

Zero-emission bus and truck market in the United States and Canada: 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 the United States and Canada—including buses, heavy trucks, and medium trucks and vans.¹

The global market for zero-emission HDVs rebounded in 2021, returning to 2019 levels after a 34% drop in sales during the outbreak of the COVID-19 pandemic in 2020.² This rebound was driven by the Chinese market, which has accounted for nearly 92% of zero-emission HDV sales since 2019 and 97% since 2021.

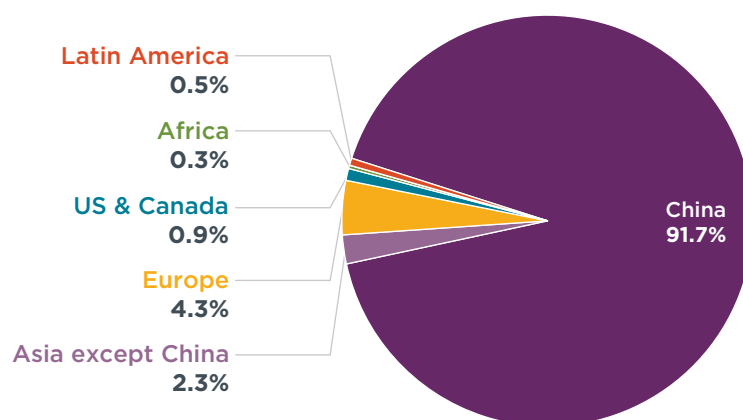


Figure 1. Shares of zero-emission heavy-duty vehicle sales by region in 2019–2021

¹ Buses refers to all buses. Heavy trucks include Class 8 trucks with a gross vehicle weight rating greater than 33,000 lbs, and medium trucks and vans include Class 4–7 trucks and vans with a gross vehicle weight rating of 14,001–33,000 lbs. Medium trucks and vans are separated into two vehicle groups when enough vehicle data is available to differentiate. The vehicle market in the United States and Canada is referred to as the North American market while Mexico is included in the Latin American market.

² Zero-emission commercial vehicle sales obtained from EV-Volumes, <https://www.ev-volumes.com/datacenter/>.

