Infrastructure Advisory

CRISIL
An S&P Global Company

All-India study on sectoral demand for petrol and diesel

Final report | (October 2020 – September 2021)

PPAC

IndianOil | Bharat Petroleum | HP

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Abbreviations

Acronym	Definition
KL	Kilolitre
APM	Administered pricing mechanism
BPCL	Bharat Petroleum Corporation Ltd
BTS	Base transceiver station
CEA	Central Electricity Authority
CNG	Compressed natural gas
CPSE	Central public sector enterprise
CRIS	CRISIL Risk & Infrastructure Solutions
DG	Diesel generator
DG-C	DG - Commercial
DG-I	DG – Industrial
DG-R	DG - Residential
EV	Electric vehicle
HCNG	Hydrogen compressed natural gas
HPCL	Hindustan Petroleum Corporation Ltd
HSD	High speed diesel
IOCL	Indian Oil Corporation Ltd
LNG	Liquefied natural gas
LPG	Liquefied petroleum gas
MMTPA	Million metric tonne per annum
MORTH	Ministry of Road Transport and Highways
MS	Motor spirit
OCC	Oil Coordination Committee
OMC	Oil marketing company
PDS	Public distribution system
PPAC	Petroleum Planning & Analysis Cell
RO	Retail outlet
SOP	Standard operating procedure
SUV	Sports utility vehicle
UT	Union territory
AP	Andhra Pradesh
ASM	Assam
BIH	Bihar

Acronym	Definition
CHHT	Chhattisgarh
DEL	Delhi
GUJ	Gujarat
HAR	Haryana
JH	Jharkhand
KAR	Karnataka
KER	Kerala
MP	Madhya Pradesh
MAH	Maharashtra
ODI	Odisha
PUNJ	Punjab
RAJ	Rajasthan
TN	Tamil Nadu
TEL	Telangana
UP	Uttar Pradesh
UK	Uttarakhand
WB	West Bengal

Foreword

Understanding the end use of petroleum products is important for making investment and policy decisions. Apart from petrol, diesel, kerosene and liquefied petroleum gas (LPG), all other products are sold directly by Oil Marketing Companies (OMCs) to end consumers, and this sales data is captured in their information systems. End use of LPG is also captured by OMCs as the product is priced as per its end use. The sectoral demand of kerosene for use as a fuel for lighting or cooking is captured in the quadrennial surveys conducted by the National Sample Survey Organization.

More than 95% of petrol and 85% of diesel is sold through retail outlets of OMCs, but there is no methodology to capture the end use. A field survey was conducted by the Petroleum Planning & Analysis Cell (PPAC) and OMCs in 2011-12 to ascertain the sectoral demand of petrol and diesel based on sales through retail outlets, the results of which have been used by analysts, government agencies, academicians, industries, etc.

To assess the consumption pattern of petrol and diesel, under the directions of its Governing Body, PPAC, in association with public sector undertaking (PSU) OMCs, viz., Indian Oil Corporation Ltd (IOCL), Bharat Petroleum Corporation Ltd (BPCL) and Hindustan Petroleum Corporation Ltd (HPCL), commissioned an 'All India study on sectoral demand of diesel & petrol' through M/s CRISIL Risk & Infrastructure Solutions (CRIS). The study involved collecting data over four quarters (total 12 months) to observe the impact of seasonality also.

M/s CRIS carried out a detailed survey-based study at about 3,000 retail outlets spread across 212 districts in 20 states and two union territories, for seven consecutive days, once in each quarter to estimate the percentage share of sectors/ segments in petrol and diesel sales through the selected retail outlets. The retail outlets were selected by the PPAC in consultation with the OMCs. Handheld geo-tagged devices were used to capture the latitude/longitude of each transaction in real time.

The PPAC contributed to technical details and coordination, while OMCs successfully executed the study in collaboration with M/s CRIS, using their knowledge and experience of the fuel retailing business, retail outlet operations, coordination with their state level coordinators, etc. The officers involved in the study were Shri Ganesha Nadar - PPAC, Shri H.K. Shirbhate - IOCL, Shri Balaji Naik - IOCL, Shri Arul Muthunathan - BPCL, Shri Pulkit Mathur - BPCL, Shri Navneet Kumar - BPCL, Shri V.V. Muralikrishna - HPCL, Shri Subhankar Dutta - HPCL, Shri Debashis Pattnaik - HPCL, and Shri Shubhabrata Khan - HPCL.

The study, which was to commence on April 1, 2020, got delayed due to the Covid-19 pandemic and finally commenced on October 1, 2020. Despite the second wave of the pandemic during April-May 2021, the survey work was completed by the vendor by 30 September 2021. This was possible because of the efforts of thousands of enumerators and supervisors responsible for collection of field data from 3,000 retail outlets over four quarters spanning 12 months.

The survey echoes the upbeat sentiment following the economic recovery during October - December 2020 after the lifting of lockdowns; strong revival in robust commercial activities from January - March 2021; emergence from the setback brought on by the second wave during April - June 2021; and return to economic stability during July - September 2021.

This report provides useful insights into the consumption pattern of diesel and petrol across sectors and segments at the state, zonal and all India level. The study found significant changes in consumption patterns of some sectors compared with the study conducted in 2011-12. Noteworthy changes in diesel consumption include increase in contribution of trucks (heavy/ light commercial vehicle or HCV/LCV) to 64% from 33%, indicating extensive economic prosperity, and reduction of consumption in the agriculture sector (diesel generator sets/ tractors) to 4.7% from 14%, indicating power penetration and industrialisation during the past decade. Petrol consumption registered a decrease

in the share of two-wheelers to 59% from 61%, while the cars/utility vehicles segment showed an increase to 40% from 36%, indicating economic prosperity. Consumption of petrol in the utility vehicles segment alone drastically increased to 10% from 2% as consumers opt for premium products with higher price points.

The government's thrust on infrastructure and manufacturing has led to commercial vehicles (HCV/LCV) contributing to the lion's share of diesel consumption at 64% out of the total diesel sold through retail fuel stations. Diesel consumption in power generation stood at 1.6%, indicator of the shift towards renewable sources of energy. The two-wheelers segment leads petrol consumption from retail outlets with 59% share. Petrol consumption of passenger cars at 30% and utility vehicles at 10% shows the high purchasing power of consumers, which may augur well for rapid adoption of electric vehicles.

On behalf of the PPAC, I would like to thank the Governing Body of PPAC for giving directions and guidance throughout the study. Thanks are also due to Additional Director I/C D&ES (PPAC) Dr Pankaj Sharma & predecessor incumbent Ms Anju Jai Misra, PPAC, ED Retail Transformation IOCL Shri Sandeep Makker, ED Retail BPCL Shri P.S. Ravi, ED Retail (Retd.) HPCL Shri S.K. Suri and the Industry Working Group consisting of officers from the PPAC, IOCL, BPCL and HPCL, who were associated with the study and contributed to its timely completion.

I would like to acknowledge the role of the state level coordinators of PSU OMCs, retail sales officers and retail outlet dealers for extending their cooperation during this study.

I hope this report would be useful to the policy makers, industry and academia alike.

New Delhi
March 09, 2022

Praveen M Khanooja
Director General
Petroleum Planning & Analysis Cell (PPAC)

Acknowledgement

We are thankful to Ministry of Petroleum & Natural Gas (MoPNG), Government of India, Petroleum Planning & Analysis Cell (PPAC), and the oil marketing companies (Indian Oil Corporation Limited, Bharat Petroleum Corporation Limited and Hindustan Petroleum Corporation Limited) for giving CRISIL Risk & Infrastructure Solutions Limited an opportunity to work on the study 'All India study on sectoral demand of Petrol and Diesel being sold from retail outlets of IOCL, BPCL and HPCL'.

We are grateful to Shri Praveen M Khanooja, Director General (PPAC), and Dr Pankaj Sharma, Additional Director (PPAC), for extending their kind support.

During this assignment, we had the pleasure of interacting with representatives of the OMCs at state and zonal levels for support from time to time.

We would also like to extend our gratitude to the entire team of research professionals, our field staff across India, and support teams for their valuable time and dedication in completing this assignment.

1 Executive summary

The pan-India study provides insights into the sales pattern of petrol and diesel dispensed at retail outlets to the agriculture, industrial and transportation segments across India. The survey encompasses urban cities, including metros and semi-urban areas, and semi-rural and rural areas. This section provides the background of the study and presents survey details and key findings.

