Infrastructure Advisory

CRISIL
An S&P Global Company

All-India study on sectoral demand for petrol and diesel

Submitted to:

PPAC
IndianOil
Bharat Petroleum
HP

Submitted by:

CRISIL Infrastructure Advisory
An S&P Global Company

Abbreviations

Acronym	Definition
kL	Kilo Litres
APM	Administered Pricing Mechanism
BPCL	Bharat Petroleum Corporation Limited
BTS	Base Transceivers System
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 Limited
HSD	High Speed Diesel
IOCL	Indian Oil Corporation Limited
LNG	Liquefied natural gas
LPG	Liquefied Petroleum Gas
MMTPA	Million Metric Tonnes Per Annum
MORTH	Ministry of Road Transport and Highways
MRPL	Mangalore Refinery and Petrochemicals Ltd.
MS	Motor Spirit
OCC	Oil Coordination Committee
OMC	Oil Marketing Companies
PDS	Public Distribution System
PPAC	Petroleum Planning & Analysis Cell
RO	Retail Outlet
SOP	Standard Operating Procedure
SUV	Sports Utility Vehicle

Acronym	Definition
UT	Union Territories
AP	Andhra Pradesh
ASM	Assam
BIH	Bihar
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

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CRISIL
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Letter of Submission

23 February 2022

To,

Dr. Pankaj Sharma – Petroleum Planning and Analysis Cell, Government of India
Shri. M. Balaji Naik – Indian Oil Corporation Limited
Shri. Arul Muthunathan – Bharat Petroleum Corporation Limited
Shri. Navneet Kumar – Bharat Petroleum Corporation Limited
Shri Muralikrishna V Vadrevu – Hindustan Petroleum Corporation Limited
Shri. Shubhabrata Khan – Hindustan Petroleum Corporation Limited

Respected Sir(s),

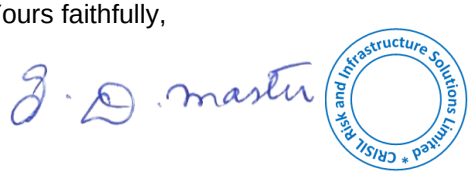
Subject: Consultancy services to carry out *"All India study on Sectoral demand of Petrol and Diesel being sold from retail outlets of IOCL, BPCL and HPCL"*

In accordance with the tasks and the deliverables set out in the Contract for the captioned assignment, we are submitting the **Full Year**. This report covers the analysis of fuel consumption data being observed during Full Year and showcases the data outcome and observations through the survey carried out across 3000 Retail Outlets.

We would like to express our sincere thanks to concerned divisions & senior management from PPAC and respective OMCs for the inputs provided during the Full Year of the study.

The study aims to provide a clear understanding of the usage patterns of petrol and diesel in different sectors that would, in turn, help OMCs estimate the requisite supply and infrastructure-requirement plan for future and would be extremely helpful to the policymaking bodies in the oil and gas sector to plan and forecast demand for these products effectively and efficiently.

Yours faithfully,



Pranav Master

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1. Executive summary

The pan India study on petrol and diesel dispensed at retail outlets provides insights into the sales pattern of the fuels to the agriculture, industrial, and transportation segments across states and union territories in India. The survey encompasses urban cities, including metros and semi-urban areas, and semi-rural and rural areas. This section provides a background, survey coverage, and key findings observed over 12 months across various consumer segments.

1.1 Background

Diesel and petrol are crucial cogs of the Indian economy. Hence, the usage pattern of both fuels in the agricultural, industrial, and transportation segments, and for back-up power generation through DG sets provides a gauge with regards to the health of the Indian economy. In fact, optimising and improving efficiencies in transportation acts as a catalyst in enhancing the competitiveness of all sectors of the economy, and can significantly improve India's goal of becoming a $5 trillion economy by 2025.

To be sure, the fuel retailing segment has been resilient since 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 end-use segment-wise secondary sales.

The analysis is even more crucial as India diversifies 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 and Analysis Cell, along with oil marketing companies (OMCs) – Indian Oil Corporation Ltd, Bharat Petroleum Corporation Ltd, and Hindustan Petroleum Corporation Ltd – have 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 Limited (CRIS) to carry out an observation study each quarter (for an overall period of 12 months), covering **3,000** ROs that have high level of 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 the segments that would, in turn, help the OMCs project the requisite supply and infrastructure requirement. The survey was to also provide 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, with answers sought at each of the identified ROs. These questionnaires were 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 held for **24 hours** for seven consecutive days across the quarter for ROs situated at **national/state highways**. For retail outlets situated in urban, semi-urban, semi-rural, and rural areas, the survey was undertaking for **12 hours** for seven consecutive days.

The study was uniquely designed, wherein activity at the 3,000 ROs was observed each quarter (i.e., four times in total) to capture seasonality or other aspects related to the sale of diesel and petrol.

1.2 Survey period captured fuelling pattern from unlocking economic recovery

The objective of the study is to ascertain 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).

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

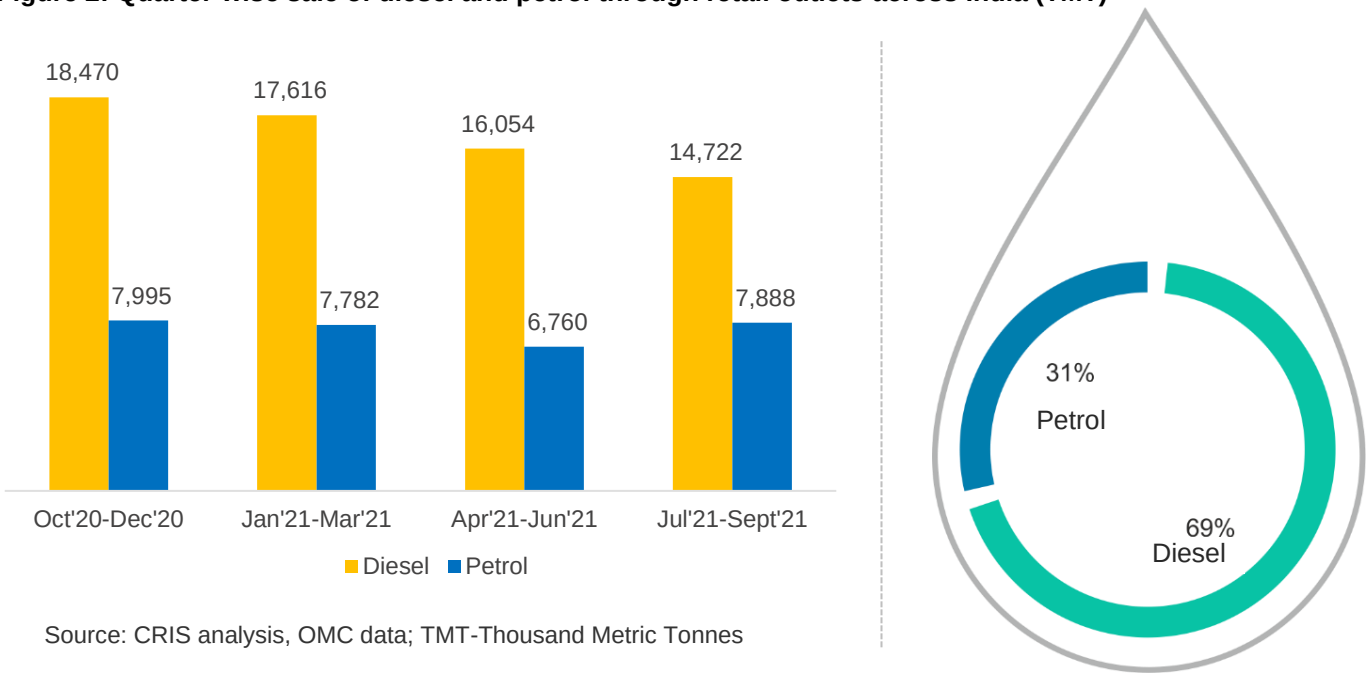
State	A	B	C	D (NH/SH ROs)	E	Total
Pan India	251	240	710	1198	601	**3000**
Zone-wise bifurcation						
East zone	21	31	117	262	174	**605**
North zone	73	86	279	334	140	**912**
South zone	91	73	180	291	138	**773**
West zone	66	50	134	311	149	**710**

Source: Based on 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 surveyed ROs covered ~17% of total high-speed diesel (HSD) sold from ROs in the country, and ~9% of overall petrol retail sales. Low coverage of petrol sale was because the 3,000 surveyed ROs constituted the highest diesel selling ROs in the country.

Figure 2: Quarter-wise sale of diesel and petrol through retail outlets across India (TMT)



Source: CRIS analysis, OMC data; TMT-Thousand Metric Tonnes

1.3 Diesel refuelling- Retail Sales

During the survey period, diesel retail sale constitutes 68% share of the petrol-diesel basket, with the **transport segment** of diesel accounting for **87%** share and non-transport segment of diesel, the remaining **13%**. North zone (36%) contributes 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 lion's share

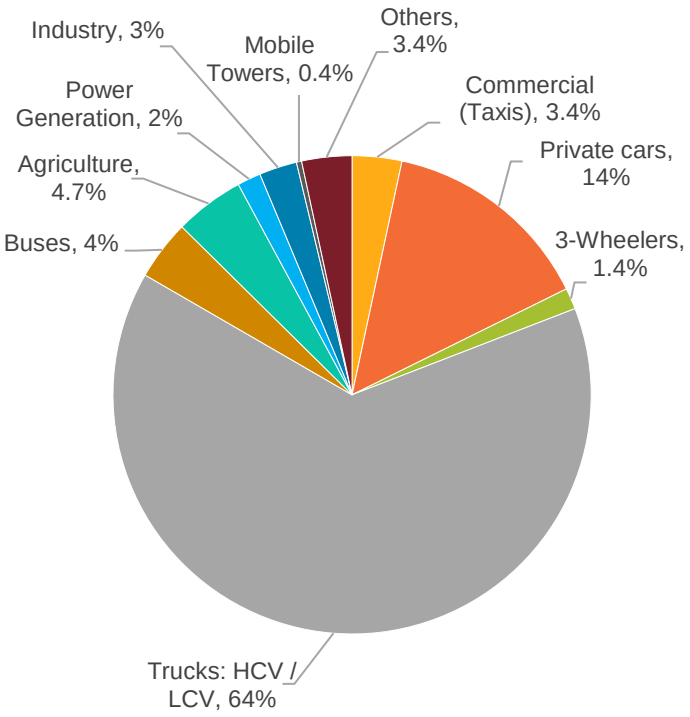
Road transportation is the dominant mode for freight movement in the country, comprising 71% share of total domestic freight transported. As trucks are the most widely used vehicles for road freight, these will continue to drive diesel demand in the country. Implementation of e-waybill and introduction of radio-frequency identification-enabled FASTag for 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 of diesel from this vehicle segment, which currently accounts for 64% share of retail fuel sales.

Within the truck segment, light commercial vehicles, which largely cater to 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 has resulted in lion's share of total freight transport by roads (71%).

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

Consumer segment		*Share (%)*
		Full year
	Commercial (taxis)	3.4%
	Private cars	14.3%
	3-wheelers	1.4%
	Trucks: HCV / LCV	64.2%
	Buses	4.1%
Sub-total – transport		**87.0%**
	Agriculture	4.7%
	Power generation – gensets	1.6%
	Industry	2.6%
	Mobile towers	0.4%
	Others	3.4%
Sub-total - non-transport		**13.0%**



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

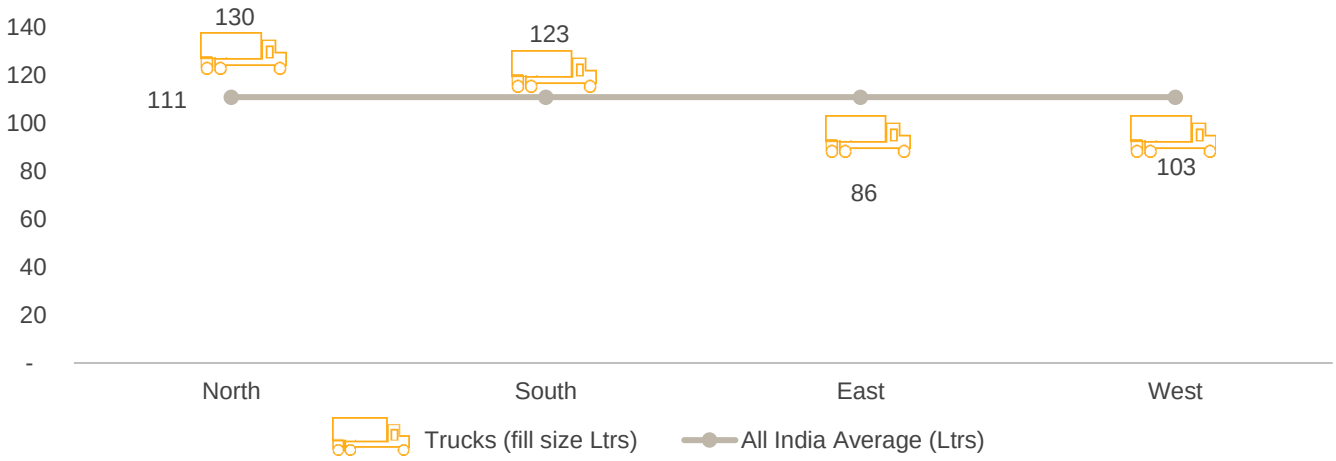
Source: CRIS analysis on primary survey data

1.3.1 Transport segment

The top three states that contribute the highest to diesel sales in the truck segment are Uttar Pradesh (14%), Maharashtra (13%), and Haryana (12%).

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

Figure 3: Zone-wise average fill size – trucks (litres)



Source: CRIS analysis

With logistics forming the backbone of the agriculture and manufacturing sectors in India, consequently, road freight has a significant imprint on the country's GDP. Thus, development of road infrastructure strengthens the logistic 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. Hence, innovative distribution mechanisms will be required. Door-to-door delivery in one such mechanism to aid in efficient utilisation of existing retail fuel outlets. Door-to-door delivery of ~200,000 kilo litre of HSD has already commenced. It is expected that small and medium fleet owners would benefit with such innovative delivery mechanisms.

Bus segment – sustainable and resilient transport system

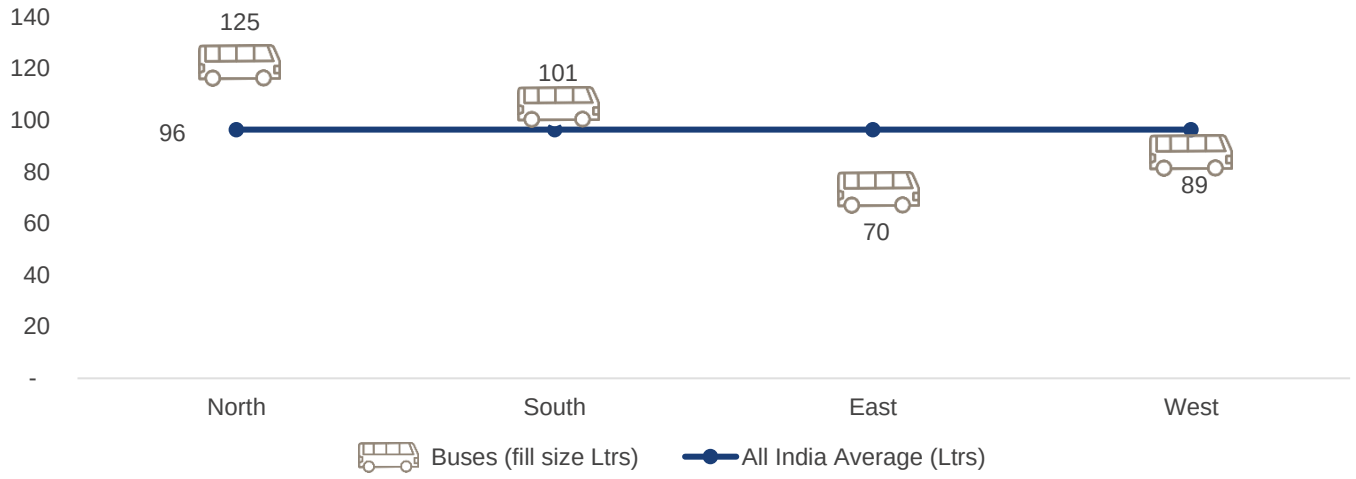
Buses are critical to mass mobility. Majority of the cities are planning to improve their transport system, with buses playing a major role. Also, with ridership expected to reach pre-Covid-19 level, the segment will remain a significant consumer of diesel. Also, the government aims to enable innovative 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 the space, majority of the commuters utilise state transport undertaking (STU) buses, followed by private buses for inter-state/inter-district movement. There are ~70 STUs in the country, having ~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 retail outlets. The retail share of the bus segment in overall diesel sales at a pan India level, though, was observed at only ~4.1%.

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

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



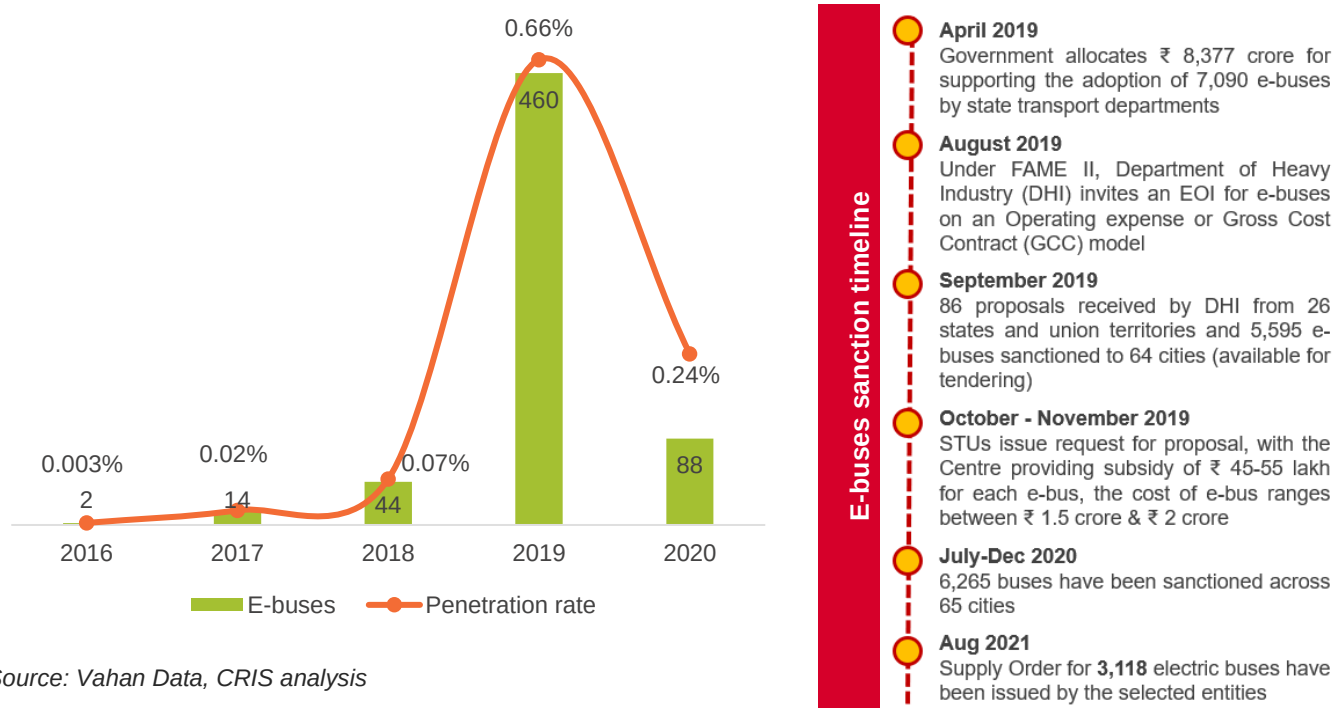
Source: CRIS analysis

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 rise of CNG/ electric vehicle (EV) buses, and improved bus infrastructure (bus rapid transit), India may see an increase in daily ridership in bus fleet.

Electric buses: FAME subsidies and state tenders under Gross Cost Contract (GCC) model to drive adoption; however, utilisation levels and rollout of charging infrastructure critical

EV bus adoption, spurred by government initiatives, such as Faster Adoption and Manufacture of (Hybrid and) Electric Vehicles (FAME; FAME-I and -II), will likely be visible only in metro and tier-II cities.

Figure 5: E-buses registered in India

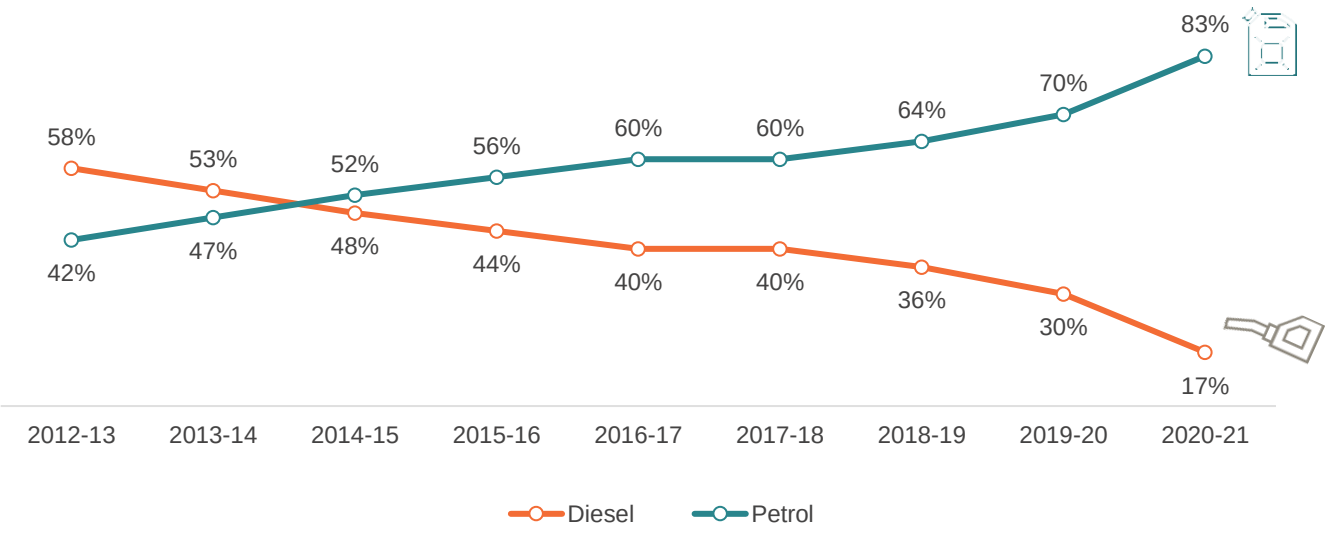


Source: Vahan Data, CRIS analysis

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 Indian market has reduced significantly over the past decade, with diesel passenger vehicles' share falling to ~17% in fiscal 2021 from 58% in fiscal 2013. The shift in preference to petrol is mainly because of a narrowing gap between diesel and petrol prices.

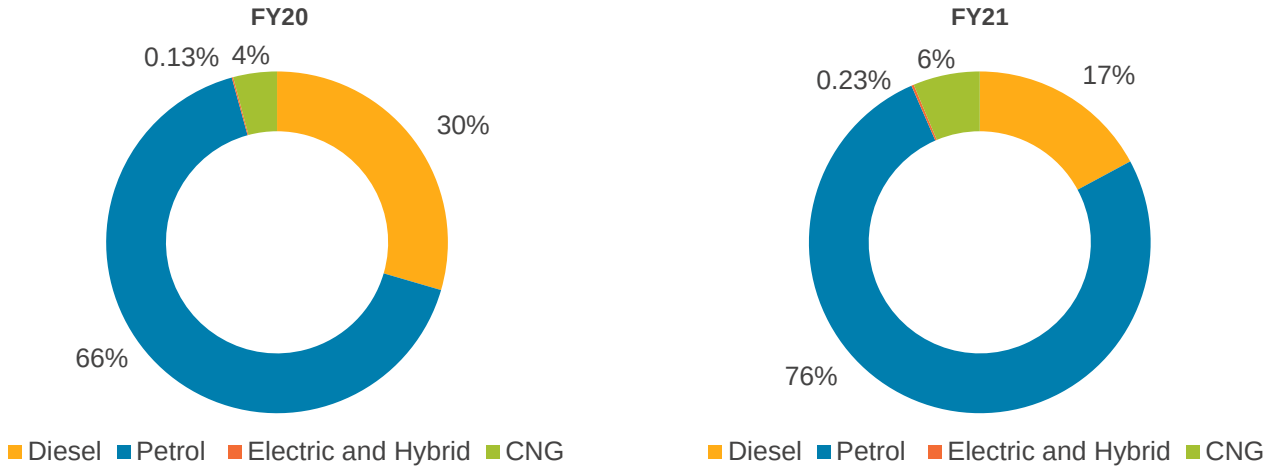
Figure 6: Share of diesel and petrol passenger cars



Source: Society of Indian Automobile Manufacturers (SIAM) data

Awareness of higher pollution by diesel vehicles, high cost of ownership, and low shelf life have triggered the shift towards fuels, such as petrol, CNG, electric, and hybrid. However, in the sports utility vehicle (SUV) segment, diesel remains the preferred fuel.

Figure 7: Share of passenger vehicles based on fuel combustion

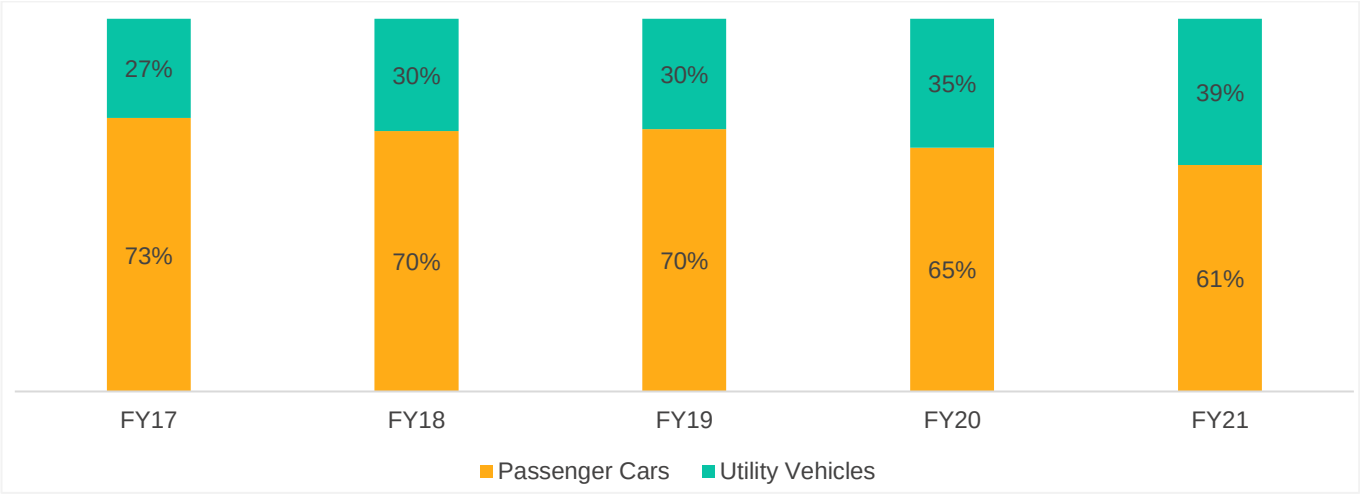


Source: SIAM data

The passenger car category contributes nearly ~18% to diesel sales observed from the fuel retail outlets. Private vehicles accounted for ~14.3%, and commercial vehicles, ~3.4% of total diesel sales. The share of diesel offtake by private cars has been relatively higher from Maharashtra (14%), Uttar Pradesh (11%) and Rajasthan (8%).

Further, it has been observed that the rising share of SUVs sales in overall car sales (from 27% in fiscal 2017 to 39% in fiscal 2021), coupled with almost double the average fill size, points to a potential increase in share of the cars segment in diesel sales (fill size of SUVs is typically ~27 litre, while that of cars is ~17 litre).

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



Source: CRIS analysis, industry data

The introduction of BS-VI norms for diesel engines to counter the ever-increasing pollution and make the tailpipe emissions less harmful, would require many manufacturers to scale up their investments. The usage of expensive

filters in BS-VI-compliant diesel engines and the huge money-input by the companies will result in diesel cars getting a lot pricier, which will eventually lead to a steep drop in diesel car demand. 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 contributes 38% to direct sales. Of this, the highest contribution is from industries (30%), where diesel is used for process and power requirements. Diesel consumed in the agriculture segment from depots constitutes 6% of direct sales, while the power segment contributes ~2%.

Retail outlet sales

Non-transport segment incorporates sale of diesel to the agriculture segment (includes tractors, agri-implements and diesel pumps), power generation (includes DG gensets (Diesel Generators) which are 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 (includes fishing boats, jugad vehicles and resale).

Diesel sold from retail outlets in the non-transport segment contributes ~13% to the overall diesel sales.

During the survey period, 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 contributed 2.6%, agricultural implements 1.5% and diesel pumps 0.6%.

Uttar Pradesh (20%), Haryana (13%) and Punjab (11%) are the top three states collectively contributing 44% to total diesel sold to the agriculture segment. The north zone (54%) accounts for the highest share (54%) in quantity of diesel sold to this segment, while the south contributes the least (12%).

Various initiatives have been undertaken by the Government of India such as Jawaharlal Nehru National Solar Mission and KUSUM, which have increased solar pumps penetration in India replacing fuel demand diesel pumps. Solar pumps have registered 66% CAGR between fiscals 2014 and 2020 (a jump from 11,626 to 246,074 solar pumps)

Figure 9: 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

Tractor sales in fiscal 2021 grew 26.9% on-year (to 8,99,429 vs 7,09,002 in fiscal 2020). The high growth was due to the lower base effect and pent-up demand due to lockdown last 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.

Figure 10: Top 10 agricultural states comprise ~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

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

Haryana, Uttar Pradesh and Tamil Nadu collectively contributed 52% to the total diesel sales to the DG-genset segment.

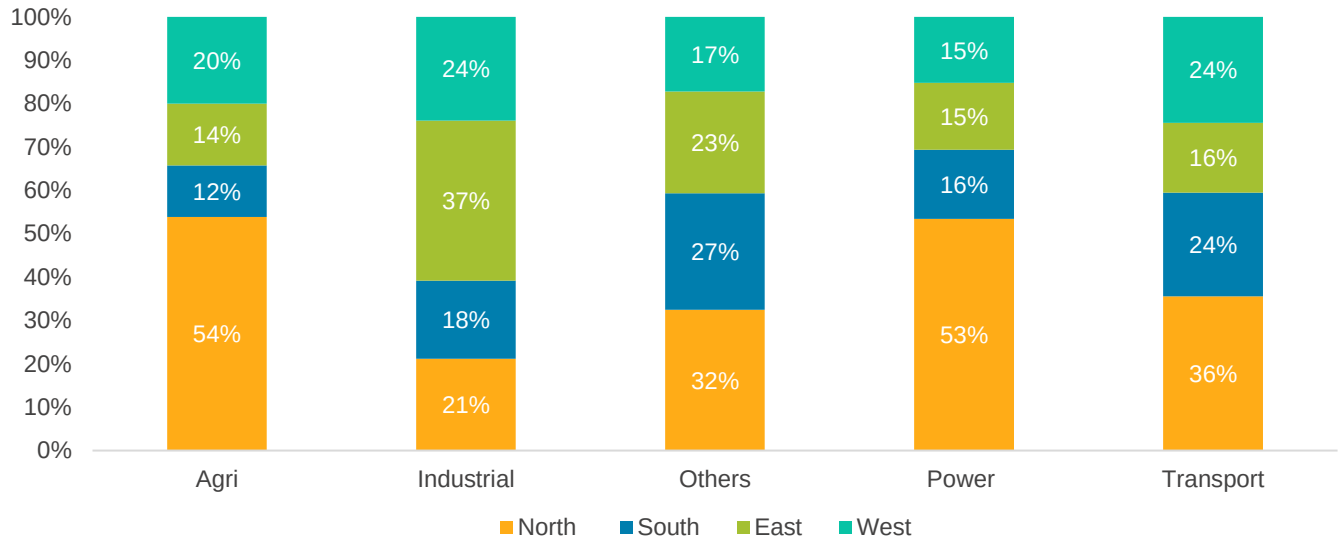
In the mobile tower segment, Uttar Pradesh (32%) had the highest share. This was due to the presence of a high number of mobile BTS towers in the state (Telecom Statistics, 2019).

The other industrial sector, which comprises sales of diesel in the industry for purposes other than power generation, contributed 2.6% to overall and 20% to diesel sales in the non-transport category. This segment saw the highest sales in the east zone (37%), with high contribution from West Bengal, Assam and Jharkhand, and lowest in the south zone (18%). The presumable reason for higher sales in the east is the presence of coal, iron and allied industries, which uses diesel for purposes such as mining, drilling and construction.

1.3.2.1 Segment-wise diesel sales

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

Figure 11: Segment-wise diesel sales – zonal (% share)



Source: CRIS analysis and primary survey

The following observations are made based on the figure above:

- For the **transport segment** at the zonal level, the north zone (36%) contributes the highest share (36%) to quantity of diesel sold to this segment, followed by south and west zones (24% each).
- For the **agriculture segment**, the north zone contributes the highest share (54%) to quantity of diesel sold to this segment, while the south zone contributes the lowest (12%).

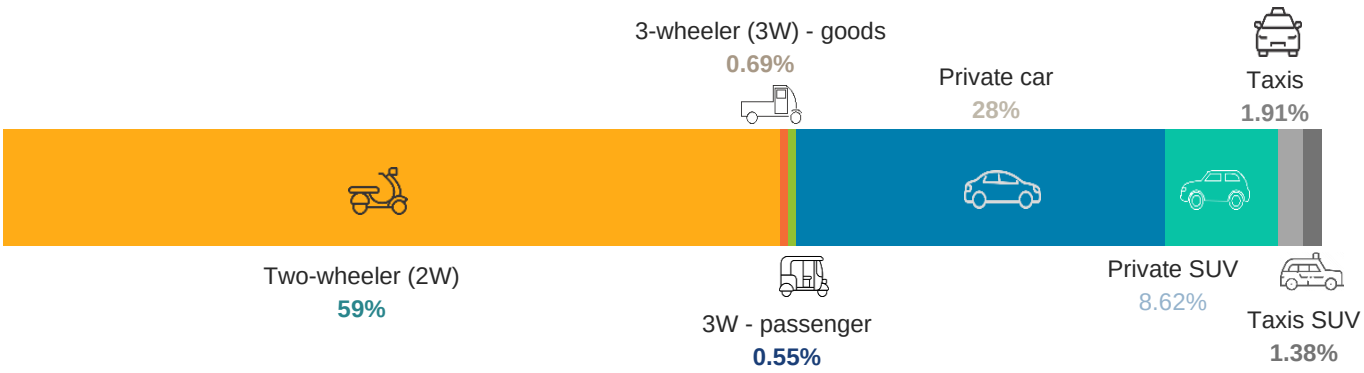
  The north zone has a larger area under cultivation which boosts demand for diesel for non-transport segment.
- In the **power segment**, the north zone (53%) contributes the highest (53%) to quantity of diesel sold to the segment, while the east and west zones contribute the least (15% each).

  The presence of a high number of mobile BTS towers in Uttar Pradesh (Telecom statistics, 2019), along with frequent load-shedding may have resulted in a higher share of diesel consumption by mobile tower units.
- In the **industrial segment**, the east zone (37%) contributes the highest share (37%) to the quantity of diesel sold to this segment, and the south zone contributes the least (18%).

  Restrictions, specifically in the region of Delhi-NCR amid rising pollution levels, has reduced diesel consumption by industrial segment in the north zone.
- In the **others segment**, *the* north zone contributes the highest share (32%) to the highest quantity of diesel sold, followed by south zone (27%)

1.4 Petrol refuelling - retail

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 that of cars

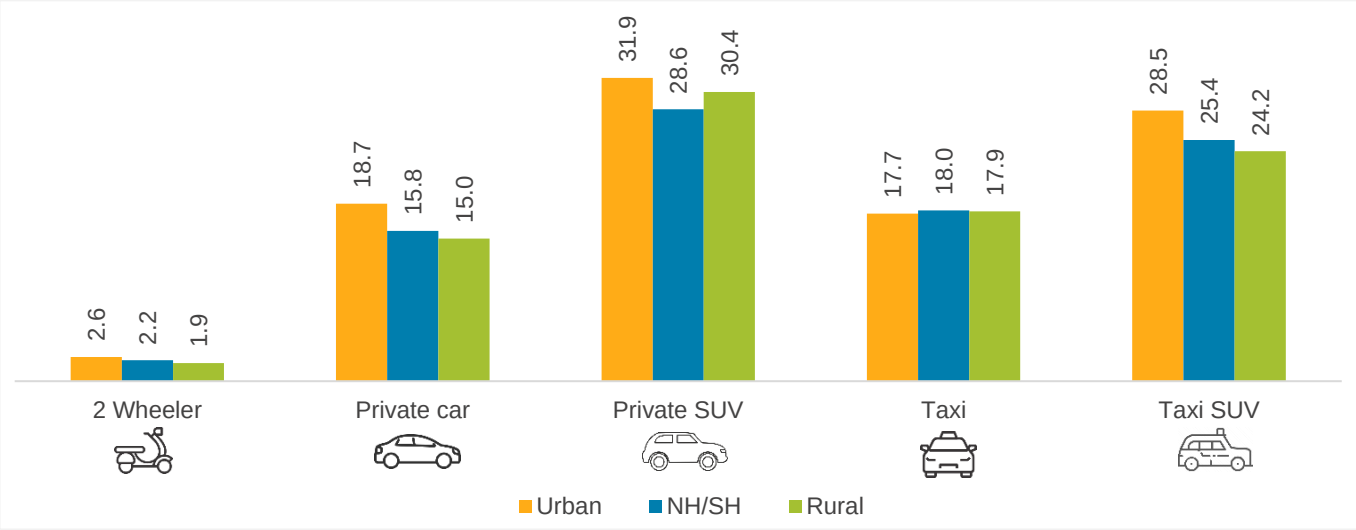
The highest sale of petrol is observed in the 2W category (59%) followed by private car (28%).

The top three states with highest contribution to 2W segment are Uttar Pradesh, Maharashtra and Tamil Nadu, collectively contributing 33% to overall petrol sales to this segment.

The pandemic has resulted in preference for using personal mobility for commuting. Further, rising disposal income and perceptions of social status have created demand of pre-owned cars in tier 2/3 cities and rural India, especially in the under Rs 5 lakh car segment.

Similar fill size patterns of petrol driven private cars is observed across urban and rural retail outlets. During the survey period, due to restricted mobility, the taxi segment (taxi and taxi SUV) contributed ~3% to the total petrol sales, with an average fill size of 22 litre.

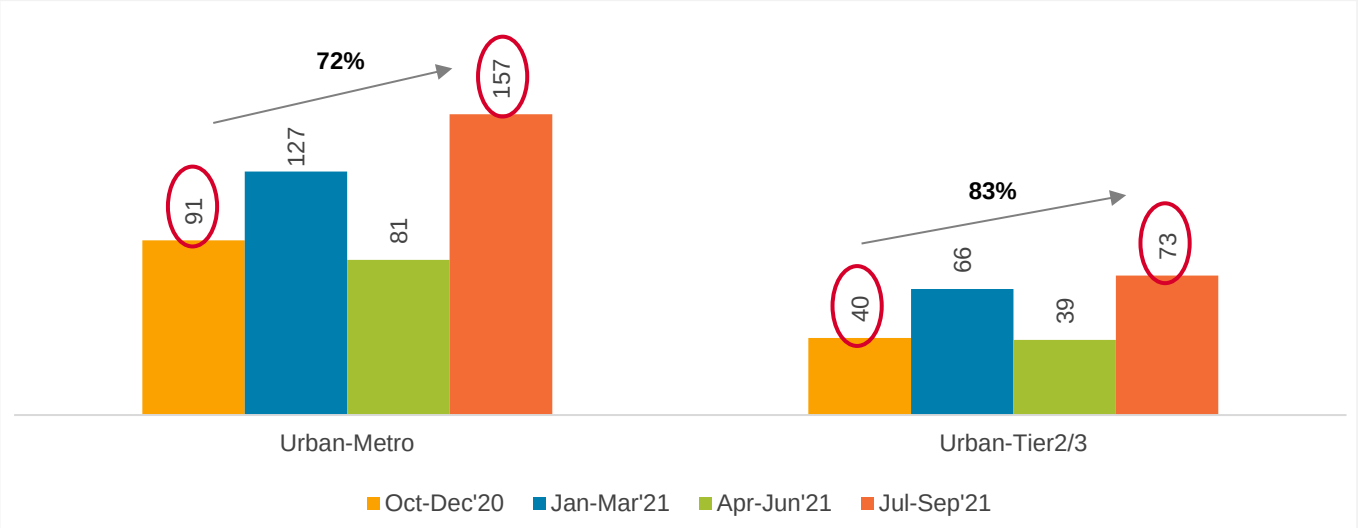
Figure 12: Fill size among various petrol vehicle segments (litre)



Source: CRIS analysis

Petrol car transactions in emerging districts in tier 2/3 cities picked up faster than in metros, similar recovery in fill size observed in rural India too

Figure 13: Transaction in tier 2/3 vs metros - petrol cars

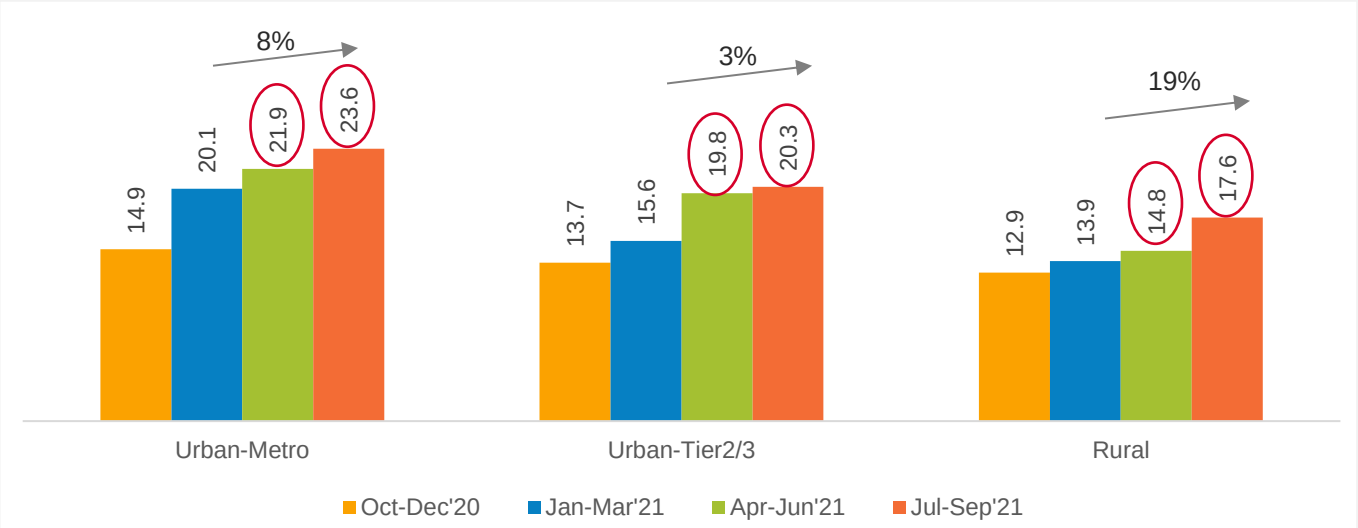


Source: CRIS analysis

Petrol car transactions rose 72% in metros, over the first leg to the last leg of the survey. Tier-2/3 cities showed faster pick-up in momentum, with an increase of 83%.

While comparing recovery from the second wave (April-June 2021 quarter), it was observed that fill size of private cars at rural category ROs picked up faster (19%) as compared with urban-metro (8%) and tier 2/3 cities (3%).

Figure 14: Fill size for petrol cars in metro, tier 2/3, rural areas (litres)



Source: CRIS analysis

Petrol segment 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 in 3Ws and cars

CNG provides considerable savings as compared with petrol, along with low maintenance cost. According to industry data, recent increase in fuel prices has led to massive sales of CNG vehicles during April-September period. The following table shows the CNG vs other vehicle scenarios for 3Ws, where CNG has high penetration:

Figure 15: 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%**

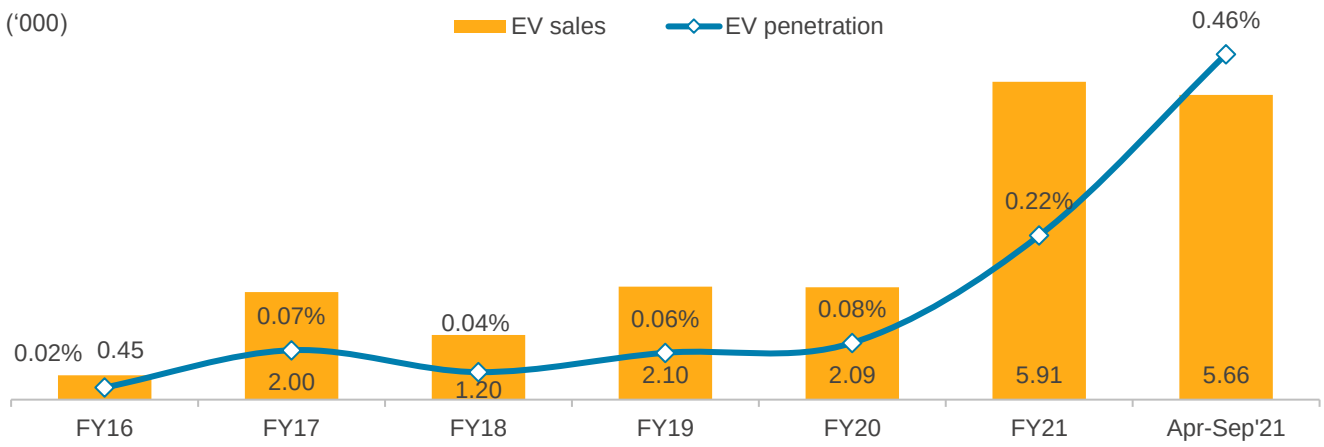
Source: Industry data

Similar scenario has been observed in CNG cars segment. A total of 1,01,412 CNG cars were sold during April-September 2021, 97% higher on-year.

The Indian EV-4W market is at a nascent stage but should accelerate over the next few years led by favourable policies, introduction of more products, and rising use of mobility as a service (MaaS)

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

Figure 16: EV-4W sales in India and EV penetration



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

EV-4W sales tripled in fiscal 2021 over pervious year, led by incentives and new models. The rising adoption 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:

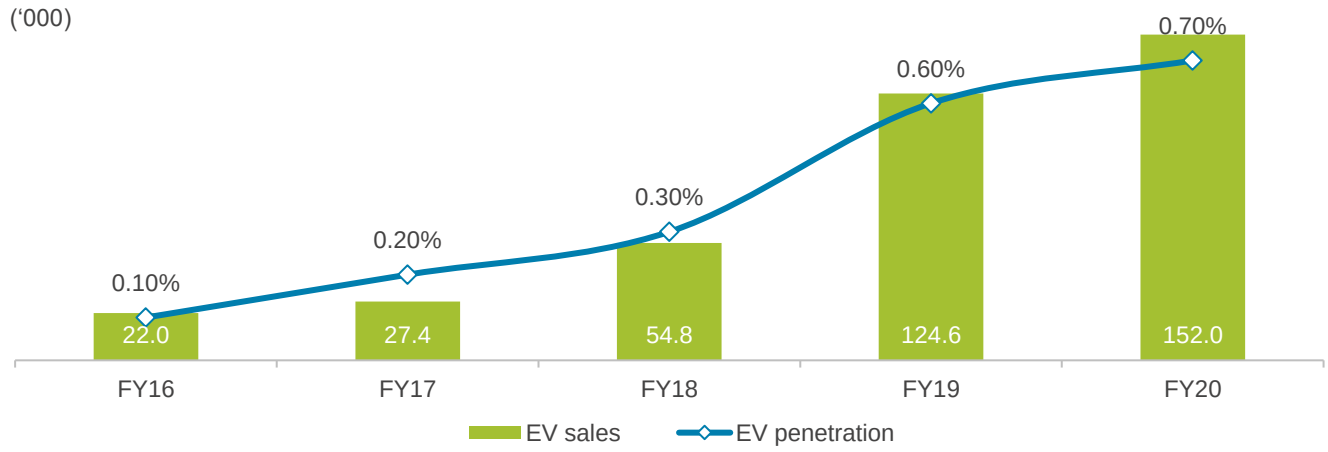
- Growth in last-mile connectivity services
- Rapid urbanisation and economic growth
- Growth of taxi and ride sharing services

Moreover, sales are benefitting from robust 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. In 2019, only four states had dedicated EV policies, 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, a shift in consumer behaviour towards EVs due to affordable prices, lower running and maintenance costs, and concerns about environment and sustainability, has been observed.

Going forward, the economics will play further in favour of EVs as battery costs reduce, and against ICE vehicles, as compliance costs rise. That said, while the policy incentives and general buzz in the market has created a momentum for EV adoption in the Indian market, Indian customers are more sensitive to the upfront cost. Hence, large-scale adoption will only happen when the upfront prices drop further.

Figure 17: EV-2W sales and market penetration



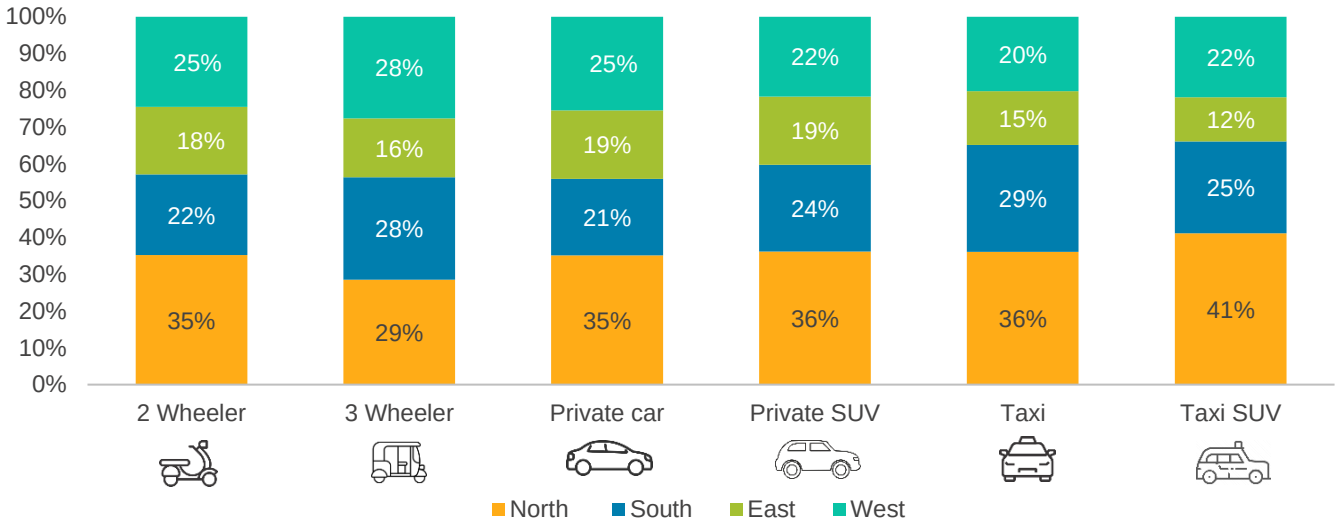
Source: SIAM, CRIS analysis

Among EV-2W, high speed EVs (>25 km/h) are picking up pace in the country as compared with low speed EVs. The impact is visible in metro cities where battery charging infrastructure activities are on the rise.

1.4.1.2 Segment wise petrol sales

The following figure depicts segment wise petrol sale across four zones and at an all-India level.

Figure 18: Segment wise petrol sales – zonal (% share)



Source: CRIS analysis and primary survey

The following observations are made based on the figure above:

- Petrol sold to 2W segment was highest in the north zone (35%) followed by west zone (25%)
- Petrol sold to the private cars segment was highest in the north zone (35%), followed by west zone (25%)

The trucks segment, which plays a pivotal role in the country's logistics sector, will have higher diesel dependence. With economic growth, this segment is expected to rise, thereby increasing diesel fuel consumption in the country. Innovative mechanisms such as door-to-door delivery will assist retail outlets in improving efficiency, destressing the fuelling infrastructure and thereby increasing customers' fuelling experience. Policy support is also expected to drive a sustainable mass mobility growth.

The bus segment is expected to grow at healthy rate, with policies such as FAME-II promoting e-mobility. However necessary role out of 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 non-transport segment is expected to reduce with increasing penetration of renewable energy, reducing demand of all category of gensets and diesel power generators at mobile towers.

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

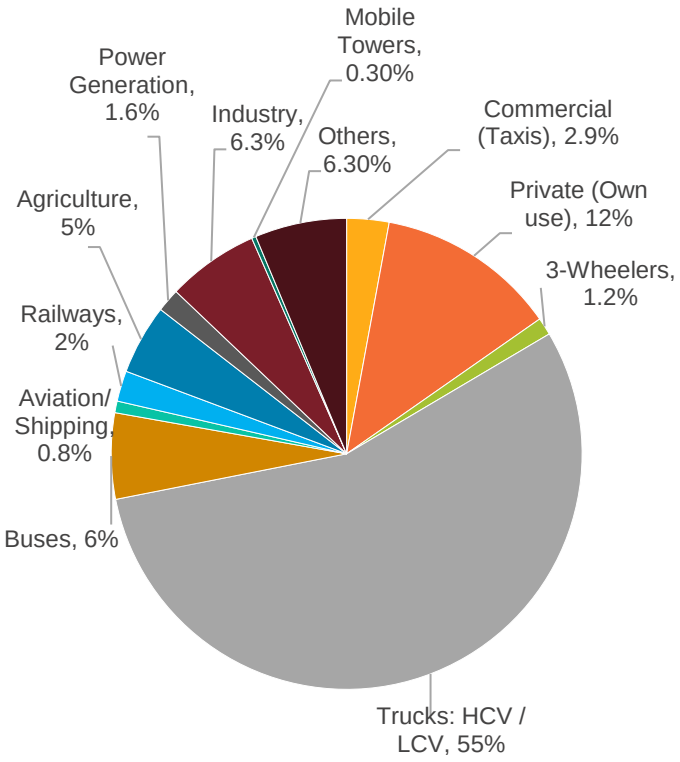
The advent of EV technologies particular in 2Ws and 3Ws will drive faster adoption, with a considerable shift from ICE to electric engines taking place. A faster pace of CNG penetration in the 3W commercial and hatchback car segment may reduce petrol demand in future.

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 shown below.

All India end-use share (%) of diesel (Retail + Direct)

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%**



2. Introduction

2.1 Petroleum Sector at glance

The oil and gas sector are one the eight core industries of India and has a substantial influence in the decision-making process of the country. The sector is expected to grow in importance given that India is a fast-growing economy which necessitates a correspondingly growing energy sector, thus, making the sector ripe for fruitful investments in the future. The Central Government has allowed 100% Foreign Direct Investment (FDI) in many segments of the sector, including natural gas, petroleum products and refineries among others which will prove to be a major stimulant for the sector's growth story.

According to the BP Statistical Review of World Energy 2021, oil is the second most important energy source after coal in India, taking a little over 28% share of the primary energy mix. While the country is exploring other energy sources like natural gas (6.7% of the primary energy mix) and other cleaner sources of energy to tackle environmental pollution and meet environment goals, it is still largely dependent on coal and oil to meet energy requirements as these sources meet over 83% of the country's primary energy demand. The indigenous oil production capacity has been outstripped by the demand which warrants the country's dependence on crude oil imports to fuel its growth story and this trend is expected to continue going forward.

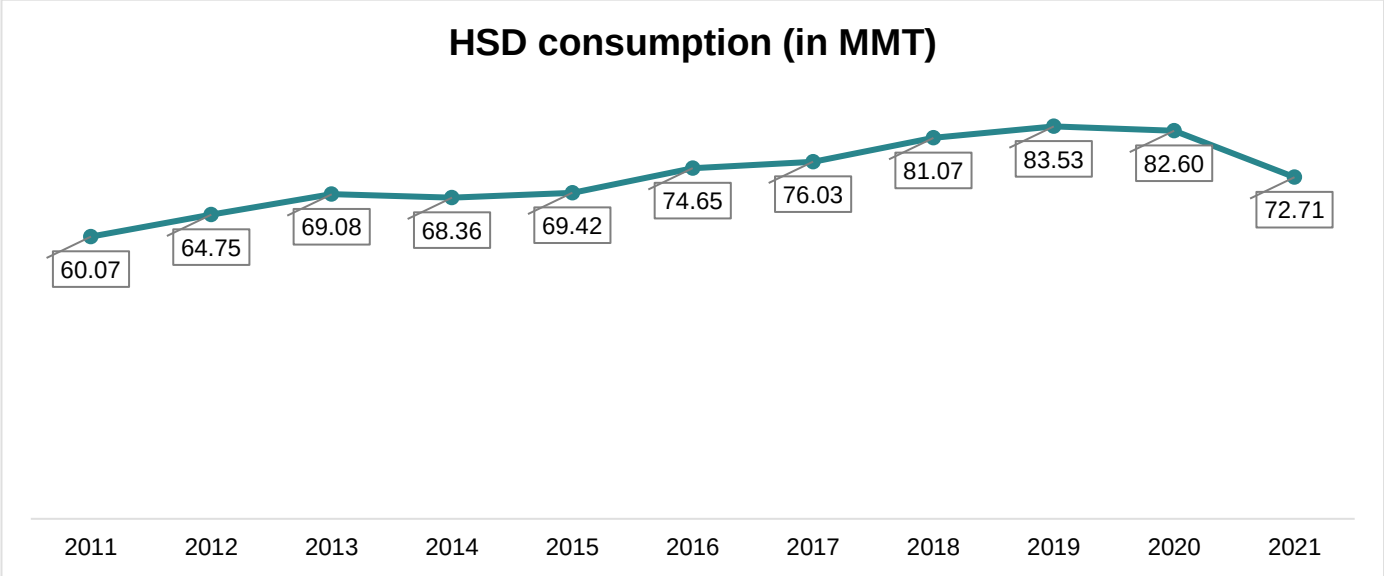
- In 2020-2021, the crude oil import of India stood at 196.46 million metric tonnes (MMT) as against 226.95 MMT for the same in 2019-2020; while the LNG imports stood at 24.8 MMT in 2020-2021 as against 25.6 MMT in 2019-2020, the reductions were encountered on account of strong downward pressure due to the COVID – 19 pandemic.
- Consumption of petroleum products stood at 194.3 MMT during 2020-2021 as compared to 214.13 MMT for the same in 2019-2020 which marks a decline of 9.3% on account of the COVID – 19 pandemic, while India remained a net exporter of petroleum products in 2020-2021.

Natural gas is expected to become a major fuel in the future due to its low-polluting nature. At present its share in the primary mix is at 6.7% which is well below the global average, hence, the Government has set a target to bring the share of natural gas to 15% of the primary energy mix by 2030. So, it can be expected that large investments in this space will continue to be observed in order to meet the target set by the Government. This trend has been observed on the world stage and is expected to be replicated in the Indian context as well.

Another major reason for the push towards diversification in energy sources is to reduce dependence on oil imports which have proven to be a gargantuan burden on the exchequer as India has to import over 80% of its crude oil requirements. The diversification of energy sources is not only aimed at fighting pollution but also at reducing the high concentration risk India faces at present on account the quantum of oil import needed to sustain the country's growth. The Hon'ble Prime Minister of India, in August 2021, set an "Energy Independence" target for the country by 2047 (India's 100th Independence Year) through a mix of gas-based economy, electric mobility, doping ethanol in petrol, and by making India a hub for hydrogen production. The push towards natural gas can also be seen by the aggressive roll-out of Round 11 of CGD Bidding which will bring almost the entire country under the purview of CGD networks and will bring about the proliferation of compressed natural gas (CNG) and piped natural gas (PNG) to the country in an expeditious manner.

2.2 Trend in Diesel consumption

The following figure shows the trend in the consumption of diesel (HSD – High Speed Diesel) over the past 10 years from 2010-2011 to 2020-2021.



Source: PPAC

Diesel is mainly used in the road transport, agriculture, industry, and power generation sectors. It is of particular importance to the national economy due to its dominance in the transport sector which links its prices to those of several essential commodities pan-India.

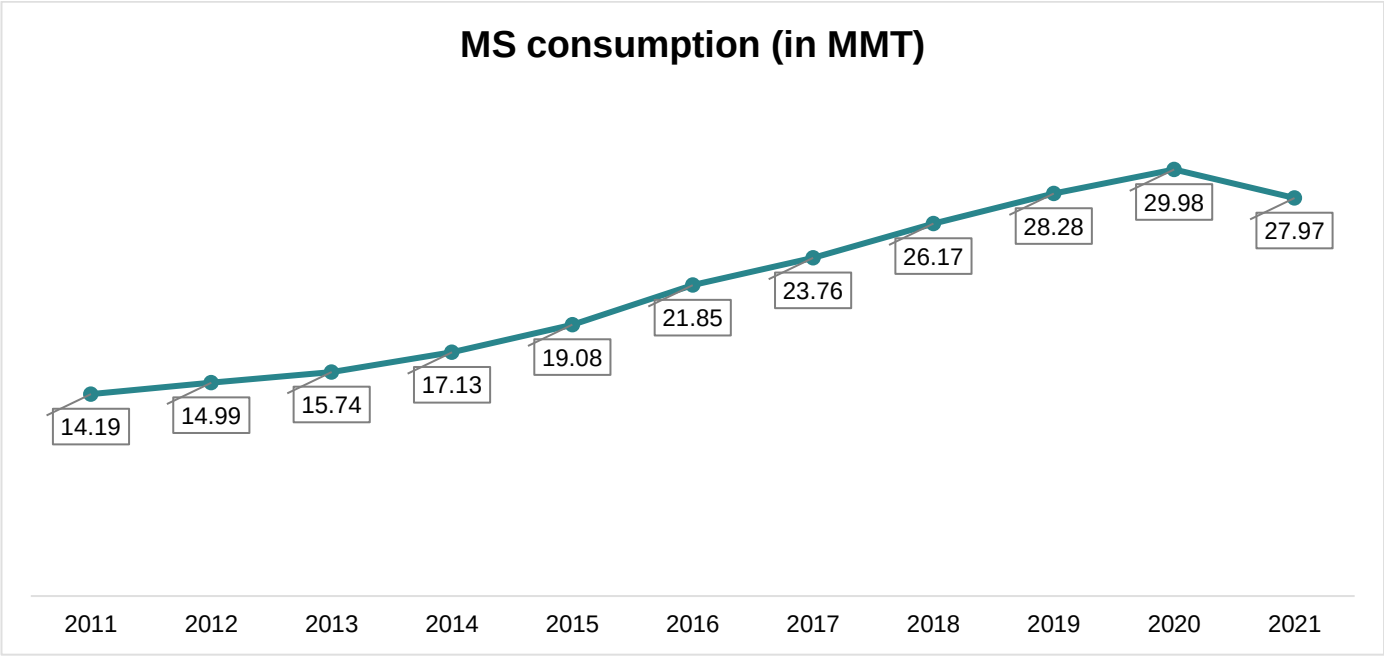
The consumption of HSD has grown steadily over the years with one major aberration in 2020-2021 wherein a decline of 11.9% is observed from the previous year which was brought about by the COVID – 19 pandemic. The consumption has grown at a CAGR of 1.9% from 2011 to 2021. The growth has been at 3.6% CAGR (2011 to 2020) if the pandemic year (2021) is excluded from the calculation.

2.3 Trend in Petrol consumption

Motor spirit (MS – Motor Gasoline, Petrol and Gasoline are terms interchangeably used in India for this light distillate product of refineries) is used as a transportation fuel in vehicles such as passenger cars, two-wheelers, and three-wheelers. It can be observed in the figure below that petrol or MS consumption in India has grown at a fast pace. From 2011 to 2021 the consumption growth has been at 7% CAGR, with the declining consumption observed in 2021 being on account of it being the COVID -19 pandemic year. If we exclude 2021, then the consumption has grown at a healthy rate of 8.6% CAGR. The reduction in the gap between petrol and diesel prices has also contributed to this rapid increase.

This rapid and sustained growth can be attributed to the recent boom in the sales of private vehicles observed in the country which is the main consumption center for petrol or MS. The sales of these vehicles have been adversely impacted by the COVID – 19 pandemic which has had a subsequent impact on the consumption trends of MS or petrol.

The following figure shows the trend in the consumption of petrol (MS) over the past 10 years from 2010-2011 to 2020-2021.



Source: PPAC

2.4 Major segments dependent on Diesel and Petrol

2.4.1 Diesel dependent sectors

2.4.1.1 Transport sector

Diesel has been the dominant fuel in the transport sector as the road freight movement is catered by the High Commercial Vehicle (HCV), Medium Commercial Vehicle (MCV) and Light Commercial Vehicle (LCV) which predominantly uses diesel powered engines to transport the freight from one corner of the country to another. Further, with improvement in road connectivity across India, road freight movement has increased significantly contributing to diesel sales.

Lower fuel price difference between diesel and petrol has also encouraged sales of petrol driven cars in compared to diesel driven cars. Further. some car manufacturers are moving away from diesel engines with brands like Maruti Suzuki, Renault, Volkswagen, Nissan, etc. announcing that they will cease making diesel engines soon and will focus on electric mobility, petrol-hybrid, petrol variants, etc. to become eco-compliant while some brands like Ford, Tata, Mahindra, etc. have said they will manufacture BS-VI compliant diesel variants for the country. This is bound to put significant downward pressure on diesel consumption from passenger cars.

2.4.1.2 Non-Transport sector

Tractors and agricultural implements

India is one of the largest markets in the world for tractors (along with China) due to the majority of country's populace being engaged in agricultural activities for employment, it is set to keep growing as the Indian farmer realizes the importance of mechanization in efficient farming. The tractor market in India is geared up to adopt the BS-TR Tractor EM-Emission (TREM) 4 norms for tractors over 50 HP (tractors below 50 HP are expected to make the switch by October 2023). According to industry sources, the switch is likely to impact the overall volumes by ~7%-10% as the cost of tractors will be pushed upwards and manufacturers will also need to upgrade fuel injection systems, electronic

controls, and exhaust treatment systems. Additionally, the Government is also interested in shifting tractors to greener fuels like CNG, ethanol, etc. with February 2021 seeing the launch of India's first CNG-powered tractor.

Besides their use in farming, tractors find application in activities such as harvesting and irrigation, land reclamation, drawing water, powering agricultural implements and rural transportation. In addition, the tractors are also being used for non-agricultural purposes including haulage in construction and infrastructure projects, which provides an additional revenue source for the tractor market.

Generators

India being a fast-growing economy has proven to be power hungry with supply often outstripping the demand. The power crisis has been made worst in the present times due to severe coal shortages forcing coal-fired power plants to run on fumes leading to the highest power shortages faced by the country in over five years (shortage of 1,201 million units in October 2021).

These conditions in the country have made for a strong market for diesel gensets which are relied on by commercial, industrial, and residential users alike to fulfill their power needs and have access to continuous and stable power.

According to industry sources, the diesel genset market is expected to grow at 12.5% CAGR from 2020 to 2030 with states like Tamil Nadu and Andhra Pradesh being the major markets. The growth in the manufacturing sector of India, along with the rising demand for power for commercial applications, are considered to be the major factors driving the growth of the Indian diesel genset industry. The one factor which is likely to pull back diesel genset demand would be rollout of stringent regulations to curb toxic emission seeing the alarming levels of pollution in the country, especially in metropolitan cities like Delhi, Mumbai, etc. Additionally, the BS-VI norms also have diesel gensets in their purview which will also review significant upgrades to the technology leading to increased costs.

Agricultural pumps

India's impressive agricultural output is in part due to its irrigation facilities, while a lot of farmers still depend on good monsoons to get a good crop, a good number also rely on artificial irrigation through pumps which run on either electricity or on diesel power (in places where electricity supply is unreliable). However, diesel, being an expensive fuel, is not the best option for farmers who are already hit with several other financial woes which makes life difficult for them. The Government also provides subsidies on these facilities which leads to wasteful usage as farmers aren't incentivized to save fuel and is also a big burden on the exchequer, consequently, the Government is trying to promote the usage of solar power pumps to address all these problems which is likely to reduce demand from diesel agricultural pumps in the future.

Mobile towers

The telecom industry has been a major consumer of diesel but with the volatility and rise in diesel prices (expected to increase operating expenses of telcos by 7%-8%) telcos are forced to look for alternative sources of energy. They have already started infrastructure sharing to save capital cost and the cost of fuel needed to operate the Base Transceiver Station (BTS). The high pollution level from diesel usage has also attracted attention of the Government as it tries to reduce the country's carbon footprint. Attempts are being made to electrify mobile towers in order to bring them off diesel-power; in more recent attempts the Government is trying to convert diesel-powered mobile towers to natural gas in order to reduce the pollutants generated and also boosting the usage of natural gas in the process.

2.4.2 Petrol dependent sectors

Petrol in India is almost exclusively consumed by the transport sector, while in the past sales of petrol were on the lower end due to the significant difference between prices of diesel and petrol which also impacted sales of petrol cars (diesel accounted for ~80% of sales in some cars where both diesel and petrol variants were present in spite of

the higher cost of a diesel vehicle), this trend, however, has been changing in the recent past as the price difference between the two fuels has reduced by an appreciable margin.

The sales share of diesel engine passenger vehicles (PVs) has dropped to its lowest in recent history as per the Society of Indian Automobile Manufacturers (SIAM). In the April-October 2020 period, diesel PVs formed just 17% of total sales, down by half compared to the same period last year (33%). This dip is even more stark in hatchbacks and sedans while diesel still has good demand in the utility vehicles segment (SUVs plus MPVs). Another contributing factor to this change is carmakers pulling out diesel variants with the switch to BS-VI norms and petrol cars getting more and more efficient.

However, both fuels are expected to face headwinds from alternative fuels like CNG, LNG, EV, etc. on account of the meteoric rise in the prices of petrol and diesel alike. These alternative fuels will also be aided by the policy push from the Government as they are less polluting and are in line with the Government's targets to reduce pollution in the country.

3. Background and Objective

The study aims to provide a clear understanding of the usage patterns of petrol and diesel in different sectors that would, in turn, help OMCs estimate the requisite supply and infrastructure-requirement plan for future. The detailed survey would help in providing a realistic picture of the consumption pattern.

On 1st October 2020, CRIS commenced the detailed survey to Analyze *the percentage share of sectors/ segments in petrol and diesel sold through retail outlets on a state-wise and all India basis on the end-use basis of the fuel*". To meet the study objectives, at each RO, retail data was collected through primary survey technique collecting data from the dispensers against the vehicle category /model during 12 hours period (24 hours in case of a RO situated on a highway) for 7 days in a staggered manner. The entire survey activity is carried out on weekly basis during each quarter.

The following report covers the analysis of fuel consumption data being observed during the survey (October 2020 to September 2021) and showcases observations and outcome through a survey in identified Retail Outlets.

3.1 Scope of Work of study

The scope of work of the study captures following vehicle segments in diesel and petrol fuel category.

Diesel	Petrol
a. Transport with sub-categories such as Buses, Trucks, Taxies & SUVs/ Cars (Personal Vehicles) b. Agriculture with sub-categories such as Tractors, Pumps, Agriculture implements such as Tillers/ Harvesters/ Thrashers c. Power Generation (Gensets): Residential, Commercial, Industrial and Mobile towers d. Industrial Applications other than for power generation. e. 'Others' for what is not included in any of the above categories. The 'others' category would have to be defined clearly and subcategorized unambiguously in order to eliminate any confusion and wrong categorization of sectors.	a. Cars (Private and Commercial) b. 2-wheelers (Bike, Scooty. Moped etc.) c. 3-wheelers (Goods and Passengers) d. SUVs (Private and Commercial) e. Others

3.2 Time period of study

The time period for the observation study was selected in consultation with PPAC and OMCs. The first phase of survey was from October 2020 till December 2020, the second phase of survey was from January 2021 till March 2021, the third phase of survey was from April 2021 till June 2021 and the last phase of survey was from July 2021 till September 2021. The survey activity was carried out over four quarters to capture the seasonality in sale of diesel and petrol.

3.3 Selection of Retail Outlets

The observation study is a year-round activity, wherein 3000 retail outlets has to be surveyed spread across 22 States and Union Territories (UTs) covering 212 districts every quarter.

The selection of 3000 retail outlet has been carried out in consultation with PPAC and OMCs. The study sample holistically covers five different categories of ROs (namely - Urban-Metro (A), Urban-Tier II (B), Urban-Tier III (C), National Highway/State Highway (D) and Rural (E)) across 212 districts of India.

The methodology for selection of retail outlets is based on selection of highest diesel selling outlets of IOCL, HPCL and BPCL as diesel contributes majority portion of fuel sale (~70%) in India.

Out of total of 57,944 number of retail outlets of OMCs (as on 31.03.2019), HSD sales volumes from around 56,804 retail outlets was collected (remaining retail outlets were either inactive or market classification data was not available. Based on HSD sales volumes from these retail outlets, top 20 states with highest diesel sales (95.7% of total diesel sales) were selected. Around 212 districts were allocated to selected 20 states based on proportionate distribution of number of districts in each state. State-wise total number of districts are based on records maintained in PPAC. The sample size of 3000 retail outlets were distributed in a following manner:

- 1201 Urban RO's: Urban class RO's are further divided into three sub classes i.e. A, B & C and RO's distribution in these sub classes were done based on HSD sales volume in each class. Out of 1201 RO's allocation in urban area A, B & C classes have been allocated as 251, 240 and 710 respectively.
- 1198 Highway RO's: Allocated 1198 RO's in Highway category market. D1 & D2 categories provided both have been considered as one (D) class.
- 601 Rural RO's: 601 rural category RO's were selected.

Class-wise number of RO's distribution in the selected districts have been made based on proportionate HSD sales volume and ROs have been selected based on highest HSD sales volume.

Further, 3000 ROs were distributed among OMCs with 1256 ROs from IOCL, 902 ROs from BPCL and 842 ROs from HPCL.

3.4 Study Methodology

To collect the data in order to meet the research objectives, there were two sets of questionnaires that were administered at each of the identified RO, through **mobile based web application**.

3.4.1 Observation Questionnaire

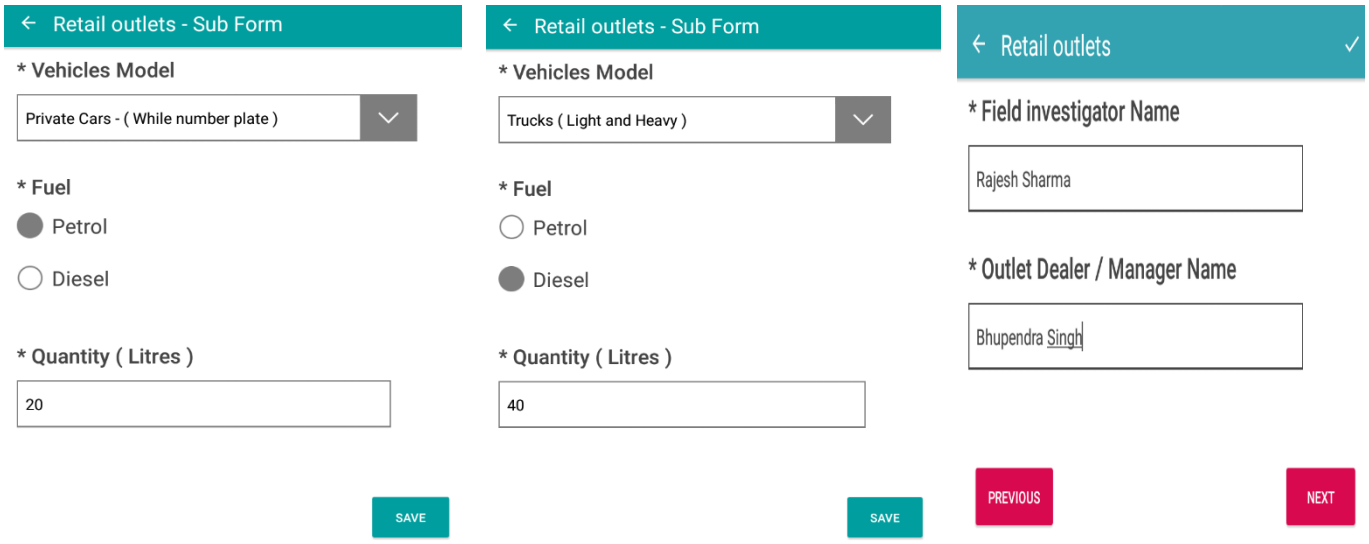
Enumerators were physically present at ROs and noted the volume of fuel (through mobile based application) filled from the dispensers against the vehicle category / model for each vehicle entering the RO and also capture the sales in barrels of diesel.

For each RO, this exercise was carried out for 12 hours for 7 days in a staggered manner across the quarter. In case an identified RO was situated on a state / national highway, instead of 12 hours the same exercise was done for 24 hours for 7 consecutive days.

In order to perform this assignment, CRIS ensured that sufficient enumerators are allocated for each RO depending on the location and traffic that comes in and out of that RO.

As part of observation study, everyday field enumerators use to record opening and closing reading of each dispensing unit present at the RO being surveyed. The recorded data has helped in verifying the field inputs

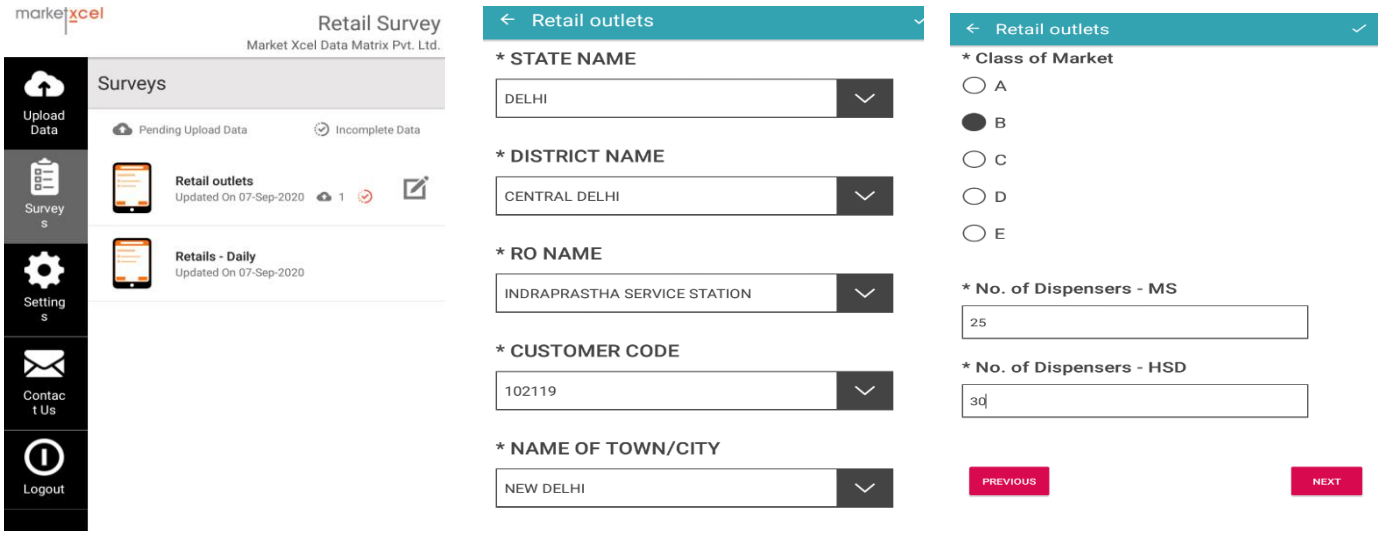
Mobile based Application



3.4.2 Outlet Questionnaire (One time survey)

This questionnaire was administered to the outlet owner/manager by the supervisor on duty, to have an overall view of the filling pattern, volume, type of vehicles that are coming to their RO, hours of operation, seasonality and more.

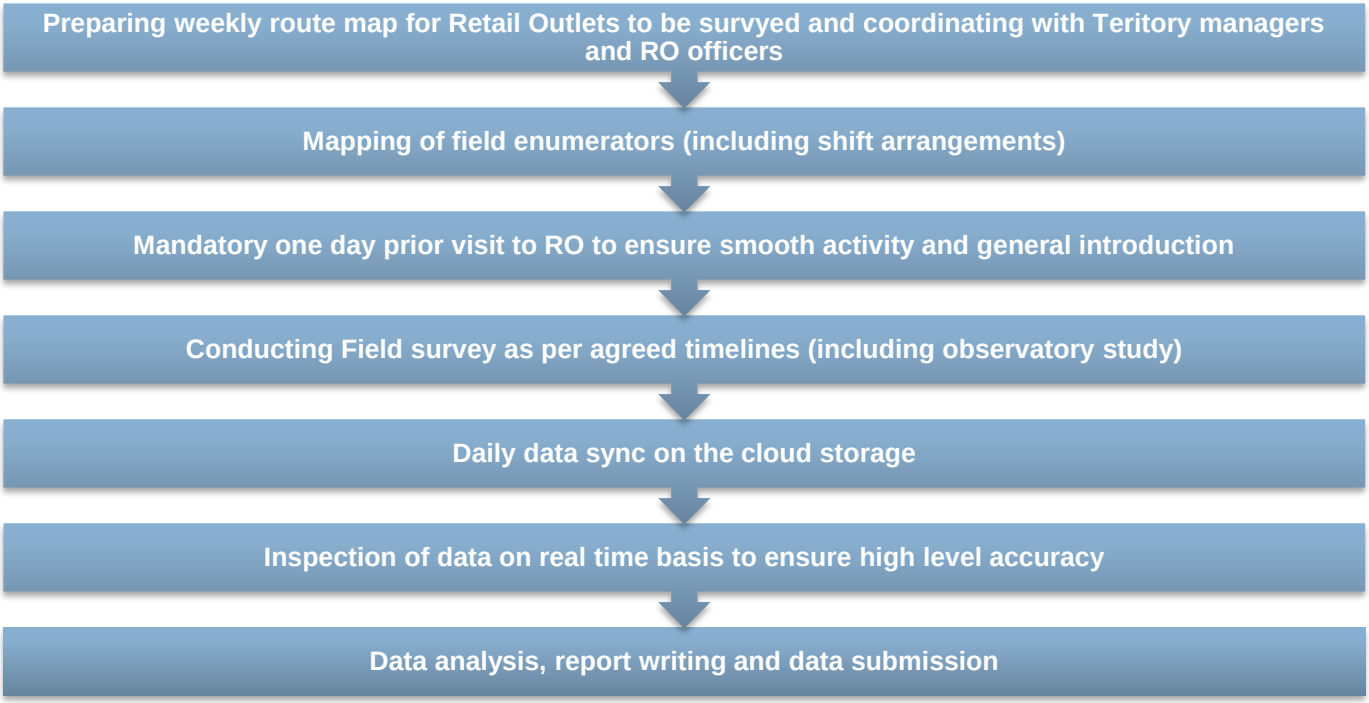
Mobile based Application



3.5 Overall approach for carrying out observation study

CRIS approach for execution has been designed keeping in view the grass root issues in data collection and thus, ensuring error–free tapping of data via a web enabled application based on the android platform. The entire survey operations has been designed to efficiently achieve survey objectives.

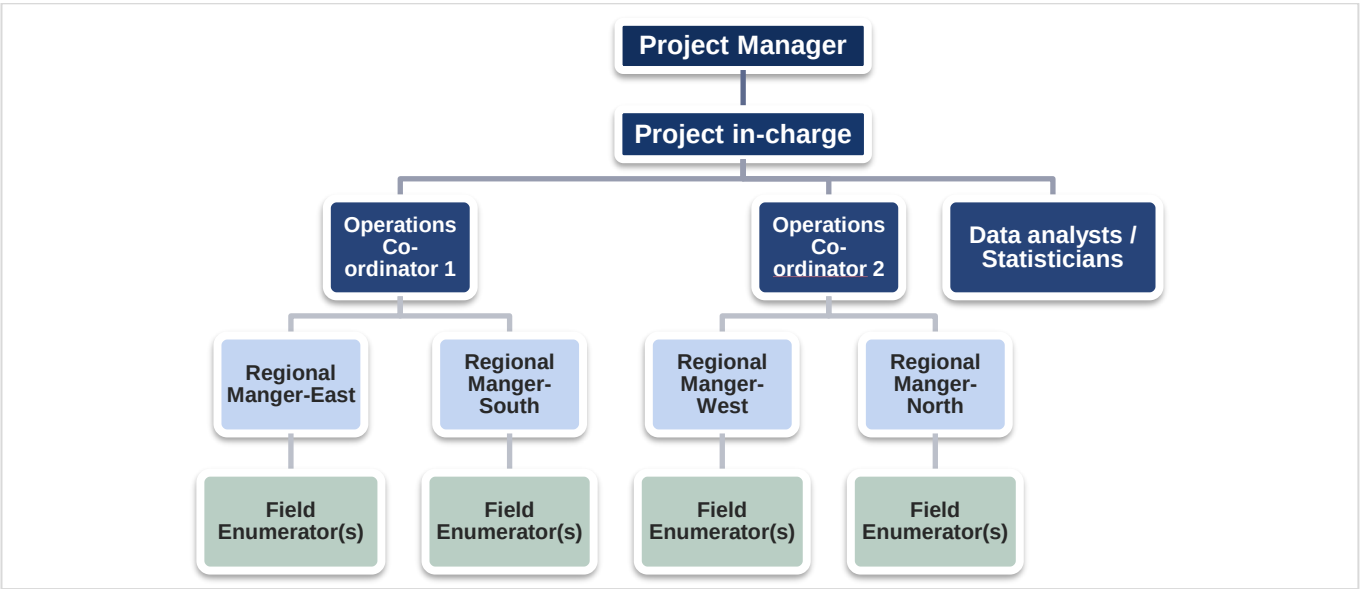
Figure 19: CRIS overall approach for assignment execution



3.6 The Core execution team

To carry out the said survey activity, the operation hierarchy is designed to ensure a system of relevant checks and control is performed to maintain the highest degree of accuracy. CRIS have assembled a team of highly experienced and skilled professionals.

Figure 20: The core executing team



3.7 Training and Development

CRIS strongly believes that the input data is the backbone for reporting key statistics in an informative manner assisting in designing and formulating a robust strategy. CRIS ensured that the on-ground trained staff understands the primary objective of the study, thus ensuring highest level of diligence while reporting data.

The field enumerators appointed were provided thorough training to understand the terminologies, denomination, figures, etc. required to carry out survey activity. In addition, to overcome language barriers, flash cards are also provided to the field enumerators in the training sessions that can be carried along on field. Every enumerator has access to FAQ guide available on the web application to adapt to different state of affairs with respect to each retail outlet and report the data in a standardized manner on the application itself.

3.8 Standard Operating Procedures

A well–defined Standard Operating Procedures (SOPs) were in place to maintain adherence to the benchmarks and quality standards across the operation hierarchy.