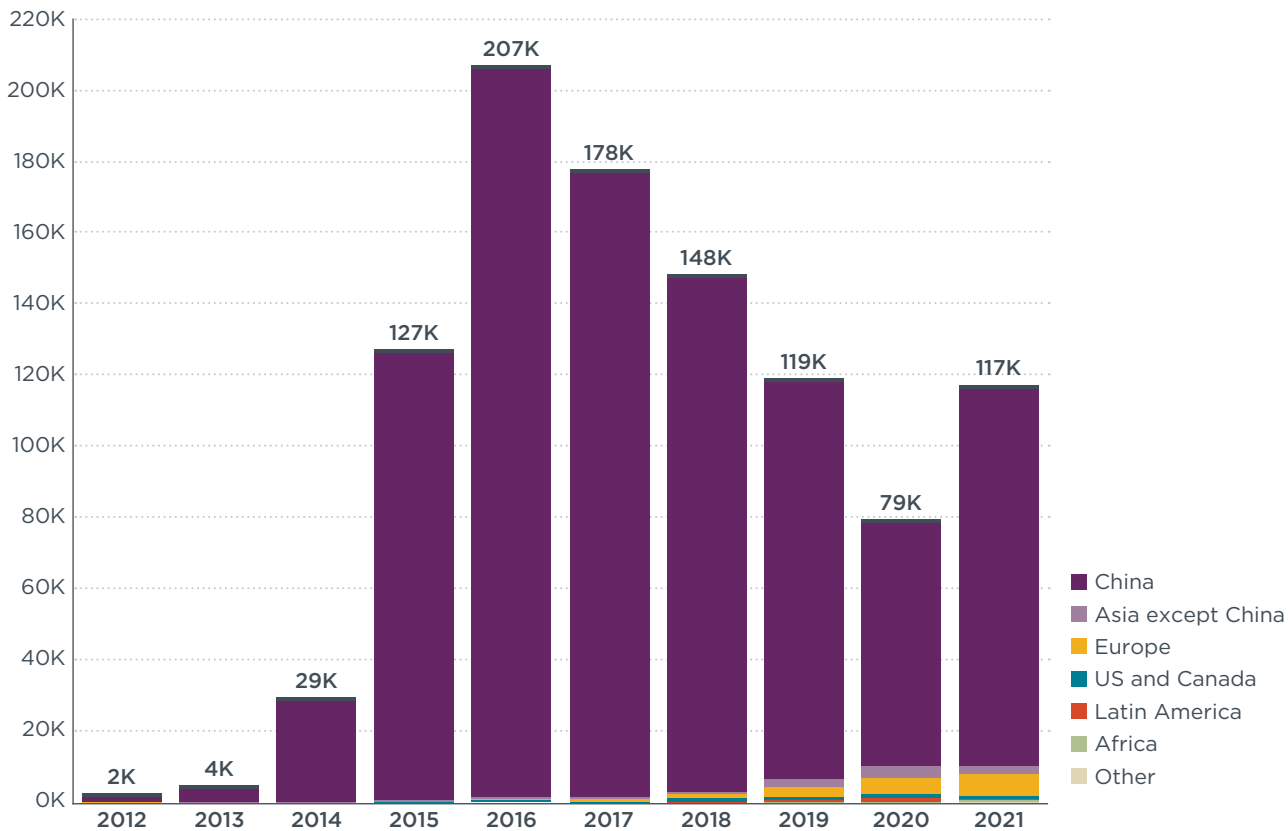


Figure 2. Global zero-emission heavy-duty vehicle sales

Zero-emission HDV sales in the United States and Canada trended in the opposite direction, however, shrinking by 36% in 2021 after recording a banner year in 2020. This mimics the trend in conventional HDV sales during the COVID-19 pandemic.³ Despite this, both the United States and Canada recorded a substantial increase in the sale of zero-emission heavy trucks, with 101 units sold compared to only 46 in 2019 and 2020 combined. Zero-emission bus sales cooled to 624 units in 2021, down from more than 1,000 units sold in 2020. Sales of zero-emission medium trucks and vans also cooled from 236 to 96.

³ CALSTART, “Zeroing in on Zero-Emission Trucks,” (June 2022), <https://calstart.org/wp-content/uploads/2022/07/ZIO-ZETs-June-2022-Market-Update.pdf>; Christiane Stein, “Global Bus Market Will See Double-Digit Growth in the next 3 Years,” *IHS Markit*, (February 11, 2021), <https://ihsmarkit.com/research-analysis/global-bus-market-will-see-double-digit-growth-in-next-3-years.html>.

