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Zero-emission bus and truck market in Europe: A 2021 update

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This fact sheet provides an overview of the 2021 market for new zero-emission heavy-duty vehicles (HDVs) in Europe—including buses, heavy trucks, and light and medium trucks.[1]

The global zero-emission heavy-duty vehicle (ZE-HDV) market continues to be dominated by China, which accounts for nearly 92% of zero-emission sales since 2019, and 97% since 2012. As such, the sales of zero-emission trucks and buses in Europe are dwarfed by the Chinese market; Of the 117,000 total sales of ZE-HDVs globally, 4,000 were in Europe. However, the market for ZE-HDVs in Europe is expanding rapidly, with sales increasing by an average of 72% per year over the past five years. Even as the total sales volume of HDVs fell in the period 2019–2020 following the pandemic, the sales share of ZE-HDVs continued to grow.

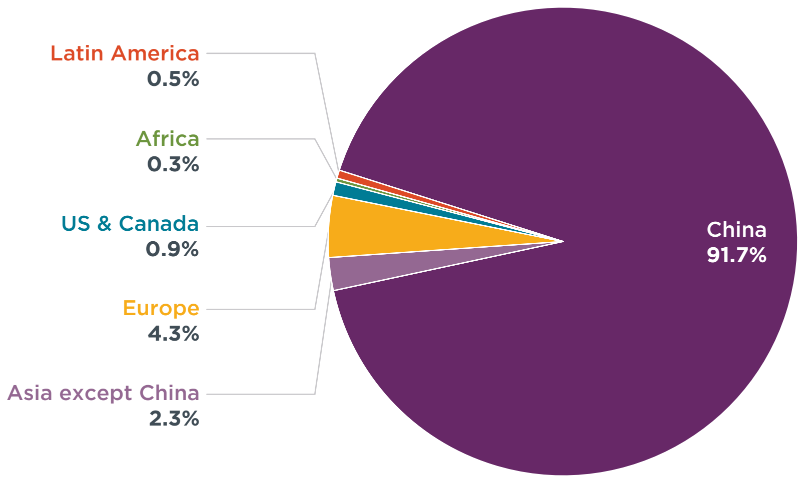

Figure 1. Shares of zero-emission heavy-duty vehicle sales by region in 2019–2021

1 Buses refers to all buses with a gross vehicle weight above 3.5t. Heavy trucks include trucks with a gross vehicle weight greater than 12 tons; Light and medium trucks include trucks with a gross vehicle weight between 3.5 and 12 tons. This fact sheet focuses on the sale and registration of commercial trucks and all buses in the 27 Member States of Europe, excluding Bulgaria.

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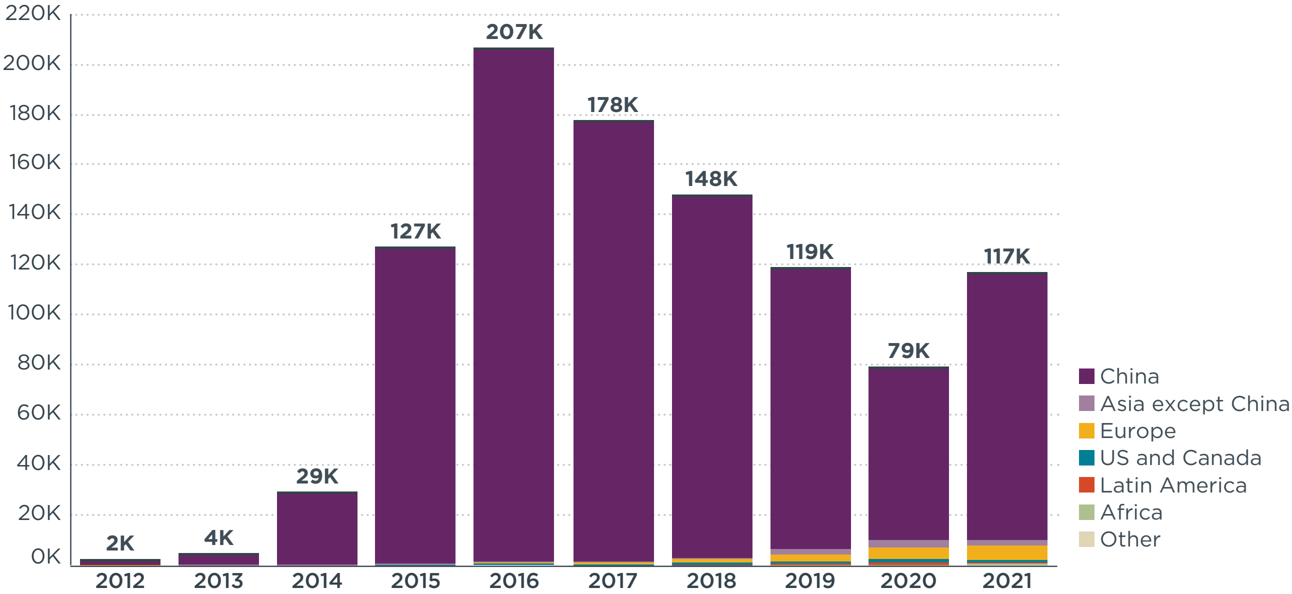