Operations Team – Field Enumerators	Operations Team – Supervisors & State Heads
• Investigator reported at designated RO before 8 am every day and shared attendance with their respective supervisors; • Introduced themselves to RO Owner/Manager by showing relevant authority letters and ID card; • Post introduction, administer the Retail Outlet Survey with RO Owner/Manager; • Start with survey i.e. Observation Questionnaire by taking Totalizers readings first; • Observe and record relevant information during the day (12-hour shift); • Close the shift at 8 pm with Totalizer readings in same order; • Report to respective supervisor and leave for the day. *For D category RO the same activity was repeated twice in 24 hours*	• **Field Data & QC check** – Supervisors to be on field every day and visit the ROs on random basis to check Investigators diligence; • **Field Data & QC checks** – During the visits, supervisors to meet RO managers and check sale of fuel on random basis to match with Investigators report; • Weekly call with State & Zonal Heads to review the progress & other aspects – By Operation coordinators and Project in-charge.

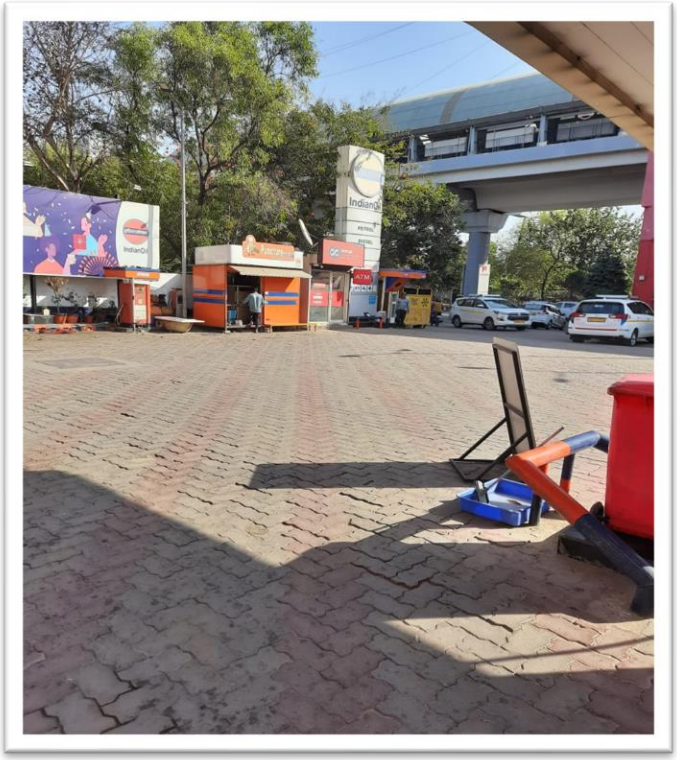
3.9 Analysis/ Output

The integrated data collected on ground is directly accessed by data quality team in real time to inspect the nuances and report anomalies in the data, if any, on the same day itself. The data is received by analysts and statisticians who look after individual states data respectively. These experts convert the raw data into designated formats, which are used to carry out analysis.

These data experts are also responsible to remove any redundancy, bias or any other form of human error from the reported data. Sophisticated software like IBM SPSS, MS- Excel, and Python are used for the same.

The sanitized data is further analyzed, interpreted and reported in the monthly and quarterly reports/ deliverables in a logical and structured manner. Since the team comprises of statisticians to analysts, they can also present the key underlying trends in the market in addition to relevant observations and findings during the period. The reports act as a ready reckoner to understand the all India sectoral demand of diesel & petrol during the recent period and thus formulate strong strategies to ensure smooth delivery and price stability of the fuel soon.

3.10 Glimpse of field survey activity




HP
Pandher
Pandher
P.T.C
Pandher
Diesel
Diesel

4. Coverage of Survey

Primary survey to record fueling pattern in different vehicle segments was carried out in 3000 Retail outlets (RO) during survey period.

912 ROs were covered in north zone comprising of state of *Chandigarh*, *Delhi, Haryana, Punjab, Rajasthan, Uttar Pradesh and Uttarakhand;* Maximum number of ROs covered were in **Uttar Pradesh** with 355 ROs.

710 ROs were covered in west zone comprising of *Chhattisgarh, Daman & Diu, Gujarat, Madhya Pradesh and Maharashtra;* Maximum number of ROs covered were in **Maharashtra** with 254 ROs.

605 ROs were covered in east zone comprising of state *of Assam, Bihar, Jharkhand, Odisha and West Bengal;* Maximum number of ROs covered were in **Bihar** with 144 ROs

773 ROs were covered in south zone comprising of *Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and Telangana*; Maximum number of ROs covered were in **Karnataka** with 226 ROs.

Following table represent the state wise coverage of RO surveyed.

Table 1: RO market classification- (State wise)

State	Classification of Market					Total
	A	B	C	D	E	
Andhra Pradesh	-	16	26	35	26	**103**
Assam	-	6	24	72	19	**121**
Bihar	-	6	24	50	64	**144**
Chandigarh	-	5	-	-	-	**5**
Chhattisgarh	-	7	26	37	27	**97**
Daman & Diu	-	-	2	3	-	**5**
Delhi	45	-	-	-	-	**45**
Gujarat	18	10	25	86	18	**157**
Haryana	5	11	64	63	17	**160**
Jharkhand	-	8	19	41	20	**88**
Karnataka	27	18	43	95	43	**226**
Kerala	-	10	28	35	19	**92**
Madhya Pradesh	5	16	51	61	64	**197**
Maharashtra	43	17	30	124	40	**254**
Odisha	-	6	24	43	38	**111**
Punjab	4	10	47	38	17	**116**
Rajasthan	7	18	52	80	29	**186**
Tamil Nadu	36	23	47	86	21	**213**
Telangana	28	6	36	40	29	**139**
Uttar Pradesh	12	34	107	130	72	**355**
Uttarakhand	-	8	9	23	5	**45**

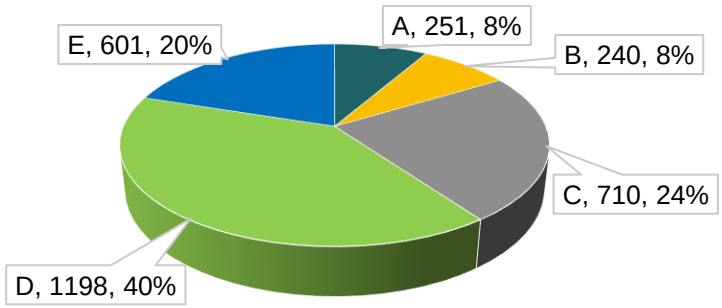
State	Classification of Market					Total
	A	B	C	D	E	
West Bengal	21	5	26	56	33	**141**
Grand Total	**251**	**240**	**710**	**1198**	**601**	**3000**

Source: CRIS analysis

During the survey period, **212 districts** were covered across **22 states/UTs**. The highest number of districts were covered in **Uttar Pradesh** with 26 districts followed by **Madhya Pradesh** with 18 districts and **Bihar** with13 districts.

Of the surveyed ROs, the maximum number of outlets were of class D, followed by class C and class E. The classification of market is as per following table:

Figure 21: RO market classification- (PAN India)



Source: CRIS analysis

For the purpose of analysis, retail outlets were bifurcated in four zones. Following state have been considered in respective zones.

- **North:** Chandigarh, Delhi, Haryana, Punjab, Rajasthan, Uttar Pradesh and Uttarakhand
- **South:** Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and Telangana
- **East:** Assam, Bihar, Jharkhand, Odisha and West Bengal
- **West:** Chhattisgarh, Daman & Diu, Gujarat, Madhya Pradesh and Maharashtra

Table 2: Zone wise RO market classification

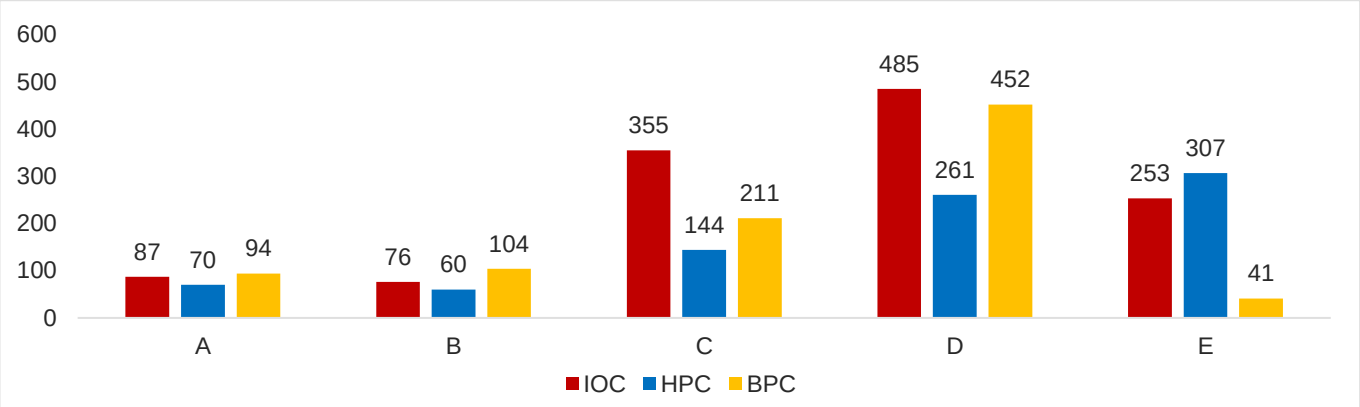
Category	Description	East	West	North	South
A	Urban-Metro	21	66	73	91
B	Urban-Tier II	31	50	86	73
C	Urban-Tier III	117	134	279	180
D	National Highway/State Highway	262	311	334	291
E	Rural	174	149	140	138
Total		**605**	**710**	**912**	**773**

Source: CRIS analysis

Out of total number of ROs surveyed **1256 ROs** were of **IOCL**, **902** were of **BPCL** and **842** were of **HPCL**.

Following chart represents company wise share of ROs and description of market classification of ROs.

Figure 22: RO market classification- OMC wise share



Source: CRIS analysis

The district wise RO coverage is shown in below table:

Table 3: RO market classification- (District wise)

State/UT:- District	A	B	C	D	E	Grand Total
Andhra Pradesh		**16**	**26**	**35**	**26**	**103**
East Godavari			9	9	7	25
Guntur		3	7	8	7	25
Krishna		5	6	9	7	27
Visakhapatnam		8	4	9	5	26
Assam		**6**	**24**	**72**	**19**	**121**
Barpeta				7	3	10
Cachar				10		10
Dibrugarh			3	5	2	10
Golaghat			3	4	3	10
Jorhat			4	4	2	10
Kamrup			3	6	2	11
Kamrup Metropolitan		6		4		10
Kokrajhar				10		10
Nagaon			3	4	3	10
Sibsagar			4	5	2	11
Sonitpur			4	4	2	10
Tinsukia				9		9
Bihar		**6**	**24**	**50**	**64**	**144**
Aurangabad			1	4	5	10
Begusarai			1	4	5	10

State/UT:- District	A	B	C	D	E	Grand Total
Bhagalpur			2	3	5	10
Champaran-East			3	3	7	13
Darbhanga			1	3	6	10
Gaya		1	2	4	3	10
Muzzafarpur			2	4	8	14
Patna		5	1	6	3	15
Purnia			2	5	5	12
Rohtas			3	3	4	10
Samastipur			2	2	6	10
Saran			2	4	4	10
Vaishali			2	5	3	10
Chandigarh		**5**				**5**
Chandigarh		5				5
Chhattisgarh		**7**	**26**	**37**	**27**	**97**
Balodabazar			2	3	5	10
Bilaspur			2	4	4	10
Durg		3	2	3	2	10
Janjgir Champa			4	3	3	10
Korba			5	4	4	13
Raigarh			3	4	3	10
Raipur		4	2	5	3	14
Rajnandgaon			2	5	3	10
Surguja			4	6		10
Daman & Diu			**2**	**3**		**5**
Daman			2	3		5
Delhi	**45**					**45**
Central Delhi	4					4
East Delhi	4					4
New Delhi	4					4
North Delhi	5					5
North East Delhi	4					4
North West Delhi	4					4
Shahdara	4					4
South Delhi	4					4
South East Delhi	4					4
South West Delhi	4					4

State/UT:- District	A	B	C	D	E	Grand Total
West Delhi	4					4
Gujarat	**18**	**10**	**25**	**86**	**18**	**157**
Ahmedabad	15			8		23
Banas Kantha			5	6		11
Bharuch			3	7	1	11
Gandhinagar			4	6		10
Kutch			6	17		23
Mehsana			2	3	3	8
Morbi			1	9	4	14
Rajkot		2	2	7	2	13
Surat	3	4		11	3	21
Surendranagar				6	4	10
Vadodara		4	2	6	1	13
Haryana	**5**	**11**	**64**	**63**	**17**	**160**
Bhiwani			7	7	4	18
Faridabad	1	6	5	3	2	17
Gurugram	4	5	11	11	3	34
Hisar			10	7	1	18
Rewari			9	21	4	34
Sirsa			16	5	2	23
Sonipat			6	9	1	16
Jharkhand		**8**	**19**	**41**	**20**	**88**
Bokaro			5	4	2	11
Dhanbad		1	4	5	4	14
East Singhbhum		3	2	3	2	10
Giridih			3	5	2	10
Hazaribagh				8	2	10
Ramgarh			3	4	3	10
Ranchi		4	2	5	2	13
Saraikela Kharasawan				7	3	10
Karnataka	**27**	**18**	**43**	**95**	**43**	**226**
Bangalore Rural			4	15	2	21
Bangalore Urban	27	1	1	7		36
Belgaum		3	5	10	10	28
Bellary		2	5	10	4	21
Bidar			4	9	3	16

State/UT:- District	A	B	C	D	E	Grand Total
Bijapur			4	13	7	24
Dakshin Kannada		6	5	10	1	22
Gulbarga		3	3	7	7	20
Mysore		3	4	6	1	14
Tumkur			8	8	8	24
Kerala		**10**	**28**	**35**	**19**	**92**
Ernakulam		5	5	7	5	22
Kannur			5	4	4	13
Kozhikode		2	5	5	1	13
Malappuram			5	8	3	16
Thiruvananthapuram		3	3	4	2	12
Thrissur			5	7	4	16
Madhya Pradesh	**5**	**16**	**51**	**61**	**64**	**197**
Betul			3	3	4	10
Bhopal		5	3	3		11
Chhindware			4	3	3	10
Dewas			2	3	5	10
Dhar			3	5	2	10
Gwalior		3	1	2	6	12
Indore	5	4	3	7	4	23
Jabalpur		3	1	4	2	10
Khargone			4	3	3	10
Raisen				8		8
Rajgarh			3	3	4	10
Ratlam			3	4	3	10
Rewa			5		5	10
Sagar			3	2	5	10
Satna			3	4	3	10
Sehore			4	3	4	11
Ujjain		1	3	2	6	12
Vidisha			3	2	5	10
Maharashtra	**43**	**17**	**30**	**124**	**40**	**254**
Ahmednagar			3	13	7	23
Aurangabad		1	1	11	3	16
Mumbai City	12	1				13
Mumbai Suburban	11					11

State/UT:- District	A	B	C	D	E	Grand Total
Nagpur	4		1	16	2	23
Nasik		5	2	12	6	25
Palghar		1	3	15	5	24
Pune	10	2	5	14	7	38
Raigad		2	6	12	1	21
Satara			3	9	3	15
Sholapur			3	12	5	20
Thana	6	5	3	10	1	25
Odisha		**6**	**24**	**43**	**38**	**111**
Angul			2	5	3	10
Balasore			3	2	7	12
Bargarh			3	4	3	10
Cuttack		2	1	4	3	10
Ganjam			2	5	3	10
Jajpur			1	5	5	11
Keonjhar			3	5	4	12
Khurda		4	1	3	3	11
Sambalpur			3	6	1	10
Sundargarh			5	4	6	15
Punjab	**4**	**10**	**47**	**38**	**17**	**116**
Amritsar		1	3	4	1	9
Bathinda			8	6	4	18
Fazilka			5	8	6	19
Jalandhar		3	6	4	2	15
Ludhiana	4	6	8	6	1	25
Patiala			8	6	2	16
Sangrur			9	4	1	14
Rajasthan	**7**	**18**	**52**	**80**	**29**	**186**
Ajmer		2	3	10	5	20
Barmer			4	7	1	12
Bhilwara			8	4	4	16
Bikaner		1	4	7	3	15
Chhittorgarh			6	5	2	13
Jaipur	7	7	4	10	4	32
Jodhpur		6	6	9	3	24
Nagaur			5	7	4	16

State/UT:- District	A	B	C	D	E	Grand Total
Pali			5	7		12
Sirohi			3	7		10
Udaipur		2	4	7	3	16
Tamil Nadu	**36**	**23**	**47**	**86**	**21**	**213**
Chennai	13					13
Coimbatore		8	6	10	3	27
Kancheepuram	10	1	4	12	2	29
Madurai		6	2	5	2	15
Namakkal			6	8	2	16
Salem		4	6	10	2	22
Tirunelveli		2	4	6	3	15
Tiruppur		2	5	7	3	17
Tiruvallur	13		5	10	2	30
Tuticorin			4	8	1	13
Vellore			5	10	1	16
Telangana	**28**	**6**	**36**	**40**	**29**	**139**
Hyderabad	10					10
Karim Nagar		2	2	4	3	11
Khammam			3	4	5	12
Mahabubnagar		2	4	3	1	10
Medchal-Malkajgiri	9	1	3	5		18
Nalgonda			4	5	4	13
Nizamabad		1	3	2	4	10
Rangareddy	8		3	7	2	20
Sangareddy	1		3	4	2	10
Siddipet			7	4		11
Suryapet			4	2	8	14
Uttar Pradesh	**12**	**34**	**107**	**130**	**72**	**355**
Agra		3	5	8	5	21
Allahabad		2	5	6	6	19
Azamgarh			7	3		10
Bara Banki			7	3	1	11
Bareilly		2	5	3	2	12
Bijnor			4	5	1	10
Chandauli			3	7		10
Faizabad			5	5		10

State/UT:- District	A	B	C	D	E	Grand Total
Fatehpur			2	5	5	12
Gautam Budh Nagar	1	2	14	1	2	20
Ghaziabad		6	3	3	2	14
Gorakhpur		3	3	5	4	15
Jaunpur			3	5	2	10
Jhansi		2	3	9	4	18
Kanpur Nagar	7	1		7	3	18
Kushinagar			4	6	2	12
Lakhimpur			4	5	1	10
Lucknow	4	4	2	5	4	19
Mathura		1	6	6	6	19
Meerut		4	3	2	1	10
Mirzapur			2	9	4	15
Moradabad		2	5	3	1	11
Sitapur			6	2	5	13
Sonbhadra			2	6	6	14
Unnao			2	5	5	12
Varanasi		2	2	6		10
Uttarakhand		**8**	**9**	**23**	**5**	**45**
Dehradun		6	3	4		13
Haridwar		2	3	4	3	12
Nainital				8	2	10
Udham Singh Nagar			3	7		10
West Bengal	**21**	**5**	**26**	**56**	**33**	**141**
Birbhum			6	4	4	14
Hooghly			1	9	4	14
Howrah	2	1	1	8	3	15
Kolkata	14					14
Murshidabad			4	5	2	11
North 24 Parganas	5	1	6	5	1	18
Paschim Bardhaman		3	3	7	5	18
Paschim Medinipur			1	8	8	17
Purba Medinipur			4	10	6	20
Grand Total	**251**	**240**	**710**	**1198**	**601**	**3000**

Source: List of ROs provided by OMCs and PPAC

5. All India consolidated findings- Retail segment

This section covers outcomes for the complete survey period at Pan-India level across the surveyed ROs and comprise of zone wise analysis of segmental demands in both diesel and petrol sale.

5.1 Sales- All India

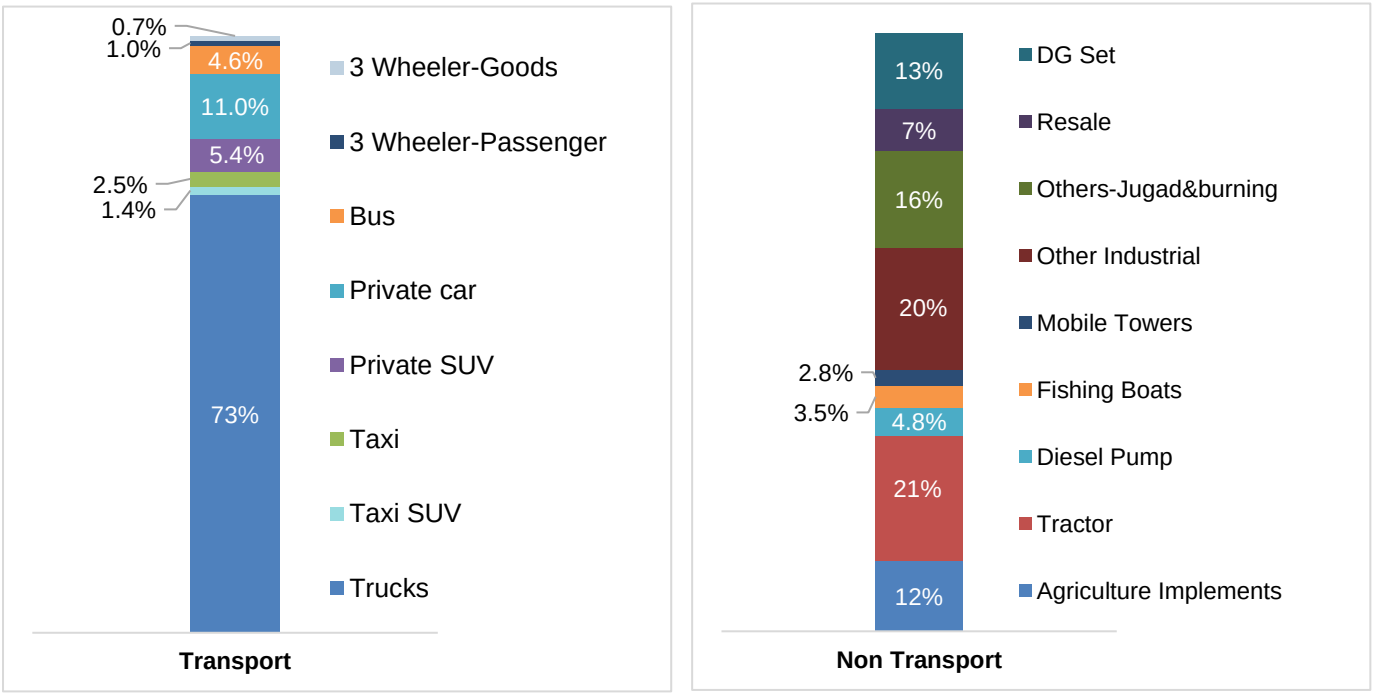
The split of fuel sale between diesel and petrol was **68%** for diesel and **32%** for petrol. This is mainly because trucks (HCV/LCV), which contribute heavily to diesel consumption, are used as primary mode for freight transport by road in India.

5.1.1 Diesel

In Diesel segment at all India level, transport segment contributes **87%** and remaining **13%** share is contributed by non-transport segment. Transport segment includes Private Cars, Private SUV, Taxi, Taxi SUV, 3-Wheeler Goods & Passenger, Buses (except state run buses which have their own captive pumps) and Trucks. Non-Transport segment includes diesel used for Agriculture use (Tractors, Diesel Pumps, Agriculture Implements such as combines), Gensets (DG Set- Residential, DG Set-Commercial, DG-Set-Industrial), Mobile Towers, Industrial (machinery used in industries such as crusher) and Others segment (Fishing boat, Jugad & burning, Resale).

Following figure shows transport segment and non-transport segment wise diesel sale at all India level.

Figure 23: Diesel sale – segment wise (%)



Source: CRIS analysis & primary survey

In transport segment of diesel sale, Truck segment drives the highest share **(73%)** of diesel consumption in the transport sector. This is because road freight accounts for ~71% of total freight in India and majority of this is done through trucks (*Source: Niti Ayog*). Also, average daily distance travelled by trucks is around 250-400 km (*Source:*

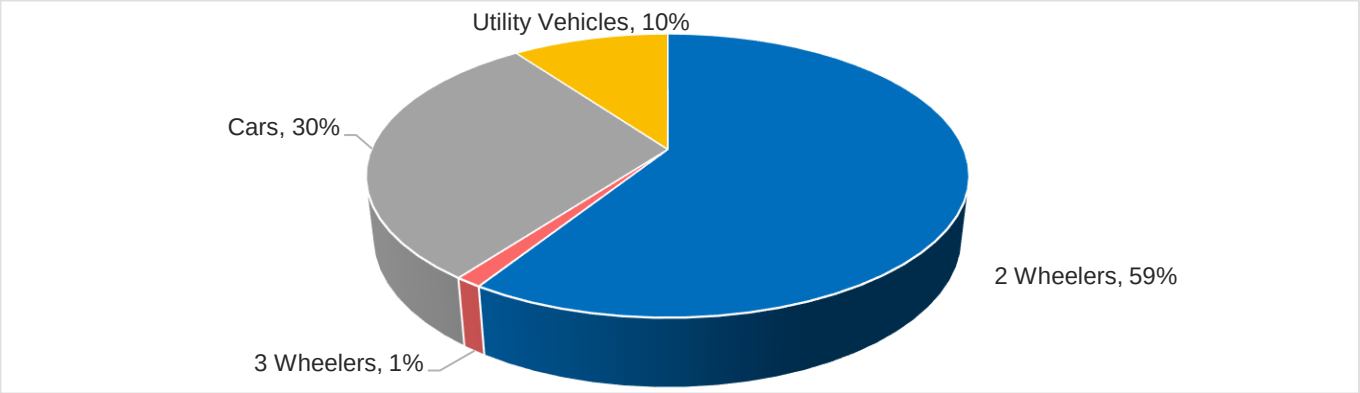
Niti ayog). After trucks second highest diesel consuming segment was **Private cars** (~**11%** of diesel sold to transport category) and the lowest was sold to **3-Wheelers (Goods)** (**0.7%** of diesel sold to transport category).

In non-transport segment of diesel sale, tractor is the highest contributing segment. The presumable reason is because tractors are being used for both agriculture and transportation purposes. After Tractor, second highest share is contributed by Others- Industrial in non-transport segment. This is probably because machinery used in the industries consume high volume of diesel due to heavy load factor which is required to be performed by them. It is interesting to note that Jugad vehicles which are locally made motor vehicles (made by placing diesel engine on a cart and are majorly used in rural belts) is consuming significant amount of diesel. Diesel sales to power sector (DG set and Mobile Towers) contributed **~16%** of diesel sales in the non-transport segment. Also, diesel sales were highest in DG-Industrial (~**7%** of overall diesel sales in the non-transport segment**)** and lowest in DG-Residential (**1.5%** of overall diesel sales in the non-transport segment), while DG-Commercial contributed **4%** of overall diesel sales in the non-transport segment. Lowest contribution is made from Mobile Towers mainly because of better penetration of power distribution across rural and urban areas of India. Mobile towers contributed **2.8%** of overall diesel sales in the non-transport segment.

5.1.2 Petrol

Following figure represents share of end user vehicle segment for petrol sale.

Figure 24: Petrol sale



Source: CRIS analysis & primary survey

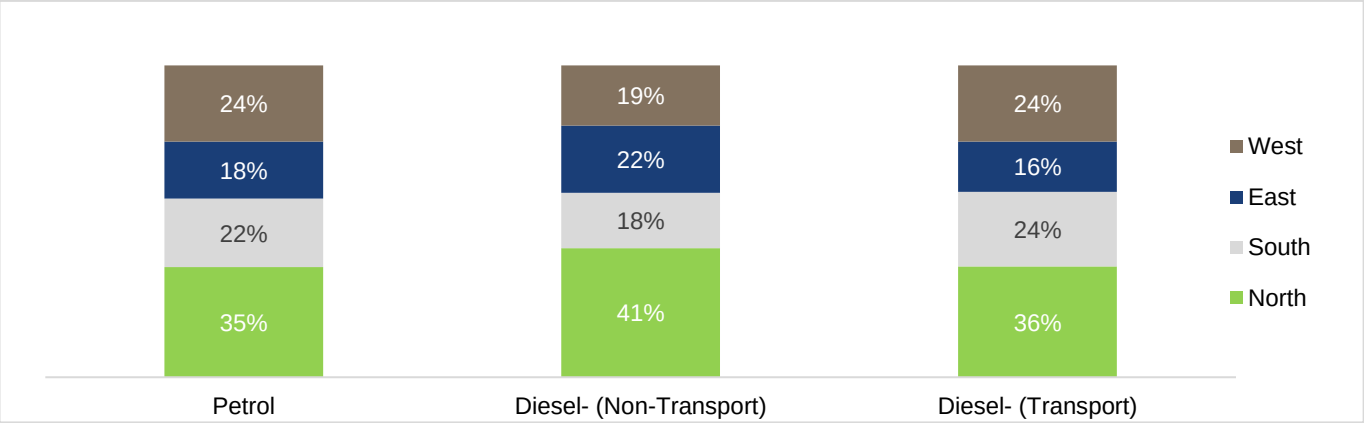
In petrol sale, 2-Wheelers observed around 59% of total petrol sale. Presence of 2-Wheelers for mobility due to affordability and lower vehicle ownership cost across India is one of the major reasons for such high contribution in the overall petrol sales. This is followed by Cars and Utility segment which include Private Cars, Private SUV, Taxi and Taxi SUV. The share of petrol driven 3 -wheeler are significantly on the lower side, given the fact that alternate fuels such as CNG and Auto LPG have made high penetration in this segment. Also, off late the electric 3-wheeler segment has been heavily contributing in the overall electric vehicle sales. Further, the above reasons will have impact on the petrol sales particularly in the 3-wheeler and 2-wheeler category, with policy and fiscal push from the Central and State governments for faster adaptation to the electric mobility.

5.2 Zone wise analysis

5.2.1 PAN India

The following figure shows the diesel and petrol sales across zones (North, South, East and West) for the ROs surveyed during the survey period.

Figure 25: Diesel and petrol sale zone wise- PAN India (% share)



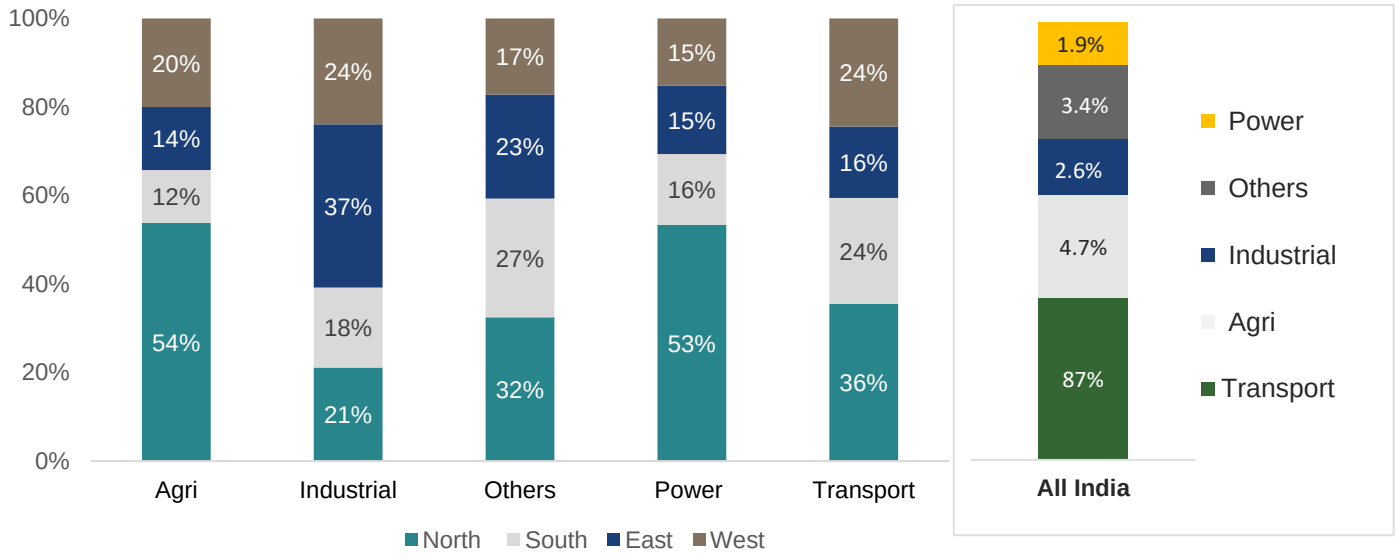
Source: CRIS analysis & primary survey

It is observed that diesel sale in transport segment was highest for **north zone** (**36%**) and lowest for **east zone** (**16%**). Further, diesel sale in non-transport segment has highest contribution from **north zone** (**41%**) and lowest from **south zone** (**18%**). For petrol, **north zone** has highest share (**35%**) and **east zone** has lowest share (**18%**).

5.2.1.1 Segment wise Diesel sales

Following figure depicts segment wise diesel sale across four zones and at All India level.

Figure 26: Segment wise Diesel sales –zonal (% share)



Source: CRIS analysis & primary survey

Following observations are made based on above figure

- For **transport segment** at zonal level, north zone (36%) contributes the highest quantity of diesel sold to transport segment followed by south and west zone (24% each).

  *The top three states that contribute the highest in diesel sales to the truck segment are: **Uttar Pradesh** (14%), **Maharashtra** (13%) and **Haryana** (12%). The probable reason for higher share of Uttar Pradesh and Maharashtra in diesel sales to the truck segment is because trade activity is higher due to presence of golden quadrilateral and large number of industries in the state. The probable reason for higher share of Haryana in diesel sales to the truck segment as trucks plying on Delhi-Mumbai corridor (the busiest route across India) prefer refuelling in Haryana. The preference is because of lower diesel prices as compared with its neighbouring states.*

- For **agriculture segment**, north zone (54%) contributes the highest quantity of diesel sold to agriculture segment and lowest is contributed by south zone (12%).

  *North zone has larger area under cultivation which boosts up demand for diesel for non-transport segment. Uttar Pradesh, Haryana and Punjab are top 3 states collectively contributing **44%** of total diesel sold to agriculture segment.*

- In **power segment**, north zone (53%) contributes the highest quantity of diesel sold to power segment and lowest is contributed by east and west zone (15% each).

  Haryana, Uttar Pradesh and Tamil Nadu have contributed 52% collectively in the total diesel sale to DG-Industrial segment. The probable reason is the presence of industrial zone and SEZs in the surveyed districts.

  Further, presence of a high number of mobile BTS towers in Uttar Pradesh (telecom statistics, 2019), along with frequent load-shedding may have resulted in a higher share of diesel consumption by mobile tower units.

- In **industrial segment**, east zone (37%) contributes the highest quantity of diesel sold to industrial segment and lowest is contributed by south zone (18%).

  Restriction specifically in the region of Delhi-NCR amid rising pollution levels has reduced diesel consumption by industrial segment in north zone.

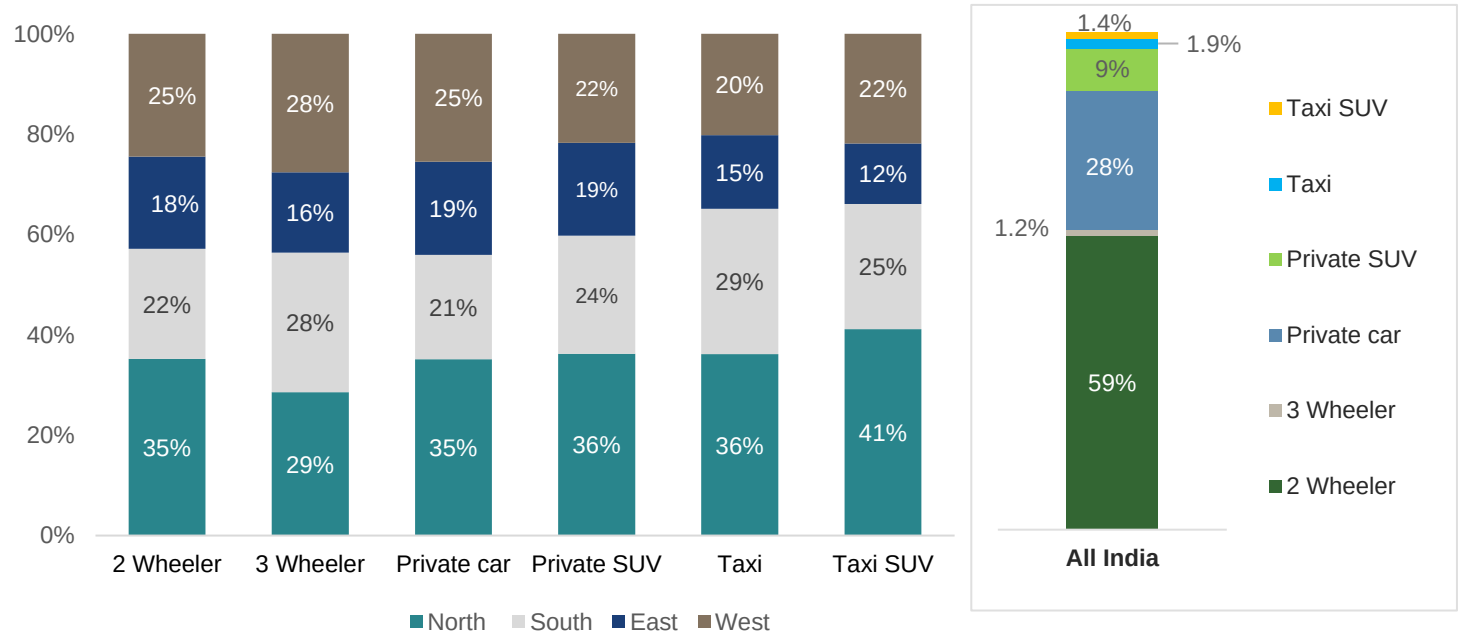
- In **others segment**, north zone (32%) contributes the highest quantity of diesel sold followed by south zone (27%)

  Uttar Pradesh, Tamil Nadu and Karnataka are the top three states in terms of diesel sales in this segment.

5.2.1.2 Segment wise Petrol sales

Following figure depicts segment wise petrol sale across four zones and at All India level.

Figure 27: Segment wise Petrol sales –zonal (% share)



Source: CRIS analysis & primary survey

Following observations are made based on above figure

- Petrol sold to 2-Wheeler segment was highest in north zone (35%) followed by west zone (25%).

  The top three states with highest contribution to 2-Wheeler segment are Uttar Pradesh, Maharashtra and Tamil Nadu, collectively contributing 33% to overall petrol sales to 2-Wheeler segment.

- North zone (35%) contributes the highest share in petrol sold to private cars segment, followed by west zone (25%).

  For Private car segment of petrol sales Maharashtra, Uttar Pradesh and Delhi were the highest contributors collectively contributing 30% to overall petrol sales to Private car segment.

  In taxi segment top three states are Rajasthan, Tamil Nadu and Maharashtra.

5.2.2 North Zone

The north zone consists of Chandigarh, Rajasthan, Punjab, Uttar Pradesh, Haryana, Uttarakhand and Delhi. A total of **912 ROs** were surveyed in the north zone out of which **394** are of **IOCL**, **261** are of **HPCL** and **257** are of **BPCL**. Market classification for north zone ROs is as follows:

Table 4: RO market classification-North Zone

Category	Description	Total
A	Urban-Metro	**73**
B	Urban-Tier II	**86**

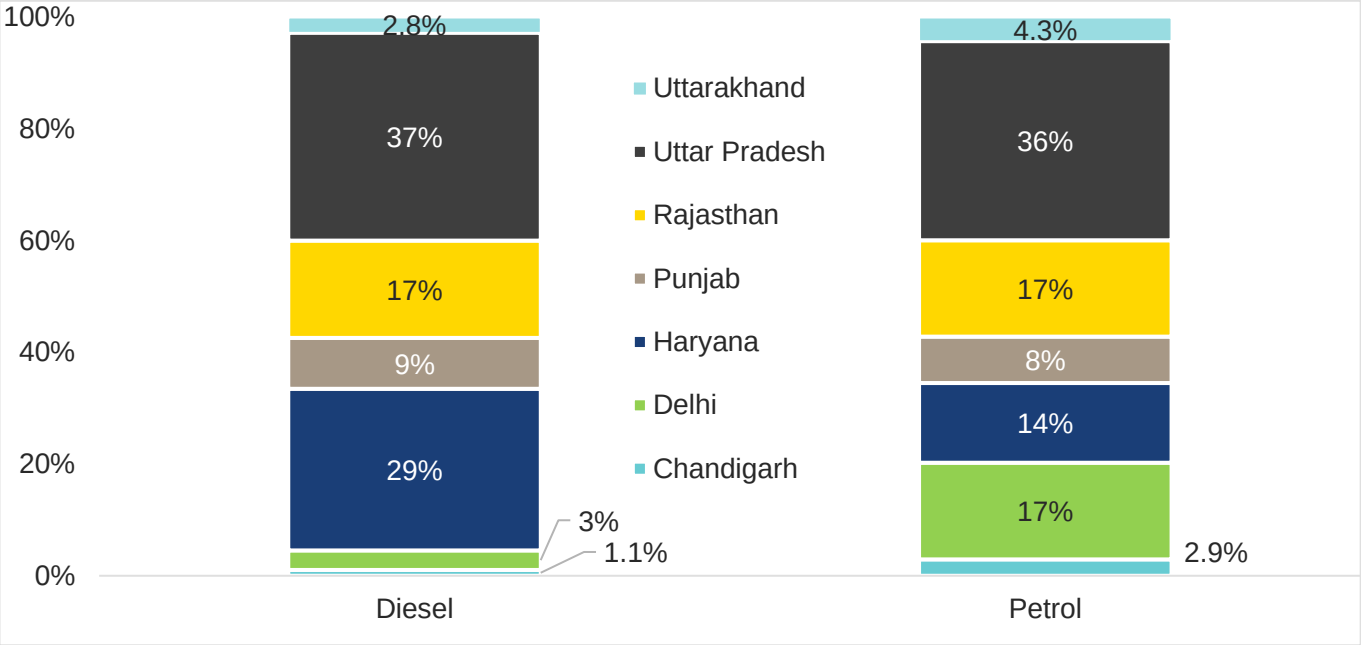
Category	Description	Total
C	Urban-Tier III	**279**
D	National Highway/State Highway	**334**
E	Rural	**140**
Total		**912**

Source: CRIS analysis & primary survey

5.2.2.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 28: Diesel and petrol sales - North Zone (% share)



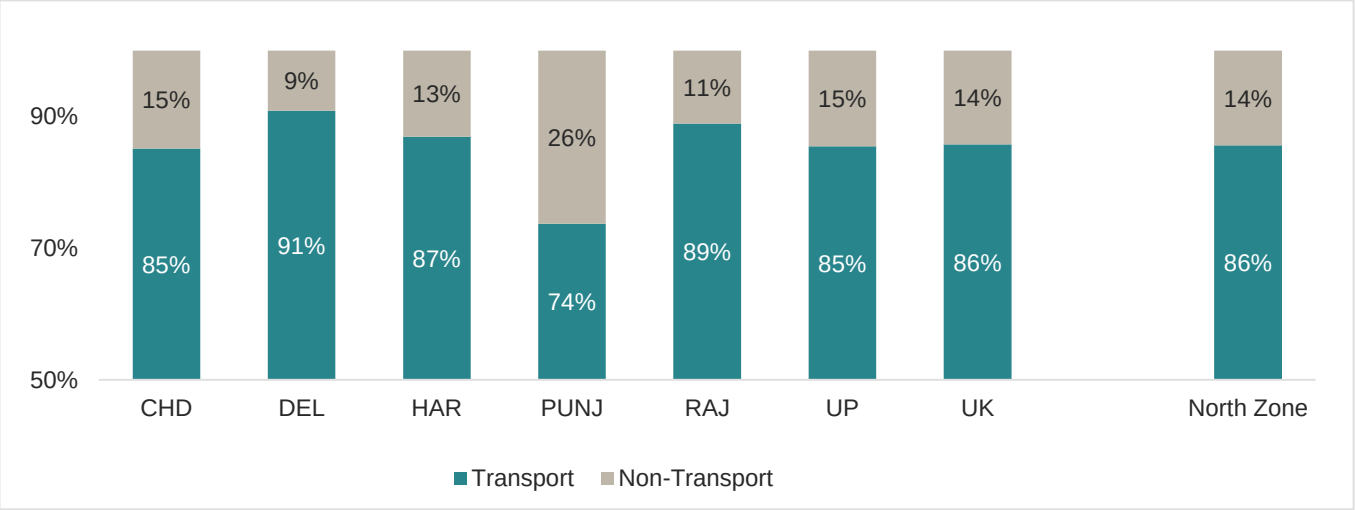
Source: CRIS analysis & primary survey

Following observations are made:

- In total diesel sales, highest sales were recorded in Uttar Pradesh (37% of total diesel sold in north zone), and lowest were recorded in Chandigarh (1.1% of total diesel sold in north zone).
- In total petrol sales, Uttar Pradesh (36% of total petrol sold in north zone) recorded the highest sale, while the lowest sale was recorded in Chandigarh (3% of total petrol sold in north zone).

Diesel sales to **transport segment** contributed 86%, remaining is contributed by **non-transport segment** (agriculture, power, industrial and others). Consumption in transport and non-transport sector is maximum in **Uttar Pradesh**.

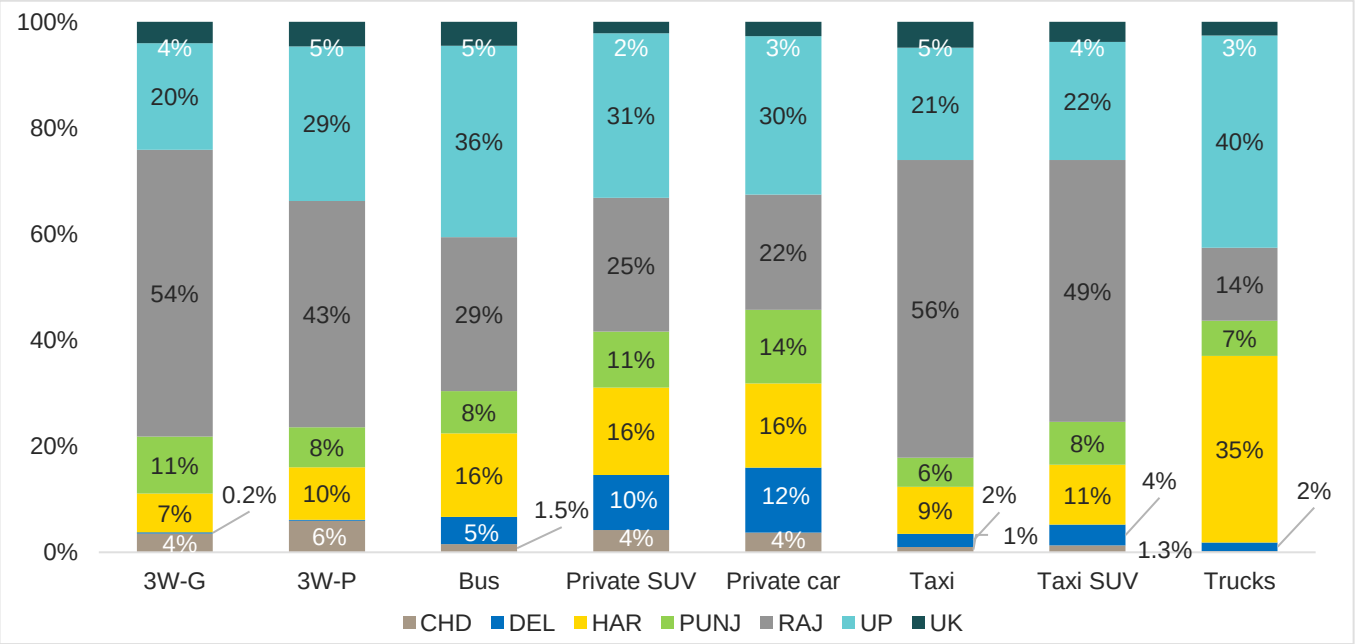
Figure 29: End use share of diesel- North Zone



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in north zone.

Figure 30: End use share of diesel sold to transport segment

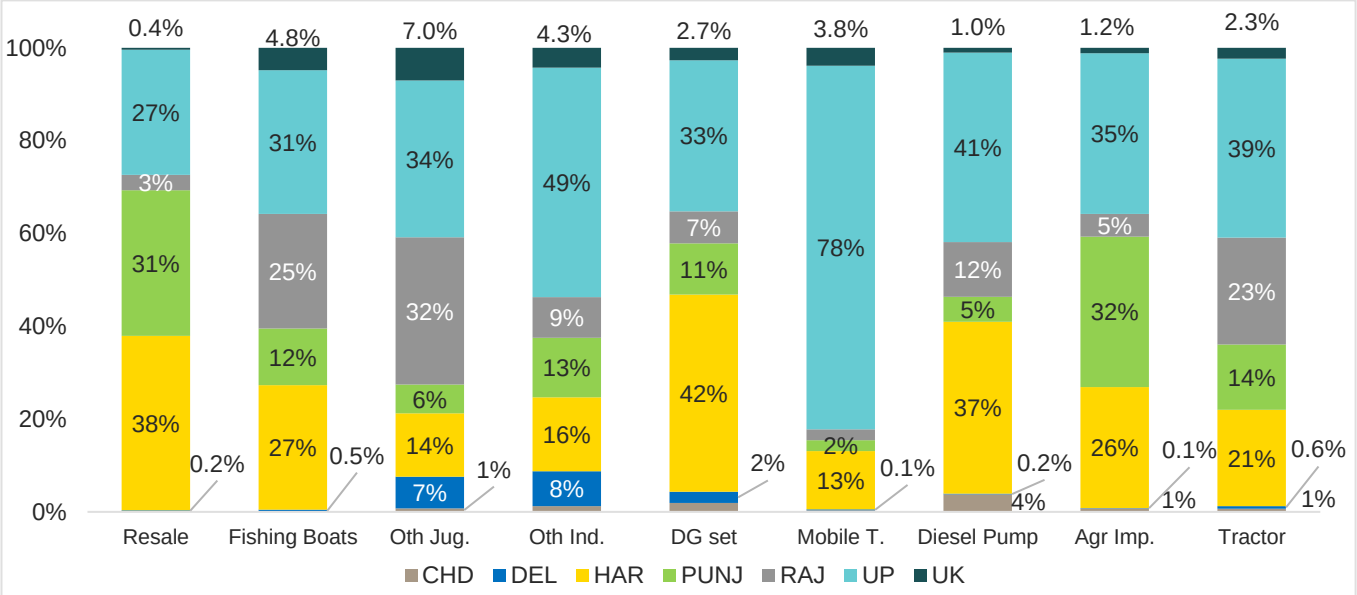


Source: CRIS analysis & primary survey

Uttar Pradesh and Rajasthan has witnessed the higher share of diesel sale within north zone in 3-Wheeler Goods/ Passenger and Taxi segments. Bus, Private car, Private SUV and Trucks segments have highest share in Uttar Pradesh. Higher share of Uttar Pradesh among various diesel transport segment is probably due to its large area. Haryana has higher contribution in trucks segment as compared to other segments.

In non-transport segment of diesel, following figure shows sales pattern across north zone:

Figure 31: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

Oth Jug. Is Others Juggad and Burining

Consumption of diesel by DG set used at mobile towers is highest in Uttar Pradesh (78% of total diesel sold to Mobile Towers in north zone). This is mainly due to highest number of BTS (Base Transceivers System) towers installed in Uttar Pradesh within North Zone *(Source: Telecom statistics 2019)* and poor sub-transmission lines in some areas leading to load shedding in the region *(Source CEA).*

Further, diesel sale to agricultural implements was highest in Uttar Pradesh at 35% followed by Punjab (32%) and Haryana (26%). Tractors saw highest contribution from Uttar Pradesh (39%), followed by Rajasthan (23%) and Haryana (21%).

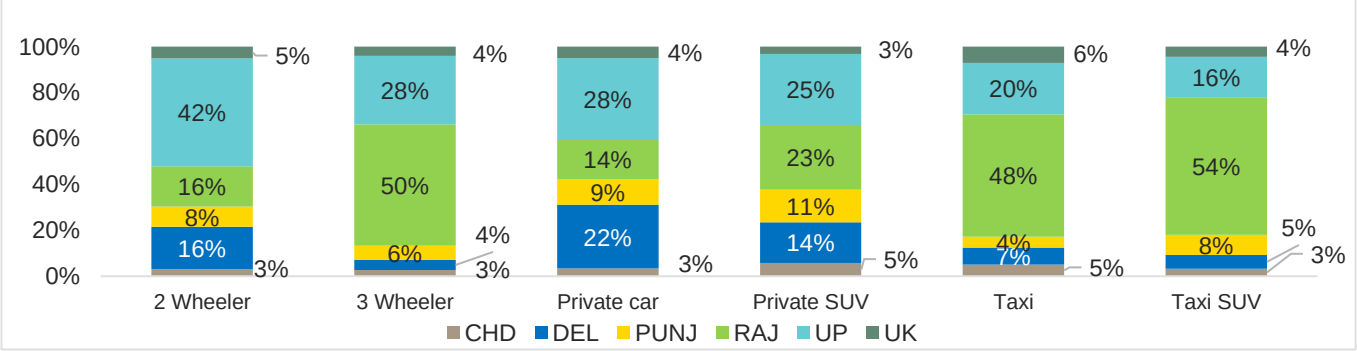
DG set diesel consumption in north zone was highest in Haryana (42%) followed by Uttar Pradesh (33%).

There is also small presence of fishing boats in North zone which is mainly contributed from small ponds in states of Rajasthan, Haryana and Uttar Pradesh.

5.2.2.2 Petrol Sales

End user segment wise petrol sale pattern in north zone is shown in following figure:

Figure 32: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

From the above chart following observations can be made:

- Delhi has higher share in Private Cars segment (22%) as compared to other segments of Delhi.
- Due to high proportion of 3-Wheeler vehicles and taxi in Rajasthan, higher consumption of petrol from these two segments has been observed.
- Uttar Pradesh has high density of 2–Wheelers (~10% of the total registered 2-Wheelers in India- *Source : MORTH*) resulting in highest proportion (42%) of petrol sales from this segment

5.2.3 South zone

South zone consists of Karnataka, Andhra Pradesh, Tamil Nadu, Telangana and Kerala. A total of **773** ROs were surveyed in the south zone out of which **287** are of **IOCL**, **251** are of **HPCL** and **235** are of **BPCL**. Market classification south zone ROs is as follows:

Table 5: RO market classification-South Zone

Category	Description	Total
A	Urban-Metro	**91**
B	Urban-Tier II	**73**
C	Urban-Tier III	**180**
D	National Highway/State Highway	**291**
E	Rural	**138**
Total		**773**

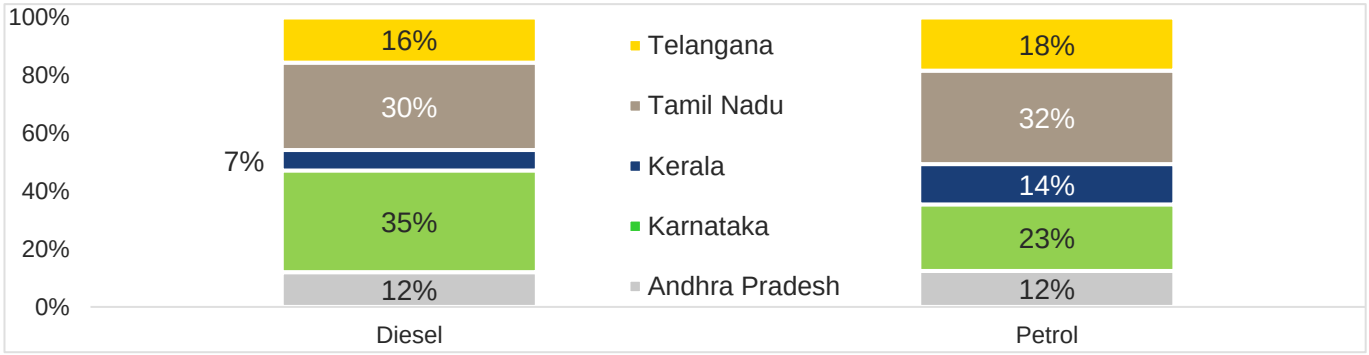
Source: CRIS analysis & primary survey

The share of diesel and petrol at state level in south zone level is shown below:

5.2.3.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 33: Diesel and petrol sales South Zone (% share)



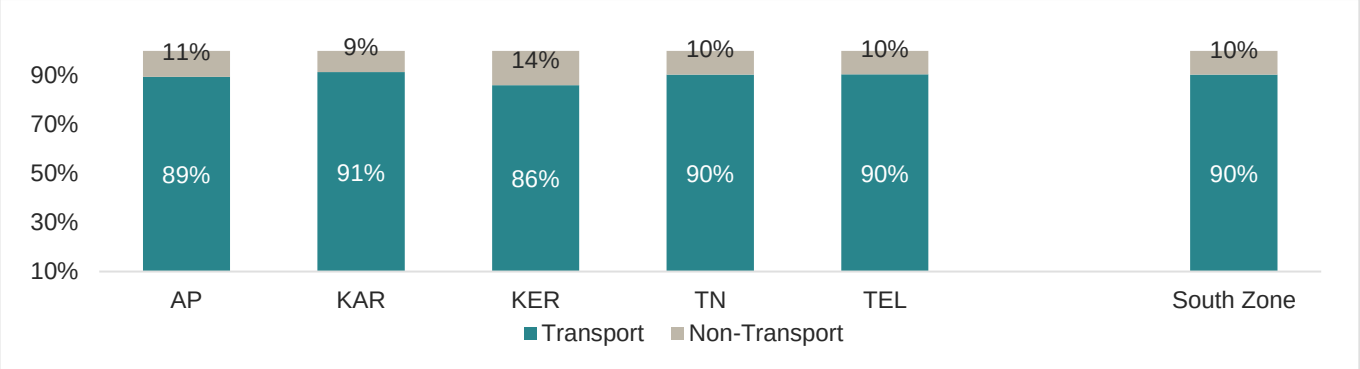
Source: CRIS analysis & primary survey

Following observations are made:

- In total diesel sales, highest sales were recorded in Karnataka (35% of total diesel sold in south zone), while lowest were recorded in Kerala (7% of total diesel sold in south zone).
- In total petrol sales, highest sales were recorded in Tamil Nadu (32% of total petrol sold in south zone) and lowest were recorded in Andhra Pradesh (12% of total petrol sold in south zone).

Diesel sales to transport segment contributed 90%, remaining 10% is contributed by non-transport segment (agriculture, power, industrial and others). Diesel consumption in transport sector and non-transport of south zone is maximum in Karnataka.

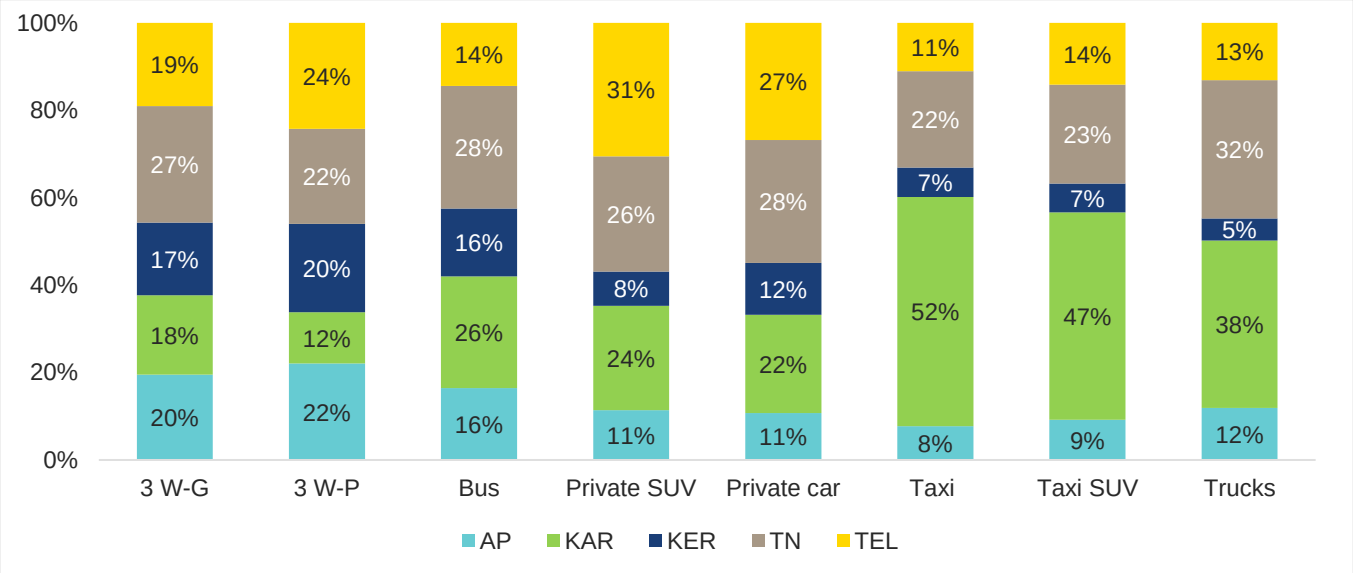
Figure 34: End use share of diesel - South Zone



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in south zone.

Figure 35: End use share of diesel sold to transport segment



Source: CRIS analysis & primary survey

From above chart following observations are made for sale of fuel from surveyed ROs:

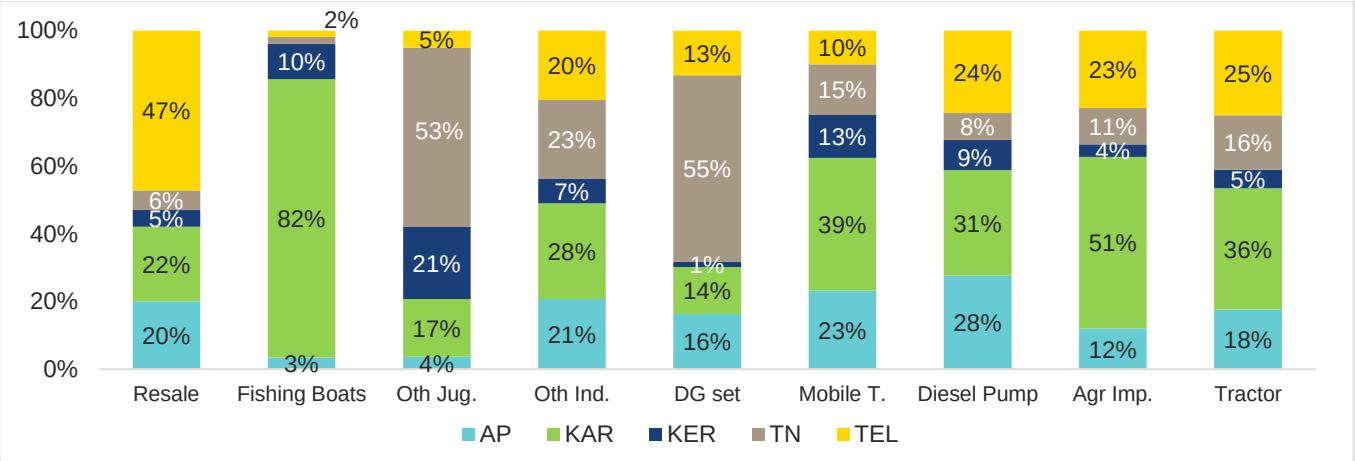
- Trucks segment which is major contributor of diesel sales showed highest contribution to sale from Karnataka (38% of total diesel sale to trucks in south zone). This is due to the fact that Karanataka is manufacturing hub on some of the largest PSU in the country (Hindustan Aeronautics Limited, National Aerospace

Laboratories, Bharat Heavy Electricals Limited, Bharat Earth Movers Limited and HMT (formerly Hindustan Machine Tools) and also around 623 km of golden quadrilateral passes through Karnataka state

- In Private car, Tamil Nadu has highest share of 26% and in Private SUV Telangana has highest share of 28%. While Karnataka has highest share in Taxi (52%) and Taxi SUV (47%) segment.
- Higher contribution is observed from Andhra Pradesh, Tamil Nadu and Telangana from 3-Wheeer vehicle category.

In non-transport segment of diesel, following figure shows sales pattern across south zone:

Figure 36: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

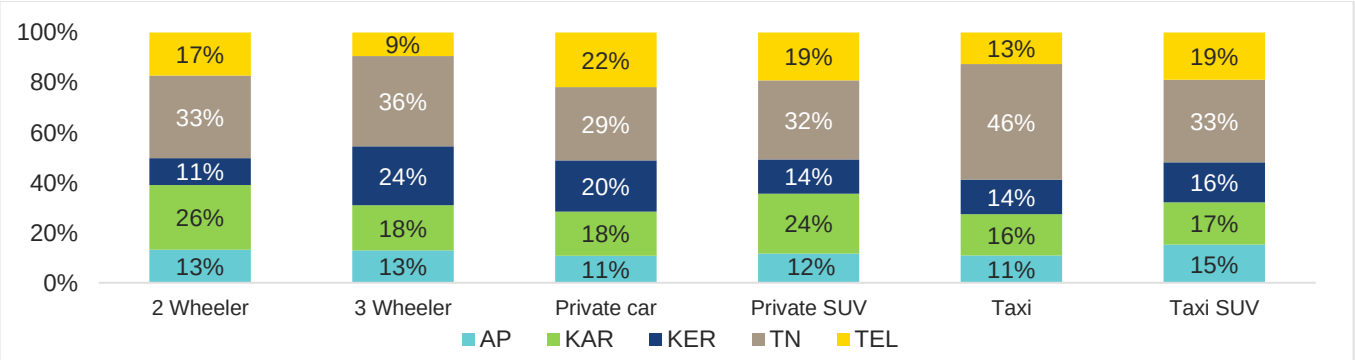
From the above chart following observations can be made:

- Karnataka has higher offtake of diesel by Agriculture implements and tractor categories. This is due to the fact that agriculture and its allied activities contribute ~49% to state's economy.
- Presence of large number of mobile towers in Andhra Pradesh (~43k) and Karnataka (~36k) led to higher share of diesel sale in Mobile Tower segment.

5.2.3.2 Petrol Sales

End user segment wise petrol sale pattern in south zone is shown in following figure:

Figure 37: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

From the above chart following observation can be made:

- Tamil Nadu has higher share in all of petrol segment. This is due to presence vast number of vehicles in state of Tamil Nadu. A probable reason is that ~35-40% of India's auto industry is present in state of Tamil Nadu.

5.2.4 East zone

The east zone consists of Assam, Bihar, Odisha, Jharkhand and West Bengal. A total of **605** ROs were surveyed in the east zone out of which **327** are of **IOCL**, **158** are of **BPCL**, and **120** are of **HPCL**. Market classification east zone ROs is as follows:

Table 6: RO market classification-East Zone

Category	Description	Total
A	Urban-Metro	**21**
B	Urban-Tier II	**31**
C	Urban-Tier III	**117**
D	National Highway/State Highway	**262**
E	Rural	**174**
Total		**605**

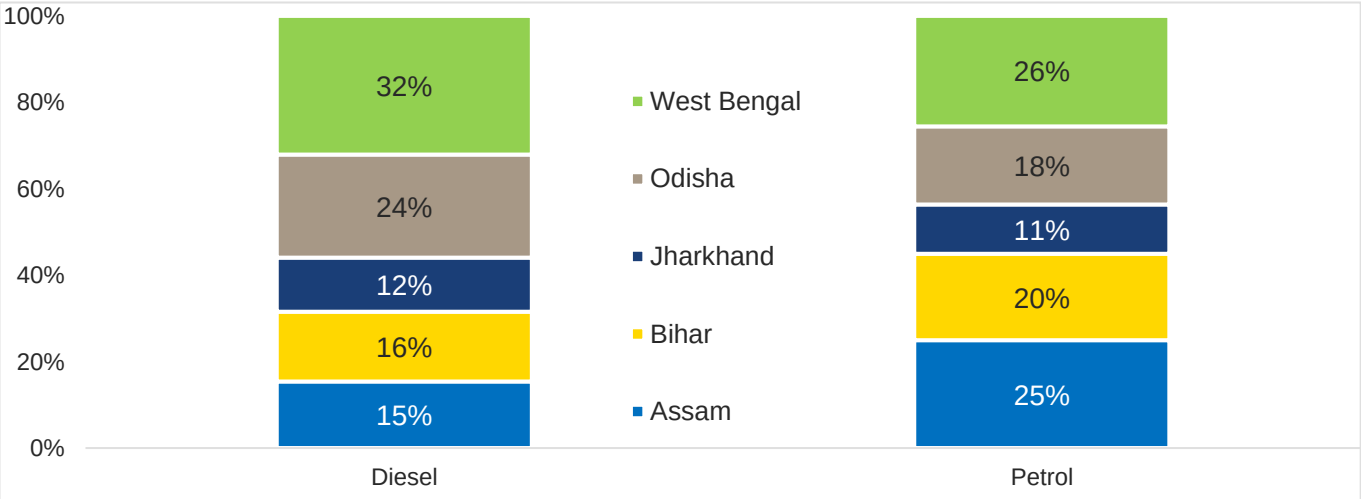
Source: CRIS analysis & primary survey

The share of diesel and petrol at state level in east zone level is shown below:

5.2.4.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 38: Diesel and petrol sales - East Zone



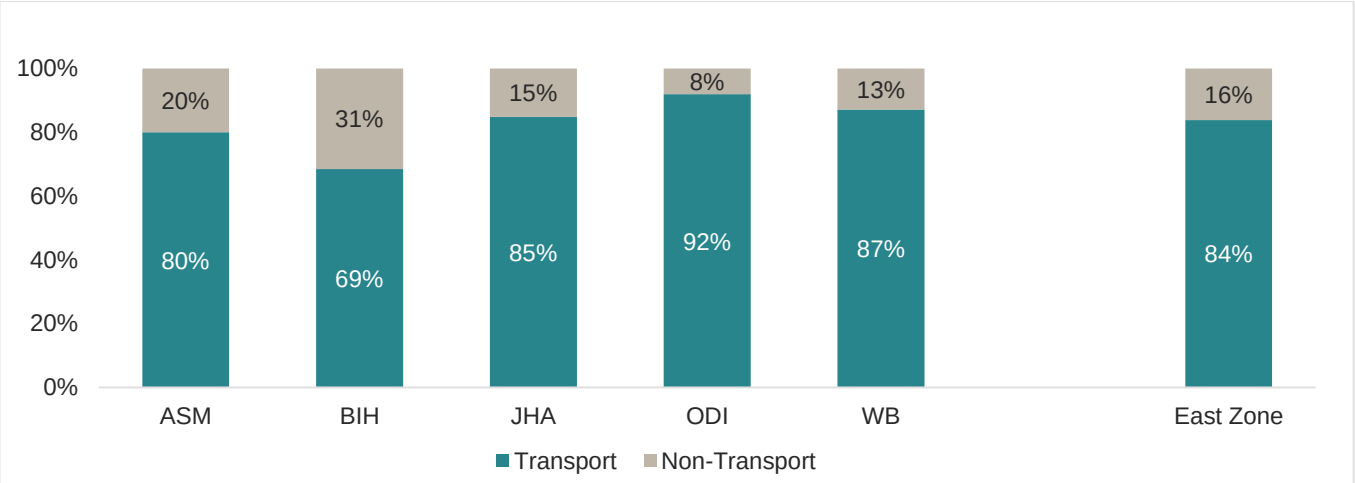
Source: CRIS analysis & primary survey

Following observations are made:

- In total diesel sales, highest sales were recorded in West Bengal (32% of total diesel sold in east zone) and lowest were recorded in Jharkhand (12% of total diesel sold in east zone).
- Highest petrol sales were recorded in West Bengal (26% of total petrol sold in east zone) and lowest were recorded in Jharkhand (11% of total petrol sold in east zone).

Diesel sales to transport segment contributed **84%** in total diesel sale, remaining is contributed by non-transport segment (agriculture, power, industrial and others). Diesel consumption in transport and non-transport sector of east zone is maximum in **West Bengal** and **Bihar** respectively.

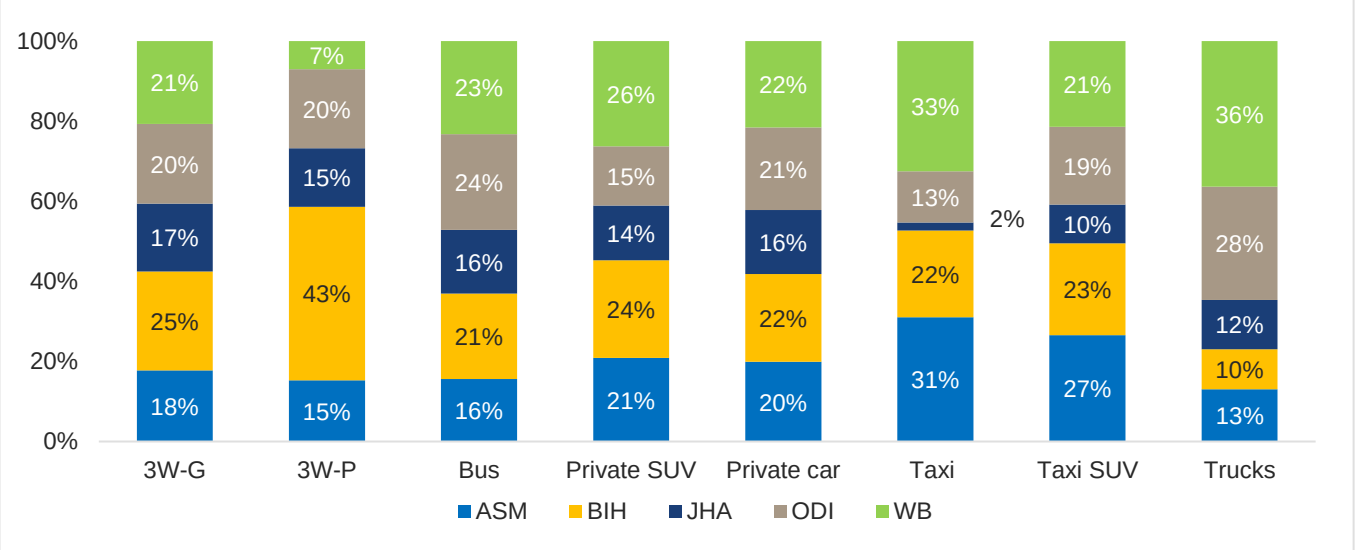
Figure 39: End use share of diesel - East Zone



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in east zone.

Figure 40: End use share of diesel sold to transport segment



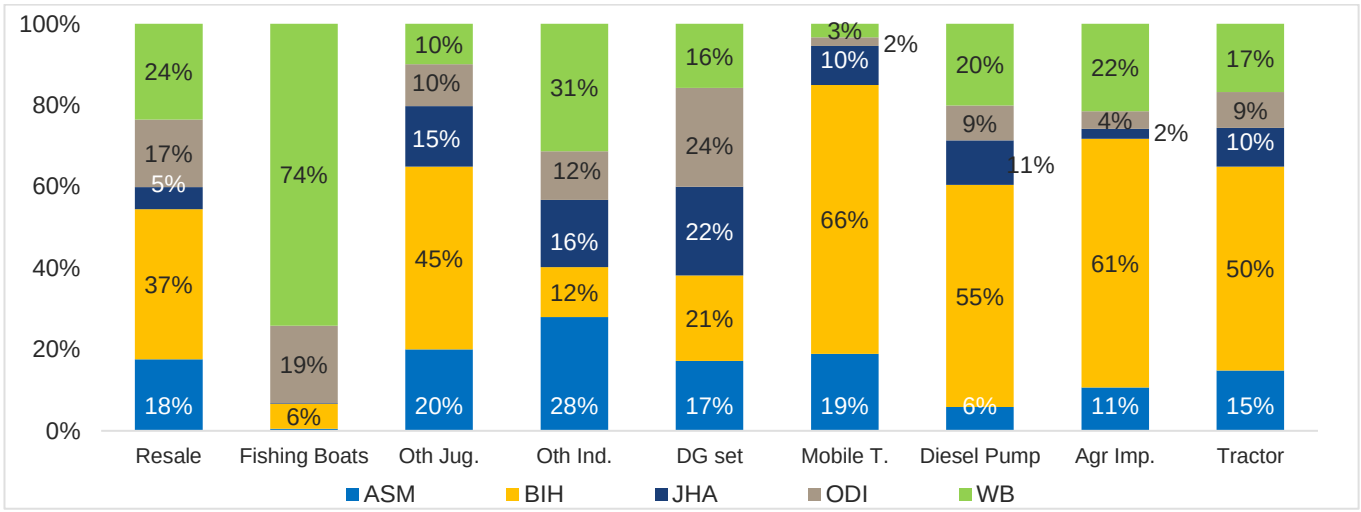
Source: CRIS analysis & primary survey

From above chart following observations are made for sale of fuel from surveyed ROs:

- Trucks segment which is major contributor of diesel sales showed highest contribution to sale from West Bengal (36% of total diesel sale to trucks in east zone). This could presumably be due to higher trade activity leading to higher diesel sales in the state.

In non-transport segment of diesel, following figure shows sales pattern across east zone:

Figure 41: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

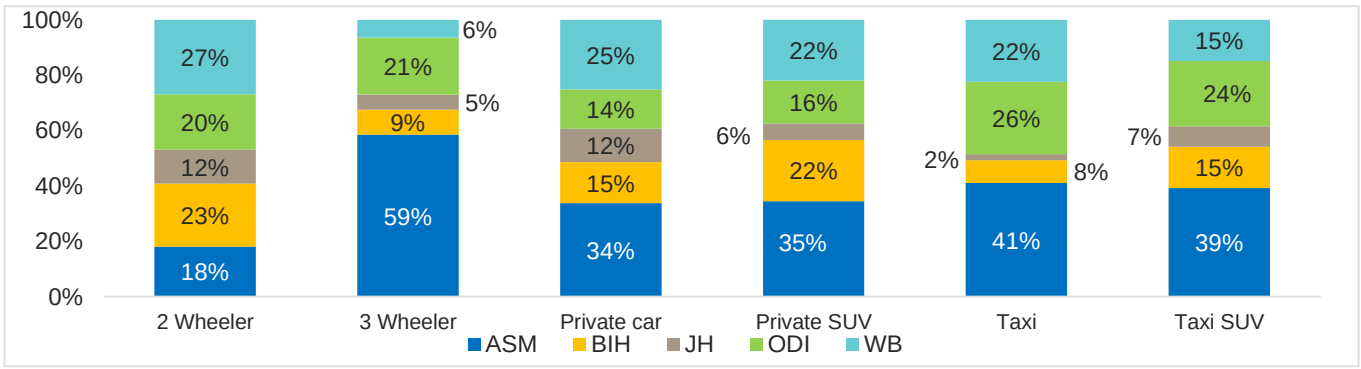
From the above chart following observations can be made:

- Bihar recorded the lion's share in diesel sale to tractors, diesel pump, mobile tower and agriculture segments. This is due to higher agricultural activity in the state.
- Share of diesel sale for other industrial usage has been dominated by West Bengal, Assam and Jharkhand.
- Presence of high number of Mobile BTS towers in Assam and Bihar *(Telecom statistics 2019)* coupled with below par sub transmission network has resulted in load shedding, thus the higher share of diesel consumption by mobile tower units within the state.

5.2.4.2 Petrol Sales

End user segment wise petrol sale pattern in east zone is shown in following figure:

Figure 42: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

From the above chart following observations can be made:

- Assam has highest contribution to petrol sales from Private cars followed by West Bengal.
- 2-Wheelers saw highest contribution from West Bengal followed by Bihar and Odisha.
- Taxi and Taxi SUV segments have highest contribution from Assam followed by Odisha.

5.2.5 West zone

The west zone consists of Chhattisgarh, Maharashtra, Madhya Pradesh and Gujarat. A total of **710 ROs** were surveyed in the west zone out of which **252** are of **BPCL**, **248** are of **IOCL** and **210** are of **HPCL**. Market classification of west zone ROs is as follows:

Table 7: RO market classification-West Zone

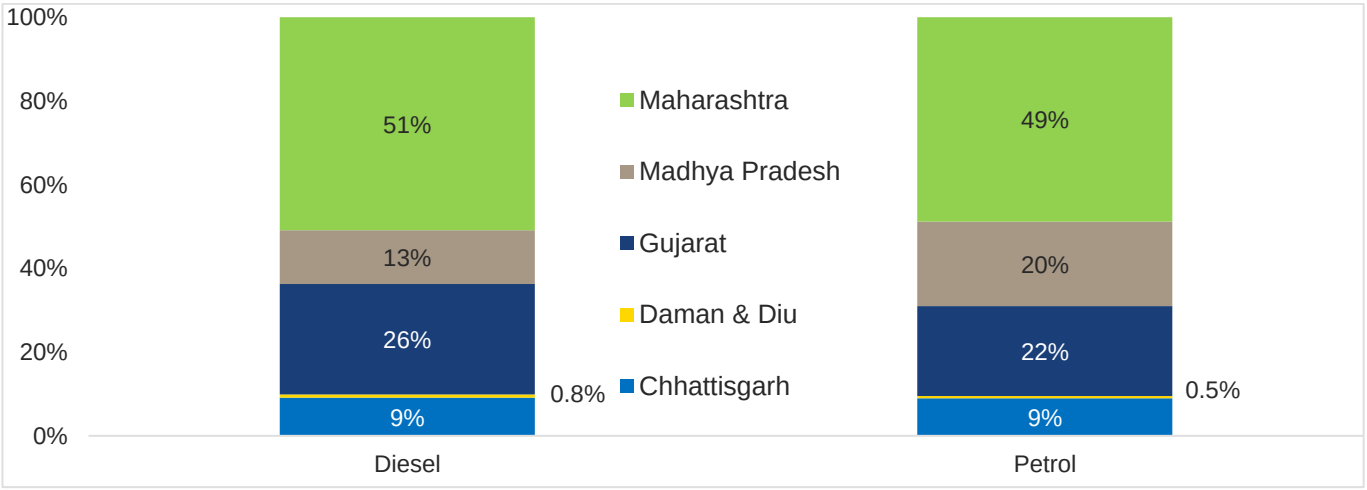
Category	Description	Total
A	Urban-Metro	**66**
B	Urban-Tier II	**50**
C	Urban-Tier III	**134**
D	National Highway/State Highway	**311**
E	Rural	**149**
Total		**710**

Source: CRIS analysis & primary survey

5.2.5.1 Fuel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 43: Diesel and petrol sales - West Zone



Source: CRIS analysis & primary survey

Following observations are made:

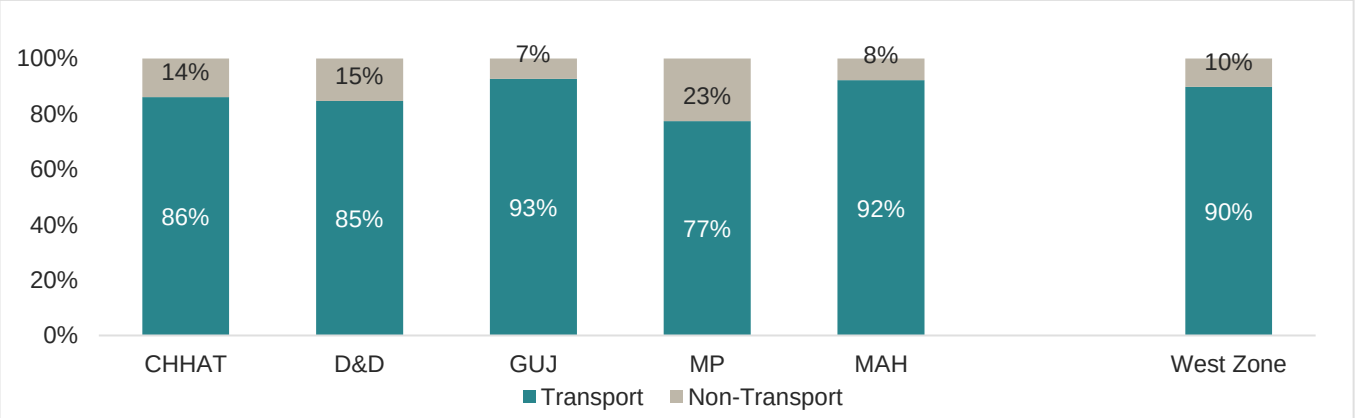
- Highest diesel sales were recorded in Maharashtra (51% of total diesel sold in west zone) and lowest were recorded in Daman & Diu (0.8% of total diesel sold in west zone).

- In total petrol sales, highest sales were recorded in Maharashtra (49% of total petrol sold in west zone) and lowest were recorded in Daman & Diu (0.5% of total petrol sold in west zone).

5.2.5.2 Diesel Sales

Diesel sales to transport segment contributed 90% in total diesel sale, remaining is contributed by non-transport segment (agriculture, power, industrial and others). Diesel consumption in transport sector and non-transport of west zone is maximum in **Maharashtra**.

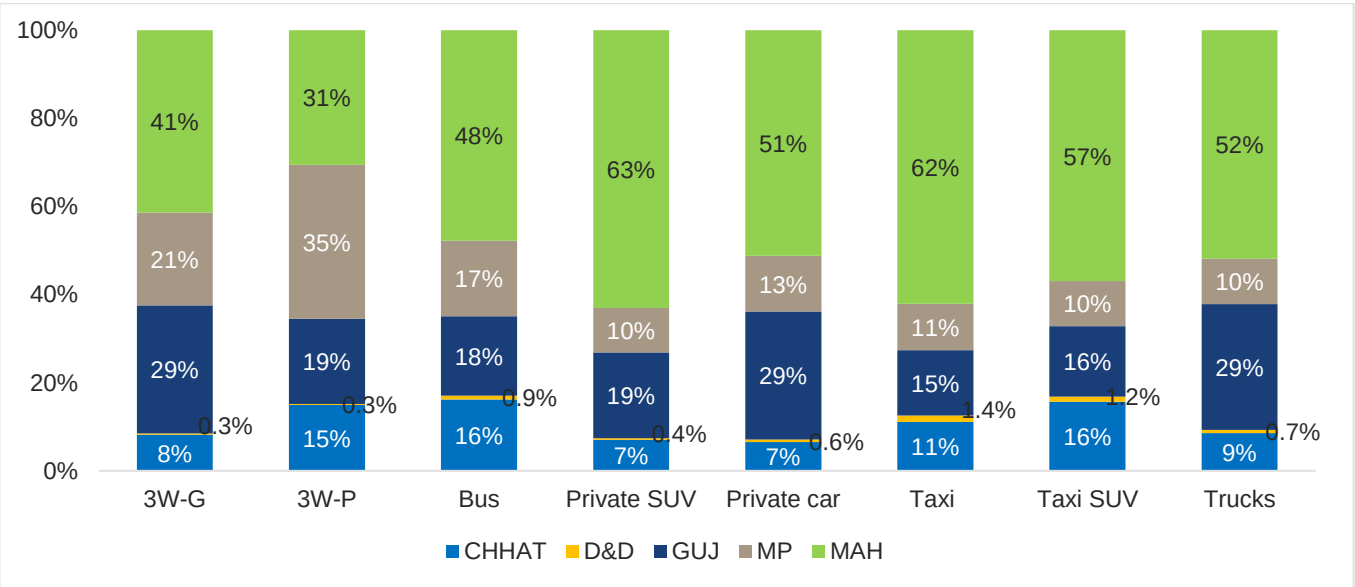
Figure 44: End use share of diesel - West Zone



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in west zone.

