European Confederation of Fuel Distributors

ECFD Briefing

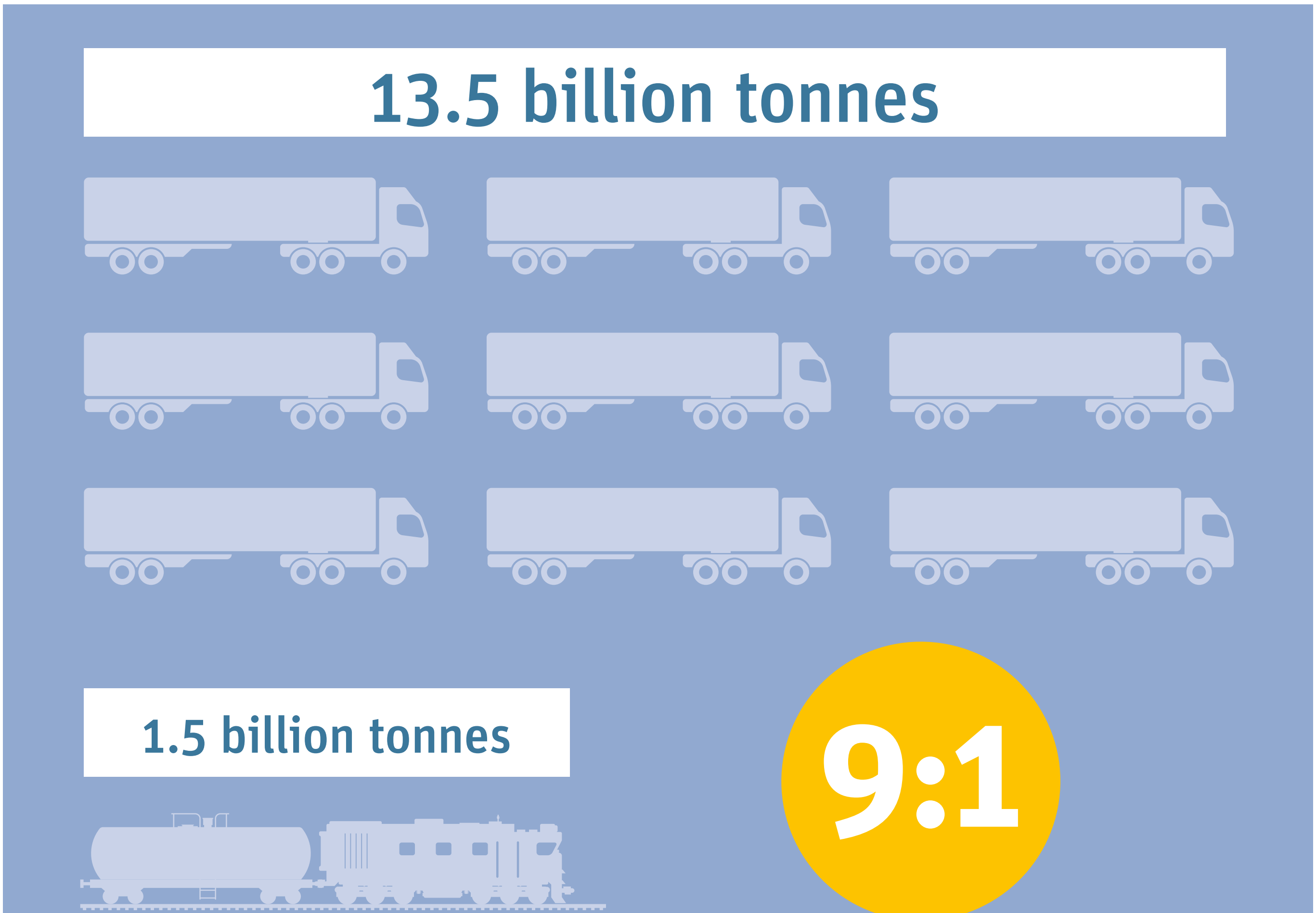
Heavy-duty transport in the EU – No security of supply without CO_2-neutral fuels

Trucks with internal combustion engines are the backbone of Europe’s security of supply

Heavy-duty transport is indispensable for the functioning of the European economy. Trucks deliver a wide range of goods, including food, building materials and machinery in a cost-effective way. A dense European road and refuelling network of 5.5 million kilometres ensures a timely supply to companies and end consumers.