1.1 Background

Diesel and petrol are crucial cogs of the Indian economy. Hence, the usage pattern of these fuels in the agriculture, industrial, and transportation segments, and for back-up power generation through diesel generator (DG) sets, is an indicator of the health of the economy. In fact, optimising and improving efficiencies in the transportation sector can help enhance the competitiveness of all sectors of the economy, and significantly improve India's goal of becoming a $5 trillion economy by 2025.

To be sure, the fuel retailing segment has shown resilience over the past several years, owing to rising per capita income, and expanding commercial and industrial sectors. But projection of crude oil demand (along with its derivatives) is critical for policymakers to devise strategies for supply optimisation. Analysing diesel and petrol consumption trends across sectors/ sub-sectors also assists in estimating segment-wise secondary sales.

The analysis is even more crucial when India is diversifying its energy base. The road transportation sector is transitioning from crude oil derivate fuels to alternate fuels such as compressed natural gas (CNG), as well as electric mobility. Driving this are the government's various policy measures, including fiscal initiatives.

Against this backdrop, the Petroleum Planning & Analysis Cell (PPAC), along with oil marketing companies (OMCs) – Indian Oil Corporation Ltd (IOCL), Bharat Petroleum Corporation Ltd (BPCL), and Hindustan Petroleum Corporation Ltd (HPCL) – has undertaken an **all-India study on segment-wise demand for diesel and petrol sold at retail outlets (ROs)** of the OMCs.

The OMCs have engaged CRISIL Risk & Infrastructure Solutions Ltd (CRIS) to carry out an observation study each quarter for 12 months (i.e., four times in total), covering **3,000** ROs that have high diesel sales, across 212 districts in 20 states and two union territories. The study aims to provide a sharp understanding of usage patterns of diesel and petrol across segments that would, in turn, help the OMCs project the supply and infrastructure requirements. The survey was aimed at providing a realistic picture of the consumption pattern.

To meet the objectives of the study, at each selected RO, observations were recorded via electronic devices in real time. Two sets of questionnaires were prepared for the ROs. Answers to these questionnaires were recorded on a **mobile-based web application**. Enumerators were physically present at each of the surveyed ROs to record the fuelling of diesel and petrol in different vehicular segments, such as cars, buses, taxis, tractors, and trucks, along with filling of barrels for usage in agriculture and industrial applications, or back-up power generation.

The study was conducted for **24 hours** for seven consecutive days in each quarter for ROs situated along **national/state highways**. For ROs situated in urban, semi-urban, semi-rural, and rural areas, the survey was conducted for **12 hours** for seven consecutive days.

The study was uniquely designed to capture seasonality or other aspects related to diesel and petrol sales.

1.2 Survey period captured fuelling pattern from unlocking economic recovery

The objective of the study was to assess segmental retail fuel sales, as diesel and petrol together account for majority of the overall transportation fuel basket. The study holistically covered five categories of ROs: urban-metro (A), urban – Tier II (B), urban – Tier III (C), national highway/state highway (D), and rural (E).

Table 1: Zone-wise bifurcation of ROs selected for the survey

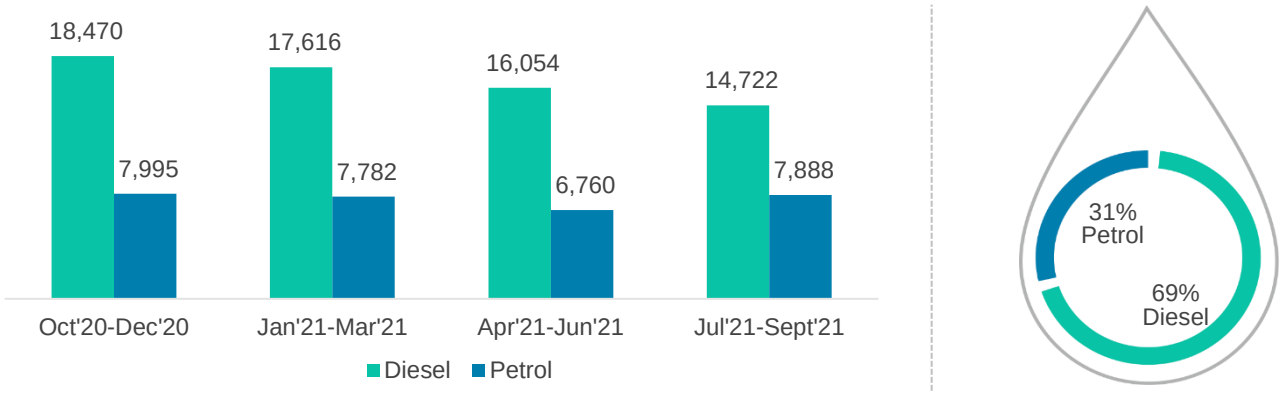
State	A	B	C	D	E	Total
Pan India	251	240	710	1,198	601	**3,000**
Zone-wise bifurcation						
East zone	21	31	117	262	174	**605**
North zone	73	86	279	334	140	**912**
South zone	91	73	180	291	138	**773**
West zone	66	50	134	311	149	**710**

Source: Discussion with OMCs and PPAC

The survey captured end-user-wise fuelling pattern post lifting of the nationwide and state-imposed lockdowns, i.e., October-December 2020, capturing the subsequent economic momentum during January-March 2021, followed by subdued sales between April-June 2021 because of a severe second wave of Covid-19 infections, and reduced mobility during peak of the monsoon season, i.e. July-September 2021.

The 3,000 ROs contributed to ~17% of total high speed diesel (HSD) sold from ROs in the country, and ~9% of overall petrol retail sales. Low coverage of petrol sales was because the surveyed ROs constituted the highest diesel selling ROs in the country.

Figure 1: Quarter-wise diesel and petrol sales through ROs across India (TMT)



Note: TMT - Thousand metric tonne

Source: CRIS analysis, OMC data

1.3 Diesel refuelling - Retail sales

During the survey period, diesel retail sales constituted 68% share of the petrol-diesel basket, with the **transport segment** accounting for **87%** share of diesel and non-transport segment, the remaining **13%**. North zone (36%) contributed to the highest volume of diesel retail sale to the transport segment, followed by west zone (24%), south zone (23%), and east zone (17%).

High contribution of road transport in total freight drives diesel demand; truck segment accounts for the lion's share

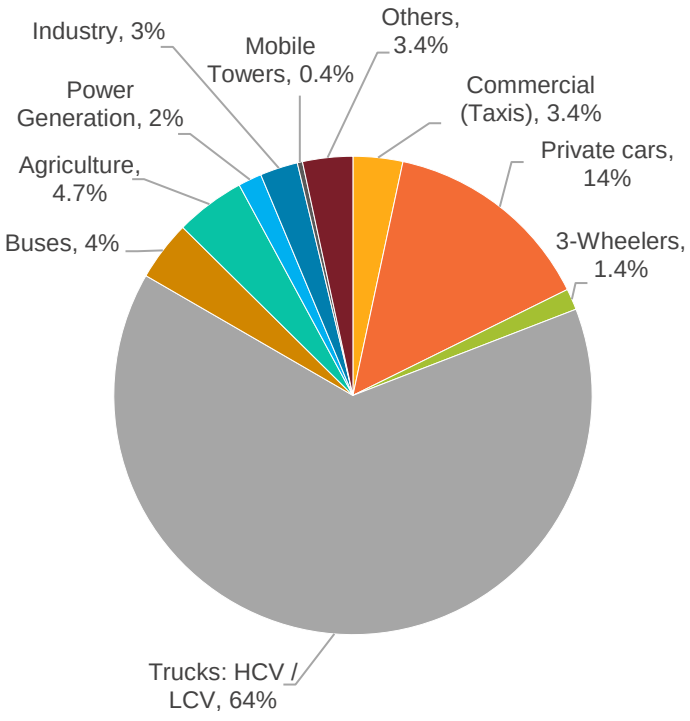
Road transportation is the dominant mode of freight movement in the country, comprising 71% share of total domestic freight transported. Trucks are the most widely used vehicles for road freight and will continue to drive diesel demand in the country. Implementation of the e-Way Bill and introduction of radio-frequency identification-enabled FASTag for toll payment of toll have ensured efficiency in operations, which will also lead to better utilisation of trucks. Thus, going forward, truck movement will increase, translating into steady demand for diesel from this vehicle segment, which currently accounts for 64% share of retail fuel sales.

Within the truck segment, light commercial vehicles or LCVs, which largely cater to the movement of agricultural produce, e-retail, pharmaceuticals, and consumer staples, have shown resilience following lifting of restrictions post subsiding of Covid-19 infections. Along with medium and heavy commercial vehicles, the segment has been an enabler of India's economic growth.