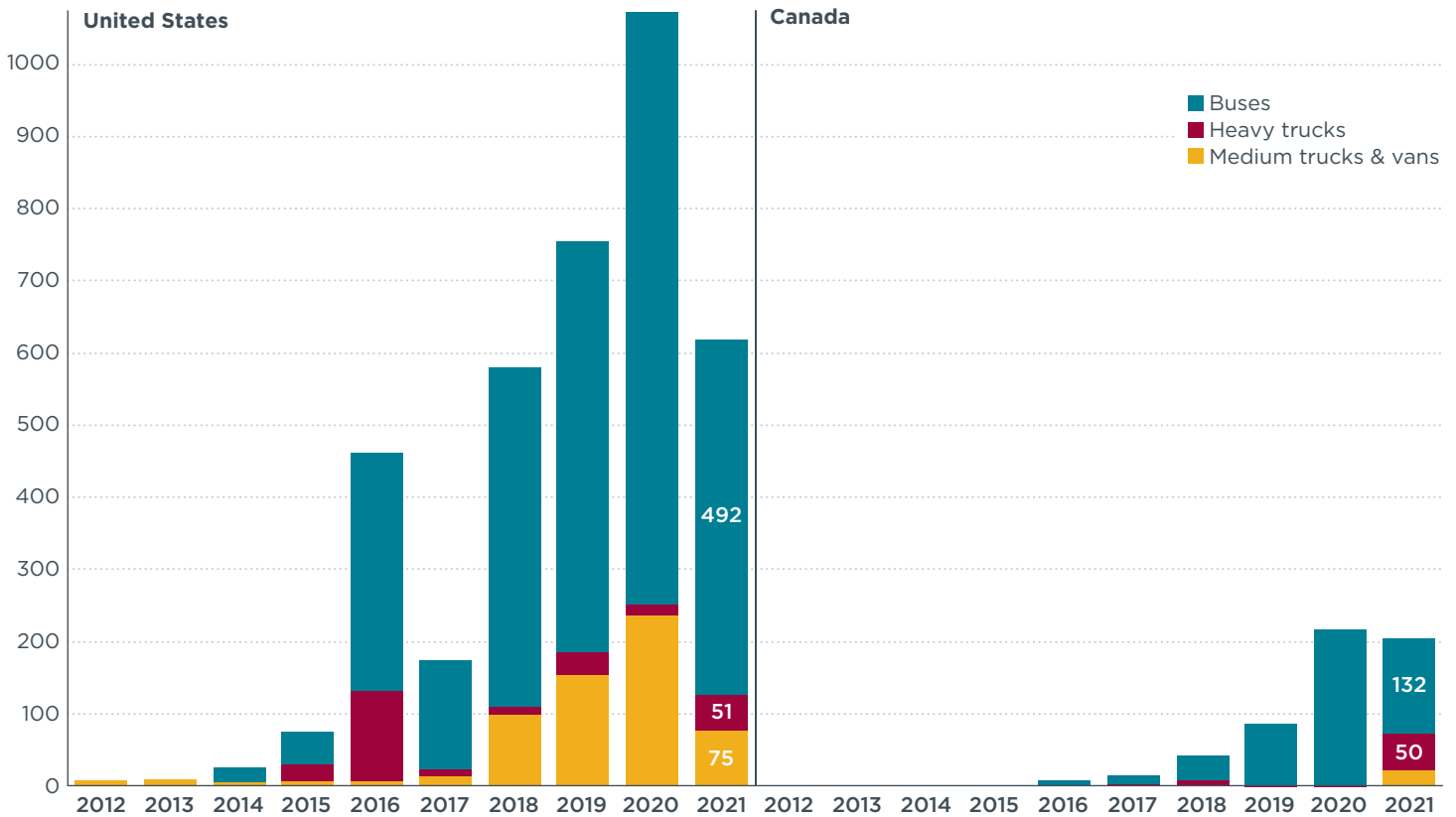


Figure 3. Zero-emission heavy-duty vehicle sales in North America

Most zero-emission HDVs sold globally to date have utilized battery-electric technology. Of those sold in North America, battery sizes range widely from sub-100 kWh for medium trucks and vans up to nearly 700 kWh for the largest trucks and buses sold in 2021. A small portion of fuel cell powertrains have broken onto the scene in the last few years, particularly in the budding heavy truck market.