In particular, heavy-duty vehicles carrying more than 3.5 tonnes of freight facilitate cost-effective and flexible transportation over long distances. Production sites, retailers and end consumers throughout Europe are thus easily connected.

The performance and importance of heavy-duty vehicles is illustrated both by their share in freight volumes (transport weight in tonnes, see chart 1) and in the **transport performance** (transport weight x distance in tonne-kilometres, see charts 2 and 4) in the following charts. Figure 3 shows that this performance is largely dependent on the use of liquid fuels (diesel).



Graphic 1

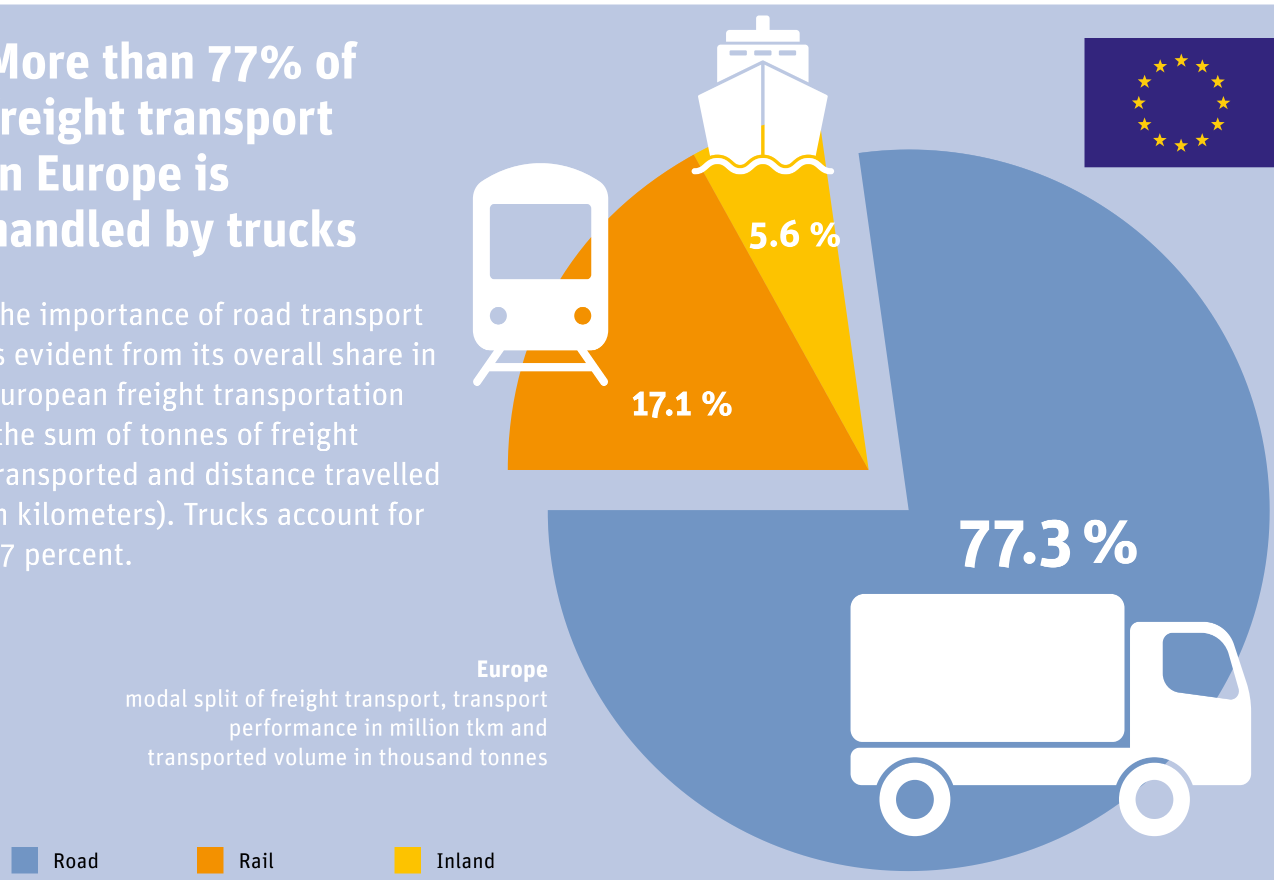
More than **13 billion tonnes of goods and raw materials** were transported by truck on Europe’s roads in 2022. In the same period, **rail transport** only reached **just under 1.5 billion tonnes**!