Significant increase of 10% in billion tonne km (an indicator of total freight transported through roads) from 2013 to 2019 resulted in the lion's share of freight being transported by roads (71%).

Figure 2: All India end-use share (%) of diesel from surveyed ROs

Consumer segment		*Share*
		Full year
	Commercial (taxis)	3.4%
	Private cars	14.2%
	3-wheelers	1.4%
	Trucks: HCV / LCV	64.2%
	Buses	4.1%
Sub-total – Transport		**87.3%**
	Agriculture	4.7%
	Power generation – Gensets	1.6%
	Industry	2.6%
	Mobile towers	0.4%
	Others	3.4%
Sub-total - Non-transport		**12.7%**



Notes:

1. *Agriculture: Agriculture implements, tractors, and diesel pumps*

2. *Power generation: DG sets (residential, commercial, and industrial)*
3. *Others: Fishing boats, others – Jugad vehicles, burning and resale*

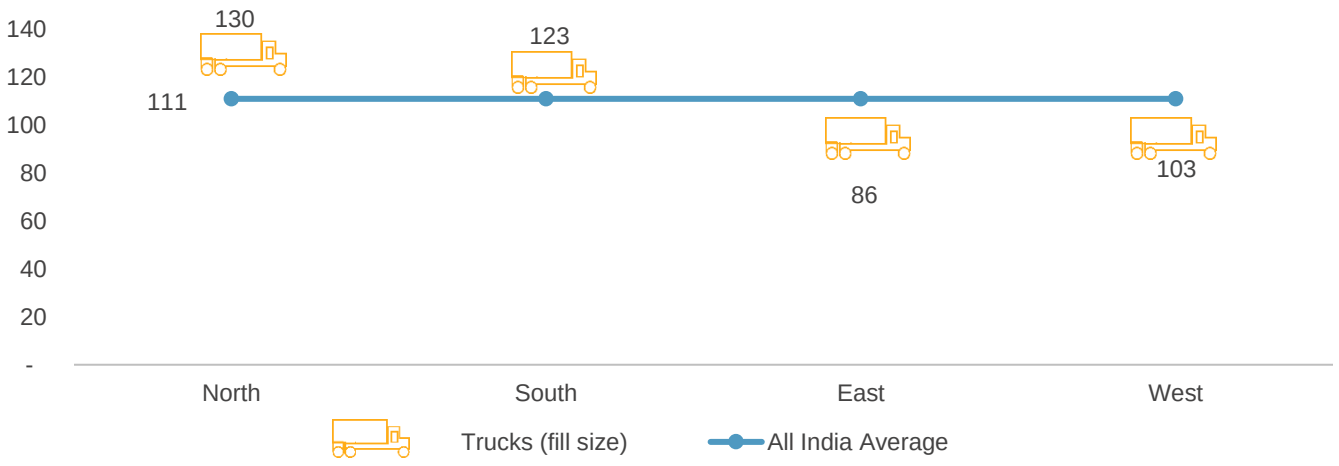
Source: CRIS analysis on primary survey data

1.3.1 Transport segment

Top three states that contributed the highest to diesel sales in the truck segment were Uttar Pradesh (14%), Maharashtra (13%), and Haryana (12%).

Meanwhile, average fill size for a truck in India is 111 litre. However, zone wise, the fill size varies. Average fill size in the north zone (Chandigarh, Delhi, Haryana, Punjab, Rajasthan, Uttar Pradesh, and Uttarakhand) is the highest, at 130 litre, and the east zone (Assam, Bihar, Jharkhand, Odisha, and West Bengal), the lowest, at 86 litre. Fill size in the south zone (Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, and Telangana) is 123 litre and the west zone (Chhattisgarh, Daman and Diu, Gujarat, Madhya Pradesh, and Maharashtra), 103 litre.

Figure 3: Zone-wise average fill size – Trucks (litre)



Source: CRIS analysis

With logistics forming the backbone of the agriculture and manufacturing sectors in India, road freight has significant imprint on the country's gross domestic product. Thus, development of road infrastructure strengthens the logistics sector as industrial clusters and ports are well-connected to warehouses across India. Improving road transportation infrastructure via providing last-mile connectivity, i.e., warehouse to customers, connecting important industrial corridors and port cities, and increasing transit traffic, also increases commercial traffic in the country.

Rising diesel demand from the truck segment, though, could put pressure on the existing fuelling infrastructure. This calls for innovative distribution mechanisms. Door-to-door delivery is one such option to aid efficient utilisation of existing retail fuel outlets. Door-to-door delivery of ~200,000 kilolitre of HSD has already commenced. Small and medium-sized fleet owners would benefit from such innovative delivery mechanisms.

1.3.1.1 Bus segment – Sustainable and resilient transport system

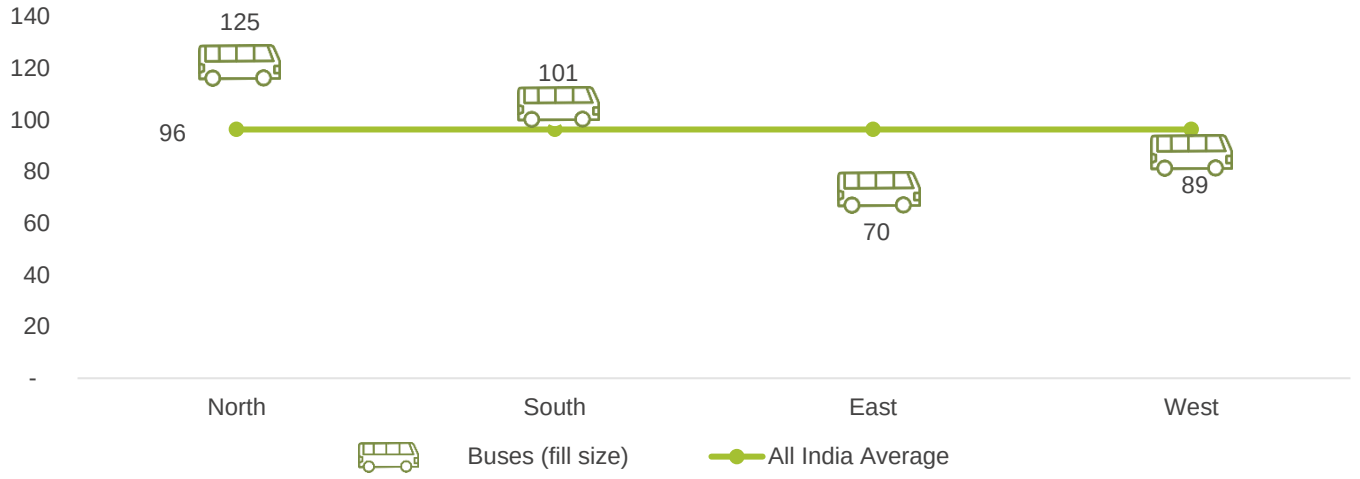
Buses are critical to mass mobility. Majority of the cities are planning to improve their transport system, with buses playing a major role. Also, with ridership expected to reach pre-Covid-19 levels, the segment will remain a significant consumer of diesel. Also, the government aims to enable innovative public-private partnership models, with private sector players operating and maintaining fleets of ~20,000 buses, thereby further boosting diesel demand from the bus segment.

Within this segment, majority commuters utilise state transport undertaking (STU) buses, followed by private buses for inter-state/inter-district movement. There are ~70 STUs in the country, with ~1.6 million buses. However, with rising urbanisation, inter-city bus services are increasingly becoming crucial for daily commute. Educational institutions and corporates are also increasingly using daily bus services.

Based on the depot sales during the survey period, diesel supplied to STU buses constituted 17% of total depot sales, while restricted mobility of buses, particularly for education and corporate offices, resulted in muted diesel fuel sales from ROs. Retail share of the bus segment in overall diesel sales at a pan-India level, though, was only ~4.1%.

Meanwhile, the average per fill size for a bus across India is 96 litre, with the north zone having the highest average fill size, at 125 litre, and east zone, the lowest at 70 litre. Fill size in the south zone is 101 litres, and west zone, 89 litres.