Figure 45: End use share of diesel sold to transport segment



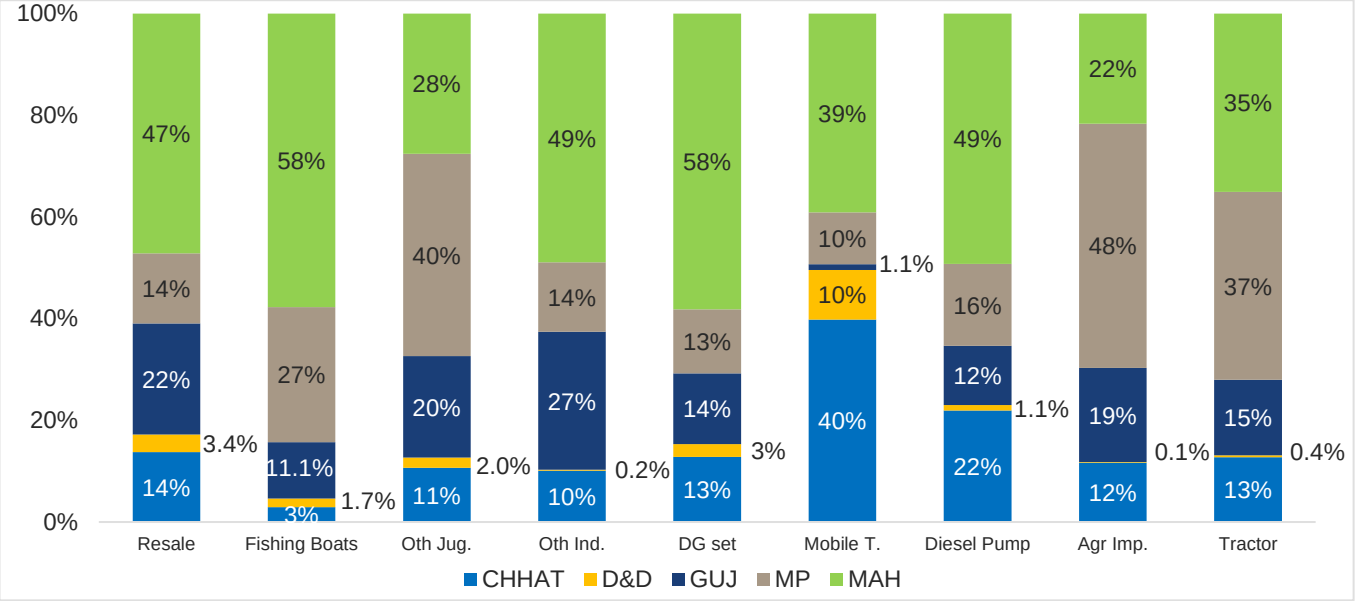
Source: CRIS analysis & primary survey

From above chart following observations are made for sale of fuel from surveyed ROs:

- Trucks segment which is major contributor of diesel sales showed highest contribution to sale from Maharashtra (52% of total diesel sale to trucks in west zone). This can be presumably due to presence of large industrial and commercial hubs in Maharashtra which contributes to higher truck traffic.

In non-transport segment of diesel, following figure shows sales pattern across west zone:

Figure 46: Non-transport segment share of diesel sold



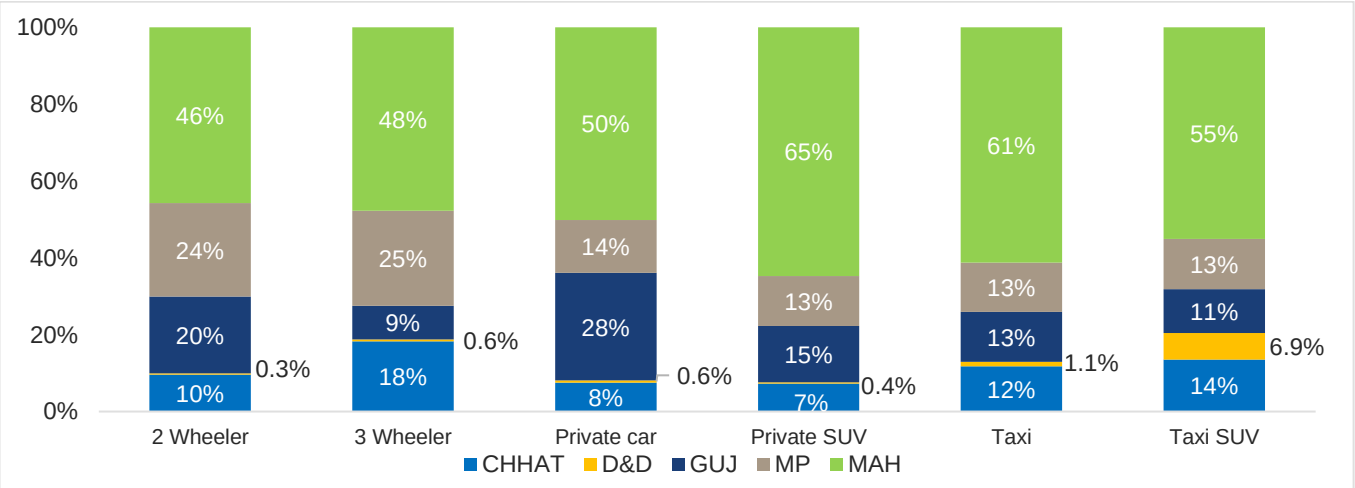
Source: CRIS analysis & primary survey

In diesel sold to non-transport segment, segmental contribution in agriculture sector was higher from Madhya Pradesh due to presence of large area under cultivation.

5.2.5.3 Petrol Sales

End user segment wise petrol sale pattern in west zone is shown in following figure:

Figure 47: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

Petrol sale in west zone is dominated by state of Maharashtra. While Madhya Pradesh showed higher contribution in petrol sold to 2-Wheelers, Gujarat showed higher share in Private Cars. Daman and Diu being a tourist destination attracted higher share in Taxi SUV as compared to other segments. Chhattisgarh showed higher contribution in 3-Wheelers.

6. October - December 2020 All India consolidated findings- Retail

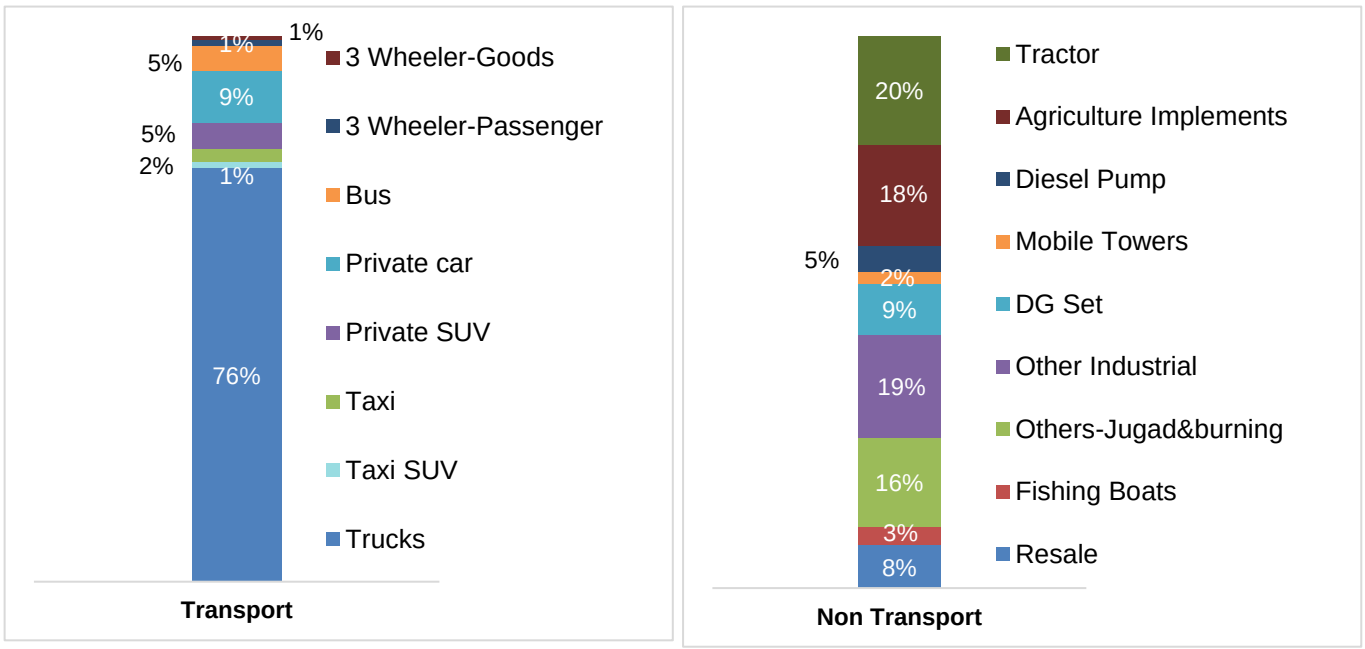
6.1 Sales- All India

The split of fuel sale between diesel and petrol was **69%** for diesel and **31%** for petrol. During the quarter, sales witnessed a rising trend due to festive season (Durga Puja, Diwali, Navratri and Dusshera) and harvest season (Kharif crop) in the country. This period was the time when economy started opening after lockdown and lot of mobility was visible on account of festival season.

6.1.1 Diesel

For diesel segment at all India level, transport segment contributed **89%** to diesel sales and remaining **11%** share is contributed by non-transport segment. Due to presence of festive season during this quarter, higher commercial activity was observed which led to higher contribution in Diesel sales from transport segment. Following figure shows transport segment and non-transport segment wise diesel sale at all India level.

Figure 48: Diesel sale



Source: CRIS analysis & primary survey

Truck segment drives the highest share of diesel consumption in the transport sector. At NH/SH ROs category level trucks occupied the share of 82% in share of diesel sold to transport segment, which is an indicative that national highway/state highway are the preferred location of refueling by truck segment.

After trucks, the highest quantity of diesel was sold to Private cars (9% of diesel sold to transport category) and the lowest was sold to Taxi-SUV (1% of diesel sold to transport category)

In non-transport segment, **Agriculture segment** has higher share. Diesel sale to agricultural sector remained at 45% in total diesel sold to non-transport category. This is contributed by diesel sale to tractors, agricultural implements and diesel pumps.

Power: Diesel sales to power sector contributed **~11%** of overall diesel sales in the non-transport segment. Accordingly, diesel sales were highest in DG-Industrial (5.6%) and lowest in DG-Residential (1%), while DG-Commercial contributed 2.7% and mobile towers contributed 2%.

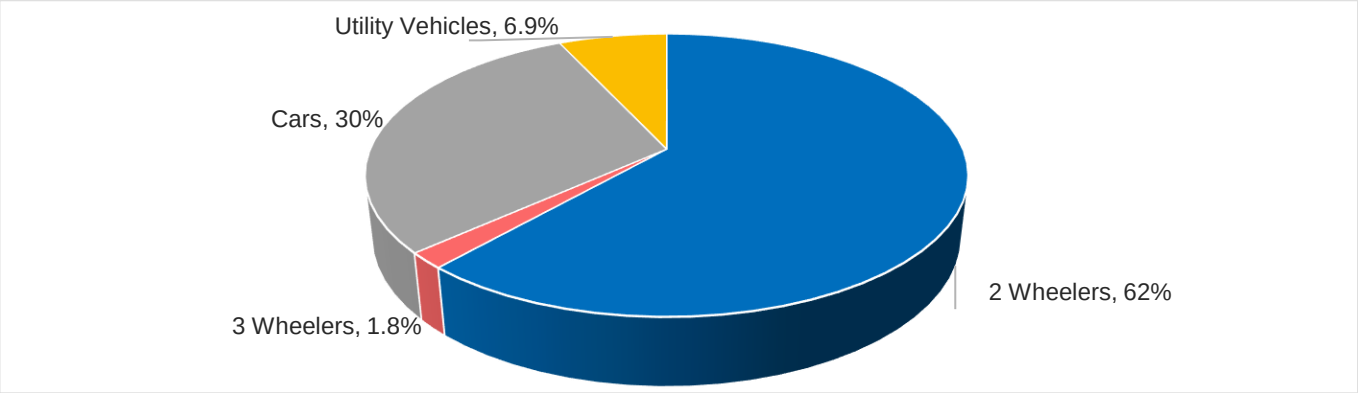
Industrial: The industrial sector (*Other Industrial*) – which contains sales of diesel in the industry for purposes other than power generation – contributed **15%** in total diesel sold to the non-transport category.

In the **others segment,** Others-Jugad and Burning contributes a 16% share in diesel sold to the non-transport segment.

6.1.2 Petrol

Following figure represents share of end user vehicle segment for petrol sale.

Figure 49: Petrol sale



Source: CRIS analysis & primary survey

Following observations are made based on the above figure:

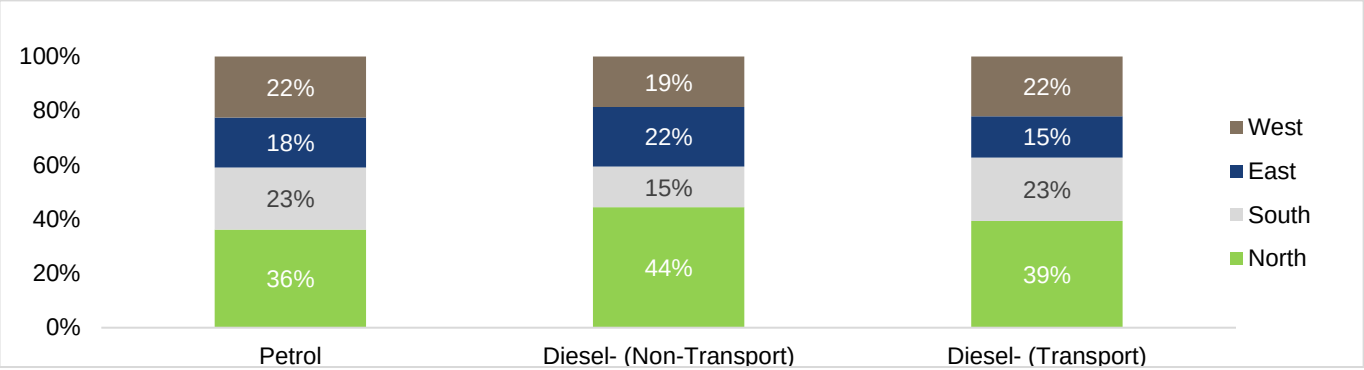
- Higher sale of petrol is observed in **2-Wheeler** category at 62% followed by **Cars** at 30%.
- The Utility segment, consisting Private SUV and Taxi SUV, contributes 6.9% to total petrol sales.

6.2 Zone wise analysis

6.2.1 PAN India

The following figure shows the diesel and petrol sales across zones (North, South, East and West) for the October-December 2020 surveyed period.

Figure 50: Diesel and petrol sale zone wise- PAN India (% share)



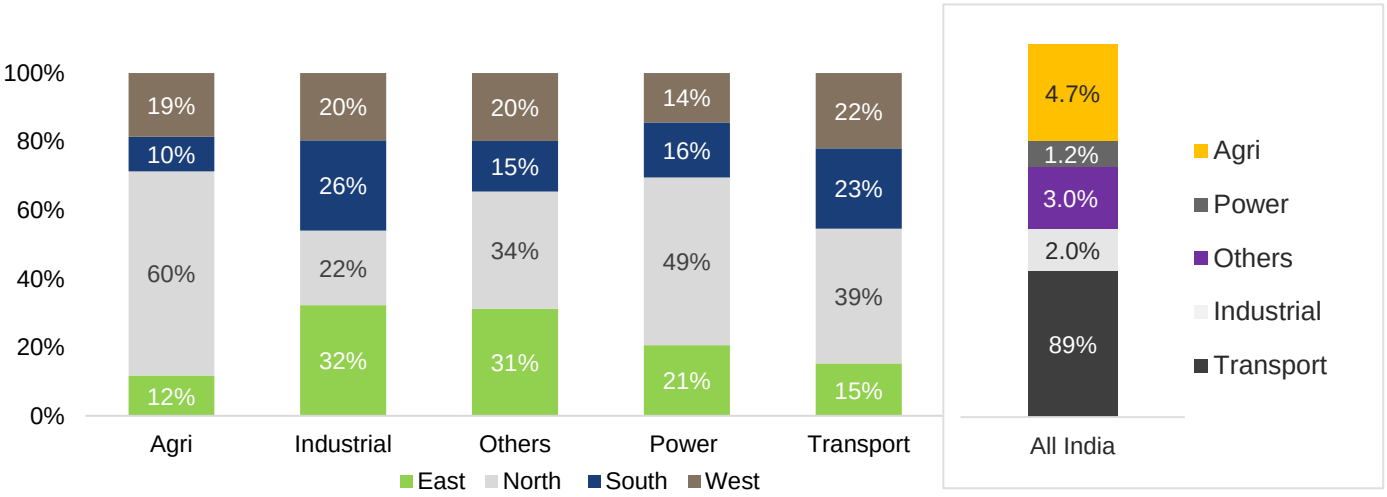
Source: CRIS analysis & primary survey

It is observed that diesel sale in transport segment was highest for north zone (39%) and lowest for east zone (15%). Further, diesel sale in non-transport segment has highest contribution from north zone (44%) and lowest from south zone (15% each). The north zone has the highest diesel sales partly due to maximum ROs being surveyed from the region and partly due to increased agriculture activity during the quarter (Kharif season), especially in the state of Punjab and Haryana. For petrol, north zone has highest share (36%) and east zone has lowest share (18%).

6.2.1.1 Segment wise Diesel sales

Following figure depicts segment wise diesel sale across four zones and at All India level.

Figure 51: Segment wise Diesel sales –zonal (% share)



Source: CRIS analysis & primary survey

Following observations are made based on above figure

- For **transport segment** at zonal level, north zone (39%) contributes the highest quantity of diesel sold to transport segment followed by south zone (23%).

  *The top three states that contribute the highest in diesel sales to the truck segment are: **Haryana** (15%), **Uttar Pradesh** (13%) and **Maharashtra** (10%).*

- For **agriculture segment**, north zone (60%) contributes the highest quantity of diesel sold to agriculture segment and lowest is contributed by south zone (10%). During the quarter, agriculture activities got boost due to harvesting season of Khariff crop in the north zone which led to its high share in diesel sales.

  Uttar Pradesh, Rajasthan and Madhya Pradesh are top 3 states collectively contributing 50% of total diesel sold to agriculture segment. For tractor sales, Uttar Pradesh, Rajasthan, Bihar leads the segment with 44% share of the diesel sale for tractor.

- In **power segment**, north zone (49%) contributes the highest quantity of diesel sold to power segment and lowest is contributed by west zone (14%). In Haryana and Uttar Pradesh due to relatively poor sub-transmission and distribution network load shedding is common in most part of these states. Overall, the electricity shortage in the survey period in the northern region comprising Uttar Pradesh, Haryana, Punjab, Rajasthan and Uttarakhand was ~5.8%. *(Source CEA)*

  Frequent power cuts in Punjab, Uttar Pradesh and Bihar led to the highest share of diesel sales for DG-Residential sets in the state. On average during the survey period ~2.4 hours/day electricity outage was recorded in Punjab, while it is ~1.8 hours/day in Uttar Pradesh and ~1.1 hours/day in Bihar.

  Uttar Pradesh, Haryana and Maharashtra has contributed 53% collectively in the total diesel sale to DG-Industrial segment within non-transport category. The probable reason is the presence of industrial zone and SEZs in the surveyed districts.

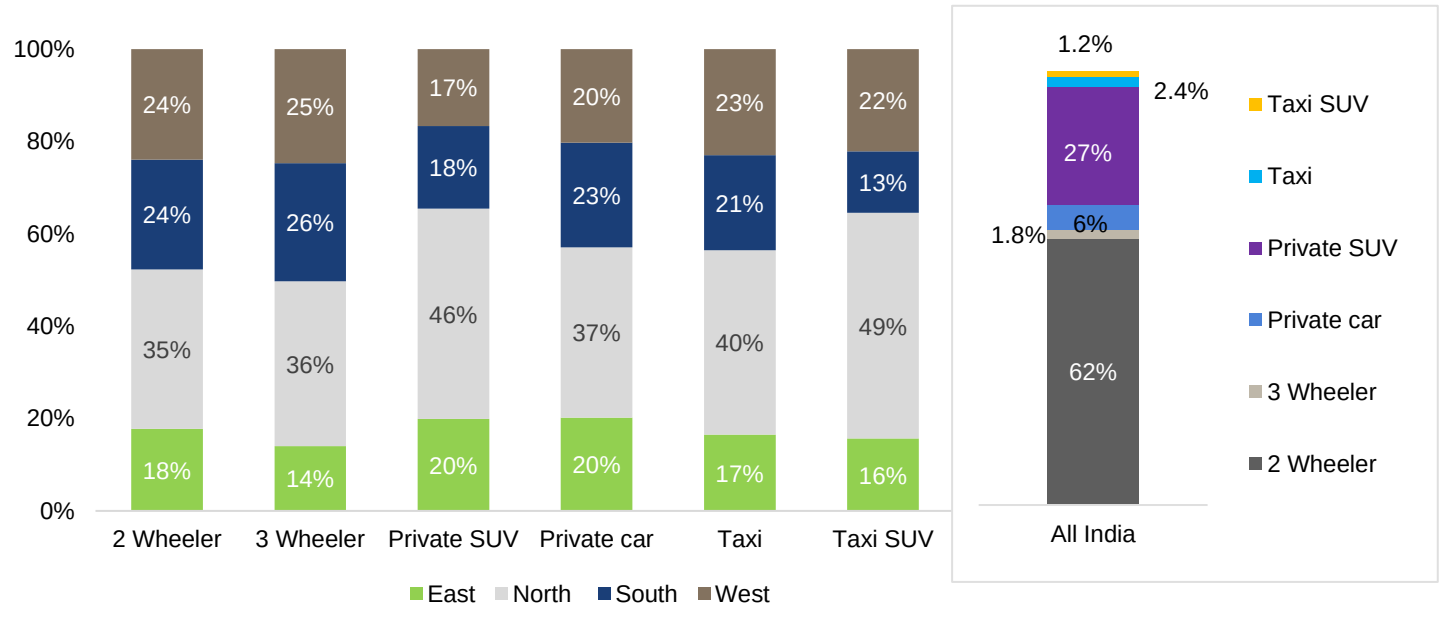
- In **industrial segment**, east zone (32%) contributes the highest quantity of diesel sold to industrial segment and lowest is contributed by north zone (22%).

- Diesel sale in others-industrial category was observed to be highest in East zone (32% of total sale of diesel for others-industrial category) followed by South zone (26%).

6.2.1.2 Segment wise Petrol sales

Following figure depicts segment wise petrol sale across four zones and at All India level.

Figure 52: Segment wise Petrol sales –zonal (% share)



Source: CRIS analysis & primary survey

Following observations are made based on above figure

- Petrol sold to 2-Wheeler (35%) contributed most to north zone while east zone contributed least.

  The top three states with highest contribution to 2-Wheeler segment are Uttar Pradesh, Maharashtra and Rajasthan, collectively contributing 32% to overall petrol sales to 2-Wheeler segment.

- North zone (37%) contributes the highest share in petrol sold to private cars segment along with taxi segment (40%), followed by south zone for petrol cars (23%) and west zone for taxi segment (23%)

  For Private car segment of petrol sales Maharashtra, Uttar Pradesh and Delhi were the highest contributors collectively contributing 29% to overall petrol sales to Private car segment.

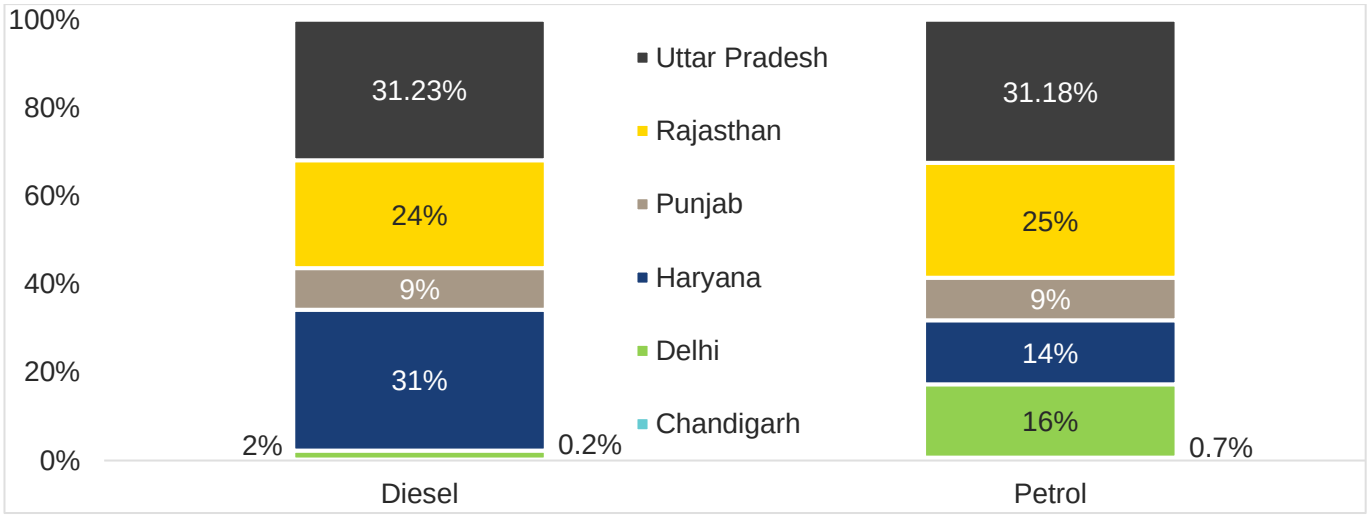
  In taxi segment top three states are Haryana, Delhi and Rajasthan.

6.2.2 North Zone

6.2.2.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 53: Diesel and petrol sales



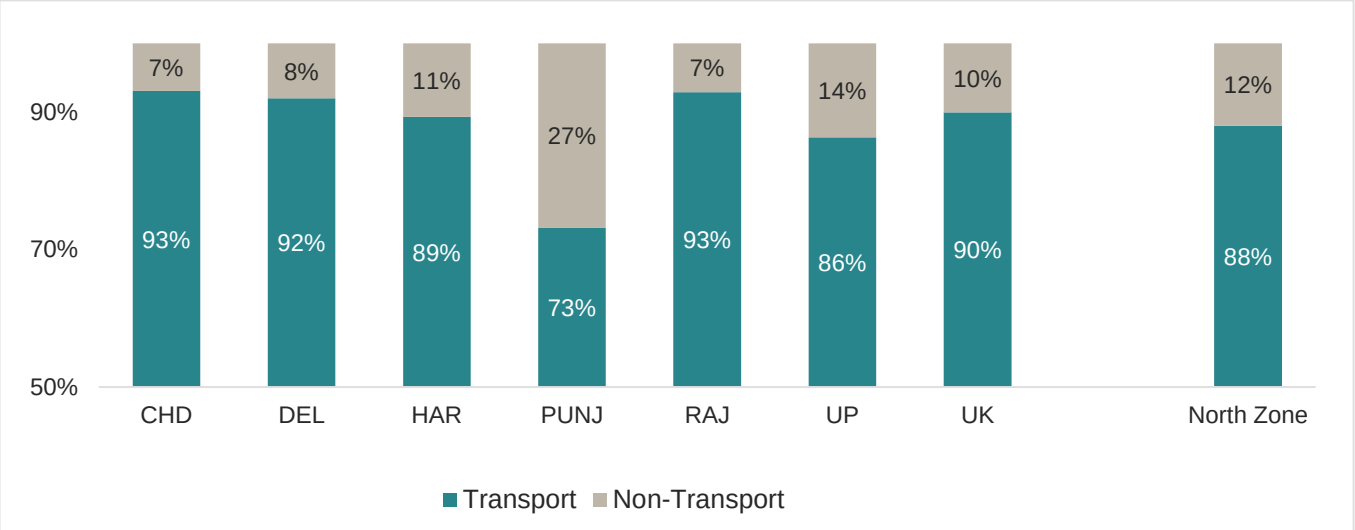
Source: CRIS analysis & primary survey

Following observations are made from the above table:

- In total diesel sales in north zone, highest sales were recorded in Uttar Pradesh and Haryana (31% of total diesel sold in north zone) and lowest were recorded in Chandigarh (0.2% of total diesel sold in north zone).
- In total petrol sales in north zone, highest sales were recorded in Uttar Pradesh (31% of total petrol sold in north zone) and lowest were recorded in Chandigarh (0.7% of total petrol sold in north zone).

In north zone, diesel sales to **transport segment** contributed 88% in total diesel sale in north zone, remaining is contributed by **non-transport segment** (agriculture, power, industrial and others). In the north zone, diesel consumption in transport sector is maximum in **Haryana** and in non-transport diesel consumption is maximum in **Uttar Pradesh**.

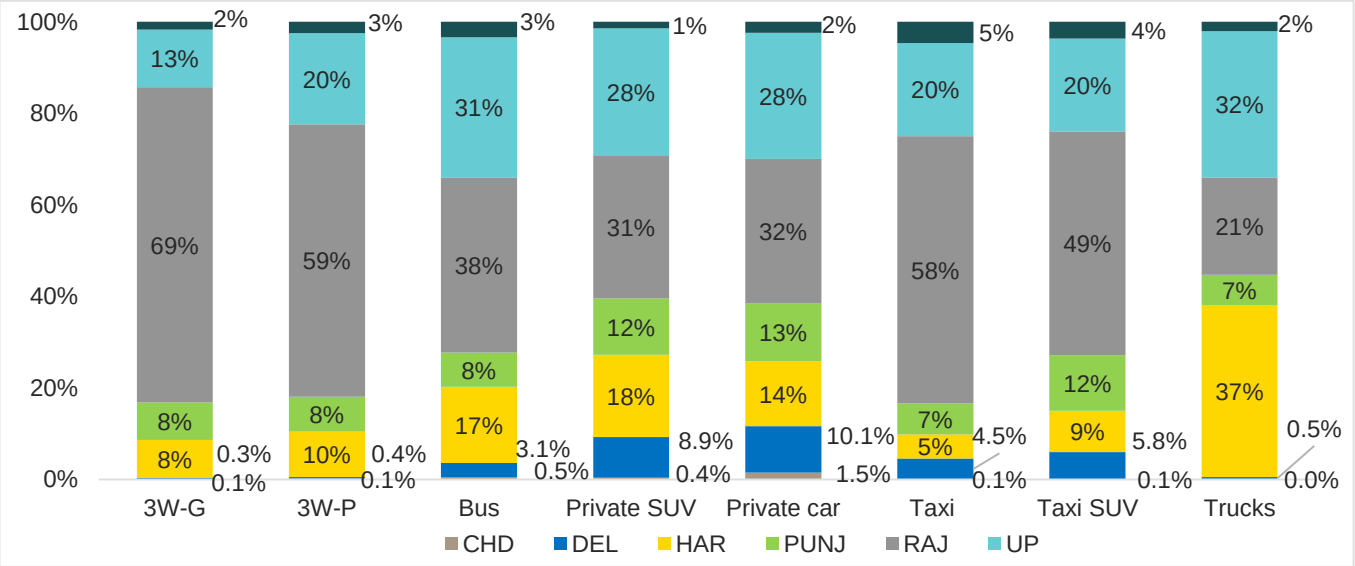
Figure 54: End use share of diesel



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in north zone.

Figure 55: End use share of diesel sold to transport segment



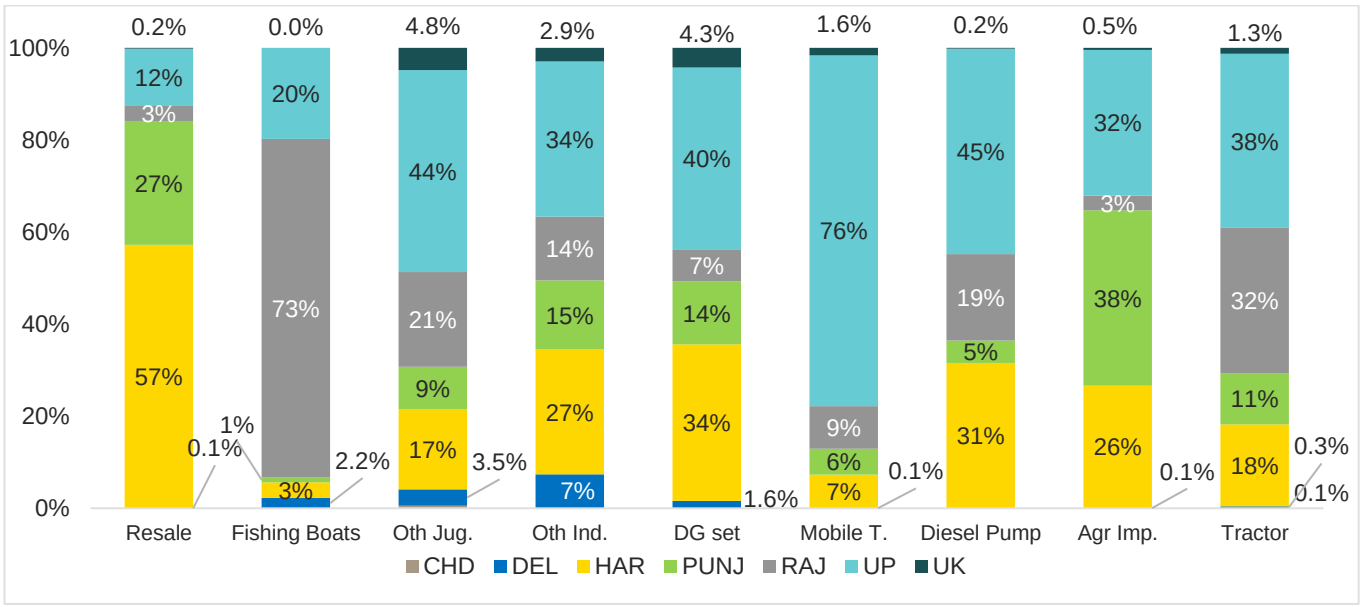
Source: CRIS analysis & primary survey

From above chart following observations are made for sale of fuel from surveyed ROs:

- Trucks segment which is major contributor of diesel sales showed highest contribution to sale from Haryana (37% of total diesel sale to trucks in north zone). This can be presumably due to lower fuel price in Haryana which makes it a destination for fuel refilling for trucks moving between Delhi and Mumbai corridor.

In non-transport segment of diesel, following figure shows sales pattern across north zone:

Figure 56: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

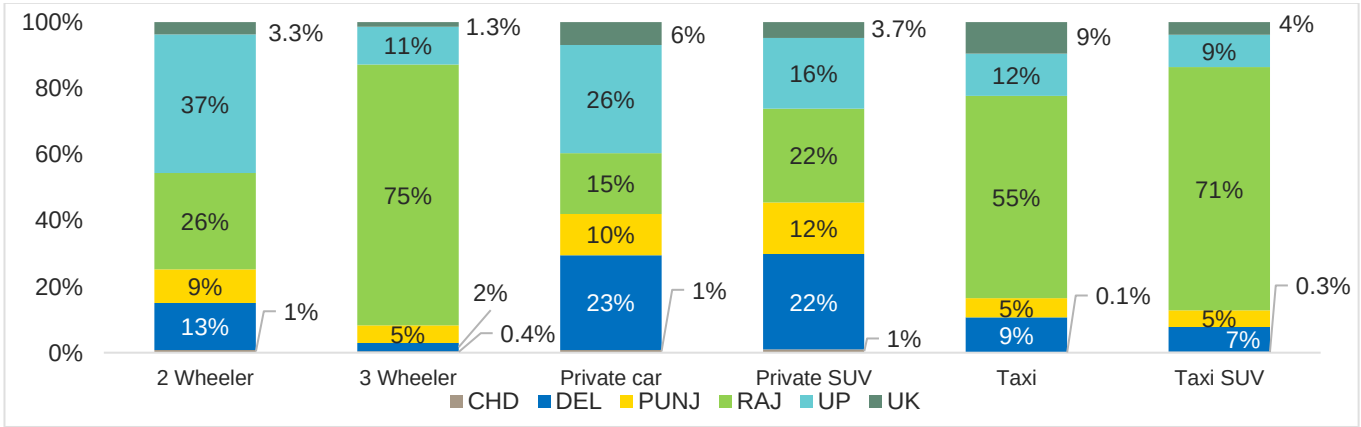
From the above chart following observations can be made:

- Consumption of diesel by DG set used at mobile towers is highest in Uttar Pradesh (76% of total diesel sold to Mobile Towers in north zone).
- Further, November being the Kharif crop harvesting season, diesel sale to agricultural implements was high in Punjab at 38% followed by Uttar Pradesh at 32%
- Frequent power cuts in the state of Punjab (~2.4 hours/day) *(Source: CEA)*, led to the highest share of diesel sale for DG-Residential sets in the state

6.2.2.2 Petrol Sales

End user segment wise petrol sale pattern in north zone is shown in following figure:

Figure 57: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

From the above chart following observations can be made:

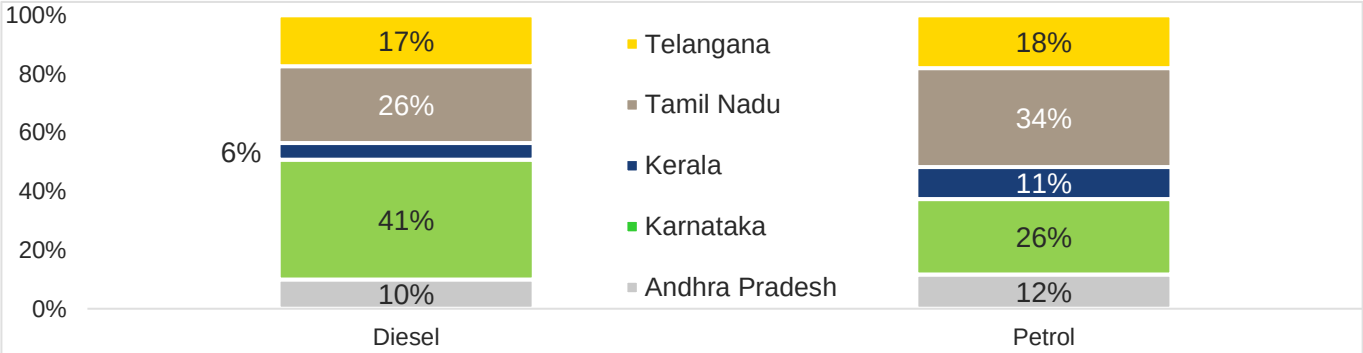
- Delhi had higher share in Private cars and SUV segments during this survey period
- Due to high proportion of 3-Wheeler vehicles in Rajasthan, higher consumption of petrol from these two segments has been observed.
- Uttar Pradesh has higher proportion (37%) of petrol sales from 2-Wheeler segment

6.2.3 South zone

6.2.3.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 58: Diesel and petrol sales



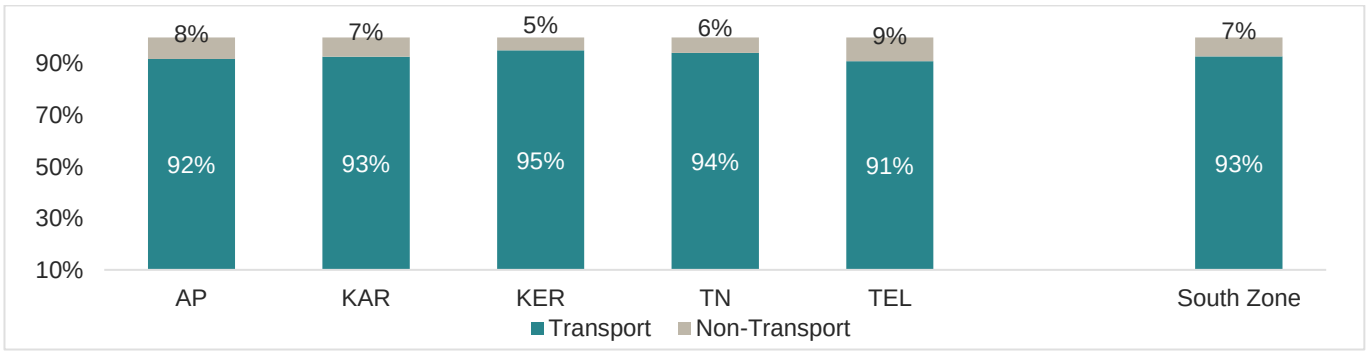
Source: CRIS analysis & primary survey

Following observations are made:

- In total diesel sales in south zone, highest sales were recorded in **Karnataka** (41% of total diesel sold in south zone) and lowest were recorded in **Kerala** (6% of total diesel sold in south zone).
- In total petrol sales in south zone, highest sales were recorded in Tamil Nadu (34% of total petrol sold in south zone) and lowest were recorded in Kerala (11% of total petrol sold in south zone).

In south zone, diesel sales to transport segment contributed 93% in total diesel sale in south zone, remaining is contributed by non-transport segment (agriculture, power, industrial and others). Diesel consumption in transport sector and non-transport of south zone is maximum in Karnataka and least in Kerala.

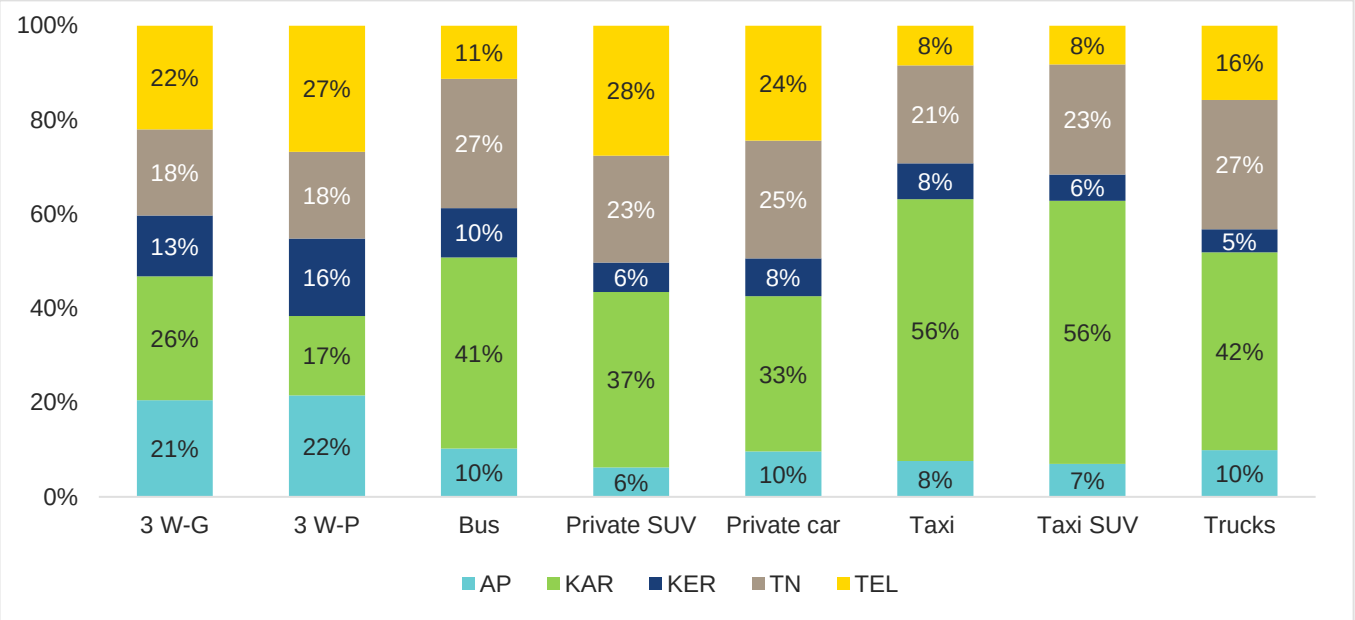
Figure 59: End use share of diesel



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in south zone.

Figure 60: End use share of diesel sold to transport segment



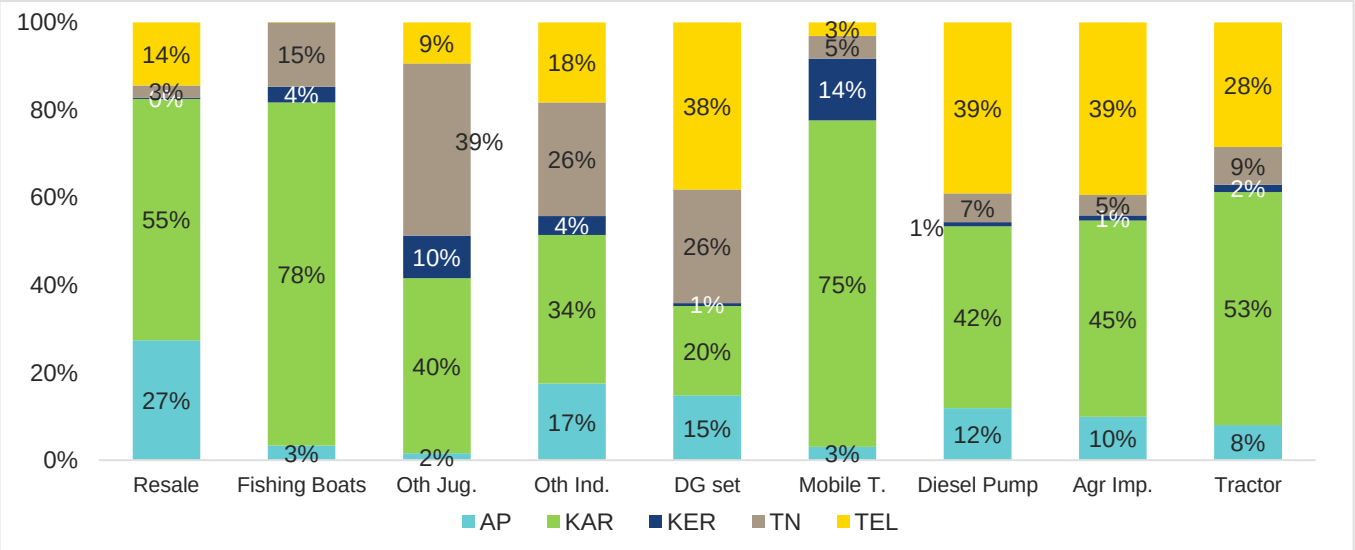
Source: CRIS analysis & primary survey

From above chart following observations are made for sale of fuel from surveyed ROs:

- Trucks segment which is major contributor of diesel sales showed highest contribution to sale from Karnataka (42% of total diesel sale to trucks in south zone).
- High contribution to diesel sale by Private cars and SUV segment in Karnataka was observed.

In non-transport segment of diesel, following figure shows sales pattern across south zone:

Figure 61: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

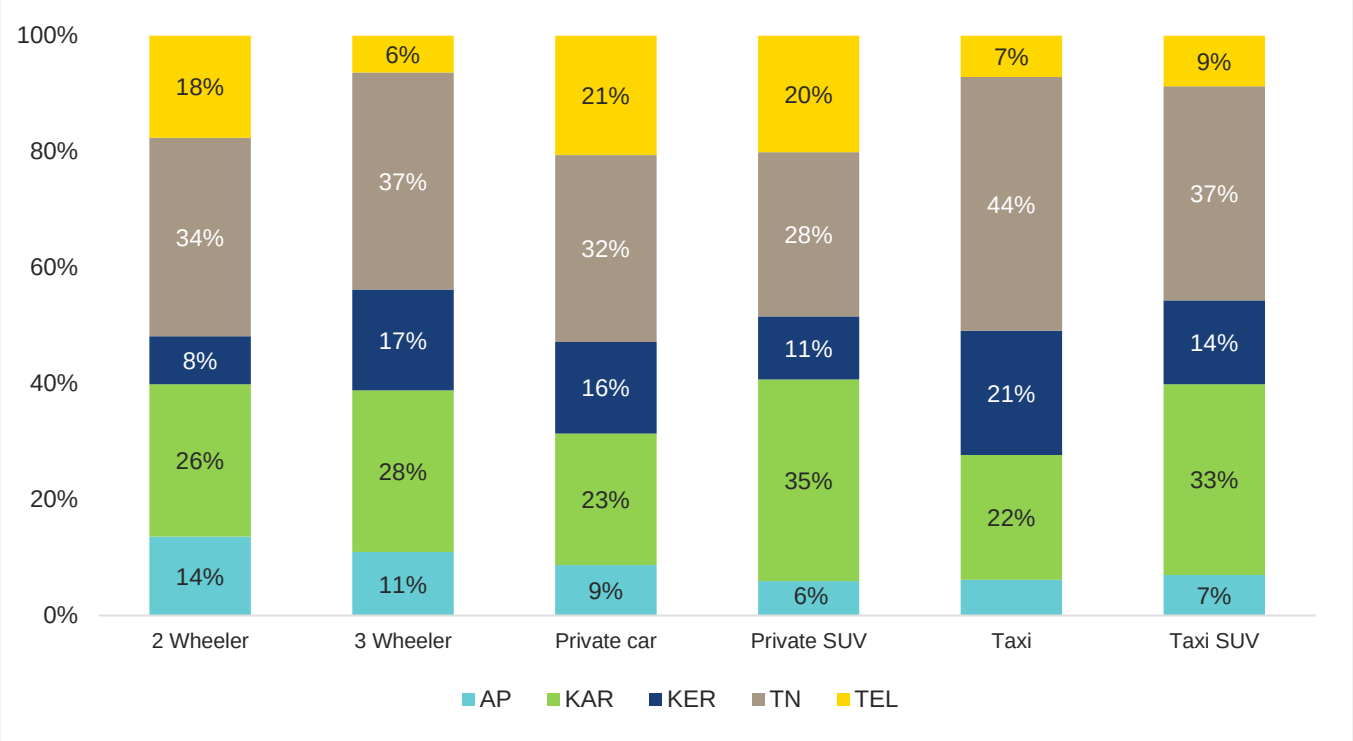
From the above chart following observations can be made:

- Karnataka and Telangana had higher share agricultural segment. Also, diesel sold to Mobile Towers in Karnataka state had contribution of ~75% during this survey period. Karnataka, Tamil Nadu and Telangana had 34%, 26% and 18% share respectively in Other-Industrial segment.

6.2.3.2 Petrol Sales

End user segment wise petrol sale pattern in north zone is shown in following figure:

Figure 62: End user segment wise analysis of petrol sale



Source: CRIS analysis & primary survey

From the above chart following observation can be made:

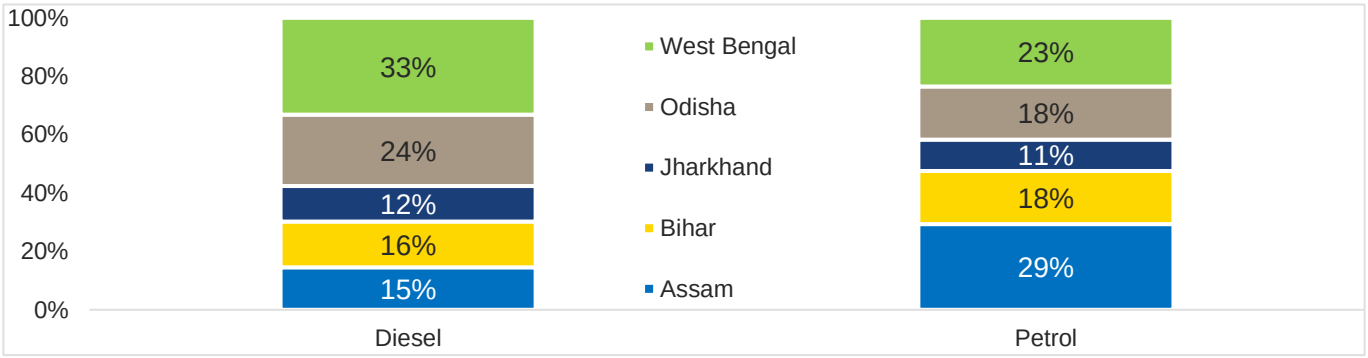
- Share of petrol sales to most of segment in the south zone was highest from Tamil Nadu during this survey period. Karnataka contributed ~23% in petrol sold to Private car in south zone. Private SUV and Taxi SUV also saw higher contribution from Karnataka.

6.2.4 East zone

6.2.4.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 63: Diesel and petrol sales



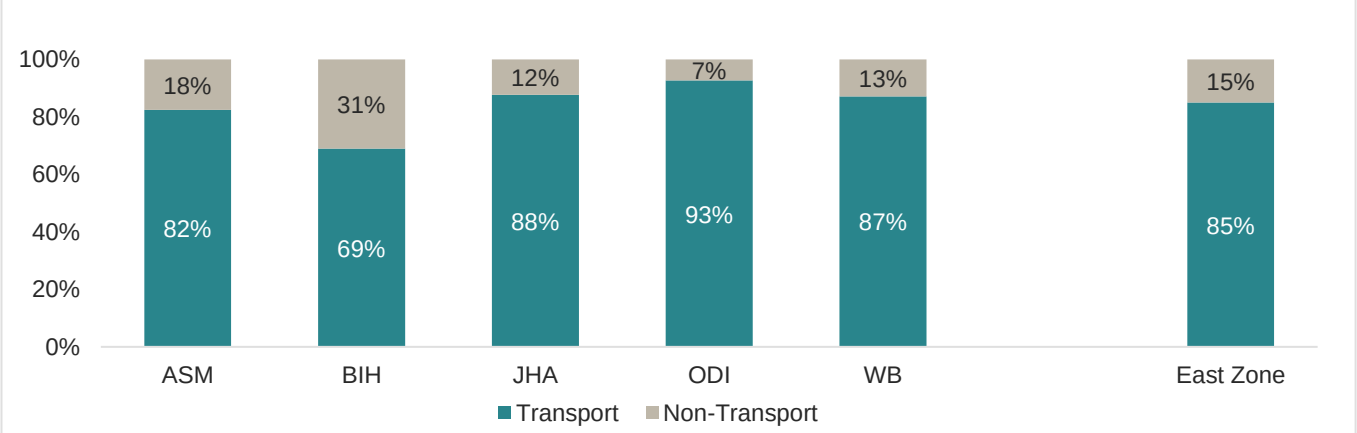
Source: CRIS analysis & primary survey

Following observations are made:

- In total diesel sales in east zone, highest sales were recorded in West Bengal (33% of total diesel sold in east zone) and lowest were recorded in Jharkhand (12% of total diesel sold in east zone).
- In total petrol sales in east zone, highest sales were recorded in Assam (29% of total petrol sold in east zone) and lowest were recorded in Jharkhand (11% of total petrol sold in east zone).

In east zone, diesel sales to transport segment contributed 85% in total diesel sale in east zone, remaining is contributed by non-transport segment (agriculture, power, industrial and others). Diesel consumption in transport sector of east zone is maximum in **West Bengal** and least in **Jharkhand**. Diesel consumption in non-transport of east zone is maximum in **Bihar** and least in **Jharkhand**.

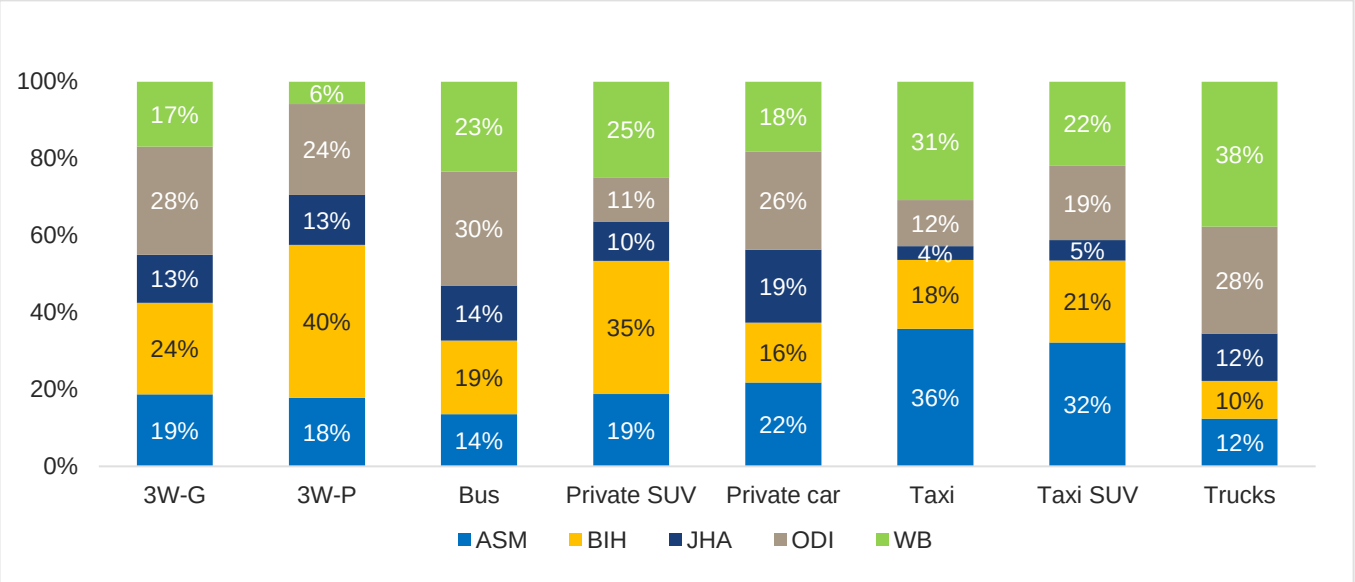
Figure 64: End use share of diesel



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in east zone.

Figure 65: End use share of diesel sold to transport segment



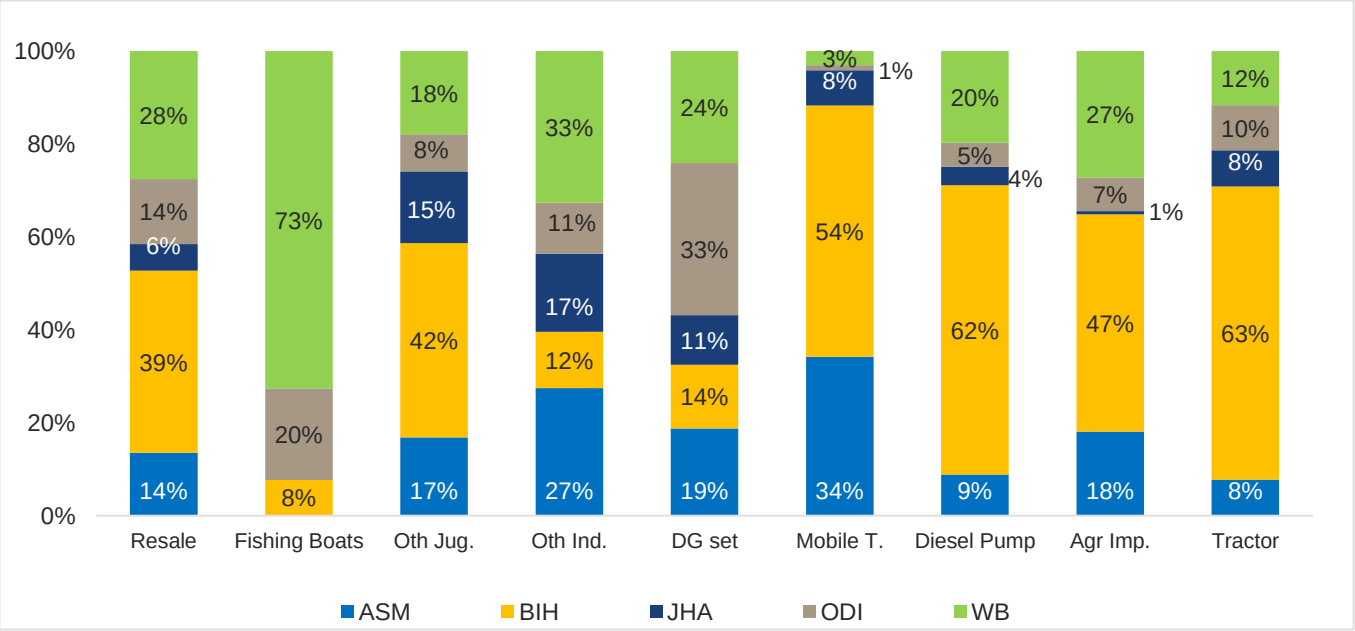
Source: CRIS analysis & primary survey

From above chart following observations are made for sale of fuel from surveyed ROs:

- Trucks segment which is major contributor of diesel sales showed highest contribution to sale from West Bengal (38% of total diesel sale to trucks in east zone).
- During this survey period, festivities in the region has led to higher commercial activity in the east zone contributing to diesel sales for Private car, Taxi and Taxi SUV segment.
- Bihar saw highest diesel sale in Private SUV category due to mass movement of people during Chatt festival.

In non-transport segment of diesel, following figure shows sales pattern across east zone:

Figure 66: Non-transport segment share of diesel sold



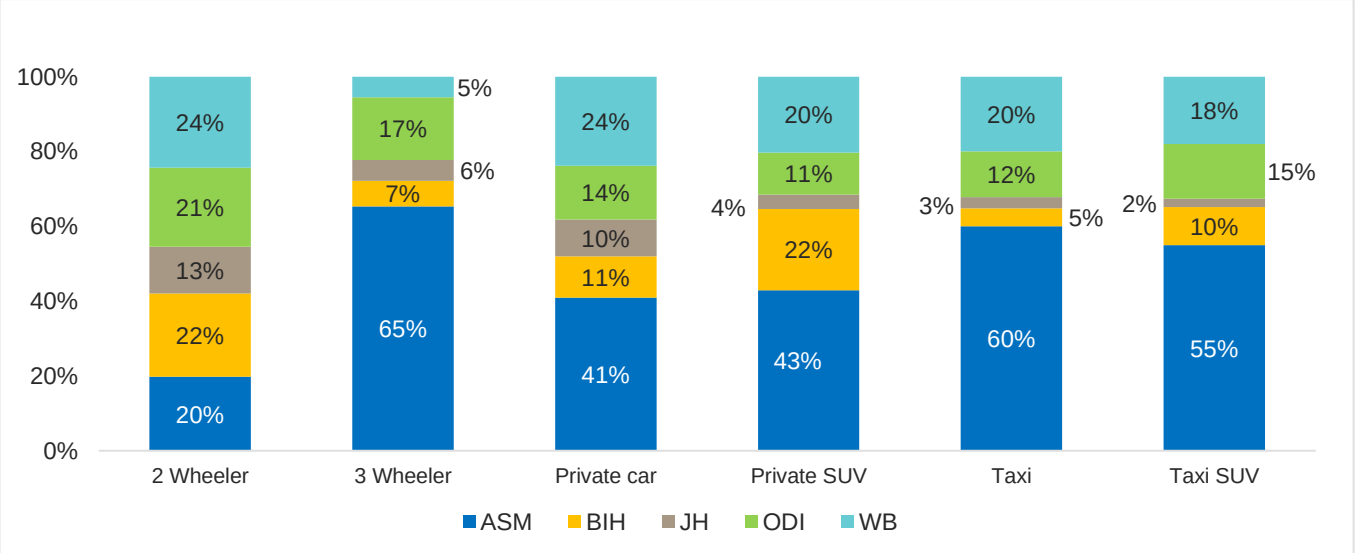
Source: CRIS analysis & primary survey

This survey period saw heavy movement for agricultural produce during the quarter from Bihar that has led to its higher contribution of diesel sales to Tractor segment (63%). Share of diesel sale for other industrial usage has been dominated by West Bengal and Assam.

6.2.4.2 Petrol Sales

End user segment wise petrol sale pattern in north zone is shown in following figure:

Figure 67: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

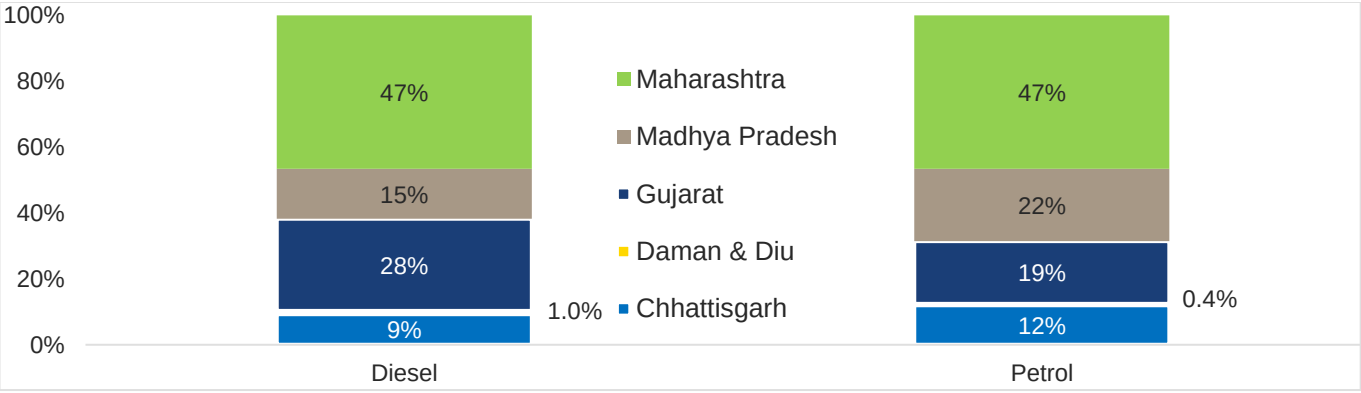
During this survey period Assam saw higher contribution to petrol sales from Private cars and Taxi segment. Petrol sales to 2-Wheeler segment was approximately equally distributed in the east zone.

6.2.5 West zone

6.2.5.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 68: Diesel and petrol sales



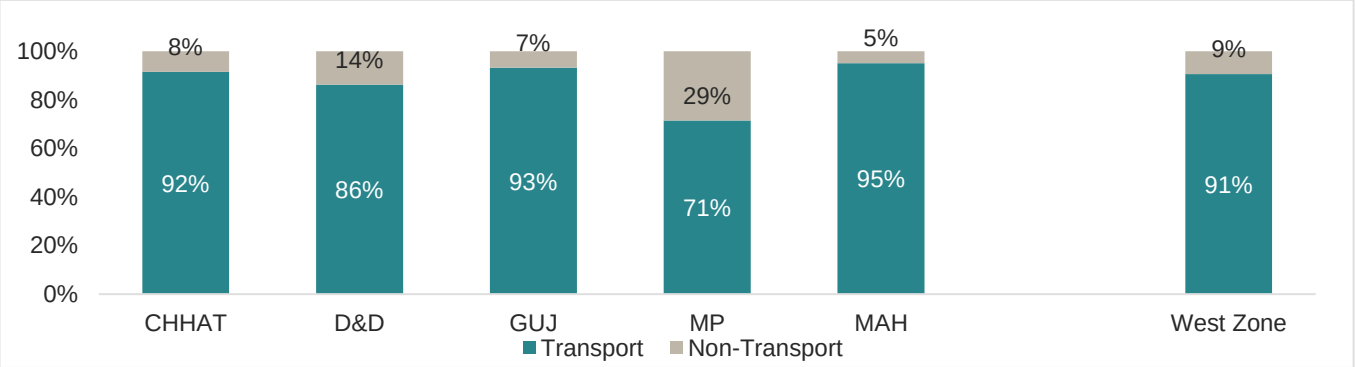
Source: CRIS analysis & primary survey

Following observations are made:

- In total diesel sales in west zone, highest sales were recorded in Maharashtra (47% of total diesel sold in west zone) and lowest were recorded in Daman & Diu (1% of total diesel sold in west zone).
- In total petrol sales in west zone, highest sales were recorded in Maharashtra (47% of total petrol sold in west zone) and lowest were recorded in Daman & Diu (0.39% of total petrol sold in west zone).

In west zone, diesel sales to transport segment contributed 91% in total diesel sale in west zone, remaining is contributed by non-transport segment (agriculture, power, industrial and others). Diesel consumption in transport sector and non-transport of west zone is maximum in Maharashtra (49% of total diesel to transport segment in west zone) and least in Daman & Diu (1% of total diesel to transport segment).

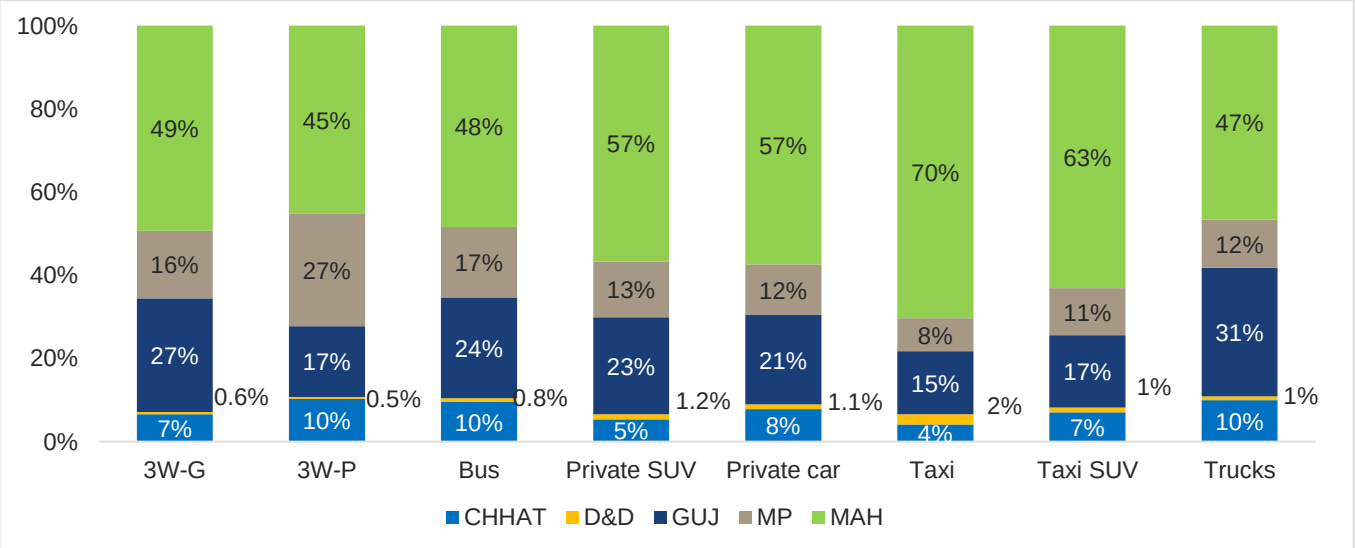
Figure 69: End use share of diesel



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in west zone.

Figure 70: End use share of diesel sold to transport segment

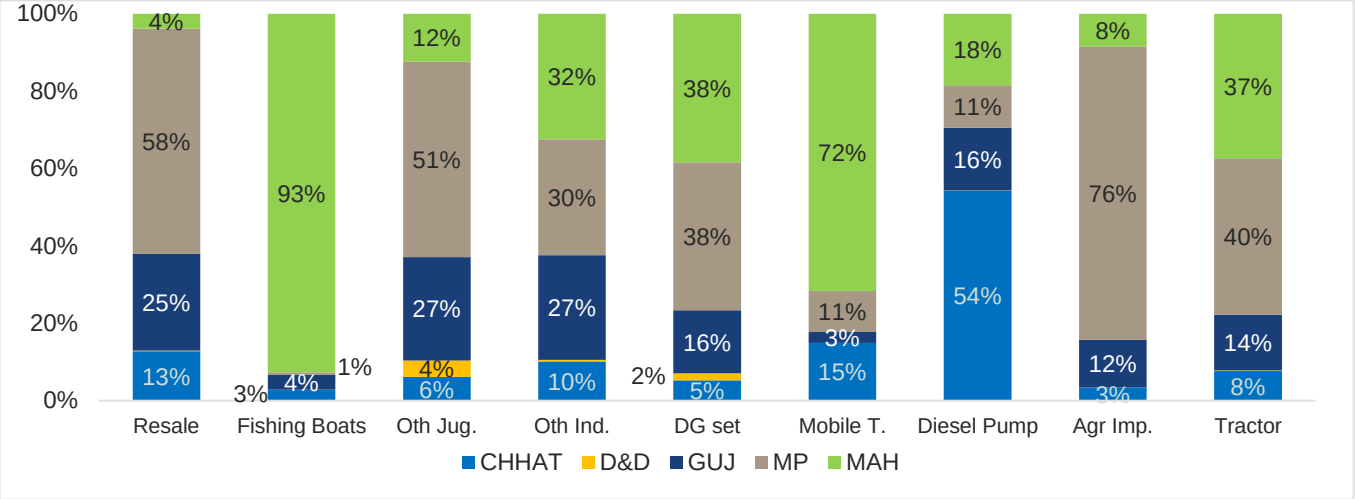


Source: CRIS analysis & primary survey

Trucks segment saw contribution of ~47% from Maharashtra in diesel sold to trucks in west zone during this survey period. Gujarat where new year falls during these months saw higher trade activity. Both Maharashtra and Gujarat also saw increasing diesel & petrol sales in private car segment presumably due to higher commercial activity on the occasion of festive shopping during these months.

In non-transport segment of diesel, following figure shows sales pattern across west zone:

Figure 71: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

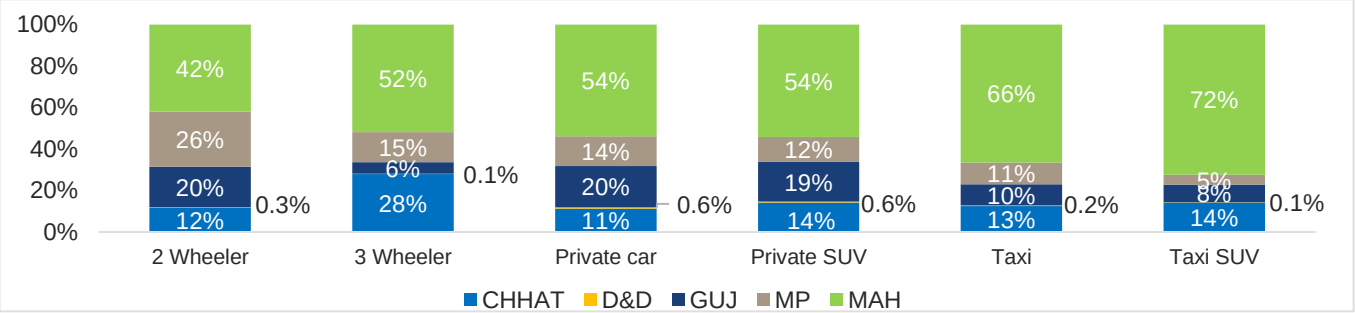
From the above chart following observations can be made:

- Higher agricultural activity was observed in Madhya Pradesh leading to higher share in diesel sale in agriculture implements and tractors segment.
- The consumption of diesel in DG set commercial and industrial was relatively higher in Madhya Pradesh due to poor electricity supply specifically in these two segments. The average power cut in the state of Madhya Pradesh during the quarter was ~2.3 hours/day *(Source CEA)*.
- Diesel sale to fishing boats and Mobile Towers was high from Maharashtra.
- Madhya Pradesh has contribution of ~30% in Other-industrial segment. Gwalior district which is one of the important commercial and industrial regions of Madhya Pradesh has highest share in diesel consumed in industrial sector.

6.2.5.2 Petrol Sales

End user segment wise petrol sale pattern in north zone is shown in following figure:

Figure 72: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

Maharashtra leads in all segments of petrol sales. This quarter saw higher commercial activity on account of festival season. Taxi SUV (72%), 3-Wheeler (52%) and Private Cars (54%) contributed highest towards petrol sales in Maharashtra. In Madhya Pradesh 2-Wheeler contributed 26% in petrol sales in Madhya Pradesh while private car contributed only 14%.

7. January - March 2021 All India consolidated findings- Retail

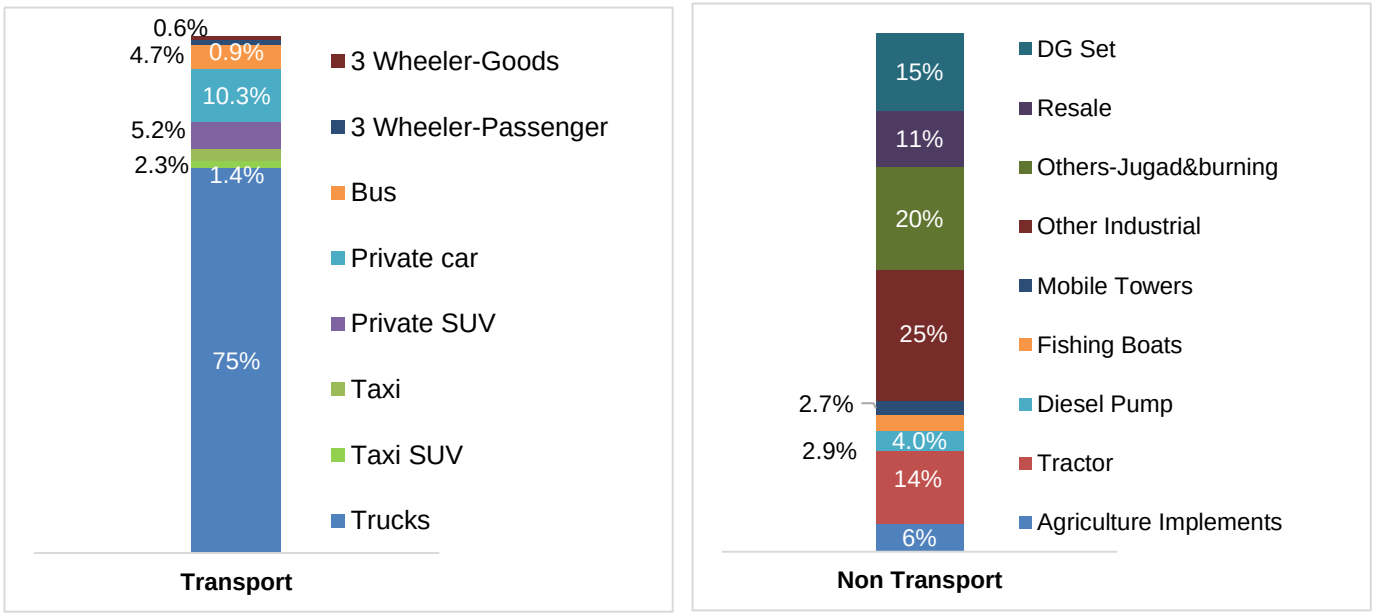
7.1 Sales- All India

The split of fuel sale between diesel and petrol was **69%** for diesel and **31%** for petrol. During this period, economic indicators showed an uptick indicating reviving economy. This quarter saw increased footfalls at retail outlets for each and every segment.

7.1.1 Diesel

Diesel segment at all India level, transport segment contributed **88%** to diesel sales and remaining **12%** share is contributed by non-transport segment. Following figure shows transport segment and non-transport segment wise diesel sale at all India level.

Figure 73: Diesel sale



Source: CRIS analysis & primary survey

Truck segment drives the highest share of diesel consumption in the transport sector. Second highest diesel consuming segment was **Private cars** (**10.3%** of diesel sold to transport category) and the lowest was sold to **Taxi-SUV** (**1.4%** of diesel sold to transport category). Diesel sales to power sector contributed **~18%** of overall diesel sales in the non-transport segment. Accordingly, diesel sales were highest in DG-Industrial (**7.9%** of overall diesel sales in the non-transport segment**)** and lowest in DG-Residential (**2.4%** of overall diesel sales in the non-transport segment), while DG-Commercial contributed **4.6%** of overall diesel sales in the non-transport segment. Mobile towers contributed **2.7%** of overall diesel sales in the non-transport segment.

Agricultural sector remained at **23%** of total diesel sold to non-transport category. This is contributed by tractors, agricultural implements and diesel pumps.

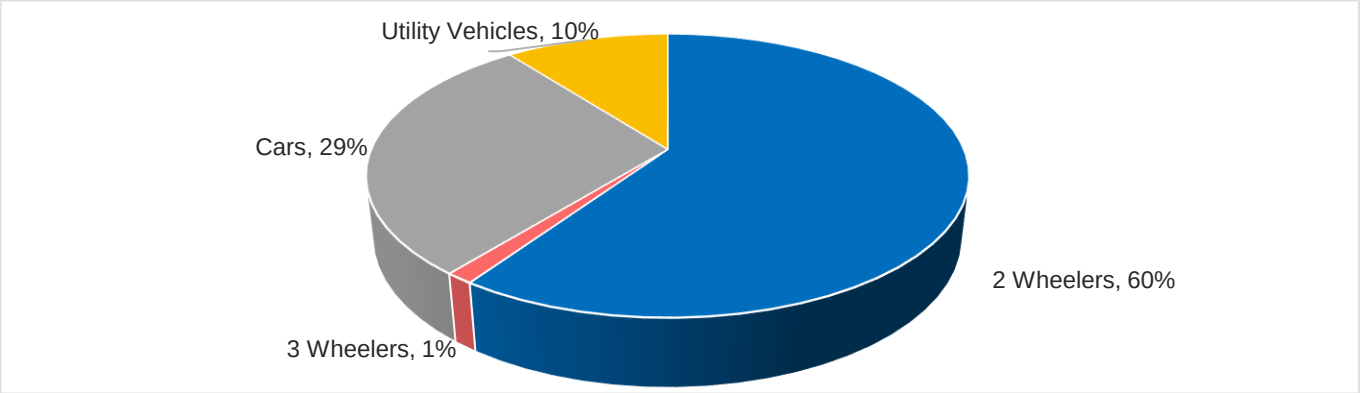
Industrial: The industrial sector (*Other Industrial*) – which contains sales of diesel in the industry for purposes other than power generation – contributed **25%** in total diesel sold to the non-transport category.

In the **others segment,** Others-Jugad and Burning contributed 20% share in diesel sold to the non-transport segment. Other categories in **others segment** are diesel sold to Resale and Fishing Boat which contributed **11%** and **3%** respectively to total diesel sold to non-transport category.

7.1.2 Petrol

Following figure represents share of end user vehicle segment for petrol sale.

Figure 74: Petrol sale



Source: CRIS analysis & primary survey

Following observations are made based on the above figure:

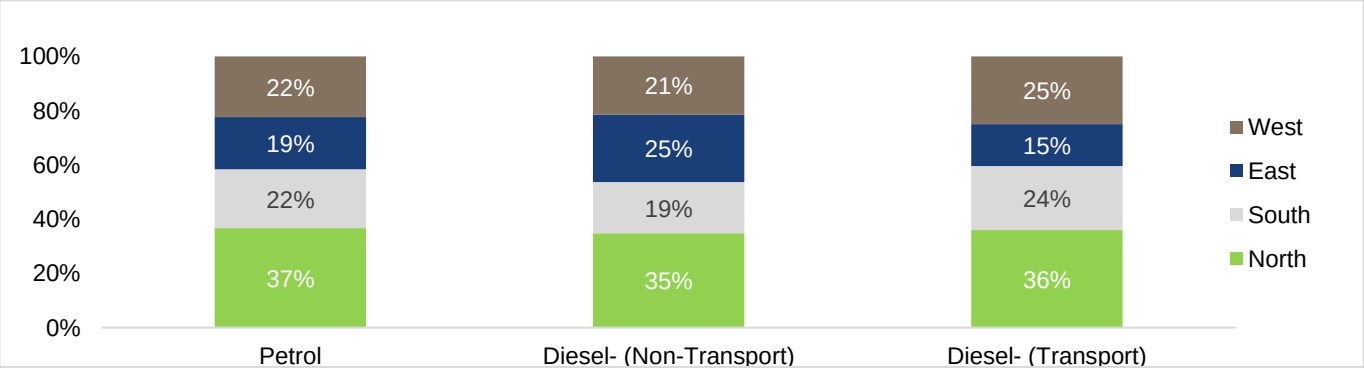
- Higher sale of petrol is observed in **2-Wheeler** category at 60% followed by **private cars** at 29%.
- The Utility segment, consisting Private SUV and Taxi SUV, contributes 10% to total petrol sales.

7.2 Zone wise analysis

7.2.1 PAN India

The following figure shows the diesel and petrol sales across zones (North, South, East and West) for the surveyed period.

Figure 75: Diesel and petrol sale zone wise- PAN India (% share)



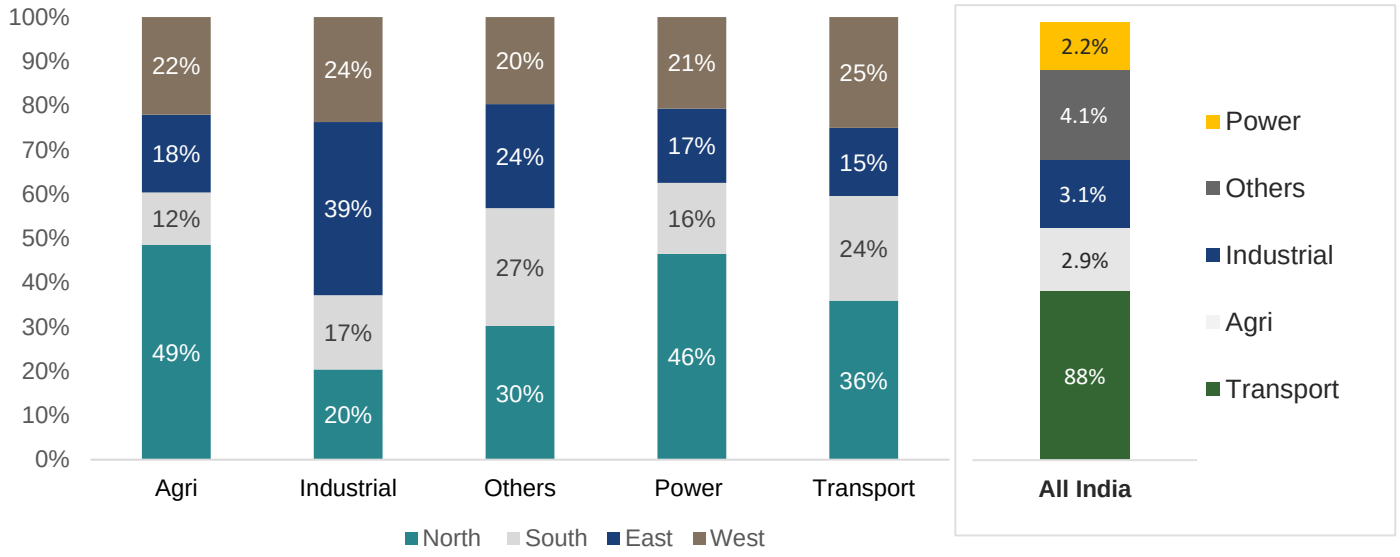
Source: CRIS analysis & primary survey

It is observed that diesel sale in transport segment was highest for north zone (36%) and lowest for east zone (15%). Further, diesel sale in non-transport segment has highest contribution from north zone (35%) and lowest from south zone (19%). For petrol, north zone has highest share (37%) and east zone has lowest share (19%).

7.2.1.1 Segment wise Diesel sales

Following figure depicts segment wise diesel sale across four zones and at All India level.