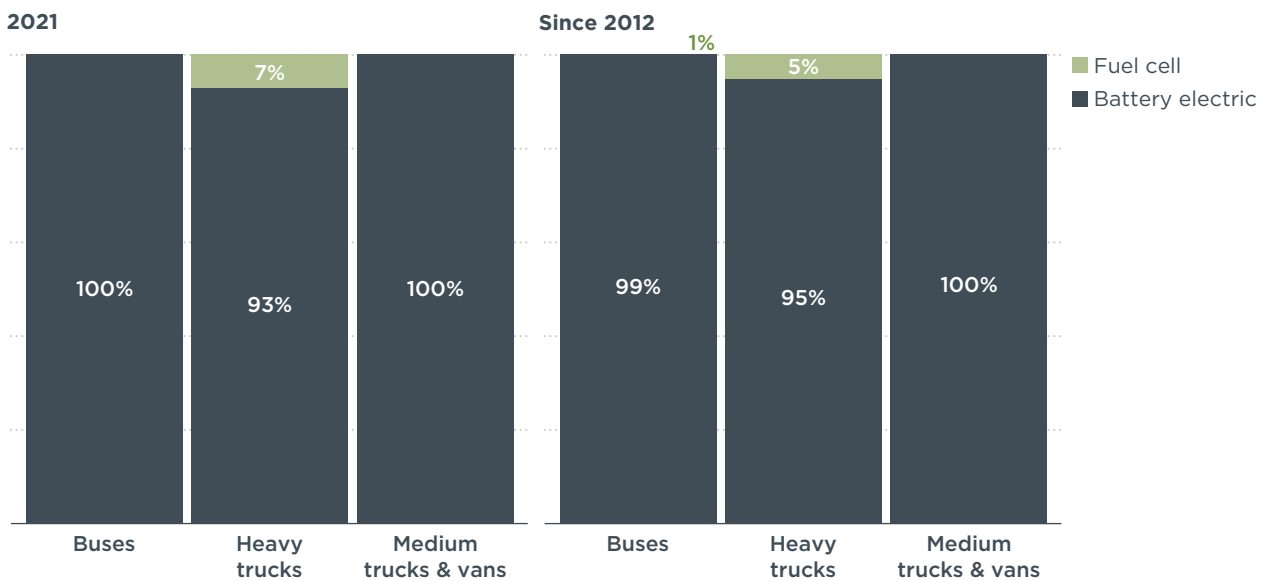


Figure 4. Technology shares of zero-emission heavy-duty vehicle sales in North America

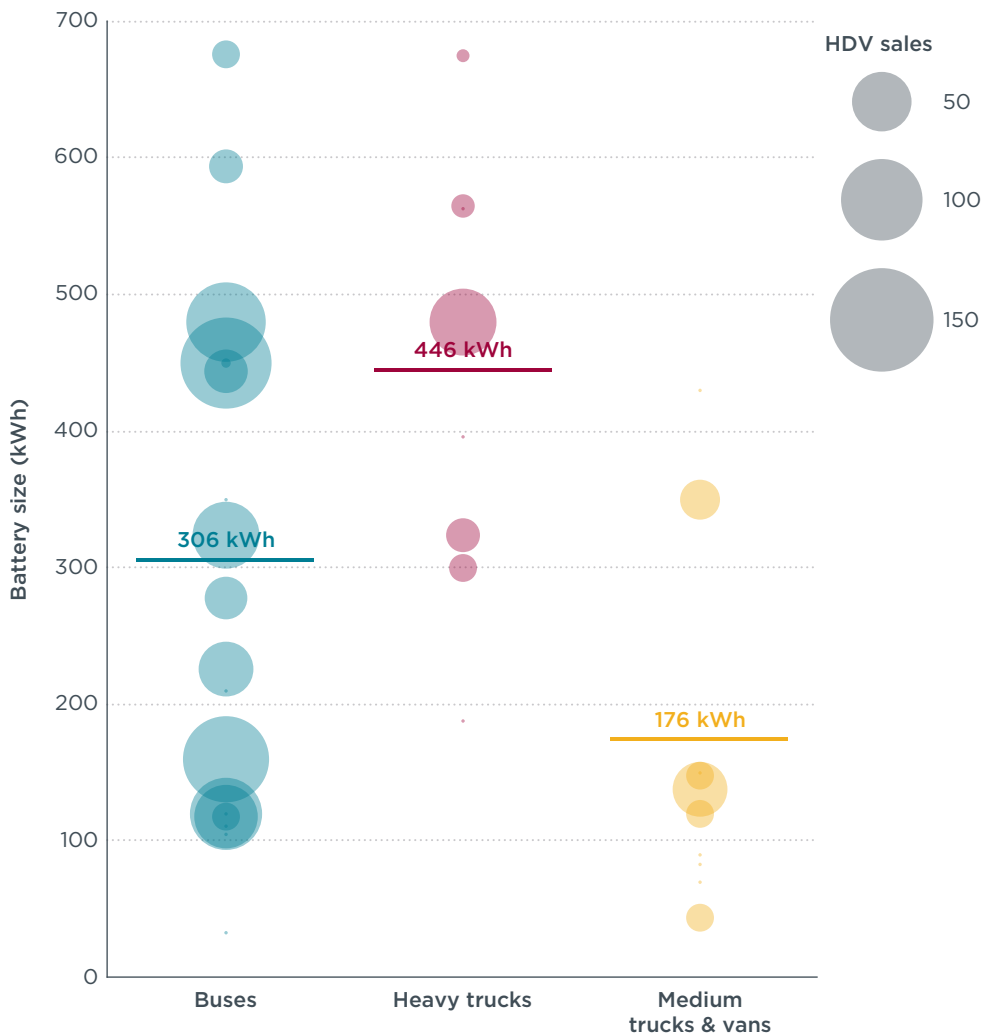


Figure 5. Battery size distribution of battery-electric heavy-duty vehicle sales in North America in 2021

The registration of zero-emission HDVs has not kept pace with sales. This is likely due, at least in part, to supply chain disruptions and delays in vehicle delivery and infrastructure readiness. While EV-Volumes reported 618 zero-emission HDV sales in the United States in 2021, IHS Markit reported only 174 newly registered zero-emission HDVs.⁴ Overall, including both conventional and zero-emission technologies, new HDV registrations are dominated by medium and heavy trucks, together representing 87% of new registrations in 2021. Buses represented less than 4% of the HDV market but accounted for nearly 80% of zero-emission sales and new registrations.