Figure 4: Zone-wise average fill size – Buses (litres)



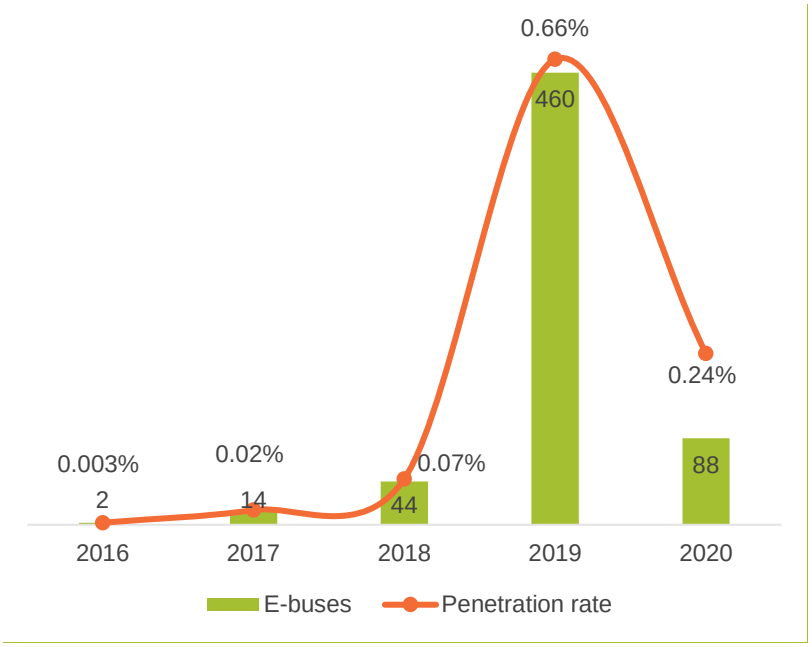
Source: CRIS analysis

Over the years, though, preference has shifted from public transport to private transport, owing to comfort amid rising income and living standards. However, with the increase in the number of CNG/ electric buses, and improved bus infrastructure (bus rapid transit), bus fleet in India may see a rise in daily ridership.

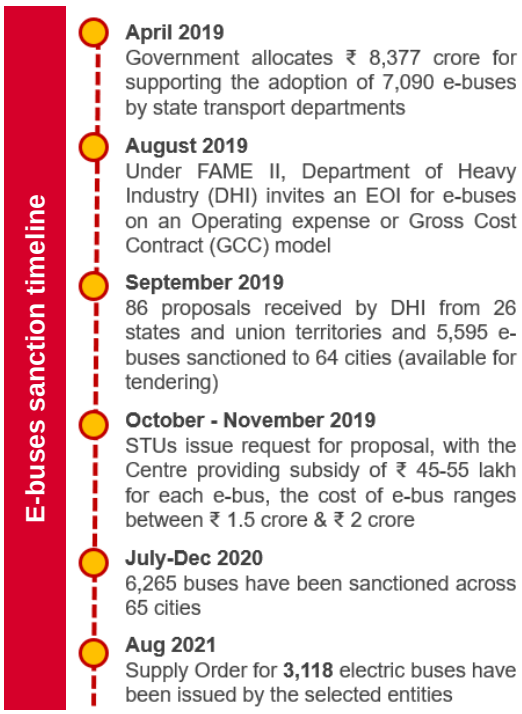
Electric buses: Subsidies under the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme and state tenders under the Gross Cost Contract (GCC) model are expected to drive adoption of electric buses. However, utilisation levels and rollout of charging infrastructure remain critical.

Electric bus adoption, spurred by government initiatives such as FAME (I and II), will likely be visible only in metro and Tier II cities.

Figure 5: E-buses registered in India

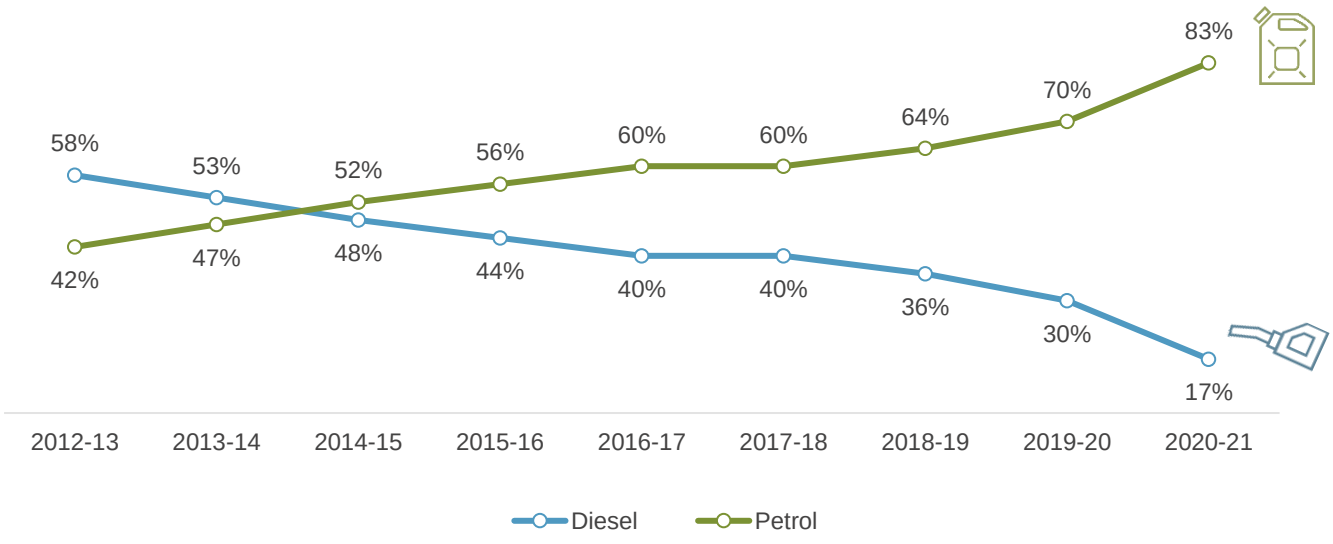


Source: Vahan Data, CRIS analysis



Cars and commercial taxis: Rising share of SUVs in cars segment along with nearly double the average fill size of SUVs portends to potential increase in share of cars segment in diesel sales. The preference for diesel passenger vehicles in the domestic market reduced significantly over the past decade. In fiscal 2021, share of diesel passenger vehicles stood at ~17%, considerably lower than 58% in fiscal 2013. The shift in preference for petrol is mainly because of a narrowing gap between diesel and petrol prices.

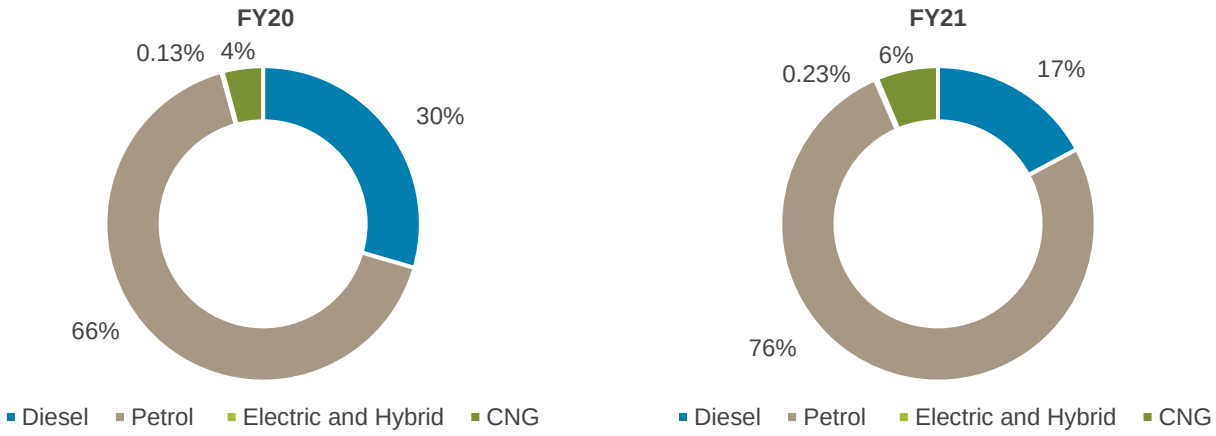
Figure 6: Share of diesel and petrol passenger cars



Source: Society of Indian Automobile Manufacturers (SIAM) data

Awareness that diesel vehicles are more polluting, high cost of ownership of diesel vehicles and their low shelf life have triggered the shift towards petrol, CNG, electric, and hybrid vehicles. However, in the SUV segment, diesel remains the preferred fuel.