Figure 2. Global zero-emission heavy-duty vehicle sales

The majority of this growth was derived from the bus sector. Last year, zero-emission buses comprised a sales share above 10% across the EU-27,[2] outpacing the share witnessed in the private car market. As there is currently of no regulation requiring manufacturers to invest in zero-emission buses, the growth in sales of ZE-HDVs is largely driven through demand. The Clean Vehicles Directive came into force in August of 2021, requiring between 12% and 25% of all publicly procured buses to be zero-emission. This is expected to drive sales of zero-emission vehicles further in the coming years.

Total sales volumes of zero-emission trucks remain low, particularly in the heavy truck segment. Just 0.1% of total sales of trucks with a gross vehicle weight (GVW) above 12 tons were zero-emission. Light and medium trucks with a GVW between 3.5 t and 12 t experienced higher growth, largely driven from the increased number of Streetscooter branded light trucks entering the market in Germany.

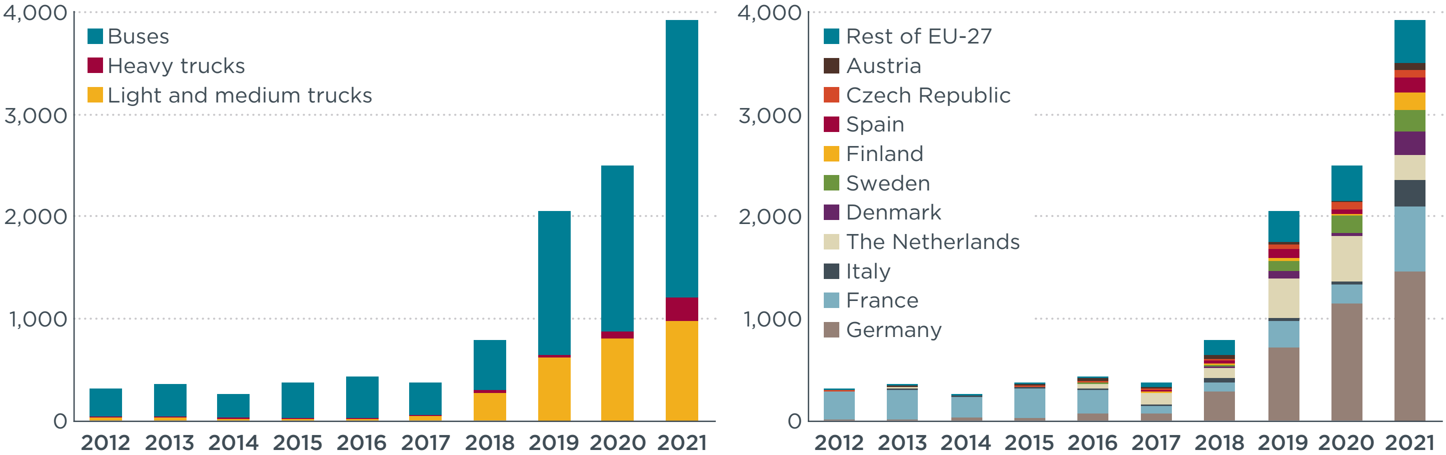

Figure 3. Zero-emission heavy-duty vehicle sales in Europe by vehicle type and Member State

The majority of ZE-HDV sales are located with Western Europe—Germany and France

2 Data sourced from EV-Volumes (sales, global), https://www.ev-volumes.com/datacenter/ and IHS-Markit (registrations), IHS Global SA; Copyright © IHS Global SA, 2022.

accounted for over half of the ZE-HDV sales in 2021—while sales in Eastern Europe remain low in comparison. Battery electric technology dominates the ZE-HDV market. Battery sizes in heavy trucks averaged 288 kWh, 310 kWh in buses, and 76 kWh in light and medium trucks. The market for fuel cell trucks remains nascent, with just 15 fuel cell trucks and 74 fuel cell buses sold in 2021.

