WORKING PAPER

NOVEMBER 2024

Fuel consumption from light commercial vehicles in India in fiscal years 2021–22, 2022–23, and 2023–24

By Harsimran Kaur and Ashok Deo

INTRODUCTION

Light commercial vehicles (LCVs) are vehicles primarily designed for the transportation of goods and are smaller in size compared with medium- and heavy-duty trucks. They play a crucial role in the logistics and supply chain sectors, particularly in urban areas where their compact size allows for easier navigation and delivery. LCVs include mini trucks and pickup trucks that are essential for small- and medium-sized businesses, as well as last-mile delivery services. Because of their role in economic activity, particularly in urban areas, understanding the fuel efficiency of LCVs is important for the development of sustainable transport systems.

India has implemented fuel efficiency regulations and incentive programs for electric vehicles to support the decarbonization of the road transport sector. While this includes fuel economy regulations for passenger cars, LCVs are not subject to any such regulations. These standards have proven to play a critical role in decarbonizing the road transport sector (Deo & Kaur, 2024). To this end, this paper examines the fleet-average carbon dioxide (CO_2) emissions of LCVs in India. Our analysis establishes a baseline of fleet-average fuel consumption using CO_2 emissions as a proxy, and this is key to developing effective CO_2 emission standards. We further analyze the Indian LCV fleet characteristics relative to the European Union, as well as examine the performance of original equipment manufacturers (OEMs) of Indian LCVs if passenger car fuel consumption standards were to be applied.

The paper focuses on N1 category vehicles, which are vehicles that have a gross vehicle weight of less than 3,500 kg and consist of two body types—mini trucks and pickup trucks. This paper is a continuation in the series of working papers on the Indian LCV market, dating back to 2016 (Deo, 2021; Menon & Bandivadekar, 2016; Narla et al., 2021).

Acknowledgments: The authors thank Anirudh Narla, Aviral Yadav, and Sunitha Anup of the ICCT for helpful reviews, and Amy Smorodin for editing.

www.theicct.org

communications@theicct.org

@theicct.org

icct
THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

DATA SOURCES AND DATABASE CONSTRUCTION

To examine the fleet-average fuel consumption of LCVs in India, this study uses the following parameters:

- Engine displacement (cc)
- Engine power (kW)
- Fuel type
- CO_2 emissions (g CO_2/km)

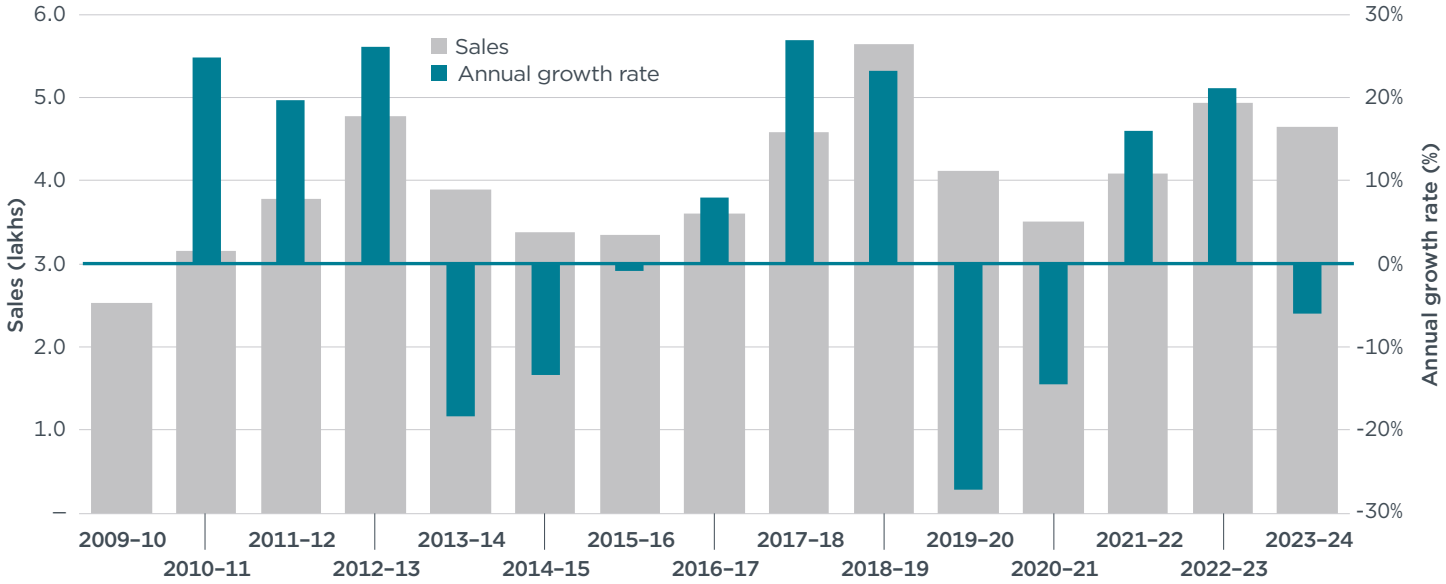
To construct our database of the LCV fleet in India, we use sales data from Segment Y Automotive Intelligence, an independent automotive data supplier. The data, however, had missing values for certain parameters and did not include fuel consumption. Therefore, in constructing the database, we included information from manufacturer and third-party websites. Information on fuel consumption was obtained from JATO Dynamics, another automotive data supplier. Once the database was assembled, we calculated the sales-weighted averages of all parameters for the LCV segment. All CO_2 values used in our analysis are measured on a standard Modified Indian Drive Cycle (MIDC).

FLEET CHARACTERISTICS OF LIGHT COMMERCIAL VEHICLES IN INDIA

The light-duty vehicle market consisted of approximately 88% passenger cars and 12% LCVs in FY 2021–22 (shortened to FY22 here onward for all such fiscal years). The share shifted to 89% passenger cars and 11% LCVs in FY23, and 90% passenger cars and 10% LCVs at the end of FY24. LCVs are primarily used for last-mile delivery of goods in Indian cities. Of the total goods commercial vehicle market, LCVs occupied 57% of the market share in FY22, while medium- and heavy-duty trucks contributed the remaining 43%. The market share of LCVs dropped to 52% in FY23 and 48% in FY24. As shown in Figure 1, sales of LCVs peaked in FY19, at 5.6 lakhs. However, with the COVID-19 pandemic, sales declined by 27% in FY20 and 14% in the year after. LCV sales recovered in FY22 at 4.9 lakhs, followed by a slight decline of 6% in FY24. This decline can be attributed to the initial high baseline and a slowdown in the e-commerce market (Balachandar, 2024).