⁴ New U.S. registrations obtained from IHS-Markit Global S.à.r.l ©.

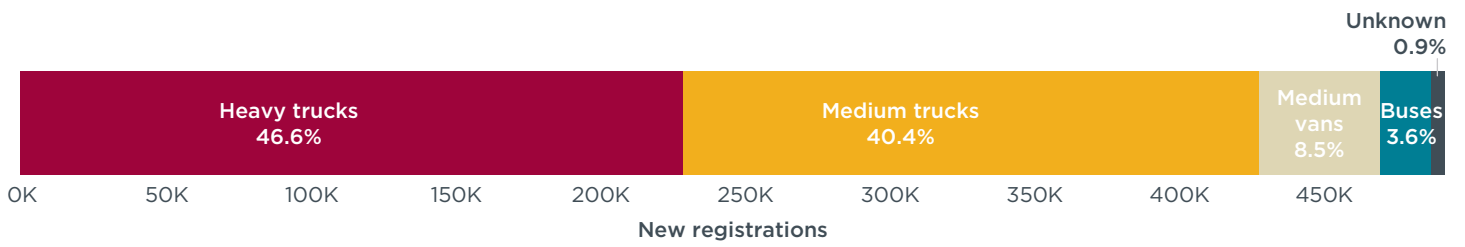


Figure 6. New heavy-duty vehicle registrations in the United States by vehicle group in 2021

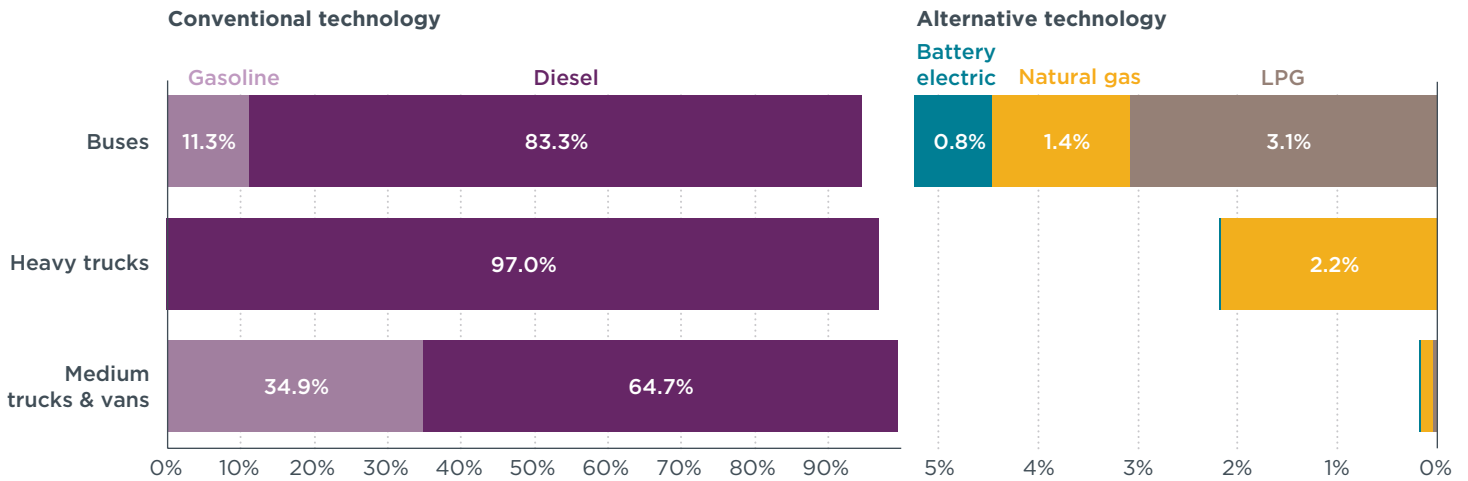


Figure 7. Conventional and alternative technology shares of new heavy-duty vehicle registrations in 2021

Many legacy manufacturers have entered the zero-emission market alongside newer all-electric manufacturers. The contrast is particularly stark in the bus market, in which new all-electric players like Proterra, GreenPower, and NFI subsidiary New Flyer accounted for more than 90% of zero-emission sales over the last few years. Legacy manufacturers accounted for a slightly larger share of the zero-emission market for heavy trucks (26%), and even more for medium trucks and vans (56%).