Figure 7: Share of passenger vehicles based on fuel combustion

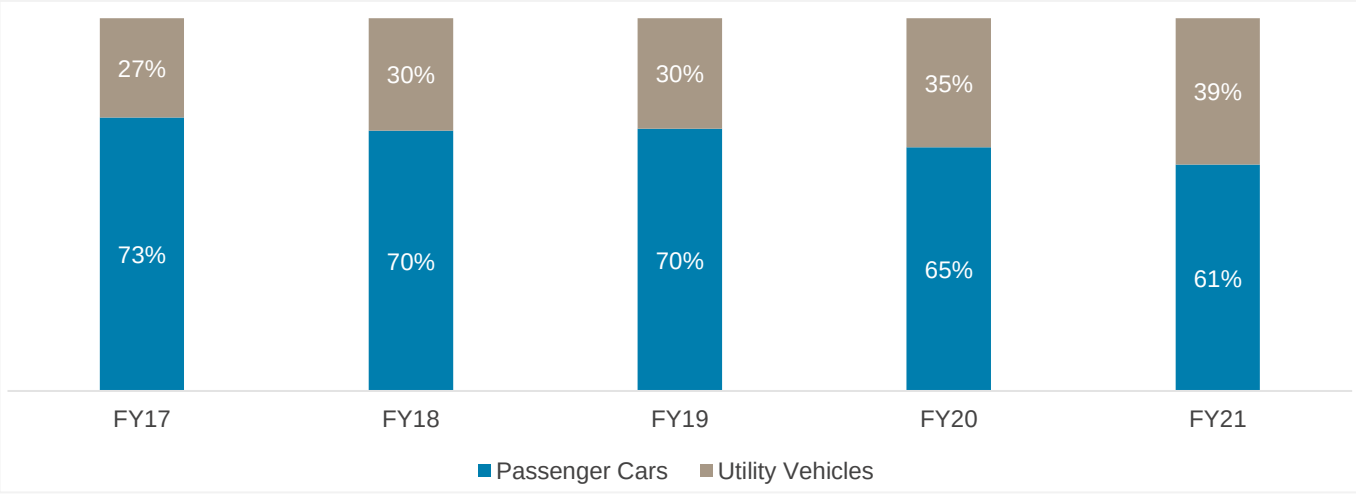


Source: SIAM data

Passenger cars account for nearly ~18% of diesel sales at fuel retail outlets. Private vehicles account for ~14.3%, and commercial vehicles ~3.4% of total diesel sales. Diesel offtake by private cars is relatively higher in Maharashtra (14%), Uttar Pradesh (11%) and Rajasthan (8%).

The share of SUVs in overall car sales rose from 27% in fiscal 2017 to 39% in fiscal 2021. They also have much higher average fill size ~27 liters compared with cars' ~17 liters.

Figure 8: Share of SUVs in total car sales in India (% share)



Source: CRIS analysis, industry data

The BS-VI norms for diesel engines, introduced to counter the ever-increasing pollution and to make tailpipe emissions less harmful, would require many manufacturers to scale up their investments. Usage of expensive filters in BS-VI-compliant diesel engines and huge investments will make diesel cars much pricier. This will eventually lead to a steep fall in the demand for diesel cars. However, the SUV market has shown preference for diesel-powered engines, which should ensure an uptick in diesel sales.

1.3.2 Non-transport segment

Direct sales

Diesel sold through depots in non-transport segment accounted for 38% of direct sales — industries in which the fuel is used for process and power requirements account for 30%, the highest; the agriculture segment, 6%; and the power segment ~2%.

Retail outlet sales

The non-transport segment sales included diesel sold to the agriculture segment (tractors, agri-implements and diesel pumps), power generation (diesel generators used for industrial, commercial and residential purpose and mobile towers), industrial segment (includes machinery used for industrial purpose such as crushers and cranes) and others (fishing boats, jugad vehicles and resale).

Diesel sold from retail outlets to the non-transport segment accounted for ~13% of overall diesel sales.

At the time of the survey, the agriculture segment accounted for ~4.7%, which includes diesel sale to agriculture implements, tractors and DG pumps. Agri-implements largely comprise tractor-based agri-equipment such as harvesters and threshers. Within the sector, tractors accounted for 2.6%, agricultural implements 1.5% and diesel pumps 0.6%.

The top three states that consumed 44% of total diesel sold to the agriculture segment were Uttar Pradesh (20%), Haryana (13%) and Punjab (11%). A zone-wise breakup shows, north had the highest share in quantity of diesel sold to agriculture sector— 54%. And at 12%, south had the least share.

The government has undertaken various initiatives, such as Jawaharlal Nehru National Solar Mission and KUSUM, to deepen the penetration of solar pumps in India and reduce use of diesel pumps. Solar pumps have logged 66% CAGR between fiscals 2014 and 2020 (up from 11,626 to 246,074, in absolute terms)

Table 2: Top 10 states with highest number of solar pumps (as of 2019)

States	No of solar pumps
Chhattisgarh	61,970
Rajasthan	48,175
Andhra Pradesh	34,045
Uttar Pradesh	20,546
Madhya Pradesh	17,813
Gujarat	11,522
Odisha	9,551
Maharashtra	9,337
Karnataka	7,420
Tamil Nadu	5,459

Source: MNRE

In fiscal 2021, tractor sales grew 26.9% on-year to 899,429 from 709,002 in fiscal 2020. The high growth was due to the lower base and pent-up demand after the lockdown in the previous year. It is interesting to note that tractors are undergoing a shift from rental to ownership model. Earlier, a large land owner used to give his tractor on rent to small land owners. Now, small land owners are able to buy their own tractors.

Table 3: Top 10 agricultural states account for ~83% of total tractor sales in the country

States	Share in tractor sales (FY20, %)
Uttar Pradesh	17.4
Madhya Pradesh	12.4
Rajasthan	9.7
Maharashtra	8.7
Gujarat	7.8
Bihar	6.1
Telangana	5.9
Karnataka	5.7
Haryana	5.5
Punjab	3.9

Source: CRIS analysis, industry data

Of total diesel sales, 1.6% was to the power sector (gensets) and ~13% to the non-transport segment. In overall diesel consumption by gensets, DG-industrial accounted for the highest share at 0.9%, followed by DG-commercial (0.5%) and DG-residential (0.2%).

As much as 52% of diesel sales to DG-gensets were in Haryana, Uttar Pradesh and Tamil Nadu combined.

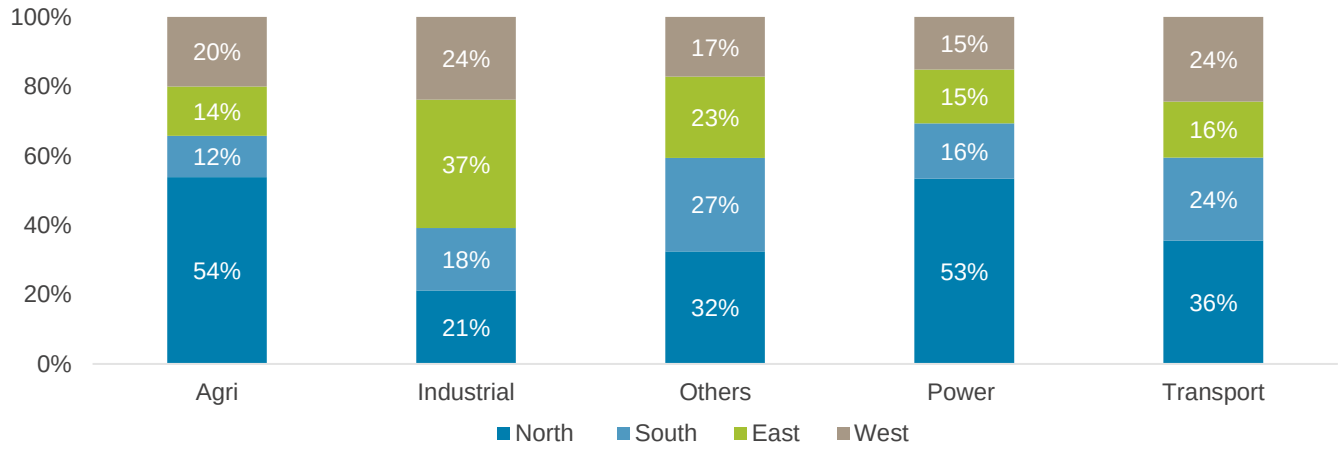
In the mobile tower segment, Uttar Pradesh had the highest share at 32% because of a high number of mobile BTS towers in the state (Telecom Statistics, 2019).

The other industrial sector (where diesel is used for purposes other than power generation) accounted for 2.6% of overall diesel sales and 20% of diesel sales to the non-transport category. This segment saw the highest sales in the east zone (37%), with West Bengal, Assam and Jharkhand consuming the most, and the lowest in the south zone (18%). The presumable reason for higher sales in the east is the presence of coal, iron and allied industries there, which use diesel for mining, drilling and construction.