Figure 1

Annual light commercial vehicle sales and growth rate year-on-year



THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION **THEICCT.ORG**

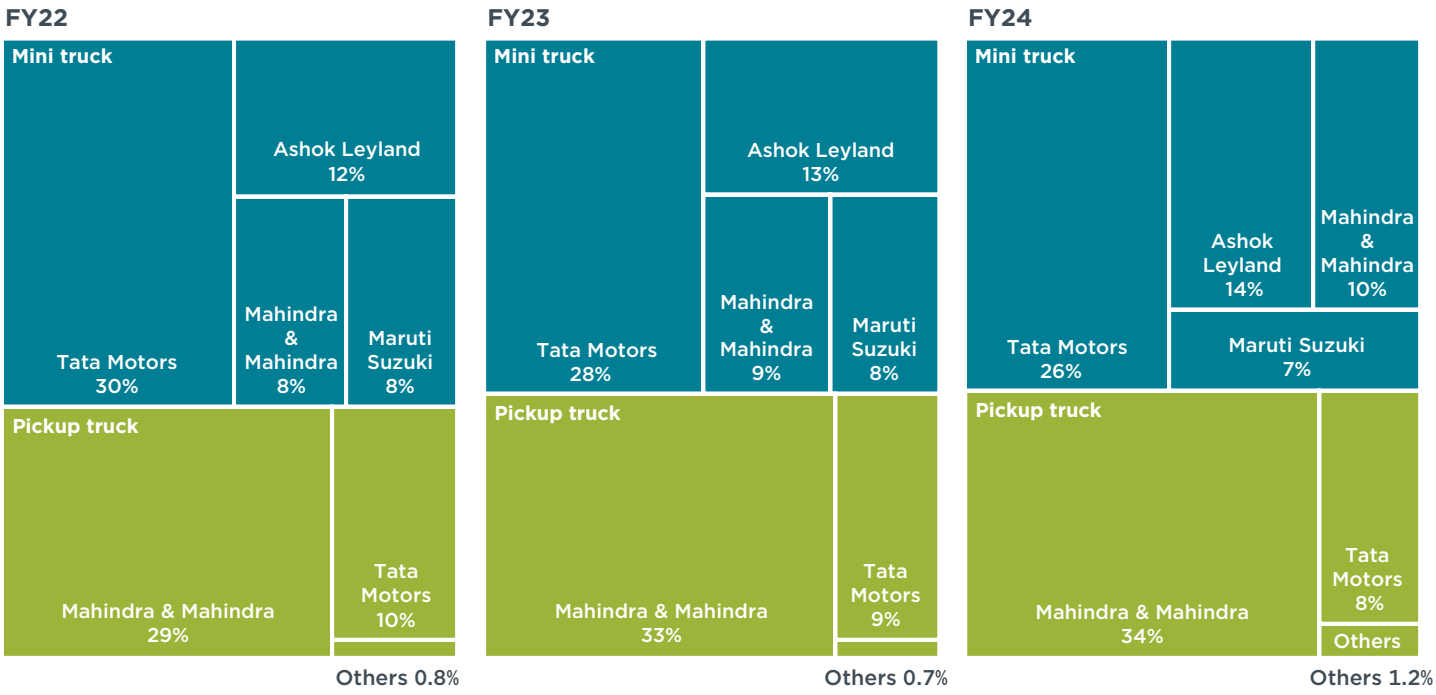
The Indian LCV market is dominated by mini trucks, which accounted for 59% of the market share in FY22, and 57% in FY23 and FY24. While mini trucks are popular for last-mile delivery of goods, pickup trucks are used for both commercial and personal purposes. Pickup trucks are generally equipped with multicylinder diesel engines and higher payload capacities than lighter mini trucks. Figure 2 summarizes LCV sales by segment type in FY22, FY23, and FY24.

As seen in Figure 2, Tata Motors had the highest market share in mini trucks, followed by Ashok Leyland and Mahindra. The Tata Ace Gold in the compressed natural gas (CNG), gasoline, and diesel variants is the highest-selling model in the mini truck segment. However, between FY23 and FY24, with the launch of the Tata Ace HT+ variant, Ace Gold sales declined, particularly of the gasoline variant (see Figure 3) ("Tata Motors launches," 2023). In total, the sales of Tata Motors in the mini truck segment declined by 4% between FY22 and FY24. The sales of Ashok Leyland and Mahindra & Mahindra jumped by 26% and 40%, respectively, in the same period.

In the case of pickup trucks, Mahindra & Mahindra and Tata Motors together accounted for 97% of the market share in FY24. Sales of Mahindra & Mahindra in this segment grew by 30% between FY22 and FY24. Tata Motors, on the other hand, observed a 9% decline in sales in the same period. The Mahindra Bolero Maxitruck is the highest selling model in this segment, followed by the Tata Yodha. While the sales of diesel variants of the Mahindra Bolero Maxitruck declined between FY23 and FY24, sales of the CNG variant increased in the same period.

Figure 2

Share of all light commercial vehicle sales by manufacturer

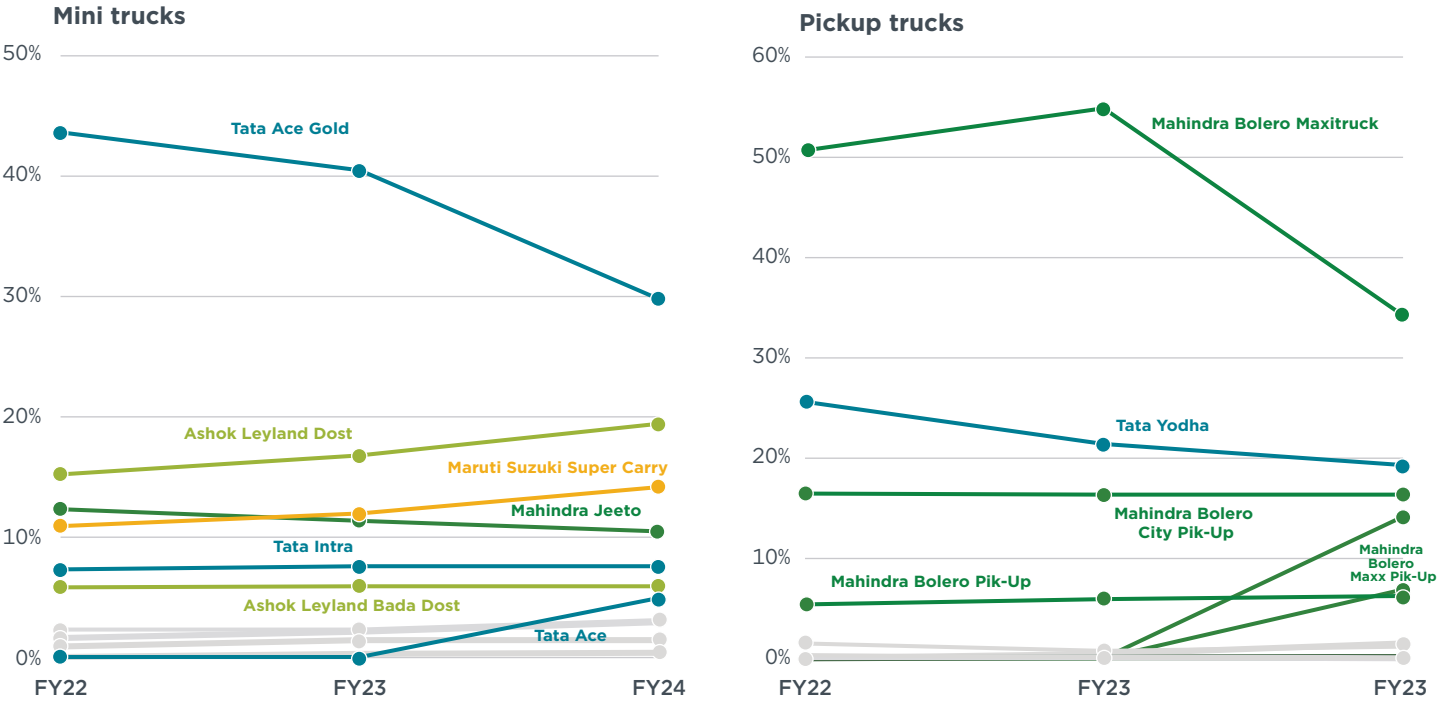


Notes: Light commercial vehicles include mini trucks and pickup trucks. Others includes Isuzu Motors, Toyota, Force Motors.

THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION **THEICCT.ORG**

Figure 3

Sales share of the top models in the light commercial vehicle segment



THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION **THEICCT.ORG**

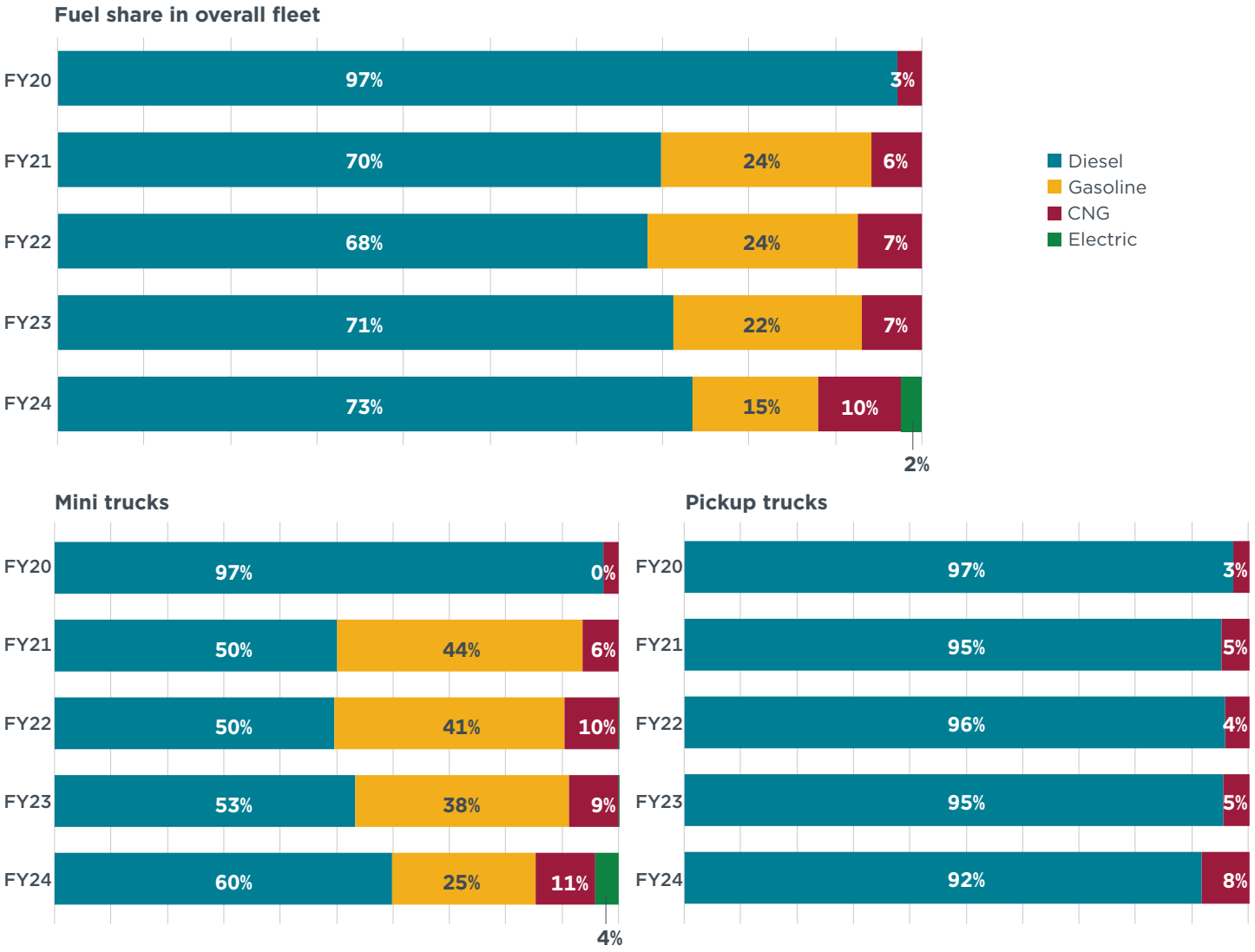
After implementation of the Bharat Stage VI (BS VI) standards in FY21, the diesel fleet lost about a quarter of its market share to gasoline vehicles, and the share of

CNG vehicles doubled. Since then, the market share of diesel LCVs has remained at approximately 70%, with a slight increase to 73% in FY24 (see Figure 4). While the share of CNG vehicles gradually increased from 6% in FY21 to 10% in FY24, the share of gasoline vehicles decreased from 24% to 15% over the same time frame.

When comparing the vehicles segments by fuel type, we find that the share of gasoline vehicles in the mini truck segment has shrunk over the 3 years analyzed, while the share of CNG vehicles has remained stable and the share of diesel vehicles increased. In the pickup truck segment, a shift towards CNG vehicles is observed between FY22 and FY24; the CNG share doubled from 4% to 8% while the share of diesel vehicles in the segment decreased. An interesting trend observed in FY24 is the increasing share of electric LCVs (eLCVs) in the mini-truck segment, when they contributed to 4% of the total sales, led by Tata Ace EV, the single highest selling model among eLCVs.

Figure 4

Market share of light commercial vehicles by fuel type



THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION **THEICCT.ORG**

Mahindra & Mahindra sold half of all diesel LCVs in each of the 3 years between FY22 and FY24. Tata Motors accounted for a quarter of diesel LCV sales, while Ashok Leyland had 18% of sales in the same period.

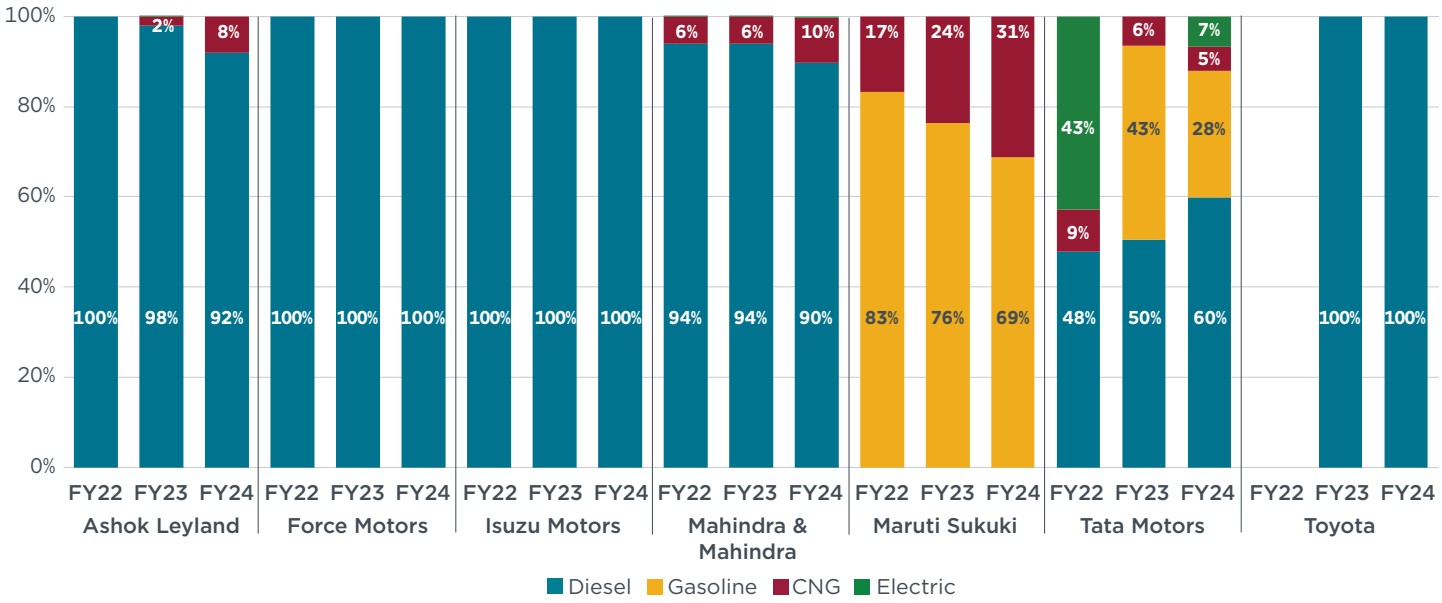
Tata Motors is the market leader in gasoline LCV sales. Its share, however, has declined from 72% in FY22 to 65% in FY24. This decline can be attributed to lower sales of the Tata Ace Gold, which fell 38% between FY22 and FY24. Maruti Suzuki, the only other original equipment manufacturer with gasoline LCV sales, increased its sales share.

In FY22, 51% of total CNG vehicle sales in the LCV segment were attributed to Tata Motors. However, with the decline in the sales of the Tata Ace Gold, Mahindra & Mahindra pulled ahead in FY23 with 36% of CNG sales in the LCV segment, closely followed by Tata Motors at 34%. And by the end of FY24, Ashok Leyland became the LCV leader in CNG sales at 46%, followed by Mahindra & Mahindra at 23% and Tata Motors at 19%.

Five of the seven LCV manufacturers focused almost exclusively on diesel vehicles (Figure 5). Ashok Leyland's sales in all three fiscal years were primarily diesel vehicles except for a small but growing share of CNG vehicles. After Ashok Leyland launched a CNG variant of the Dost model in FY23, the share of CNG vehicles in the company's sales increased from 2% in FY23 to 8% in FY24. The sales of Isuzu Motors, Force Motors, and Toyota were all diesel vehicles in the pickup truck segment category. Toyota entered the LCV segment with its Toyota Hilux pickup truck model in FY23.