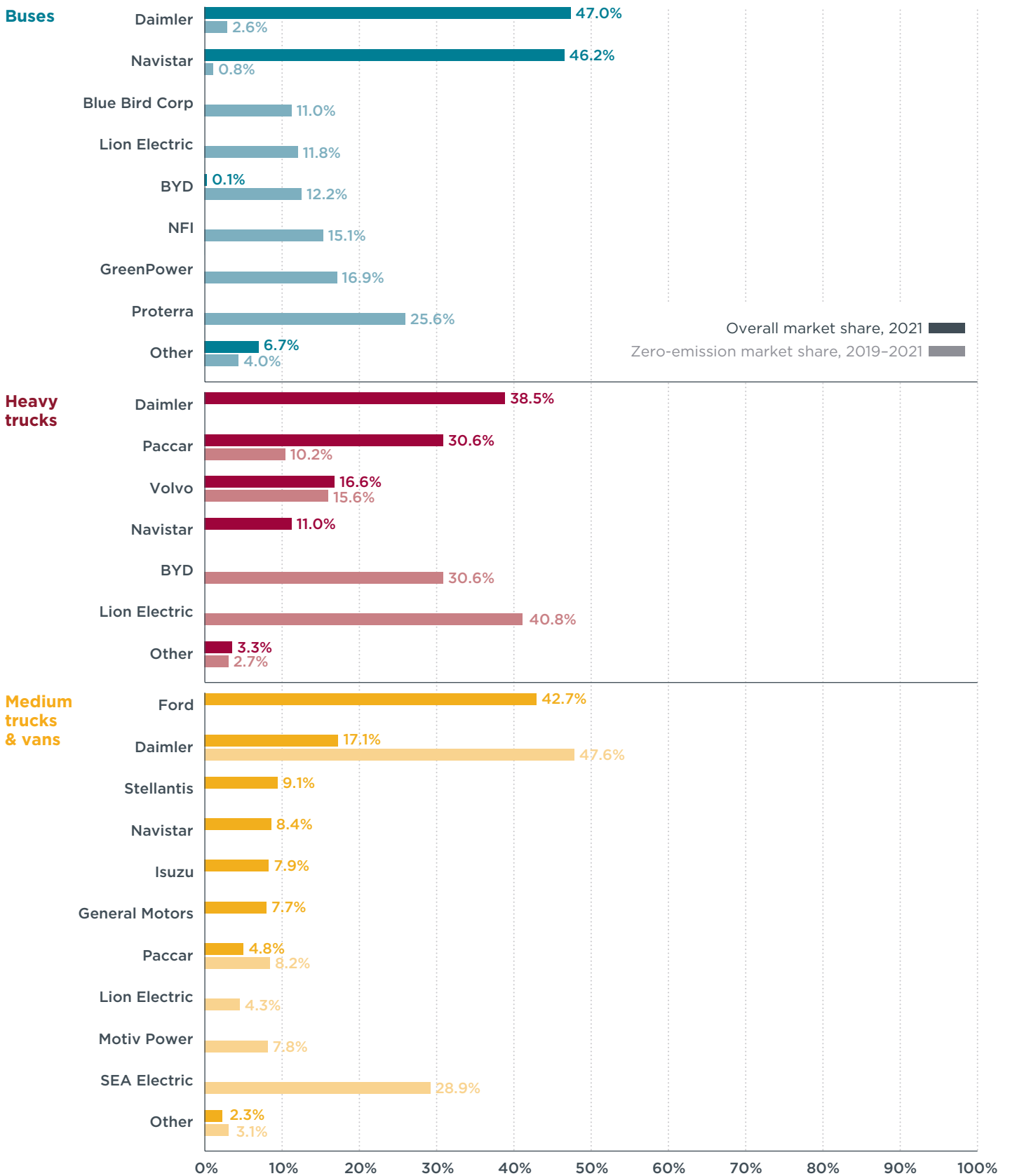


Figure 8. North American heavy-duty vehicle market share by manufacturer

Of zero-emission HDVs sold in North America since 2019, roughly 61% were manufactured locally in their country of sale. In both the United States and Canada, the next highest country of origin is the respective other: Canada accounted for 22% of the United States market and the United States accounted for 39% of the Canadian market. Medium trucks and vans are the only vehicle group not dominated by North American manufacturing, owing to production in Japan by Mitsubishi and Hino in roughly equal shares. This share is expected to decline as Mitsubishi exited the North American HDV market in 2020.⁵