Figure 76: Segment wise Diesel sales –zonal (% share)



Source: CRIS analysis & primary survey

Following observations are made based on above figure

- For **transport segment** at zonal level, north zone (36%) contributes the highest quantity of diesel sold to transport segment followed by west zone (25%).

  *The top three states that contribute the highest in diesel sales to the truck segment are: **Uttar Pradesh** (15%), **Maharashtra** (14%) and **Haryana** (13%)*

- For Private car segment of petrol sales Maharashtra, Delhi and Uttar Pradesh were the highest contributors collectively contributing 36% to overall petrol sales to Private car segment.
- In taxi segment top three states are Rajasthan, Tamil Nadu and Maharashtra.
- For **agriculture segment**, north zone (49%) contributes the highest quantity of diesel sold to agriculture segment and lowest is contributed by south zone (12%). During the quarter, agriculture saw reduced activity presumably because this quarter lies in between Khariff harvesting and Rabi harvesting.
- *Uttar Pradesh, Haryana and Maharashtra are top 3 states collectively contributing 43% of total diesel sold to agriculture segment. This is due to the fact that these states have high area under food-grain cultivation and also higher share of surveyed ROs.*
- In **power segment**, north zone (46%) contributes the highest quantity of diesel sold to power segment and lowest is contributed by south zone (16%). The higher consumption is due to larger sample of surveyed ROs from north region. Further, in Haryana and Uttar Pradesh due to relatively poor sub-transmission and distribution network load shedding is common in most part of these states.

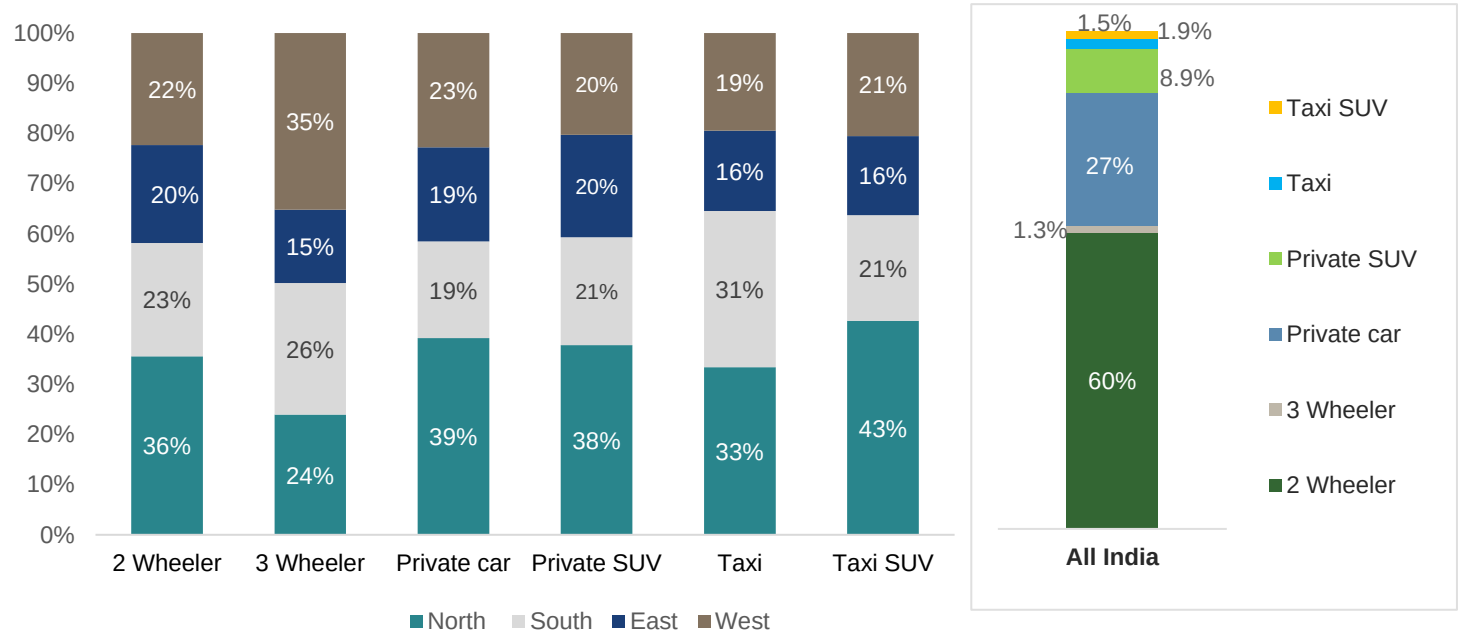
  Power supply disruptions due to power cuts in Haryana, Tamil Nadu and Uttar Pradesh led to the highest share of diesel sales for DG-Residential sets.

- *Uttar Pradesh, Haryana and Maharashtra has contributed **52%** collectively in the total diesel sale to DG-Industrial segment within non-transport category. The probable reason is the presence of industrial zone and SEZs in the surveyed districts*
- In **industrial segment**, east zone (39%) contributes the highest quantity of diesel sold to industrial segment and lowest is contributed by south zone (17%). Restriction specifically in the region of Delhi-NCR amid rising pollution levels has reduced diesel consumption by industrial segment in north zone.

7.2.1.2 Segment wise Petrol sales

Following figure depicts segment wise petrol sale across four zones and at All India level.

Figure 77: Segment wise Petrol sales –zonal (% share)



Source: CRIS analysis & primary survey

Following observations are made based on above figure

- Petrol sold to 2-Wheeler segment was highest in north zone (36%) followed by south zone (23%).

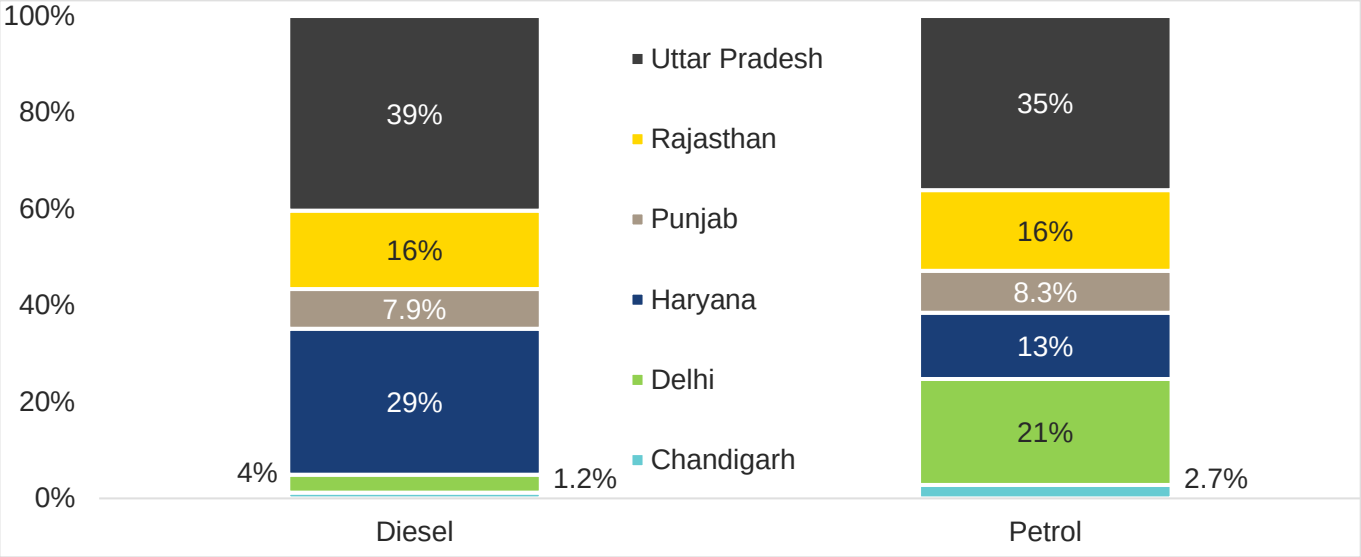
  The top three states with highest contribution to 2-Wheeler segment are Uttar Pradesh, Maharashtra and Delhi, collectively contributing 31% to overall petrol sales to 2-Wheeler segment.
- North zone (39%) contributes the highest share in petrol sold to private cars segment, followed by west zone (23%)

7.2.2 North Zone

7.2.2.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 78: Diesel and petrol sales - North Zone (% share)



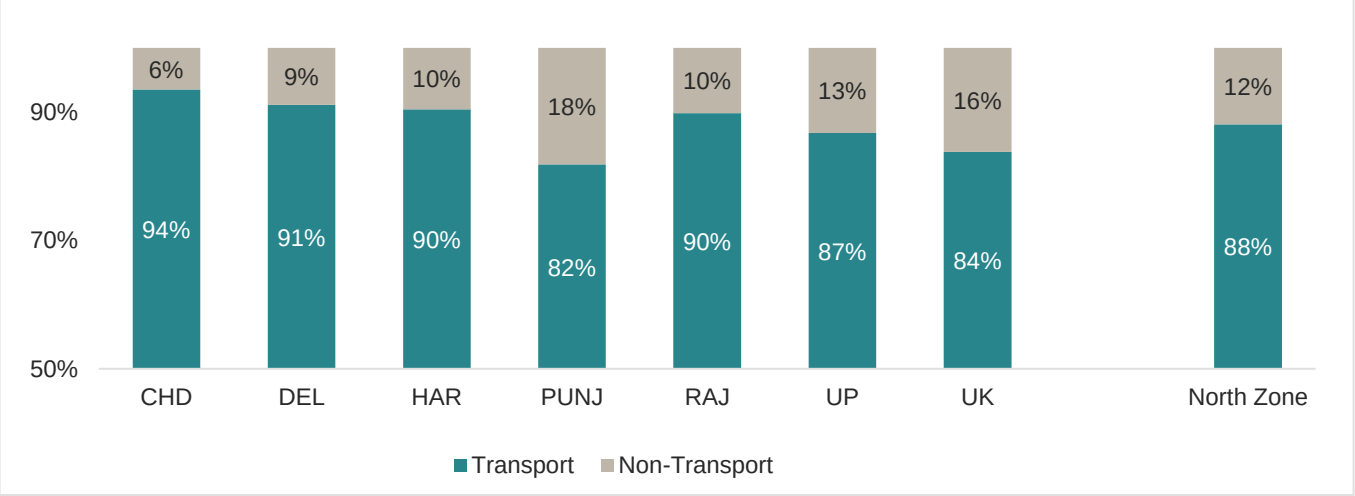
Source: CRIS analysis & primary survey

Following observations are made from the above table:

- In total diesel sales, highest sales were recorded in Uttar Pradesh (39% of total diesel sold in north zone) and lowest were recorded in Chandigarh (1.2% of total diesel sold in north zone).
- In total petrol sales, Uttar Pradesh (35% of total petrol sold in north zone) recorded the highest sale, while the lowest sale was recorded in Chandigarh (2.7% of total petrol sold in north zone).

Diesel sales to **transport segment** contributed 88%, remaining is contributed by **non-transport segment** (agriculture, power, industrial and others). Consumption in transport and non-transport sector is maximum in **Uttar Pradesh**.

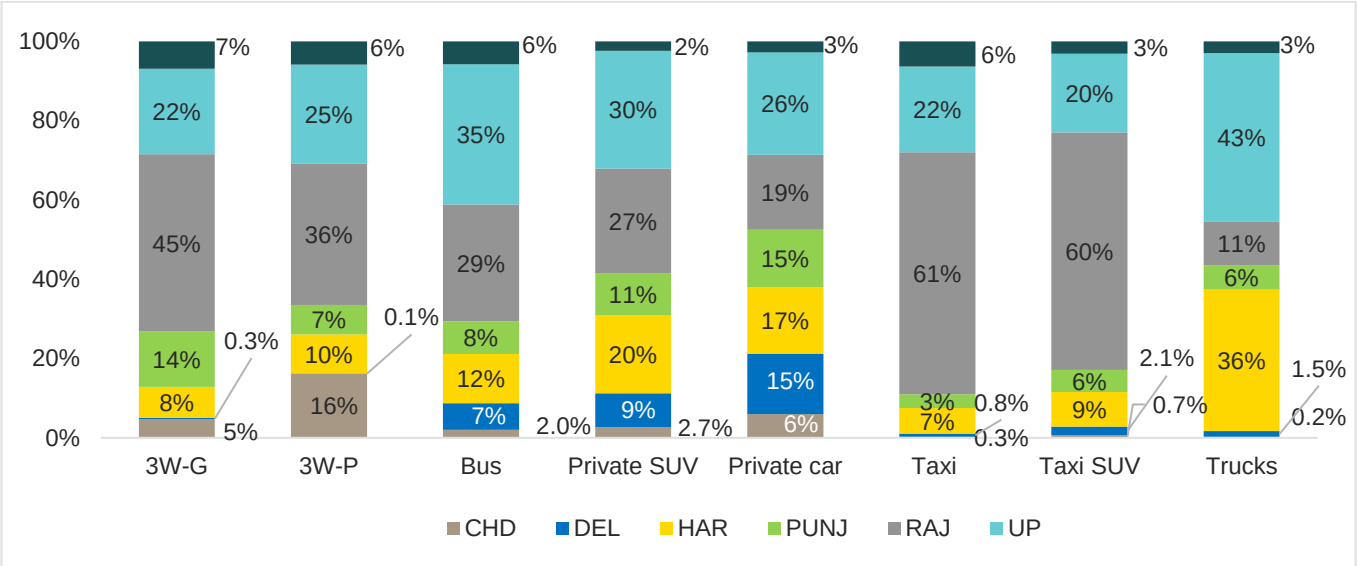
Figure 79: End use share of diesel- North Zone



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in north zone.

Figure 80: End use share of diesel sold to transport segment



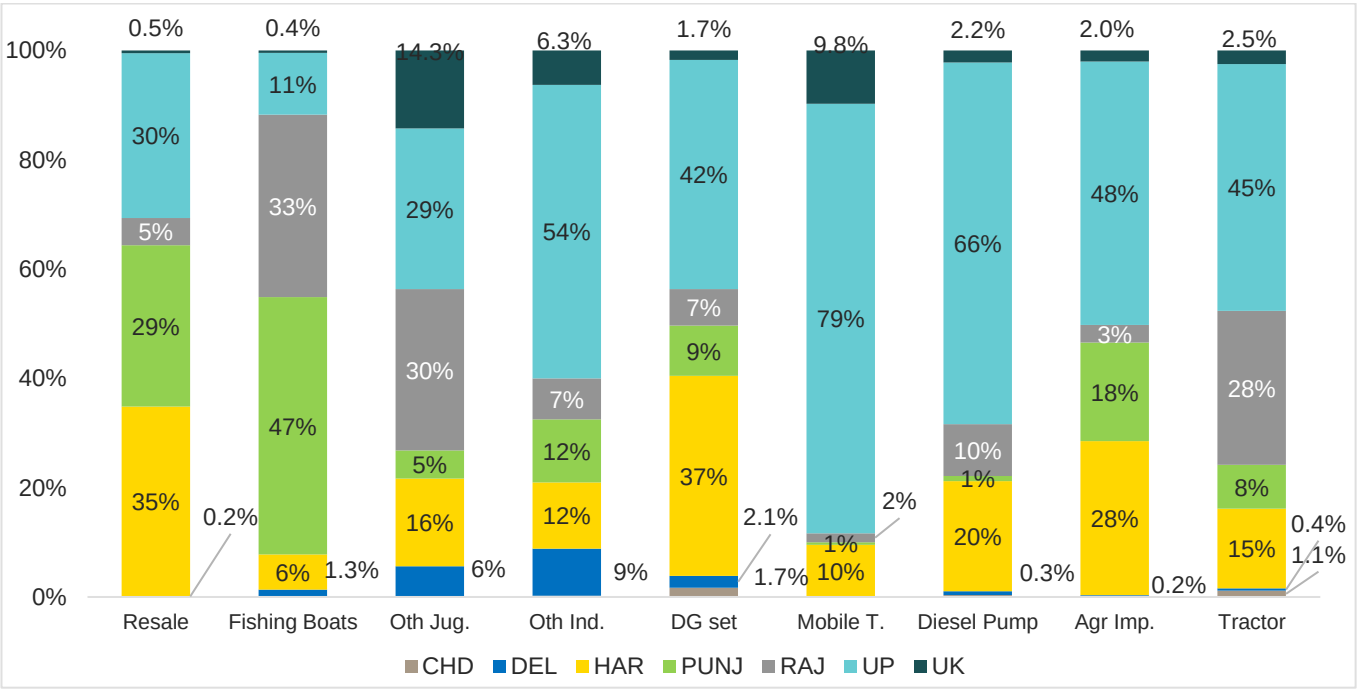
Source: CRIS analysis & primary survey

From above chart following observations are made for sale of fuel from surveyed ROs:

- Rajasthan has witnessed the highest share of diesel sale within north zone in 3-wheeler goods, passenger and taxi segments. While, Uttar Pradesh has the highest share in other transport segments.

In non-transport segment of diesel, following figure shows sales pattern across north zone:

Figure 81: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

From the above chart following observations can be made:

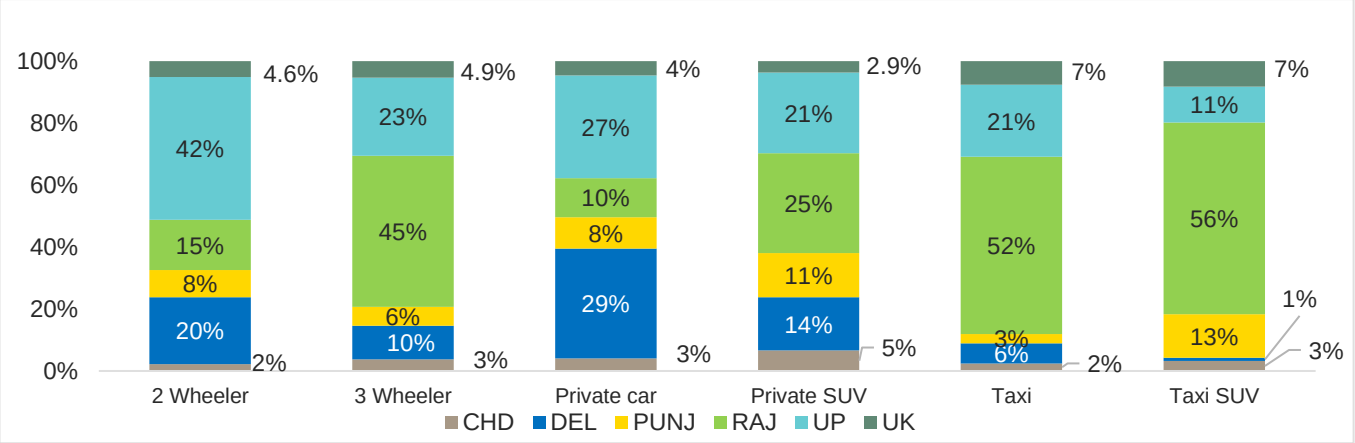
- Consumption of diesel by DG set used at mobile towers is highest in Uttar Pradesh (79% of total diesel sold to Mobile Towers in north zone).

- Further, diesel sale to agricultural implements was high in Uttar Pradesh at 48% followed by Haryana at 28%
- DG set diesel consumption in north zone was highest in Uttar Pradesh (42%) followed by Haryana (37%).

7.2.2.2 Petrol Sales

End user segment wise petrol sale pattern in north zone is shown in following figure:

Figure 82: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

From the above chart following observations can be made:

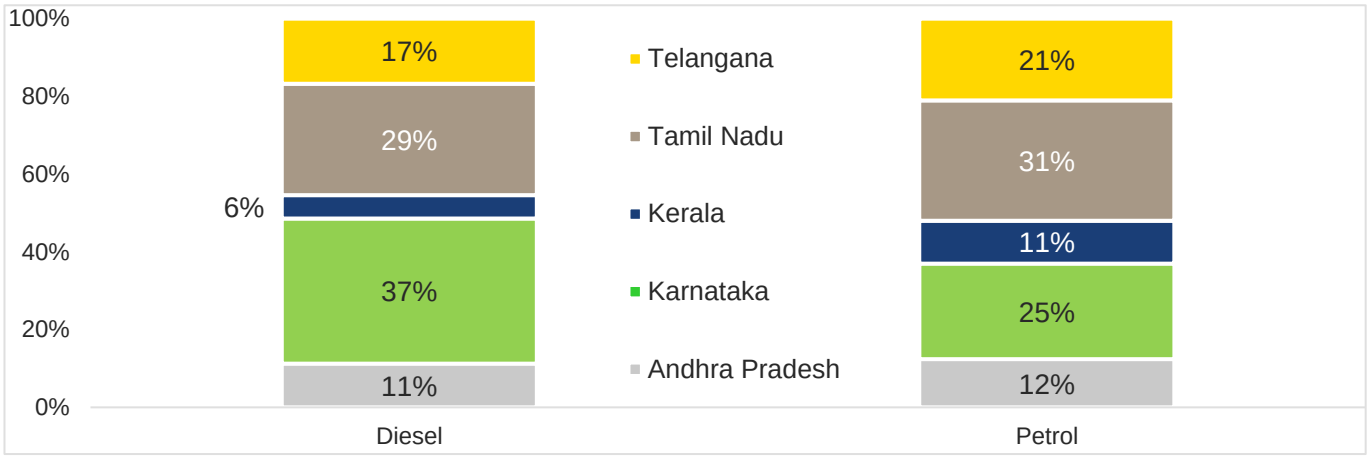
- Delhi has 29% share in Private cars during this survey period
- Due to high proportion of 3-Wheeler vehicles in Rajasthan, higher consumption of petrol from these two segments has been observed.
- Uttar Pradesh has higher proportion (42%) of petrol sales from 2-Wheeler segment

7.2.3 South zone

7.2.3.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 83: Diesel and petrol sales South Zone (% share)



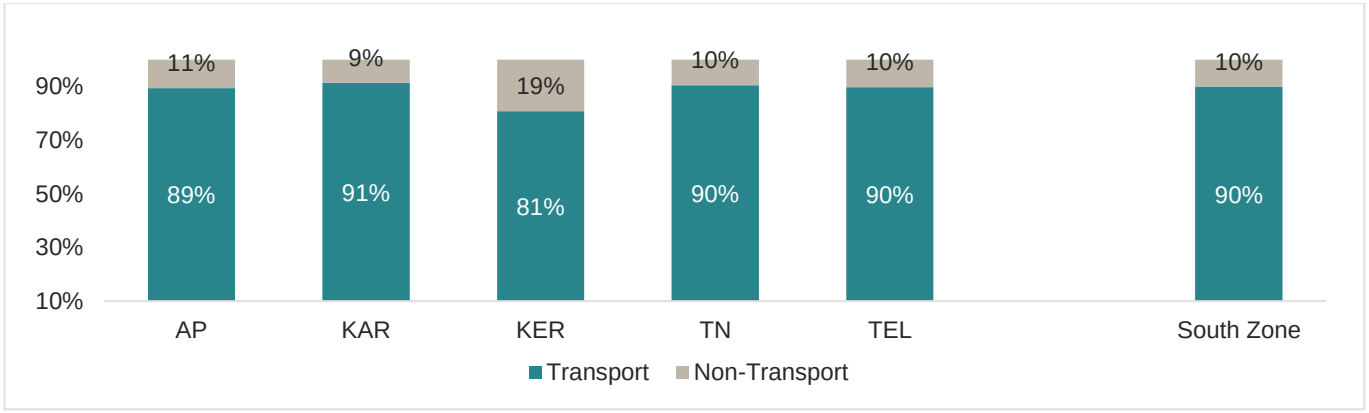
Source: CRIS analysis & primary survey

Following observations are made:

- In total diesel sales, highest sales were recorded in **Karnataka** (37% of total diesel sold in south zone), while lowest were recorded in **Kerala** (6% of total diesel sold in south zone).
- In total petrol sales, highest sales were recorded in **Tamil Nadu** (31% of total petrol sold in south zone) and lowest were recorded in Kerala (11% of total petrol sold in south zone).

Diesel sales to transport segment contributed 90%, remaining 10% is contributed by non-transport segment (agriculture, power, industrial and others). Diesel consumption in transport sector and non-transport of south zone is maximum in Karnataka and least in Kerala.

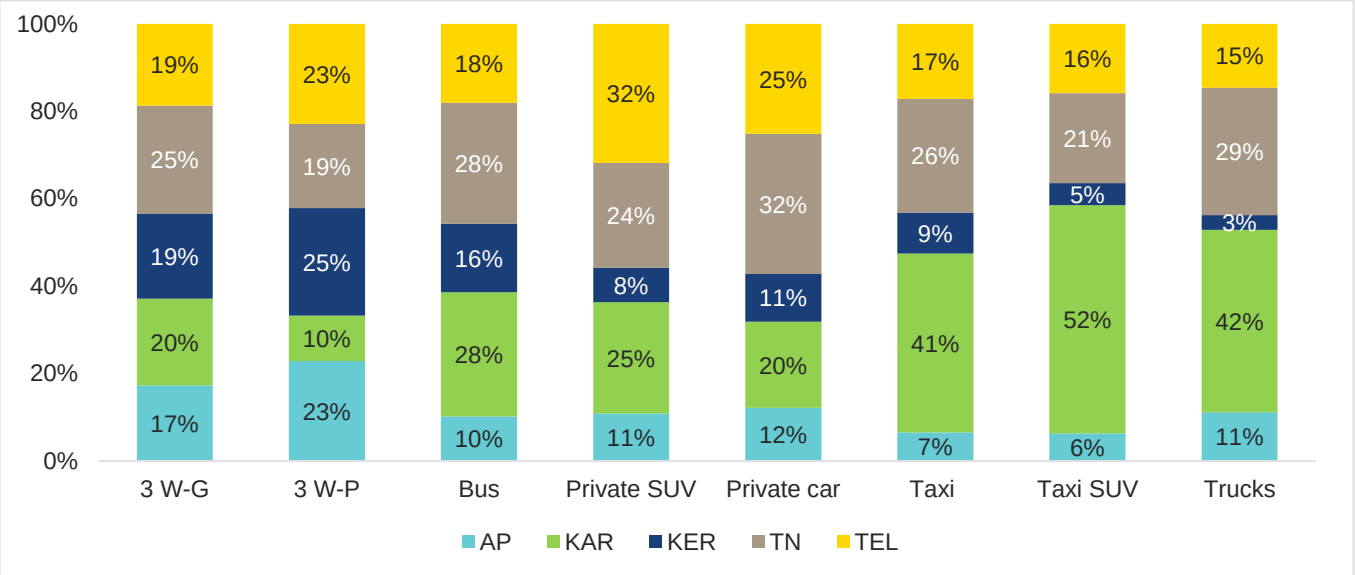
Figure 84: End use share of diesel - South Zone



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in south zone.

Figure 85: End use share of diesel sold to transport segment



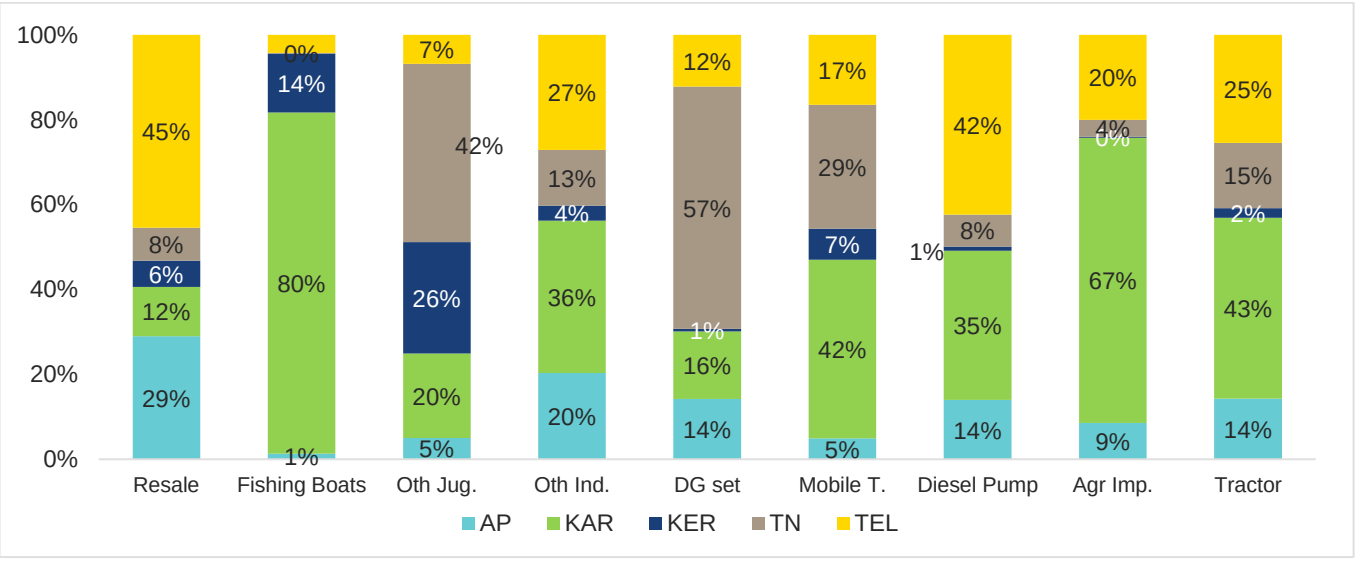
Source: CRIS analysis & primary survey

From above chart following observations are made for sale of fuel from surveyed ROs:

- Trucks segment which is major contributor of diesel sales showed highest contribution to sale from Karnataka (42% of total diesel sale to trucks in south zone).
- The share of Tamil Nadu and Telangana grew during this quarter for Private cars (32% Tamil Nadu; 25% Telangana) and SUV (24% Tamil Nadu; 32% Telangana) segments.

In non-transport segment of diesel, following figure shows sales pattern across south zone:

Figure 86: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

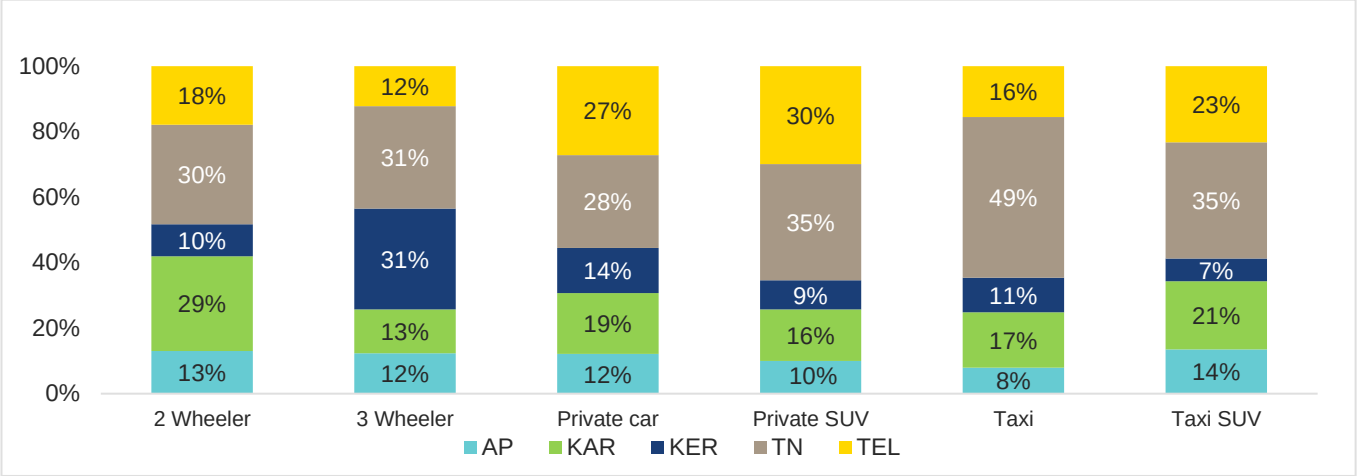
From the above chart following observations can be made:

- Karnataka and Telangana have higher offtake of diesel by Agriculture implements and tractor categories.

7.2.3.2 Petrol Sales

End user segment wise petrol sale pattern in north zone is shown in following figure:

Figure 87: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

From the above chart following observation can be made:

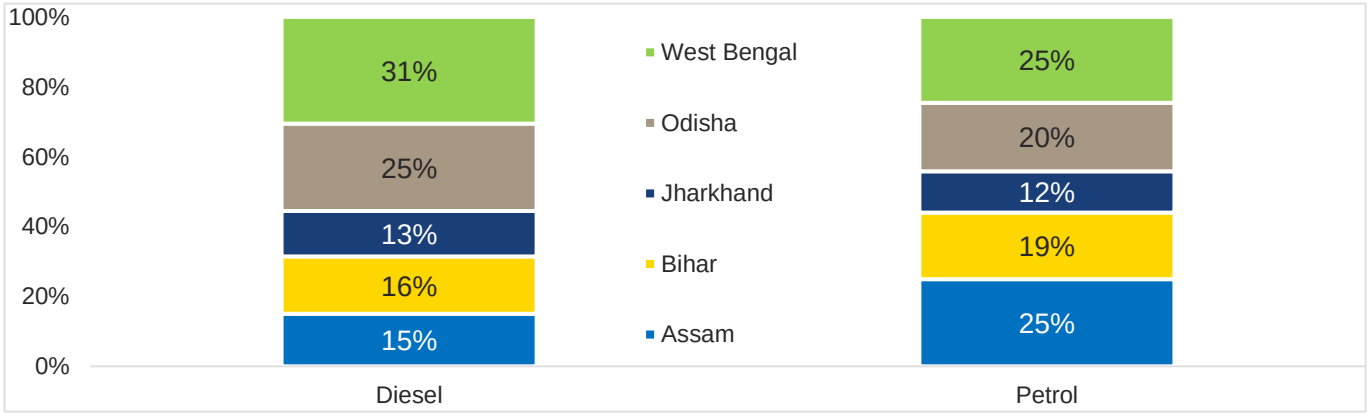
- Tamil Nadu across south zone has led to higher share in most of petrol segment.

7.2.4 East zone

7.2.4.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 88: Diesel and petrol sales - East Zone



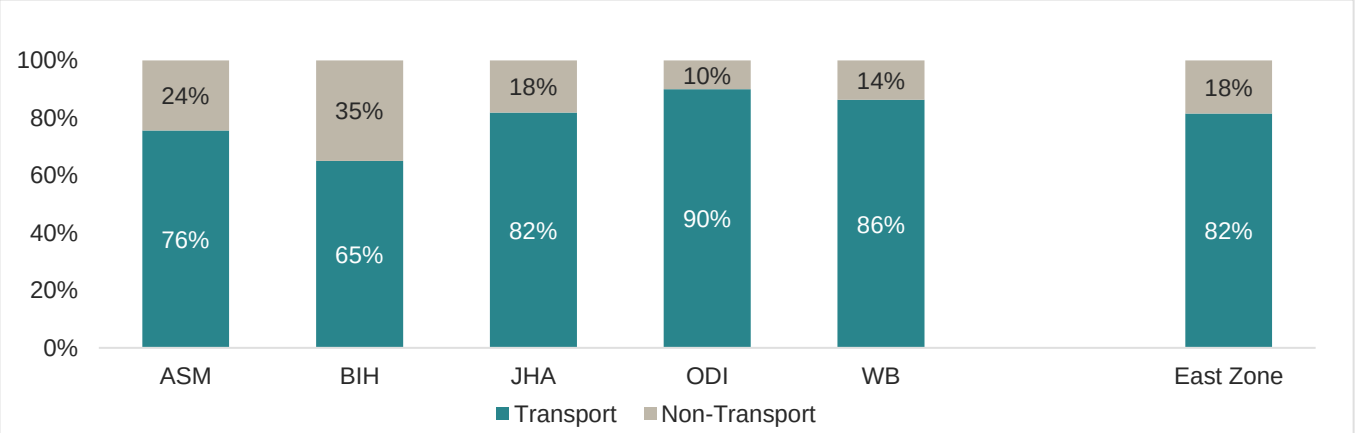
Source: CRIS analysis & primary survey

Following observations are made:

- In total diesel sales, highest sales were recorded in West Bengal (31% of total diesel sold in east zone) and lowest were recorded in Jharkhand (13% of total diesel sold in east zone).
- Highest petrol sales were recorded in Assam and West Bengal (25% each of total petrol sold in east zone) and lowest were recorded in Jharkhand (12% of total petrol sold in east zone).

Diesel sales to transport segment contributed **82%** in total diesel sale, remaining is contributed by non-transport segment (agriculture, power, industrial and others). Diesel consumption in transport sector of east zone is maximum in **West Bengal** and least in **Bihar**. Diesel consumption in non-transport is maximum in **Bihar** and least in **Jharkhand**.

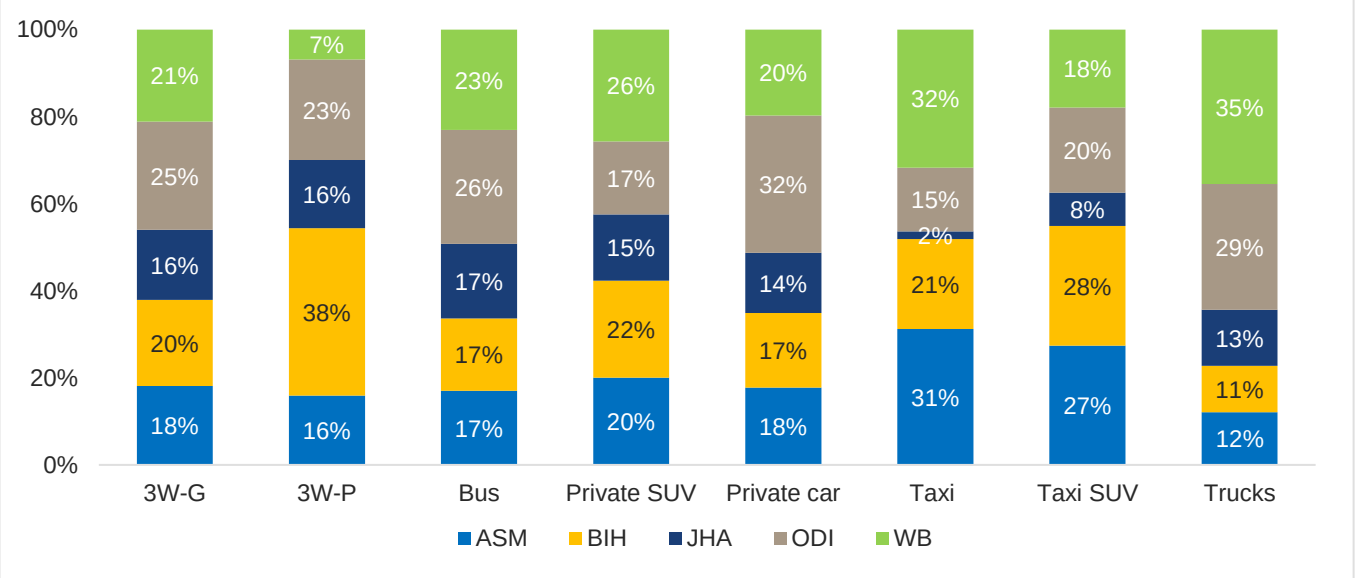
Figure 89: End use share of diesel - East Zone



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in east zone.

Figure 90: End use share of diesel sold to transport segment



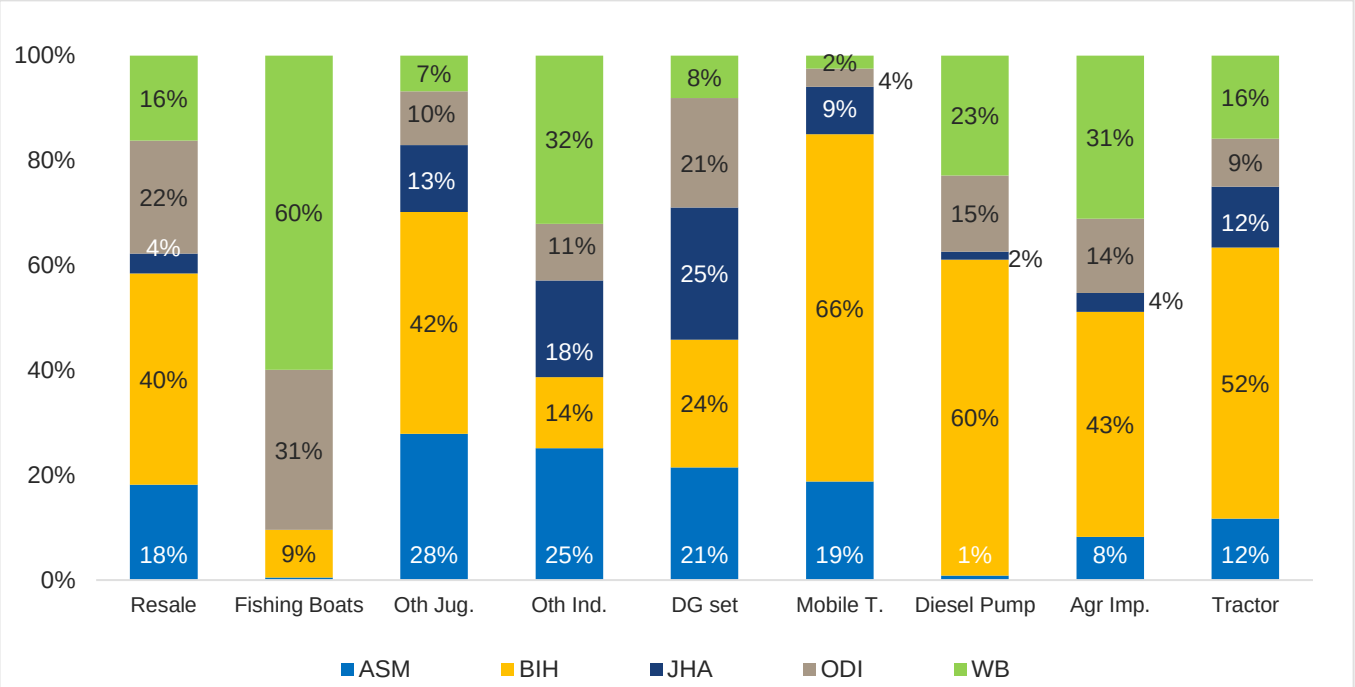
Source: CRIS analysis & primary survey

From above chart following observations are made for sale of fuel from surveyed ROs:

- Trucks segment which is major contributor of diesel sales showed highest contribution to sale from West Bengal (35% of total diesel sale to trucks in east zone). This could presumably be due to higher trade activity leading to higher diesel sales in the state.

In non-transport segment of diesel, following figure shows sales pattern across east zone:

Figure 91: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

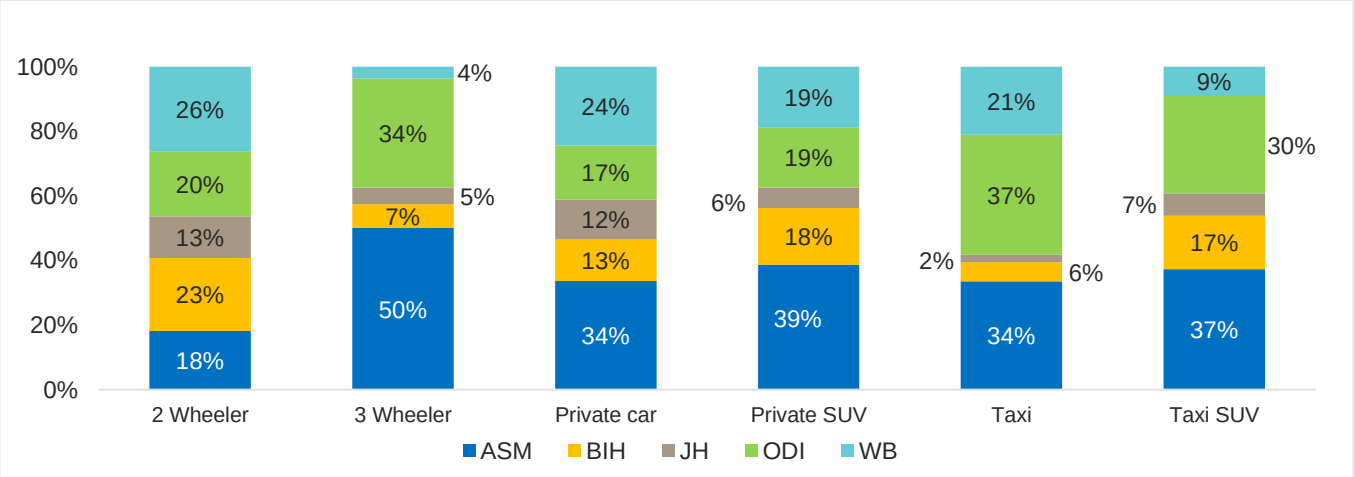
From the above chart following observations can be made:

- Bihar recorded the lion's share in diesel sale to tractors, diesel pump, mobile tower and agriculture segments.
- Share of diesel sale for other industrial usage has been dominated by West Bengal and Assam

7.2.4.2 Petrol Sales

End user segment wise petrol sale pattern in north zone is shown in following figure:

Figure 92: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

From the above chart following observations can be made:

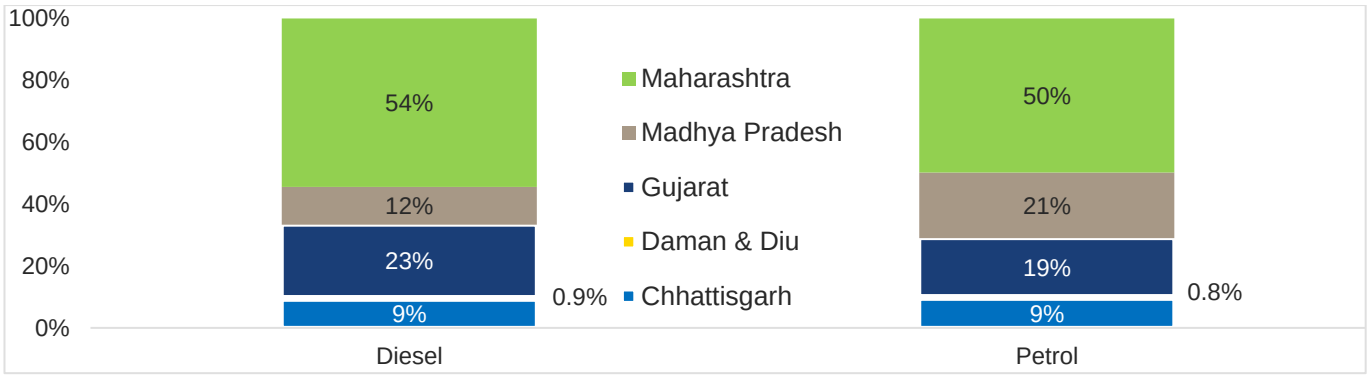
- Assam has higher contribution to petrol sales from Private cars.

7.2.5 West zone

7.2.5.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 93: Diesel and petrol sales - West Zone



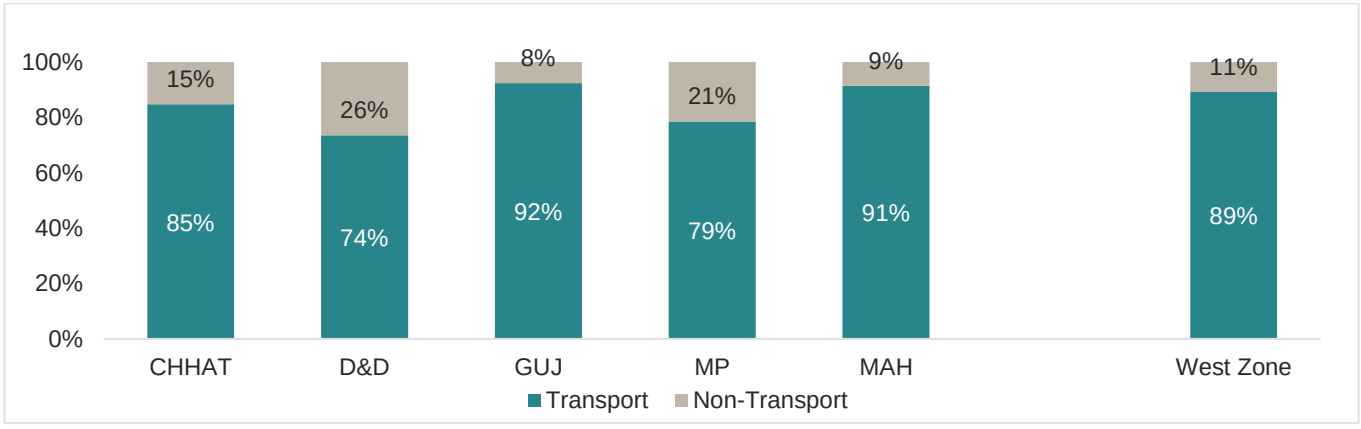
Source: CRIS analysis & primary survey

Following observations are made:

- Highest diesel sales were recorded in Maharashtra (54% of total diesel sold in west zone) and lowest were recorded in Daman & Diu (1% of total diesel sold in west zone).
- In total petrol sales, highest sales were recorded in Maharashtra (50% of total petrol sold in west zone) and lowest were recorded in Daman & Diu (1% of total petrol sold in west zone).

Diesel sales to transport segment contributed 89% in total diesel sale, remaining is contributed by non-transport segment (agriculture, power, industrial and others). Diesel consumption in transport sector and non-transport of west zone is maximum in **Maharashtra** (56% of total diesel to transport segment in west zone) and least in **Daman & Diu** (1% of total diesel to transport segment).

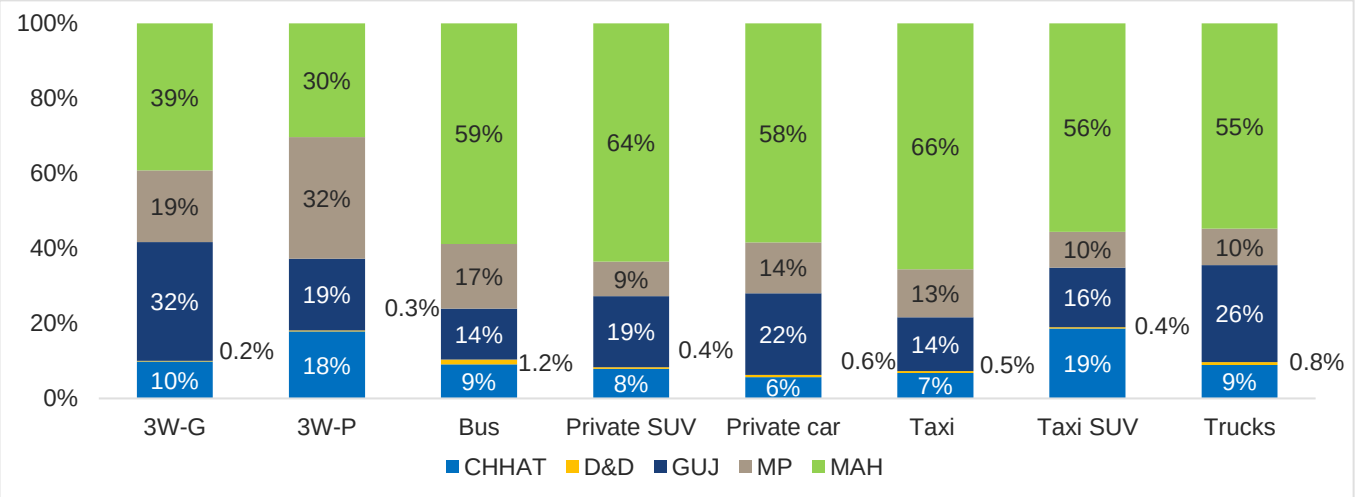
Figure 94: End use share of diesel - West Zone



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in west zone.

Figure 95: End use share of diesel sold to transport segment



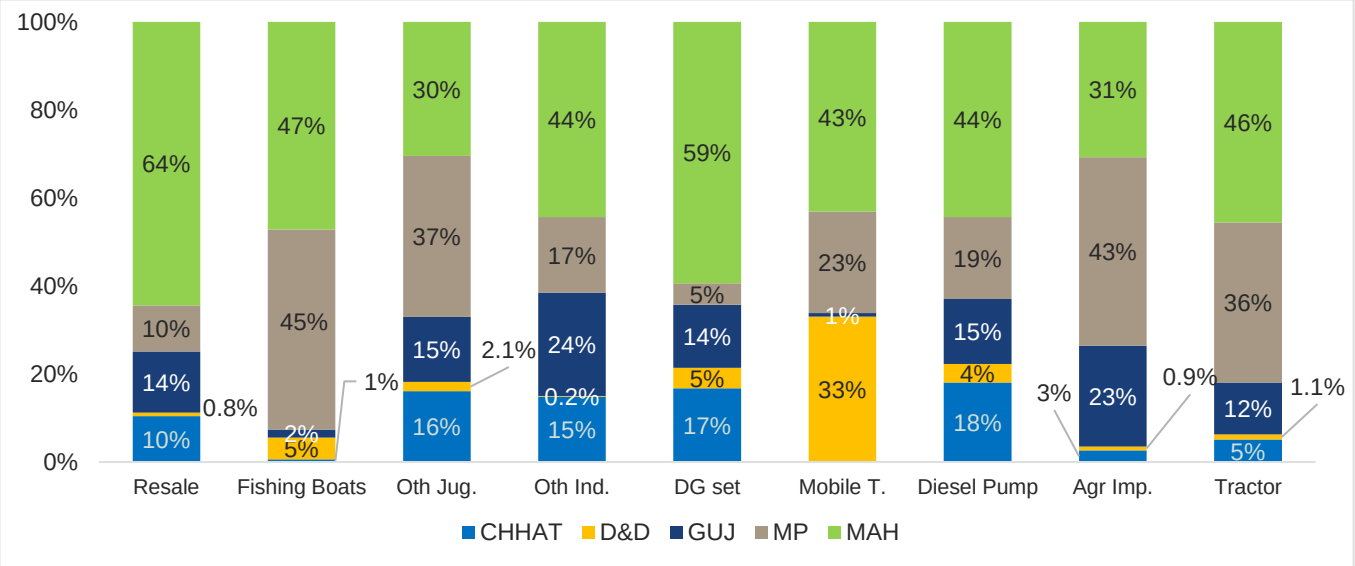
Source: CRIS analysis & primary survey

From above chart following observations are made for sale of fuel from surveyed ROs:

- Trucks segment which is major contributor of diesel sales showed highest contribution to sale from Maharashtra (55% of total diesel sale to trucks in west zone).
- Both Maharashtra and Gujarat also saw increasing diesel & petrol sales in private car segment.
- This survey period saw higher share of diesel sale to 3-Wheeler category from state of Madhya Pradesh (3-Wheeler Goods: 19%, 3-Wheeler Passenger: 32%) as compared to last quarter

In non-transport segment of diesel, following figure shows sales pattern across west zone:

Figure 96: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

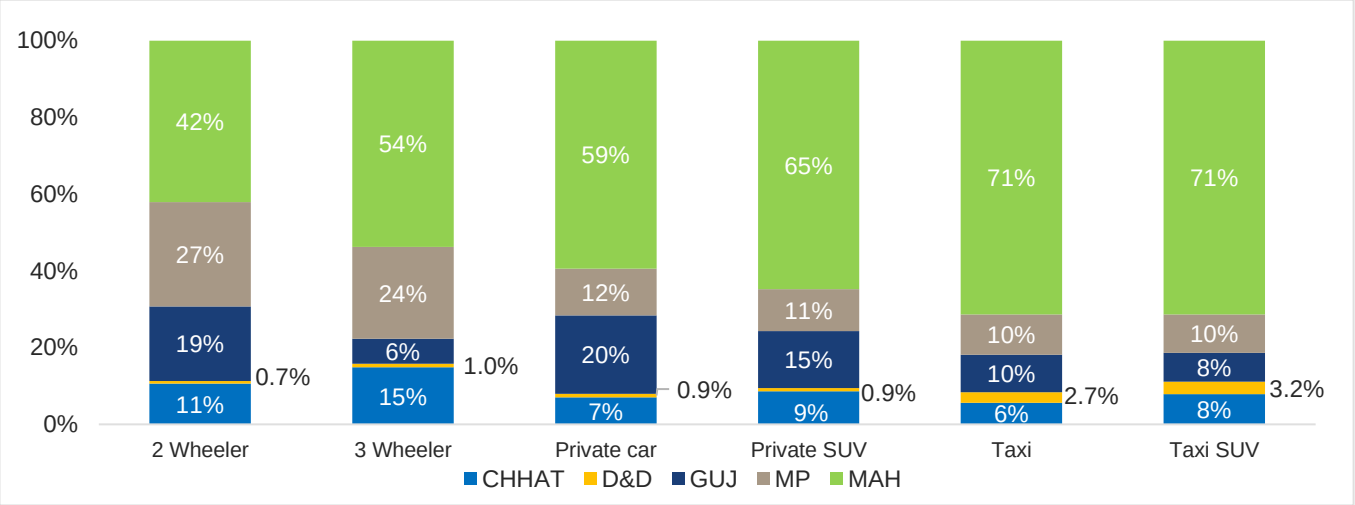
From the above chart following observations can be made:

- The consumption of diesel in DG set commercial and industrial was relatively higher in Maharashtra.
- Diesel sale to fishing boats and Mobile Towers was high from Maharashtra.

7.2.5.2 Petrol Sales

End user segment wise petrol sale pattern in north zone is shown in following figure:

Figure 97: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

From the above chart following observations can be made:

- Maharashtra leads in all segments of petrol sales. Taxi/Taxi SUV (71%), 3-Wheeler (54%) and private cars (59%) contributed highest towards petrol sales in Maharashtra. In Madhya Pradesh 2-Wheeler contributed 27% in petrol sales in Madhya Pradesh while private car contributed only 12%.

8. April- June 2021 All India consolidated findings-Retail

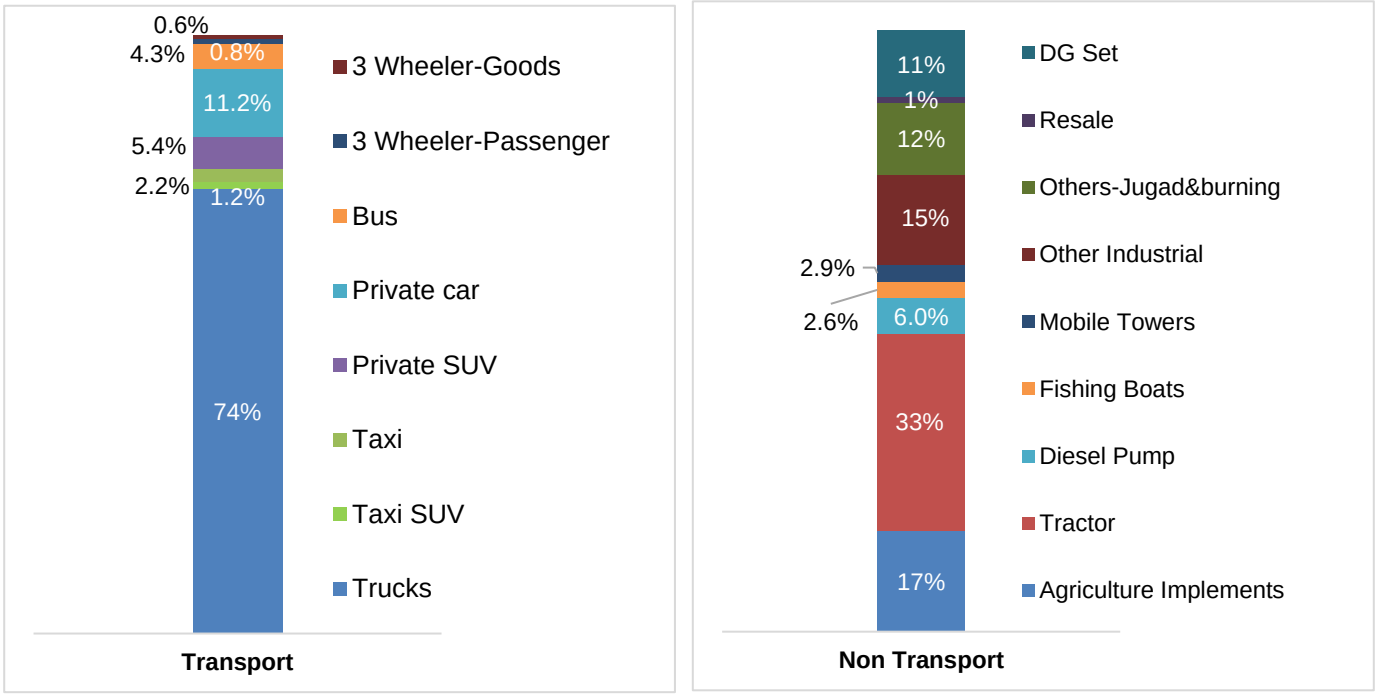
8.1 Sales- All India

The split of fuel sale between diesel and petrol was **70%** for diesel and **30%** for petrol. With the advent of second wave and respective state induced partial lockdowns impacted the mobility which resulted in lower footfall from retail outlets. However, agriculture activities were at peak due to Rabbi crop sowing season.

8.1.1 Diesel

Diesel segment at all India level, transport segment contributed **83%** to diesel sales and remaining **17%** share is contributed by non-transport segment. Following figure shows transport segment and non-transport segment wise diesel sale at all India level.

Figure 98: Diesel sale – segment wise (%)



Source: CRIS analysis & primary survey

From above graph following observations are made:

- Truck segment (74%) drives the highest share of diesel consumption in the transport sector.
- Second highest diesel consuming segment was **Private cars** (~**11%** of diesel sold to transport category) and the lowest was sold to **Taxi-SUV** (**1.2%** of diesel sold to transport category)
- **Power:** Diesel sales to power sector contributed **~14%** of diesel sales in the non-transport segment. Also, diesel sales were highest in DG-Industrial (~**6%** of overall diesel sales in the non-transport segment**)** and lowest in DG-Residential (**1.3%** of overall diesel sales in the non-transport segment), while DG-Commercial contributed **3.6%** of overall diesel sales in the non-transport segment.

Mobile towers contributed **2.9%** of overall diesel sales in the non-transport segment.

Power segment was similar in this quarter (2% in overall diesel sale) as compared to previous quarter (2% in overall diesel sale) but was higher than in Q1, presumably due to increased demand during summer season.

- **Agriculture:** agricultural sector sale boosted to **~56%** of total diesel sold to non-transport category. This is contributed by tractors, agricultural implements and diesel pumps. The probable reasons are Rabi crop sowing season, high area under food-grain cultivation and high share of surveyed ROs.

  Sale to Agriculture segment saw growth in this quarter (~9% in overall diesel sale) as compared to previous quarter (Q2: 3% and Q1: 5% in overall diesel sale) presumably due to higher agricultural activity during this quarter on account of Rabbi crop sowing.

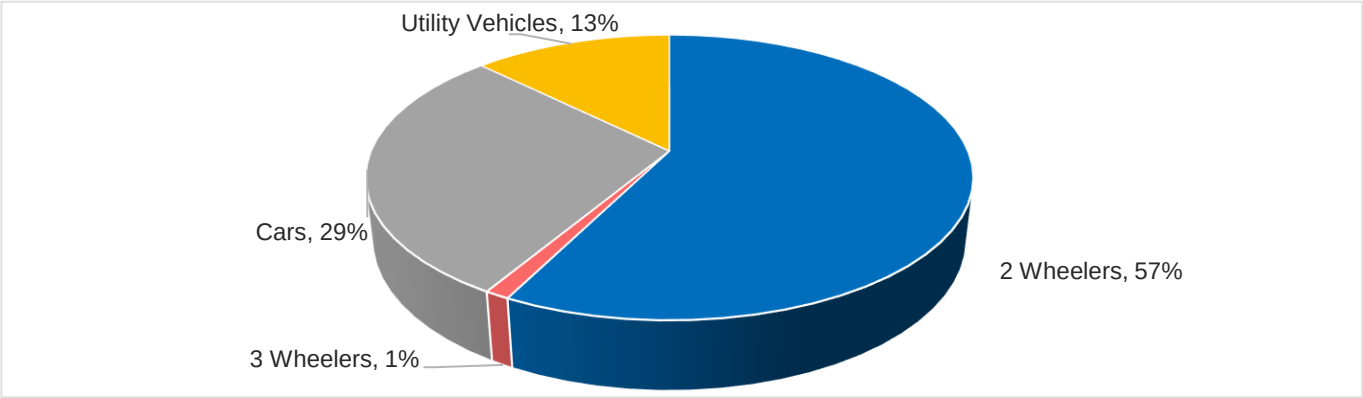
- **Industrial:** The industrial sector (*Other Industrial*) – which contains sales of diesel in the industry for purposes other than power generation – contributed **~15%** in total diesel sold to the non-transport category. A decrease in contribution was observed during this quarter (2.5% of total diesel sale) as compared to last quarter (Q2: 3% in total diesel sale)

- In the **others segment,** Others-Jugad and Burning contributed **12%** share in diesel sold to the non-transport segment. Other categories in **others segment** are diesel sold to Resale and Fishing Boat which contributed **0.9%** and **2.6%** respectively to total diesel sold to non-transport category.

8.1.2 Petrol

Following figure represents share of end user vehicle segment for petrol sale.

Figure 99: Petrol sale



Source: CRIS analysis & primary survey

Following observations are made based on the above figure:

- Higher sale of petrol is observed in **2-Wheeler** category at **57%** followed by **Cars** at **29%**. Cars segment which includes Private cars and Taxi saw increased contribution in petrol sale during this quarter (38%) as compared to previous quarters (Q2: 36% and Q1: 27%). Post Unlock regime, commuters are wary of using mass transit mode for daily commute. This may have in turn, led to increased use of personal vehicles, thereby increasing the petrol offtake in the Car segment.

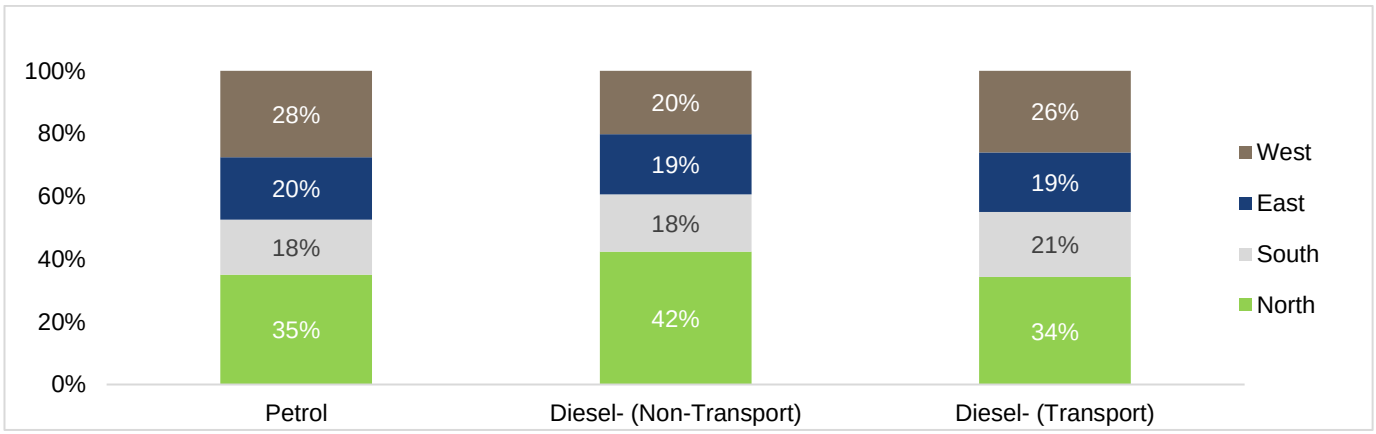
- The Utility segment, consisting Private SUV and Taxi SUV, contributes 13% to total petrol sales.

8.2 Zone wise analysis

8.2.1 PAN India

The following figure shows the diesel and petrol sales across zones (North, South, East and West) for the ROs surveyed during the survey period.

Figure 100: Diesel and petrol sale zone wise- PAN India (% share)



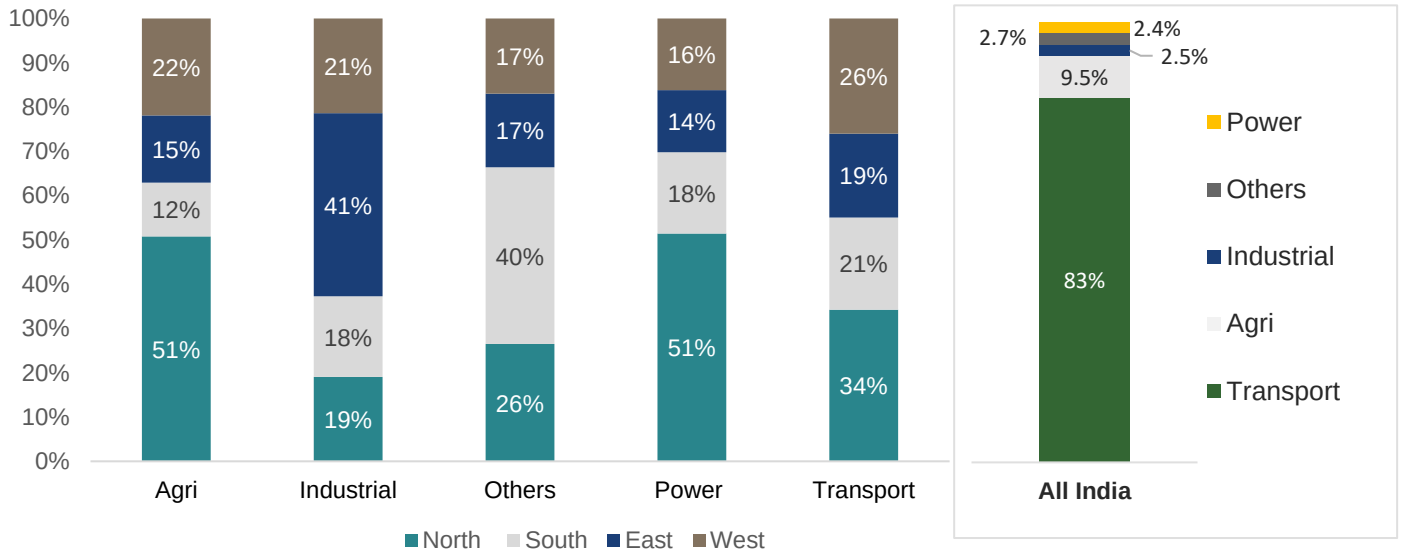
Source: CRIS analysis & primary survey

It is observed that diesel sale in transport segment was highest for **north zone** (**34%**) and lowest for **east zone** (**19%**). Further, diesel sale in non-transport segment has highest contribution from **north zone** (**42%**) and lowest from **south zone** (**18%**). For petrol, **north zone** has highest share (**35%**) and **east zone** has lowest share (**18%**).

8.2.1.1 Segment wise Diesel sales

Following figure depicts segment wise diesel sale across four zones and at All India level.

Figure 101: Segment wise Diesel sales –zonal (% share)



Source: CRIS analysis & primary survey

Following observations are made based on above figure

- For **transport segment** at zonal level, north zone (34%) contributes the highest quantity of diesel sold to transport segment followed by west zone (26%).

  The top three states that contribute the highest in diesel sales to the truck segment are: **Uttar Pradesh** (14%), **Maharashtra** (14%) and **Haryana** (11%)

- For **agriculture segment**, north zone (51%) contributes the highest quantity of diesel sold to agriculture segment and lowest is contributed by south zone (12%). This quarter, agriculture saw increased activity presumably because of Rabi crop sowing.

- *Uttar Pradesh, Haryana and Punjab are top 3 states collectively contributing 42% of total diesel sold to agriculture segment.*

- Within non-transport segment, Uttar Pradesh, Haryana and Punjab leads the segment with 37% share in the diesel sale to tractor.

- In **power segment**, north zone (51%) contributes the highest quantity of diesel sold to power segment and lowest is contributed by east zone (14%). The higher consumption is due to larger sample of surveyed ROs from north region. Further, due to higher absolute consumption as well as poor sub-transmission and distribution network load shedding is common in most part of Haryana and Uttar Pradesh.

- Haryana, Uttar Pradesh and Tamil Nadu has contributed **50%** collectively in the total diesel sale to DG-Industrial segment within non-transport category. The probable reason is the presence of industrial zone and SEZs in the surveyed districts.

- In **industrial segment**, east zone (41%) contributes the highest quantity of diesel sold to industrial segment and lowest is contributed by south zone (18%). Restriction specifically in the region of Delhi-NCR amid rising pollution levels has reduced diesel consumption by industrial segment in north zone.

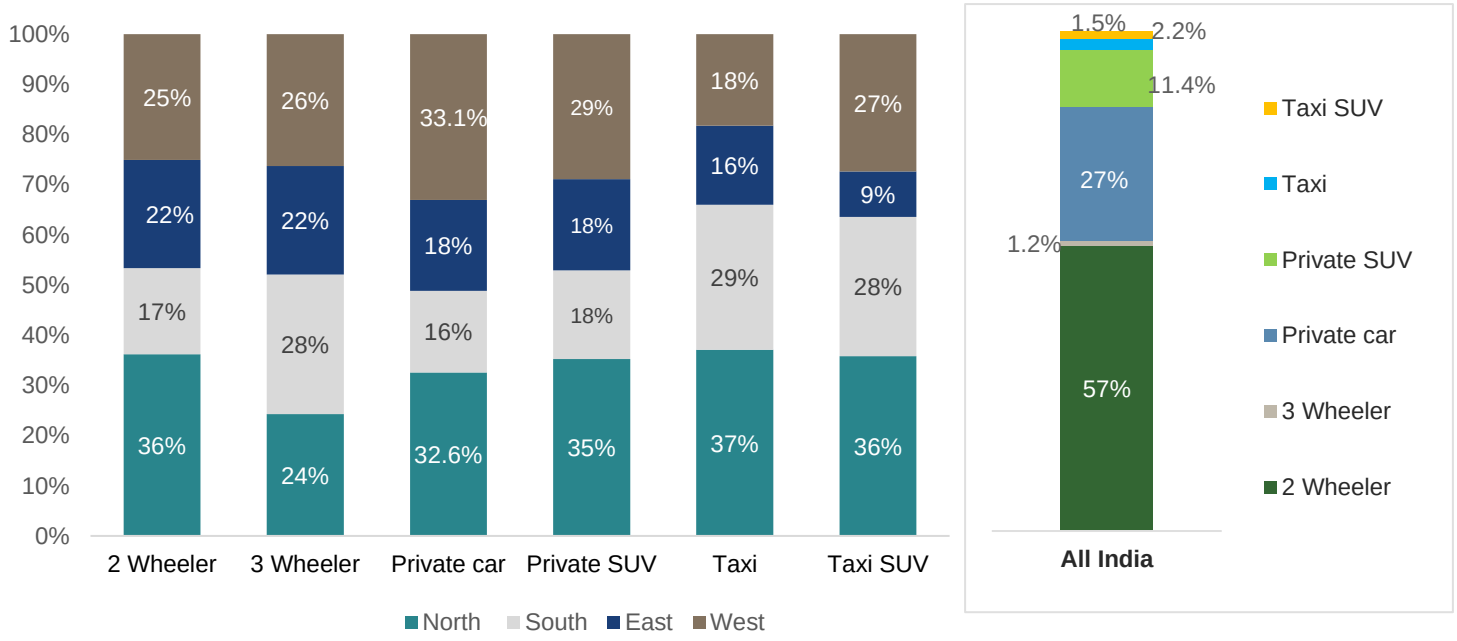
- Diesel sale in others-industrial category was observed to be highest in **East zone** (**41%** of total sale of diesel for others-industrial category) followed by **West zone** (**21%**). The presumable reason is presence of industries-based coal, iron and allied industries, which uses diesel for purposes such as mining, drilling, construction etc.

- ***Others segment Tamil Nadu**, **Rajasthan and Kerala** are the top three states in terms of diesel sales in this segment.*

8.2.1.2 Segment wise Petrol sales

Following figure depicts segment wise petrol sale across four zones and at All India level.

Figure 102: Segment wise Petrol sales –zonal (% share)



Source: CRIS analysis & primary survey

Following observations are made based on above figure

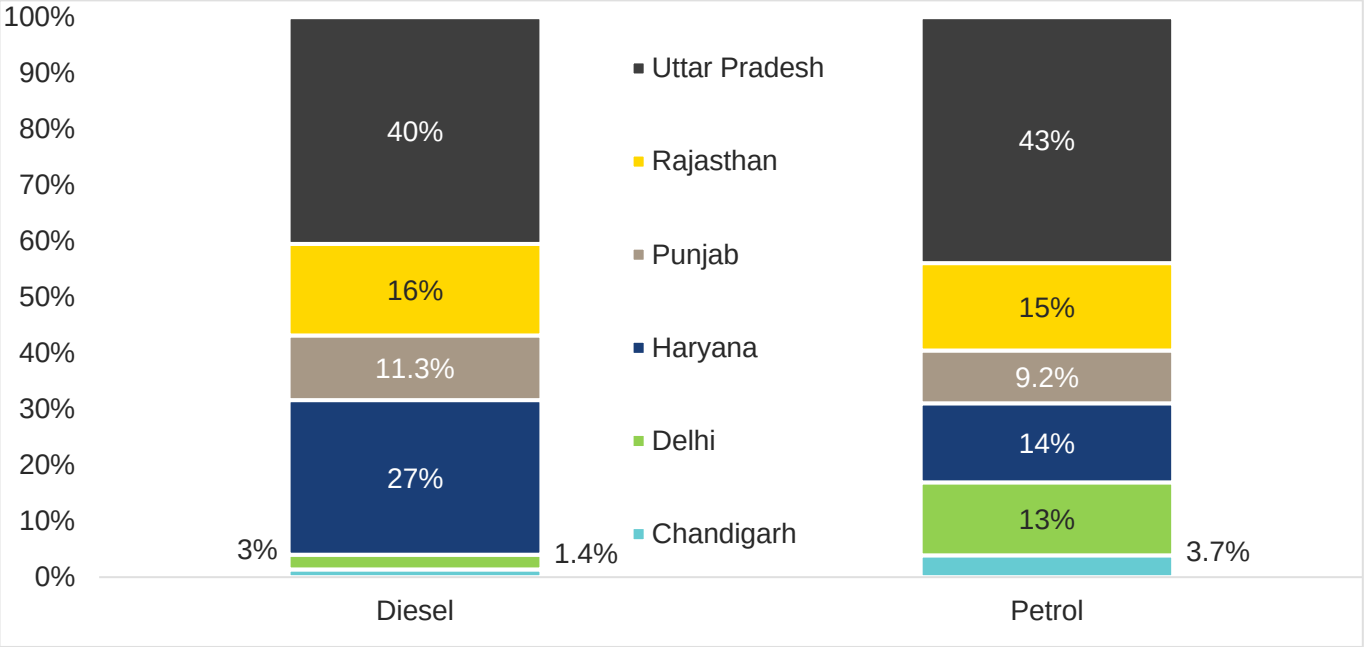
- Petrol sold to 2-Wheeler segment was highest in north zone (36%) followed by west zone (25%), as maximum number of Urban categories ROs (A, B and C) were in North zone.
- The top three states with highest contribution to 2-Wheeler segment are Uttar Pradesh, Maharashtra and Tamil Nadu, collectively contributing 37% to overall petrol sales to 2-Wheeler segment.
- For Private car segment of petrol sales Maharashtra, Uttar Pradesh and Gujarat were the highest contributors collectively contributing 37% to overall petrol sales to Private car segment.
- In taxi segment top three states are Rajasthan, Tamil Nadu and Maharashtra.
- West zone (33%) contributes the highest share in petrol sold to private cars segment, followed by north zone (32.6%)

8.2.2 North Zone

8.2.2.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 103: Diesel and petrol sales - North Zone (% share)



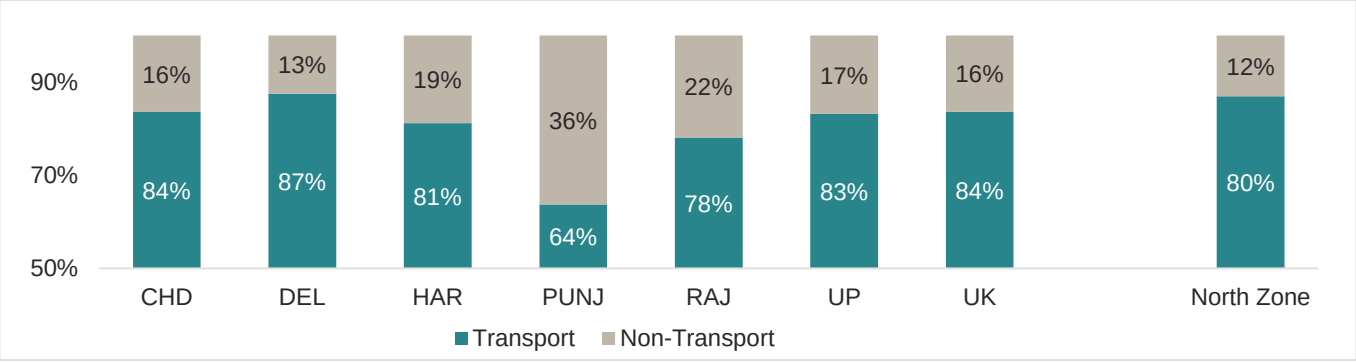
Source: CRIS analysis & primary survey

Following observations are made from the above table:

- In total diesel sales, highest sales was recorded in Uttar Pradesh (40% of total diesel sold in north zone), and lowest were recorded in Chandigarh (1.4% of total diesel sold in north zone).
- In total petrol sales, Uttar Pradesh (43% of total petrol sold in north zone) recorded the highest sale, while the lowest sale were recorded in Chandigarh (3.7% of total petrol sold in north zone).

Diesel sales to **transport segment** contributed 80%, remaining is contributed by **non-transport segment** (agriculture, power, industrial and others). Consumption in transport and non-transport sector is maximum in **Uttar Pradesh**.

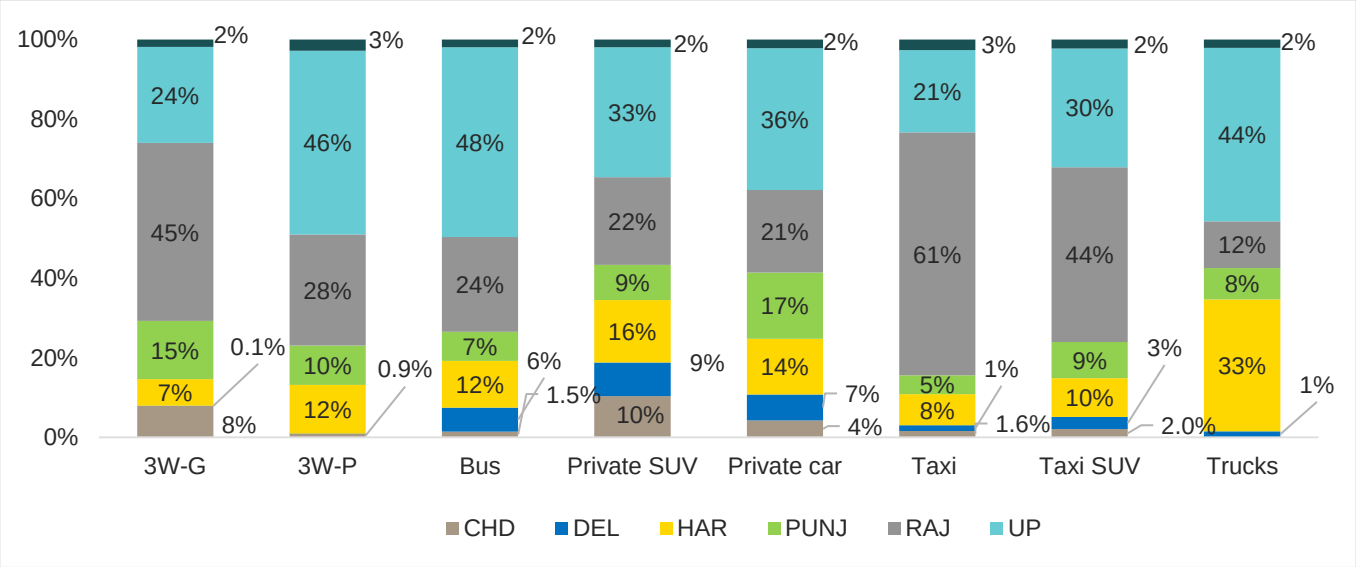
Figure 104: End use share of diesel- North Zone



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in north zone.

Figure 105: End use share of diesel sold to transport segment



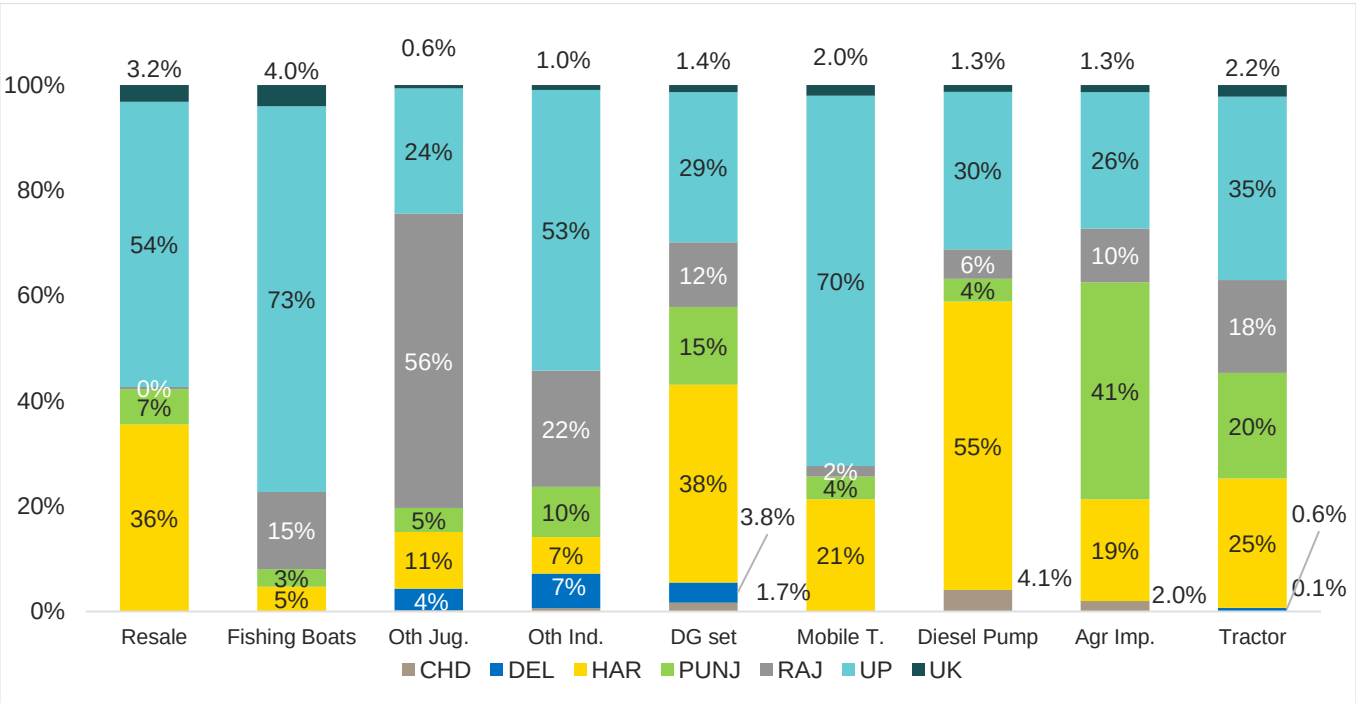
Source: CRIS analysis & primary survey

From above chart following observations are made for sale of fuel from surveyed ROs:

- Uttar Pradesh and Rajasthan has witnessed the higher share of diesel sale within north zone in 3 wheeler goods, passenger and taxi segments.
- Haryana has highest contribution in trucks segment
- While, Uttar Pradesh has the highest share in other transport segments.