Figure 5

Fleet mix of diesel, gasoline, CNG, and electric light commercial vehicles sold by each manufacturer



ENGINE DISPLACEMENT

The fleet-average engine displacement decreased from 1624 cc to 1555 cc (a 4% decline) between FY21 and FY22. However, it later increased by 3% year-on-year to reach 1,650 cc in FY24 (see Figure 6). Fleet-average engine displacement increased gradually between FY22 and FY24 for both the mini truck and the pickup truck segments. We find that the fleet-average engine displacement of Ashok Leyland and Force Motors remained the same between FY20 and FY24. In the case of Mahindra & Mahindra, the sales share of LCVs with an engine displacement below 1,000 cc increased gradually to 23% in FY24. On the other hand, in the case of Tata Motors, the sales share of sub-1,000 cc vehicles decreased from 71% in FY22 to 67% in FY24, increasing the fleet's average engine displacement. Maruti Suzuki's sub-1,000 cc diesel Super Carry was discontinued in favor of the 1,200 cc gasoline and CNG engine models

after FY20 to comply with the BS VI regulation. The diesel Super Carry model accounted for 90% of Maruti Suzuki's sales in FY20, explaining the large difference in Maruti Suzuki's fleet- average displacement between FY20 and FY24.

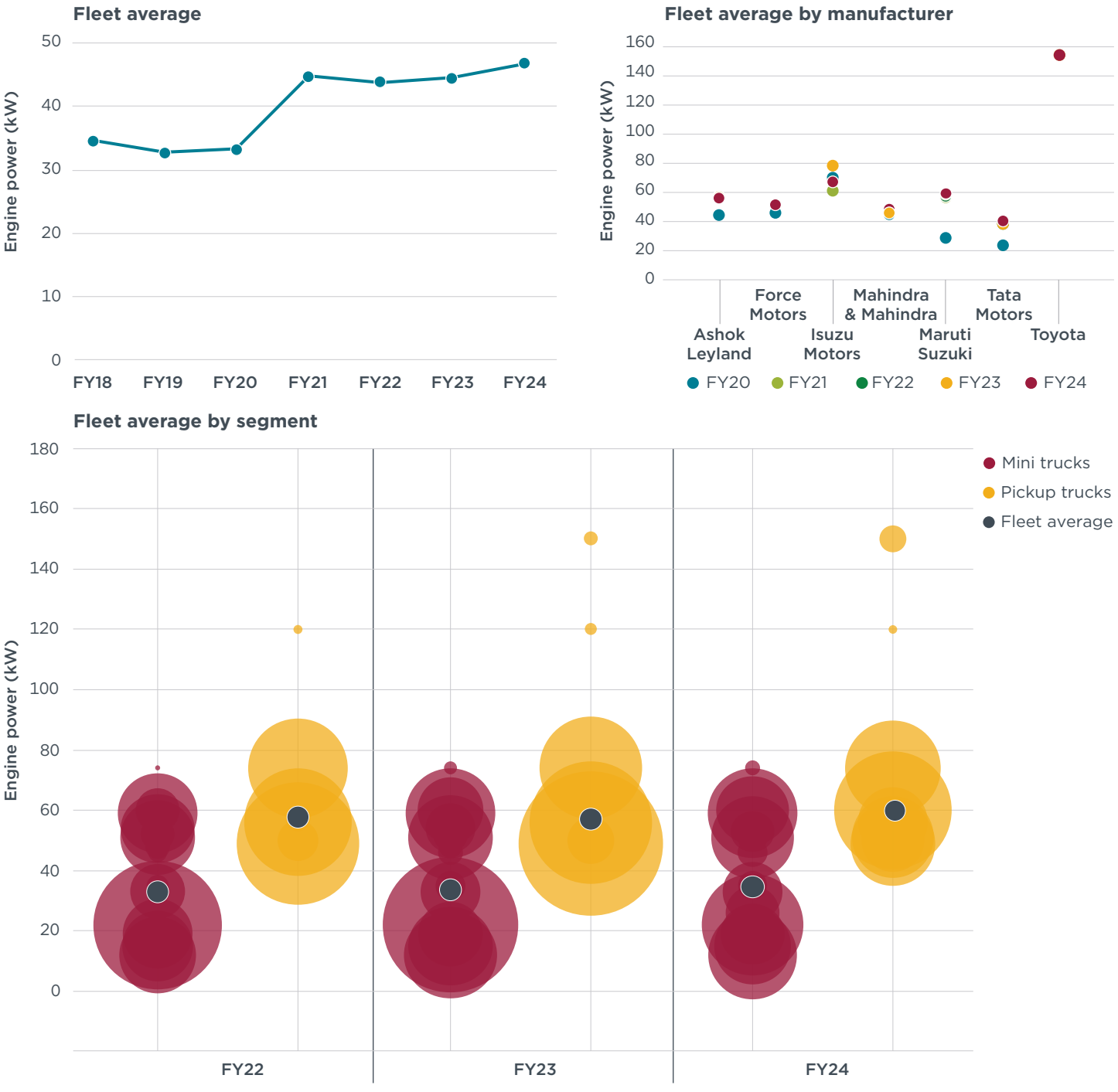
Figure 6
Fleet-average engine displacement of light commercial vehicles by manufacturer and segment

ENGINE POWER

Between FY22 and FY24, the fleet-average engine power of LCVs increased by 7%, from 43 kW to 45.7 kW (see Figure 7). This increase was consistent for both the mini truck and pickup truck segments. Owing to the phaseout of low-power LCV models by Maruti Suzuki and Tata Motors with the introduction of BS VI, the fleet-average engine power increased from 26 kW (Maruti Suzuki) and 22 kW (Tata Motors) in FY20, to 55 kW and 36 kW in FY22, and to 56 kW and 38 kW in FY24. The fleet-average power of Tata Motors increased by 6% between FY22 and FY24. This is attributed to the increased sales share of the high-power Tata Yodha models, which accounted for a quarter of Tata Motors' sales. The power-to-weight ratio of the LCV fleet was 0.033 kW/kg in FY22, which increased by 2% to 0.034 kW/kg in FY24.

Figure 7

Fleet-average engine power of light commercial vehicles by manufacturer and segment