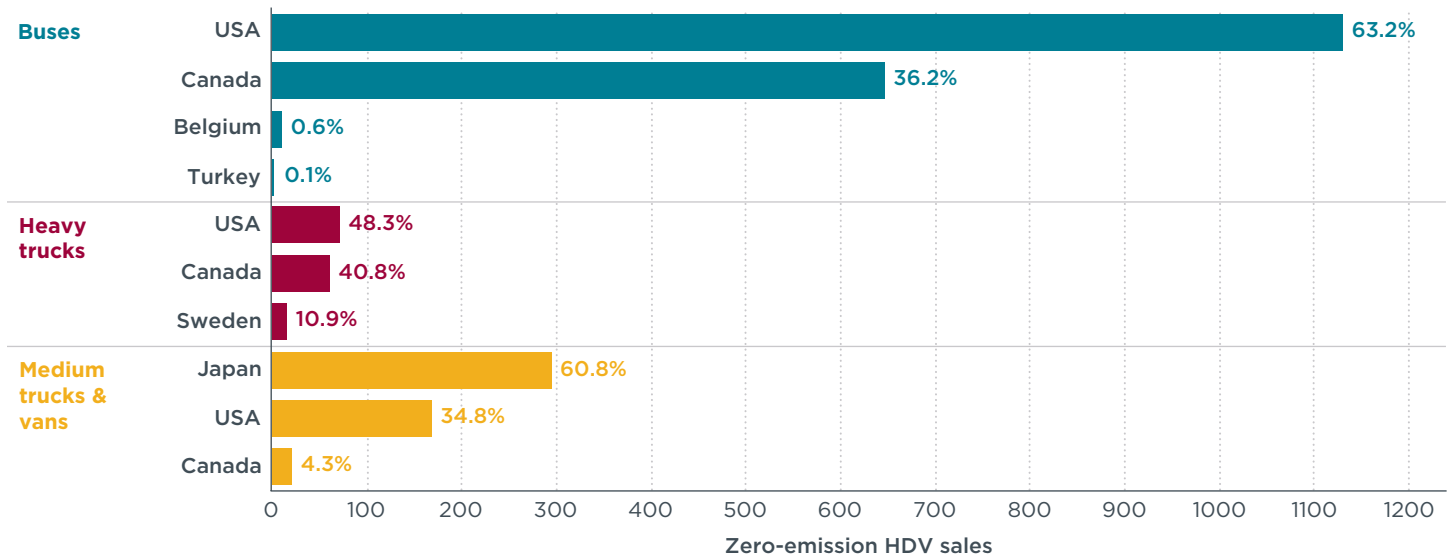


Figure 9. Chassis origin of zero-emission heavy-duty vehicles sold in North America in 2019-2021

There are currently 34 manufacturing plants producing zero-emission HDVs in the United States and Canada.⁶ Of these, 13 are fully zero-emission production lines. Buses are manufactured at 21 plants, consisting of 3 producing only zero-emission buses, 6 producing zero-emission buses alongside other zero-emission vehicle types, and 12 producing zero-emission buses alongside conventional buses.

The production of zero-emission HDVs in the United States is distributed across the lower 48 states, with a notable concentration of manufacturing plants in California and a strong showing in south central and southeastern states. More zero-emission HDV manufacturing plants are expected to come online, including a GreenPower plant for school buses in West Virginia.⁷ In Canada, production is largely concentrated in the province of Québec.

⁵ “Mitsubishi Fuso Truck of America Discontinues New-Truck Sales,” *Truckinginfo*, (May 27, 2020), <https://www.truckinginfo.com/359173/mitsubishi-fuso-truck-of-america-discontinues-new-truck-sales>.