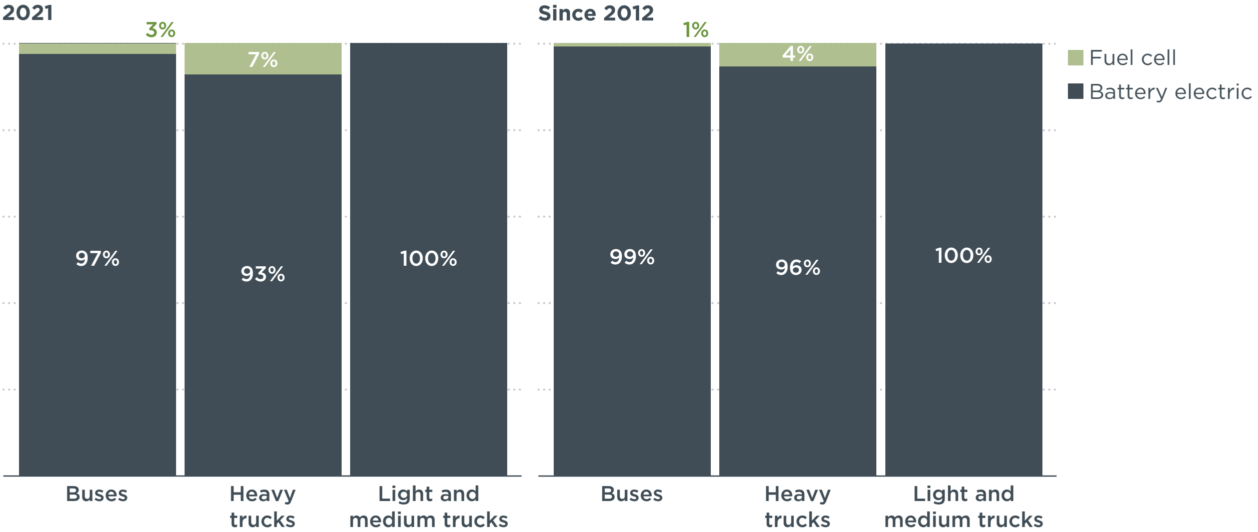

Figure 4. Technology shares of zero-emission heavy-duty vehicle sales in Europe

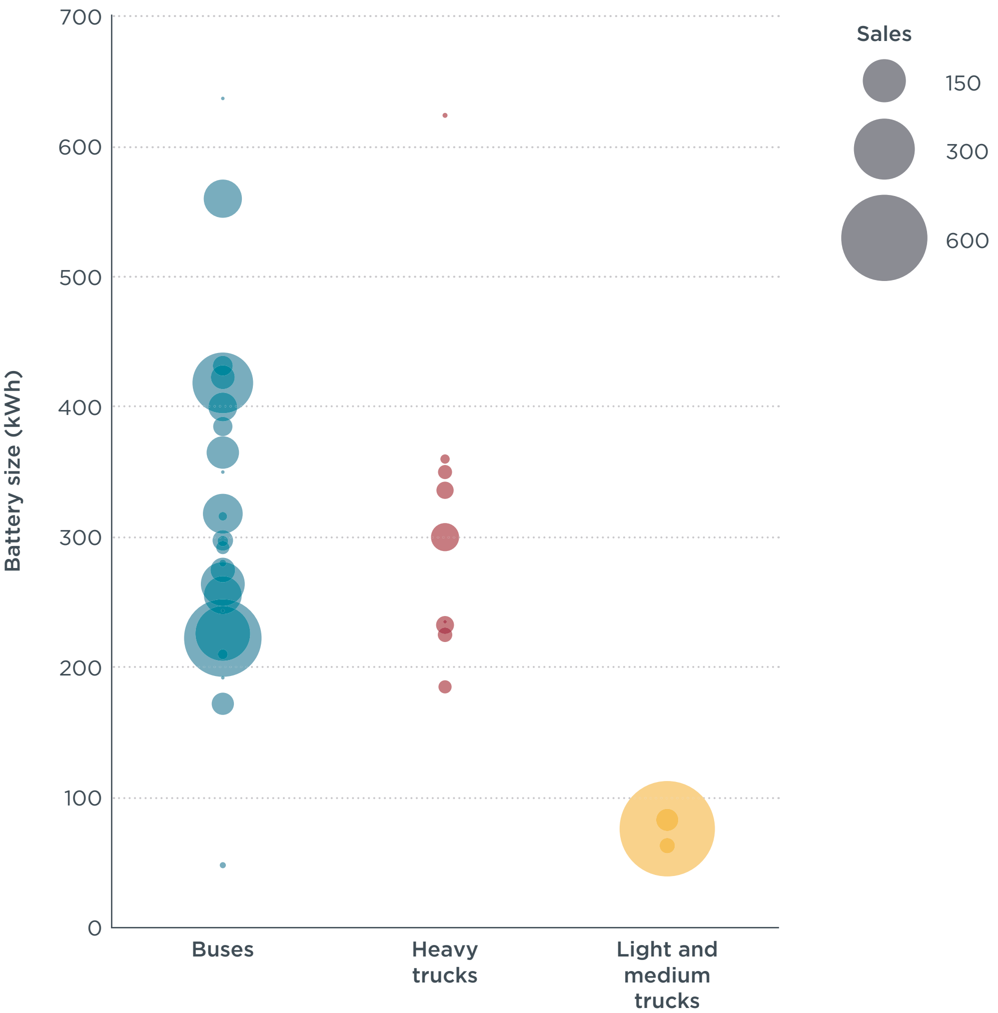

Figure 5. Battery size distribution of battery-electric heavy-duty vehicle sales in Europe in 2021

Figure 6. New heavy-duty vehicle registrations in Europe by vehicle group in 2021

Sales of natural gas fueled vehicles have been growing most notably in the bus market. Under the Clean Vehicles Directive, natural gas is deemed as a clean fuel, despite offering neither climate nor health benefits. The targets for public procurement established in this Directive may thus be achieved through purchasing natural gas fueled buses, partially giving rise to an increase in their sales share.

The market for HDVs has been traditionally dominated by a small number of manufacturers. Just seven manufacturers were responsible for 97% of all truck sales in the EU-27 in 