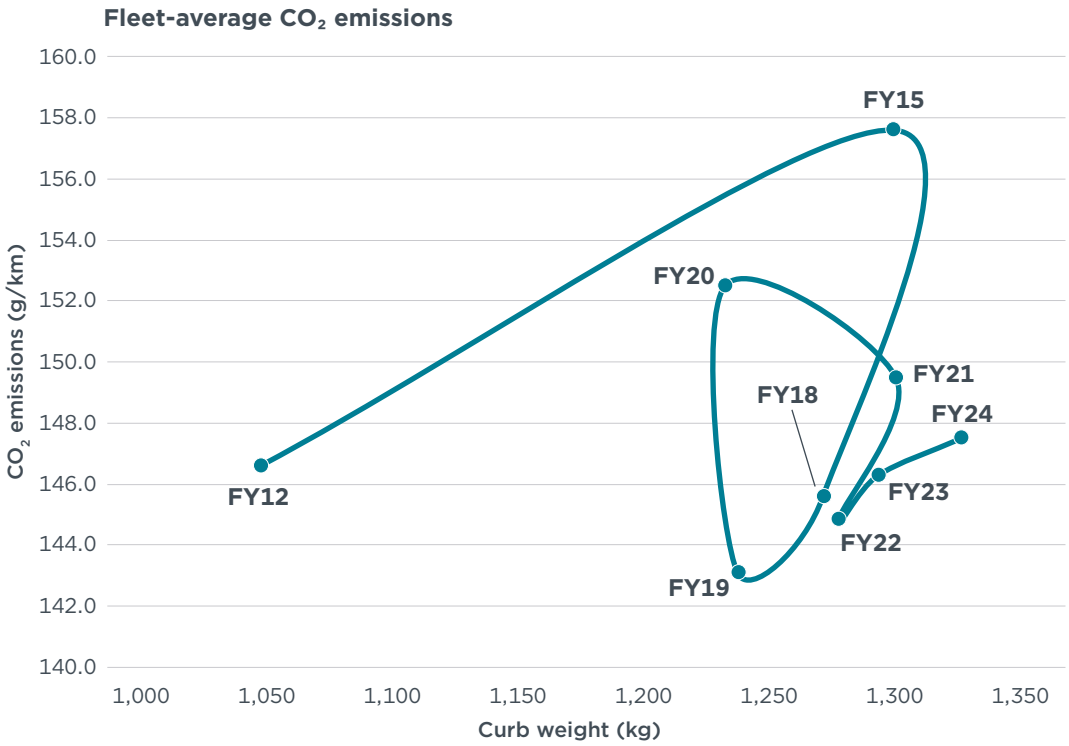
CO_2 EMISSIONS AND CURB WEIGHT

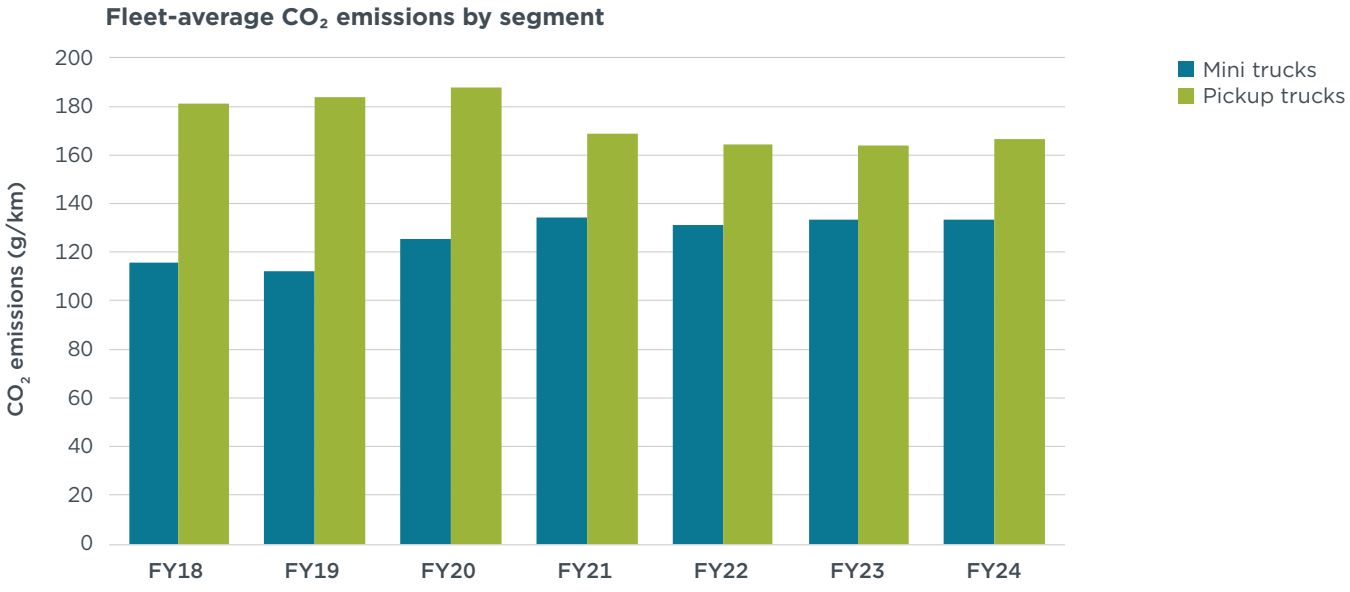
Fleet-average CO_2 emissions of LCVs dropped from 150 g/km in FY21 to 145 g/km in FY22, a 3% decrease (see Figure 8). This decline can be attributed to the decrease in sales of high-power diesel LCVs to a 68% market share, the lowest of the years analyzed (see Figure 4). In FY23 and FY24, the fleet-average emissions grew by 1% year-on-year, as diesel vehicles started to regain their market share.

The fleet-average emissions of the pickup truck segment has decreased since FY21, following implementation of BS VI standards, as the share of diesel sales declined and the share of CNG vehicles increased from 4% in FY22 to 8% in FY24 (see Figure 4). However, in case of mini trucks, fleet-average CO_2 emissions have remained stable between FY22 and FY24.

Figure 8

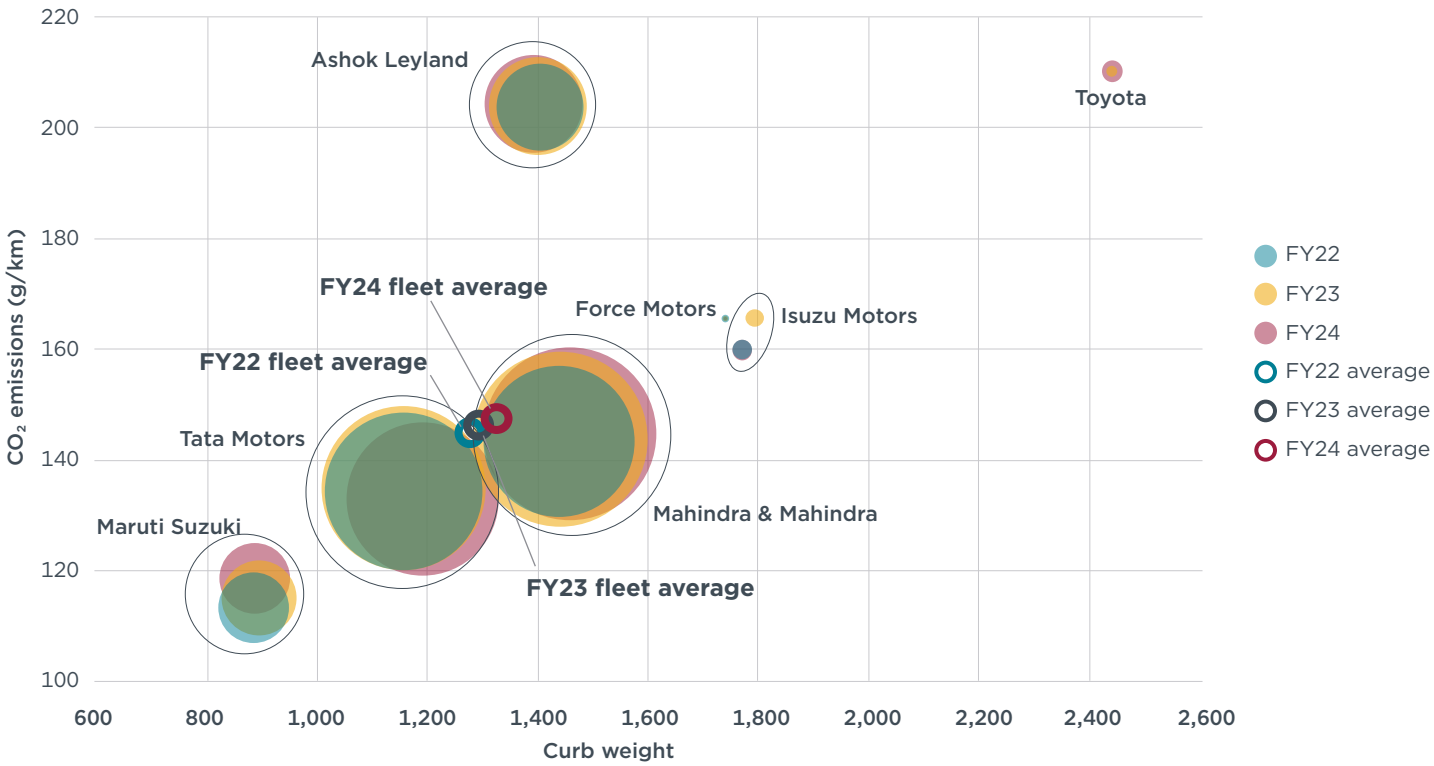
Fleet-average CO_2 emissions by curb weight and light commercial vehicle segment





While the fleet-average emissions of most OEMs remained about the same in the period between FY22 and FY24, Maruti Suzuki observed a 5% increase in fleet-average CO_2 emissions in the same period (see Figure 9). Maruti Suzuki offers two models: the Super Carry with average CO_2 emissions of 109 g/km and the EECO Cargo with average CO_2 emissions of 144 g/km. While sales of the Super Carry increased, its sales share in total LCV sales of Maruti Suzuki decreased from 98% in FY22 to 94% in FY24, resulting in slightly higher fleet-average CO_2 emissions.