Graphic: TMvectorart, Ivan Burchak, Bokica, kazy, page23, picoStudio – stock.adobe.com

Source: eurostat

More than 77% of freight transport in Europe is handled by trucks

The importance of road transport is evident from its overall share in European freight transportation (the sum of tonnes of freight transported and distance travelled in kilometers). Trucks account for 77 percent.

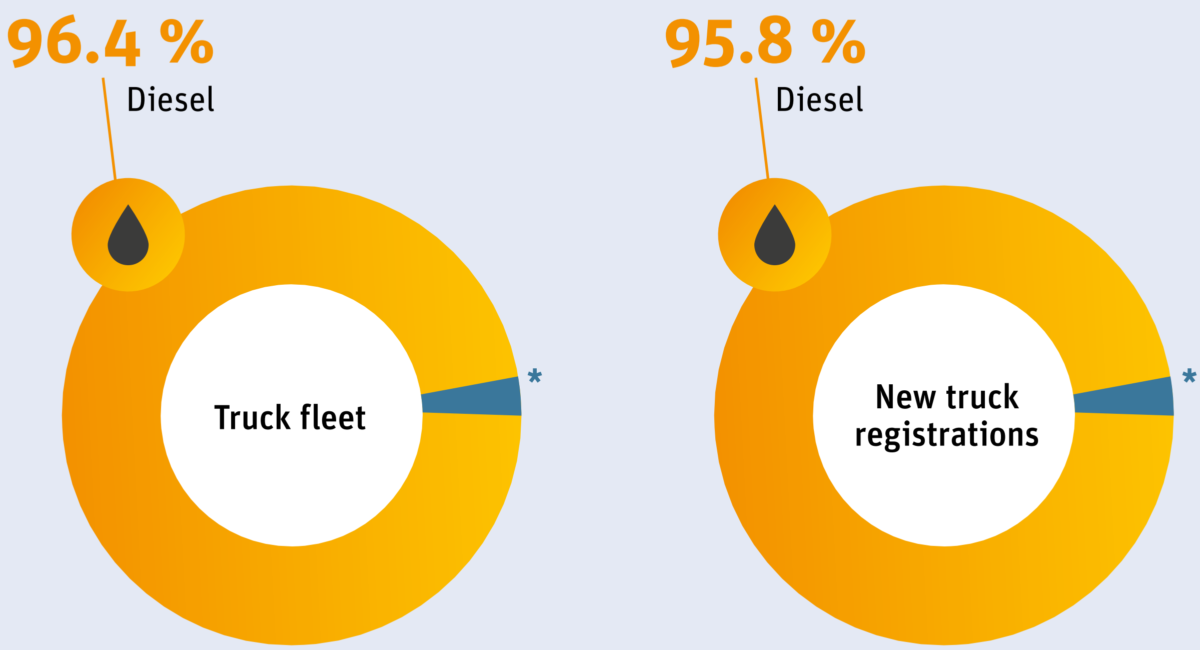


Europe
modal split of freight transport, transport performance in million tkm and transported volume in thousand tonnes