2021. The bus market is slightly less consolidated, with the top seven manufacturers responsible for 74% of sales. The increasing demand for zero-emission vehicles is giving way to new entrants to the market, most visibly in the bus market. Several bus manufacturers have entered the market who are solely focused on ZE-HDV production, such as BYD for buses, Emoss for heavy trucks, and Streetscooter for light and medium trucks.

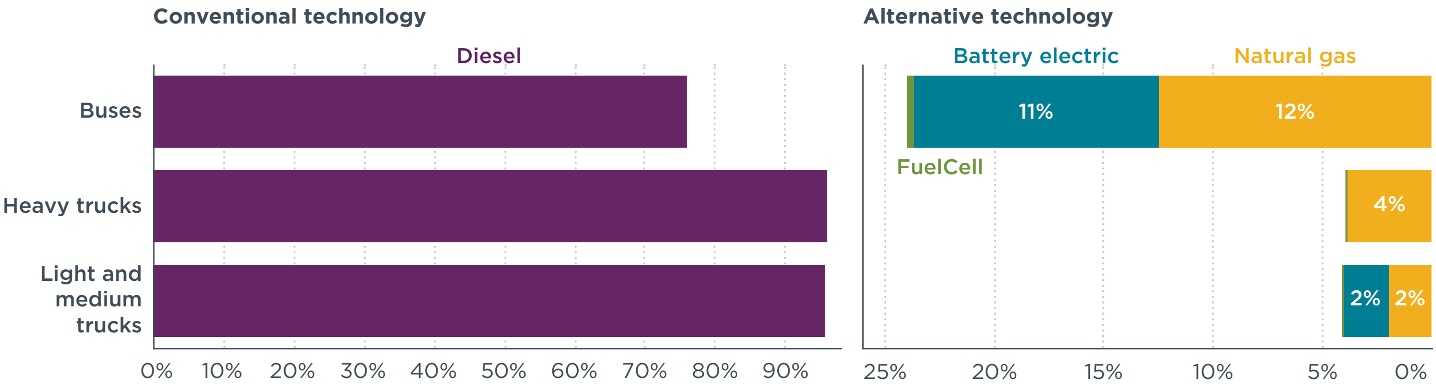

Figure 7. Conventional and alternative technology shares of new heavy-duty vehicle registrations

There have been an increasing number targets set by countries in Europe for the phase-out of conventional fueled trucks across the EU-27. Six Member States—Portugal, Luxembourg, Finland, Denmark, The Netherland, and Austria—have signed a Global Memorandum of Understanding, pledging for 30% of sales of trucks and buses to be zero-emission by 2030 and 100% by 2040.