Figure 9
Fleet-average CO_2 emissions by manufacturer, as measured over MIDC



India's fuel consumption standard for the M1 category of passenger vehicles, the first such standard in the country, was implemented on April 1, 2017, by the Ministry of Road Transport and Highways, in collaboration with the Bureau of Energy Efficiency (Ministry of Power, 2015). Compliance with the standard is determined by the average fuel consumption of all vehicles sold by a manufacturer in the fiscal year. Based on this standard, it is expected that the fuel consumption of the passenger car fleet will decline (Bureau of Energy Efficiency, 2024). A similar standard for LCVs has not been implemented.

With gross vehicle weights of less than 3.5 tons, both passenger cars and LCVs have similar vehicle architectures, powertrains, and engine displacements, although real-world payloads and drive cycles differ considerably. Due to the design similarities of these segments, most of the technologies deployed in cars to improve fuel economy can be easily applied in LCVs as well.

Table 1 shows the CO_2 performance of individual LCV manufacturers against the current M1 category fuel consumption standards implemented for passenger cars in April 2022. For each manufacturer, an individual target is calculated based on the average weight of the manufacturer's vehicle fleet. Ashok Leyland would need to reduce CO_2 emissions the most if the M1 category fuel consumption standards were extended to LCVs. On

average, manufacturers would need to improve fuel consumption by 18% to be well within the limit for passenger cars in India.

Table 1
CO_2 emissions gap compared with FY24 passenger car fuel consumption standards by manufacturer

Manufacturer	Fleet- average curb weight (kg)	Fleet-average CO_2 emissions (g/km)	CO_2 target based on M1 industry average weight (g/km)	Gap
Ashok Leyland	1,393	204	128	60%
Force Motors	1,740	166	144	15%
Isuzu Motors	1,771	160	146	10%
Mahindra & Mahindra	1,459	145	131	10%
Maruti Suzuki	888	118	104	14%
Tata Motors	1,192	133	118	12%
Toyota	2,440	210	178	18%
Fleet average	**1,326**	**147**	**125**	**18%**

COMPARISON WITH THE EUROPEAN UNION

In 2022, 87% of on-road vehicles in the European Union were passenger cars, 10% were LCVs, and the remaining 3% were heavy-duty vehicles with gross vehicle weight greater than 3.5 tonnes (International Council on Clean Transportation, 2024).

The European Union adopted a separate set of CO_2 standards for passenger cars and LCVs in 2019. In the latest phase of the standards, adopted in March 2023, the European Union became the first major market to introduce a 100% CO_2 emission reduction target for all cars and vans newly registered from 2035 onward. As shown in Figure 10 (Dornoff, 2023), the standards require LCV manufacturers to meet a fleet- average CO_2 emissions target of 153 g/km by 2025 under the Worldwide harmonized Light vehicle Test Procedure (WLTP). The WLTP replaced the New European Driving Cycle (NEDC).

Figure 10
Light commercial vehicle fleet CO_2 emission trends and targets in the European Union

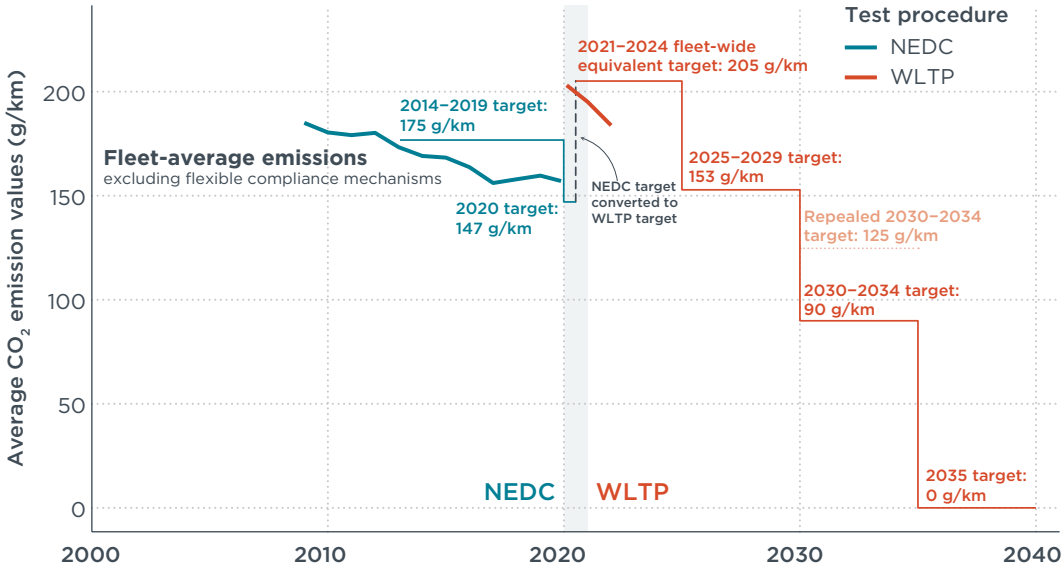


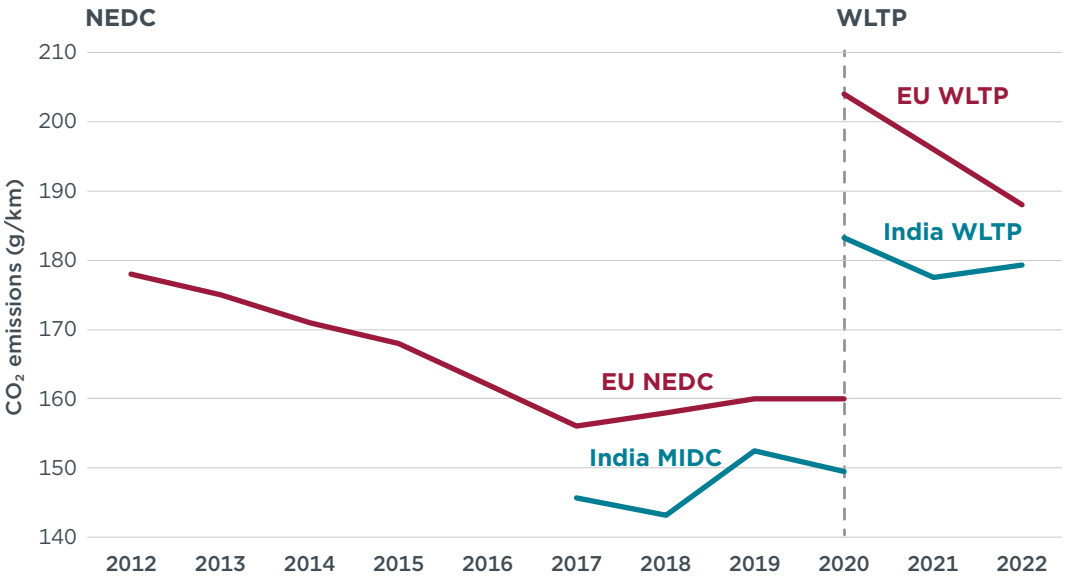
Table 2 compares the characteristics of LCVs in India with those in the European Union. We find that LCV engines in India are smaller than those in the EU fleet. Similarly, the average curb weight is 617 kg lower than the average weight in the EU fleet. India's CO_2 emission values are determined on the MIDC test cycle, while those of the European Union are determined on the WLTP cycle. The WLTP cycle is more representative of the everyday driving conditions, unlike the MIDC, which is a derivative of the NEDC with urban and highway phases.