In non-transport segment of diesel, following figure shows sales pattern across north zone:

Figure 106: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

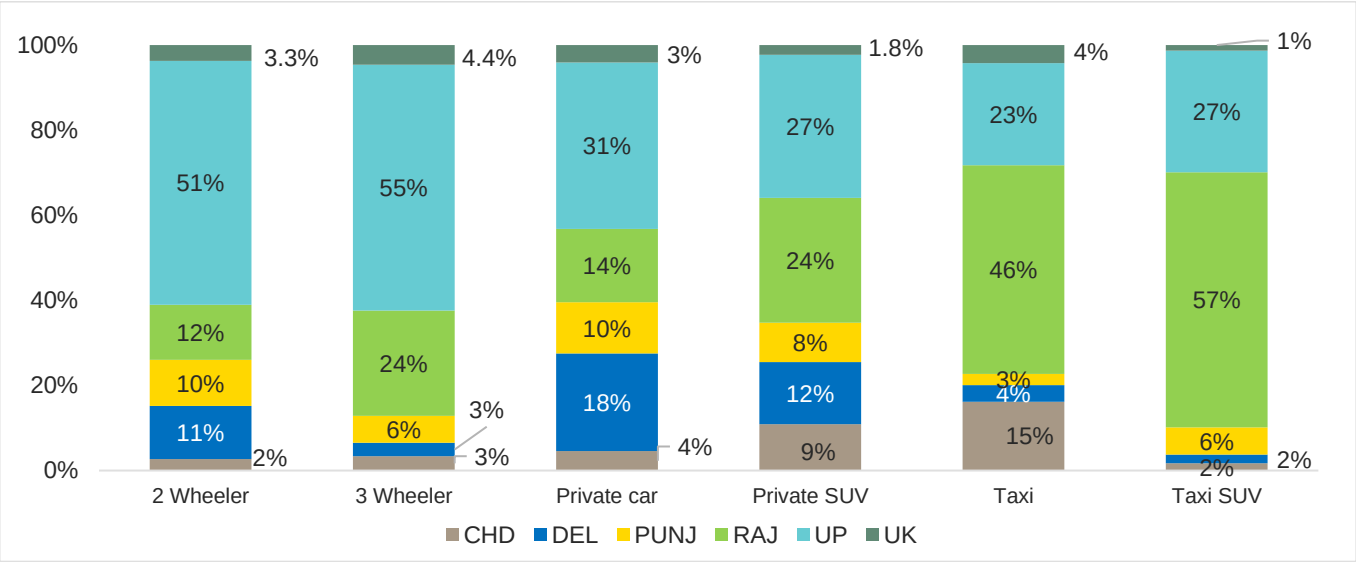
From the above chart following observations can be made:

- Consumption of diesel by DG set used at mobile towers is highest in Uttar Pradesh (70% of total diesel sold to Mobile Towers in north zone).
- Further, diesel sale to agricultural implements was highest in Punjab at 41% followed by Uttar Pradesh at 26%. Tractors saw highest contribution from Uttar Pradesh (35%), followed by Haryana (25%) and Punjab (20%).
- DG set diesel consumption in north zone was highest in Haryana (38%) followed by Uttar Pradesh (29%).

8.2.2.2 Petrol Sales

End user segment wise petrol sale pattern in north zone is shown in following figure:

Figure 107: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

From the above chart following observations can be made:

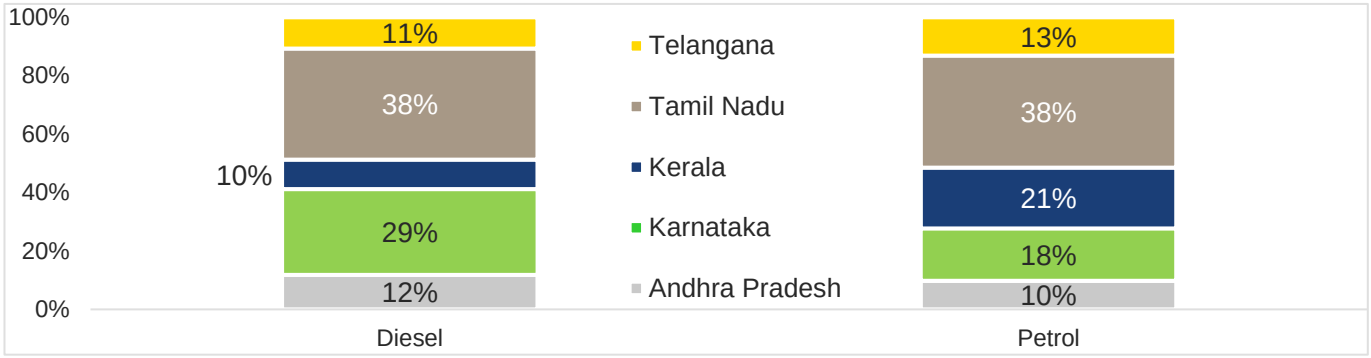
- Delhi higher share in Private cars has been observed
- Due to high proportion of 3-Wheeler vehicles and taxi in Rajasthan, higher consumption of petrol from these two segments has been observed.
- Uttar Pradesh has highest proportion (51%) of petrol sales from this segment

8.2.3 South zone

8.2.3.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 108: Diesel and petrol sales South Zone (% share)



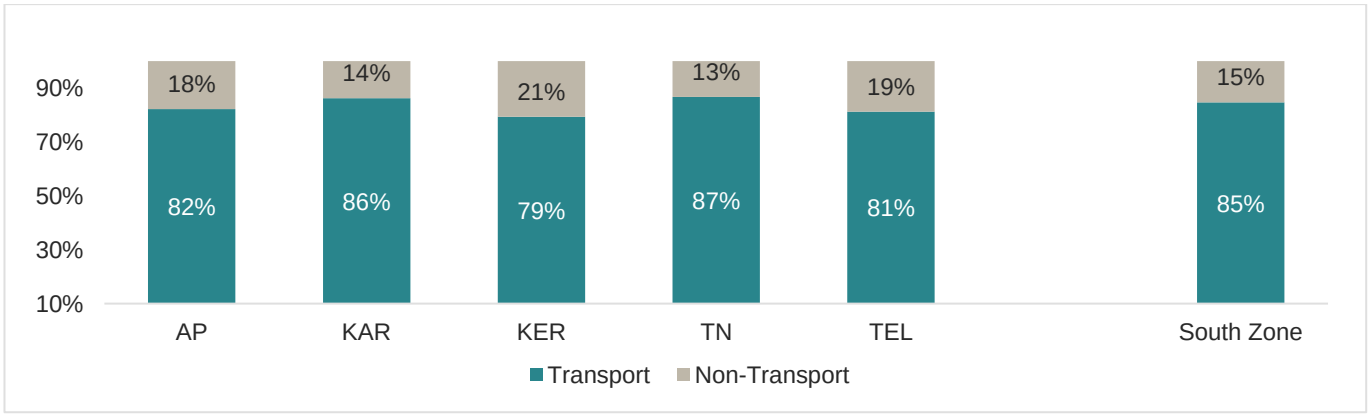
Source: CRIS analysis & primary survey

Following observations are made:

- In total diesel sales, highest sales were recorded in Tamil Nadu (38% of total diesel sold in south zone), while lowest were recorded in Kerala (10% of total diesel sold in south zone).
- In total petrol sales, highest sales were recorded in Tamil Nadu (38% of total petrol sold in south zone) and lowest were recorded in Andhra Pradesh (10% of total petrol sold in south zone).

Diesel sales to transport segment contributed 85%, remaining 15% is contributed by non-transport segment (agriculture, power, industrial and others). Diesel consumption in transport sector and non-transport of south zone is maximum in Tamil Nadu.

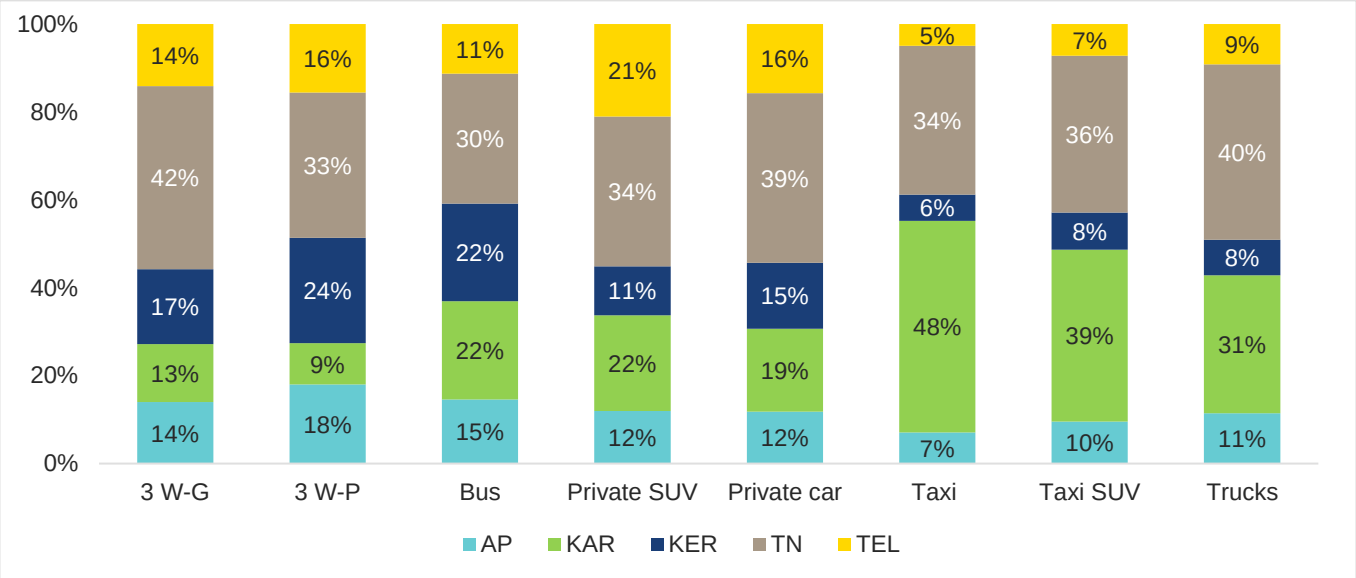
Figure 109: End use share of diesel - South Zone



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in south zone.

Figure 110: End use share of diesel sold to transport segment



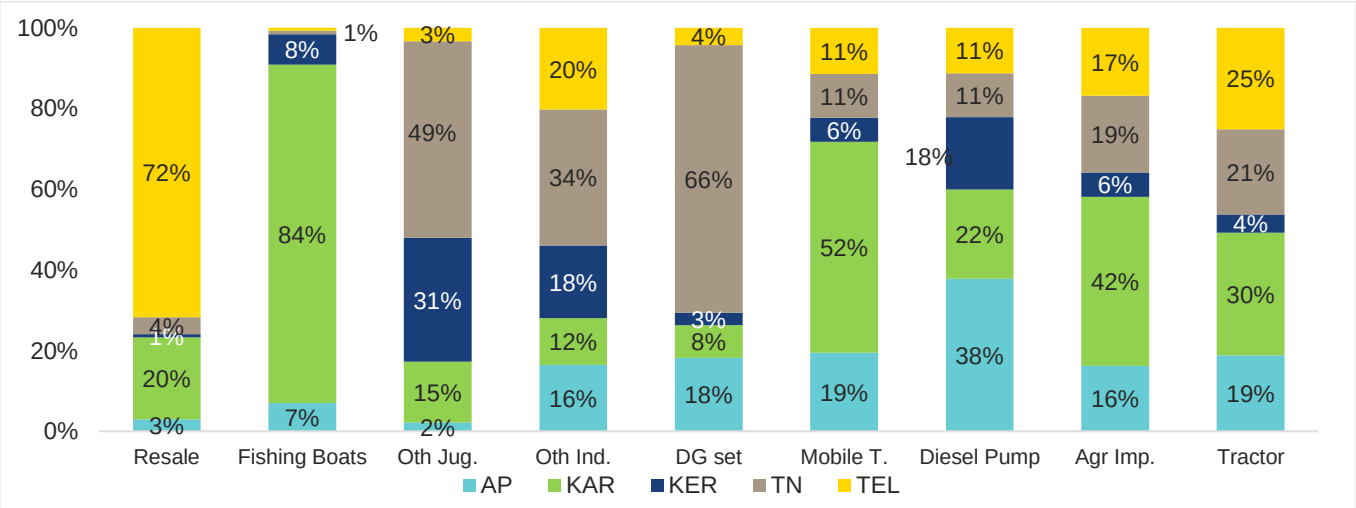
Source: CRIS analysis & primary survey

From above chart following observations are made for sale of fuel from surveyed ROs:

- Trucks segment which is major contributor of diesel sales showed highest contribution to sale from Tamil Nadu (40% of total diesel sale to trucks in south zone) due to highest D category ROs. This share is lower as compared to the last quarter shares (Q2: 42%; Q1:42%).
- The share of Tamil Nadu grew during this quarter for Private cars (39% Tamil Nadu) and SUV (34% Tamil Nadu) segments. During Q2, contribution of diesel sale to Private cars from Tamil Nadu was 32%, while for Private SUV the percentage were 24% for Tamil Nadu. The contributions during Q1 were, 25% for Private Cars and 23% for SUV.

In non-transport segment of diesel, following figure shows sales pattern across south zone:

Figure 111: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

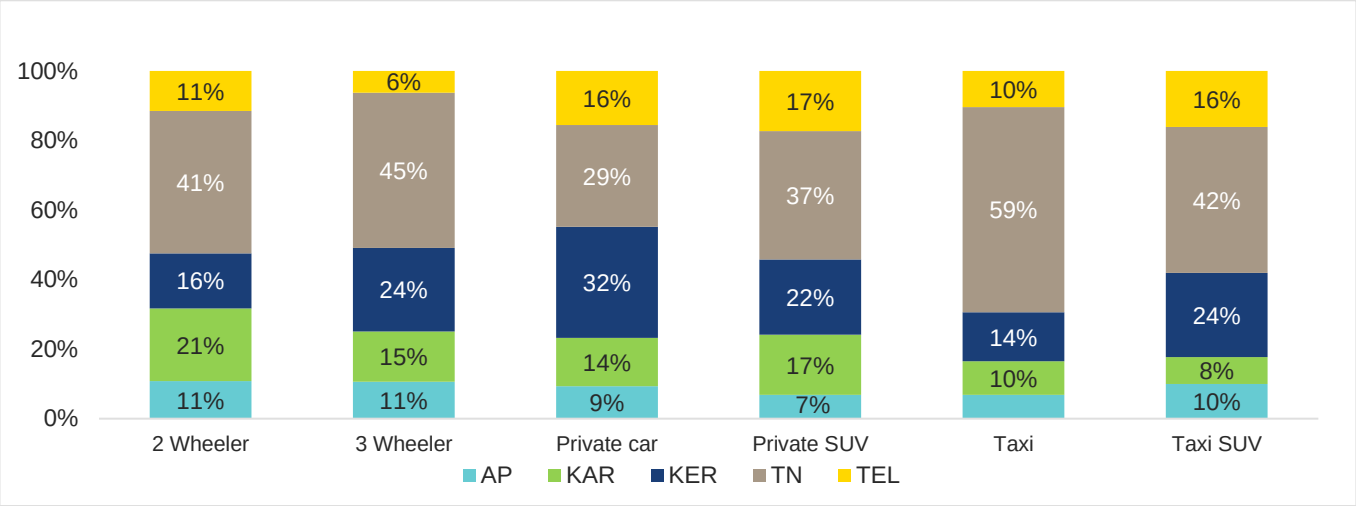
From the above chart following observations can be made:

- Higher share of E category ROs in Karnataka (35% of total E category ROs in south) in south has led to higher offtake of diesel by Agriculture implements and tractor categories.

8.2.3.2 Petrol Sales

End user segment wise petrol sale pattern in south zone is shown in following figure:

Figure 112: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

From the above chart following observation can be made:

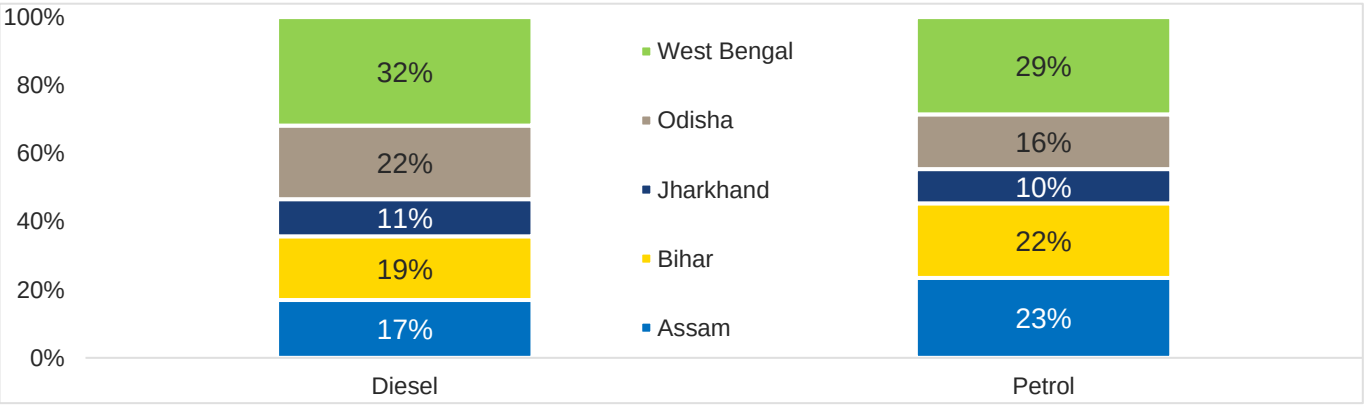
- Presence of highest number of A category ROs in Tamil Nadu (64% of A category ROs in south zone) across south zone has led to higher share in most of petrol segment.

8.2.4 East zone

8.2.4.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 113: Diesel and petrol sales - East Zone



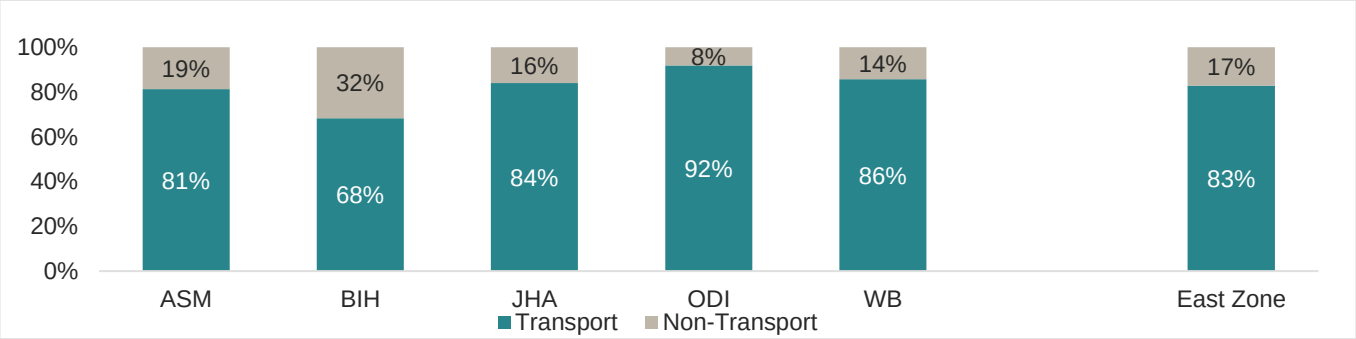
Source: CRIS analysis & primary survey

Following observations are made:

- In total diesel sales, highest sales were recorded in West Bengal (32% of total diesel sold in east zone) and lowest were recorded in Jharkhand (11% of total diesel sold in east zone). The low sales of diesel in Jharkhand are because it has lowest number of ROs (60 ROs,) surveyed in the quarter in east zone.
- Highest petrol sales were recorded in West Bengal (29% of total petrol sold in east zone) and lowest were recorded in Jharkhand (10% of total petrol sold in east zone).

Diesel sales to transport segment contributed **83%** in total diesel sale, remaining is contributed by non-transport segment (agriculture, power, industrial and others). Diesel consumption in transport sector of east zone is maximum in **West Bengal** and in non-transport is maximum in **Bihar**.

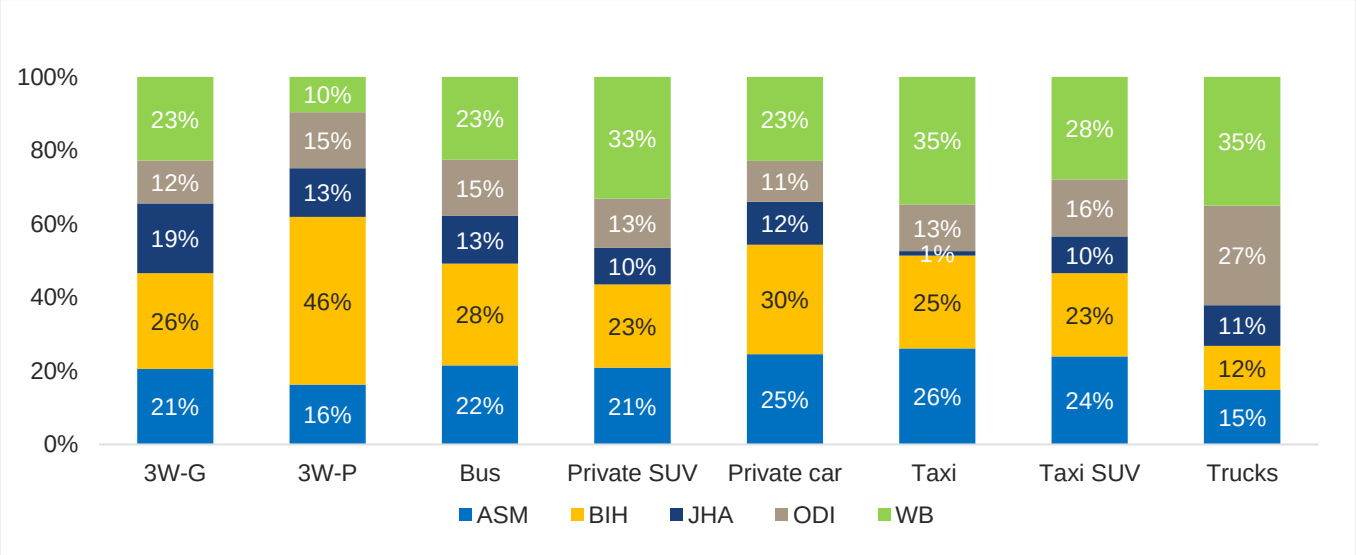
Figure 114: End use share of diesel - East Zone



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in east zone.

Figure 115: End use share of diesel sold to transport segment



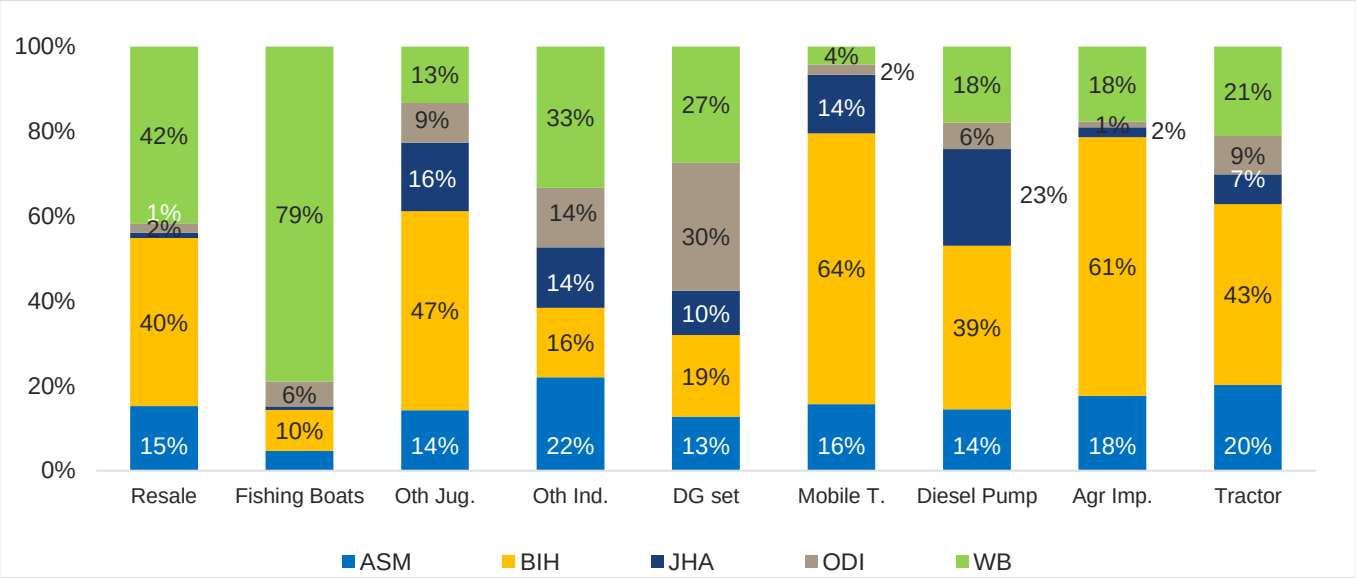
Source: CRIS analysis & primary survey

From above chart following observations are made for sale of fuel from surveyed ROs:

- Trucks segment which is major contributor of diesel sales showed highest contribution to sale from West Bengal (35% of total diesel sale to trucks in east zone). This could presumably be due to higher trade activity leading to higher diesel sales in the state. This contribution was similar to last quarter Q2 (35%) but was marginally higher (38%) during Q1.

In non-transport segment of diesel, following figure shows sales pattern across east zone:

Figure 116: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

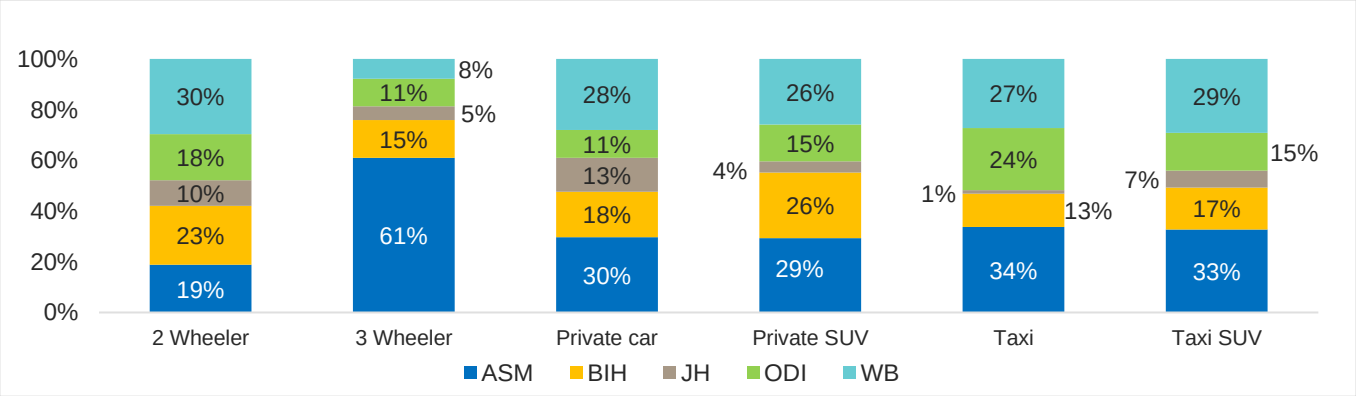
From the above chart following observations can be made:

- Bihar recorded the lion's share in diesel sale to tractors, diesel pump, mobile tower and agriculture segments.
- Share of diesel sale for other industrial usage has been dominated by West Bengal and Assam, presumably due to maximum share of ROs being surveyed.
- Presence of high number of Mobile BTS towers in Assam and Bihar *(Telecom statistics 2019)* coupled with below par sub transmission network has resulted in load shedding, thus the higher share of diesel consumption by mobile tower units within the state.

8.2.4.2 Petrol Sales

End user segment wise petrol sale pattern in east zone is shown in following figure:

Figure 117: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

From the above chart following observations can be made:

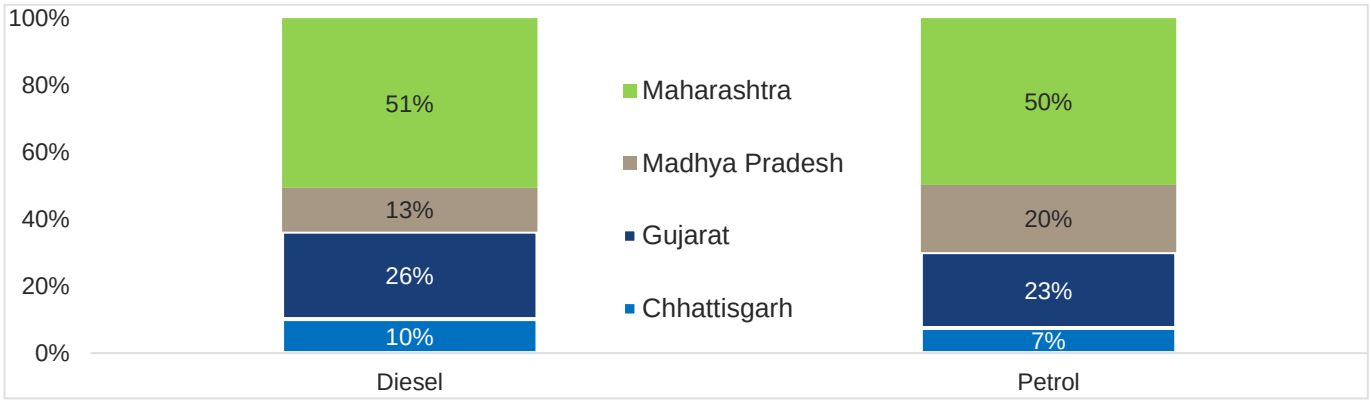
- Highest share of D category ROs in Assam (72 ROs) has led to higher contribution to petrol sales from Private cars.

8.2.5 West zone

8.2.5.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 118: Diesel and petrol sales - West Zone



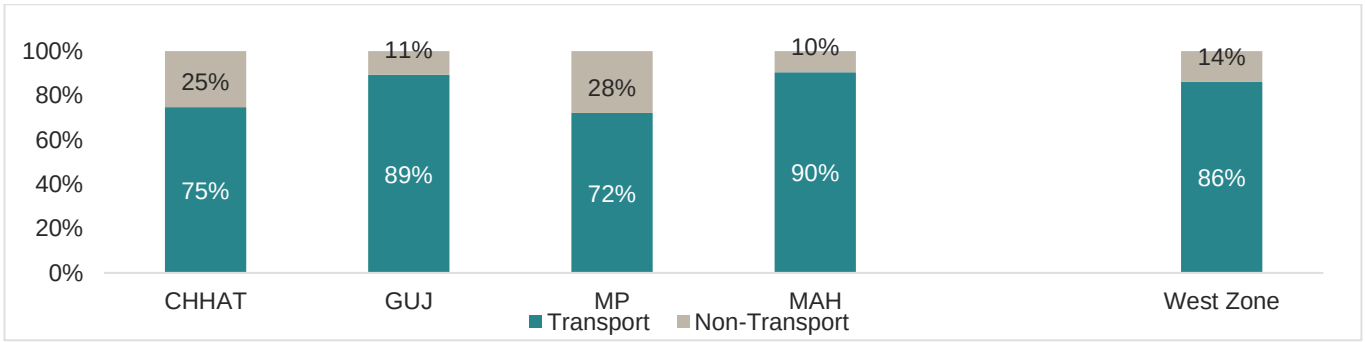
Source: CRIS analysis & primary survey

Following observations are made:

- Highest diesel sales were recorded in Maharashtra (51% of total diesel sold in west zone) and lowest were recorded in Chhattisgarh (10% of total diesel sold in west zone).
- In total petrol sales, highest sales were recorded in Maharashtra (50% of total petrol sold in west zone) and lowest were recorded in Chhattisgarh (7% of total petrol sold in west zone).

Diesel sales to transport segment contributed 86% in total diesel sale, remaining is contributed by non-transport segment (agriculture, power, industrial and others). Diesel consumption in transport sector and non-transport of west zone is maximum in **Maharashtra**.

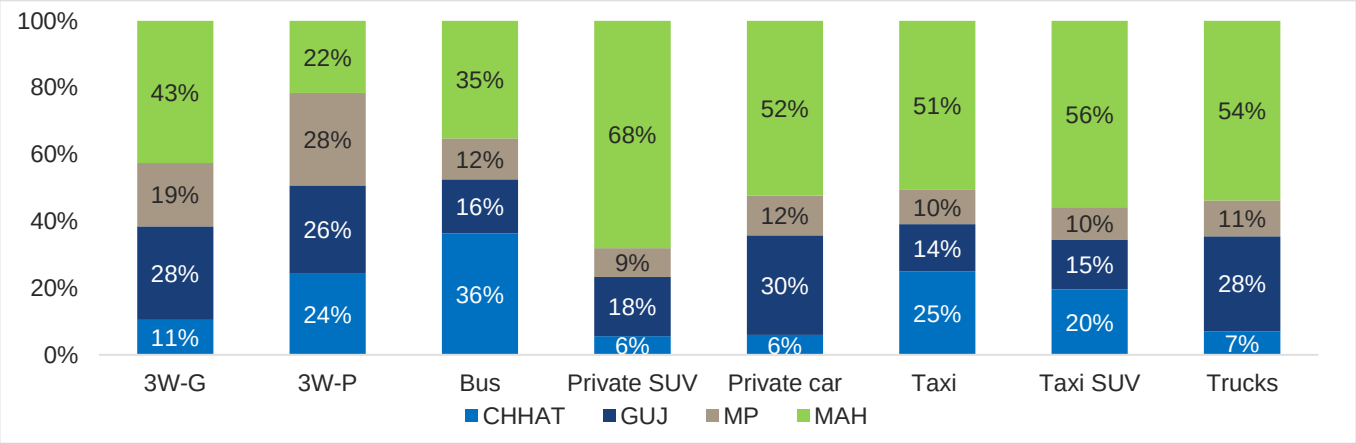
Figure 119: End use share of diesel - West Zone



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in west zone.

Figure 120: End use share of diesel sold to transport segment



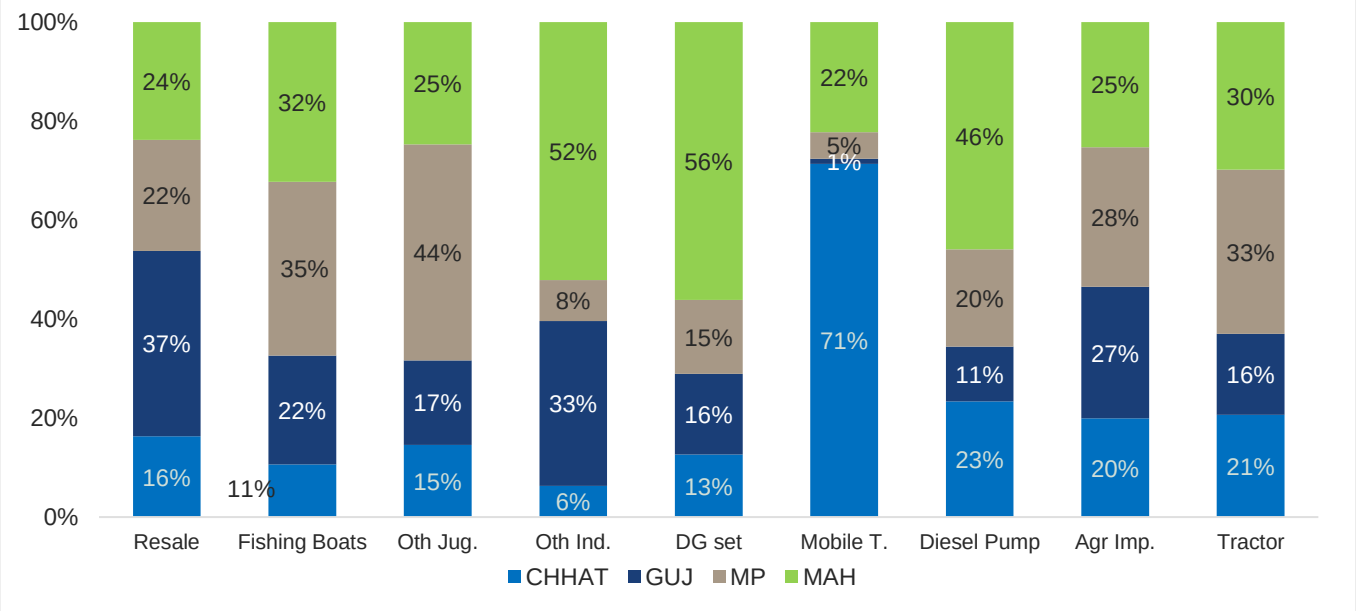
Source: CRIS analysis & primary survey

From above chart following observations are made for sale of fuel from surveyed ROs:

- Trucks segment showed highest contribution to sale from Maharashtra (54% of total diesel sale to trucks in west zone). Gujarat saw increasing diesel sales contribution in private car segment compared to previous survey periods.

In non-transport segment of diesel, following figure shows sales pattern across west zone:

Figure 121: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

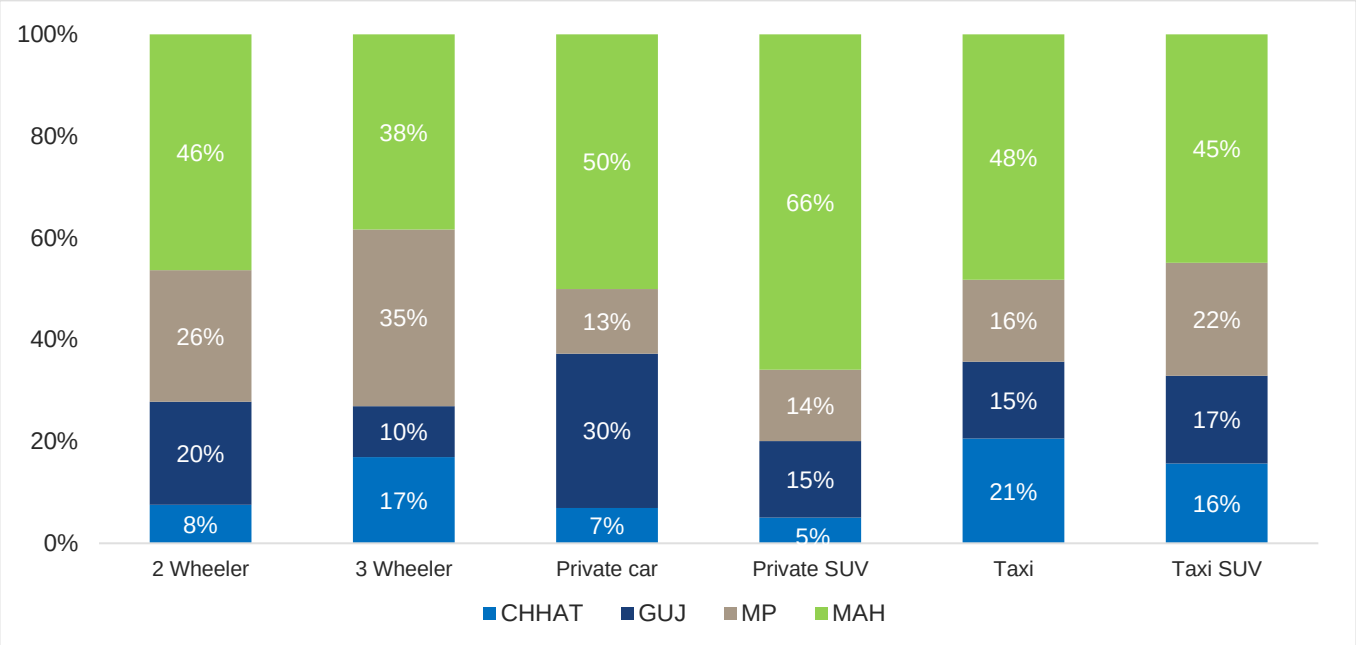
From the above chart following observations can be made:

- Madhya Pradesh contributed 28% to Agri-pump and 33% to tractors. The consumption of diesel in DG set commercial and industrial was relatively higher in Maharashtra.

8.2.5.2 Petrol Sales

End user segment wise petrol sale pattern in west zone is shown in following figure:

Figure 122: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

From the above chart following observations can be made:

- Maharashtra leads in all segments of petrol sales. Taxi SUV (45%), 3-Wheeler (38%) and private cars (50%) contributed highest towards petrol sales in Maharashtra. In Madhya Pradesh 2-Wheeler contributed 26% in petrol sales in Madhya Pradesh while private car contributed only 13%.

9. July-September 2021 consolidated findings- Retail segment

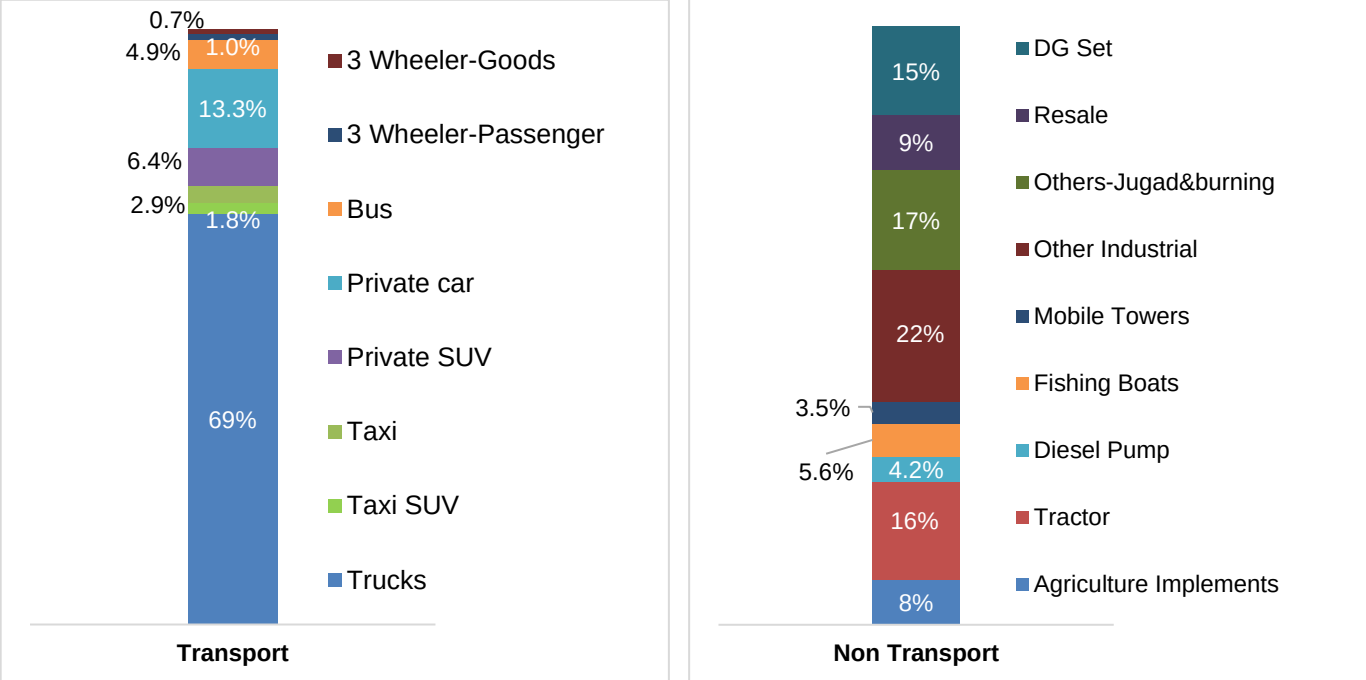
9.1 Sales- All India

The split of fuel sale between diesel and petrol was **65%** for diesel and **35%** for petrol. Transport segment particularly the commercial segment was impacted during this quarter due to monsoons.

9.1.1 Diesel

Diesel segment at all India level, transport segment contributed **89%** to diesel sales and remaining **11%** share is contributed by non-transport segment. Following figure shows transport segment and non-transport segment wise diesel sale at all India level.

Figure 123: Diesel sale – segment wise (%)



Source: CRIS analysis & primary survey

From above graph following observations are made:

- Trucks segment drives the highest share at 69% of diesel consumption in the transport sector. Second highest diesel consuming segment was Private cars (~13% of diesel sold to transport category) and the lowest share of diesel was sold to 3-Wheeler Goods (0.7% of diesel sold to transport category)

- Diesel sales to power sector (DG set and Mobile Towers) contributed ~18.5% of diesel sales in the non-transport segment. Also, diesel sales were highest in DG-Industrial (~9% of overall diesel sales in the non-transport segment) and lowest in DG-Residential (1.2% of overall diesel sales in the non-transport segment), while DG-Commercial contributed 4.6% of overall diesel sales in the non-transport segment. Mobile towers contributed 3.5% of overall diesel sales in the non-transport segment.

- Agricultural sector sale boosted to ~28% of total diesel sold to non-transport category. This is contributed by tractors, agricultural implements and diesel pumps. Uttar Pradesh, Haryana and Bihar are top 3 states collectively contributing 47% of total diesel sold to agriculture segment. The probable reasons are Rabi crop sowing season, high area under food-grain cultivation and high share of surveyed ROs.

  Within non-transport segment, Uttar Pradesh, Haryana and Rajasthan leads the segment with 41% share in the diesel sale to tractor.

- The industrial sector (*Other Industrial*) – which contains sales of diesel in the industry for purposes other than power generation – contributed ~22% in total diesel sold to the non-transport category. The contribution to diesel sale by industrial segment was similar as observed during previous quarters. The core industries production data (Jul'21 & Aug'21), which showed marginal uptick in IIP index, especially in industrial (manufacturing) and construction activities (real estate) in the country during the quarter as compared to preceding quarter.

  Diesel sale in others-industrial category was observed to be highest in East Zone (33% of total sale of diesel for others-industrial category) followed by West zone (31%). The presumable reason is presence of industries-based coal, iron and allied industries, which uses diesel for purposes such as mining, drilling, construction etc.

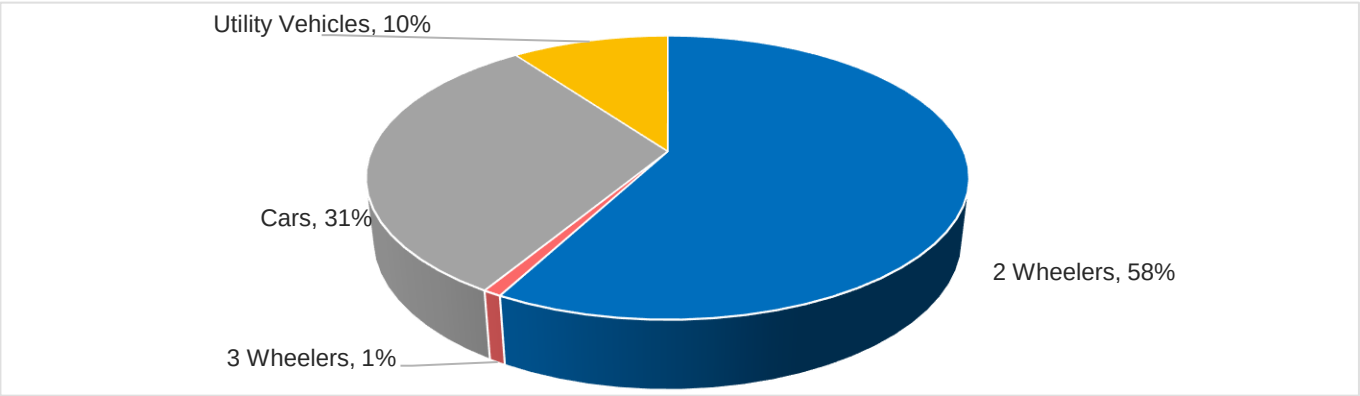
- In the others segment, Others-Jugad and Burning contributed 17% share in diesel sold to the non-transport segment. Tamil Nadu, Uttar Pradesh and Maharashtra are the top three states in terms of diesel sales in this segment.

  Other categories in others segment are diesel sold to Resale and Fishing Boat which contributed 9% and 5.6% respectively to total diesel sold to non-transport category.

9.1.2 Petrol

Following figure represents share of end user vehicle segment for petrol sale.

Figure 124: Petrol sale



Source: CRIS analysis & primary survey

Following observations are made based on the above figure:

- Higher sale of petrol is observed in **2-Wheeler** category at **58%** followed by **Cars** at **31%**. The top three states with highest contribution to 2-Wheeler segment are Uttar Pradesh, Maharashtra and Tamil Nadu, collectively contributing **33%** to overall petrol sales to 2-Wheeler segment.
- For Private car segment of petrol sales Maharashtra, Uttar Pradesh and Gujarat were the highest contributors collectively contributing **30%** to overall petrol sales to Private car segment.

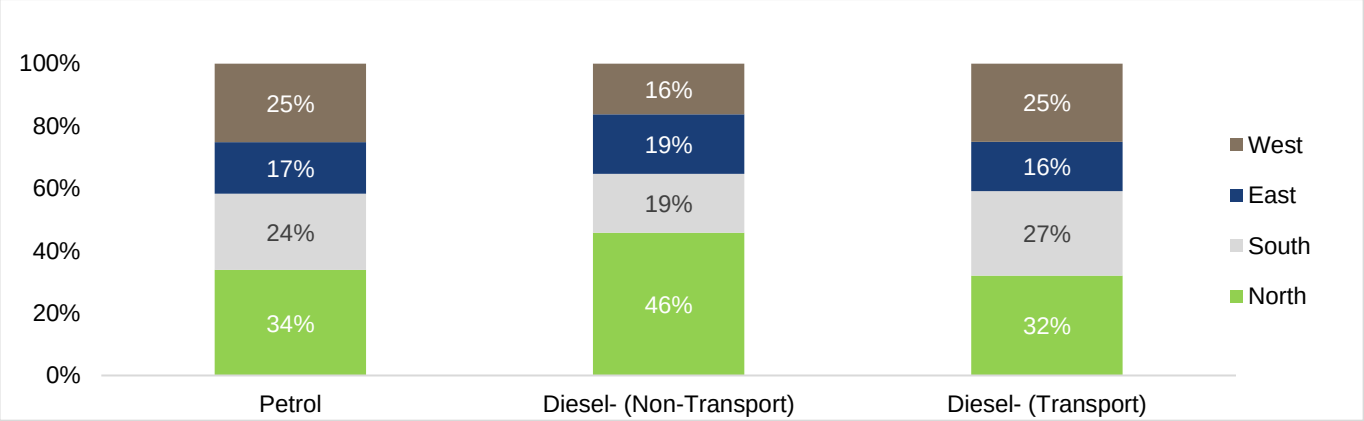
Post Unlock regime, commuters are wary of using mass transit mode for daily commute. This may have in turn, led to increased use of personal vehicles, thereby increasing the petrol offtake in the Car segment. In the taxi segment, taxi (yellow number plate) contributes **1.43%**, while taxi SUV category contributes **1.36%** to total petrol sales. In taxi segment top three states are Tamil Nadu, Rajasthan and Maharashtra.

9.2 Zone wise analysis

9.2.1 PAN India

The following figure shows the diesel and petrol sales across zones (North, South, East and West) for the ROs surveyed during the quarter.

Figure 125: Diesel and petrol sale zone wise- PAN India (% share)



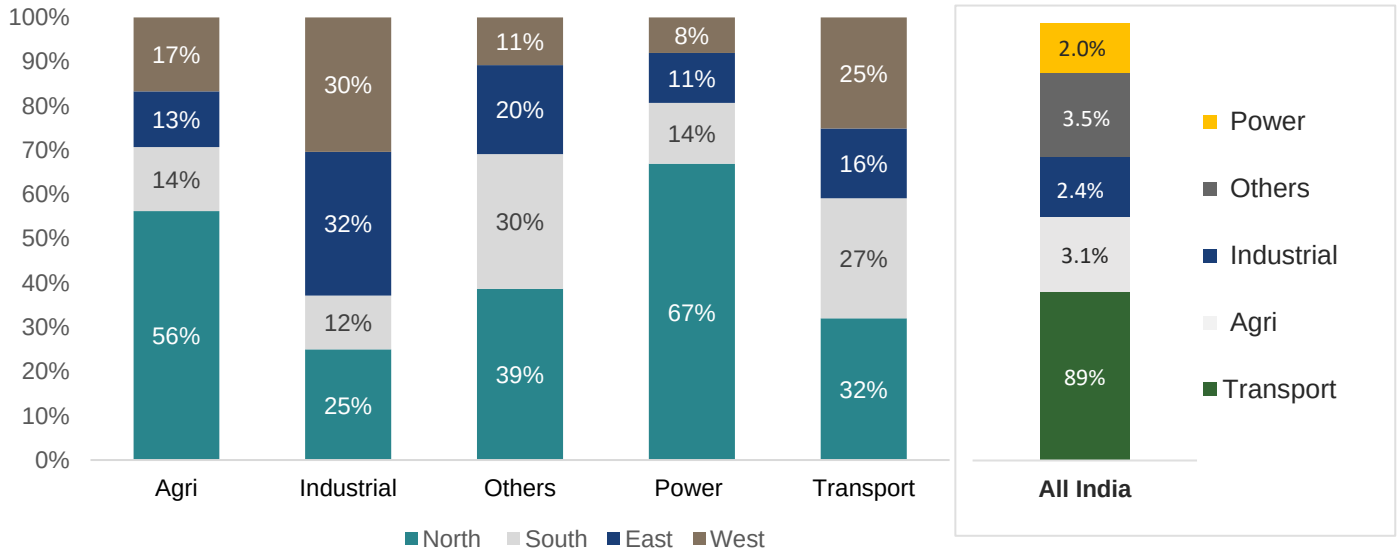
Source: CRIS analysis & primary survey

It is observed that diesel sale in transport segment was highest for **north zone** (**32%**) and lowest for **east zone** (**16%**). Further, diesel sale in non-transport segment has highest contribution from **north zone** (**46%**) and lowest from **west zone** (**16%**). For petrol, **north zone** has highest share (**34%**) and **east zone** has lowest share (**17%**).

9.2.1.1 Segment wise Diesel sales

Following figure depicts segment wise diesel sale across four zones and at All India level.

Figure 126: Segment wise Diesel sales –zonal (% share)



Source: CRIS analysis & primary survey

Following observations are made based on above figure

- For **transport segment** at zonal level, north zone (32%) contributes the highest quantity of diesel sold to transport segment followed by south zone (27%).

  The top three states that contribute the highest in diesel sales to the truck segment are: Uttar Pradesh (14%), Maharashtra (13%) and Haryana (10%)

- For **agriculture segment**, north zone (56%) contributes the highest quantity of diesel sold to agriculture segment and lowest is contributed by east zone (13%).

- In **power segment**, north zone (67%) contributes the highest quantity of diesel sold to power segment and lowest is contributed by west zone (8%).

- Power supply disruptions due to power cuts in Uttar Pradesh, Punjab and Maharashtra led to the highest share (**60%**) of diesel sales for DG-Residential sets.

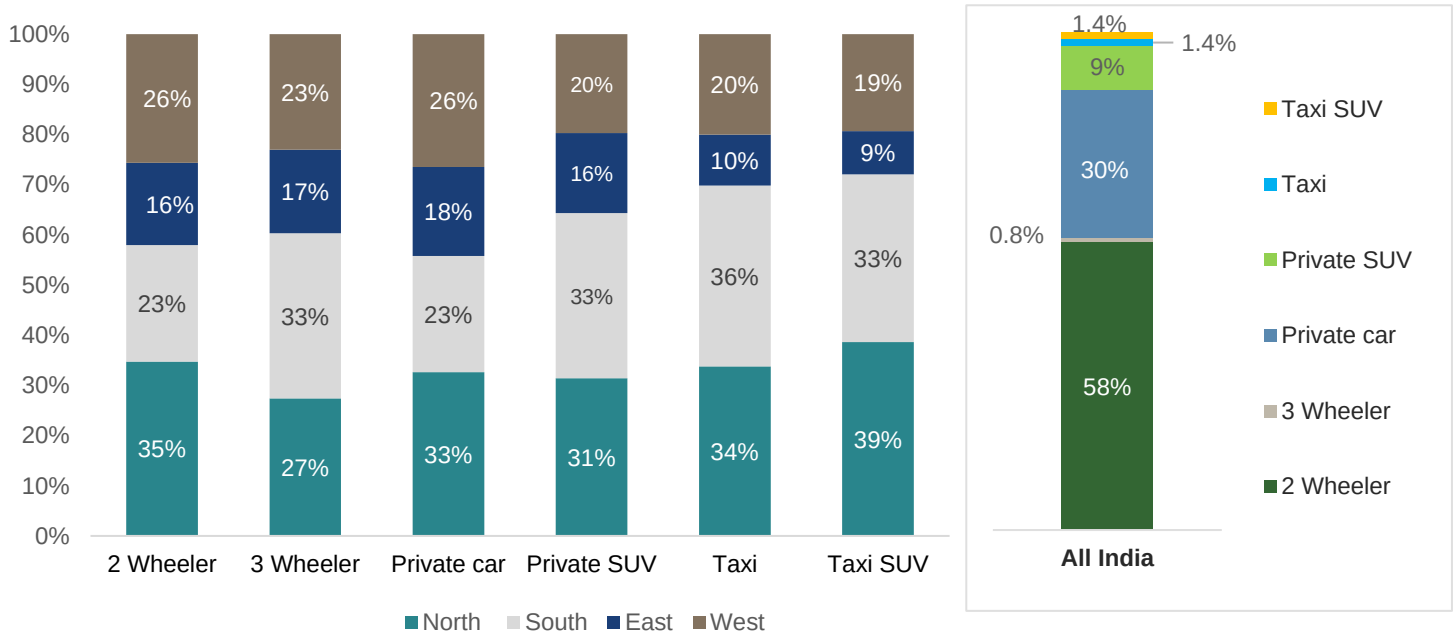
  Haryana, Uttar Pradesh and Maharashtra have contributed 74% collectively in the total diesel sale to DG-Industrial segment.

- In **industrial segment**, east zone (33%) contributes the highest quantity of diesel sold to industrial segment and lowest is contributed by south zone (12%).

9.2.1.2 Segment wise Petrol sales

Following figure depicts segment wise petrol sale across four zones and at All India level.

Figure 127: Segment wise Petrol sales –zonal (% share)



Source: CRIS analysis & primary survey

Following observations are made based on above figure

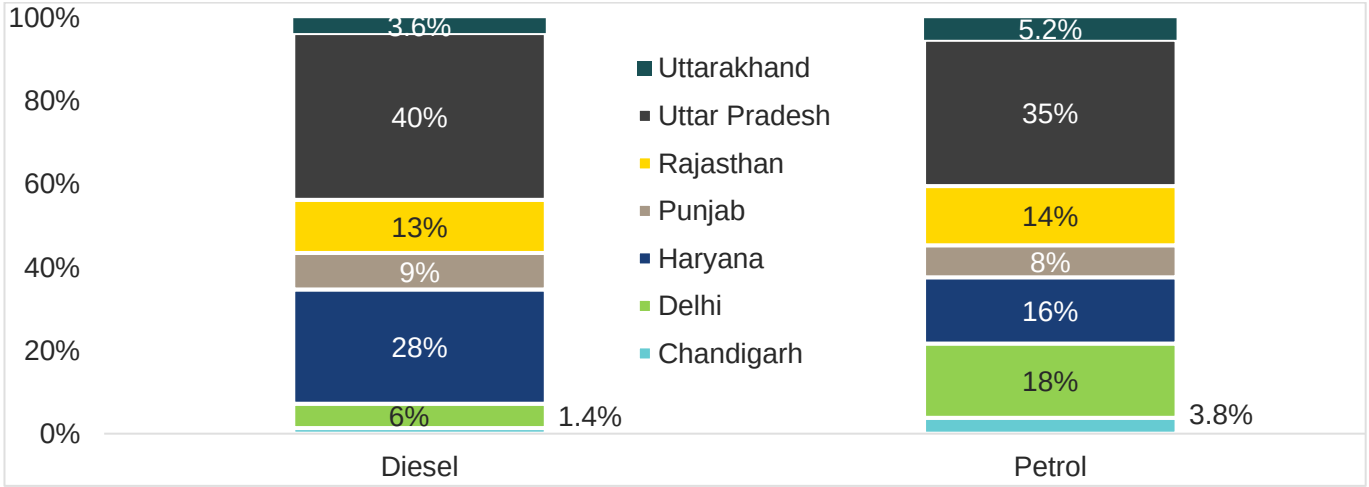
- Petrol sold to 2-Wheeler segment was highest in north zone (35%) followed by west zone (26%).
- North zone (33%) contributes the highest share in petrol sold to private cars segment, followed by west zone (26%)

9.2.2 North Zone

9.2.2.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 128: Diesel and petrol sales - North Zone (% share)



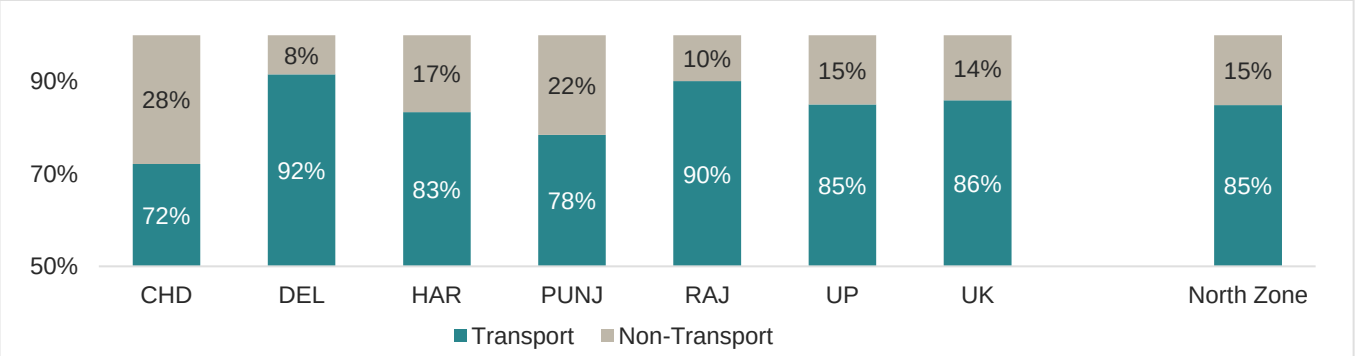
Source: CRIS analysis & primary survey

Following observations are made from the above table:

- In total diesel sales, highest sales were recorded in Uttar Pradesh (40% of total diesel sold in north zone), and lowest were recorded in Chandigarh (1.4% of total diesel sold in north zone).
- In total petrol sales, Uttar Pradesh (35% of total petrol sold in north zone) recorded the highest sale, while the lowest sale was recorded in Chandigarh (3.8% of total petrol sold in north zone).

Diesel sales to **transport segment** contributed 85%, remaining is contributed by **non-transport segment** (agriculture, power, industrial and others). Consumption in transport and non-transport sector is maximum in **Uttar Pradesh**, due to higher number of surveyed ROs.

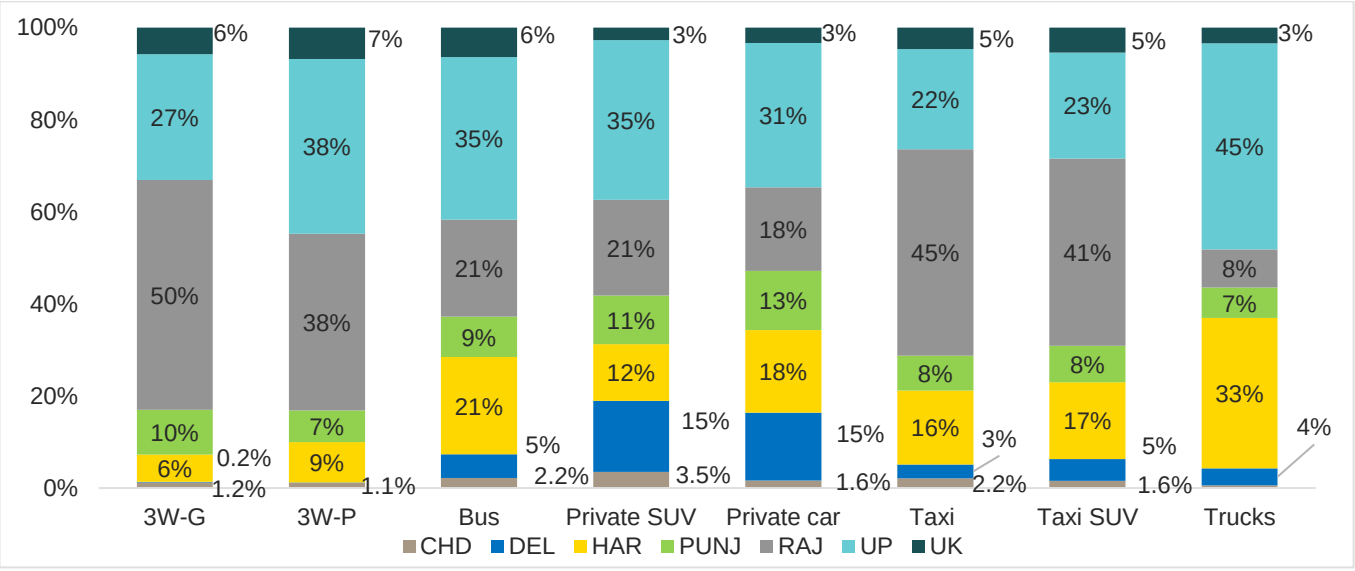
Figure 129: End use share of diesel- North Zone



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in north zone.

Figure 130: End use share of diesel sold to transport segment



Source: CRIS analysis & primary survey

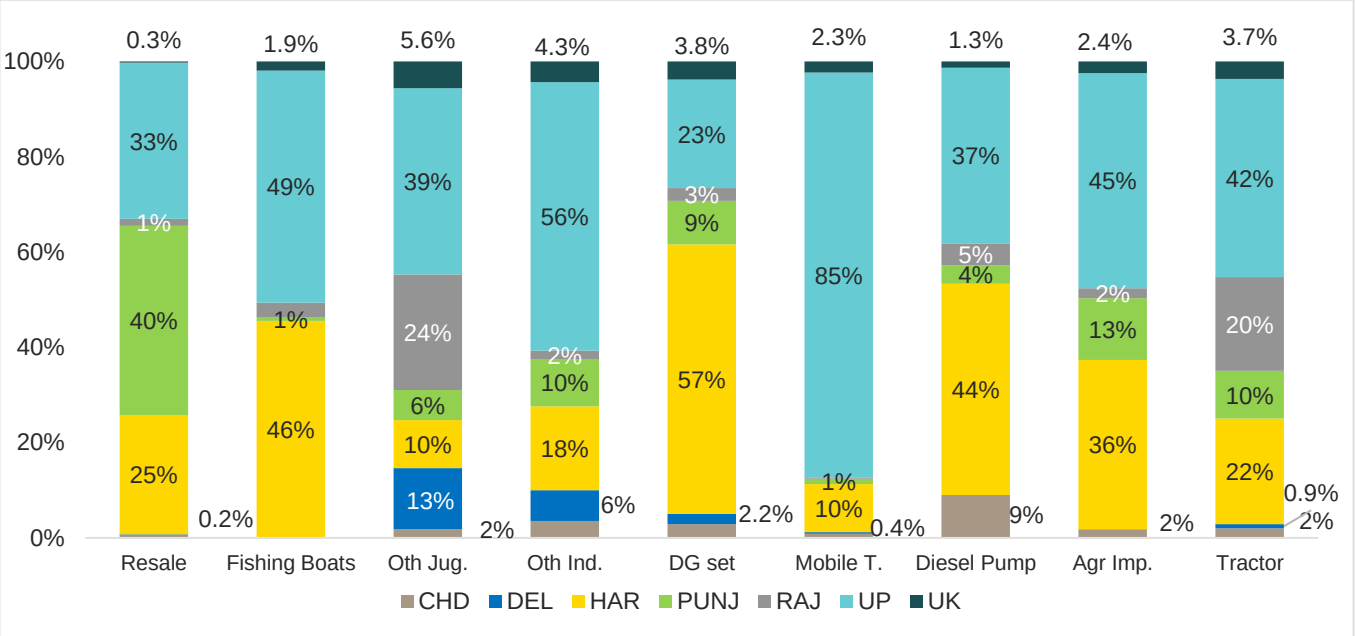
From above chart following observations are made for sale of fuel from surveyed ROs:

- Uttar Pradesh and Rajasthan has witnessed the higher share of diesel sale within north zone in 3-wheeler goods, passenger and taxi segments.

- Bus, Private car, Private SUV and Trucks have highest share in Uttar Pradesh.
- Haryana has highest contribution in trucks segment as compared to other segments of Haryana.

In non-transport segment of diesel, following figure shows sales pattern across north zone:

Figure 131: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

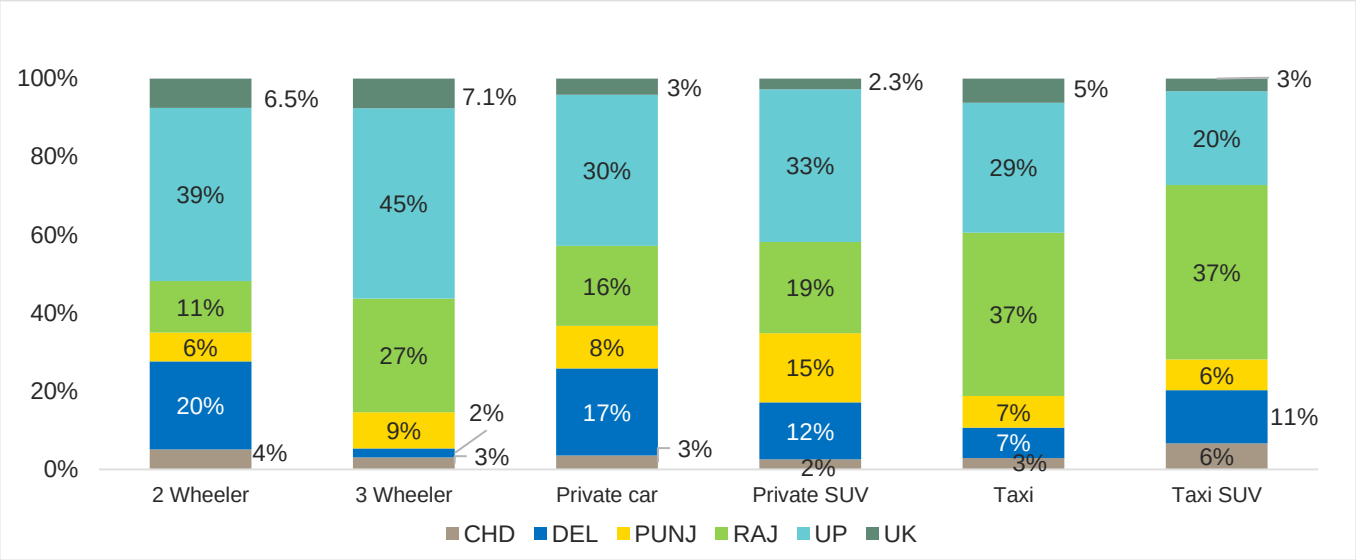
From the above chart following observations can be made:

- Consumption of diesel by DG set used at mobile towers in Uttar Pradesh (85% of total diesel sold to Mobile Towers in north zone).
- Further, diesel sale to agricultural implements was highest in Uttar Pradesh at 45% followed by Haryana (36%) and Punjab (13%). Tractors saw highest contribution from Uttar Pradesh (42%), followed by Haryana (22%) and Rajasthan (20%).
- DG set diesel consumption in north zone was highest in Haryana (57%) followed by Uttar Pradesh (23%).

9.2.2.2 Petrol Sales

End user segment wise petrol sale pattern in north zone is shown in following figure:

Figure 132: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

From the above chart following observations can be made:

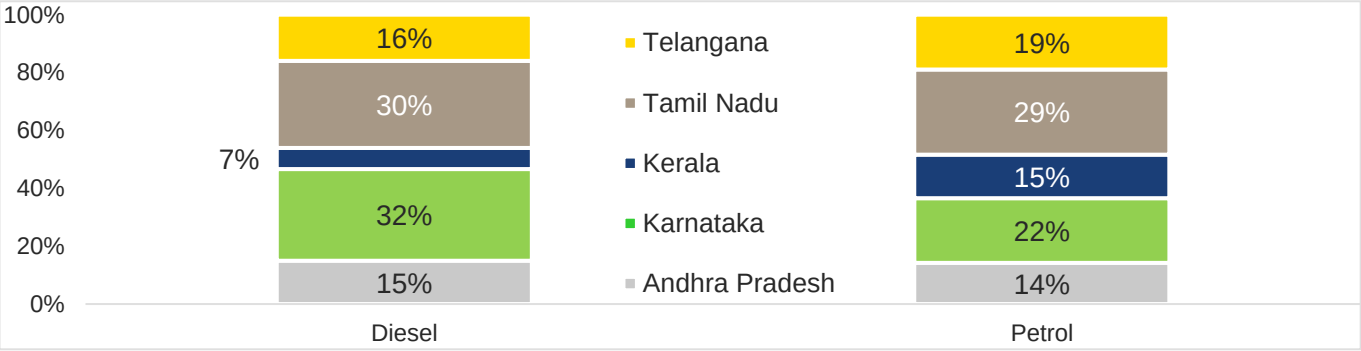
- Delhi has higher share in Private cars (17%) and 2-Wheelers (20%) among other categories
- Due to high proportion of 3-Wheeler vehicles and taxi in Rajasthan, higher consumption of petrol from these two segments has been observed.
- Uttar Pradesh has high density of 2–Wheelers resulting in highest proportion (39%) of petrol sales from this segment

9.2.3 South zone

9.2.3.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 133: Diesel and petrol sales South Zone (% share)



Source: CRIS analysis & primary survey

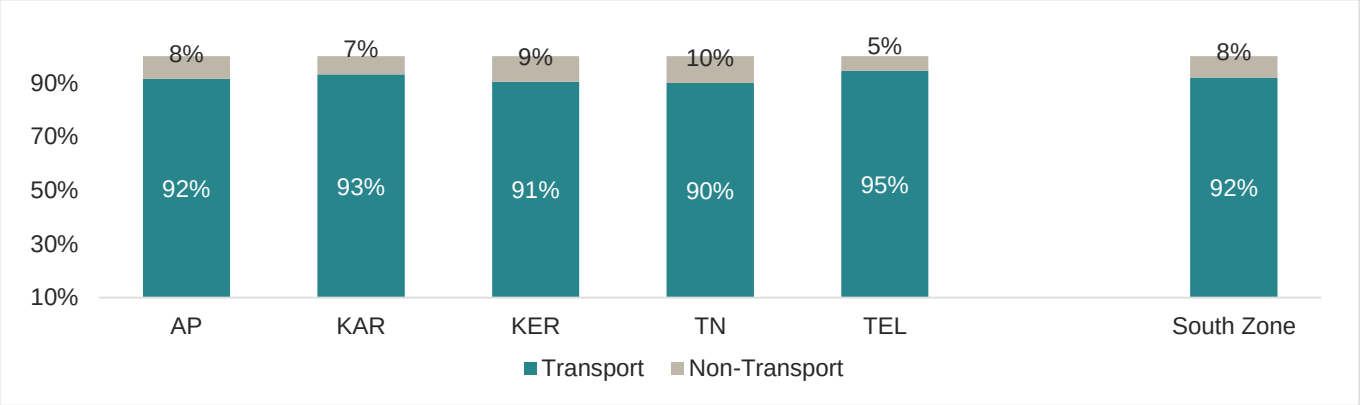
Following observations are made:

- In total diesel sales, highest sales were recorded in Karnataka (32% of total diesel sold in south zone), while lowest were recorded in Kerala (7% of total diesel sold in south zone).

- In total petrol sales, highest sales were recorded in Tamil Nadu (29% of total petrol sold in south zone) and lowest were recorded in Andhra Pradesh (14% of total petrol sold in south zone).

Diesel sales to transport segment contributed 92%, remaining 8% is contributed by non-transport segment (agriculture, power, industrial and others). Diesel consumption in transport sector and non-transport of south zone is maximum in Karnataka and Tamil Nadu respectively.

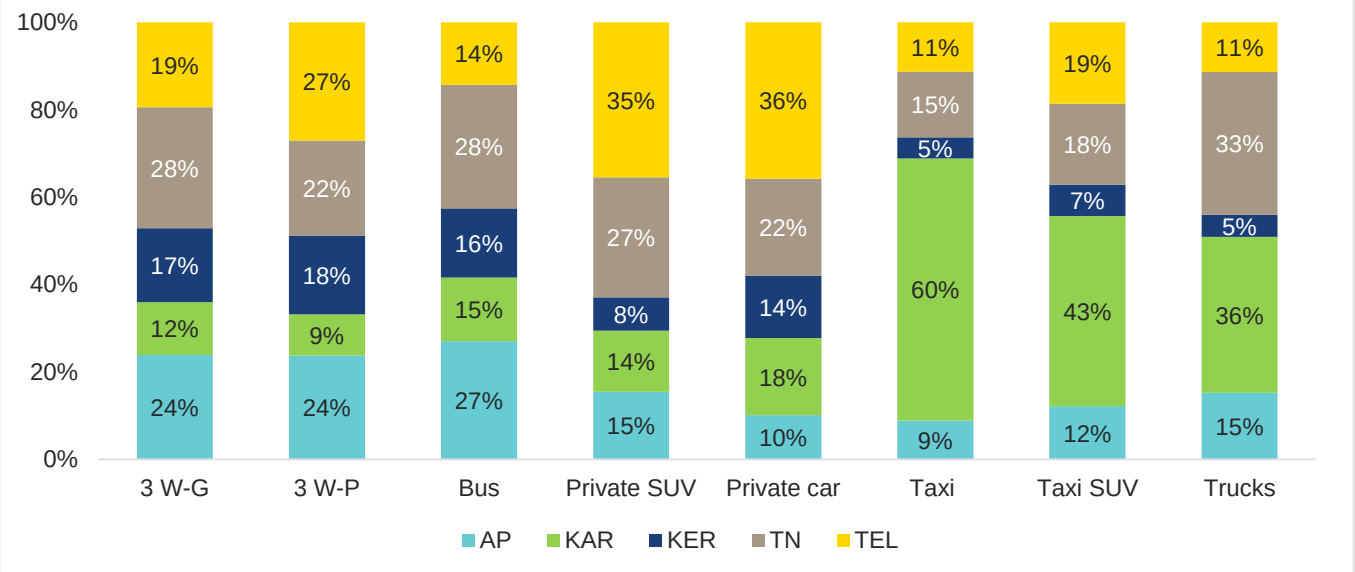
Figure 134: End use share of diesel - South Zone



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in south zone.

Figure 135: End use share of diesel sold to transport segment



Source: CRIS analysis & primary survey

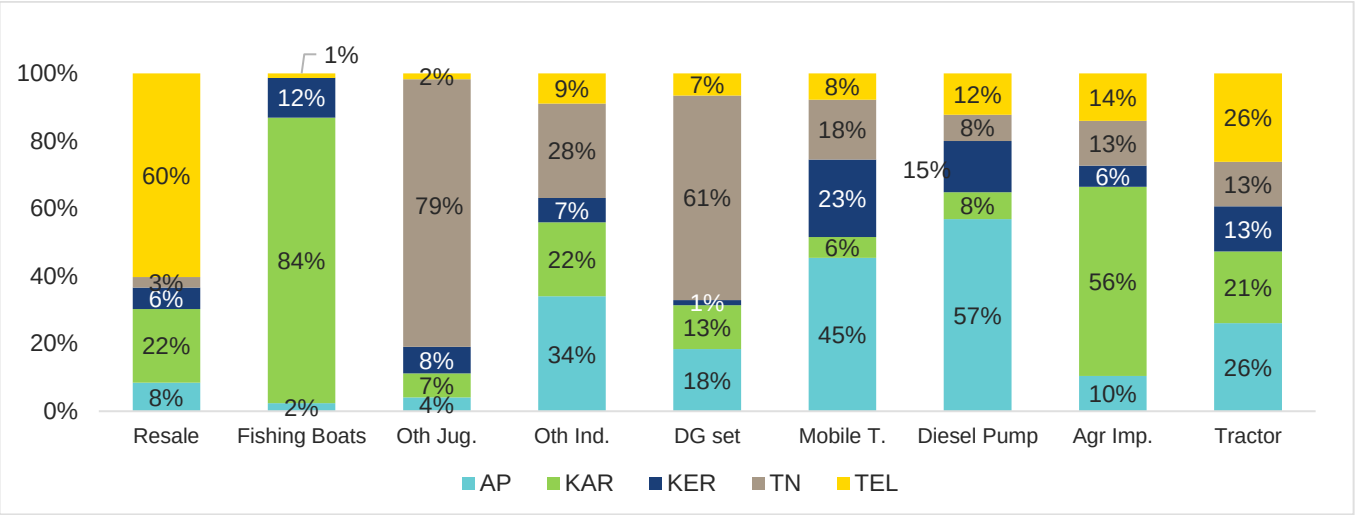
From above chart following observations are made for sale of fuel from surveyed ROs:

- Trucks segment which is major contributor of diesel sales showed highest contribution to sale from Karnataka (36% of total diesel sale to trucks in south zone).
- In Private car and Private SUV, Telangana has highest share. While Karnataka has highest share in Taxi and Taxi SUV segment.

- Higher contribution is observed from Andhra Pradesh, Tamil Nadu and Telangana from 3-Wheeler vehicle category.

In non-transport segment of diesel, following figure shows sales pattern across south zone:

Figure 136: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

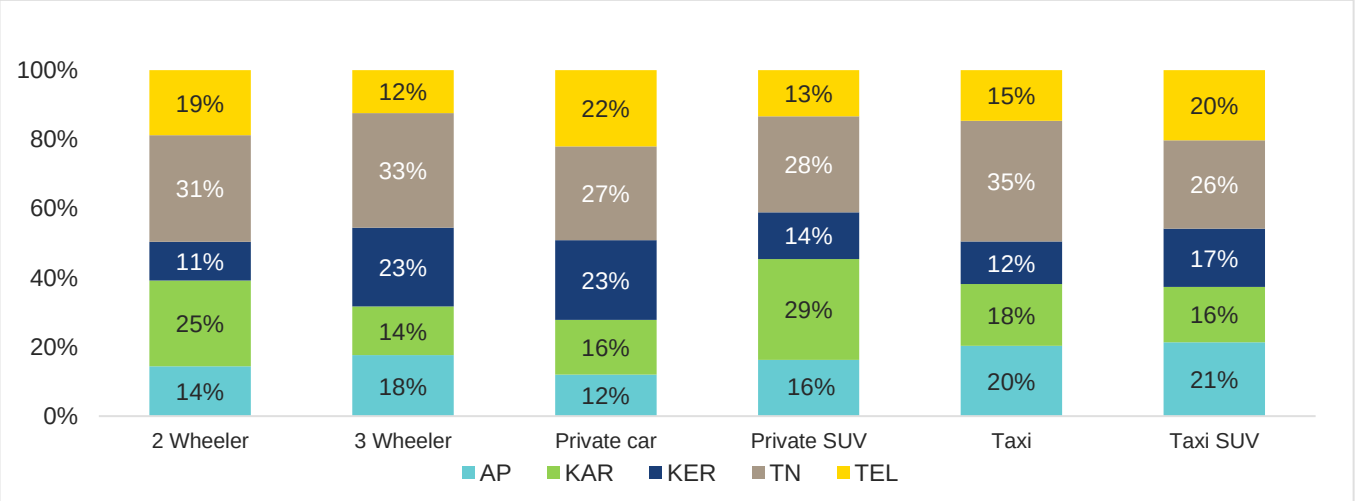
From the above chart following observations can be made:

- Karnataka has higher offtake of diesel by Agriculture implements while Telangana and Andhra Pradesh have highest share in tractor categories.
- Others-Jugad and DG set have highest share from Tamil Nadu

9.2.3.2 Petrol Sales

End user segment wise petrol sale pattern in south zone is shown in following figure:

Figure 137: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

From the above chart following observation can be made:

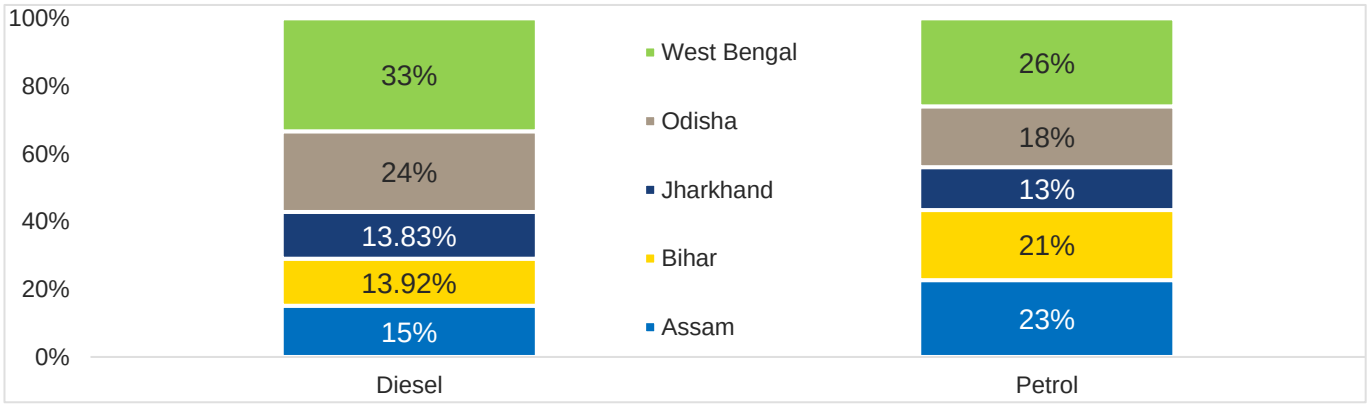
- Tamil Nadu has higher share in almost all of petrol segment except Private SUV.