⁶ Information on manufacturing plants in the United States and Canada obtained from MarkLines, www.marklines.com. Original research supplemented manufacturing plant data when available.

⁷ GreenPower Motor Company, “GreenPower to Manufacture All Electric School Buses in West Virginia,” GreenPower Motor Company, January 12, 2022, <https://greenpowermotor.com/greenpower-manufacture-electric-school-buses-west-virginia/>.

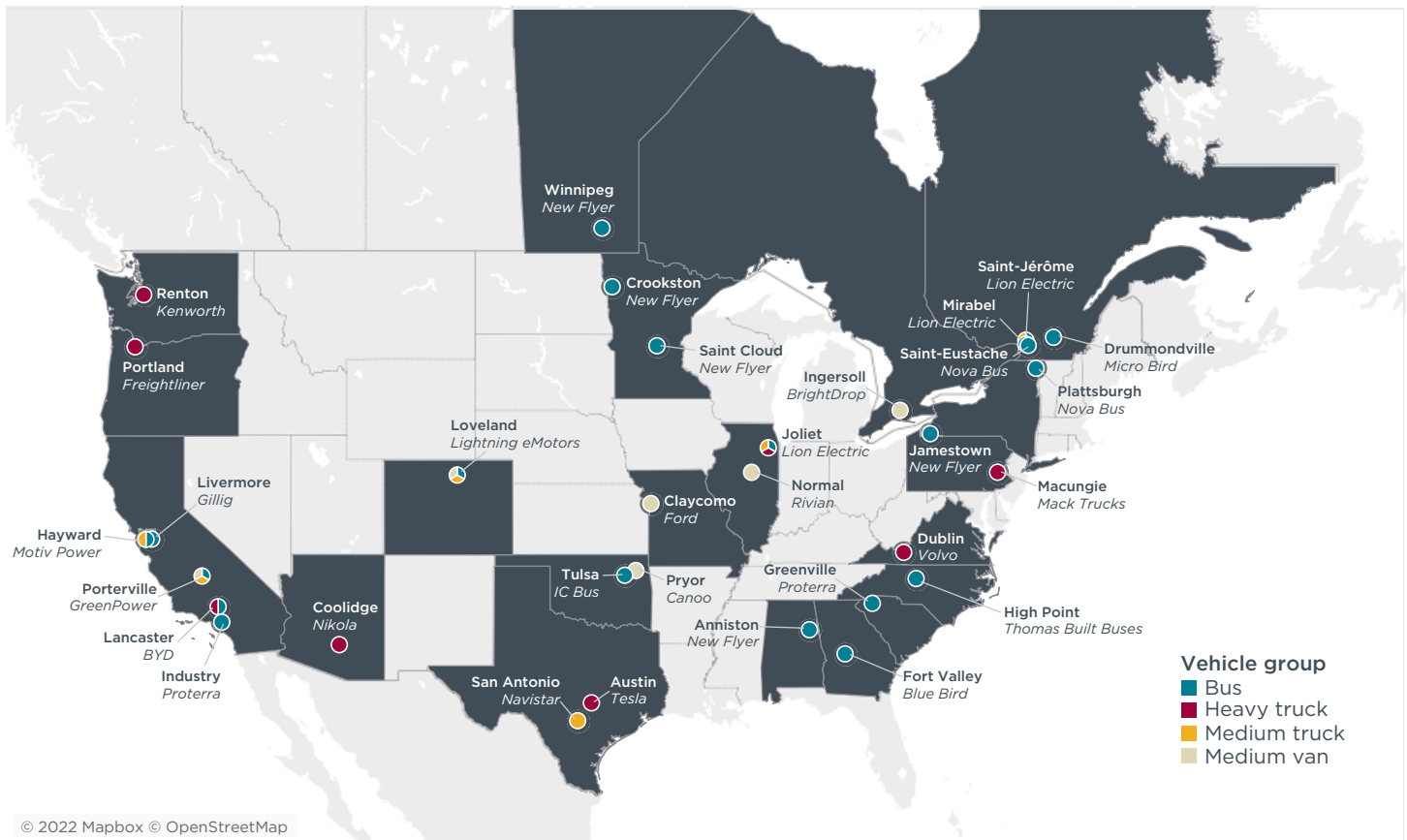


Figure 10. Current manufacturing plants for zero-emission heavy-duty vehicles in North America

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