1.3.2.1 Segment-wise diesel sales

The following figure presents segment-wise diesel sales across four zones and at the all-India level.

Figure 9: Segment-wise diesel sales – zonal (% share)



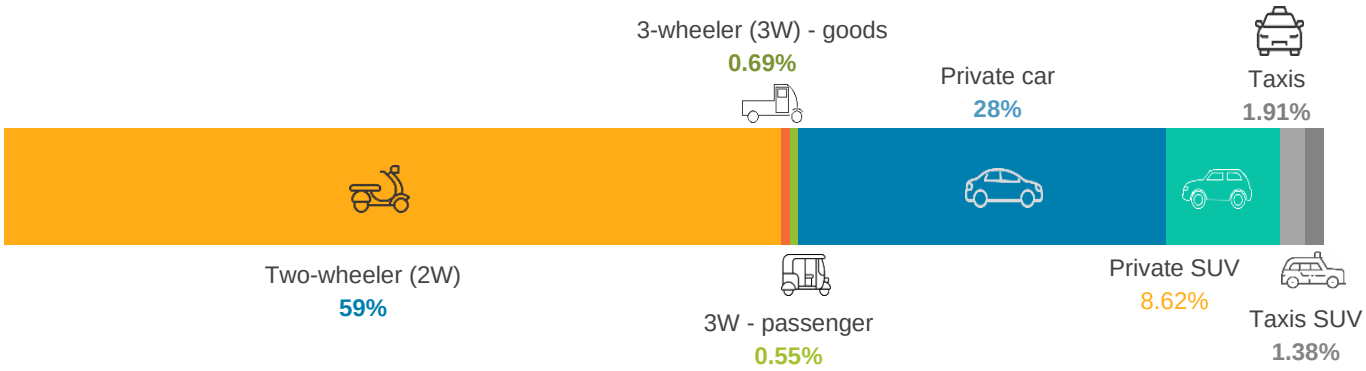
Source: CRIS analysis and primary survey

We infer the following from the above figure:

- Diesel consumption by the **transport segment** was the highest in the north zone (36%), followed by south and west zones (24% each)
- Diesel sales to the **agriculture segment** was the highest in the north zone (54%) and the lowest in the south zone (12%). *The north zone has a larger area under cultivation which boosts demand for diesel for non-transport segment*
- Diesel sales to the **power segment** was the highest in the north zone (53%) and the lowest in the east and west zones (15% each). *Presence of a high number of mobile BTS towers in Uttar Pradesh (Telecom statistics, 2019) and load-shedding may have resulted in a higher share of diesel consumption by mobile tower units*
- Diesel sales to the **industrial segment** was the highest in the east zone (37%) and the lowest in the south zone (18%). *Restrictions to curb pollution, specifically in the Delhi-NCR, have reduced diesel consumption by industrial segment in the north zone*
- Diesel sales to the **others segment** was the highest in the north zone (32%), followed by south zone (27%)

1.4 Petrol refuelling – retail

Figure 10: All India end-use share (%) of petrol from surveyed retail outlets



Source: CRIS analysis and primary survey

Petrol refuelling: Gradual shift from Internal Combustion Engines (ICE) to electric engines visible; population in urban cities favour more capacity filling; SUV filling almost double than that of cars

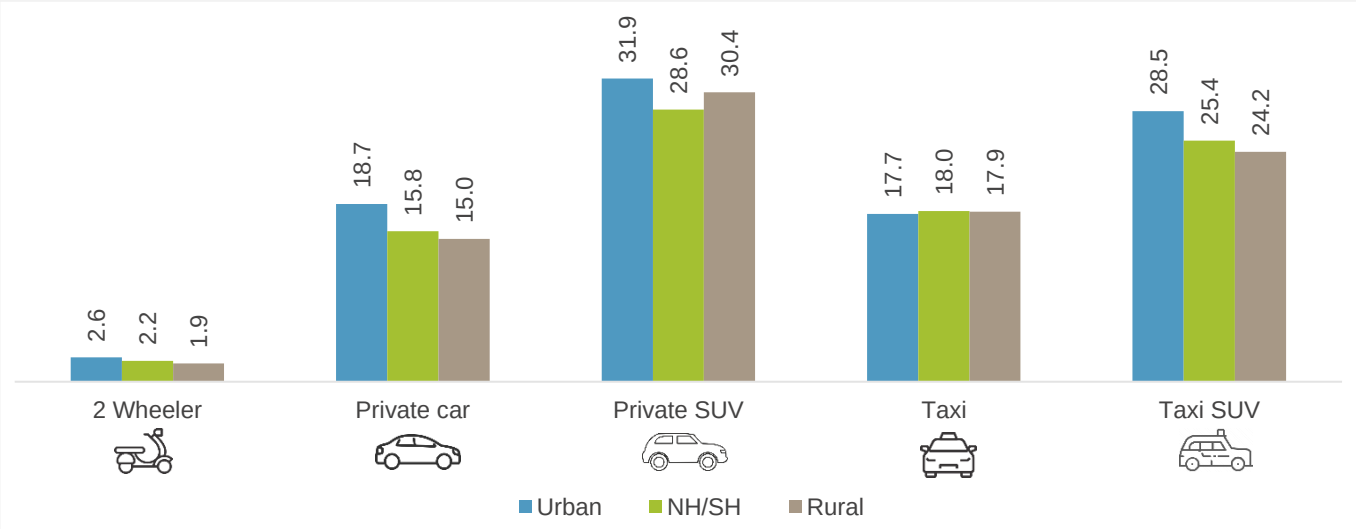
Petrol sales was the highest sale to the 2W category (59%), followed by private cars (28%).

Petrol sales to the 2-wheelers were the highest in Uttar Pradesh, Maharashtra and Tamil Nadu, collectively accounting for 33% of overall petrol sales to the segment.

The pandemic encouraged people to use personal vehicles for commuting for safety reasons. Rising disposable income and a yearning for higher social status have pushed up demand for pre-owned cars, especially in the sub-Rs 5 lakh segment, in tier-2 and -3 cities and rural India.

Fill size of petrol-driven private cars is similar across urban and rural retail outlets. During the survey period, due to restricted mobility, the taxi segment (taxi and taxi SUV) accounted for ~3% of the total petrol sales, with an average fill size of 22 liters.

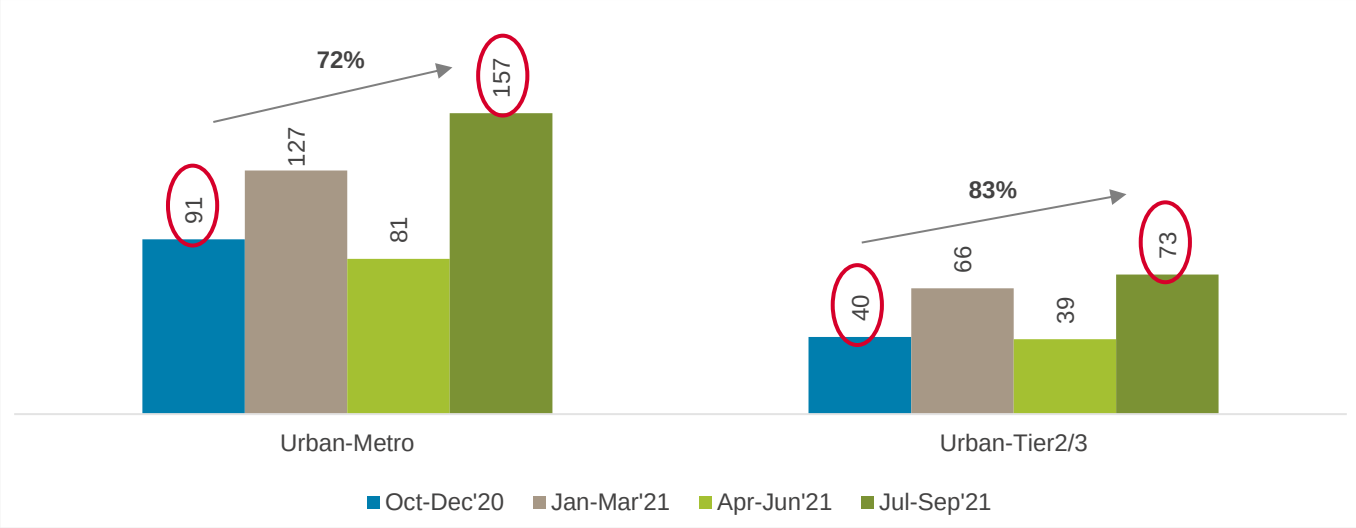
Figure 11: Fill size among various petrol vehicle segments (in liters)



Source: CRIS analysis

Petrol car transactions in emerging districts in tier-2 and 3 cities picked up faster than in metros. Rural India, too, saw a similar recovery in fill size.