9.2.4 East zone

9.2.4.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 138: Diesel and petrol sales - East Zone



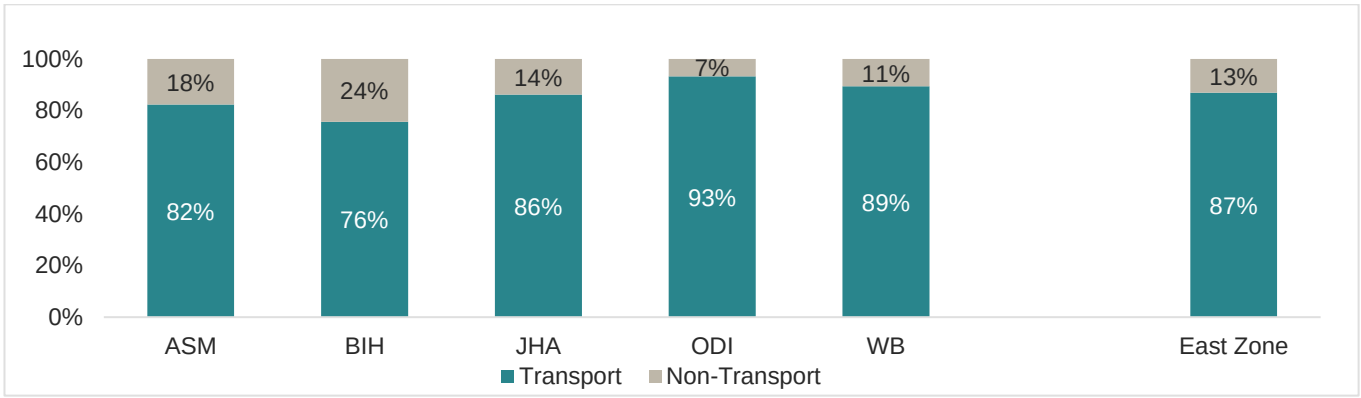
Source: CRIS analysis & primary survey

Following observations are made:

- In total diesel sales, highest sales were recorded in West Bengal (33% of total diesel sold in east zone) and lowest were recorded in Jharkhand and Bihar (~14% each of total diesel sold in east zone).
- Highest petrol sales were recorded in West Bengal (26% of total petrol sold in east zone) and lowest were recorded in Jharkhand (13% of total petrol sold in east zone).

Diesel sales to transport segment contributed **87%** in total diesel sale, remaining is contributed by non-transport segment (agriculture, power, industrial and others). Diesel consumption in transport and non-transport sector of east zone is maximum in **West Bengal**.

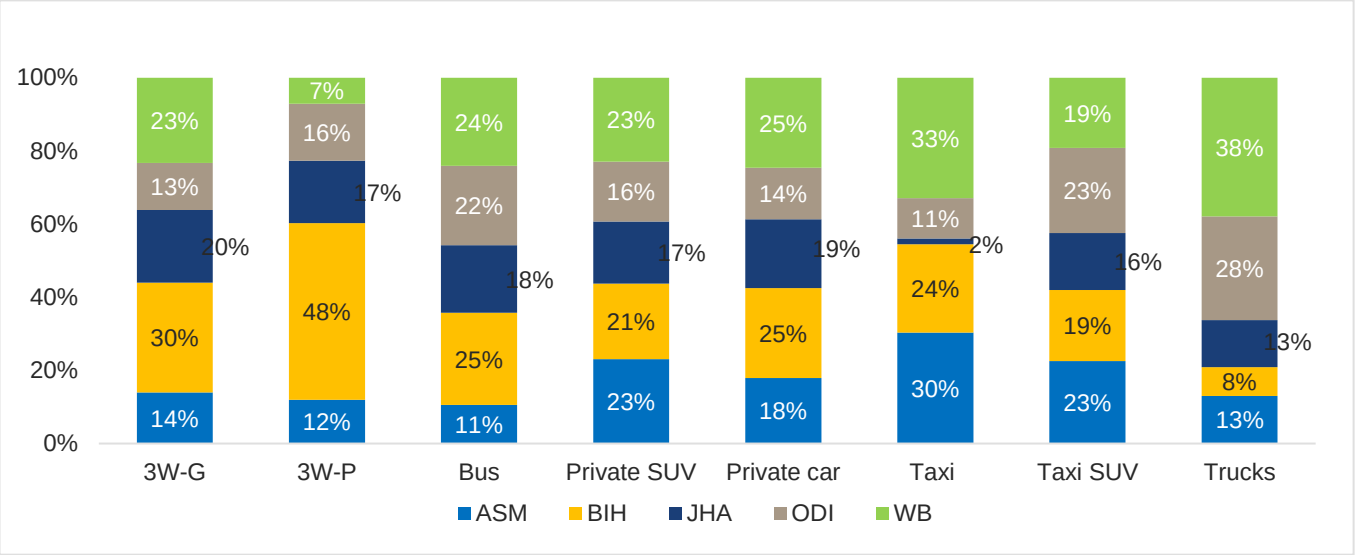
Figure 139: End use share of diesel - East Zone



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in east zone.

Figure 140: End use share of diesel sold to transport segment



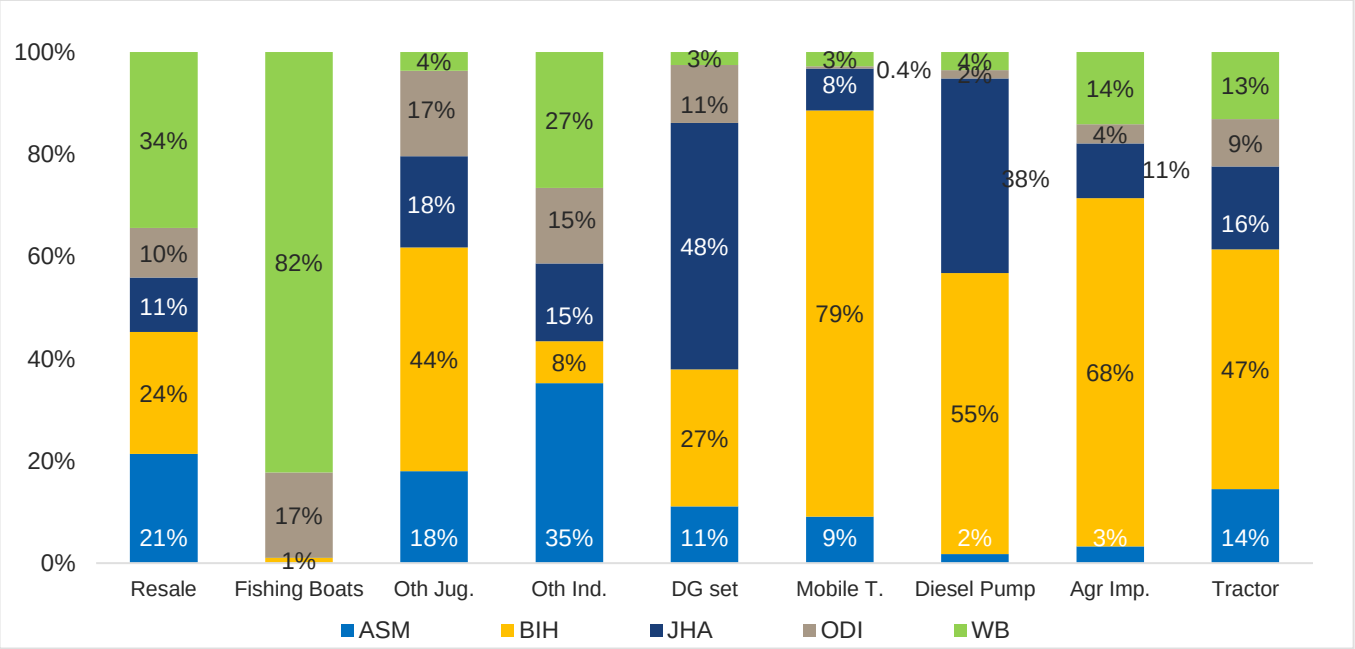
Source: CRIS analysis & primary survey

From above chart following observations are made for sale of fuel from surveyed ROs:

- Trucks segment which is major contributor of diesel sales showed highest contribution to sale from West Bengal (38% of total diesel sale to trucks in east zone). This could presumably be due to higher trade activity leading to higher diesel sales in the state.

In non-transport segment of diesel, following figure shows sales pattern across east zone:

Figure 141: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

From the above chart following observations can be made:

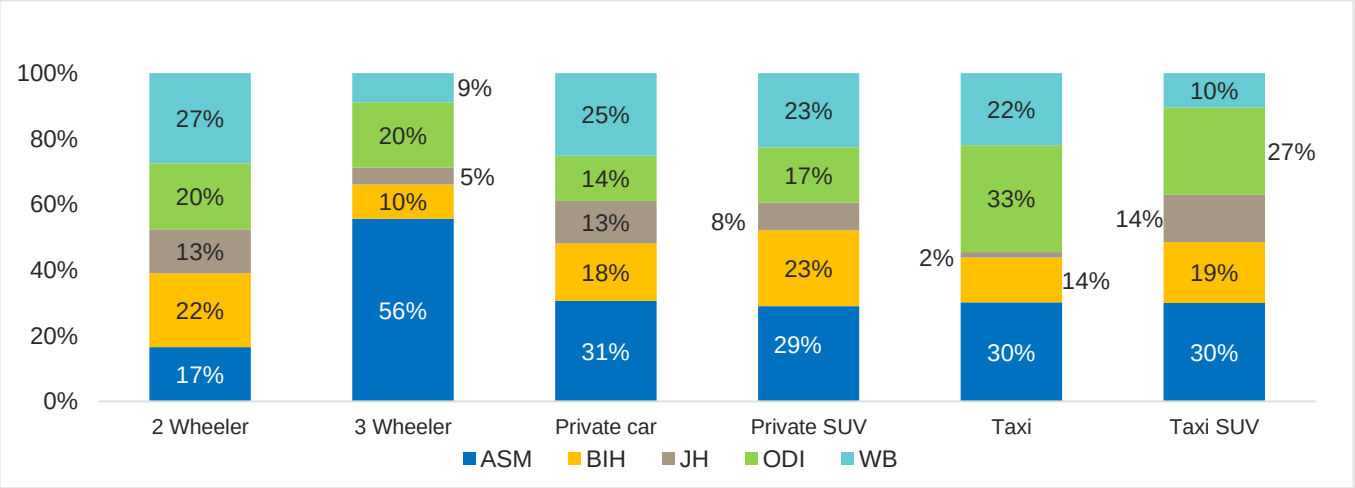
- Bihar recorded the lion's share in diesel sale to tractors, diesel pump, mobile tower and agriculture segments.

- Share of diesel sale for other industrial usage has been dominated by West Bengal and Assam, presumably due to maximum share of ROs being surveyed.

9.2.4.2 Petrol Sales

End user segment wise petrol sale pattern in east zone is shown in following figure:

Figure 142: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

From the above chart following observations can be made:

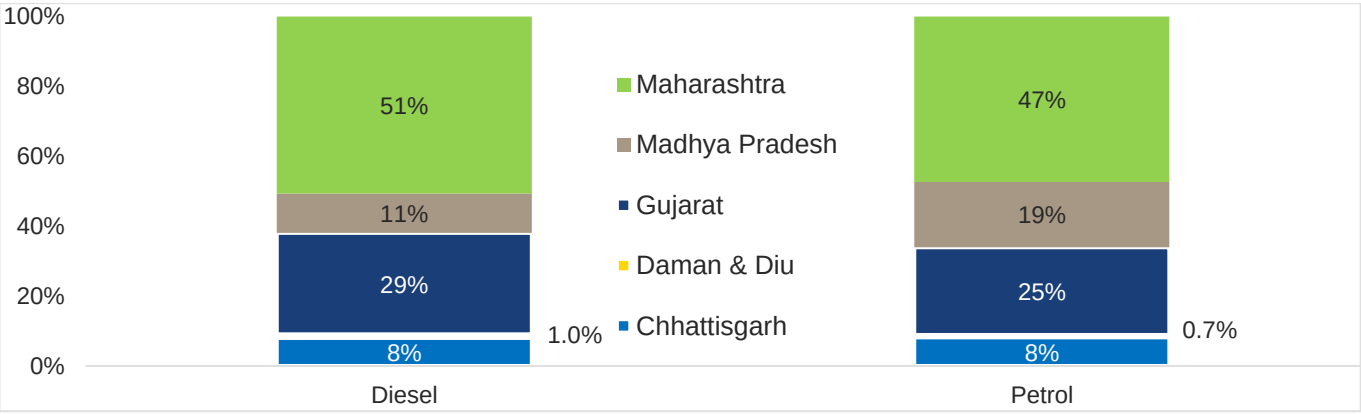
- Assam has higher contribution to petrol sales from almost all segments except 2-Wheelers.

9.2.5 West zone

9.2.5.1 Diesel Sales

The share of diesel and petrol at state level and zone level is shown below:

Figure 143: Diesel and petrol sales - West Zone



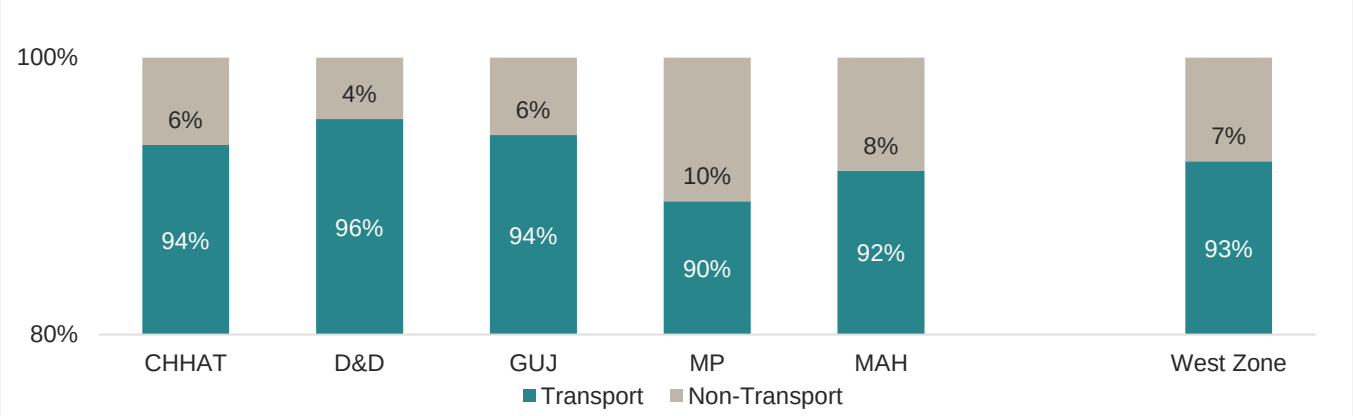
Source: CRIS analysis & primary survey

Following observations are made:

- Highest diesel sales were recorded in Maharashtra (51% of total diesel sold in west zone) and lowest were recorded in Daman & Diu (1% of total diesel sold in west zone).
- In total petrol sales, highest sales were recorded in Maharashtra (47% of total petrol sold in west zone) and lowest were recorded in Daman & Diu (0.7% of total petrol sold in west zone).

Diesel sales to transport segment contributed 93% in total diesel sale, remaining is contributed by non-transport segment (agriculture, power, industrial and others). Diesel consumption in transport sector and non-transport of west zone is maximum in **Maharashtra**.

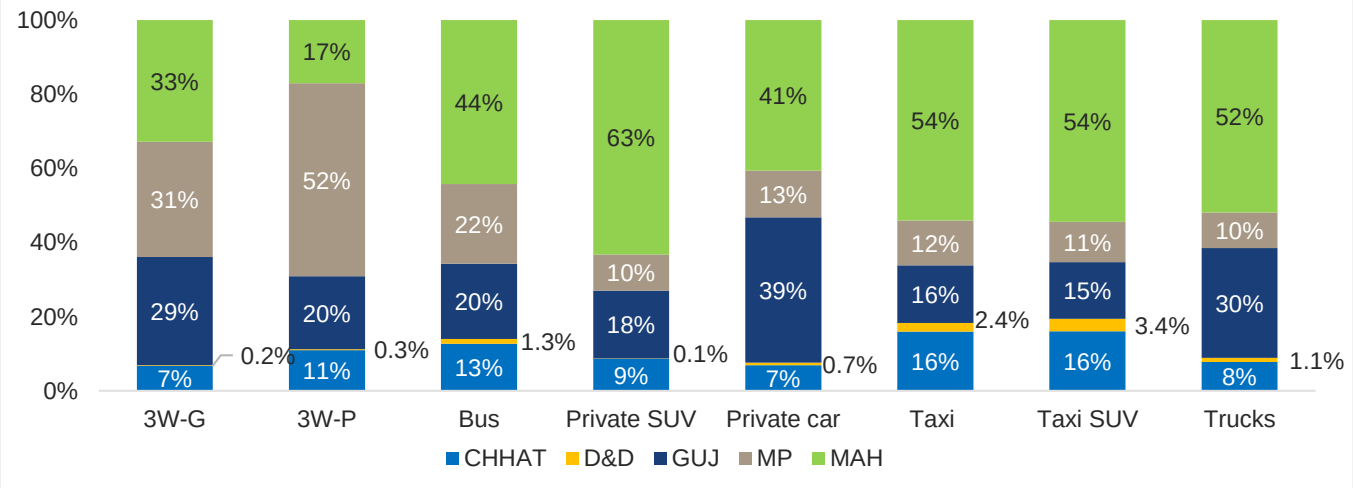
Figure 144: End use share of diesel - West Zone



Source: CRIS analysis & primary survey

Following figure shows diesel sales in major category of transport segment based on end use of diesel in west zone.

Figure 145: End use share of diesel sold to transport segment



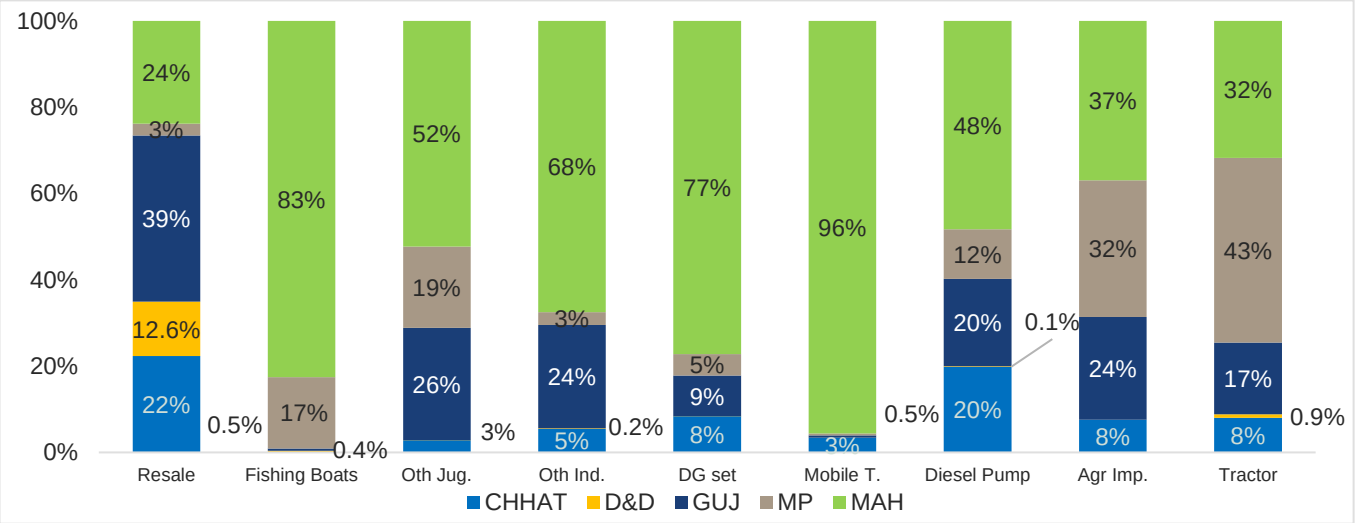
Source: CRIS analysis & primary survey

From above chart following observations are made for sale of fuel from surveyed ROs:

- Trucks segment which is major contributor of diesel sales showed highest contribution to sale from Maharashtra (52% of total diesel sale to trucks in west zone). This can be presumably due to presence of large industrial and commercial hubs in Maharashtra which contributes to higher truck traffic..

In non-transport segment of diesel, following figure shows sales pattern across west zone:

Figure 146: Non-transport segment share of diesel sold



Source: CRIS analysis & primary survey

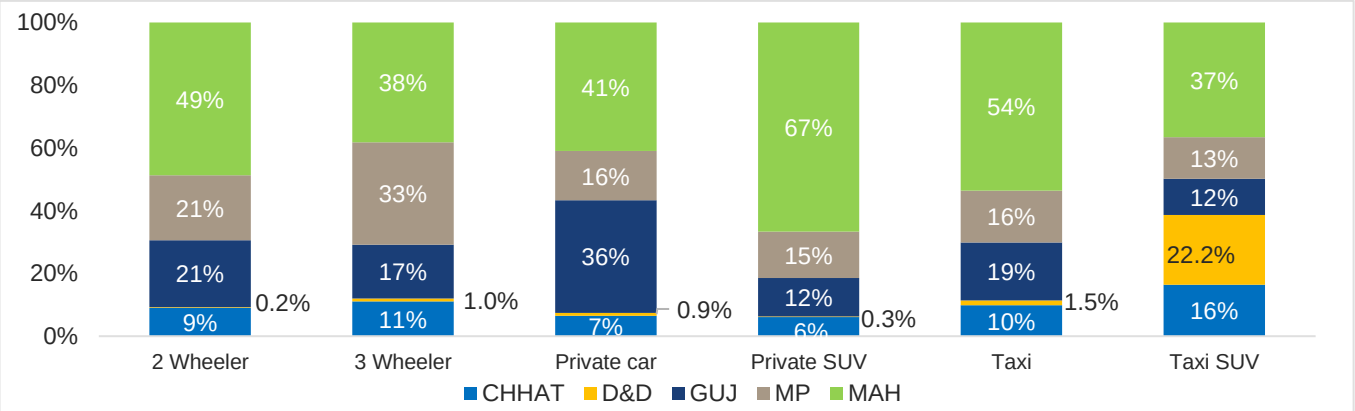
From the above chart following observations can be made:

- The consumption of diesel in DG set commercial and industrial was relatively higher in Maharashtra.

9.2.5.2 Petrol Sales

End user segment wise petrol sale pattern in west zone is shown in following figure:

Figure 147: End user segment wise analysis of petrol sales



Source: CRIS analysis & primary survey

From the above chart following observations can be made:

- Maharashtra leads in all the segments of petrol sales.
- In Madhya Pradesh 2-Wheeler contributed 21% in petrol sales in Madhya Pradesh while private car contributed only 16%.

10. Market class wise finding- Consolidated all-India- Diesel and Petrol (Retail)

This section covers all-India analysis of diesel and petrol sale based on classification of retail outlets. The OMCs define retail outlets based on their presence and categories them into:

- "A" Category: Urban (Tier I)
- "B" Category: Urban (Tier II)
- "C" Category: Urban (Tier III)
- "D" Category: National/ State Highway
- "E" Category: Rural

For this analysis, RO are based on Urban category (A, B, C), National/State Highway (D) and Rural (E) category.

For diesel sale, following table shows segment wise sale in three categories of ROs (Urban, NH/SH and Rural).

Figure 148: End user segment wise analysis of diesel sales-Urban/ NH-SH/ Rural ROs

Segments	Urban	National/State Highway	Rural
Commercial (Taxis)	4.3%	2.9%	3.7%
Private cars	23.4%	10.5%	15.0%
3-Wheelers	2.0%	1.0%	3.2%
Trucks: HCV / LCV	47.9%	73.2%	43.6%
Buses	5.4%	3.5%	3.8%
Sub Total-Transport	**83.1%**	**91.1%**	**69.3%**
Agriculture	5.3%	3.4%	14.8%
Power Generation	2.9%	1.0%	2.1%
Industry	3.6%	1.9%	5.2%
Mobile Towers	0.5%	0.3%	0.4%
Others	4.8%	2.3%	8.2%
Sub Total- Non-Transport	**16.9%**	**8.9%**	**30.7%**
Total	**100%**	**100%**	**100%**

Source: CRIS analysis & primary survey

Following observations are made based on above table:

- Commercial and Private Car segment is more prevalent in Urban category ROs as compared to Rural or National/State Highway. This can be presumably due to presence of major corporate office spaces and residential areas in Urban areas
- 3-Wheeler has higher contribution in Rural category ROs as compared to Urban or NH/SH ROs which shows it is preferred means of transport in Rural areas

- Trucks drives lion's share in D category at 73.2% contribution to diesel fuel consumption
- In non-transport sector, Agricultural shows highest contribution from Rural category RO at ~15%. Similar observation can be made in Others segment. This is presumably due to presence of higher number of Jugaad vehicle (which is a contributes ~61% of Others segment) in rural areas.
- Power generation through DG-sets consume more diesel from Urban category ROs while Industrial segment consumes more diesel from Rural category ROs.

For petrol sale, following table shows segment wise sale in three categories of ROs (Urban, NH/SH and Rural).

Figure 149: End user segment wise analysis of petrol sales-Urban/ NH-SH/ Rural ROs

Segments	Urban	National/State Highway	Rural
2 Wheeler	58.6%	56.9%	68.8%
3 Wheeler-Goods	0.6%	0.8%	0.8%
3 Wheeler-Passenger	0.4%	0.7%	0.5%
Private car	29.1%	28.6%	18.9%
Private SUV	8.4%	9.1%	8.2%
Taxi	1.7%	2.3%	1.5%
Taxi SUV	1.2%	1.7%	1.2%
Grand Total	**100.0%**	**100.0%**	**100.0%**

Source: CRIS analysis & primary survey

Following observation can be made:

- 2-Wheelers segment is dominates in Rural category ROs with almost 70% of total petrol consumption. National/State Highway and Urban ROs contributes similar share in 2-Wheeler category.
- Use of 3-Wheelers in three categories is almost similar which is evident from similar petrol consumption
- Private Car dominates in Urban category RO while Private SUV dominates National/State Highway category ROs. This shows preference of SUVs for long drives.
- Taxi share is prominent in National/State Highway ROs.

11. Consolidated Retail and Direct Sales for Diesel segment at Pan India level

This section covers both segmental share of Retail and Direct sale. Direct sales are majorly consumed in Aviation, Shipping, Railways and State Transport buses in transport segment. In non-transport segment, direct sale accounts majority portion with Industries (Manufacturing and Mining) as major segments. Segmental share observed during the survey period is applied to Retail sales from OMCs

Figure 150: End user segment wise analysis of diesel sales (Direct and Retail) -All India

Segments	Retail Share (%)	OMC-Retail (TMT)	Direct (TMT)	Retail + Direct (TMT)	Retail + Direct (%)
Commercial (Taxis)	3.4%	2,244	-	2,244	2.9%
Private cars	14%	9,590	-	9,590	12.4%
3-Wheelers	1.4%	959	-	959	1.2%
Trucks: HCV / LCV	64%	42,939	-	42,939	55.4%
Buses	4.1%	2,709	1,829	4,537	5.9%
Aviation/ Shipping	-	-	626	626	0.8%
Railways	-	-	1,603	1,603	2.1%
Agriculture	4.7%	3,154	589	3,743	4.8%
Power Generation	1.6%	1,064	206	1,270	1.6%
Industry	2.6%	1,709	3,137	4,846	6.3%
Mobile Towers	0.4%	234	-	234	0.3%
Others	3.4%	2,266	2,637	4,903	6.3%
Total	**100%**	**66,869**	**10,627**	**77,496**	**100%**

Source: CRIS analysis & OMC data

It is observed that diesel sale to transport segment contributes almost 81% to total diesel sale (both direct and retail) and remaining 19% is contributed by non-transport segment. In transport segment, share of diesel sale is highest in Trucks (HCV/LCV) at 55%, this is followed by diesel sale to Private Cars at 12%.

In non-transport segment of diesel sale, highest contribution is from Industries and Others (6.3% each). The share of diesel sold to agriculture segment contributes 4.8% to total diesel sale and power segment has contribution of 1.6% in total diesel sale.

12. Past sectoral survey studies- (2012-13 study)

This section covers in brief about results of past sectoral survey studies and provide overview when compared with present survey period. AC Nielsen conducted sectoral analysis of petrol and diesel sale in 2012-13. During 2012-13, 2006 retail outlets were surveyed across 150 districts in 16 states, while the current survey covered 3000 retail outlets spread across 212 districts. It must be noted that 2020-21 survey period witnessed variety of swings in economy such as including both lockdown phase and re-opening of economy.

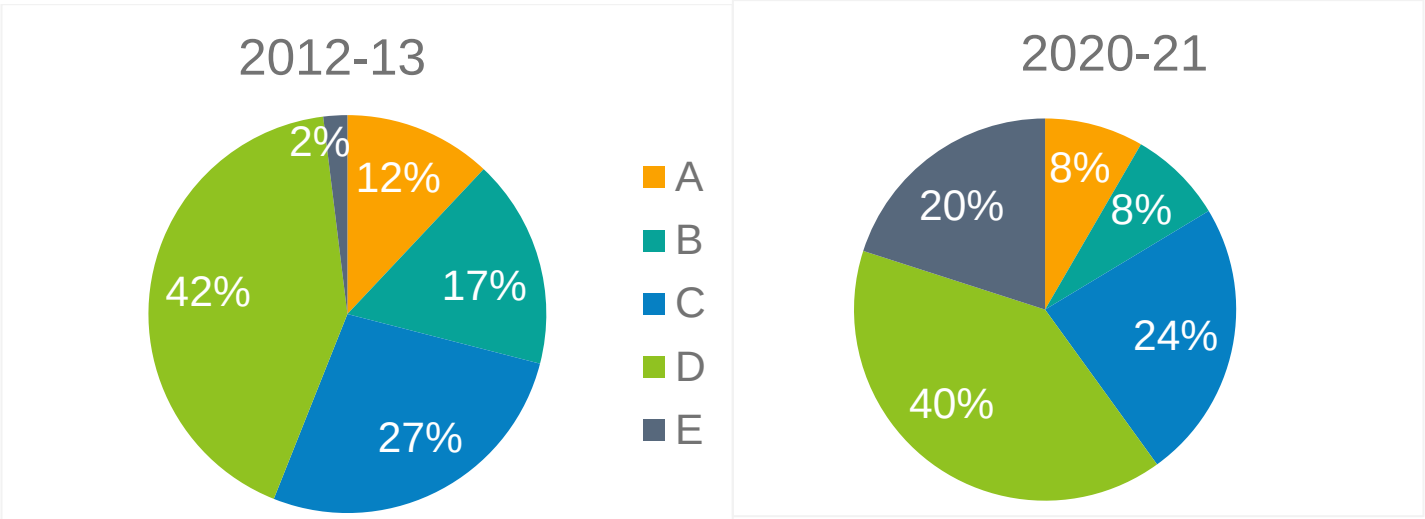
Figure 151: Coverage during 2012-13 and 2020-21 studies

State	Districts		ROs	
	2012-13	2020-21	2012-13	2020-21
Andhra Pradesh	7	4	89	103
Assam	8	12	100	121
Bihar	12	13	173	144
Chandigarh	-	1	-	5
Chhattisgarh	-	9	-	97
Daman & Diu	-	1	-	5
Delhi	3	11	42	45
Gujarat	8	11	108	157
Haryana	7	7	99	160
Jharkhand	-	8	-	88
Karnataka	9	10	117	226
Kerala	4	6	59	92
Madhya Pradesh	16	18	178	197
Maharashtra	12	12	154	254
Odisha	9	10	112	111
Punjab	6	7	87	116
Rajasthan	10	11	145	186
Tamil Nadu	10	11	131	213
Telangana	-	11	-	139
Uttar Pradesh	23	26	325	355
Uttarakhand	-	4	-	45
West Bengal	6	9	87	141
Grand Total	150	212	2006	3000

Source: Reports

Distribution of retail outlets during 2012-13 study viz-a-viz 2020-21 study is shown in the following figure.

Figure 152: Share of market classification during 2012-13 and 2020-21 (in %)

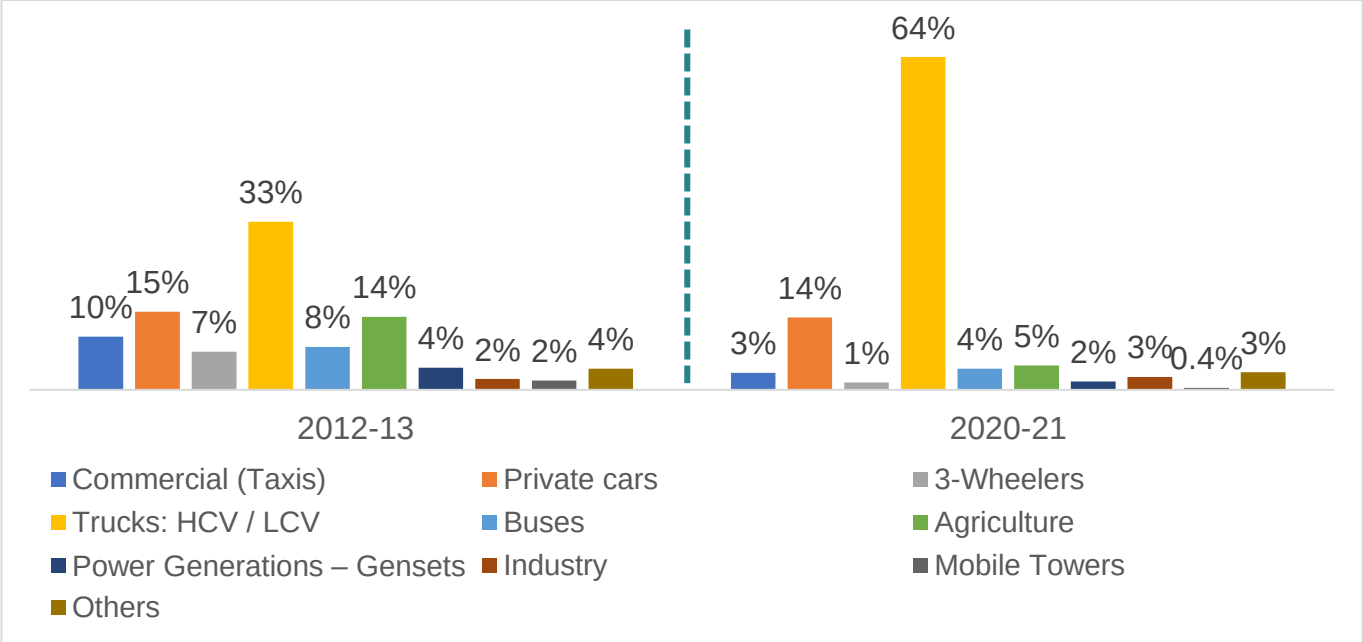


Source: Reports

Diesel segmental share

The survey conducted during 2012-13 had share of diesel sold to transport segment at 73.6% and around 26.4% sold to non-transport segment. While, in 2020-21 study share of diesel sold to transport is around 87% and 13% is contributed from non-transport segment.

Figure 153: End user segment wise share of diesel sales from retail outlets (2012-13 vs 2020-21)



Source: Reports

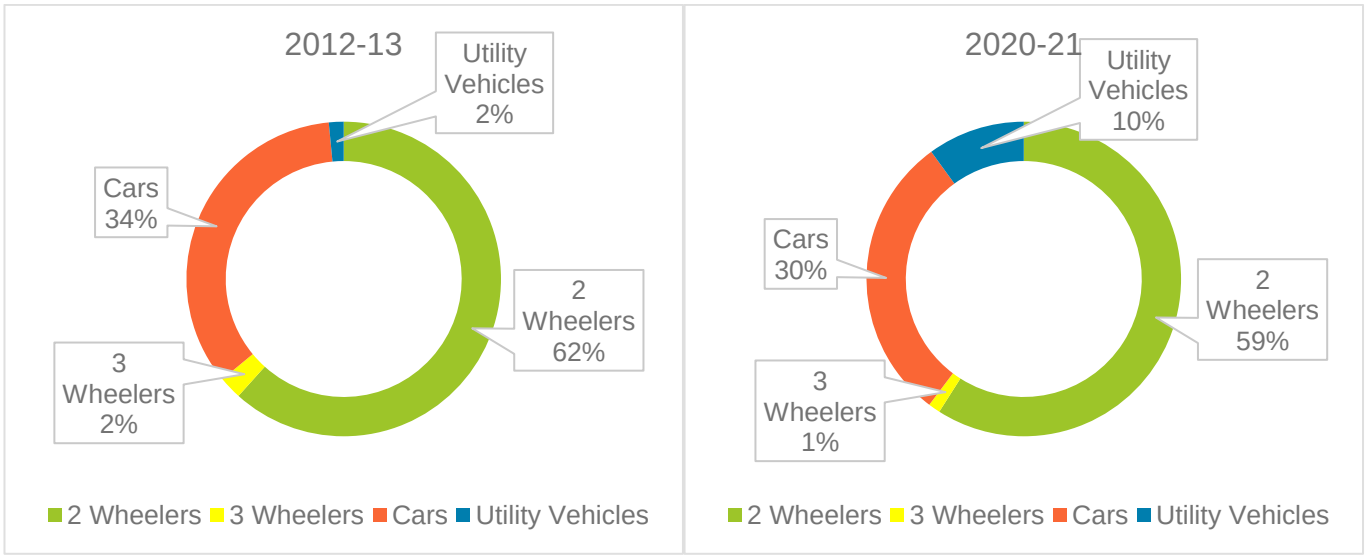
It can be observed from above figure that Trucks contributed around 33% in overall diesel sale from retail segment during 2012-13 survey period while during 2020-21 period, share of trucks is around 64%. The presumable reason is that during the time between both survey periods India witnessed massive development in road infrastructure and thereby leading to higher share of freight being transported via road.

During the 2020-21 period, education institution remained closed for most part of the period therefore the share of private buses remained around 4%. While in 2012-13 period buses contribution was at 8% to diesel sale from retail outlets. The share of diesel sold to commercial taxis was also lower during 2020-21 due to lower tourism activity as compared to 2012-13 study. The share of private cars is similar in both survey period.

Share of diesel sold to non-transport segment was significantly lower during 2020-21 survey period as compared to 2012-13 survey period. One of the prime reasons would be better penetration of solar pumps which has replaced the diesel pumps usage in the agricultural segment. Moreover, wide spread electrification across India have ensured less usage of diesel generators for electrification.

Petrol segmental share

Figure 154: End user segment wise share of petrol sales from retail outlets (2012-13 vs 2020-21)



Source: Reports

The end-use share in petrol segment was similar in 2012-13 as compared to 2020-21. The 2-Wheeler segment has 59% share in 2020-21 while in 2012-13 share was around 62%. Share of petrol sold from retail outlets to Cars segment has reduced while that of SUV segment has increased in 2020-21 survey period as compared to 2012-13 survey period.

13. Conclusion

Indian economy is poised to grow at a steady pace and is expected to be expanding to USD 5 trillion by the year 2025. A strong growth in GDP bodes well for burgeoning of energy demand, with oil and gas continue to meet the baseload of our energy demand in the foreseeable future. Further, Government's impetus on expanding the road infrastructure will ensure robust demand of transport fuel particularly diesel demand. Demand growth in petrol and diesel combined will likely to have an impact because of increasing blending of ethanol with petrol, and rising usage of vehicles powered by compressed natural gas (CNG) and electricity (EVs). The trend will also be persuaded by policy interventions as India targets net zero emissions by 2070.

Thus, to ascertain the segmental refueling patterns the survey was carried out during a very crucial period where economy witnessed returning to pre-covid levels and second wave again impacted the economy. Throughout the period, it was observed fuel sales were congruent with economy. Following conclusion can be made from this analysis:

Diesel

- The road logistics market is expected to grow significantly to support the rapidly growing e-commerce market and retail sales segment. Logistics sector contributes 14 per cent of the overall GDP of India, wherein road logistics has the largest share with 60 per cent. Further, policy initiatives undertaken by the Government to boost the manufacturing will ensure a robust growth in the road transport segment as it will connect the manufacturing hubs to the demand sectors across India.

  The largest drivers of diesel demand from the fuel retail pumps are commercial vehicles- trucks and public transport, followed by passenger vehicles. At a Pan-India level it was observed that Transport sector is driver of the overall diesel. This pattern is expected to continue in foreseeable future, with the Trucks segment being the major contributor to retail diesel sales. While the diesel consumption by the Bus segment was muted given the pandemic had an impact on closure of educational institutes along with preference for personal mobility, diesel demand emerging from the bus segment is expected to remain slow as in the longer run electric buses will be the preference with focus on clean energy. Narrow price difference between Petrol and diesel have ensured preference towards petrol driven cars, similarly with the availability of alternate gaseous fuel like CNG across India, more shared mobility (taxis etc) is expected to adopt the CNG. Thus, going forward the diesel driven passenger segment will have marginal share in the transport segment. However, the uptick in the SUV diesel consumption continues to rise with decent increase in the sales of SUV across India.

  In non-transport segment of diesel sale, Industries contribute significantly mainly carried out as Direct sales, while Agriculture segment dominates from the retail sales. Diesel is used in agriculture as fuel for tractors, combine harvesters and irrigation pumps, followed by Others segment which includes Juggad vehicle, fishing boats and resale. Diesel consumed for industrial machinery use contributes around 2.6% while diesel consumed in Power Generation (DG sets) is around 1.6%. Due to increasing focus on renewable power and power transmission infrastructure it is expected that consumption of diesel in agri-pumps and DG sets may see decline.

  At zone level, diesel sale in transport segment was highest for north zone (36%) and lowest for east zone (16%). Further, diesel sale in non-transport segment has highest contribution from north zone (41%) and lowest from south zone (18%). For transport segment at zonal level, north zone (36%) contributes the highest quantity of diesel sold to transport segment followed by south and west zone (24% each). For agriculture segment, north zone (54%) contributes the highest quantity of diesel sold to agriculture segment and lowest

is contributed by south zone (12%). In power segment, north zone (53%) contributes the highest quantity of diesel sold to power segment and lowest is contributed by east and west zone (15% each). In industrial segment, east zone (37%) contributes the highest quantity of diesel sold to industrial segment and lowest is contributed by south zone (18%). In others segment, north zone (32%) contributes the highest quantity of diesel sold followed by south zone (27%)

Petrol

- 2-Wheeler segment dominates the petrol sale contributing almost 60% followed by Passenger Cars at 30% and SUVs at 10%. The percentage may alter with the introduction of Electric 2W and adaptation of CNG in the passenger car segment. Roll out of City Gas Distribution across India, will have steady focus on the CNG infrastructure which is expected to witness further adaptation of clean fuel across India.

- At Zone level, North zone (35%) contributes the highest share in petrol sold to private cars segment, followed by west zone (25%). Petrol sold to 2-Wheeler segment was highest in north zone (35%) followed by west zone (25%). North zone (35%) contributes the highest share in petrol sold to private cars segment, followed by west zone (25%).

The insight from the survey captures the trend of refueling across segments both in diesel and petrol segments. It mirrors the economic activities across regions and showcases the fueling patterns followed by various segments like trucks, private passenger cars, agriculture segment and petrol driven vehicles. The pattern of end users will be helpful in determining new strategies for fuel retail network expansions and adaptation of new energies for transportation.

14. Appendix

Details of Retail Sales of Diesel – Zone wise

The following table shows share of diesel sale to different segments in different zones.

Segments	East	North	South	West	Overall
3-Wheeler-Goods	0.73%	0.43%	0.67%	0.63%	0.59%
3-Wheeler-Passenger	1.43%	0.72%	1.08%	0.40%	0.85%
Agriculture Implements	0.83%	2.67%	0.57%	1.04%	1.49%
Bus	4.66%	4.09%	3.37%	4.23%	4.05%
DG Set – Residential	0.11%	0.32%	0.17%	0.09%	0.19%
DG set- Commercial	0.27%	0.64%	0.54%	0.37%	0.49%
DG Set- Industrial	0.52%	1.50%	0.55%	0.63%	0.91%
Diesel Pump	0.53%	0.86%	0.39%	0.48%	0.60%
Fishing Boats	1.21%	0.01%	0.98%	0.04%	0.44%
Mobile Towers	0.89%	0.40%	0.08%	0.16%	0.35%
Other Industrial	5.61%	1.49%	1.99%	2.57%	2.56%
Others-Jugad & burning	1.80%	1.72%	2.60%	2.18%	2.05%
Private car	5.34%	10.16%	10.49%	10.84%	9.59%
Private SUV	4.30%	5.61%	3.91%	4.58%	4.75%
Resale	1.72%	1.30%	0.36%	0.23%	0.90%
Taxi	1.88%	1.99%	3.24%	1.48%	2.14%
Taxi SUV	0.96%	1.23%	1.71%	0.88%	1.21%
Tractor	2.63%	3.47%	1.47%	2.45%	2.63%
Trucks	64.58%	61.37%	65.83%	66.72%	64.21%

Source: CRIS analysis & primary survey; Note: Green cell indicates highest value and Red cell indicates lowest value in a row

Details of Retail Sales of Petrol – Zone wise

The following table shows share of diesel sale to different segments in different zones.

Segments	East	North	South	West	Overall
2 Wheeler	59.41%	58.86%	58.85%	59.14%	59.02%
3-Wheeler-Goods	0.37%	0.64%	0.88%	0.82%	0.69%
3-Wheeler-Passenger	0.72%	0.36%	0.68%	0.57%	0.55%
Private car	28.32%	27.73%	26.27%	29.00%	27.82%

Segments	East	North	South	West	Overall
Private SUV	8.75%	8.85%	9.24%	7.66%	8.62%
Taxi	1.54%	1.96%	2.52%	1.58%	1.91%
Taxi SUV	0.91%	1.61%	1.57%	1.24%	1.38%

Source: CRIS analysis & primary survey; Note: Green cell indicates highest value and Red cell indicates lowest value in a row

Details of Retail Sales of Diesel Transport segment– State wise

The following table shows share of diesel sale to different segments in different zones.

States	3-Wheeler -Goods	3-Wheeler-Passenger	Bus	Private car	Private SUV	Taxi	Taxi SUV	Trucks
Andhra Pradesh	5.19%	6.50%	3.17%	2.72%	2.18%	2.71%	3.00%	2.82%
Assam	3.75%	4.34%	3.01%	1.86%	3.18%	4.59%	3.51%	2.21%
Bihar	5.21%	12.26%	4.13%	2.06%	3.71%	3.21%	3.04%	1.69%
Chandigarh	0.96%	1.84%	0.57%	1.43%	1.79%	0.34%	0.47%	0.08%
Chhattisgarh	2.08%	1.69%	4.01%	1.75%	1.61%	1.83%	2.71%	2.11%
Daman & Diu	0.07%	0.03%	0.22%	0.16%	0.10%	0.24%	0.20%	0.18%
Delhi	0.06%	0.06%	1.87%	4.70%	4.46%	0.82%	1.44%	0.57%
Gujarat	7.41%	2.19%	4.48%	7.81%	4.45%	2.44%	2.76%	7.06%
Haryana	1.96%	3.06%	5.78%	6.12%	7.06%	3.00%	4.17%	12.18%
Jharkhand	3.56%	4.14%	3.07%	1.49%	2.08%	0.30%	1.27%	2.08%
Karnataka	4.83%	3.46%	4.91%	5.69%	4.55%	18.33%	15.48%	9.08%
Kerala	4.41%	5.94%	2.99%	2.99%	1.49%	2.35%	2.14%	1.19%
Madhya Pradesh	5.36%	3.96%	4.24%	3.40%	2.32%	1.73%	1.76%	2.54%
Maharashtra	10.55%	3.47%	11.86%	13.76%	14.44%	10.23%	9.83%	12.81%
Odisha	4.19%	5.60%	4.61%	1.93%	2.25%	1.88%	2.57%	4.78%
Punjab	2.89%	2.34%	2.90%	5.32%	4.51%	1.86%	2.99%	2.30%
Rajasthan	14.53%	13.17%	10.64%	8.35%	10.81%	18.94%	18.19%	4.78%
Tamil Nadu	7.09%	6.40%	5.40%	7.13%	5.01%	7.72%	7.39%	7.51%
Telangana	5.06%	7.14%	2.77%	6.78%	5.82%	3.86%	4.61%	3.11%
Uttar Pradesh	5.39%	9.00%	13.21%	11.48%	13.29%	7.16%	8.22%	13.87%
Uttarakhand	1.09%	1.43%	1.66%	1.04%	0.91%	1.64%	1.40%	0.90%
West Bengal	4.36%	1.98%	4.50%	2.02%	4.00%	4.81%	2.84%	6.15%

Source: CRIS analysis & primary survey; Note: Green cell indicates highest value and Red cell indicates lowest value in a row

Details of Retail Sales of Diesel Non-Transport segment– State wise

The following table shows share of diesel sale to different segments in different zones.

State	Gensets	Agriculture implements	Agri-pumps	Tractors	Industrial other than gensets	Others (include Mobile Towers and Others segment)
Andhra Pradesh	2.98%	1.07%	4.08%	2.28%	3.73%	1.36%
Assam	1.62%	1.00%	0.87%	2.49%	10.33%	3.77%
Bihar	1.98%	5.74%	8.12%	8.42%	4.54%	9.46%
Chandigarh	1.06%	0.51%	1.94%	0.32%	0.26%	0.16%
Chhattisgarh	2.06%	1.94%	4.13%	2.83%	2.41%	2.09%
Daman & Diu	0.41%	0.02%	0.20%	0.09%	0.04%	0.43%
Delhi	1.38%	0.04%	0.08%	0.28%	1.60%	1.16%
Gujarat	2.25%	3.08%	2.20%	3.29%	6.48%	3.13%
Haryana	23.81%	16.99%	19.10%	9.95%	3.36%	7.54%
Jharkhand	2.05%	0.23%	1.63%	1.61%	6.08%	2.01%
Karnataka	2.55%	4.48%	4.61%	4.64%	5.11%	8.41%
Kerala	0.27%	0.33%	1.31%	0.71%	1.29%	4.23%
Madhya Pradesh	2.03%	8.00%	3.03%	8.22%	3.27%	5.88%
Maharashtra	9.40%	3.60%	9.27%	7.79%	11.68%	5.05%
Odisha	2.30%	0.41%	1.27%	1.47%	4.43%	3.24%
Punjab	6.20%	21.09%	2.74%	6.76%	2.72%	5.10%
Rajasthan	3.86%	3.20%	6.10%	11.04%	1.85%	5.83%
Tamil Nadu	10.11%	0.95%	1.18%	2.09%	4.22%	8.85%
Telangana	2.41%	2.02%	3.60%	3.24%	3.67%	2.01%
Uttar Pradesh	18.28%	22.50%	21.02%	18.54%	10.47%	12.10%
Uttarakhand	1.49%	0.78%	0.54%	1.11%	0.90%	1.38%
West Bengal	1.49%	2.02%	2.99%	2.83%	11.56%	6.80%

Source: CRIS analysis & primary survey; Note: Green cell indicates highest value and Red cell indicates lowest value in a row

All India Study on Sectoral Demand of Diesel & Petrol

Report

Petroleum Planning and Analysis Cell

nielsen

2013

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Director General

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Foreword

Pricing of petroleum products like Diesel, Domestic LPG and PDS Kerosene continues to be regulated and subsidized. The subsidy/ under recovery on these products was of the order of Rs. 138,541 crores and Rs. 161,029 crores in 2011-12 and 2012-13 respectively. Diesel alone accounted for 57.8% of the under recoveries (Rs. 173,253 crores) during these two years.

Petroleum products are vital for the economic growth of the country. Out of the total 157.1 MMT of petroleum products consumed during 2012-13, the share of diesel was the highest at 44% (69.1 MMT), while petrol accounted for 10% (15.7 MMT). LPG and SKO accounted for 9.9% and 4.8% respectively.

Out of the total petrol and diesel consumption in the country, more than 99% of petrol and 90% of diesel are currently sold through retail outlets (petrol pumps), for which there is no system of capturing the end-use by sectors and categories. However, data on sector-wise consumption of diesel sold directly by the Oil Marketing Companies (OMCs) is available. The data related to sectoral consumption of these products is an important input for policy formulation, especially as regards subsidies.

The Petroleum Planning & Analysis Cell (PPAC), an attached office of the Ministry of Petroleum & Natural Gas, in association with the PSU OMCs, viz. Indian Oil Corporation Ltd, Bharat Petroleum Corporation Ltd and Hindustan Petroleum Corporation Ltd, commissioned an "All India Study on Sectoral Demand of Diesel & Petrol" through Nielsen (India) Pvt. Ltd., to estimate the shares of various sectors/ segments in diesel and petrol sold through retail outlets (ROs) on state level and on all India basis.

Contd……..2

The study has been completed, and the report submitted by M/s Nielsen. This was made possible by the efforts of hundreds of enumerators and supervisors for collection of field data from over 2000 retail outlets in 150 districts across 16 states in each of the four rounds, spanning a period of 18 months.

This report provides a very useful insight into the consumption patterns of diesel and petrol across various sectors and segments, on a state, zonal and all India basis.

I would like to thank Shri Rohit Dawar, Additional Director PPAC, Shri Vijay Sethi, former Additional Director PPAC, Shri Rajesh Manocha and Shri Vikram Pathak, Deputy Directors PPAC 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 Oil Marketing Companies, retail sales officers and retail outlet dealers for extending their cooperation in carrying out this study.

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

New Delhi
20th December 2013

Augustine Peter
Director General, PPAC

Acknowledgement

We are thankful to Petroleum Planning & Analysis Cell (PPAC), Ministry of Petroleum & Natural Gas, Government of India for assigning this study, "All India Study on Sectoral Demand of Diesel & Petrol" to the consultant. We are grateful to Shri Augustine Peter, Director General, PPAC, Shri Rohit Dawar, Additional Director PPAC & Shri Vijay Sethi, former Additional Director PPAC, for extending their support.

The consultant had the pleasure of interacting with the various OMC as well as their representatives *at state and zonal level for providing us the required support and help from time to time.*

Last but not the least we would like to thank our entire team of research professionals, our field staff across India and support teams for their spirit and enduring cooperation in compiling this compendium of information.

Abbreviations and Acronyms

BTS	Base Transceiver Station
GWh	Giga Watt-Hours
HCV	Heavy Commercial Vehicles
LCV	Light Commercial Vehicles
LNG	Liquefied Natural Gas
LPG	Liquefied Petroleum Gas
MMT	Million Metric Tonnes
MTS	Metric Tonnes
OMC	Oil Marketing Companies
OMCs	Oil Marketing Companies
PPAC	Petroleum Planning & Analysis Cell
PSU	Public Sector Undertaking
RO	Retail Outlet
STC	State Transport Corporation
UPS	Uninterruptible Power Supply
UV	Utility Vehicles

Executive Summary

Diesel and Petrol are strategic commodities; they play a vital role in the socio-economic development of a country. Any uncertainty about their supply can impact the functioning of the economy. In order to reduce this uncertainty it is important to plan and use the resources judiciously. But, before planning, it is essential to understand the consumption pattern of these products. Tentative information pertaining to category-wise overall consumption is available with different sources but there is no correct picture available on category-wise retail sales of Diesel / Petrol, as it is not maintained by dealers operating the retail outlets. It is important to note that during last one decade, retail share in total diesel sale has gone up from 78.5 to 82.1 per cent in 2011-12.

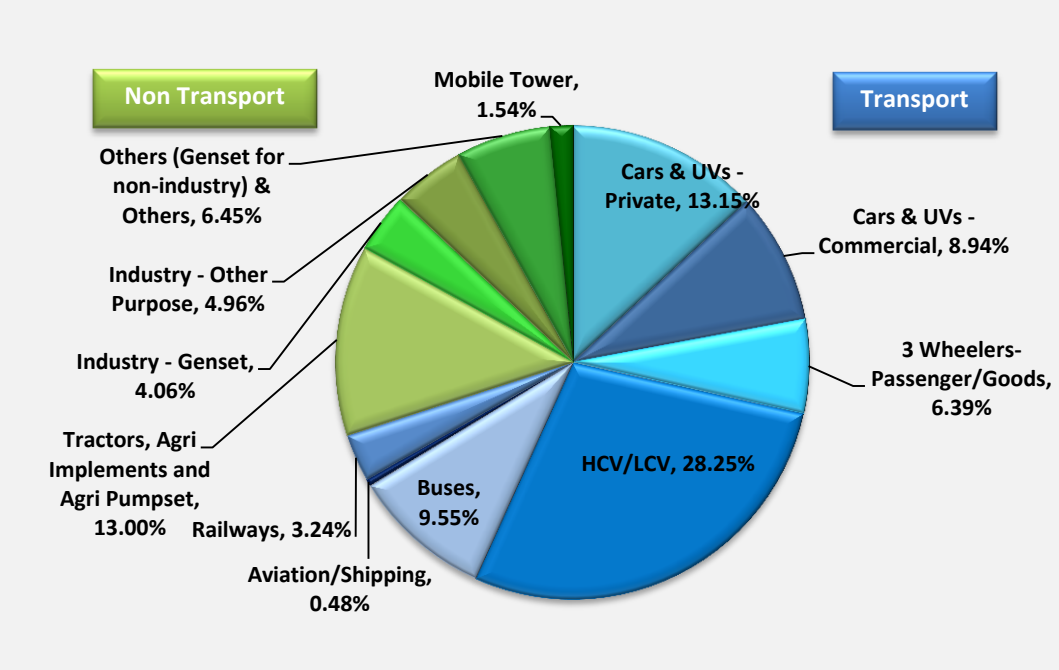
Keeping in mind with the above scenario, Petroleum Planning and Analysis Cell (PPAC), an attached office of the Ministry of Petroleum and Natural Gas, engaged Nielsen India to conduct an in-depth research covering over 2000 retail outlets (RO) spread across 150 districts in 16 states in India. The study was focused to estimate the share of different consuming segments within the transport and non-transport sector for diesel and petrol sold through retail outlets of Public Sector Undertaking (PSU) Oil Marketing Companies (OMCs) on a state-wise, zone-wise and All India basis. To give a more realistic picture, an attempt was also made to put together the direct sales figures (diesel sold directly by the Oil Marketing Companies (OMCs) to bulk consumers like industry, railways, defense, etc.) and retail sales figures to arrive an all India estimate share of different consuming segments within the transport and non-transport sector.

To meet the study objectives, at each RO, retail data was collected through primary survey technique collecting data from the dispensers against the vehicle category /model for vehicle entering for fuelling up for 12 hours (24 hours in case of a RO situated on a highway) for 7 days in a staggered manner. Besides this, direct sales data of diesel provided by PPAC has helped to draw a complete picture of the consumption pattern of diesel at the national level. This exercise was done over four different time periods – January to March 2012, July to September of 2012, October to December of 2012 and April to June of 2013 and the aggregate level data has been arrived both at national and zone

level. PPAC had commissioned Nielsen India to conduct the whole field survey and to submit a comprehensive report keeping in mind the basic objective of the study.

It appears that that transport sector accounts for 70% (both direct and retail sales) consumption of diesel at all India level; LCVs, HCVs and Buses together account for about 38%. This is due to, the large distances that are travelled by commercial vehicles vis-à-vis passenger vehicles. Cars and UVs category contribute nearly 22% of the diesel sales, in which private vehicle consumes little less than 60% of total in this category. This huge private consumption of diesel is due to growing population of UVs and cars, especially amongst private car owners. This segment is expected to grow very fast due to introduction of new generation fuel efficient vehicles by different vehicle manufacturers. Also change in consumer attitude of a particular segment to opt for UVs rather than conventional cars. However, it is interesting to note that there is significant diesel consumption in commercial car and UV segment. Agriculture sector accounts for around 13%. Agri-implements largely stand for Tractor based agri-equipment such as Harvesters, Threshers, etc. Pan India consumption pattern of diesel by transport and non-transport sector for both direct and retail sales has been presented in the following graph below:

Figure 1: All India End-use Share (%) of Diesel in Retail and Direct Sales Combined

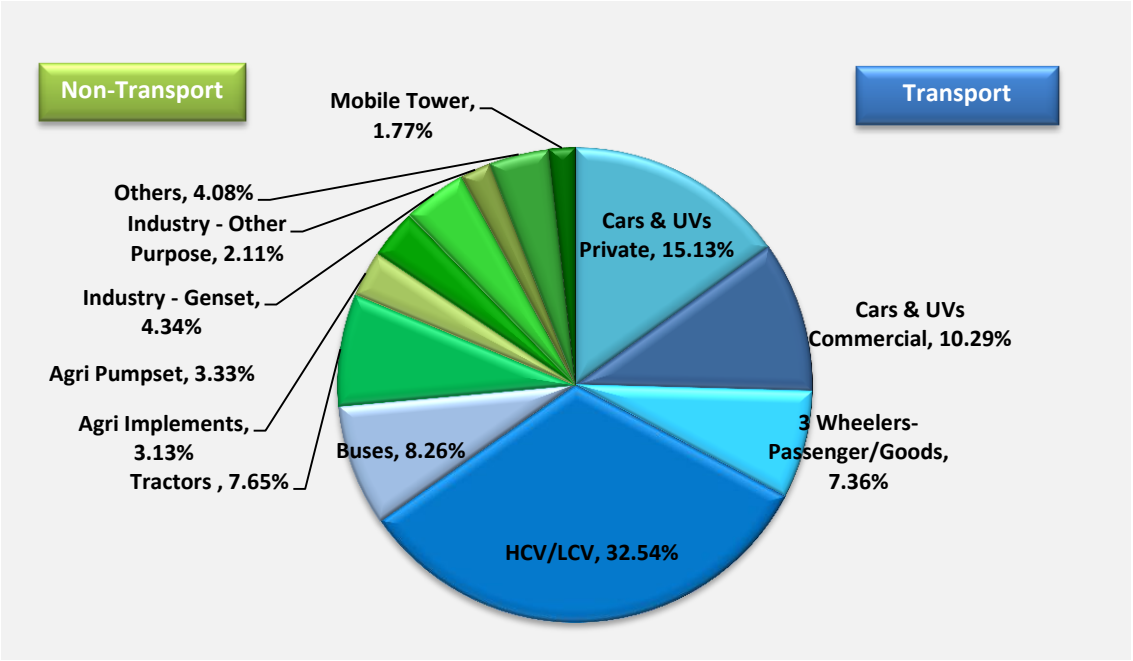


Source: Primary survey of ROs and PPAC

At an All India level, for diesel, the retail sales data echoes similar trend where in transport sector, diesel consumption is maximum in HCV/ LCV/ Buses followed by private cars and UVs. In the non-transport sector, maximum consumption is in agriculture (tractors) followed by gen-set. This may be because tractors are not necessarily used only for agricultural purposes. Today they are also used for commercial purposes, such as for transporting construction material like bricks, stones, mined sand as well as other goods. As the cost remains low for using tractors for the transportation of these materials not only due to lesser fuel consumption, but also because these vehicle enjoy various exemptions like not having to pay toll on highways. It has also been evident from the retail outlet survey that a sizeable quantity of diesel being consumed by infrastructure construction industry, stone crushers, drilling & boring, etc.

Pan India consumption pattern of diesel by transport and non-transport sector for retail sales has been presented in the following graph below:

Figure 2: All India End-use Share (%) of Diesel in Retail

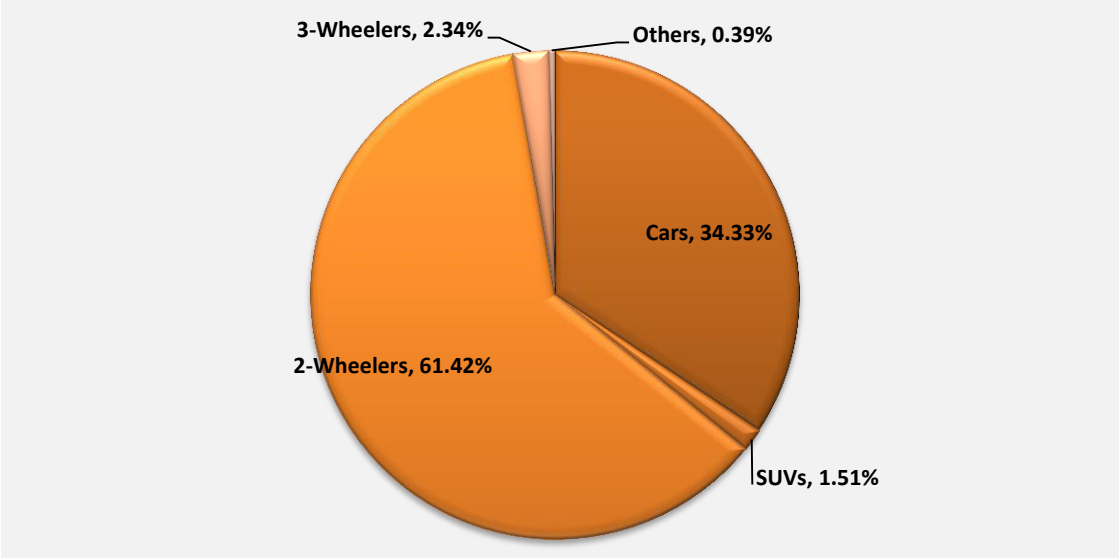


Source: Primary survey of ROs

On the other hand at an All India level, for petrol, study reveals that 2-wheelers segment accounts for the highest consumption at 61.42%. This is because majority of middle-class income population including college students prefer to travel by 2-wheelers, as it is more economical than traveling by car. Whereas

car category contributes for 34% of retail petrol consumption in India as per survey; in the coming years, there can be a significant drop in the consumption of petrol due to increasing price difference between petrol and diesel. Due to this, people prefer to opt for cars run on diesel as they find it to be more economical in the long run, though they are slightly expensive than the petrol driven car at the time of taking out on road. It is interesting to note, 2-wheeler and cars together account for 95% of the total consumption of petrol (retail sales) in India. Pan India consumption pattern of petrol has been presented in the following graph below:

Figure 3: All India End-use Share (%) of Petrol in Retail



Source: Primary survey of ROs

At a zonal level, for diesel (only retail), North zone has the highest share of diesel consumption in non-transport sector and West zone has the highest consumption of diesel in the transport sector. Similar trend is observed in case of HCV/LCV which is over and above the diesel consumption share by all the other categories in the transport sector. This trend is observed across all the four zones. In West zone the consumption share of diesel by HCV/LCV is almost half of the total diesel consumption in the zone. Amongst all the 16 states covered in the study, diesel consumption share by HCV/LCV is highest in the state of Maharashtra. This is due to positioning of large commercial hubs in West zone comprising, Maharashtra and Gujarat vis-à-vis the other states under consideration. Both, Maharashtra and Gujarat are among the top 5 contributing states to the GDP of India. Diesel consumption share in Buses is

highest in South zone, followed by East Zone. This is presumably because South India has a better road infrastructure and many of the privately owned buses not only run intra-state bus also interstate. North zone, consisting of states like Punjab, Haryana and Uttar Pradesh, has the highest share of diesel consumption in tractors, agri-implements, pump-sets and industrial purposes (including gen sets). The reason may be attributed by the fact that agriculture / agro based are the major activity in North India. Punjab, in comparison to all the other states covered in the study, ranks the highest in diesel consumption share by tractors and agri implements. Delhi has the highest diesel consumption share for Industrial back up power purposes which may be due to shortfall of power supply in the state.

In case of cars and UVs, diesel consumption share (private and commercial) is highest in the state of Delhi. This is because Delhi is an important business centre and almost every MNC has a branch/head office in Delhi/NCR. It is interesting to note that for a few states like Haryana and Bihar, the diesel consumption in commercial cars and UVs (with yellow number plates) is less vis-à-vis the other states under consideration. However, there are many cars and UVs without the yellow plates that are being used for commercial purposes in those states as per survey. For zone wise and state wise details of diesel consumption (retail) by transport and non-transport sectors, please refer to the Appendix.

At zonal level, for petrol, across all the four zones, 2-wheelers lead in the consumption share of petrol. Whereas, consumption share of petrol by cars is highest in the North zone. For North and West zone, consumption share of petrol by UVs and 3-wheelers is less than 5% while for the rest two zones; percentage share of petrol in UVs and 3-wheelers is almost double (10%). The consumption share of petrol by 3-wheeler is almost equal in South and East zone, however for North and West zone, the consumption share in 3-wheelers is almost negligible. This is presumably because several auto drivers in North and West zone may have shifted to CNG either by learning that it is more economical for them to run their 3- wheelers on CNG than on petrol or due to government mandate on use of CNG in 3 wheelers. Compared to all states, Orissa leads with highest share of petrol consumption by 2-wheelers. Delhi however is the leading state followed by Punjab in case of petrol consumption

share by cars. Assam has the highest consumption share of petrol by 3-wheelers. Gujarat has the lowest consumption share of petrol by UVs.

In-depth survey was conducted at ROs to those who are buying loose fuel (diesel and petrol) in tanks/ barrels from the ROs. It reveals, in majority of the cases there is an agreement between the RO and owner of bearer of the tank/ barrels where the bearers simply ask for certain quantity of diesel with a less knowledge about exact application of the diesel. The tracer survey reveals that majority is getting consumed to run genset for different application such as for running mobile tower, for electrification at factory/ office, hotels, hospitals as well as for commercial complex including housing complex. This kind of activity is very much rampant in case of urban outlets. Whereas in case of highway or rural outlet it is mainly consumed for running pump set and other agri-equipment as an alternative to electricity. Even in case of rural areas they carry diesel to nearby village for storage and consumption whenever needed.

1.0 Introduction

Energy is the lifeblood of economy of a nation. How the overall role energy can play in the economy of a nation and how it serves as the mainspring of economic growth do not need explanation.

Though India is the world's fourth-largest energy user, its per capita consumption is among the lowest in the world. Stagnant output of crude oil has increased external dependence for its sourcing (77% on consumption basis) and as a result crude oil constitutes the major item in India's import bill. Rising crude oil prices and volatility has negative implications for the Indian economy and the ambition of putting the economy on a higher growth trajectory.

In view of the criticality of energy usage for economic growth, it is imperative for India to formulate appropriate policies and strategies that reduce dependence on crude and product imports and review pricing strategies of regulated products, especially diesel. Lack of information on sectoral demand of diesel and petrol not only poses a challenge for taking policy decisions by the Government, but also creates a deficiency when it comes to demand estimation of these products. This necessitates estimation and analysis of diesel and petrol consumption trends in different sectors/ sub-sectors of the economy.

The other implicit purpose of this study is to bring to the fore the actual facts / statistics pertaining to the recent trend of "dieselization" of private motor transport (at the time of commissioning of the study). Debate was on whether diesel subsidy was flowing to deserving sectors and consumers or largely to the well to do sections of the society. Historically, petrol has always been more expensive than diesel because of higher incidence of taxes on petrol. Since the government has always been wary of increasing diesel prices for its perceived adverse impact on inflation, the price gap of diesel with petrol has been widening. This had led to preference for diesel vehicles vis-à-vis petrol vehicles, leading to 'dieselization' of private motor transport, in particular.

a. Petroleum sector in India at a glance

After Coal, Oil is the largest energy source for the country with a share of about 30.5% in the primary energy consumption basket[1]. The high rate of economic growth in the Indian economy has been fuelled by an increasing demand for oil, and consequently, imports of crude oil are also increasing. The indigenous production of crude oil has not been increasing in tandem with consumption and demand for petroleum products. For an emerging economy like India, this gap is likely to increase over the coming years.

- Consumption of petroleum products during 2012-13 was 157.1 million metric tonnes (MMT) (including sales through private imports) which is 6.0% higher than the 148.1 MMT consumed during 2011-12
- During 2012-13 the country imported 184.8 MMT of crude oil and 10.91 MMT LNG against 171.7 MMT and 11.63 MMT respectively during 2011-12.[2]

Being an environmentally clean fuel, Natural Gas is fast emerging as an alternative to liquid hydrocarbon. Natural Gas presently meets around 8.7% of the primary energy demand[1]. Considering the global trend of shift in energy mix from oil to natural gas, the share of natural gas in hydrocarbon consumption in the Indian context is also likely to increase substantially in the days to come.

To meet the growing energy demand over the next few years, India will have to enhance its energy security by procuring energy supplies at affordable prices. While the country has surplus refining capacity and is a net exporter of petroleum products, major investments will have to be made in the domestic upstream industry and to acquire hydrocarbon reserves abroad. To this it seems that the first few steps have already been taken, with the petroleum minister, approving raising crude oil output from Barmer oilfield in the state of Rajasthan, and stating that he is now preparing a roadmap to cut India's energy imports by 50% in next seven years to make India self-reliant by 2030[3].

[1] BP Statistical Review of Word Energy 2013
[2] Petroleum Planning & Analysis Cell
[3] http://articles.economictimes.indiatimes.com/2013-01-22/news/36484322_1_diesel-prices-petrol-and-diesel-petrol-prices

b. Major petroleum dependant sectors

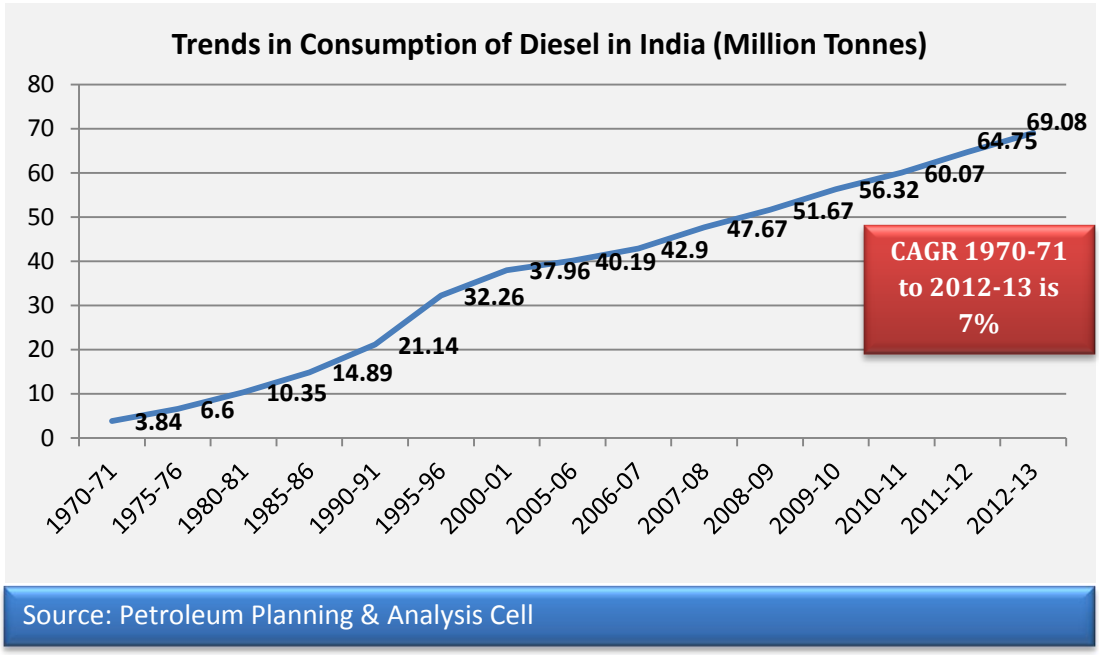
In 2012-13 India depended on foreign crude oil to meet 84.5% of its refinery requirement. However, in terms of domestic consumption of petroleum products, the dependence was significantly lower, at 77%[4], the remaining import being aimed at production for export markets.

Of the total consumption of all types of petroleum products in 2012-13, high speed diesel oil accounted for 43.98%. This was followed by Petrol (10.02%), LPG (9.93%) and Naphtha (7.82%)[4].

i. Diesel

The following table shows the trend in consumption of diesel in India over a period of 32 years.

Figure 4: Trends in Consumption of Diesel in India (Million Tonnes)



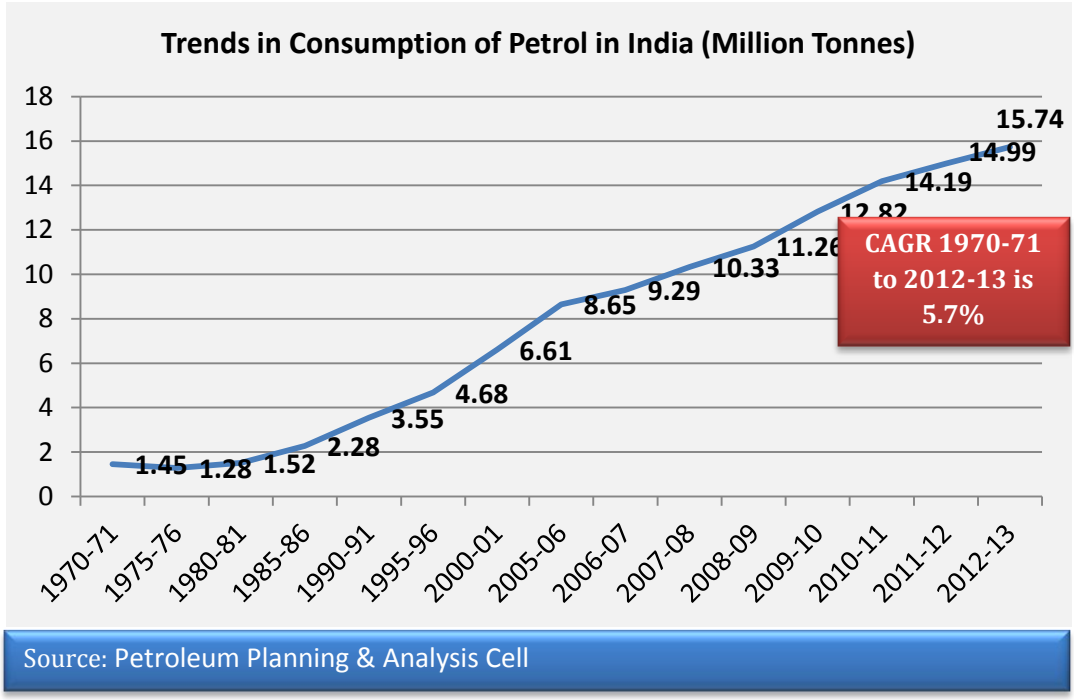
Diesel is mainly used in the road transport, agriculture, industry and power generation sectors.

[4] Petroleum Planning & Analysis Cell

ii. Petrol

The following table shows the trend in consumption of petrol in India over a period of 32 years.

Figure 5: Trends in Consumption of Petrol in India (Million Tonnes)



Motor Spirit (MS), Motor Gasoline, Petrol and Gasoline are terms interchangeably used in India for this light distillate product of refineries. Motor spirit (MS) is used as a transportation fuel in vehicles such as passenger cars, two-wheelers and three-wheelers.

c. Trends in consumption pattern of diesel

i. Transport sector

Due to lower price of diesel and widening price gap with petrol, there was a surge in the demand for diesel models in most of the passenger vehicle segments, despite the petrol variants being priced cheaper. Another complementing factor was the relatively higher fuel efficiency of diesel models. These two factors can be presumed to be the prime reasons for impacting the sales of petrol vehicles for the first time in history during 2011-12. Many models that were offering both the fuel options, the diesel variants accounted for as much as 80% of sales during 2011-12. According to the Society of Indian Automobile Manufacturers (SIAM), the proportion of diesel car sales to total sales has steadily risen from 21.4% in FY08 to 28.42% in FY11. However, in FY12, at least 40% of the total cars sold in the country run on diesel[5].

Seeing this trend many top makers like Maruti, Hyundai and Ford have announced investments to boost diesel engine capacity. However, in case of complete deregulation of diesel prices, there may be some moderation in the rush for diesel cars. But then as per industry experts, an increase in diesel price will have very little impact on UV and commercial vehicle demand, but may slightly shift demand to petrol driven cars in the passenger car segment in the small and mid-range.

[5] http://timesofindia.indiatimes.com/business/india-business/Surge-in-sales-of-diesel-cars-may-ease/articleshow/18067725.cms

ii. Non-Transport sector

Tractors and Agri-implements

In terms of volume, India is one of the largest tractor markets in the world, besides China and the USA. The prospects of domestic industry are highly linked to monsoon which remains a key factor in determining agricultural production. Better irrigated states like Punjab and Haryana have a high tractor density (over 100 per 1,000 ha), while Rajasthan, Gujarat, Himachal, Tamil Nadu, Maharashtra, Andhra, Madhya Pradesh and West Bengal have low levels of tractor penetration—a pointer to the substantial growth potential that the latter set offers. On an all-India basis, tractor penetration remains low at around 13 per 1,000 ha. Besides their use in farming, tractors find application in activities such as harvesting and irrigation, land reclamation, drawing water, powering agricultural implements and rural transportation. In addition, lately, the tractors are also being used for non-agricultural purposes including haulage in construction and infrastructure projects, which has expanded the tractor market.[6] For the financial year 2013-14, growth is expected to be modest and industry expects volume to expand by 5%-7%[7].

Also, there is expected to be a rise in use of farm tools that run on diesel, as lately farmers in India have learnt that mechanisation is important as it can help them in raising their farm income by increasing productivity and limiting post-harvest losses. And with convenient and tailor made finance options it has become much easier for them to buy tractors, tillers or other agricultural-implements.

Generators

The power shortage in India is of the order of about 9%: at peak periods it goes up to 18%. In some regions it is worse. The deficit is increasingly being met through power produced by diesel and heavy fuel oil-powered generating sets. The power backup market in India is growing at an annual rate of 10-15% due

[6] IUP Journal of Marketing Management, May 2013
[7] Indian Tractor Industry – ICRA Research Services, October 2013

to rising demand-supply gap, however varying within the three different segments – generators, UPS and inverters.[8]

Agri-pumps

Pumpsets in India are used in domestic, agriculture, construction and industrial sectors. Agriculture sector leads the usage of pumps in India with prominent uses like irrigation. The number of farmers using diesel powered pumps is high in villages having remote or minimal access to electricity. However, there too, poor farmers are ignorant of the fact that using efficient and technologically advanced pumps will be beneficial to them by bringing down the fuel usage.

Mobile Towers

In the telecom sector, service providers have started infrastructure sharing in order to save capital cost and the cost of fuel needed to operate the Base Transceiver Station (BTS). In the coming days, this transformation may reduce the consumption of diesel in mobile sites.

[8] Construction Week, Business Line

2.0 Study Background

The total diesel sold in the country during 2012-13 was 69,080 TMT and petrol 15,744 TMT. While diesel constitutes about 44% of total consumption of petroleum products in India, petrol accounts for about 10%.

Out of the total petrol and diesel sales in the country, more than 99% of the petrol and 90% of the diesel is sold through retail outlets (petrol pumps), for which there is no system of capturing the consumption data of the sectors and categories based on their end-use. However, the sector-wise consumption of diesel sold directly by the Oil Marketing Companies (OMCs) for bulk consumers like industry, railways, defense, etc. is available. The data related to sectoral consumption of these products is an important input for any policy formulation.

This study (i.e. All India Study on Sectoral Demand for Diesel and Petrol) commissioned by Petroleum Planning and Analysis Cell (PPAC) aims at providing critical inputs through Retail data on sector wise consumption of Diesel and Petrol from ROs for the intended strategic/ policy interventions. PPAC commissioned Nielsen (India) Pvt. Ltd. to carry out quarterly sample surveys across a specified number of selected retail outlets of PSU OMCs for arriving at the sectoral/ segment wise demand of Petrol & Diesel sold through retail outlets.

3.0 Research Objective

The broad objective of the study was to estimate the percentage share of sectors/ segments in consumption of Diesel and Petrol sold through retail outlets on a state-wise, zone-wise and all India basis.

4.0 Scope of work of the study

As per the terms of reference, the scope of work for this study was:

- To capture the consumption trend for diesel across the following sub-categories:
  - Cars & Utility Vehicles (UVs) – Private
  - Cars & UVs – Commercial
  - Buses
  - Light Commercial Vehicles (LCVs) & Heavy Commercial Vehicles (HCVs)
  - Agriculture (Tractors, Pump Sets, Other Agri Equipment)
  - Power Generation (Gensets)
  - Industrial Applications
  - Others (such as Mobile Towers etc.)

- To capture the consumption trend for petrol across the following sub-categories:
  - Cars
  - 2- Wheelers / 3-wheelers
  - UVs
  - Others, if any

5.0 Methodology & Coverage

This study was conducted in four phases, wherein each phase consisted of a stint of three months. This was done to understand the percentage change and factors for change in consumption pattern for both diesel and petrol at different time periods at state, zonally and all India level.

This study encompasses minimum 2000 Retail Outlets (ROs) spread across 150 districts in 16 states.

a. Selection of districts in each of the identified states

16 states were selected for this study, which constituted 85% of the total sales of diesel and petrol in India (during 2011-12).

To shortlist the districts within each of the identified states:

- Firstly, the numbers of districts in each of the identified state were listed.
- Then the ratios were calculated – number of districts in each identified state to the aggregate number of districts in these states.
- Based on these ratios, one arrived at the final number of districts to be covered in each of the 16 states.

Then the selection of urban and rural districts in these states was done based on the vehicle population data, as well as the past sales volume of petrol and diesel. (The final go ahead was taken only after the approval of the committee members of PPAC).

Table 1: Selection of Districts in Each of the Identified State

S. No.	States	No. of Districts	Proportion	No. of districts to be covered
1	Andhra Pradesh	23	0.05	7
2	Assam	27	0.06	8
3	Bihar	38	0.08	12
4	Delhi	9	0.02	3
5	Gujarat	26	0.05	8
6	Haryana	21	0.04	7
7	Karnataka	30	0.06	9
8	Kerala	14	0.03	4
9	Madhya Pradesh	50	0.10	16
10	Maharashtra	35	0.07	12
11	Orissa	30	0.06	9
12	Punjab	20	0.04	6
13	Rajasthan	33	0.07	10
14	Tamil Nadu	32	0.07	10
15	Uttar Pradesh	75	0.16	23
16	West Bengal	19	0.04	6
Total		482	1.00	150

b. Selection of retail outlet

The retail outlets were selected from the list of outlets provided by OMCs for each district. OMCs provided a list of 20 ROs per district in consultation with the joint coordination committee of PPAC and OMCs. Of these 20 ROs, in agreement to the sample size, 13-14 ROs were selected per district by Nielsen, taking into consideration the sales volume and class market catered, so as to cover all types of ROs (i.e. A, B, C, D, and E).

Table 2: State Wise RO Coverage

S. No.	State	Total ROs covered
1	Andhra Pradesh	89
2	Assam	100
3	Bihar	173
4	Delhi	45
5	Gujarat	107
6	Haryana	99
7	Karnataka	117
8	Kerala	59
9	Madhya Pradesh	178
10	Maharashtra	150
11	Orissa	112
12	Punjab	87
13	Rajasthan	145
14	Tamil Nadu & Pondicherry	131
15	Uttar Pradesh	325
16	West Bengal	89
TOTAL		**2006**

In this way the final list of ROs to be covered for this study for each district was prepared and the same was shared and discussed with PPAC and OMCs before launching of field work.

c. Operational methodology

To collect the data in order to meet the research objectives, there were two sets of questionnaires that were administered at each of the identified RO.

Figure 6: Operational Methodology

Observation Sheet

- Enumerator had to be physically present at the RO and note down the volume of fuel filled from the dispensers against the vehicle category /model for each vehicle entering the RO and also capture the loose sales of petrol and diesel
- For each RO, this exercise was carried out for 12 hours for 7 days in a staggered manner across the quarter. In case an identified RO was situated on a highway, instead of 12 hours the same exercise was done for 24 hours for 7 days in a row
- In order to perform this assignment, Nielsen ensured that sufficient enumerators are allocated to each RO depending on the location and traffic that comes in and out of that RO. However, it must be noted that 2 wheelers count as well as volume was not taken into account in case of metros /mini metros and Class 1 towns as it was practically not possible.

Outlet Questionnaire

- This questionnaire was administered to the outlet owner/manager by the supervisor on duty, in order to have a bird's eye view of the filling pattern, volume, type of vehicles that are coming to their RO, hours of operation, seasonality and more.