Table 2
Comparison of light commercial vehicle fleet characteristics in India and the European Union

Fleet characteristic	India (FY23)	EU (2022)
Engine displacement	1,603 cc	1,894 cc
Curb weight	1,293 kg	1,910 kg
CO_2 emissions	146 g/km (MIDC) 179 g/km (WLTP)	188 g/km (WLTP)
Power	43.7 kW	98 kW
Diesel	71%	86%
Gasoline	22%	0%
CNG	7%	1.2%
Battery electric	0.1%	5%
Plug-in hybrid	0%	0.2%
Full hybrid	0%	0.5%

The average CO_2 emissions from the EU fleet are higher than those of the Indian fleet. This is primarily due to LCVs in the European Union being bigger in terms of engine displacement, curb weight, and footprint. Figure 11 shows the comparison of LCV fleet CO_2 emissions in the European Union and India. We use a conversion factor of 1.226 to convert the CO_2 emissions determined on MIDC cycle to the WLTP cycle (Suarez et al., 2023). We find that, after the implementation of the BS VI standards, the LCV fleet CO_2 emissions in India were 5%–11% lower than the average CO_2 emissions of LCVs in the European Union.

Figure 11
Comparison of light commercial fleet CO_2 emissions in the European Union and India under different drive cycles



Note: MIDC is a modified version of NEDC.

Figure 12 shows the latest CO_2 emission standards for LCVs in the European Union and the fleet-average emissions of LCV manufacturers in India (Dornoff, 2023; Joint Research Centre, 2023). If India were to adopt similar CO_2 emission standards as those in the European Union, we find that Maruti Suzuki and Ashok Leyland will need to improve CO_2 emissions from their respective fleets by 52% and 51%, respectively. In contrast, Toyota will only have to improve its fleet-wide CO_2 emissions by 9%. Table 3 shows the performance of Indian LCV manufacturers if India were to adopt the same CO_2 standards for LCVs as in the European Union. On average, LCV manufacturers would have to improve fleetwide CO_2 emissions by 36%.

Figure 12

Fleet-average CO_2 emissions of Indian light commercial vehicles in FY24 with EU CO_2 standard limits in WLTP cycle

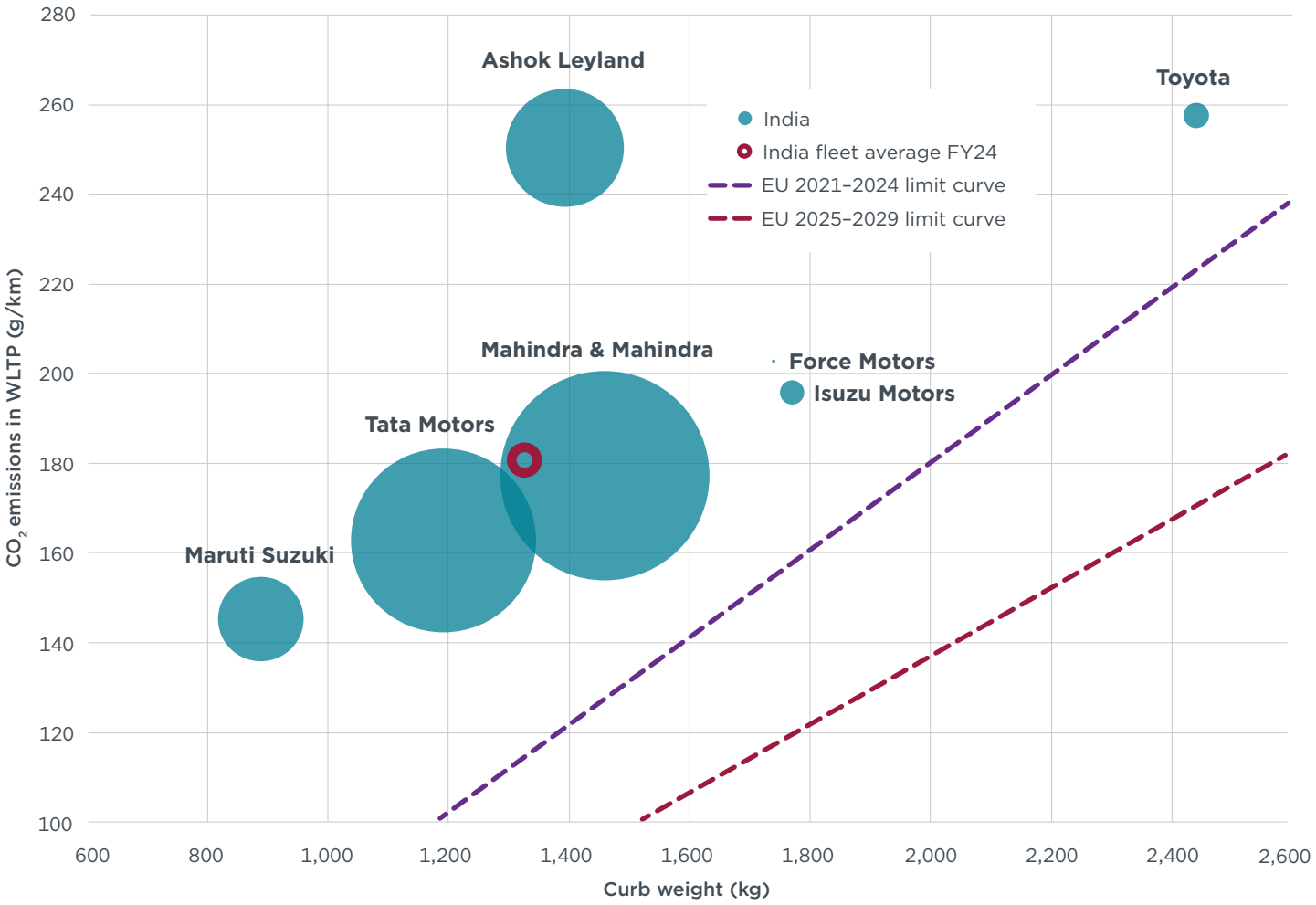


Table 3

Gap between light commercial vehicle CO_2 emissions in India in FY24 and EU light commercial vehicle targets

Manufacturer	Market share	Curb weight (kg)	CO_2 emissions (g/km)	EU 2021–2024 equivalent target	CO_2 reduction needed to meet EU target
Ashok Leyland	14%	1,393	250	123	51%
Force Motors	0.01%	1,740	203	160	21%
Isuzu Motors	0.6%	1,771	196	163	17%
Mahindra & Mahindra	44%	1,459	177	130	27%
Maruti Suzuki	7%	888	145	69	52%
Tata Motors	34%	1,192	163	101	38%
Toyota	0.6%	2,440	258	234	9%
Fleet average	**100%**	**1,326**	**181**	**112**	**36%**

ELECTRIC LIGHT COMMERCIAL VEHICLES IN INDIA

Sales of eLCVs are emerging in India, with more models being released in the market. In FY24, eLCVs accounted for nearly 2% of the total LCV sales in India. All of these sales were in the mini trucks segment, led by Tata Motors with its Tata Ace EV model. As of August 2024, there are three eLCV models available in the market. Table 4 lists the characteristics of the three eLCVs in India. Switch Mobility, a subsidiary of Ashok Leyland, has launched two eLCV models, and Tata Motors has released an electric version of the best-selling Tata Ace model.

Table 4

Characteristics of electric light commercial vehicles in India

	Switch Mobility		Tata Motors			
Model	Ie V3	Ie V4	Ace EV	Ace EV Flatbed	Ace EV 1000 CLB	Ace EV 1000 Flatbed
Body type	Mini truck	Mini truck	Mini truck	Mini truck	Mini truck	Mini truck
Gross vehicle weight	2590 kg	3490 kg	1840 kg	2120 kg	2120 kg	2120 kg
Power	40 kW peak	60 kW peak	27 kW	27 kW	27 kW	27 kW
Battery	25.6 kWh	32.2 kWh	21.3 kWh	21.3 kWh	21.3 kWh	21.3 kWh
Range	120 km	120 km	154 km	177 km	161 km	161 km
Source	Switch Mobility (n.d.)		Tata Motors (n.d.)			

Note: Switch Mobility is a subsidiary of Ashok Leyland.

Mahindra & Mahindra has allocated significant investments to the development of its first range of eLCVs, planned to launch by 2025 ("Mahindra & Mahindra's Electrifying Move," 2023). Medium- and heavy-duty truck manufacturers, such as Daimler India Commercial Vehicles and Volvo Eicher Commercial Vehicles (VECV), plan to launch eLCVs in the next couple of years (Baggonkar, 2024). Volvo Eicher Commercial Vehicles unveiled its first eLCV in 2024 and has also collaborated with Amazon to deploy up to 1000 zero-emission trucks across various payload categories in its delivery operations within the next 5 years ("Amazon to Deploy," 2023; "Eicher's EV-First SCV Truck," 2024).