Some of these countries have pledged even more ambitious targets beyond this Memorandum. For trucks, Austria has pledged to phase out the sale of conventional fueled vehicles with a GVW less than 18 t from 2030 onward, and 2035 onward for vehicles with a GVW above 18 t. For buses, The Netherlands has pledged to only buy zero-emission buses from 2025. Denmark follows closely behind, with the same target but for city buses. Ireland intends to have a fully zero-emission bus fleet by 2035. Austria plans to cease the sale of conventional buses from 2032, with the intention of having a full zero-emission fleet in operation by 2040.

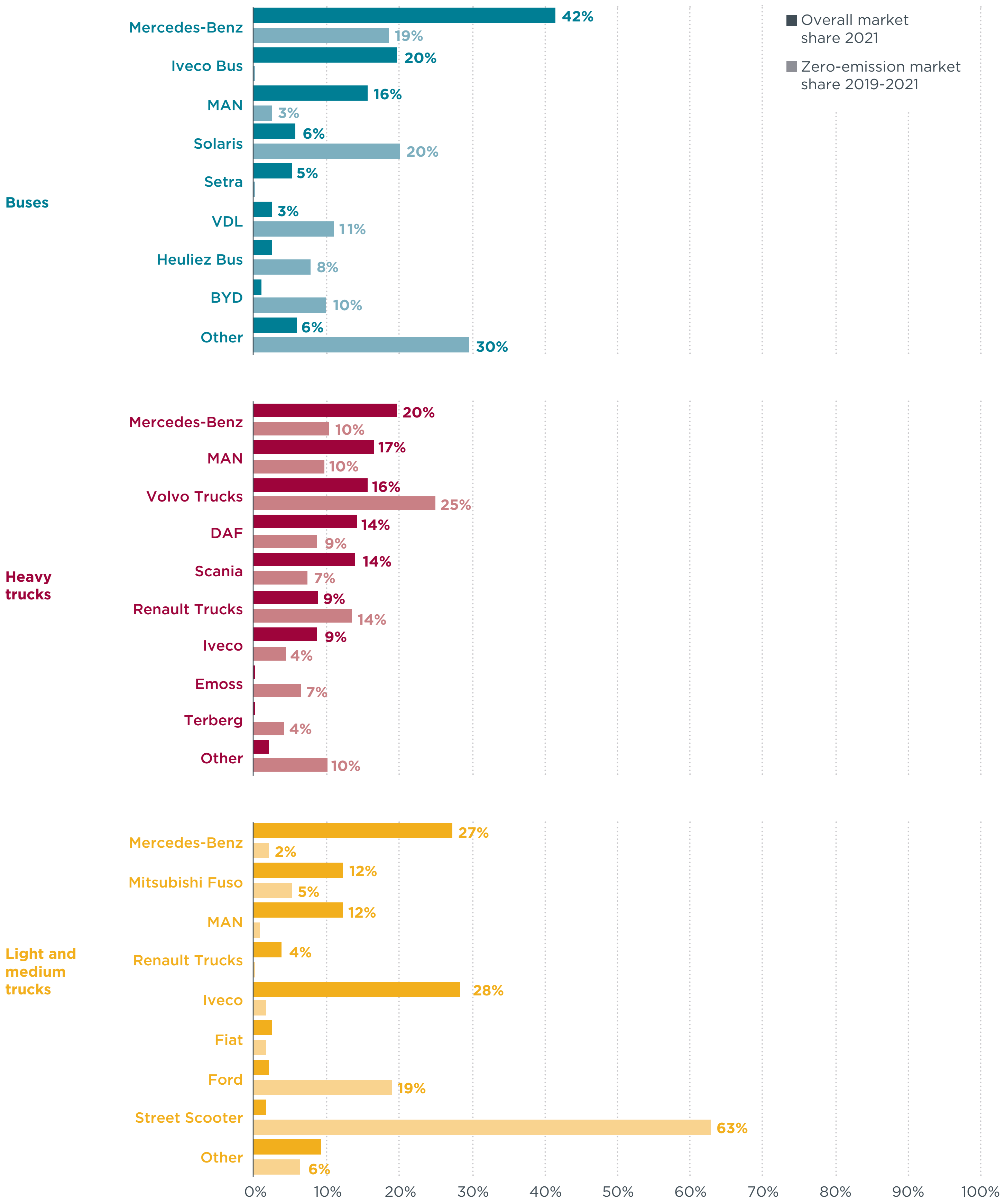

Figure 8. European heavy-duty vehicle market share by manufacturer

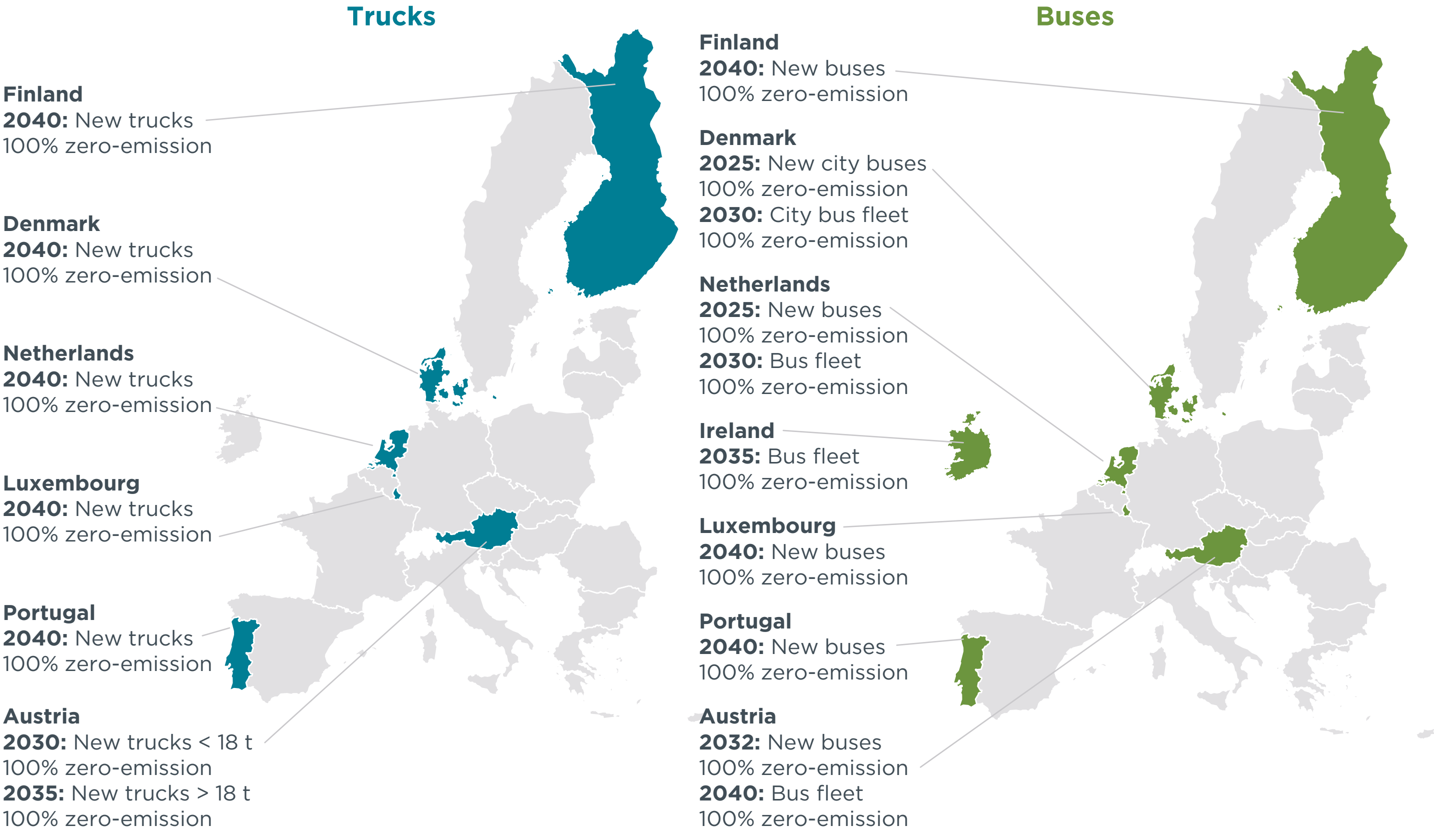

Figure 9. Phase out targets for conventional trucks and buses in Europe

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