As per the sampling frame, 13 to 14 ROs were allotted to each district. To cater to these 13-14 ROs, a team of 5 to 6 investigators were allotted to a district in each state and as per the location and traffic coming to the RO, 2 to 3 enumerators were allotted to each RO. In some cases only one enumerator was also there. The investigators were responsible for taking down observations for both the transport and non-transport segment. In case of non-transport segment i.e. for loose sales in cans, barrels containers, etc., the respondents were interviewed to find out the quantity, frequency and the purpose of this purchase. In certain cases, even the addresses for such kind of consumers were noted so that they could be traced and interviewed. In this way, close to 1000 households/consumers were interviewed in each phase,

belonging to various selected districts to understand the purpose and quantity of the loose diesel purchased from the covered ROs.

To ensure data consistency and accuracy, multiple checks were performed at various levels. Also, multiple layers were rooted during the course of the study to have a close control and monitoring at the grass root level. Each state had a supervisor and each day, every enumerator had to report to the supervisor of their respective state and brief them on the developments of the fieldwork. Apart from supervising, each supervisor was also responsible to carry out the necessary back checks of the work out carried by enumerators in each district of their respective state and also be in touch with the local sales officer/OMC for any issues or clarity while conducting the fieldwork.

All the ROs were monitored by Nielsen supervisors without the knowledge of enumerators, who were locally sourced. It was ensured that all the 2000 ROs were contacted on their land line numbers to confirm the presence of the enumerator on the field and to confirm that necessary signature with stamping was done on the daily sheets from the authorized representative of respective RO. Also, a feedback from all the ROs was taken regarding the enumerators.

d. Time period

The time periods were selected in consultation with PPAC. The first phase of survey was from January till March 2012, the second phase of survey was from July till September 2012, the third phase of survey was from October till December 2012 and the last phase of survey was from April till June 2013.

6.0 Geographical coverage

The survey carried out in sixteen States constitutes 85% of the total sales of diesel and petrol in India. Zone-wise states covered as part of the survey are as follows:

Table 3: Geographical Coverage

Zones	States
East	Assam, Bihar, Orissa, West Bengal
North	New Delhi, Haryana, Punjab, Rajasthan, Uttar Pradesh
South	Andhra Pradesh, Karnataka, Kerala, Tamil Nadu
West	Gujarat, Madhya Pradesh, Maharashtra

a. State wise coverage

Table 4: State Wise Coverage

State	Total Districts covered	Total RO covered	IOCL	HPCL	BPCL
Andhra Pradesh	7	89	34	31	24
Assam	8	100	84	8	8
Bihar	12	173	88	36	49
Delhi	3	42	25	9	8
Gujarat	8	108	48	31	28
Haryana	7	99	46	28	25
Karnataka	9	117	54	32	31
Kerala	4	59	31	14	14
Madhya Pradesh	16	178	74	50	54
Maharashtra	12	154	50	46	58
Orissa	9	112	53	27	32
Punjab	6	87	36	21	30
Rajasthan	10	145	65	40	40
Tamil Nadu	10	131	47	37	47
Uttar Pradesh	23	325	163	74	88
West Bengal	6	87	37	20	30
TOTAL	**150**	**2006**	**935**	**504**	**567**

b. List of States, Districts and number of retail outlets covered

Figure 7: Distribution amongst Category of Retail Outlets

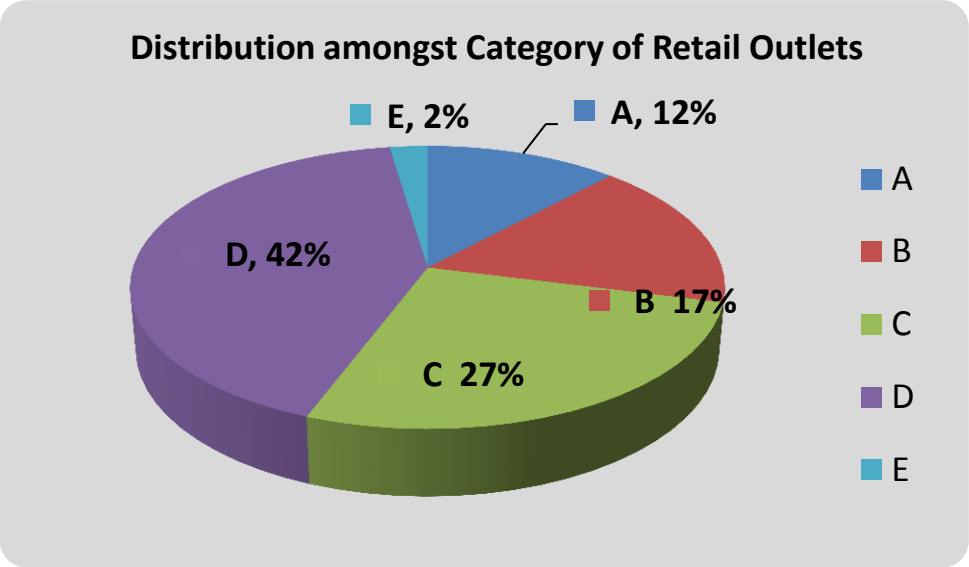


Table 5: District Wise RO Coverage

State	District	Retail Outlets Covered
Andhra Pradesh	Anantapur	12
	Hyderabad	13
	Medak	14
	Nellore	14
	Srikakulam	14
	Visakhapatnam	14
	Vijayanagaram	12
Assam	Barpeta	13
	Dhubri	12
	Lakhimpur	13
	Nagaon	13
	Kamrup Metropolitan	18
	Golaghat	13
	Tinsukia	12
	Karimganj	10
Bihar	Begusarai	13
	Bhagalpur	13
	Darbhanga	13
	Gaya	14
	Muzaffarpur	13
	Nalanda	13
	Patna	14
	Purnea	13
	Rohtas	14

State	District	Retail Outlets Covered
	Saharsa	12
	Vaishali	13
	West Champaran	14
Delhi	East	14
	North West	14
	South	14
Gujarat	Ahmedabad	14
	Anand	14
	Bharuch	9
	Mehsana	14
	Patan	14
	Rajkot	13
	Surat	12
	Surendranagar	14
Haryana	Bhiwani	15
	Gurgaon	14
	Hissar	15
	Karnal	13
	Palwal	12
	Panipat	13
	Sonepat	14
Karnataka	Bangalore	12
	Belgaum	13
	Chikaballapur	14
	Chitradurga	14
	Davangere	17
	Gulbarga	13
	Kolar	11
	Mysore	13
	Tumkur	12
Kerala	Kannur	13
	Wayanad	12
	Trivandrum	15
	Ernakulam	12
Madhya Pradesh	Ashoknagar	14
	Bhopal	13
	Damoh	13
	Dewas	13
	Dhar	13
	Gwalior	13
	Indore	13
	Khandwa	12
	Mandsaur	12
	Morena	13

State	District	Retail Outlets Covered
	Neemach	12
	Rajgarh	17
	Rewa	14
	Sagar	13
	Shajapur	12
	Ujjain	13
Maharashtra	Ahmednagar	13
	Bhandara	12
	Dhule	13
	Kolhapur	13
	Mumbai	14
	Mumbai Sub Urban	13
	Nagpur	13
	Nasik	13
	Pune	13
	Satara	13
	Solapur	14
	Thane	13
Odisha	Khurda	20
	Boudh	3
	Cuttack	19
	Gajapati	3
	Kendrapara	14
	Keonjhar	13
	Bhadrak	13
	Puri	19
	Sundergarh	14
Punjab	Bhatinda	11
	Faridkot	13
	Patiala	13
	Sangrur	15
	Ludhiana	13
	Tarn Taran	13
Rajasthan	Ajmer	14
	Banswara	14
	Barmer	14
	Bharatpur	14
	Bhilwara	14
	Chittorgarh	14
	Jaipur	14
	Jodhpur	14
	Kota	14
	Udaipur	14
Tamil Nadu	Chennai	16

State	District	Retail Outlets Covered
	Coimbatore	13
	Erode	13
	Karur	13
	Namakkal	15
	Perambalur	14
	Krishnagiri	13
	Tuticorin	13
	Thiruvarur	13
	Tirupur	13
Uttar Pradesh	Agra	14
	Allahabad	14
	Barelly	14
	Basti	14
	Ballia	14
	Bijnore	13
	Bulandshahar	14
	Deoria	14
	Faizabad	14
	Gorakhpur	14
	Goutam Budh Nagar	14
	Ghaziabad	14
	Kanpur Nagar	14
	Lucknow	14
	Mathura	14
	Mau	14
	Meerut	14
	Mirzapur	14
	Pilibhit	14
	Sitapur	14
	Saharanpur	14
	Unnao	14
	Varanasi	14
West Bengal	Bardhaman	14
	Darjeeling	14
	Kolkata	14
	Malda	13
	North 24 Parganas	14
	Purba Madinipur	14

7.0 All India Consolidated Retail Results

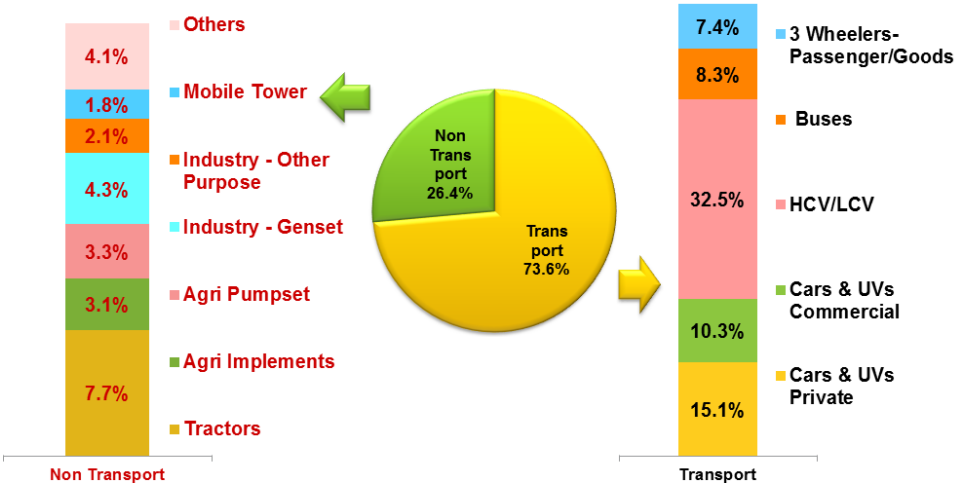
This section talks about the all India aggregate consumption of diesel and petrol through retail sales. This section also entails zone-wise and state-wise consumption of Diesel and Petrol. As data pertaining to state-wise direct sales of diesel by OMCs is not available, the state-wise consumption pattern of diesel is based on retail sales only. As regards petrol, since around 99% of the petrol sold is through the retail outlets, the state-wise as well as the all India consumption pattern is based on retail sales only. After completion of the first round of field survey (January to March, 2012), the results of were presented to the Ministry and to the OMCs. It was observed that there was under-representation of highway outlets having substantial share in diesel sale in the sample, which would distort the results. Therefore, the sample was revised and made representative before conducting the 2nd, 3rd and 4th rounds. For aggregation purposes, therefore, the results of the first round have not been taken into account. The figures and tables presented in this section are based on data collected over three rounds - July to September of 2012, October to December of 2012 and April to June of 2013.

a. All India Consolidated Findings – Retail sales

Diesel

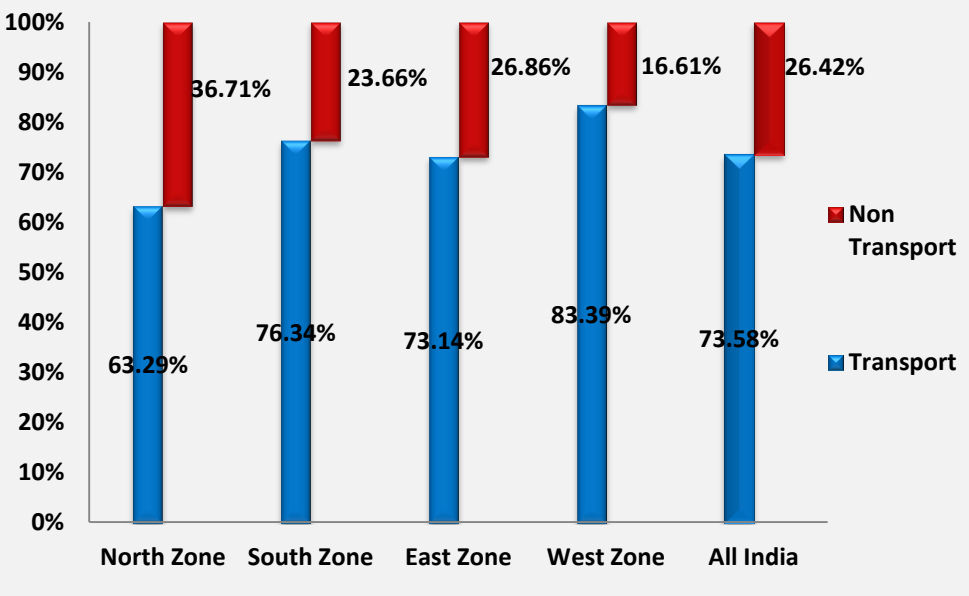
At an aggregate all India level, under the transport sector, diesel consumption is maximum in HCV/LCV followed by private cars and UVs. This huge variance in consumption is due to, the large distances that are travelled by commercial vehicles vis-à-vis passenger vehicles.

Figure 8: All India End-use Share (%) of Diesel in Retail



On the other hand for all India basis, in the non-transport sector, diesel consumption is maximum in tractors followed by industry genset. Plausible reason can be that, tractors are not necessarily used only for agricultural purposes. Today they are also used for commercial purposes, such as for transporting construction material such as bricks, stones, mined sand as well as other goods. As the cost remains low for using tractors for the transportation of these materials not only due to lesser fuel consumption, but also because these vehicle enjoy various exemptions like not having to pay toll on highways.

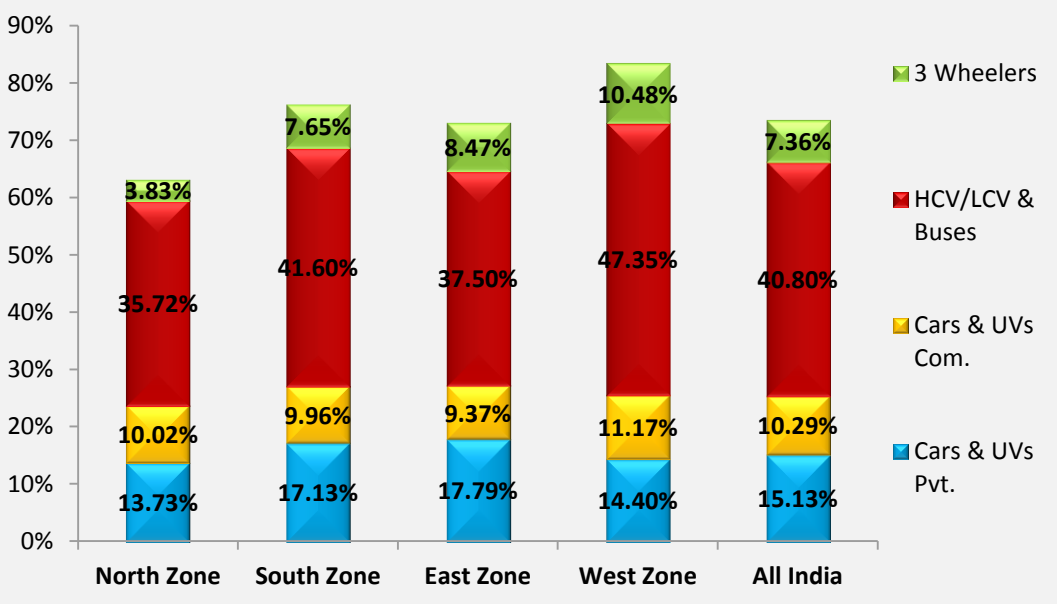
Figure 9: All India End-use % Share of Diesel in Retail – Zone Wise



North zone has the highest share of diesel consumption in non-transport sector and West zone has the highest consumption of diesel in the transport sector.

In the North zone, the diesel consumption share in transport sector is comparatively less than that of non-transport sector when compared to the other three zones. This is due to the extensive agricultural activities in the states considered under North zone (especially Punjab and Haryana) where majority of people make their livelihood through agriculture and therefore, to have high crop yield they might be making extensive use of tractors and other agricultural equipment's like power tillers etc. that run on diesel.

Figure 10: All India End-use % Share of Diesel in Retail – Zone Wise for Transport

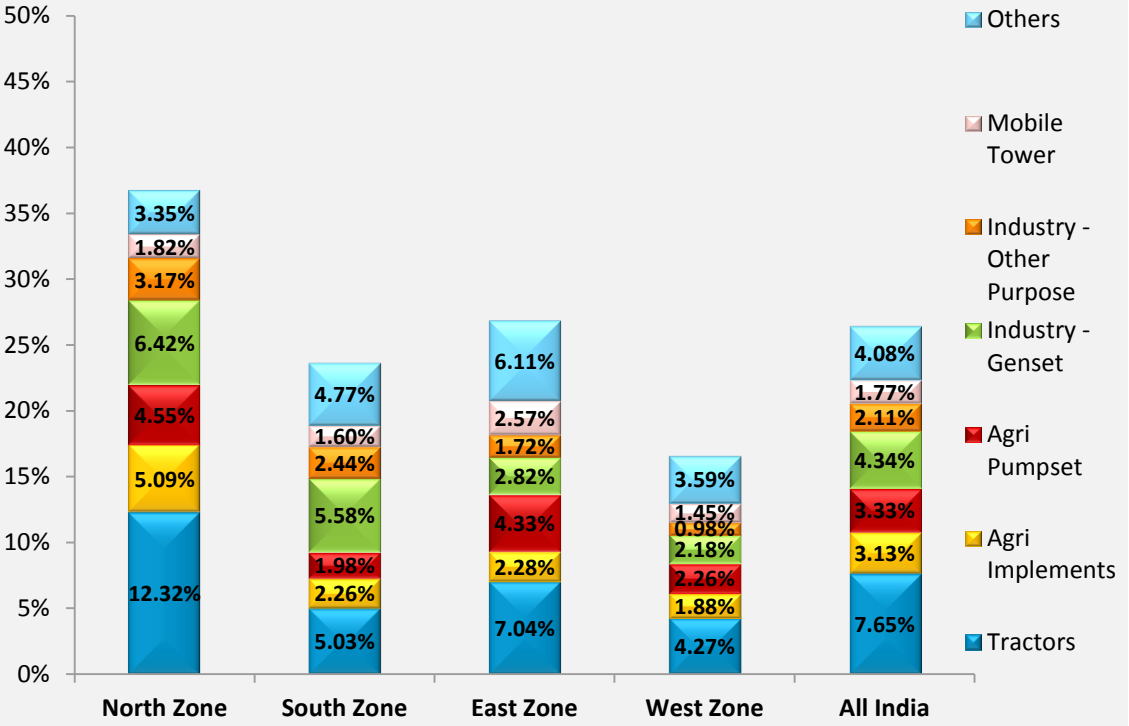


At an all India level, the diesel consumption by volume in the transport sector is the highest in the commercial and buses category (40.80%) followed by cars and UVs (25.42%). Consumption by Private cars and UV is 15.13%.

Here, the interesting point to note is that the diesel consumption in the HCV/LCV for West zone is very high compared to North, East and South zone. This is presumed to be due to more commercial activities in West zone comprising of Maharashtra, Gujarat and Madhya Pradesh vis-à-vis the other three zones. For the financial year 2010-11, Maharashtra contributed 25 per cent[9] of the country's industrial output and 23.2 per cent of its GDP; this might be the reason for high diesel consumption in the HCV/LCV for West zone.

[9] http:// www.rediff.com/business/slide-show/slide-show-1-top-25-states-with-highest-gdp/20120223.htm

Figure 11: All India End-use % Share of Diesel in Retail – Zone Wise for Non-Transport



At an all India level, the diesel consumption by volume in the Non-Transport sector is the highest in tractors (7.65%) followed by Industry genset (4.34%).

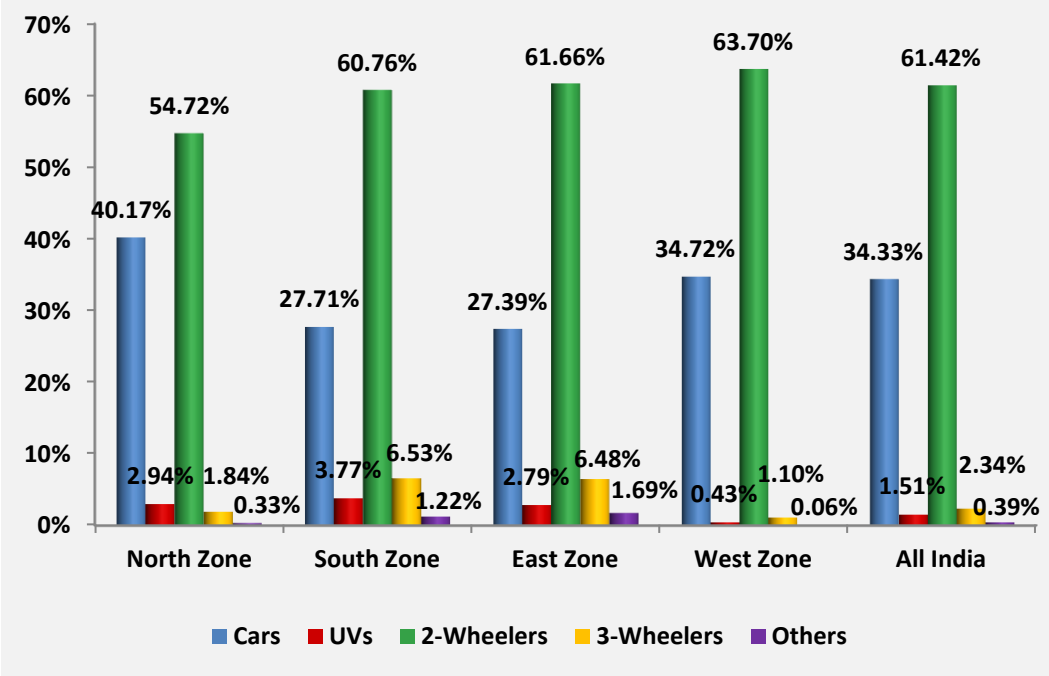
Though the shortage of electricity is a problem in states such as Delhi, Uttar Pradesh, Bihar, Tamil Nadu, Karnataka etc., the country faced a huge power deficit of over 12,000 MW[10] during the peak hours in the last financial year, but it's somehow interesting to note that for some states this gap is significantly less vis-à-vis other states. This conclusion can be inferred from the above diagram, where the diesel consumption by volume for Industry gensets in West zone is almost 1/3rd to that of North Zone.

It is also interesting to note that the diesel consumption by volume for agri pumpset is least in South zone followed by West zone. However, it is presumed that this may differ year on year, as use of agri pumpset is inversely relational to the amount of rainfall. But still, the possibilities of better irrigational systems in South zone than the rest of the zones cannot be ruled out.

[10] http:// articles.economictimes.indiatimes.com/2013-04-14/news/38529356_1_peak-power-deficit-power-shortage-central-electricity-authority

Petrol

Figure 12: Petrol-Retail Consumption Break-up (All India) – Zone Wise Aggregate



The consumption of petrol in terms of volume for 2-wheelers is highest in the West zone (63.7%) followed by East and South zone. North zone has the lowest consumption of petrol in terms of volume for 2-wheelers, and highest consumption of petrol for 4 wheelers.

The 3-wheeler consumption of petrol in terms of volume is almost equal in South and East zone, however for North and West zone, the consumption of petrol in terms of volume in 3-wheelers is almost negligible.

This is presumably because several auto drivers in North and West zone may have shifted to CNG due to one of the following reasons:

- Auto drivers learnt the fact that it is more economical for them to run their 3- wheelers on CNG than on petrol.
- Due to government mandate on use of CNG in 3 wheelers

b. All India Zone wise findings - Retail sales

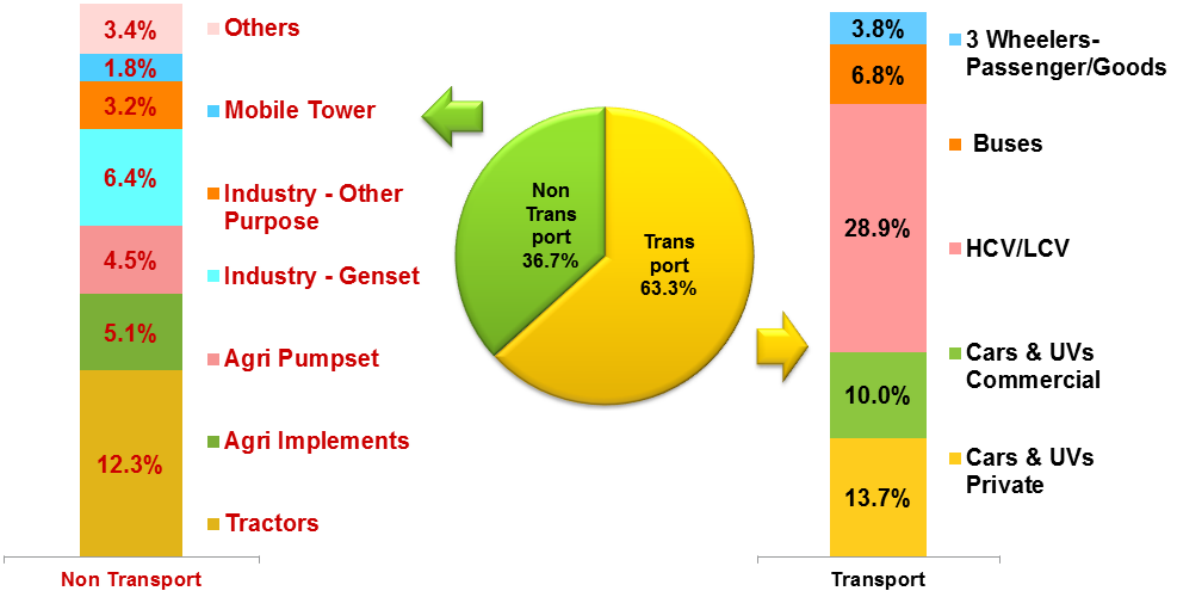
i. North Zone's break up in consumption of Diesel and Petrol - Exclusively Retail

In the Transport sector of North zone, diesel consumption is maximum in HCV/LCV (28.9%), followed by Private Cars and UVs (13.7%).

In the Non-Transport sector, diesel consumption is the maximum in tractors (12.3%).

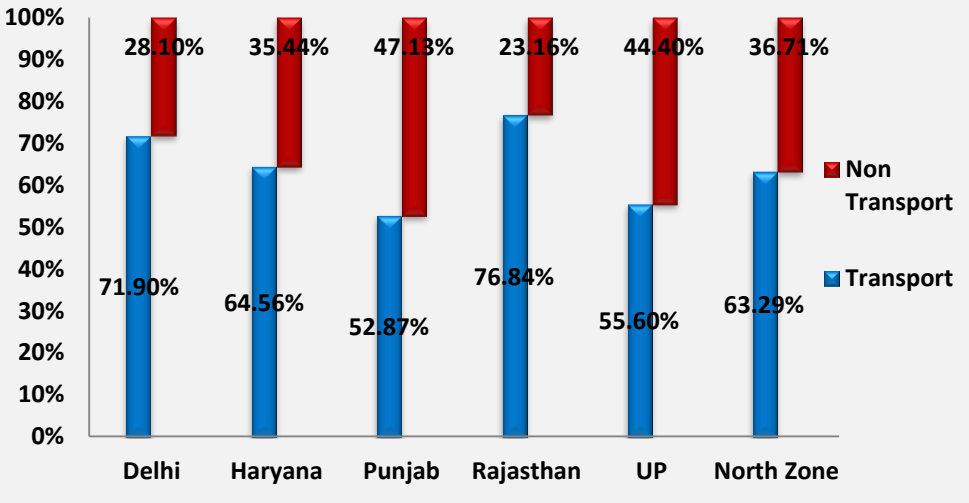
Diesel consumption in tractors, Agri-implements and Agri-pump sets congregated together is approximately 22% of the total diesel consumption in North zone. This tells that agriculture is the main industry in North zone of India. Surprisingly, for South, West and East zones, the diesel consumption in tractors, Agri-implements and Agri-pump sets grouped together is only 13.6%, 9.3% and 8.5% of the total diesel consumption in respective zones.

Figure 13: North Zone End-use Share (%) of Diesel in Retail – Final



Diesel consumption in the transport sector of North zone is maximum in the state of Rajasthan and least in Punjab. This may be due to lesser agricultural activitiy in Rajasthan.

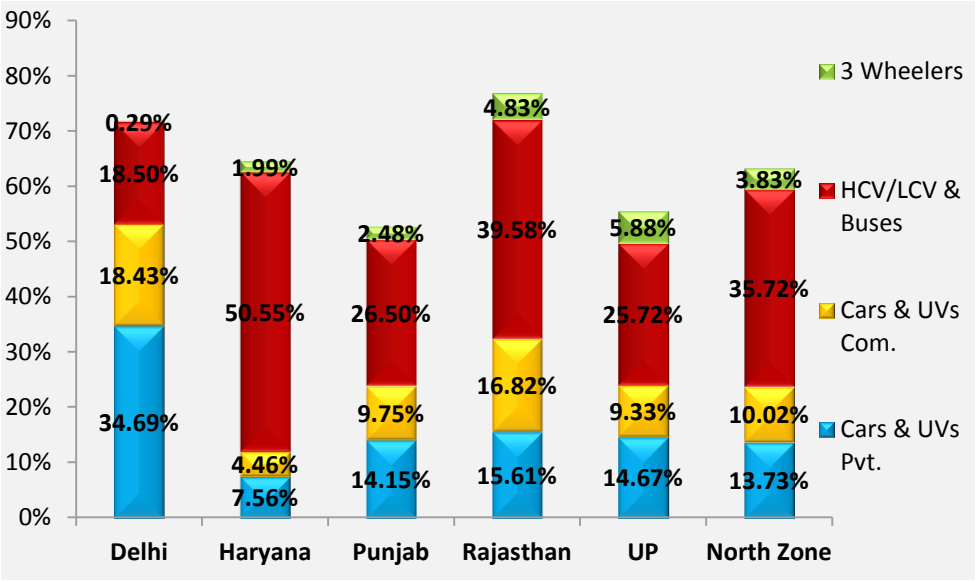
Figure 14: North Zone End-use % Share of Diesel in Retail – State Wise



In North zone, Delhi has the highest diesel consumption in private cars and UVs at 34.7%. It is interesting to note that in Haryana, there is diesel consumption of only 4.5% in commercial cars and UVs. This is presumably because, for this study only the cars and UVs with yellow number plates have been taken into account under the commercial cars and UVs segment. However, there are many cars and UVs without the yellow plates that are being used for commercial purposes, which have not been considered.

Diesel consumption in HCV/LCV and Buses segment in Haryana is the highest, presumably because long distance commercial vehicles are refuelling diesel in Haryana due to price advantage as compared to neighbouring states.

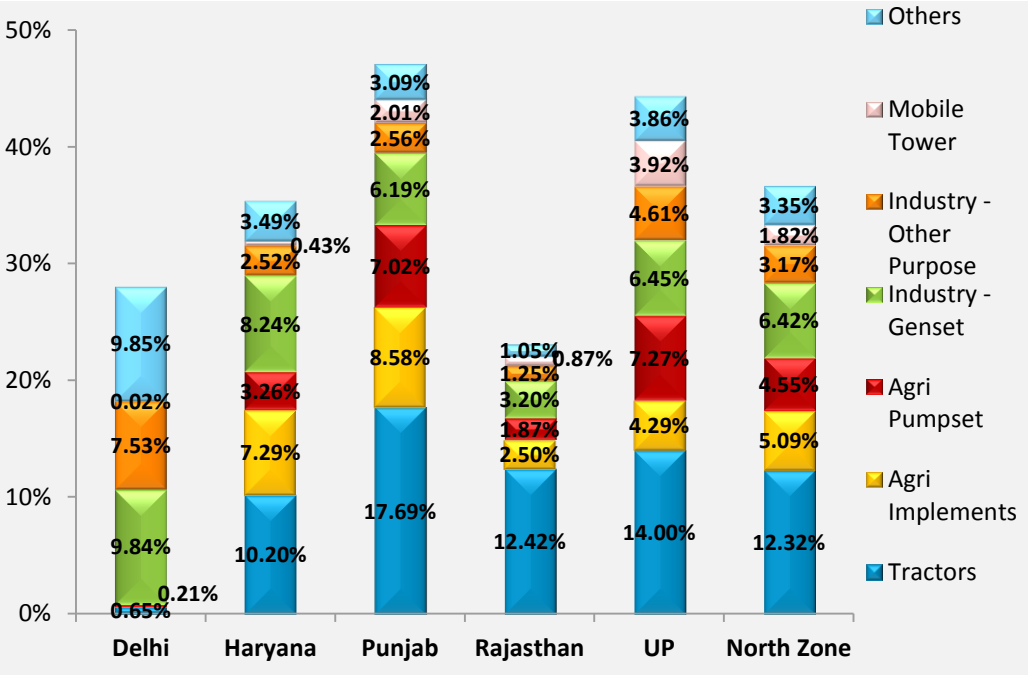
Figure 15: North Zone End-use % Share of Diesel in Retail – State Wise for Transport



In Delhi, the diesel consumption for Industrial back up power purposes is almost 17.3%. This is presumably because of the shortfall of power supply. About 58 per cent of the shortfall in the state is met by purchasing power through long-term power purchase agreements (PPA) with power generators in other states and a further 13 per cent of the shortfall is met by purchasing power on a short-term basis from other states or on the spot market[11]. In coming times, the situation may worsen, as the states that Delhi relies on for its additional power, need to bridge their deficits and might be less willing to meet Delhi's continued and growing need for power.

In Uttar Pradesh, the diesel consumption for running of mobile towers is 3.9%. This presumably is because Uttar Pradesh has the highest number of BTS installed in a state in India, almost 12 per cent[12], and to keep the mobile towers operational, diesel is essential.

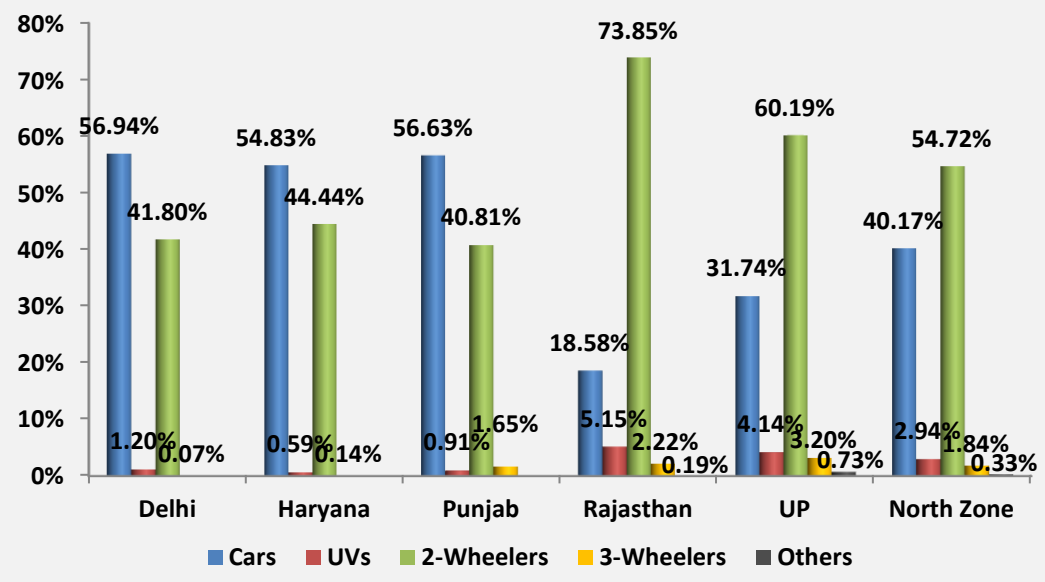
Figure 16: North Zone End-use % Share of Diesel in Retail – State Wise for Non-Transport



[11] http:// www.thehindu.com/todays-paper/tp-national/tp-newdelhi/sun-holds-key-to-end-delhis-power-shortage/article4947300.ece

[12] http://telecomtalk.info/india-has-736654mobile-towers-and-only-96112bts-are-3g-enabled/103422/

Figure 17: Petrol-Retail Consumption Break-up (North Zone) – State Wise



The state of Rajasthan leads in North zone in consumption of petrol by 2-wheelers (73.85%) whereas Delhi leads in consumption of petrol in cars (56.94%).

Interesting point to note is that in Delhi, the petrol consumption for 3 wheelers is almost zero. This may be due to the mandate by state government on use of only CNG for 3 wheelers.

Another point noteworthy is that the state of Rajasthan leads amongst all states in percentage consumption of petrol by UVs.

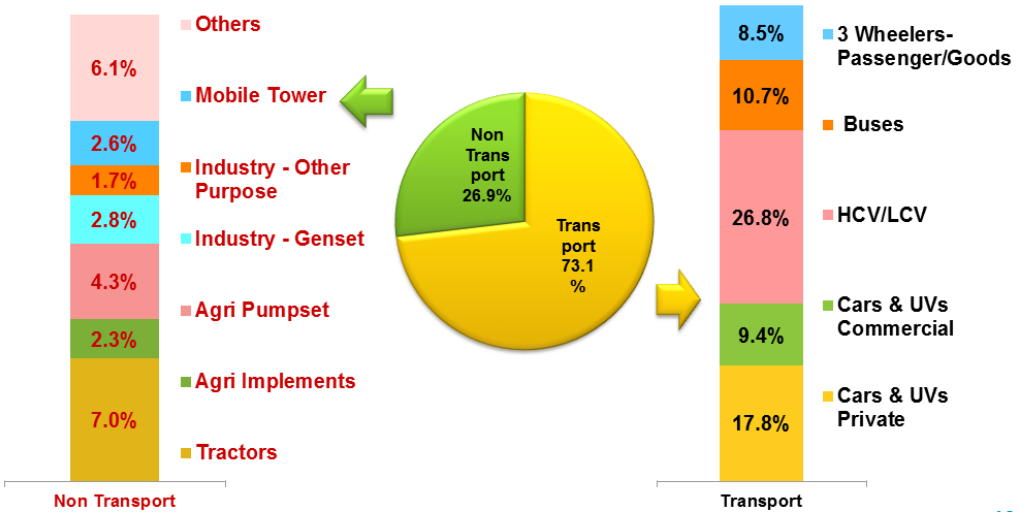
ii. East Zone's break up in consumption of Diesel and Petrol - Exclusively Retail

In the Transport sector of East zone, diesel consumption is maximum in HCV/LCV (26.8%) followed by Private Cars and UVs (17.8%). In the Non-Transport sector, diesel consumption is the maximum in tractors (7.0%).

In East zone, the diesel consumption for running of mobile towers is very significant at 2.6%. This presumably is due to the lack of power source at high altitudes because of hilly terrain. In fact the peak power deficit in the seven-sister states of North-east India - Assam, Meghalaya, Manipur, Tripura, Mizoram, Arunachal Pradesh and Nagaland - deteriorated to 11 per cent from

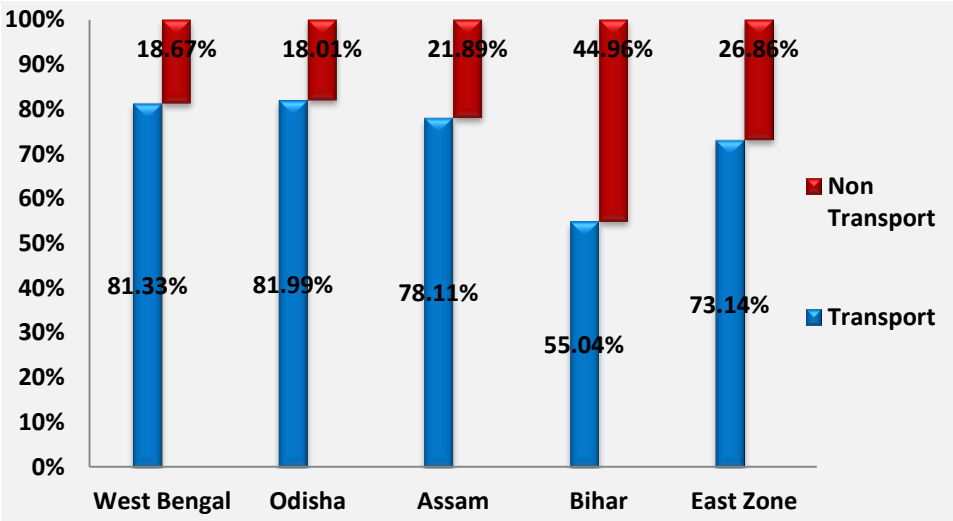
8.7 per cent[13] in 2012. In such a case, generators remain to be the only option for mobile service providers to keep the Base Transceiver Station (BTS) operational.

Figure 18: East Zone End-use Share (%) of Diesel in Retail – Final



In the East zone, share of diesel consumption in non-transport sector is maximum in the state of Bihar and least in Odisha.

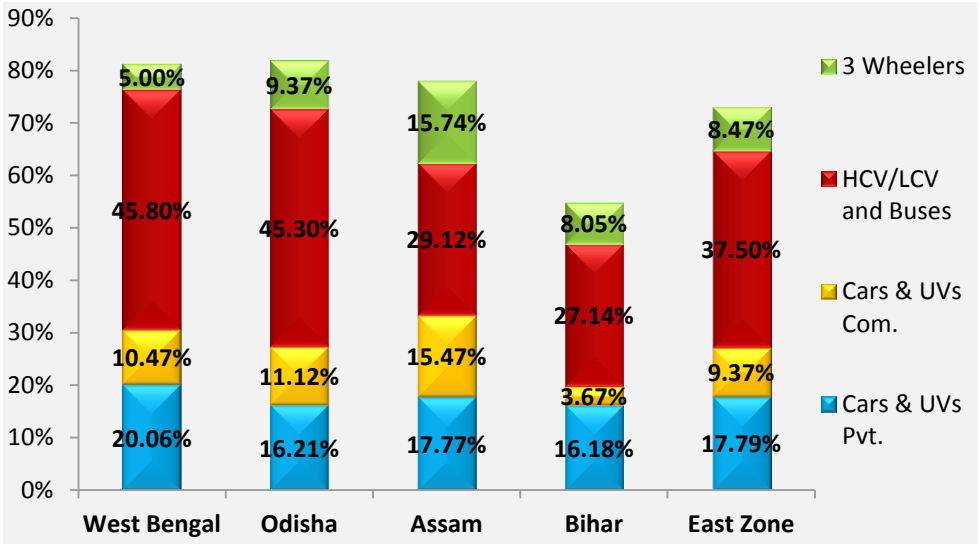
Figure 19: East Zone End-use % Share of Diesel in Retail – State Wise



[13] http:// articles.economictimes.indiatimes.com/2013-09-16/news/42114483_1_peak-power-deficit-august-2012-power-shortage

It is interesting to note that like Haryana, in Bihar there is a diesel consumption of only 3.7% in commercial cars and UVs. Again, this is presumably because for this study, only the cars and UVs with yellow number plates have been taken into account under the commercial cars and UVs segment. However, there are many cars and UVs without the yellow plates that are being used for commercial purposes.

Figure 20: East Zone End-use % Share of Diesel in Retail – State Wise for Transport

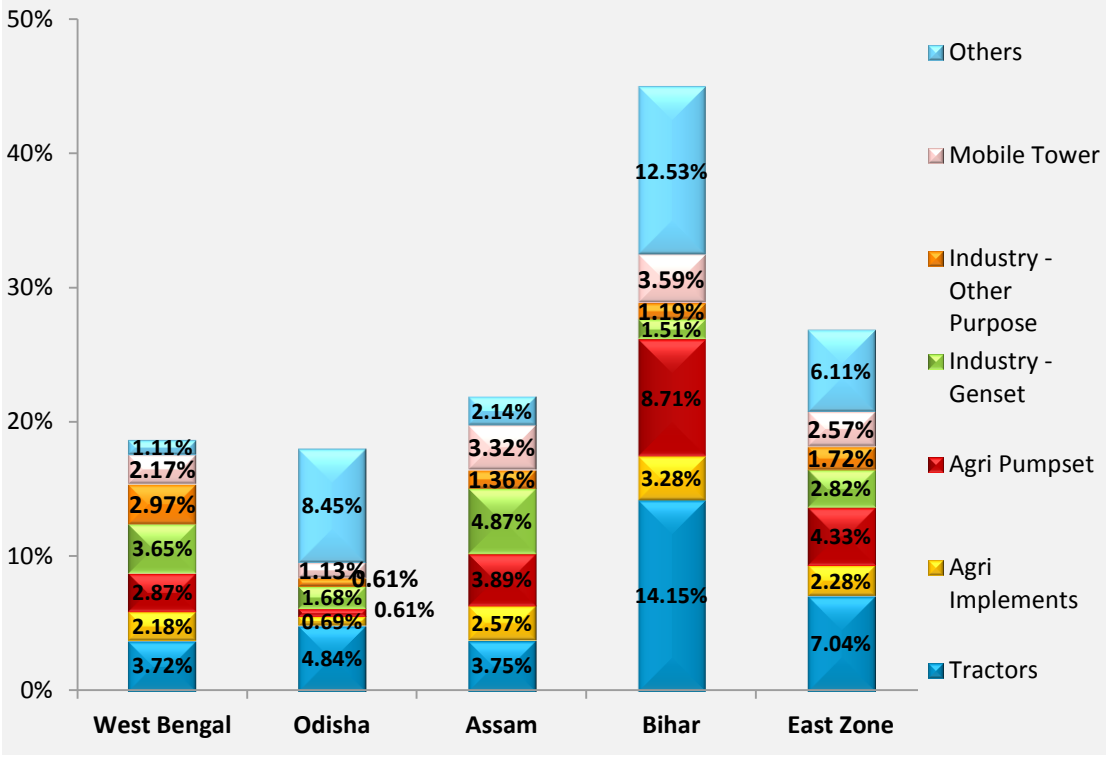


In Bihar, diesel consumption for running of mobile towers is 3.6%, the highest (by percentage of consumption) of all the four states under consideration in East zone. This is presumably because there are frequent power-cuts, some of them are for several hours. In fact, to some readers it might come as a surprise that till April, 2013, there were still 22,484 villages and hamlets[14] in Bihar without power, including those that got de-electrified. And as we know many of the BTS's are located in remote areas and to keep them operational, diesel is essential.

It is also interesting to note that in Bihar, diesel consumption for running of Agri pump set is 8.7%. It is the highest (by percentage of consumption) of all the 16 states under consideration. This is presumably a reflection of the poor irrigational facilities in Bihar or poor rainfall[15] during the time of survey that might have resulted in extensive use of Agri pumps for irrigation.

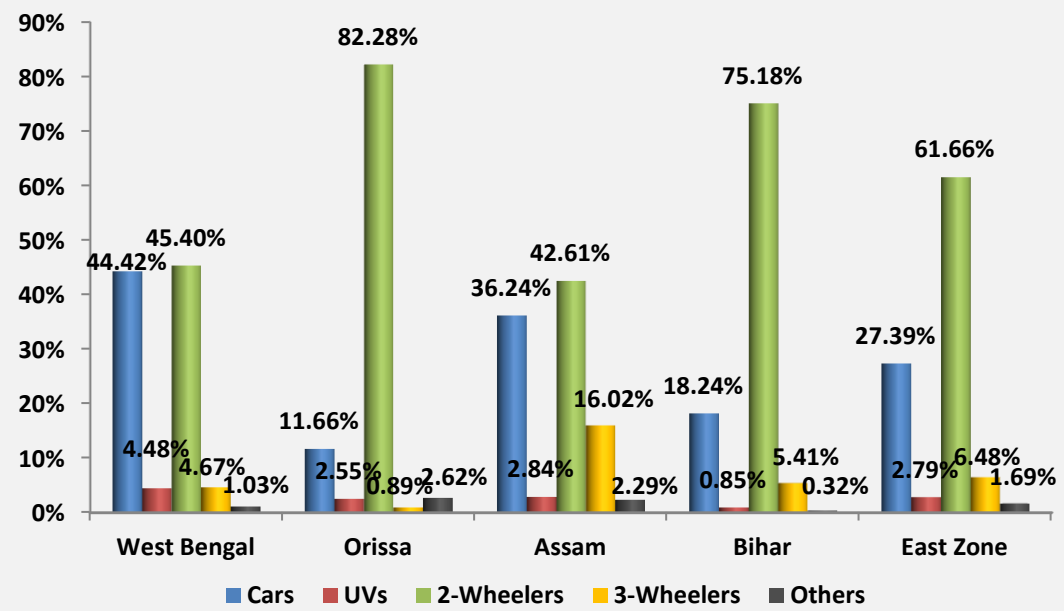
[14] http:// www.telegraphindia.com/1130428/jsp/bihar/story_16834284.jsp
[15] http:// news.oneindia.in/2013/07/24/poor-mansoon-hits-paddy-sowing-in-bihar-1266781.html

Figure 21: East Zone End-use % Share of Diesel in Retail – State Wise for Non-Transport



The state of Odisha leads in East zone in the consumption of petrol by 2-wheelers at 82.28%, whereas West Bengal leads in consumption of diesel in cars at 44.42%. This is presumably because West Bengal is more urban than Odisha and has one of the metropolitan cities (Kolkata) of India as its capital.

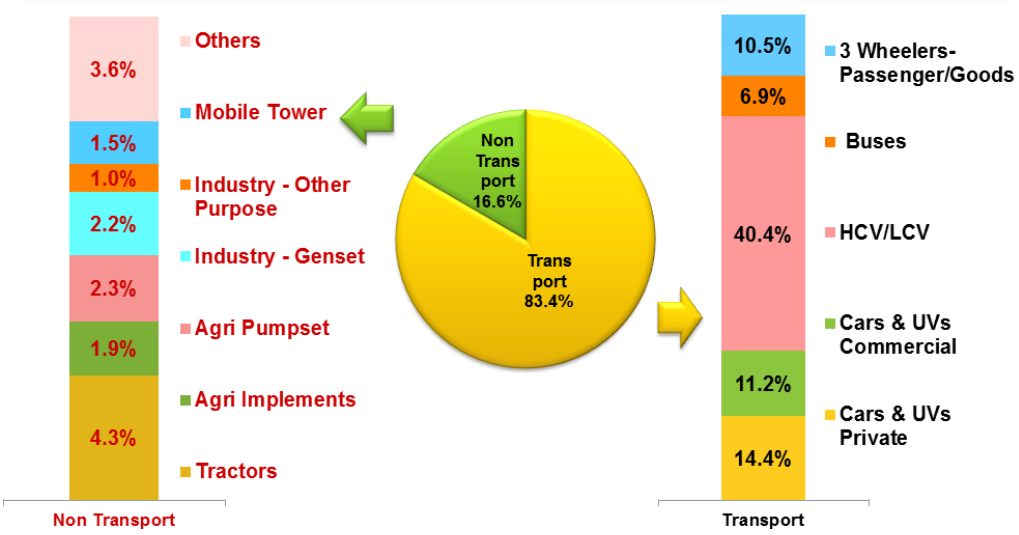
Figure 22: Petrol-Retail Consumption Break-up (East Zone) – State Wise



iii. West Zone's break up in consumption of Diesel and Petrol - Exclusively Retail

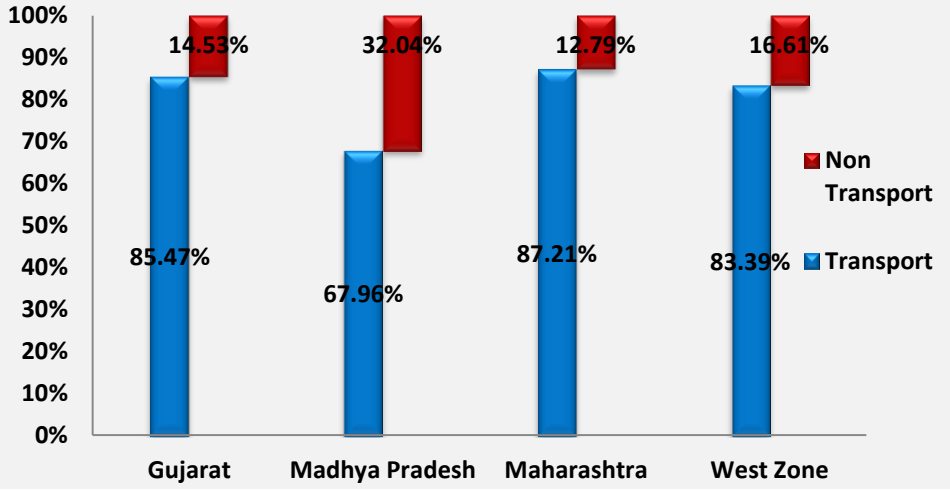
In the Transport sector of West zone, diesel consumption is maximum in HCV/LCV (40.4%) followed by Private Cars and UVs (14.4%). In the Non-Transport sector, diesel consumption is the maximum in tractors (4.3%). In the West zone, only 12.3% of the diesel consumption is there in Non-Transport sector, excluding diesel consumption in tractor. Whereas, for North, East and South zone the diesel consumption in Non-Transport sector (excluding diesel consumption in tractor) is 24.4%, 19.9% and 18.7% respectively.

Figure 23: West Zone End-use Share (%) of Diesel in Retail – Final



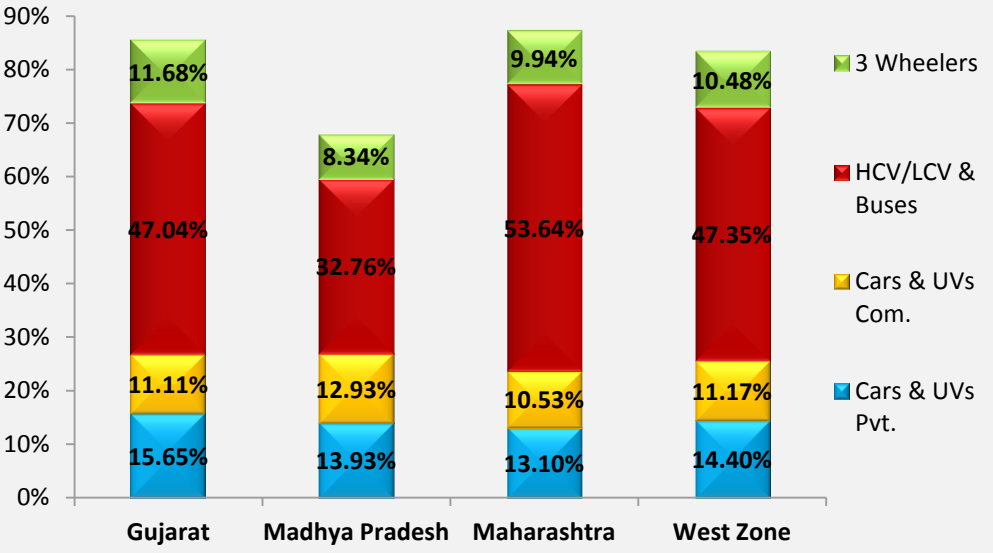
In the West zone, share of diesel consumption in the transportation segment is maximum in the state of Maharashtra (87.21%) and least in the state of Madhya Pradesh (67.96%).

Figure 24: West Zone End-use % Share of Diesel in Retail – State Wise



Both Gujarat and Maharashtra have a very high diesel consumption in HCV/LCV and Buses, as both states have very large commercial hubs wherein various industries like automobile, chemical, textiles etc. are positioned. Moreover, both these states are the most industrialized states in the country, so the high consumption of diesel by HCV/LCV is expected in these states. Both these states are amongst the top 5 contributing states to the GDP of India.[16]

Figure 25: West Zone End-use % Share of Diesel in Retail – State Wise for Transport

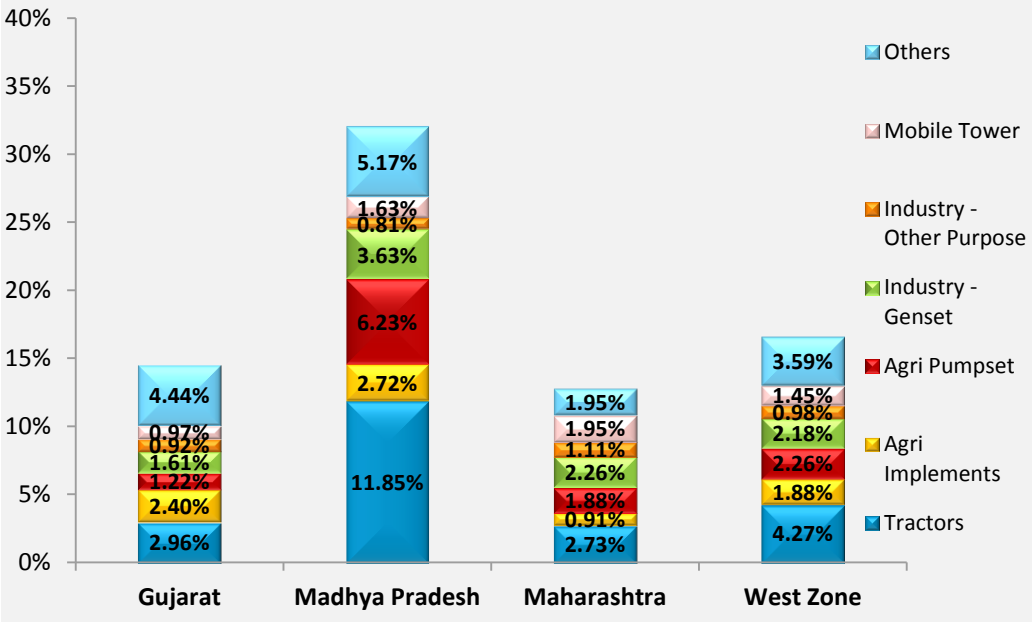


It is interesting to note that in contrast to Gujarat and Maharashtra, for Madhya Pradesh diesel consumption for running of agri pump set is 6.2%. However, this again, presumably is a reflection of the poor irrigational facilities in Madhya Pradesh or due to the fact the Madhya Pradesh is more agriculture dependent than Maharashtra and Gujarat.[17]

Another interesting point worth noting is the similarity in the composition of diesel consumption in the states of Gujarat and Maharashtra. It is presumably due to similar geographical location and like type of industries in these states or both.

[16] http:// en.wikipedia.org/wiki/List_of_Indian_states_by_GDP
[17] Directorate of Economics and Statistics, Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India

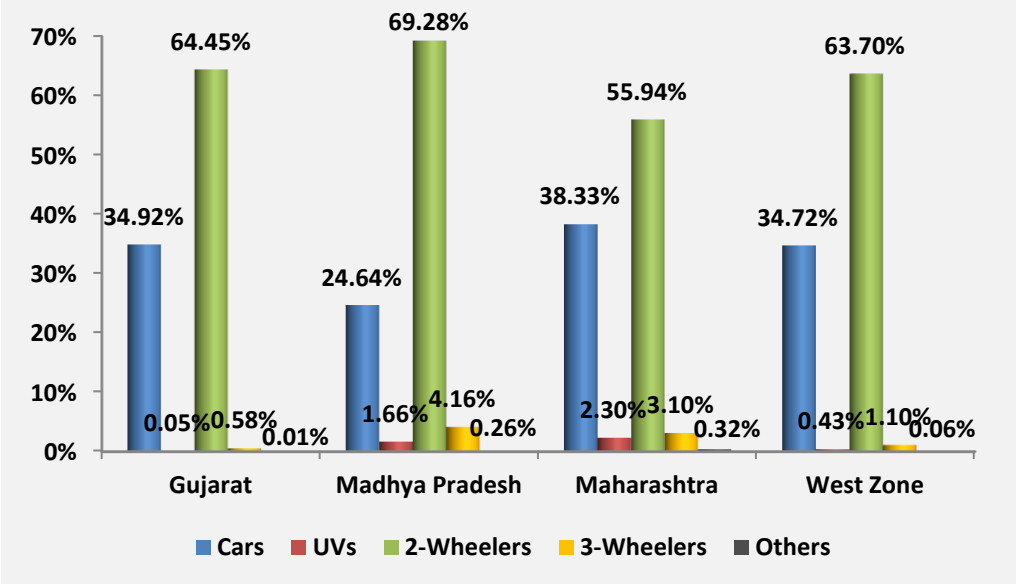
Figure 26: West Zone End-use % Share of Diesel in Retail – State Wise for Non-Transport



The state of Madhya Pradesh leads in West zone in consumption of petrol by 2-wheelers at 69.28%, whereas the state of Maharashtra leads in consumption of diesel in cars at 38.43%.

It is interesting to note that in Gujarat, consumption of petrol by volume in UVs is only 0.1%, the lowest (by percentage consumption of petrol) of all the 16 states under consideration. This is presumably because, people in Gujarat are now going for UVs that run on diesel.

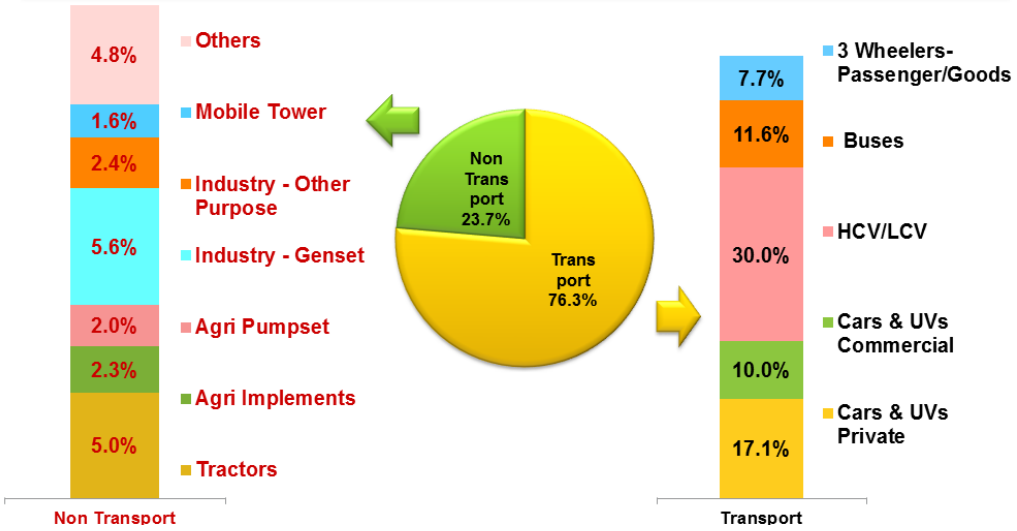
Figure 27: Petrol-Retail Consumption Break-up (West Zone) – State Wise



iv. South Zone's break up in consumption of Diesel and Petrol - Exclusively Retail

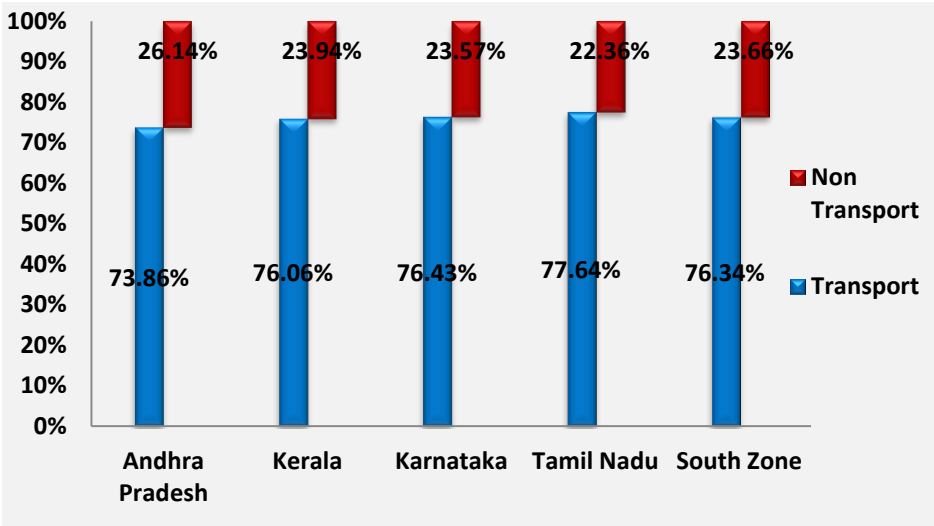
In the Transport sector of South zone, diesel consumption is maximum in HCV/LCV at 30.0%, followed by Private Cars and UVs at 17.1%. In the Non-Transport sector, diesel consumption is the maximum in Industry genset (5.6%). Diesel consumption in Buses is significantly higher in the South zone (11.6%), followed by East Zone (10.7%). It is presumably because South India has a better road infrastructure and many of the privately owned buses not only run intra state bus also interstate.

Figure 28: South Zone End-use Share (%) of Diesel in Retail – Final



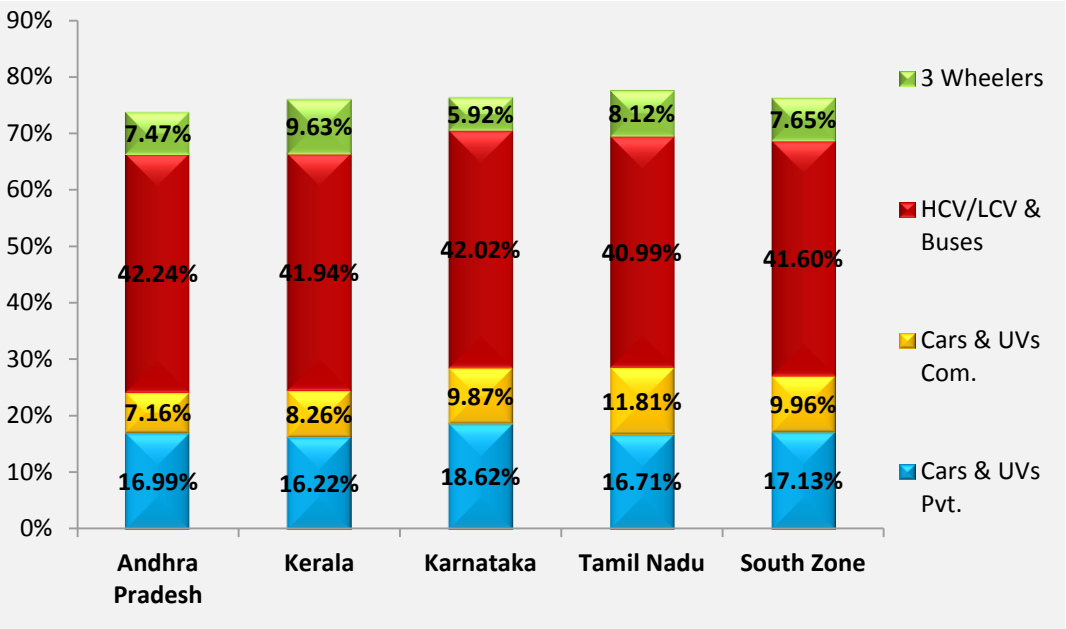
In the South zone, share of diesel consumption in transport is maximum in the state of Tamil Nadu (77.64%) and least in the state of Andhra Pradesh (73.86%).

Figure 29: South Zone End-use % Share of Diesel in Retail – State Wise



Unlike other zones, all the four states under South zone have a very similar diesel consumption pattern in Transport sector.

Figure 30: South Zone End-use % Share of Diesel in Retail – State Wise for Transport



Again, like Transport sector all the four states under South Zone have a very similar diesel consumption pattern in the overall Non-Transport sector.

Figure 31: South Zone End-use % Share of Diesel in Retail – State Wise for Non-Transport

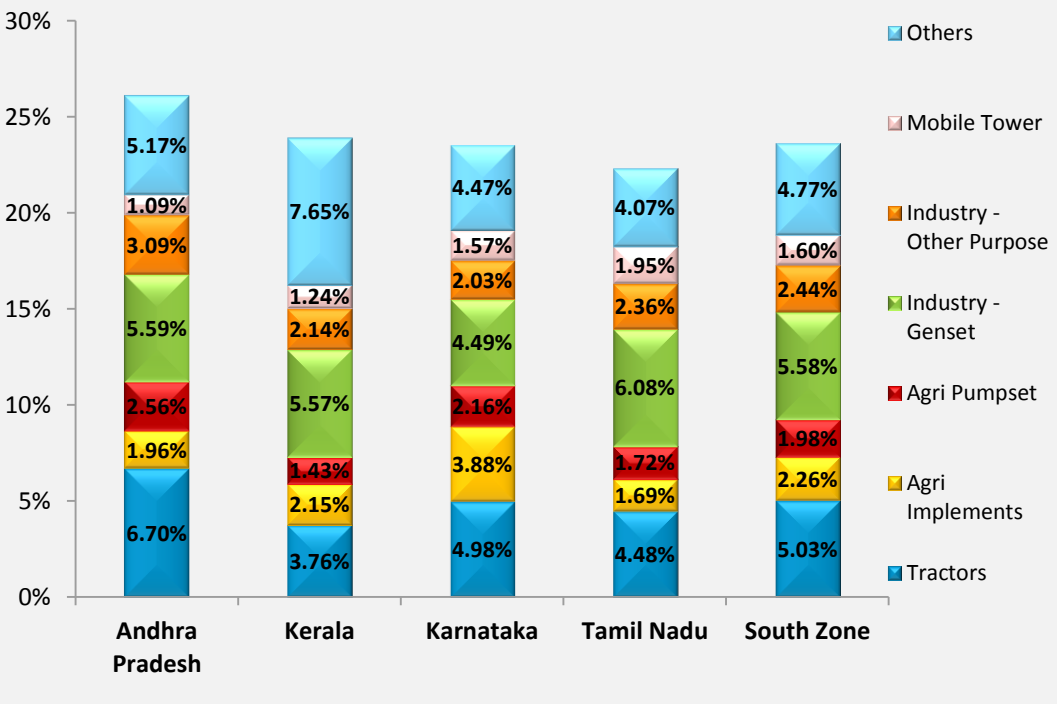
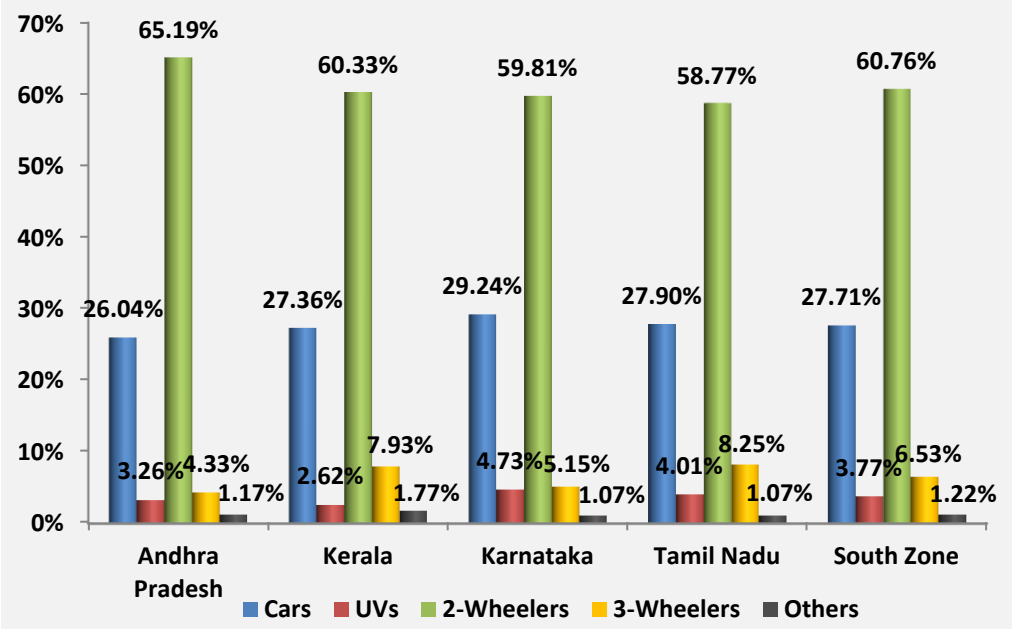


Figure 32: Petrol-Retail Consumption Break-up (South Zone) – State Wise



The state of Andhra Pradesh leads in South zone in consumption of petrol by 2-wheelers at 65.19%, whereas Karnataka leads in consumption of petrol in cars at 29.24%.

Tamil Nadu followed by Kerala has the highest percentage consumption of petrol in 3-wheelers at 8.2% and 7.9% respectively. This maybe due to very few CNG/ Auto LPG stations in these states.

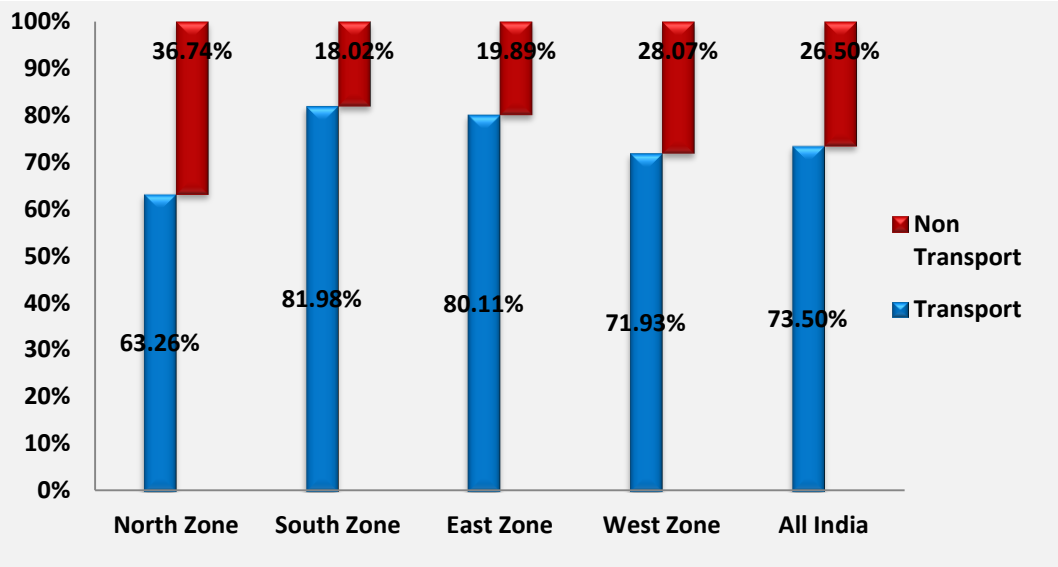
8.0 Survey Findings under different time periods – Retail Sales

July - September of 2012

All India

For the period July-September 2012, North zone has the highest share of diesel consumption in non-transport sector and South zone has the highest consumption of diesel in the transport sector.

Figure 33: Diesel Consumption Break up Amongst the Transport & Non-Transport Sector



At an all India level, for the period July-September 2012, the diesel consumption in the transport sector is the highest in the HCV/LCV and Buses category at 41.17%, followed by private cars and UVs at 14.73%.

Table 6: Diesel Consumption Break up Amongst Transport Sector Categories

July - September of 2012	Diesel Transport			
	Cars & UVs Private	Cars & UVs Commercial	HCV/LCV & Buses	3 Wheelers-Passenger/Goods
North Zone	12.67%	9.69%	36.97%	3.93%
South Zone	14.14%	11.14%	43.31%	7.62%
East Zone	16.84%	10.61%	38.15%	9.35%
West Zone	18.31%	8.43%	46.10%	7.04%
All India	**14.73%**	**10.11%**	**41.17%**	**6.52%**

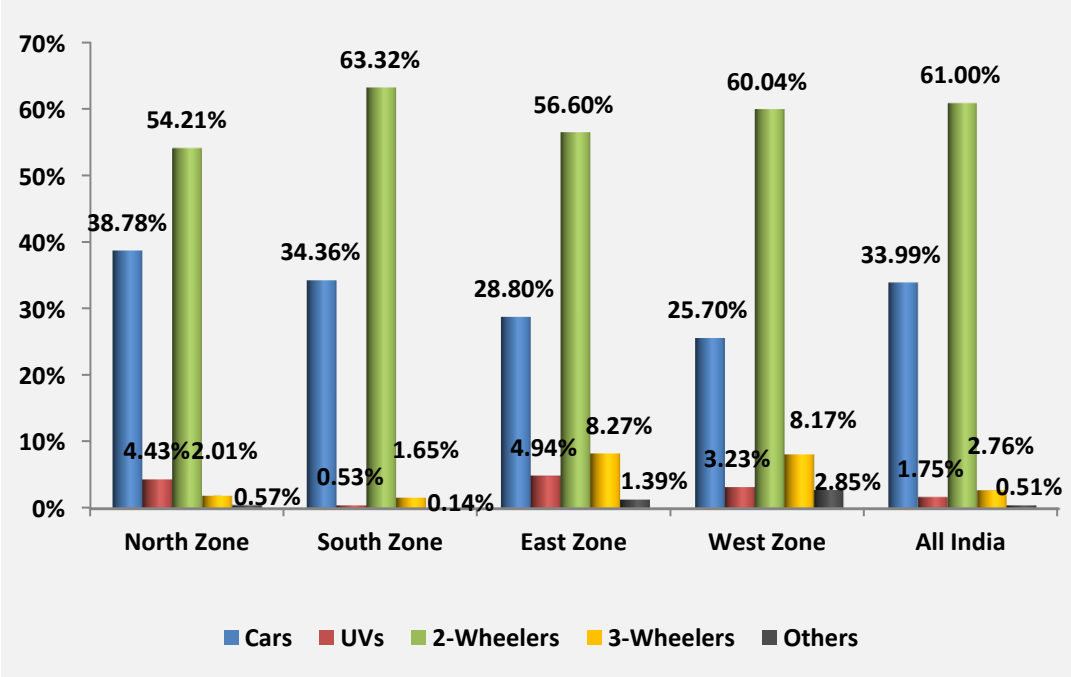
At an all India level, for the period July-September 2012, diesel consumption in the non-transport sector is the highest in the tractors category at 6.09%, followed by industry gensets at 4.46%. This is presumably because July is the last month of the Kharif season for sowing of Kharif crops and September is the first month for harvesting of crops sowed during Kharif season.

Table 7: Diesel Consumption Break up Amongst Non-Transport Sector Categories

July - September of 2012	Diesel Non-Transport						
	Tractors	Agri Implements	Agri Pumpset	Industry - Genset	Industry - Other Purpose	Mobile Tower	Others (Genset for non-industry purposes) & Others
North Zone	8.45%	4.75%	5.85%	7.91%	3.71%	2.28%	3.80%
South Zone	4.19%	2.74%	2.22%	2.32%	1.00%	1.58%	3.97%
East Zone	4.40%	2.51%	2.35%	3.64%	1.84%	1.29%	3.86%
West Zone	6.53%	2.63%	5.53%	2.00%	1.54%	3.29%	6.55%
All India	**6.09%**	**3.39%**	**4.04%**	**4.46%**	**2.18%**	**2.05%**	**4.30%**

For the period July-September 2012, the petrol consumption for 2- wheelers is highest in the South zone at 63.32%, followed by West and East zones.

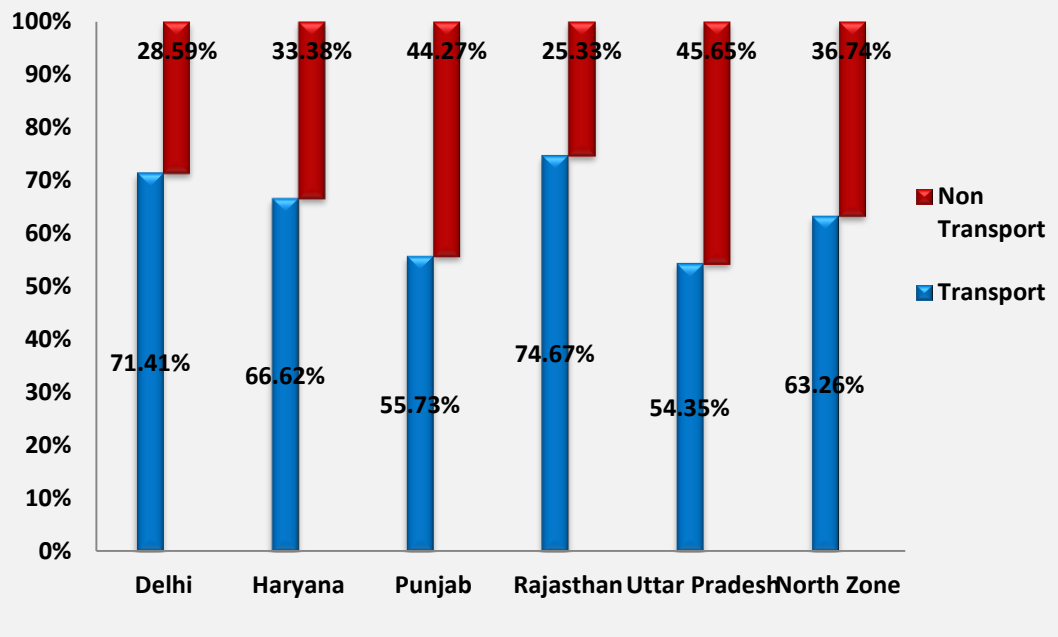
Figure 34: Petrol Consumption Break up Amongst the Sector Categories



North Zone

For the period July-September 2012, diesel consumption in the transport sector of North zone is maximum in the state of Rajasthan at 74.67% and least in Uttar Pradesh at 54.35%.

Figure 35: Diesel Consumption Break up Amongst the Transport & Non-Transport Sector Wise



For the period July-September 2012, under transport sector, Delhi has the highest diesel consumption in private cars and UVs at 33.52% in North zone. This is apparently because Delhi has the highest number of vehicles in the country.

Table 8: Diesel Consumption Break up Amongst Transport Sector Categories

July - September of 2012	Diesel Transport			
	Cars & UVs Private	Cars & UVs Commercial	HCV/LCV & Buses	3 Wheelers-Passenger/Goods
Delhi	33.52%	17.93%	19.93%	0.03%
Haryana	8.70%	5.68%	50.39%	1.86%
Punjab	13.24%	9.14%	28.42%	4.94%
Rajasthan	11.13%	14.34%	44.32%	4.88%
Uttar Pradesh	13.84%	9.40%	25.60%	5.51%
North Zone	**12.67%**	**9.69%**	**36.97%**	**3.93%**

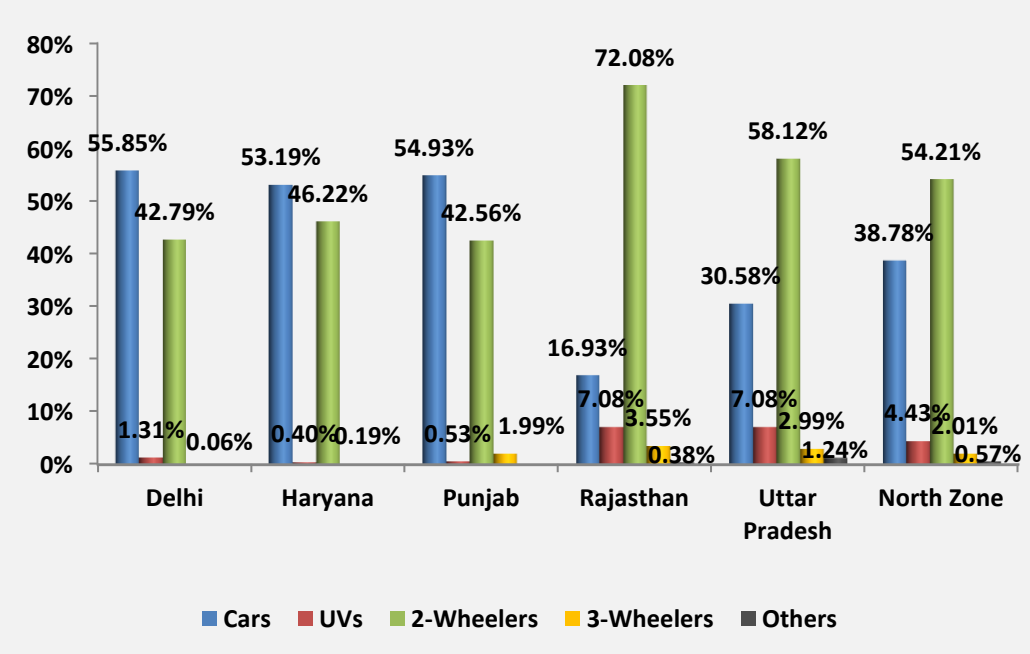
For the period July-September 2012, under non-transport sector, Punjab has the highest diesel consumption in tractors at 13.35% in North zone. It is presumably because Punjab is one of the foremost states in agricultural production not only in North zone but also in the entire country. Punjab contributes 13-14 per cent towards the total food grain production of the country.[18]

Table 9: Diesel Consumption Break up Amongst Non-Transport Sector Categories

July - September of 2012	Diesel Non-Transport						
	Tractors	Agri Implements	Agri Pumpset	Industry - Genset	Industry - Other Purpose	Mobile Tower	Others (Genset-non-industry purposes) & Others
Delhi	0.93%	0.00%	0.34%	10.53%	11.08%	0.03%	5.68%
Haryana	7.12%	6.67%	5.38%	8.60%	2.49%	0.39%	2.72%
Punjab	13.35%	6.78%	6.75%	7.61%	3.94%	3.08%	2.77%
Rajasthan	10.02%	3.60%	3.69%	3.93%	1.40%	1.40%	1.29%
Uttar Pradesh	8.18%	3.73%	8.18%	9.44%	5.04%	4.64%	6.44%
North Zone	8.45%	4.75%	5.85%	7.91%	3.71%	2.28%	3.80%

For the period July-September 2012, the state of Rajasthan leads in North zone in consumption of Petrol by 2 wheelers at 72.08%, whereas Delhi leads in consumption of MS in cars at 55.85%.

Figure 36: Petrol Consumption Break up Amongst the Sector Categories Sector Wise

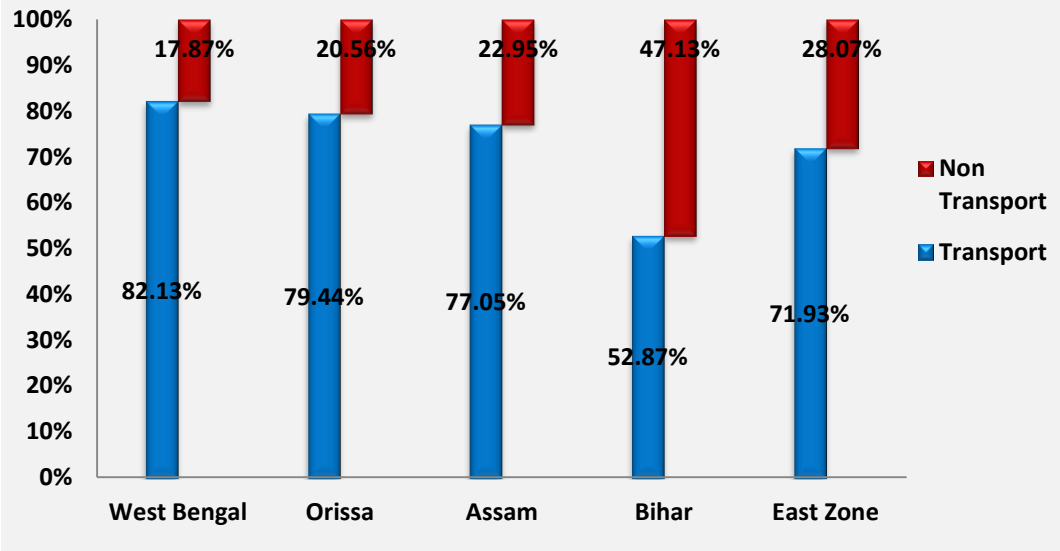


[18] Agro--Economic Research Centre, Department of Economics and Sociology, Punjab Agricultural University

East Zone

For the period July-September 2012, diesel consumption in the transport sector of East zone is maximum in the state of West Bengal and least in Bihar.