Figure 12: Transaction in tier-2 and -3 cities vs metros – (number of petrol cars)

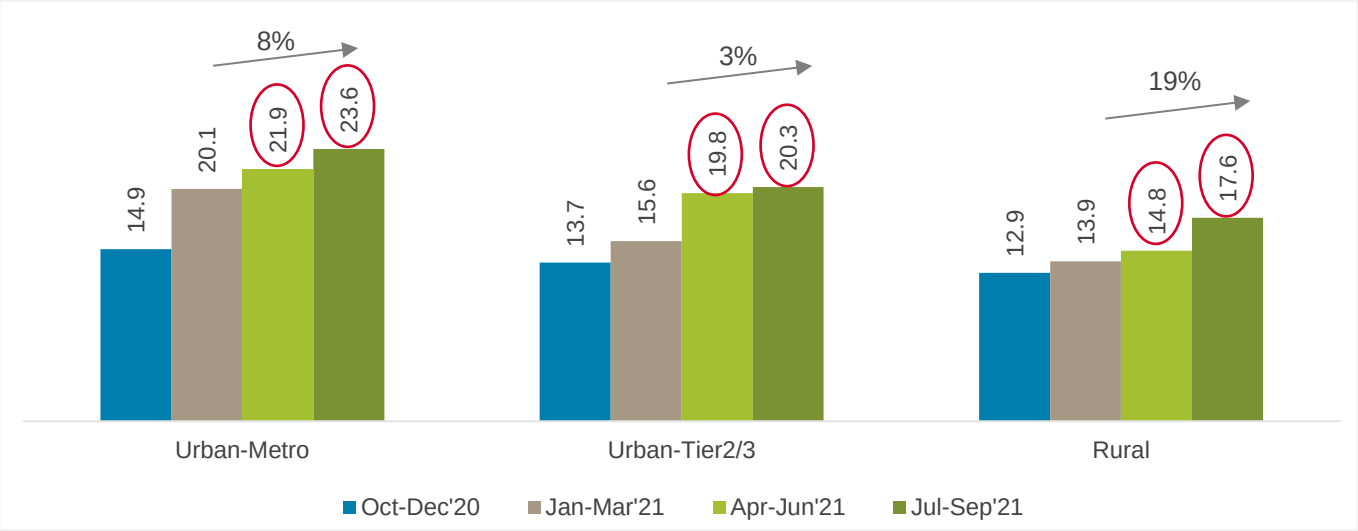


Source: CRIS analysis

Over the first leg to the last leg of the survey, petrol car transactions rose 72% in metros. In tier-2 and -3 cities, the pick-up in momentum was higher at 83%.

While comparing recovery from the second wave (April-June 2021 quarter), it was observed that fill size of private cars at rural category retail outlets picked up faster at 19%. The corresponding figure for urban-metro was 8% and for tier-2 and -3 cities 3%.

Figure 13: Fill size for petrol cars in metro, tier-2 and -3, rural areas (in litres)



Source: CRIS analysis

Petrol vehicles are most likely to have borne the impact of preference for alternative fuel-based vehicles, mainly CNG and electric.

1.4.1.1 Impact of CNG mostly visible on 3Ws and cars

CNG help consumers save money considerably more than petrol. CNG-fired vehicles have low maintenance cost, too. According to industry data, increase in fuel prices led to massive sales of CNG vehicles during April-September 2021. The following table shows how CNG-based vehicles were sold more than other fuel-based vehicles in the 3Ws segment, where CNG has deeper penetration:

Table 4: 3-W fuel wise sale

Fuel-wise sale of 3Ws	Units	Units	(%)
	April-September 2021	April-September 2020	y-o-y
Petrol	4,063	5,300	-23%
Diesel	31,524	40,748	-23%
CNG	40,908	7,709	431%
LPG	11,525	4,485	157%
Electric	7,401	1,213	510%
Total	**95,421**	**59,455**	**60%**

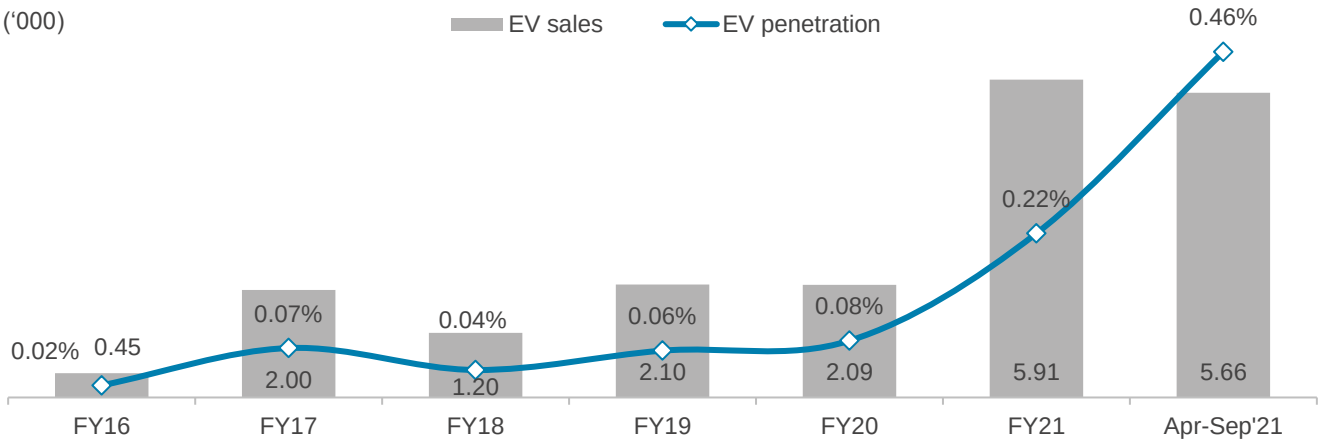
Source: Industry data

The trend was similar in the cars segment, too. A total of 1,01,412 CNG cars were sold during April-September 2021, 97% higher on-year.

The four-wheeler (4W) EV market in India is in a nascent stage but should pick up momentum over the next few years with support from favourable government policies, introduction of more products, and rising use of mobility as a service (MaaS).

The country witnessed a strong pickup in EV sales in the 4W segment, with total sales during April-September 2021 crossing 5.6 lakh units.

Figure 14: EV sales in India's 4W segment and EV penetration



Source: Federation of Automobile Dealers Associations (FADA), SIAM, CRIS analysis

In fiscal 2021, electric 4W sales tripled over the previous year aided by incentives and new models. The increasing popularity of MaaS is expected to drive EV sales in the country, going forward. Major factors contributing to growth in the shared mobility/commercial segment are:

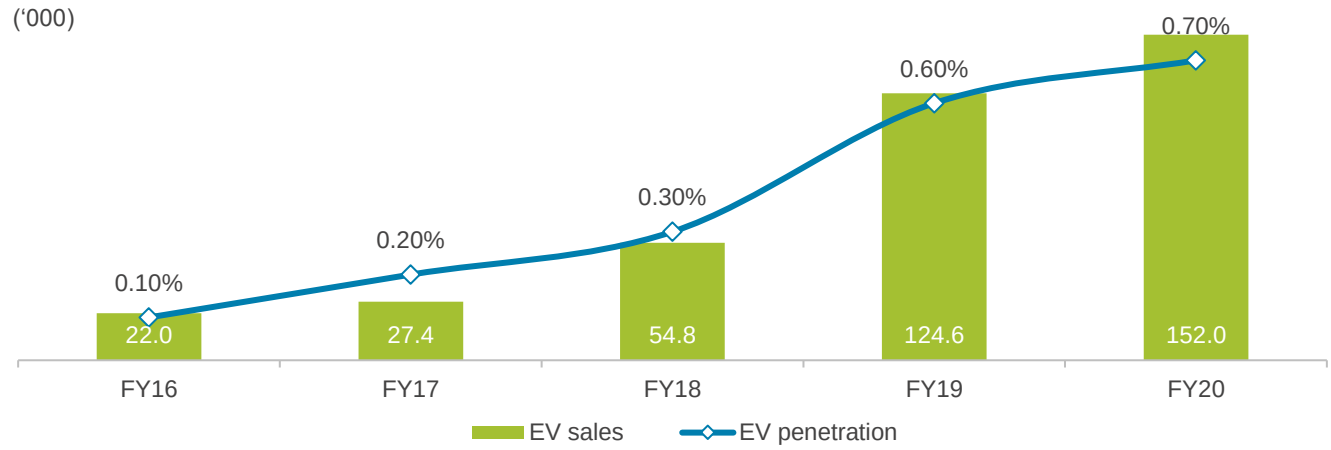
- Growth in last-mile connectivity services
- Rapid urbanisation and economic growth
- Growth of taxi and ride sharing services

Moreover, government policies such FAME-II, which aim to ensure a cleaner and greener transportation sector by reducing reliance on expensive and environmentally harmful liquid fuel, encourages EV adoption. In 2019, only four states had dedicated EV policies. But by August 2021, this had increased to 13 (Andhra Pradesh, Delhi, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu, Telangana, Uttar Pradesh, Uttarakhand, Meghalaya, Gujarat, and West Bengal).