The Ministry of Heavy Industries is supporting the deployment of eLCVs through its national purchase incentive scheme, the Faster Adoption and Manufacturing of (hybrid and) Electric Vehicles phase II (FAME-II scheme). A subsidy of ₹10,000/kWh

is provided under this scheme, which amounts to ₹1.8-2.1 lakhs for the Tata Ace EV models. The scheme ended in March 2024 and a new phase of the scheme is under consideration (Mukherjee, 2024).

SUMMARY AND CONCLUSIONS

Sales of LCVs have recovered following the COVID pandemic-related lockdowns in FY21; sales grew about 32% between FY21 and FY24. The fleet-average CO_2 emissions in the LCV segment in India was 150 g/km in FY24, a 4% increase from FY21. Other highlights of the analysis include:

- The sales share of CNG vehicles in the pickup truck segment is gradually increasing. The share was about 4% in FY22, which doubled to 8% in FY24. The average CO_2 emissions of CNG pickup trucks was 122 g/km in FY24, while the average for diesel pickup trucks was 170 g/km.
- Diesel mini trucks have gained market share in recent years, while sales of gasoline mini trucks have declined. Diesel mini trucks accounted for 50% of the sales share in FY22 and increased to 60% in FY24, driven by an increase in sales of Mahindra's Jeeto and Supro models.
- If India's existing fuel efficiency standards for passenger cars were also adopted for N1 category vehicles, the fleet-average CO_2 target for LCVs in FY24 would be 125 g/km. The fleet-average CO_2 emissions of LCVs in FY24 were 147 g/km, which falls short in complying with the target by about 18%.
- In FY23, the fleet-average CO_2 emissions of Indian LCVs were 5% lower than emissions from the European Union's LCV fleet. However, fuel consumption standards are based on vehicle mass, and thus a lighter fleet is subject to a stricter CO_2 target. Based on fleet-average weight, Indian LCVs would have to further improve by 36% to meet the EU targets.
- In the European Union, strong hybrid and plug-in hybrid vehicles accounted for 0.7% of total LCV sales in 2022. However, no strong hybrid or mild hybrids were offered for sale in India in the years analyzed, FY22 to FY24. Sales of electric LCVs, on the other hand, increased in India, occupying a 2% market share in FY24. Introducing long-term CO_2 standards with increasing stringency, such as those implemented in the European Union, could incentivize manufacturers to produce a greater number of hybrid and zero-emission vehicles. Furthermore, transitioning the CO_2 certification cycle from MIDC to the WLTP used in the European Union—as has been proposed for India's passenger car regulations—would result in more accurate measurements of emissions from LCVs.

REFERENCES

Amazon to deploy Eicher e-trucks for e-commerce deliveries in India. (2023, August 9). *ETAuto*. https://auto.economictimes.indiatimes.com/news/commercial-vehicle/lcv/amazon-to-deploy-eicher-e-trucks-for-e-commerce-deliveries-in-india/102579092

Baggonkar, S. (2024, April 18). India-made Daimler's electric mini truck to hit the road soon. *Financial Express*. https://www.financialexpress.com/business/express-mobility-india-made-daimlers-electric-mini-truck-to-hit-the-road-soon-3460261/

Balachandar, G. (2024, January 21). Ashok Leyland bucks SCV market trend, overtakes Tata in pick-up sales. *BusinessLine*. https://www.thehindubusinessline.com/companies/ashok-leyland-bucks-scv-market-trend-overtakes-tata-in-pick-up-sales/article67762642.ece

Bureau of Energy Efficiency, Ministry of Power. (2024). *Corporate Average Fuel Economy Norms for Passenger Cars*. https://beeindia.gov.in/en/programmesenergy-efficiency-in-transport-sector/fuel-efficiency

Deo, A. (2021). *Fuel consumption from light commercial vehicles in India, fiscal year 2018–19*. International Council on Clean Transportation. https://theicct.org/publication/fuel-consumption-from-light-commercial-vehicles-in-india-fiscal-year-2018-19/

Deo, A., & Kaur, H. (2024). *Role of fuel efficiency norms in accelerating sales of electric vehicles in India*. International Council on Clean Transportation. https://theicct.org/publication/role-of-fuel-efficiency-norms-in-accelerating-sales-of-electric-vehicles-in-india-jun24/

Dornoff, J. (2023). *CO_2 emission standards for new passenger cars and vans in the European Union*. International Council on Clean Transportation. https://theicct.org/publication/eu-co2-standards-cars-vans-may23/

Eicher's EV-first SCV Truck unveiled at Bharat Mobility Expo 2024 (2024, February 4). *EV Reporter*. https://evreporter.com/eichers-ev-first-scv-truck-unveiled-at-bharat-mobility-expo-2024/

International Council on Clean Transportation. (2024). *European Vehicle Market Statistics: Pocketbook 2023/24.* International Council on Clean Transportation. https://theicct.org/publication/european-vehicle-market-statistics-2023-24/

Joint Research Centre, European Commission. (2023). *Measured WLTP targets calculation* [presentation]. https://circabc.europa.eu/ui/group/4cf23472-88e0-4a52-9dfb-544e8c4c7631/library/c2445223-7ca6-4775-8e7e-3014f87573c9/details

Mahindra & Mahindra's electrifying move, launching electric LCVs in 2025. (2023, December 18). *Manufacturing Today*. https://www.manufacturingtodayindia.com/mahindra-mahindras-electrifying-move-launching-electric-lcvs-in-2025/

Menon, A., & Bandivadekar, A. (2016). *Light-commercial vehicles in India, 2014–15: Technology assessment and international comparisons*. International Council on Clean Transportation. https://theicct.org/publication/light-commercial-vehicles-in-india-2014-15-technology-assessment-and-international-comparisons/

Ministry of Power. (2015, April 23). *SO 1072 (E) Passenger cars notification.* https://beeindia.gov.in/sites/default/files/SO%201072%20(E)%20Passenger%20Cars%20Notification.pdf

Mukherjee, V. (2024, May 29). EV incentive scheme FAME 3 to roll out with Rs 10,000 crore outlay. *Business Standard*. https://www.business-standard.com/industry/auto/ev-incentive-scheme-fame-3-to-roll-out-with-rs-10-000-crore-outlay-124052900686_1.html

Narla, A., Deo, A., & Bandivadekar, A. (2021). *Fuel consumption from light commercial vehicles in India, fiscal years 2019–20 and 2020–21.* International Council on Clean Transportation. https://theicct.org/publication/fuel-consumption-from-light-commercial-vehicles-in-india-fiscal-years-2019-20-and-2020-21/

Suarez, J., Komnos, D., Ktistakis, M. A., & Fontaras, G. (2023). *2025 and 2030 CO_2 emissions targets for light duty vehicles*. Joint Research Centre, European Commission. https://op.europa.eu/en/publication-detail/-/publication/9b9aafad-1953-11ee-806b-01aa75ed71a1/language-en

Switch Mobility. (n.d.). *Presenting the revolutionary Switch IeV Series*. Retrieved Month day, year, from https://www.switchmobilityev.com/en/iev-series

Tata Motors. (n.d.). *Small commercial vehicles: Tata Ace EV.* Retrieved Month day, year, from https://smalltrucks.tatamotors.com/product/ace/tata-ace-ev

Tata Motors launches Intra V70, Intra V20 Gold, and Ace HT+ trucks in India. (2023, December 5). *Business Standard*. https://www.business-standard.com/companies/news/tata-motors-launches-intra-v70-intra-v20-gold-and-ace-ht-trucks-in-india-123120500904_1.html

www.theicct.org

communications@theicct.org

@theicct.org

icct
THE INTERNATIONAL COUNCIL
ON CLEAN TRANSPORTATION

BEIJING | BERLIN | NEW DELHI | SAN FRANCISCO | SÃO PAULO | WASHINGTON DC