Source: Eurostat, EU-Transport in Figures 2024

Graphic 2

Trucks in Europe are powered almost exclusively by liquid fuels:



* Other fuels, including hydrogen, CNG, LNG, LPG, PHEV, BEV (electric share 1.5 per cent)

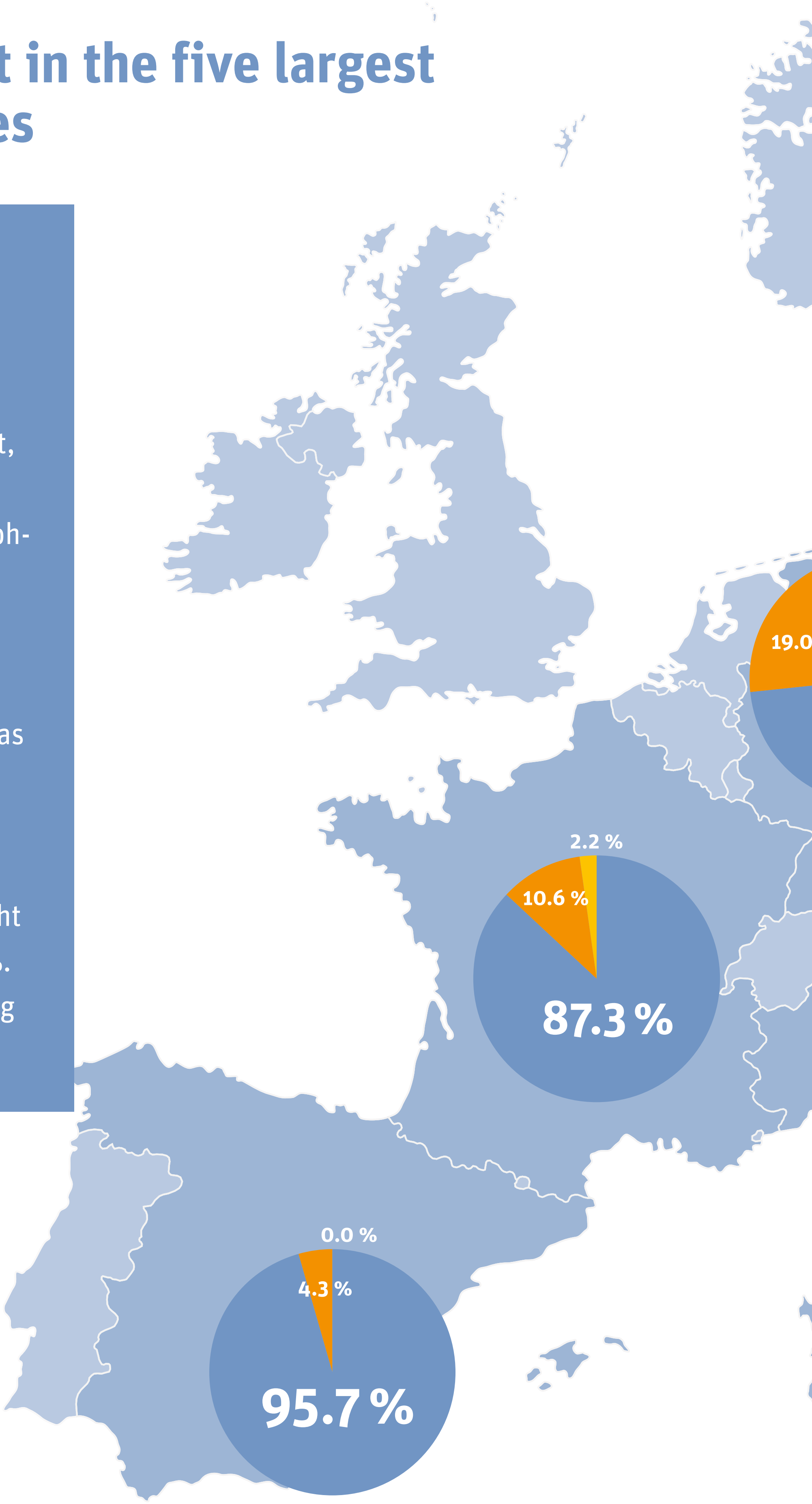
Source: KBA 2023, ACEA, European Commission, Fuels Europe

