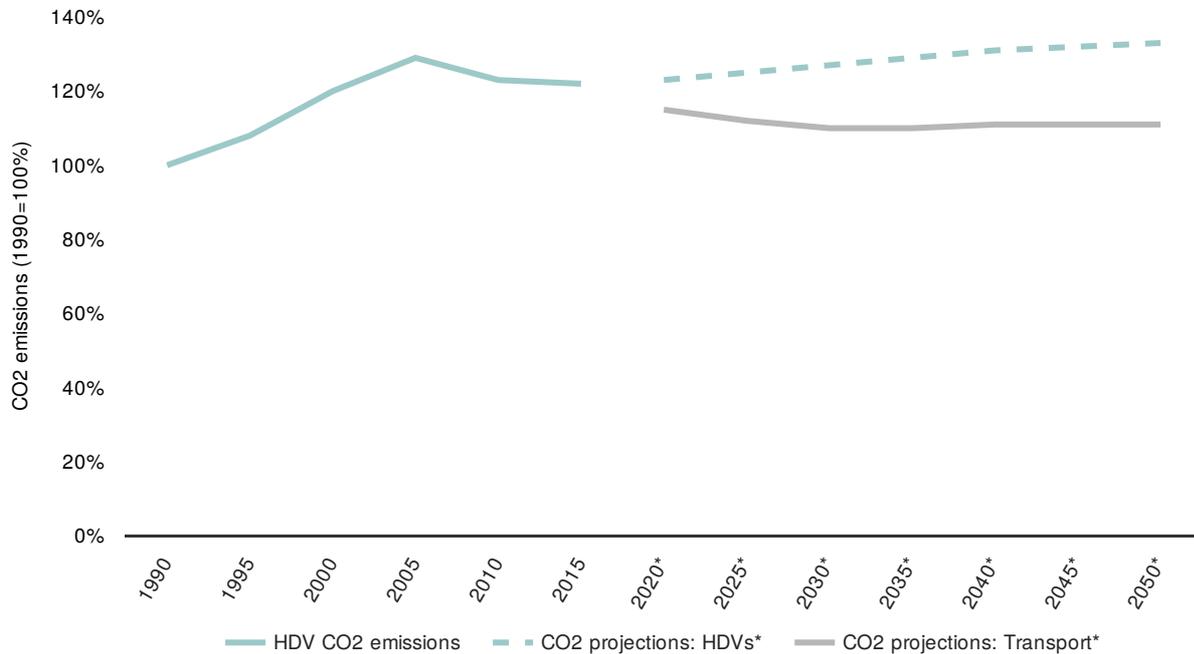
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CO₂ emissions from the HDV sector

GHG emissions from HDVs are responsible for one fifth of all transport.^[1] GHG emissions. Between 1990 and 2016, CO₂ emissions from HDVs increased by 25 % (Figure 3). Future trends show that, without additional actions to curb CO₂ emissions, the share of road transport CO₂ emissions for which the HDV sector is responsible is set to increase from 27 % in 2016 to 32 % in 2030. In absolute terms, it is set to increase by 10 % in 2030 compared with 2010 (EC, 2016b; EC, 2017a). Such increases in emissions are not compatible with the EU's long-term policy objective of reducing GHG emissions from transport by at least 60 % by 2050 compared with their 1990 level as reiterated in the European Commission's recent low-emission mobility strategy (EC, 2016a).

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Figure 3. Reported and projected CO2 emissions from HDV, EU-28



Note:

CO2 actual and projected emissions from heavy-duty vehicles in the EU-28.

Data sources: a. EEA. [EEA greenhouse gas - data viewer](#)

b. DG-CLIMA. [Projections on CO2 from HDVs and transport](#)

The largest contributors to HDV CO2 emissions in the EU-28 are, by size, Germany, France, the United Kingdom, Italy, Spain and Poland, which together represent more than 68 % of such emissions. Since 1990, the countries most responsible for the increase in CO2 emissions from HDVs have been Germany (+14.9 million tonnes of CO2 (MtCO₂)), Poland (+9.9 MtCO₂) and Spain (+7.3 MtCO₂). Together, these three countries have accounted for more than two-thirds of the total increase in HDV CO2 emissions in the EU-28.

Europe's next steps towards reducing CO₂ emissions

Unlike for new passenger cars and light-duty vehicles (vans), for which CO₂ standards and monitoring schemes have been in place for a number of years, to date there have been no mandatory procedures in the EU to monitor and report CO₂ emissions and fuel consumption from HDVs. However, new steps to change this have recently been undertaken.

In 2014, a strategy for reducing HDV fuel consumption and CO₂ emissions was published by the European Commission (EC, 2014). A number of the actions foreseen in the strategy have since been initiated, including:

- Development of a computer simulation tool — the Vehicle Energy Consumption Calculation Tool (VECTO) — to estimate fuel consumption and CO₂ emissions from HDVs (Box 1). The need for a software tool to estimate these parameters reflects that, due to the diversity of HDV types, laboratory-based emissions testing as performed for cars and vans was not considered appropriate;
- new legislation for the determination of CO₂ emissions and fuel consumption from new HDVs (the so-called Certification Regulation (EC, 2017c) which builds upon the availability of VECTO), as well as a recently agreed regulation to monitor and report such information (EC, 2017b);
- Analytical work in view of setting potential future HDV CO₂ emission standards.

Box 1. Determining HDV fuel consumption and CO₂ emissions — the VECTO tool

The large diversity of the HDV sector means it is difficult to obtain representative measurements of fuel consumption and CO₂ emissions from HDVs. Reflecting this, a computer-based vehicle simulation tool — the Vehicle Energy Consumption Calculation Tool (VECTO) — has subsequently been developed. This software will provide values for fuel consumption and CO₂ emissions from European HDVs, covering different vehicle categories, sizes and technologies (JRC, 2016). VECTO is planned to be used by vehicle manufacturers before the registration, sale or entry into service of a new HDV in the EU. The resulting information on HDV fuel consumption and CO₂ emissions will be made available via the proposed monitoring and reporting regime.

The new system for the monitoring and reporting of CO₂ emissions from specific types of new HDV and of their fuel consumption is designed to help improve market transparency and competition, and to promote more efficient vehicles on the EU market. A register on HDV fuel

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consumption and CO₂ emissions will be managed by EEA and data made publicly available, starting in 2020 for new HDVs registered in 2019.

In order to further support the implementation of the EU's 2030 climate and energy policy framework, it is anticipated that, later in 2018, the European Commission will release a proposal setting mandatory CO₂ emission limits for newly registered HDVs. Assessing progress towards meeting any new standards would be based on the new system for the monitoring and reporting of CO₂ emissions from HDVs and their fuel consumption.

While CO₂ emissions from HDVs have increased over the past two decades, it is very much hoped that an ambitious but cost effective future target will help drive innovation within the HDV sector. This should help reduce the environment and climate impacts of this key part of Europe's road transport system.

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