Further, we also saw a shift in consumer attitude towards EVs due to affordable prices, lower running and maintenance costs, and concerns about environment and sustainability.

Going forward, EVs will become more economical as battery costs reduce, and as compliance costs of ICE vehicles rise. That said, even though policy incentives and general buzz in the market have boosted adoption of EVs in the domestic market, Indian customers continue to be more sensitive to upfront cost. Hence, large-scale adoption will only happen when the upfront price decline further.

Figure 15: Electric 2W sales and market penetration



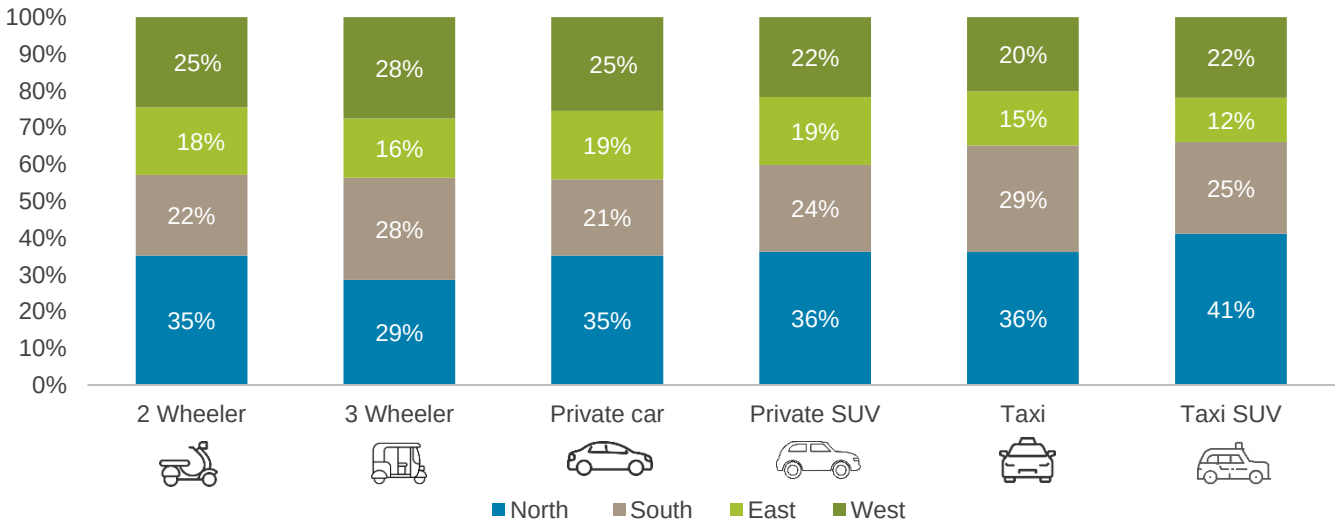
Source: SIAM, CRIS analysis

Among electric 2W, high-speed EVs (>25 km/h) are seeing gaining more sales momentum than low-speed counterparts. The impact is visible in metro cities where battery charging infrastructure is more easily available.

1.4.1.2 Segment-wise petrol sales

The following figure presents segment-wise petrol sales across four zones and across the country.

Figure 16: Segment-wise petrol sales – zonal (% share)



Source: CRIS analysis and primary survey

We infer the following from the above figure:

- Petrol sales to the 2-wheeler segment was the highest in the north zone (35%), followed by the west zone (25%)
- Petrol sales to the private car segment was the highest in the north zone (35%), followed by the west zone (25%)

The trucks segment, which plays a pivotal role in the country's logistics sector, has higher diesel dependence. With the economy growing, the segment is expected to gain momentum, thereby increasing diesel fuel consumption in the country.

The e-bus segment is expected to grow healthily, with policies such as FAME-II promoting e-mobility. However, lack of charging infrastructure will lead to slower adoption of e-buses, and hence, keep diesel demand on the uptick.

In the longer run, diesel demand from passenger cars is expected to slow down given higher ownership cost of diesel vehicles and lower price delta with respect to those that run on alternative fuels.

Diesel demand from the non-transport segment is expected to reduce with increasing penetration of renewable energy, reducing demand for all categories of gensets and diesel power generators from mobile towers.

However, diesel sales to the tractor segment looks promising, as tractor sales are expected to rise on the back of high usage of tractors for both agri-related and off-road purposes.

In two- and three-wheeler segments, newer technologies will drive faster adoption of EVs. A faster pace of CNG penetration in the 3-wheeler and hatchback car segment may reduce petrol demand in future.

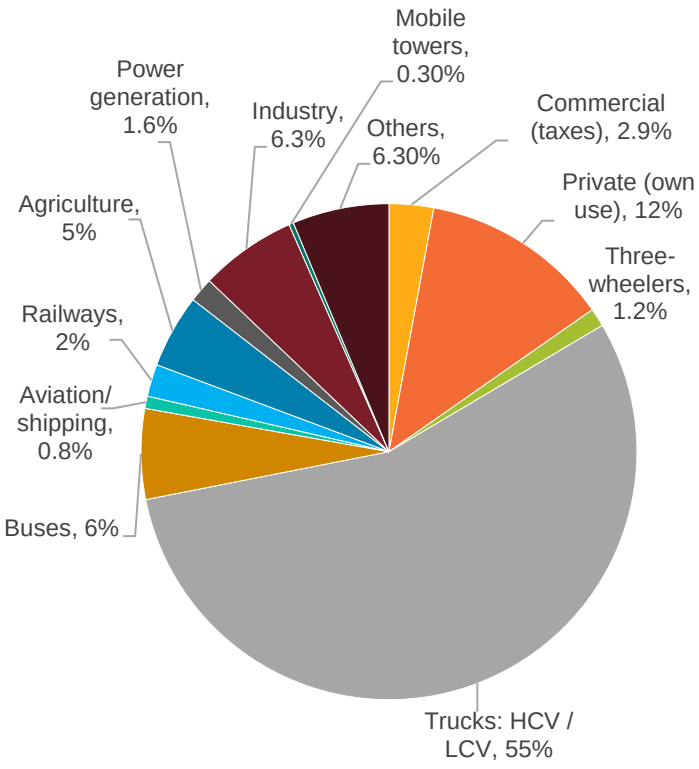
Innovative mechanisms, such as door-to-door delivery, will assist retail outlets in improving efficiency, destressing the fuelling infrastructure and thereby enhancing customers' fuelling experience. Policy support is also expected to drive a sustainable mass mobility growth.

1.5 Direct sales and retail sales – diesel

The end-use segment-wise share of diesel sale, including both retail sales and direct sales, is presented below.

Figure 17: End-use share (%) of diesel (retail and direct) across India

Consumer segment		*Share (%)*
		Full year
	Commercial (taxis)	2.9%
	Private cars	12.4%
	3-wheelers	1.2%
	Trucks: HCV / LCV	55.4%
	Buses	5.9%
	Aviation/shipping	0.8%
	Railways	2.1%
Sub-total – transport		**80.7%**
	Agriculture	4.8%
	Power generation – gensets	1.6%
	Industry	6.3%
	Mobile towers	0.3%
	Others	6.3%
Sub-total - non-transport		**19.3%**



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For complete report, you may write to epankaj.sharma@ppac.gov.in or ritwik.hatial@ppac.gov.in

Contact Details: Petroleum Planning & Analysis Cell (PPAC)
(Ministry of Petroleum & Natural Gas, Government of India)
2nd Floor, Core-8, SCOPE Complex
7 Institutional Area, Lodhi Road,
New Delhi - 110 003, India

Phone: +91-11-24306100, 24361314

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