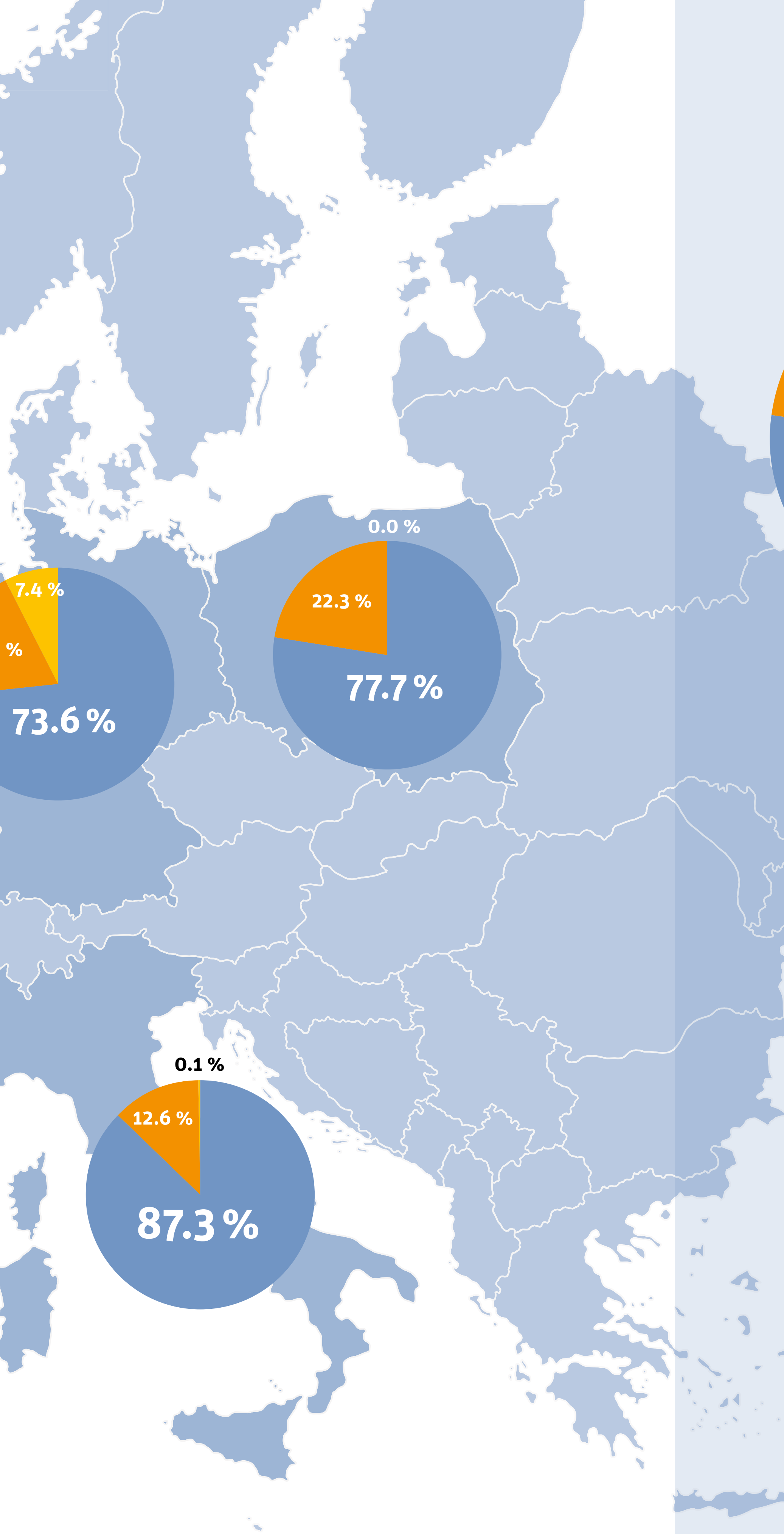
Graphic 3

Freight transport in the five largest EU member states

This map of Europe shows how much the economy in selected member states is dependent on functioning heavy goods road transport, e.g. because there are no alternatives due to geographical conditions or lack of infrastructure.

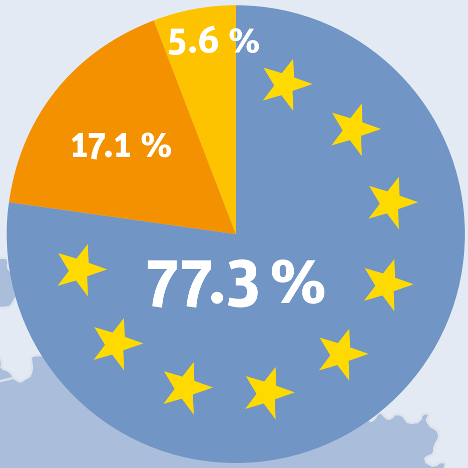
More than 77 per cent of freight in the EU in 2022 was transported by road. This corresponds to **1.9 trillion tonne-kilometres**. The railway share of EU-wide freight transport in 2022 was **17 %**. The share of inland shipping totalled 6 %.





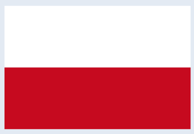
EU average of the freight transport

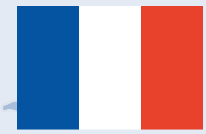
Road, Rail Inland vessels

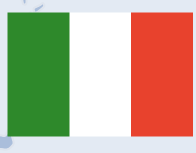


Proportion of diesel trucks in overall truck fleets


97.4 %


96.1 %


97.6 %


98.4 %


96.6 %

Graphic 4

Source: Eurostat, EU-Transport in Figures 2024

Efficiency meets capacity and versatility

Heavy-duty vehicles facilitate the direct and, therefore, cost-effective transport of goods to almost any location throughout Europe, be it urban centres or rural regions. They offer a high degree of flexibility in route selection and can react to changes in requirements at short notice, which is particularly important for time-critical deliveries.

Alternatives for combustion-powered trucks are too expensive

There is currently no technologically and economically viable alternative that can replace diesel trucks in Europe. This rules out the complete electrification of road freight transport by batteries. Issues such as the energy and power density of batteries and the origin of the renewable electricity remain unresolved (see the section on renewable electricity). To even come close to the range of a diesel truck, the vehicle weight of an electric truck would have to increase significantly due to the size of the battery. This increased vehicle weight would put additional strain on roads and bridges. At present, battery sizes are already reducing the payload capacity, which increases the utilisation costs. A Europewide charging infrastructure for electric trucks is still lacking. The ability to operate electric trucks in an economically efficient way is hamstrung by the lack of public parking spaces, charging points and the required grid infrastructure.

Renewable fuels as a solution option

Diesel trucks make up the majority of new registrations in the existing fleet and will continue to do so for many years to come. The use of renewable biogenic (HVO 100) and electricity-based synthetic liquid fuels (e-diesel) facilitates climate-friendly utilisation of cost-efficient and technologically mature combustion engine truck technology.

Advantages of diesel trucks over battery-powered electric trucks and trucks with fuel cells:

	Acquisition costs	Range	Charging and fuelling infrastructure in Europe	Fuelling / charging speed
Diesel	110,000 €	1,000 km	103,033 petrol stations	5–10 min.
Electric	From 300,000 €	300-500 km	Hardly any lorry charging points available	min. 90 min. at 350 kw/h
Hydrogen	250,000 € - 650,000 € (350 bar)	400 km	135 H_2 petrol stations	10-20 min.

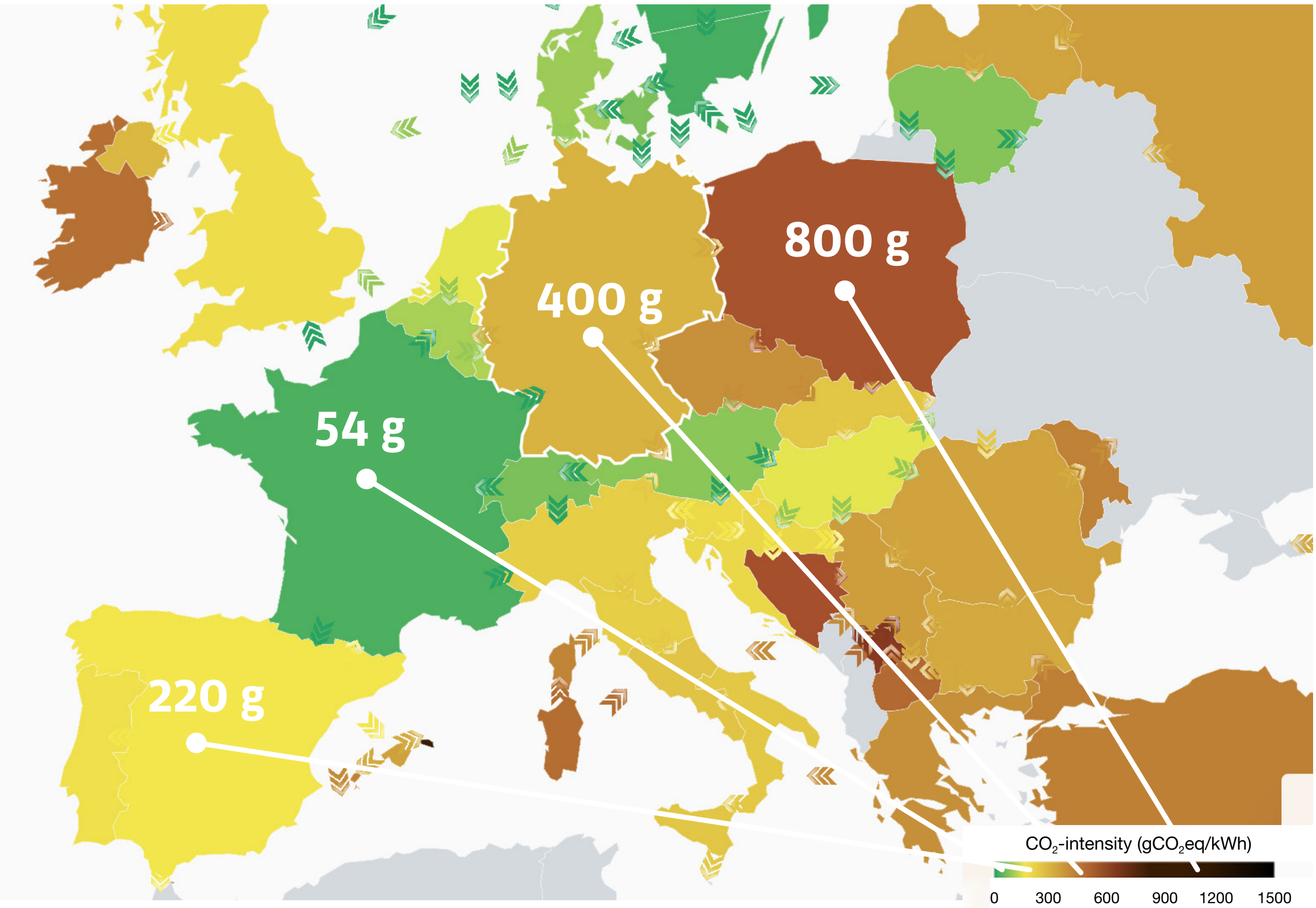
Comparative data: Mercedes Actros (diesel); Mercedes eActros 600 (electric), Hyundai Xcient Fuel Cell or Mercedes GenH2 Truck (H_2)

The combustion-powered truck is cheaper to buy, has better payload capacity, and the necessary infrastructure is already in place. Existing fleets can run on renewable fuels.

European electricity mix leads to poor carbon footprint of e-trucks

The availability of electricity exclusively from renewable energy sources such as solar and wind is severely limited in most EU Member States, which means that battery-based e-trucks are largely powered by electricity from fossil fuels and nuclear energy.

Current electricity mix in the EU:
The specific CO_2 intensity in the EU27 electricity sector averaged 250 g CO_2 per kWh in 2022. Germany is at just under 400 g CO_2 per kWh, Poland even at 800 g CO_2 per kWh. With values like these, e-trucks cannot contribute to climate protection.



Source: ElectricityMap, annual average 2022 CO_2 per KWh

100 % renewable electricity hard to achieve in Europe

Electricity currently accounts for less than a quarter of final energy consumption in the European Union. Molecules, on the other hand, continue to be the most important energy carriers. Liquid energy sources (conventional and renewable) are crucial and cover almost half of final energy consumption with a share of 46.6 %. Therefore, they form the backbone of the European economy and guarantee affordable mobility and logistics.

An (additional) amount of renewable electricity that can be used for transport operations at any time of day or night throughout the year is currently not foreseeable because the necessary infrastrucutre such as grids, storage facilities and hydrogen-based gas-fired power plants are lacking. The expansion of renewable energies itself is being hampered by land conflicts and a lack of public acceptance in some cases. The cost of fully electrified heavy goods transport is currently still completely unclear.

Conclusion: Renewable fuels allow for the sustainable use of combustion trucks and ensure CO_2-neutral logistics.

Heavy-duty vehicles are essential for the security of goods supply. They offer a unique combination of flexibility, (cost) efficiency and versatility. Although the combination of different means of transport can increase the efficiency of freight transport, heavy goods transport remains indispensable for a smooth and reliable supply. Combustion engine trucks can contribute to climate protection by using biogenic (e.g. HVO100) or renewable electricity-based liquid fuels (e-fuels). The electrification of heavy goods vehicles based solely on batteries will jeopardise Europe's security of supply and economic performance.

ECFD policy demands:

To not overburden EU member states and freight transport companies economically and jeopardise the smooth transport of goods, the EU should reform the EU CO_2 standards regulation for heavy commercial vehicles such as trucks as quickly as possible and provide it with a technology-open and market-based approach. This approach should include the regulatory crediting of the CO_2 reduction contribution of e-fuels and other renewable fuels to the CO_2 fleet limits via a crediting system*.

*https://www.renewable-fuels-for-trucks.eu/de/

The European Confederation of Fuel Distributors

ECFD is the voice of more than 10,000 distributors of liquid fuels in the EU member states, ensuring that demands of fuel retailers are heard at EU level. ECFD is actively engaged in the low-carbon energy transition via renewable fuel for the mobility and heating sectors. Our members supply sustainable conventional and advanced biofuels and are committed to the rapid market take-off of synthetic fuels in order to achieve the European climate targets. Furthermore, our members own convenience retail outlets and motorway service areas providing a vital service to local communities in cities and rural areas. They also supply fuels used in agricultural machinery and shipping as well as manage direct B2B relationships with road haulage companies.

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