Figure 37: Diesel Consumption Break up Amongst the Transport & Non-Transport Sector



For the period July-September 2012, under transport sector, Orissa (19.34%) and West Bengal (19.31%) have the highest diesel consumption in private cars and UVs in East zone.

Table 10: Diesel Consumption Break up Amongst Transport Sector Categories

July - September of 2012	Diesel Transport			
	Cars & UVs Private	Cars & UVs Commercial	HCV/LCV & Buses	3 Wheelers-Passenger/Goods
West Bengal	19.31%	8.79%	48.79%	5.24%
Orissa	19.34%	9.81%	44.43%	5.87%
Assam	19.04%	14.60%	29.18%	14.22%
Bihar	16.12%	3.83%	26.94%	5.98%
East Zone	18.31%	8.43%	38.15%	7.04%

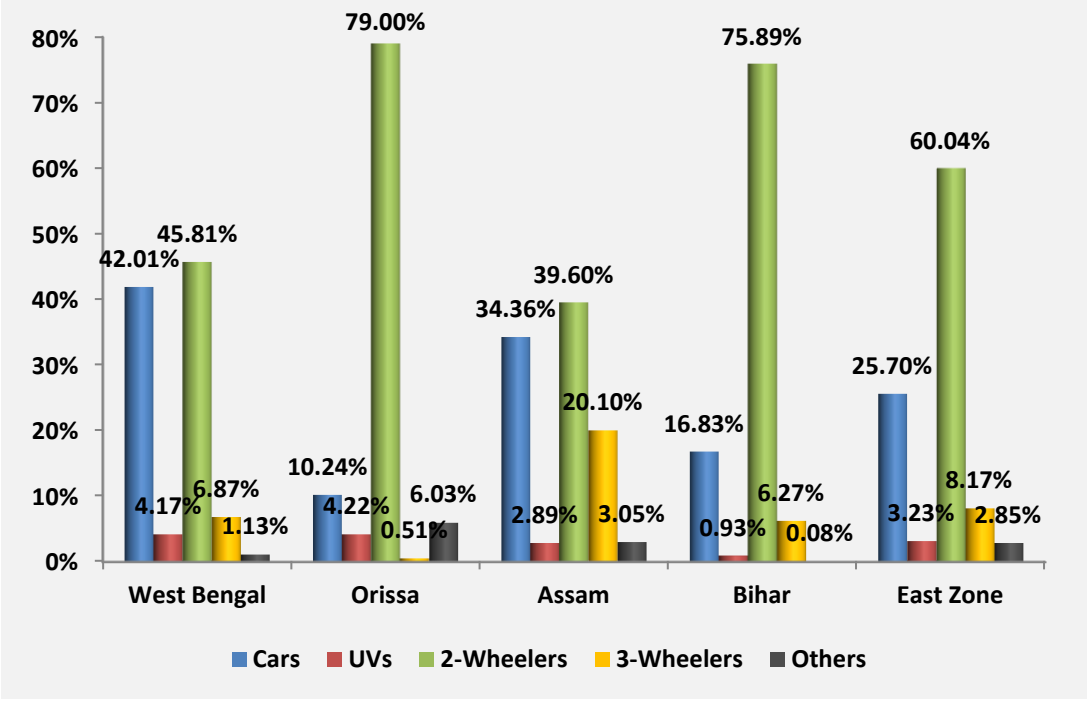
For the period July-September 2012, under non-transport sector, Bihar has the highest diesel consumption in tractors at 12.9% in East zone.

Table 11: Diesel Consumption Break up Amongst Non-Transport Sector Categories

July - September of 2012	Diesel Non-Transport						
	Tractors	Agri Implements	Agri Pumpset	Industry - Genset	Industry - Other Purpose	Mobile Tower	Others (Genset for non-industry purposes) & Others
West Bengal	2.63%	2.73%	2.87%	2.33%	2.70%	2.95%	1.66%
Orissa	4.09%	0.94%	0.94%	1.39%	1.24%	0.94%	10.99%
Assam	5.79%	2.91%	3.32%	3.59%	1.54%	3.46%	2.35%
Bihar	12.90%	3.45%	12.66%	1.15%	0.42%	5.10%	11.45%
East Zone	6.53%	2.63%	5.53%	2.00%	1.54%	3.29%	6.55%

For the period July-September 2012, the state of Orissa leads in East zone in consumption of petrol by 2 wheelers, whereas West Bengal leads in consumption of petrol in cars.

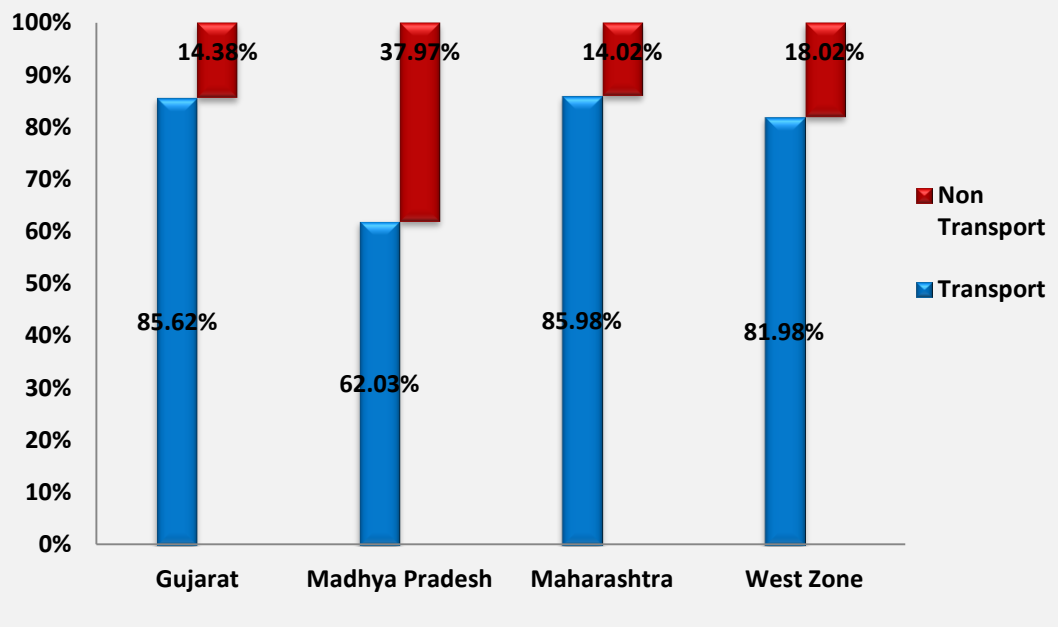
Figure 38: Petrol Consumption Break up Amongst the Sector Categories



West Zone

For the period July-September 2012, diesel consumption in the transport sector of West zone is maximum in two states namely, Gujarat and Maharashtra.

Figure 39: Diesel Consumption Break up Amongst the Transport & Non-Transport Sector



For the period July-September 2012, under transport sector, Gujarat has the highest diesel consumption in private cars and UVs Private at 15.64% in West zone.

Table 12: Diesel Consumption Break up Amongst Transport Sector Categories

July - September of 2012	Diesel Transport			
	Cars & UVs Private	Cars & UVs Commercial	HCV/LCV & Buses	3 Wheelers-Passenger/Goods
Gujarat	15.64%	11.09%	46.87%	12.02%
Madhya Pradesh	11.67%	12.09%	30.80%	7.47%
Maharashtra	13.37%	10.79%	51.60%	10.23%
West Zone	14.14%	11.14%	46.10%	10.61%

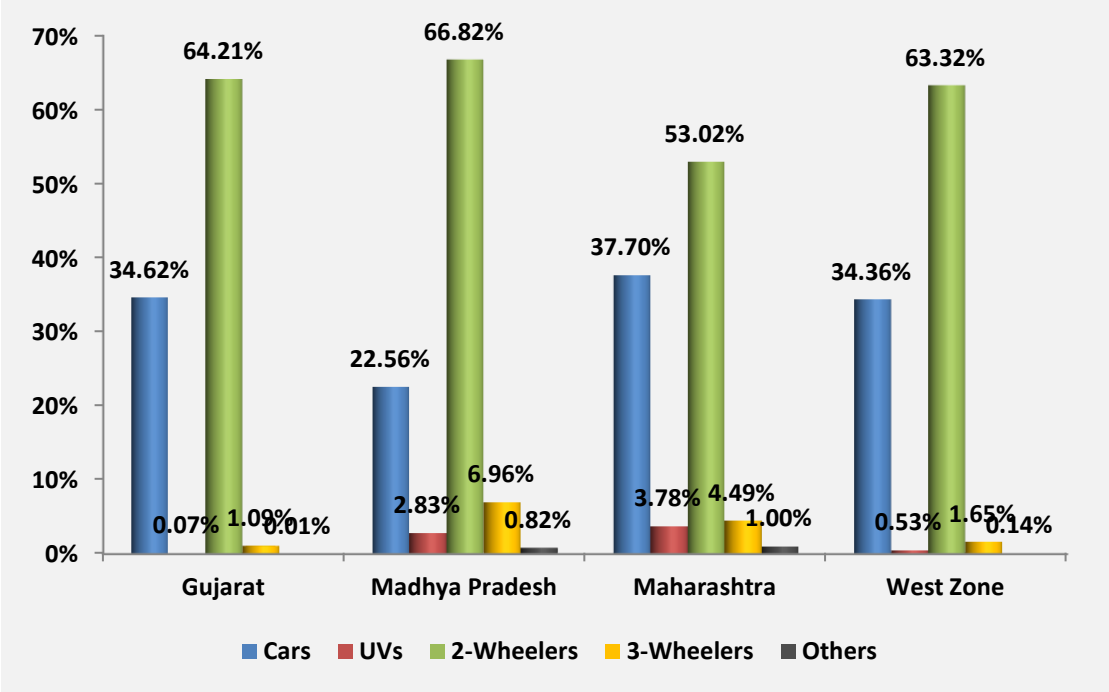
For the period July-September 2012, under non-transport sector, Madhya Pradesh has the highest diesel consumption in tractors at 12.17% in West zone.

Table 13: Diesel Consumption Break up Amongst Non-Transport Sector Categories

July - September of 2012	Diesel Non-Transport						
	Tractors	Agri Implements	Agri Pumpset	Industry - Genset	Industry - Other Purpose	Mobile Tower	Others (Genset for non-industry purposes) & Others
Gujarat	2.92%	3.52%	0.72%	1.23%	0.82%	0.97%	4.20%
Madhya Pradesh	12.17%	4.28%	7.89%	4.17%	0.96%	1.86%	6.63%
Maharashtra	2.36%	1.15%	1.64%	2.87%	1.24%	2.20%	2.57%
West Zone	4.19%	2.74%	2.22%	2.32%	1.00%	1.58%	3.97%

For the period July-September 2012, the state of Madhya Pradesh leads in West zone in consumption of petrol by 2 wheelers whereas Maharashtra leads in consumption of petrol in cars.

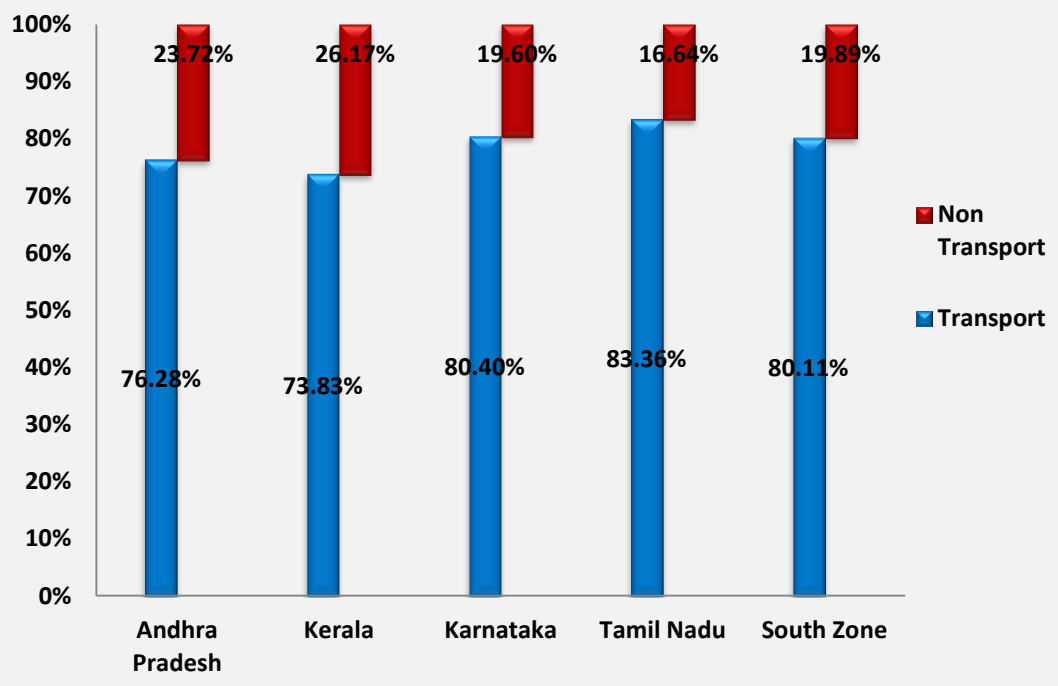
Figure 40: Petrol Consumption Break up Amongst the Sector Categories



South Zone

For the period July-September 2012, diesel consumption in the transport sector of South zone is maximum in the state of Tamil Nadu and least in Kerala.

Figure 41: Diesel Consumption Break up Amongst the Transport & Non-Transport Sector



For the period July-September 2012, under transport sector, Karnataka has the highest diesel consumption in private cars and UVs at 17.45% in South zone.

Table 14: Diesel Consumption Break up Amongst Transport Sector Categories

July - September of 2012	Diesel Transport			
	Cars & UVs Private	Cars & UVs Commercial	HCV/LCV & Buses	3 Wheelers-Passenger/Goods
Andhra Pradesh	16.47%	6.59%	43.96%	9.26%
Kerala	15.41%	9.23%	37.37%	11.81%
Karnataka	17.45%	11.10%	44.46%	7.38%
Tamil Nadu	17.07%	12.77%	43.76%	9.77%
South Zone	16.84%	10.61%	43.31%	9.35%

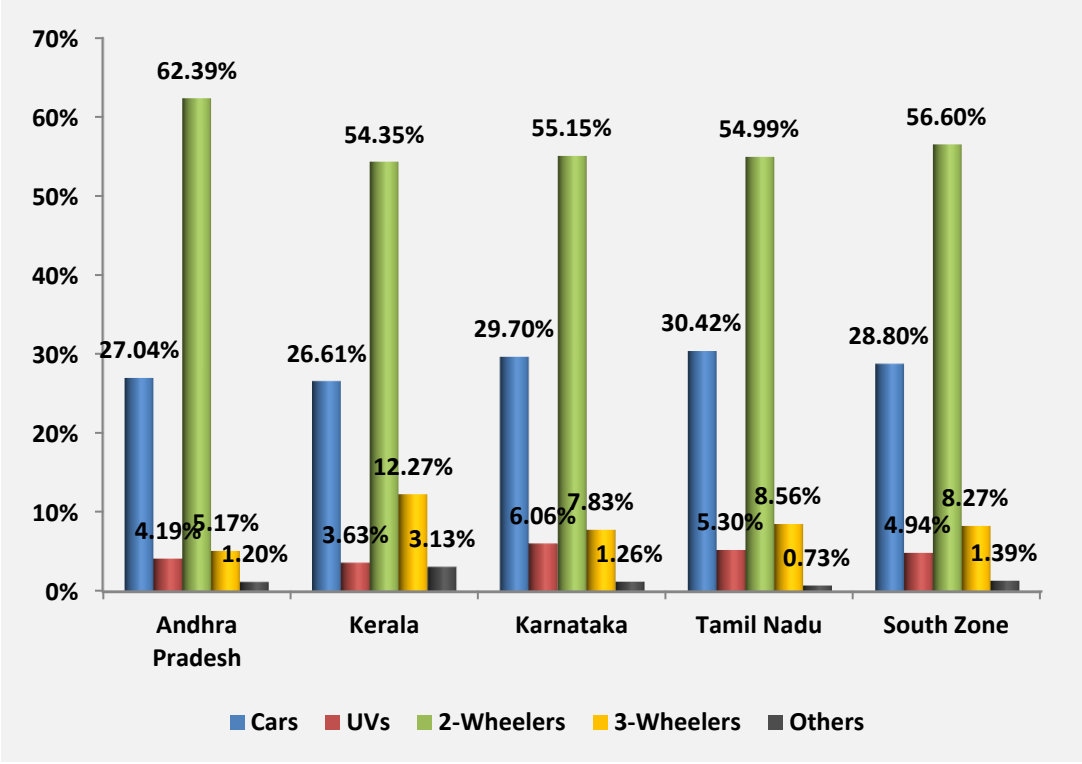
For the period July-September 2012, under non-transport sector, Tamil Nadu has the highest diesel consumption in tractors at 4.81% in South zone.

Table 15: Diesel Consumption Break up Amongst Non-Transport Sector Categories

July - September of 2012	Diesel Non-Transport						
	Tractors	Agri Implements	Agri Pumpset	Industry - Genset	Industry - Other Purpose	Mobile Tower	Others (Genset for non-industry purposes) & Others
Andhra Pradesh	4.77%	3.29%	3.46%	4.45%	3.33%	1.29%	3.13%
Kerala	2.25%	2.58%	1.38%	4.14%	2.72%	0.69%	12.40%
Karnataka	4.13%	4.35%	3.22%	3.00%	1.19%	1.23%	2.49%
Tamil Nadu	4.81%	1.24%	1.58%	3.41%	1.17%	1.45%	2.97%
South Zone	4.40%	2.51%	2.35%	3.64%	1.84%	1.29%	3.86%

For the period July-September 2012, the state of Andhra Pradesh leads in South zone in consumption of petrol by 2 wheelers whereas both Karnataka and Tamil Nadu lead in consumption of petrol in cars.

Figure 42: Petrol Consumption Break up Amongst the Sector Categories



October - December of 2012

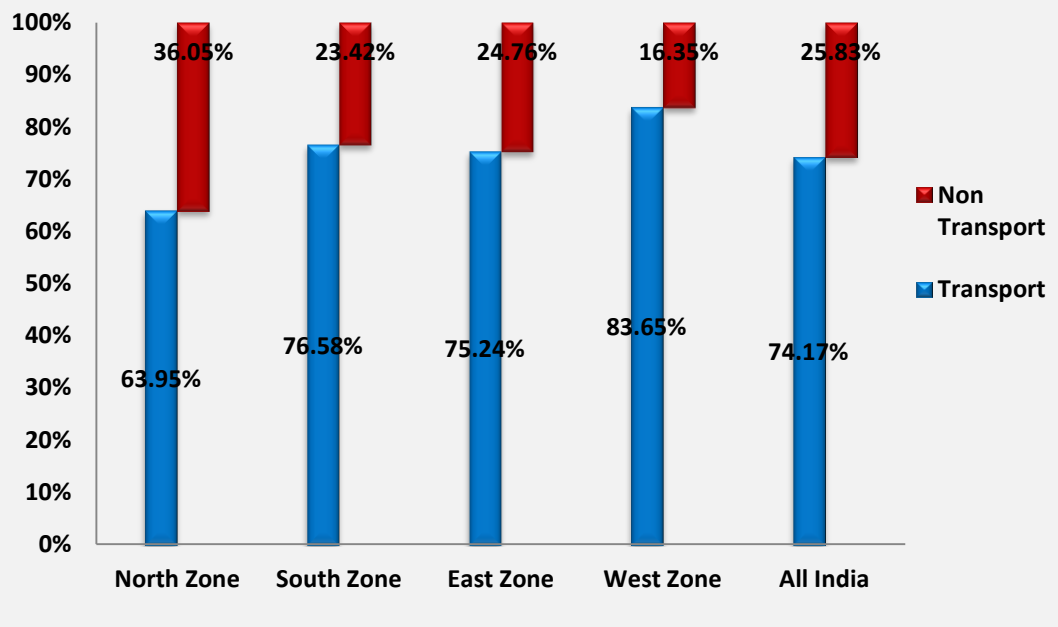
This is the period just after the increase of Rs. 5 per litre in diesel made in September, 2012

The diesel consumption for private and commercial cars and UVs taken together is highest for the period October-December 2012, of all the three periods under purview. This is probably because autumn and winter break for many schools and colleges fall in the months of October and December and during these holidays people plan for outings or vacations.

All India

For the period October-December 2012, North zone has the highest share of diesel consumption in non-transport sector and West zone has the highest consumption of diesel in the transport sector.

Figure 43: Diesel Consumption Break up Amongst the Transport & Non-Transport Sector



At an all India level, for the period October-December 2012, the diesel consumption in the transport sector is the highest in the HCV/LCV category and Buses category at 40.58% followed by private cars and UVs at 15.74%.

Table 16: Diesel Consumption Break up Amongst Transport Sector Categories

October - December of 2012	Diesel Transport			
	Cars & UVs Private	Cars & UVs Commercial	HCV/LCV & Buses	3 Wheelers- Passenger/Goods
North Zone	14.25%	10.38%	35.67%	3.64%
South Zone	18.51%	10.17%	40.64%	7.26%
East Zone	18.65%	9.23%	38.48%	8.89%
West Zone	14.48%	11.45%	47.01%	10.72%
All India	15.74%	10.50%	40.58%	7.35%

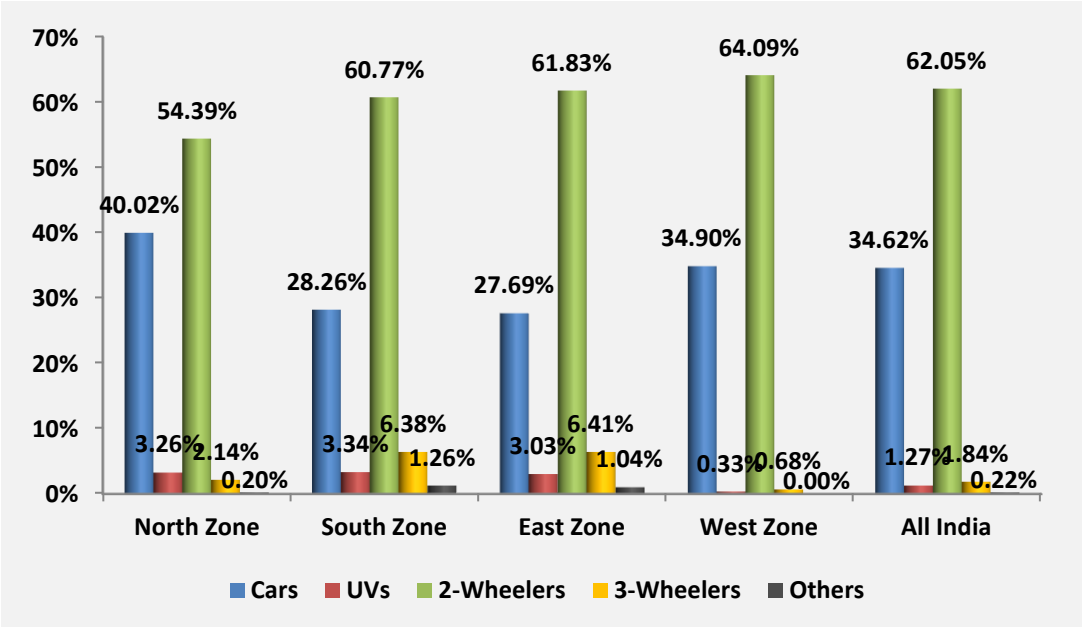
At an all India level, for the period October-December 2012, the diesel consumption in the non-transport sector is the highest in the tractors category at 8.05%. This is probably because October to December is the period for sowing of Rabi crops.

Table 17: Diesel Consumption Break up Amongst Non-Transport Sector Categories

October - December of 2012	Diesel Non-Transport						
	Tractors	Agri Implements	Agri Pumpset	Industry - Genset	Industry - Other Purpose	Mobile Tower	Others
North Zone	13.07%	4.62%	4.48%	5.82%	3.20%	1.51%	3.35%
South Zone	5.14%	1.30%	3.16%	5.02%	2.50%	1.47%	4.83%
East Zone	6.42%	1.70%	4.81%	2.15%	1.86%	2.18%	5.65%
West Zone	4.85%	1.77%	2.25%	1.89%	0.74%	1.37%	3.47%
All India	8.05%	2.69%	3.60%	3.84%	2.08%	1.57%	4.00%

For the period October-December 2012, the petrol consumption for 2-wheelers is highest in the West zone at 64% followed by East and South zone.

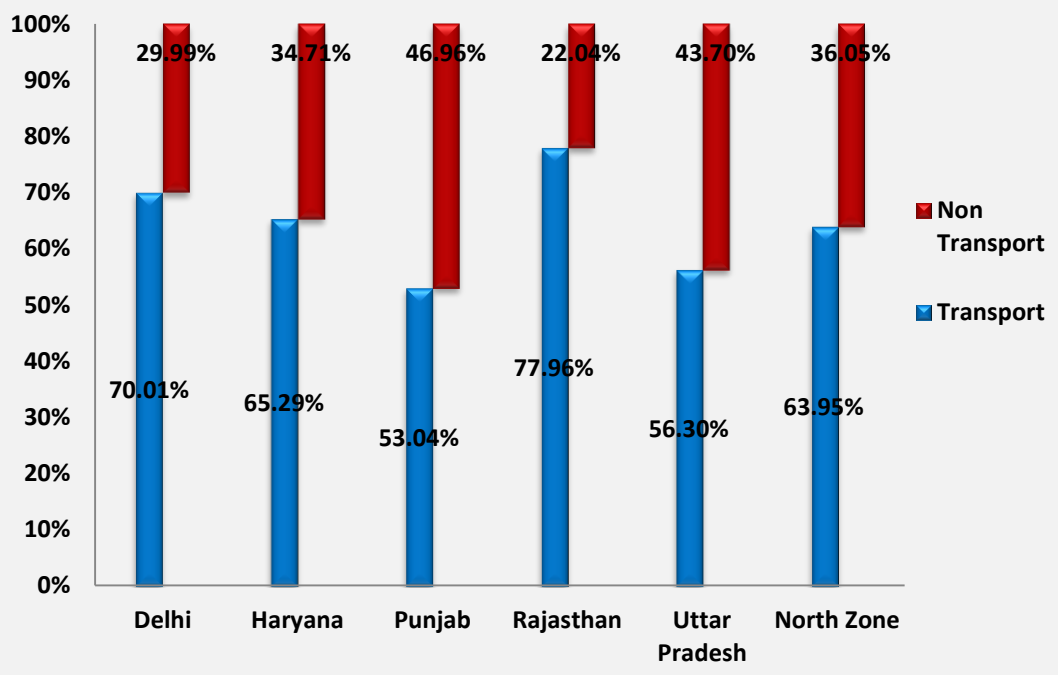
Figure 44: Petrol Consumption Break up Amongst the Sector Categories



North Zone

For the period October-December 2012, diesel consumption in the transport sector of North zone is maximum in the state of Rajasthan and least in Punjab.

Figure 45: Diesel Consumption Break up Amongst the Transport & Non-Transport Sector



For the period October-December 2012, under transport sector, Delhi has the highest diesel consumption in private cars and UVs at 36.62% in North zone.

Table 18: Diesel Consumption Break up Amongst Transport Sector Categories

October - December of 2012	Diesel Transport			
	Cars & UVs Private	Cars & UVs Commercial	HCV/LCV & Buses	3 Wheelers-Passenger/Goods
Delhi	34.62%	18.04%	17.32%	0.03%
Haryana	7.12%	4.61%	51.64%	1.92%
Punjab	14.58%	10.01%	27.33%	1.12%
Rajasthan	17.82%	16.62%	39.40%	4.12%
Uttar Pradesh	14.95%	10.27%	24.67%	6.41%
North Zone	14.25%	10.38%	35.67%	3.64%

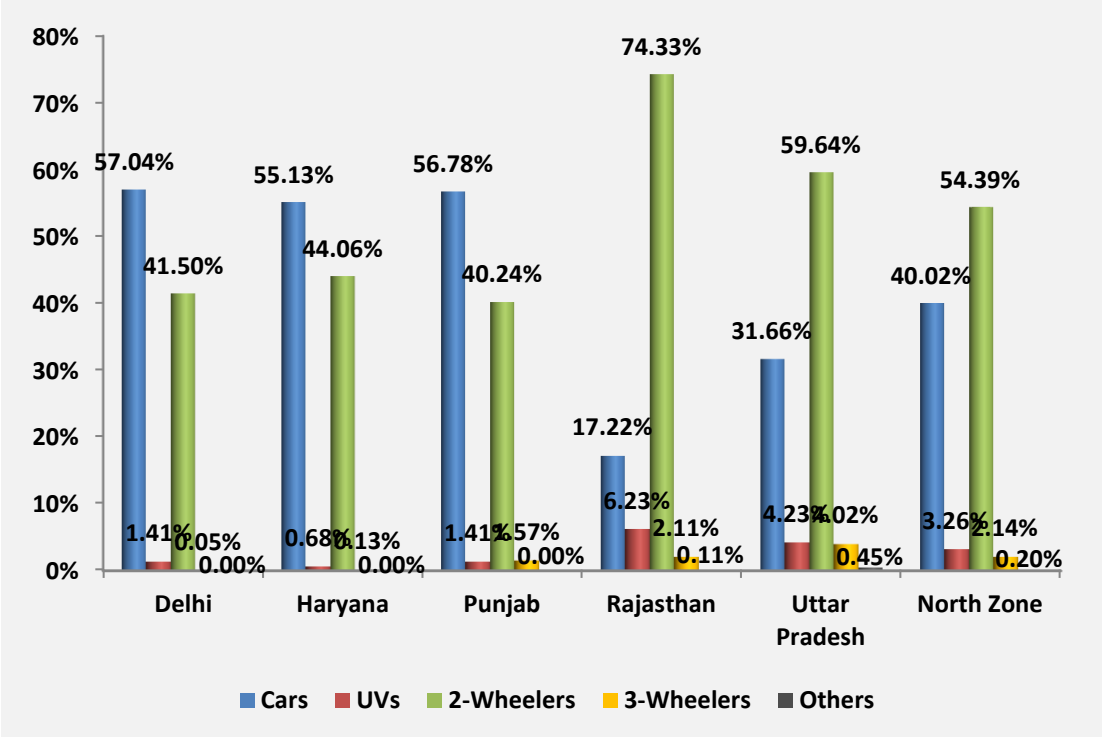
For the period October-December 2012, under non-transport sector, Punjab has the highest diesel consumption in tractors at 18.09% in North zone.

Table 19: Diesel Consumption Break up Amongst Non-Transport Sector Categories

October - December of 2012	Diesel Non-Transport						
	Tractors	Agri Implements	Agri Pumpset	Industry - Genset	Industry - Other Purpose	Mobile Tower	Others (Genset for non-industry purposes) & Others
Delhi	0.83%	0.00%	0.18%	10.79%	6.63%	0.03%	11.53%
Haryana	10.41%	6.98%	2.46%	8.04%	2.66%	0.35%	3.81%
Punjab	18.09%	8.07%	8.12%	5.04%	2.12%	2.19%	3.33%
Rajasthan	12.88%	1.89%	1.18%	2.67%	1.28%	0.58%	1.56%
Uttar Pradesh	15.58%	3.76%	7.87%	5.52%	4.89%	3.18%	2.90%
North Zone	13.07%	4.62%	4.48%	5.82%	3.20%	1.51%	3.35%

For the period October-December 2012, the state of Rajasthan leads in North zone in consumption of petrol by 2 wheelers, whereas both Delhi and Punjab lead in consumption of petrol in cars.

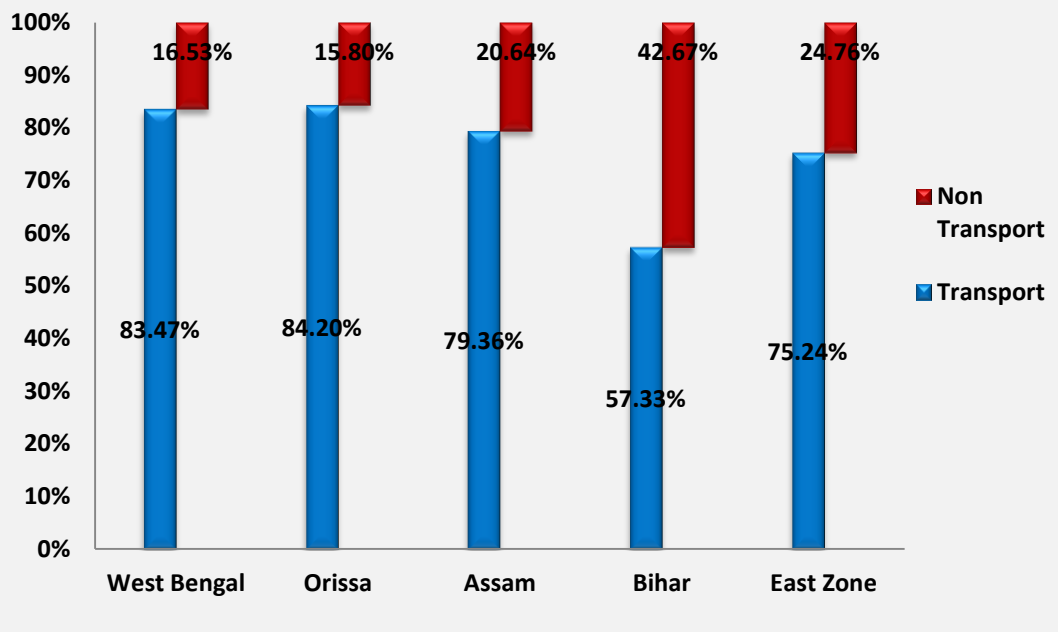
Figure 46: Petrol Consumption Break up Amongst the Sector Categories



East Zone

For the period October-December 2012, diesel consumption in the transport sector of East zone is maximum in the state of West Bengal and least in Bihar.

Figure 47: Diesel Consumption Break up Amongst the Transport & Non-Transport Sector



For the period October-December 2012, under transport sector, West Bengal has the highest diesel consumption in private cars and UVs at 22.27% in East zone.

Table 20: Diesel Consumption Break up Amongst Transport Sector Categories

October - December of 2012	Diesel Transport			
	Cars & UVs Private	Cars & UVs Commercial	HCV/LCV & Buses	3 Wheelers-Passenger/Goods
West Bengal	22.27%	10.02%	46.31%	4.87%
Orissa	13.17%	12.31%	49.10%	9.62%
Assam	18.23%	15.93%	28.66%	16.54%
Bihar	18.26%	2.67%	27.29%	9.11%
East Zone	18.65%	9.23%	38.48%	8.89%

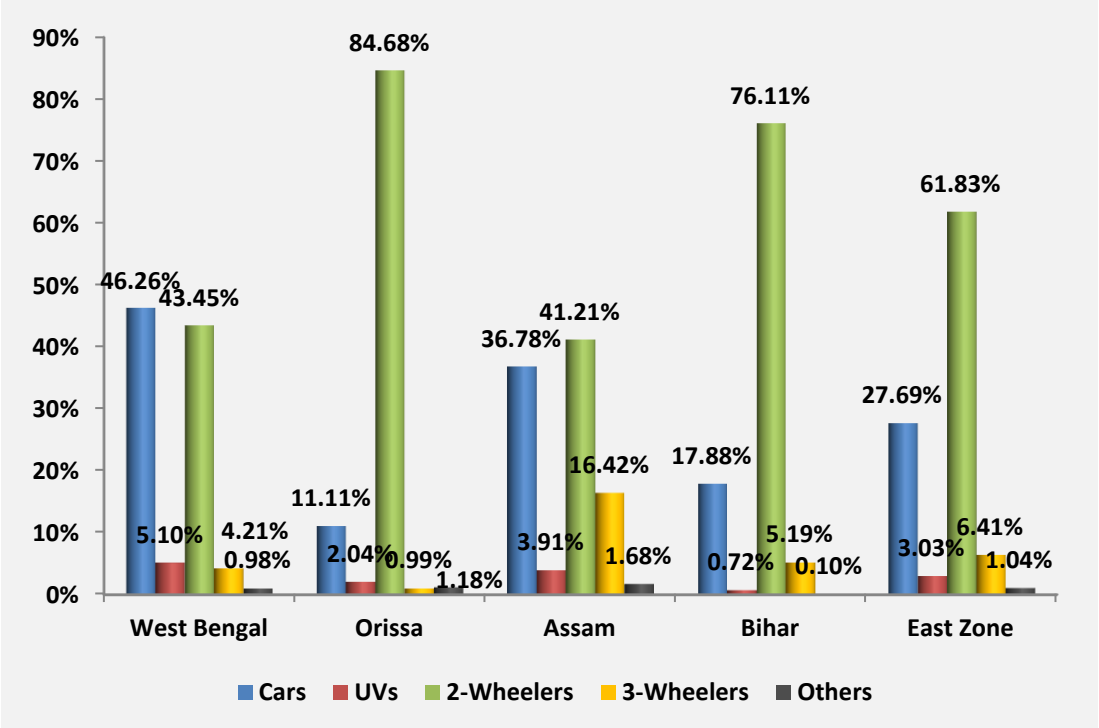
For the period October-December 2012, under non-transport sector, Bihar has the highest diesel consumption in tractors at 13.4% in East zone.

Table 21: Diesel Consumption Break up Amongst Non-Transport Sector Categories

October - December of 2012	Diesel Non-Transport						
	Tractors	Agri Implements	Agri Pumpset	Industry - Genset	Industry - Other Purpose	Mobile Tower	Others (Genset for non-industry purposes) & Others
West Bengal	3.58%	1.31%	3.27%	3.21%	3.26%	1.44%	0.46%
Orissa	5.02%	0.65%	0.57%	1.01%	0.29%	1.13%	7.13%
Assam	1.34%	1.89%	6.04%	4.87%	1.23%	3.28%	1.99%
Bihar	13.40%	2.78%	8.81%	0.21%	1.58%	3.16%	12.73%
East Zone	6.42%	1.70%	4.81%	2.15%	1.86%	2.18%	5.65%

For the period October-December 2012, the state of Orissa leads in East zone in consumption of petrol by 2-wheelers, whereas West Bengal leads in consumption of petrol in cars.

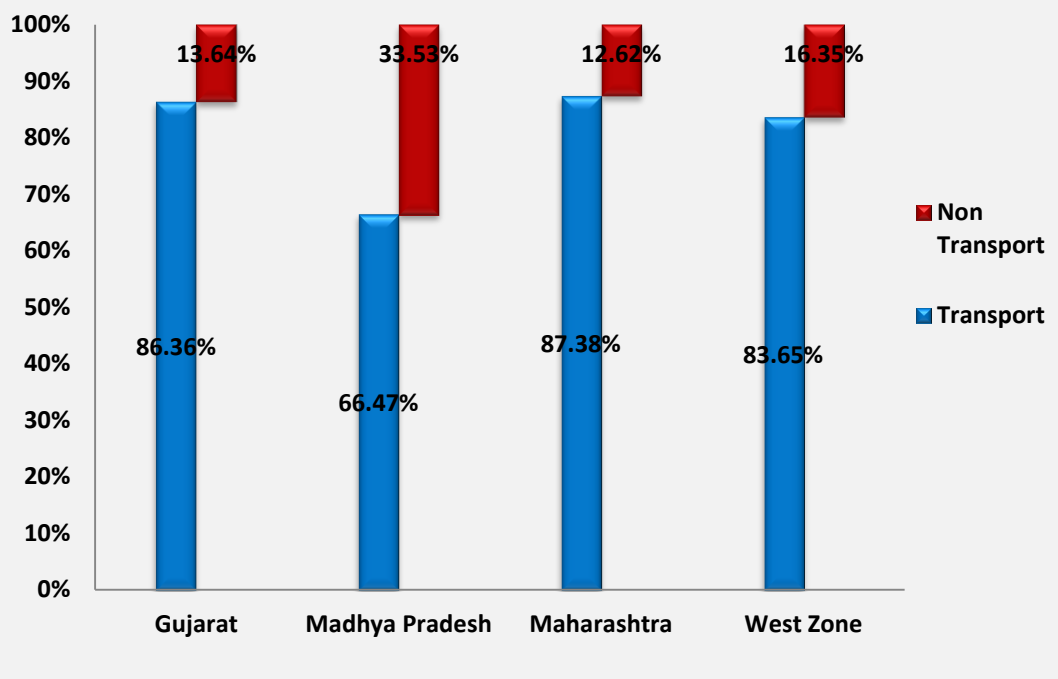
Figure 48: Petrol Consumption Break up Amongst the Sector Categories



West Zone

For the period October-December 2012, diesel consumption in the transport sector of West zone is maximum in the state of Maharashtra and least in Madhya Pradesh.

Figure 49: Diesel Consumption Break up Amongst the Transport & Non-Transport Sector



For the period October-December 2012, under transport sector, Gujarat has the highest diesel consumption in private cars and UVs at 15.87% in West zone.

Table 22: Diesel Consumption Break up Amongst Transport Sector Categories

October - December of 2012	Diesel Transport			
	Cars & UVs Private	Cars & UVs Commercial	HCV/LCV & Buses	3 Wheelers-Passenger/Goods
Gujarat	15.87%	11.22%	47.34%	11.93%
Madhya Pradesh	13.01%	15.21%	30.14%	8.11%
Maharashtra	13.44%	10.21%	53.38%	10.35%
West Zone	14.48%	11.45%	47.01%	10.72%

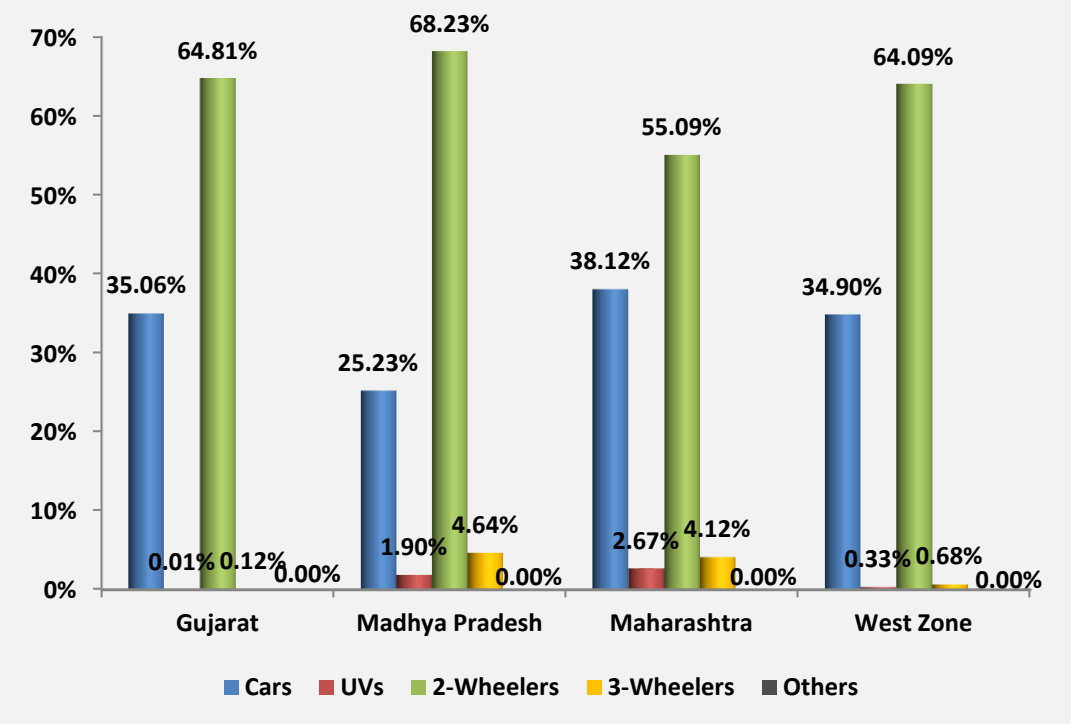
For the period October-December 2012, under non-transport sector, Madhya Pradesh has the highest diesel consumption in tractors at 14.32% in West zone.

Table 23: Diesel Consumption Break up Amongst Non-Transport Sector Categories

October - December of 2012	Diesel Non-Transport						
	Tractors	Agri Implements	Agri Pumpset	Industry - Genset	Industry - Other Purpose	Mobile Tower	Others (Genset for non-industry purposes) & Others
Gujarat	3.09%	2.31%	1.12%	1.34%	0.65%	1.01%	4.12%
Madhya Pradesh	14.32%	2.31%	6.76%	3.67%	0.33%	1.52%	4.62%
Maharashtra	3.11%	0.92%	1.76%	1.82%	1.02%	1.74%	2.25%
West Zone	4.85%	1.77%	2.25%	1.89%	0.74%	1.37%	3.47%

For the period October-December 2012, the state of Madhya Pradesh leads in West zone in consumption of petrol by 2-wheelers, whereas Maharashtra leads in consumption of petrol in cars.

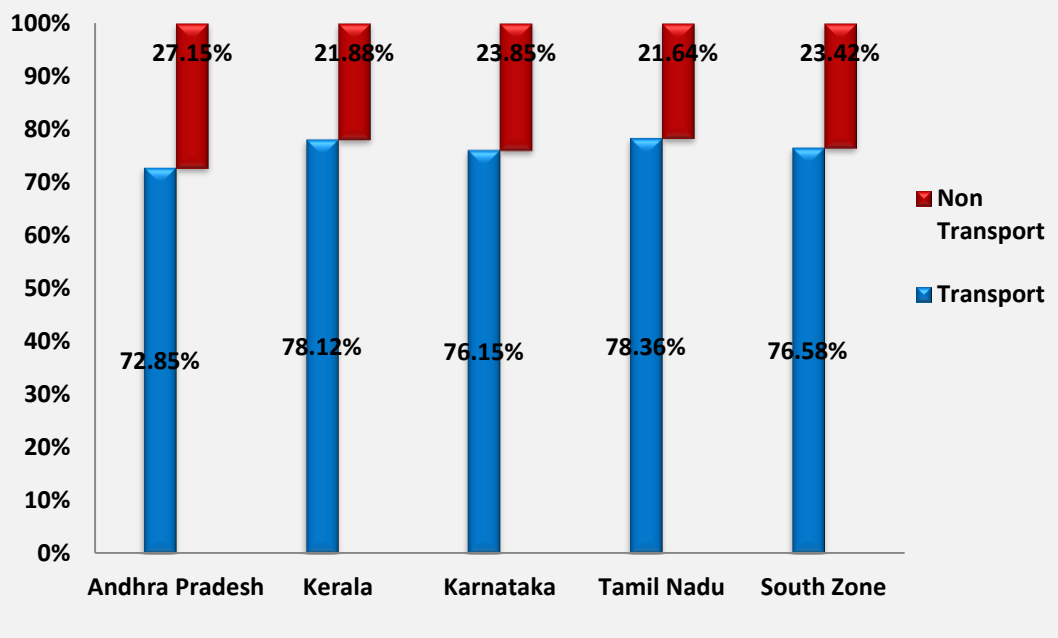
Figure 50: Petrol Consumption Break up Amongst the Sector Categories



South Zone

For the period October-December 2012, diesel consumption in the transport sector of South zone is maximum in two states, namely Kerala and Tamil Nadu and least in Andhra Pradesh.

Figure 51: Diesel Consumption Break up Amongst the Transport & Non-Transport Sector



For the period October-December 2012, under transport sector, Karnataka has the highest diesel consumption in private cars and UVs at 20.23% in South zone.

Table 24: Diesel Consumption Break up Amongst Transport Sector Categories

October - December of 2012	Diesel Transport			
	Cars & UVs Private	Cars & UVs Commercial	HCV/LCV & Buses	3 Wheelers-Passenger/Goods
Andhra Pradesh	18.29%	5.63%	42.78%	6.15%
Kerala	17.11%	7.41%	44.47%	9.13%
Karnataka	20.23%	9.12%	41.51%	5.29%
Tamil Nadu	18.13%	13.59%	38.30%	8.34%
South Zone	18.51%	10.17%	40.64%	7.26%

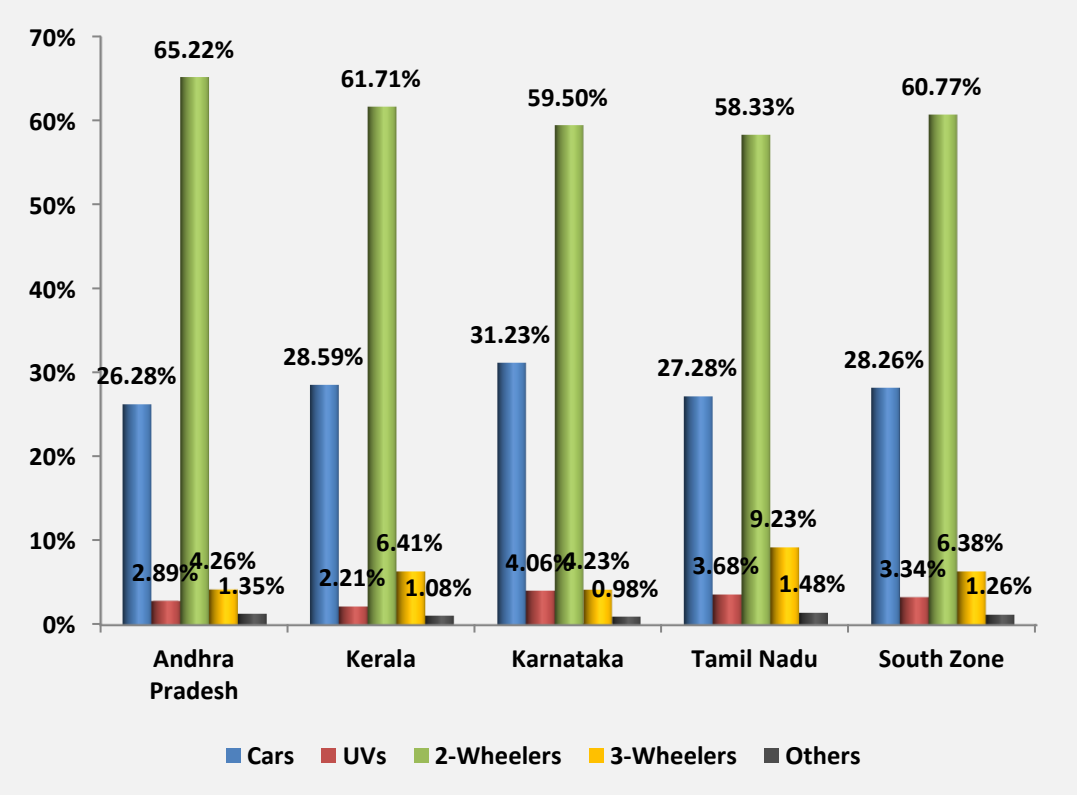
For the period October-December 2012, under non-transport sector, Andhra Pradesh has the highest diesel consumption in tractors at 7.09% in South zone.

Table 25: Diesel Consumption Break up Amongst Non-Transport Sector Categories

October - December of 2012	Diesel Non-Transport						
	Tractors	Agri Implements	Agri Pumpset	Industry - Genset	Industry - Other Purpose	Mobile Tower	Others (Genset for non-industry purposes) & Others
Andhra Pradesh	7.09%	1.48%	4.10%	5.02%	3.15%	0.79%	5.52%
Kerala	4.36%	1.68%	1.49%	5.68%	1.23%	1.21%	6.23%
Karnataka	5.39%	3.10%	2.75%	4.12%	2.11%	1.15%	5.23%
Tamil Nadu	4.20%	0.28%	3.23%	5.29%	2.63%	2.03%	3.98%
South Zone	5.14%	1.30%	3.16%	5.02%	2.50%	1.47%	4.83%

For the period October-December 2012, the state of Andhra Pradesh leads in South zone in consumption of petrol by 2-wheelers, whereas Karnataka leads in consumption of petrol in cars.

Figure 52: Petrol Consumption Break up Amongst the Sector Categories



April – June of 2013

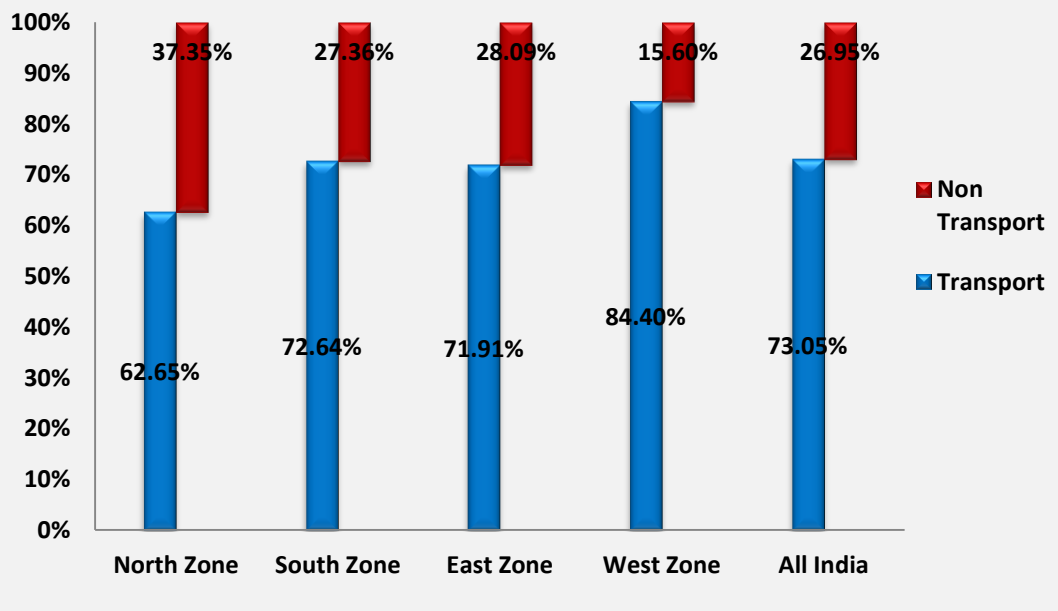
Dual pricing of diesel for retail and direct sales was made effective from mid-January, 2013. During this period, the share of diesel sold through retail outlets increased to nearly 90% from a level of 82-85% during the earlier rounds.

The diesel consumption in HCV/LCV and Buses is minimum for the period April-June 2013 vis-à-vis the other two periods i.e. July-September 2012 and October to December 2012. This is presumably because April, May and June are the hottest months of the year. Many truck drivers don't prefer to travel during the day in this period.

All India

For the period April-June 2013, North zone has the highest share of diesel consumption in non-transport sector and West zone has the highest consumption of diesel in the transport sector.

Figure 53: Diesel Consumption Break up Amongst the Transport & Non-Transport Sector



At an all India level, for the period April-June 2013, the diesel consumption in the transport sector is the highest in the HCV/LCV category and Buses category at 40.68% followed by private cars and UVs at 14.9%.

Table 26: Diesel Consumption Break up Amongst Transport Sector Categories

April – June of 2013	Diesel Transport			
	Cars & UVs Private	Cars & UVs Commercial	HCV/LCV & Buses	3 Wheelers-Passenger/Goods
North Zone	14.20%	9.94%	34.60%	3.91%
South Zone	16.05%	9.16%	40.96%	6.48%
East Zone	16.17%	10.59%	35.61%	9.55%
West Zone	14.55%	10.93%	48.78%	10.14%
All India	14.90%	10.23%	40.68%	7.24%

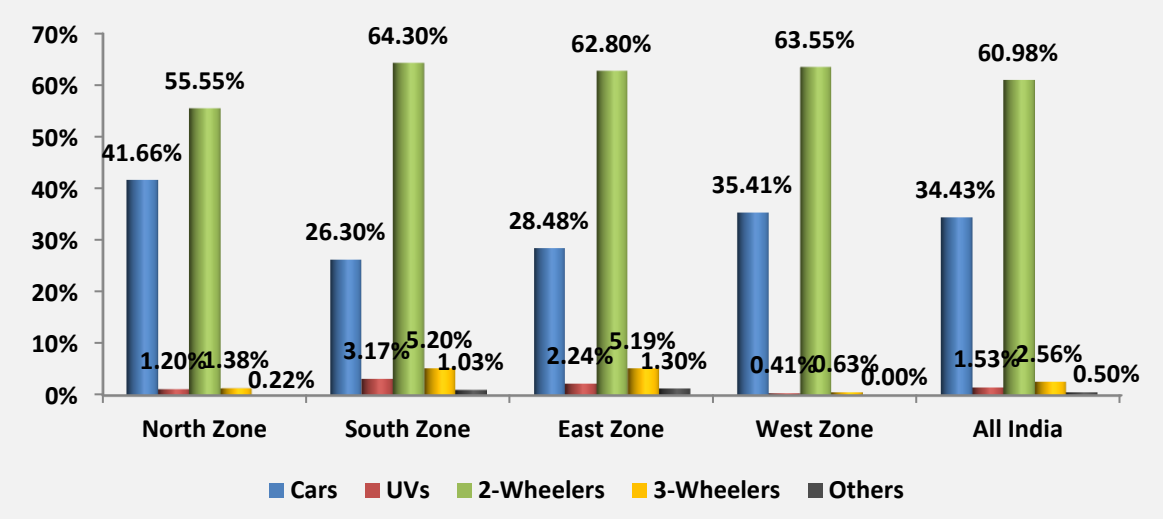
At an all India level, for the period April-June 2013, the diesel consumption in the non-transport sector is the highest in the tractors category at8.71% followed by industry gensets at 4.74%. This is presumably because December to Jaunuary is the period for harvesting of Zaid Rabi crops, May to July is the period for sowing of Kharif crops and April is the last month in the harvesting season of Rabi crop.

Table 27: Diesel Consumption Break up Amongst Non-Transport Sector Categories

April – June of 2013	Diesel Non-Transport						
	Tractors	Agri Implements	Agri Pumpset	Industry - Genset	Industry - Other Purpose	Mobile Tower	Others (Genset-non-industry purposes) & Others
North Zone	15.20%	5.88%	3.38%	5.62%	2.65%	1.69%	2.94%
South Zone	5.50%	2.98%	0.49%	7.91%	2.93%	2.00%	5.55%
East Zone	8.37%	2.59%	2.42%	4.55%	1.75%	2.25%	6.17%
West Zone	3.79%	1.21%	2.31%	2.33%	1.18%	1.41%	3.36%
All India	8.71%	3.34%	2.39%	4.74%	2.08%	1.72%	3.97%

For the period April-June 2013, the petrol consumption for 2-wheelers is highest in both South and West zones at around 64% followed by East and North zones.

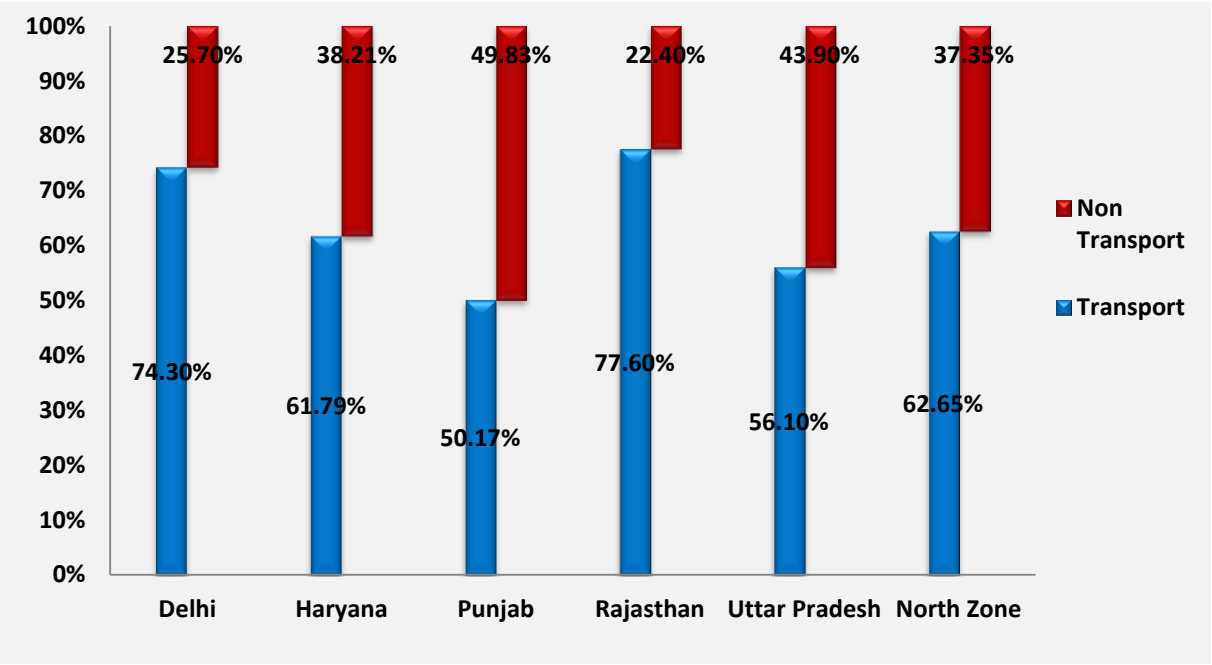
Figure 54: Petrol Consumption Break up Amongst the Sector Categories



North Zone

For the period April-June 2013, diesel consumption in the transport sector of North zone is maximum in the state of Rajasthan at 77.60% and least in Punjab.

Figure 55: Diesel Consumption Break up Amongst the Transport & Non-Transport Sector



For the period April-June 2013, under transport sector, Delhi has the highest diesel consumption in private cars and UVs at 35.9% in North zone. This maybe because most of the commercial vehicles in Delhi are running on CNG.

Table 28: Diesel Consumption Break up Amongst Transport Sector Categories

April – June of 2013	Diesel Transport			
	Cars & UVs Private	Cars & UVs Commercial	HCV/LCV & Buses	3 Wheelers-Passenger/Goods
Delhi	35.90%	19.30%	18.30%	0.80%
Haryana	6.90%	3.10%	49.59%	2.20%
Punjab	14.50%	10.01%	23.96%	1.70%
Rajasthan	17.30%	19.20%	35.60%	5.50%
Uttar Pradesh	15.20%	8.30%	26.90%	5.70%
North Zone	14.20%	9.94%	34.60%	3.91%

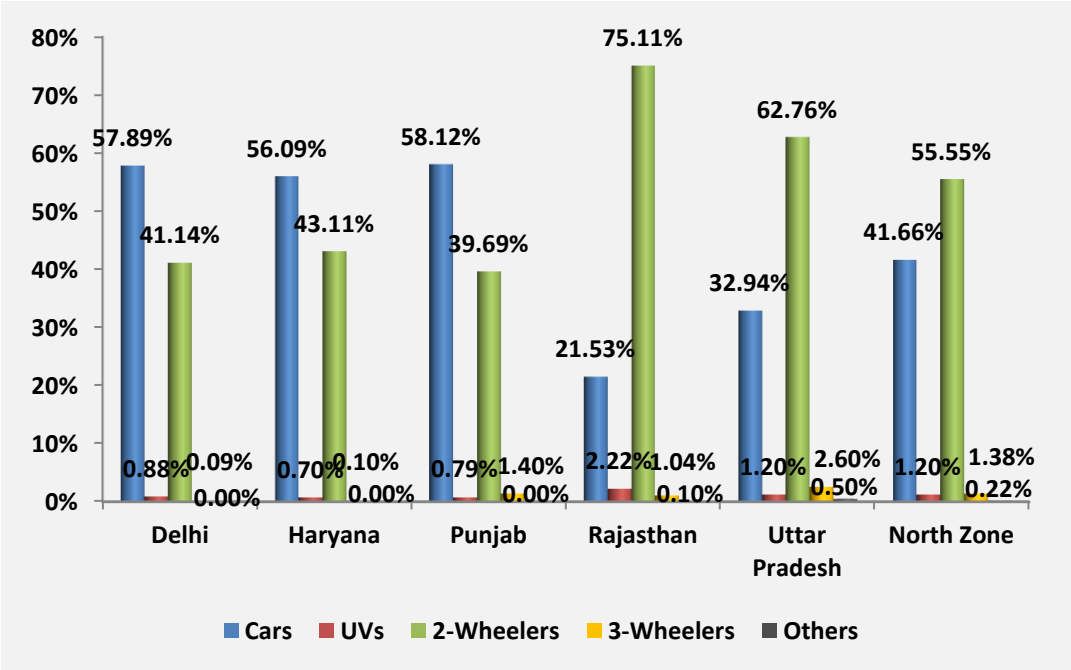
For the period April-June 2013, under non-transport sector, Punjab has the highest diesel consumption in tractors at 21.11% in North zone.

Table 29: Diesel Consumption Break up Amongst Non-Transport Sector Categories

April – June of 2013	Diesel Non-Transport						
	Tractors	Agri Implements	Agri Pumpset	Industry - Genset	Industry - Other Purpose	Mobile Tower	Others (Genset-non-industry purposes) & Others
Delhi	0.19%	0.00%	0.11%	8.20%	5.00%	0.01%	12.19%
Haryana	13.02%	8.21%	1.98%	8.10%	2.40%	0.56%	3.94%
Punjab	21.11%	10.68%	6.14%	6.10%	1.80%	0.88%	3.12%
Rajasthan	14.06%	2.16%	0.98%	3.10%	1.10%	0.69%	0.31%
Uttar Pradesh	18.04%	5.39%	5.77%	4.50%	3.90%	3.98%	2.32%
North Zone	15.20%	5.88%	3.38%	5.62%	2.65%	1.69%	2.94%

For the period April-June 2013, the state of Rajasthan leads in North zone in consumption of petrol by 2-wheelers at 75.11, whereas Punjab leads in consumption of petrol in cars at 58.12%.

Figure 56: Petrol Consumption Break up Amongst the Sector Categories

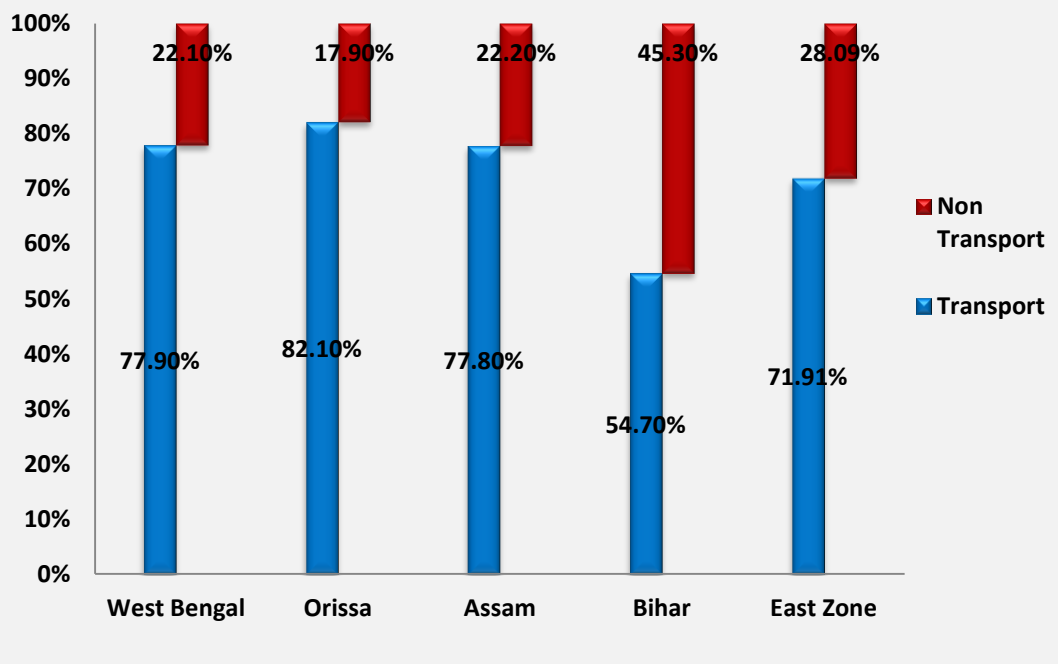


Considering all the three time periods, Delhi, Haryana and Punjab are the only states, all belonging to North zone, where the petrol consumption in cars is more than the petrol consumption in 2 wheelers. This is probably due to the lower prices of petrol in these states than the rest of the states under consideration. And also because of people preferring cars that run on petrol than diesel due to their lower initial costs and lower maintenance costs.

East Zone

For the period April-June 2013, diesel consumption in the transport sector of East zone is maximum in the state of Orissa and least in Bihar.

Figure 57: Diesel Consumption Break up Amongst the Transport & Non-Transport Sector



For the period April-June 2013, under transport sector, West Bengal has the highest diesel consumption in private cars and UVs at 18.2% in East zone.

Table 30: Diesel Consumption Break up Amongst Transport Sector Categories

April – June of 2013	Diesel Transport			
	Cars & UVs Private	Cars & UVs Commercial	HCV/LCV & Buses	3 Wheelers-Passenger/Goods
West Bengal	18.20%	12.80%	42.00%	4.90%
Orissa	16.50%	11.10%	41.60%	12.90%
Assam	15.80%	15.90%	29.60%	16.50%
Bihar	13.70%	4.70%	27.20%	9.10%
East Zone	16.17%	10.59%	35.61%	9.55%

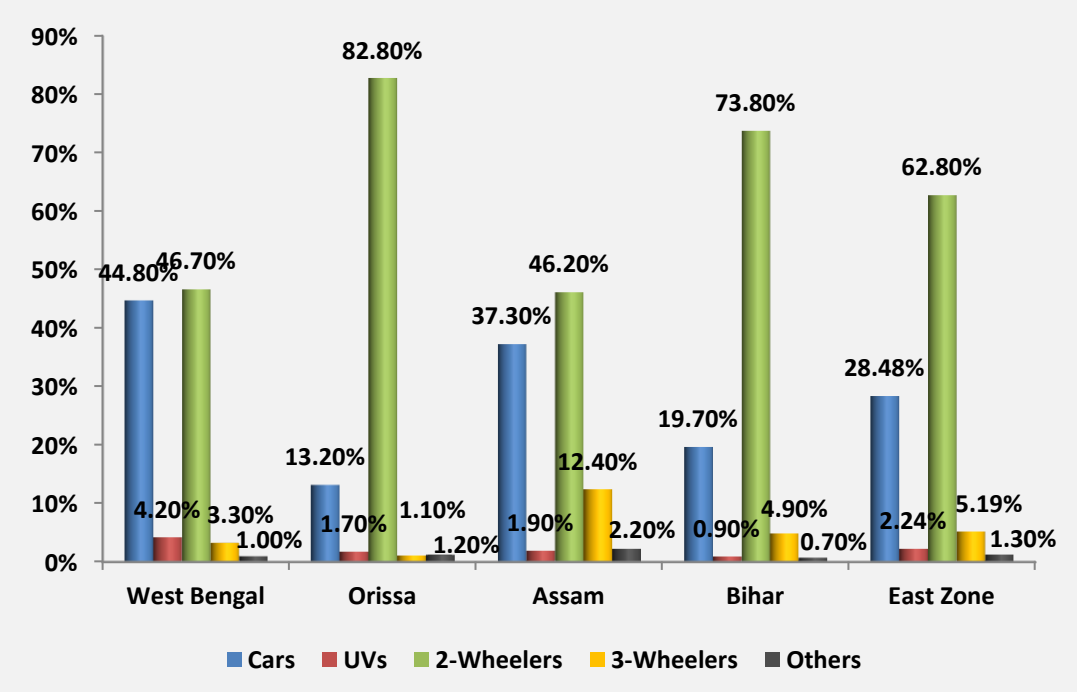
For the period April-June 2013, under non-transport sector, Bihar has the highest diesel consumption in tractors at 16.5% in East zone.

Table 31: Diesel Consumption Break up Amongst Non-Transport Sector Categories

April – June of 2013	Diesel Non-Transport						
	Tractors	Agri Implements	Agri Pumpset	Industry - Genset	Industry - Other Purpose	Mobile Tower	Others (Genset for non-industry purposes) & Others
West Bengal	5.05%	2.65%	2.40%	5.60%	2.90%	2.20%	1.30%
Orissa	5.44%	0.46%	0.30%	2.80%	0.30%	1.34%	7.26%
Assam	4.33%	2.99%	1.98%	6.30%	1.30%	3.22%	2.08%
Bihar	16.50%	3.71%	4.09%	3.50%	1.60%	2.40%	13.50%
East Zone	8.37%	2.59%	2.42%	4.55%	1.75%	2.25%	6.17%

For the period April-June 2013, the state of Orissa leads in East zone in consumption of petrol by 2-wheelers at 82.80%, whereas West Bengal leads in consumption of petrol in cars at 44.80%.

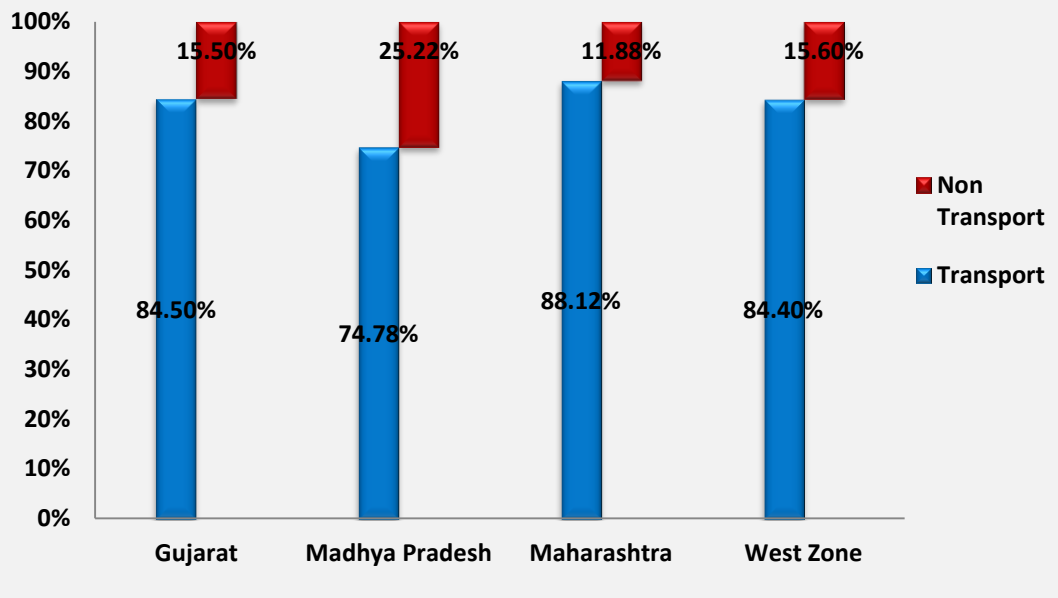
Figure 58: Petrol Consumption Break up Amongst the Sector Categories



West Zone

For the period April-June 2013, diesel consumption in the transport sector of West zone is maximum in the state of Maharashtra and least in Madhya Pradesh.

Figure 59: Diesel Consumption Break up Amongst the Transport & Non-Transport Sector



For the period April-June 2013, under transport sector, Madhya Pradesh has the highest diesel consumption in private cars and UVs at 16.88% in West zone.

For Gujarat, diesel consumption in 3-wheelers-Passenger/Goods is decreasing period on period. Diesel consumption in 3-wheelers-Passenger/Goods in July-September 2012, October-December 2012 and April-June 2013 was 12.02%, 11.93% and 11.13% respectively. This is presumably because many of the 3-wheelers-Passenger/Goods might have shifted to CNG.

Table 32: Diesel Consumption Break up Amongst Transport Sector Categories

April – June of 2013	Diesel Transport			
	Cars & UVs Private	Cars & UVs Commercial	HCV/LCV & Buses	3 Wheelers-Passenger/Goods
Gujarat	15.45%	11.02%	46.90%	11.13%
Madhya Pradesh	16.88%	11.51%	37.04%	9.35%
Maharashtra	12.56%	10.60%	55.67%	9.29%
West Zone	14.55%	10.93%	48.78%	10.14%

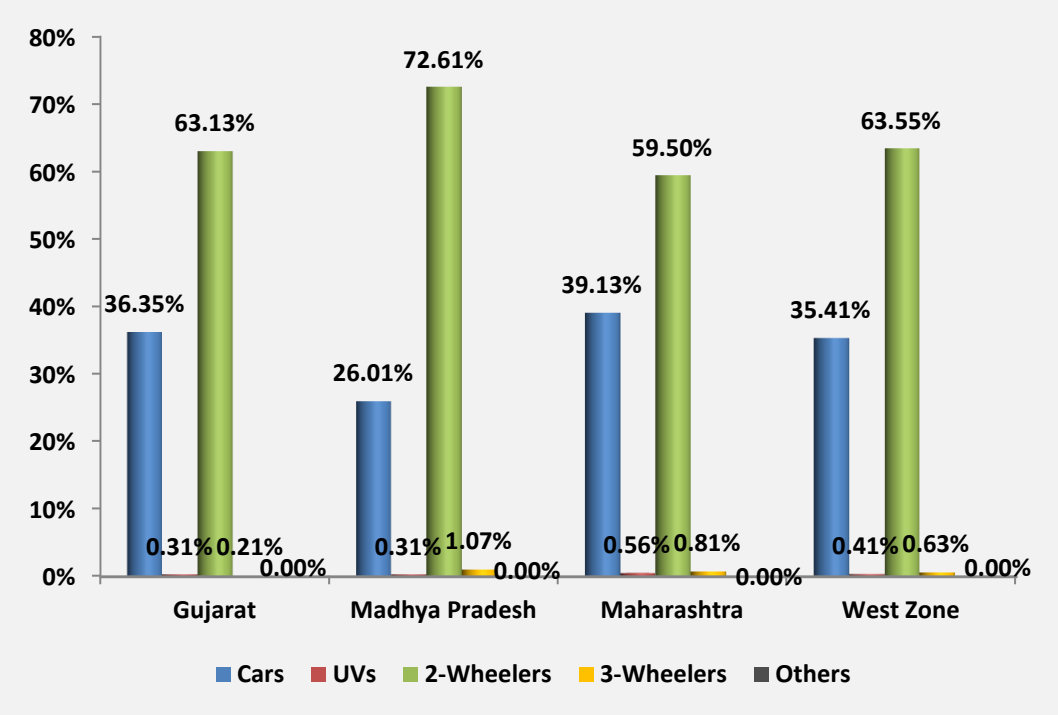
For the period April-June 2013, under non-transport sector, Madhya Pradesh has the highest diesel consumption in tractors at 9.2% in West zone.

Table 33: Diesel Consumption Break up Amongst Non-Transport Sector Categories

April – June of 2013	Diesel Non-Transport						
	Tractors	Agri Implements	Agri Pumpset	Industry - Genset	Industry - Other Purpose	Mobile Tower	Others (Genset for non-industry purposes) & Others
Gujarat	2.88%	1.48%	1.75%	2.22%	1.28%	0.94%	4.95%
Madhya Pradesh	9.20%	1.69%	4.22%	3.10%	1.13%	1.52%	4.36%
Maharashtra	2.69%	0.70%	2.21%	2.15%	1.09%	1.92%	1.12%
West Zone	3.79%	1.21%	2.31%	2.33%	1.18%	1.41%	3.36%

For the period April-June 2013, the state of Madhya Pradesh leads in West zone in consumption of petrol by 2-wheelers at 72.61%, whereas Maharashtra leads in consumption of petrol in cars at 39.13%.

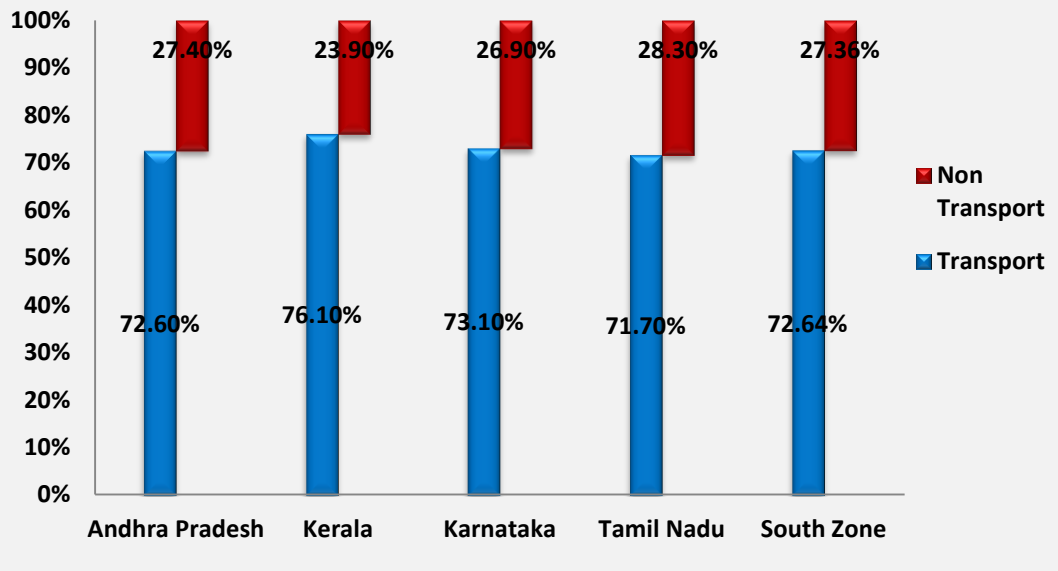
Figure 60: Petrol Consumption Break up Amongst the Sector Categories



South Zone

For the period April-June 2013, diesel consumption in the transport sector of South zone is maximum in the state of Kerala and least in Tamil Nadu.

Figure 61: Diesel Consumption Break up Amongst the Transport & Non-Transport Sector



For the period April-June 2013, under transport sector, Karnataka has the highest diesel consumption in private cars and UVs at 18.1% in South zone.

Table 34: Diesel Consumption Break up Amongst Transport Sector Categories

April – June of 2013	Diesel Transport			
	Cars & UVs Private	Cars & UVs Commercial	HCV/LCV & Buses	3 Wheelers-Passenger/Goods
Andhra Pradesh	16.20%	9.20%	40.10%	7.10%
Kerala	16.10%	8.20%	43.70%	8.10%
Karnataka	18.10%	9.50%	40.30%	5.20%
Tamil Nadu	15.00%	9.20%	41.10%	6.40%
South Zone	16.05%	9.16%	40.96%	6.48%

For the period April-June 2013, under non-transport sector, Andhra Pradesh has the highest diesel consumption in tractors at 8.11% in South zone. During April-June 2013, the diesel consumption in Industry – Gensets in Tamil Nadu is 9.3%. This is due to the deficit in power rising to 34.1%, the highest in the country, from last year's 17.5%.[19]

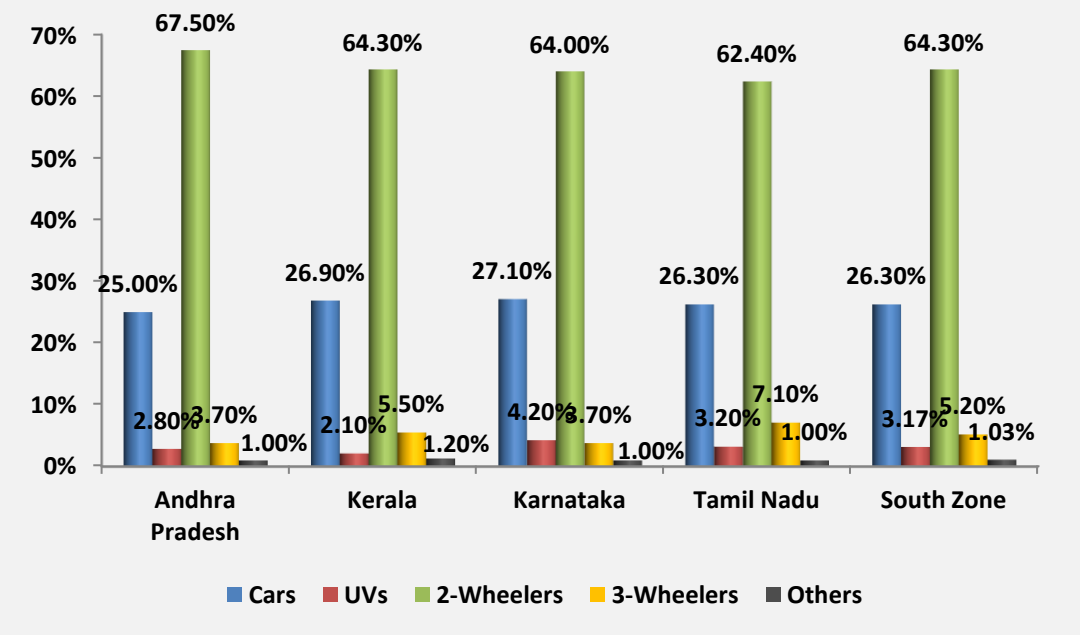
[19] Central Electricity Authority (CEA), http://articles.timesofindia.indiatimes.com/2013-09-05/india/41799899_1_eastern-and-western-grids-southern-grid-power-demand

Table 35: Diesel Consumption Break up Amongst Non-Transport Sector Categories

April – June of 2013	Diesel Non-Transport						
	Tractors	Agri Implements	Agri Pumpset	Industry - Genset	Industry - Other Purpose	Mobile Tower	Others (Genset-non-industry purposes) & Others
Andhra Pradesh	8.11%	1.19%	0.20%	7.20%	2.80%	1.19%	6.71%
Kerala	4.57%	2.22%	1.41%	6.80%	2.50%	1.77%	4.63%
Karnataka	5.36%	4.21%	0.63%	6.20%	2.70%	2.28%	5.52%
Tamil Nadu	4.44%	3.48%	0.38%	9.30%	3.20%	2.34%	5.16%
South Zone	5.50%	2.98%	0.49%	7.91%	2.93%	2.00%	5.55%

For the period April-June 2013, the state of Andhra Pradesh leads in South zone in consumption of petrol by 2-wheelers at 67.50%, whereas both Kerala and Karnataka lead in consumption of petrol in cars at around 27%.

Figure 62: Petrol Consumption Break up Amongst the Sector Categories



9.0 All India Composite Results for Diesel – Retail and Direct Sales

a. Survey Findings under different time periods – Retail and Direct Sales

July - September of 2012

For the period July-September 2012, diesel consumption in transport sector is 69.80% and in non-transport sector it is 30.20%. For this period, diesel consumption is maximum in HCV/LCV at 28.78%, followed by private Cars and UVs at 12.49%.

Table 36: All India End-use Share (%) of Diesel in Retail and Direct – July - September of 2012

End Use Segment	Overall % (Only Retail)	Retail Sales Volume (TMT)	Direct Sales Volume (TMT)	Overall Volume (Retail and Direct) (TMT)	Overall % (Retail and Direct)
CARS/UVs					
Cars & UVs - Private	**14.73**	2315.26	-	2315.26	**12.49**
Cars & UVs - Commercial	**10.11**	1589.09	-	1589.09	**8.57**
3 Wheelers-Passenger/Goods	**7.49**	1177.28	-	1177.28	**6.35**
COMMERCIAL VEHICLES					
HCV/LCV	**33.94**	5334.69	-	5334.69	**28.78**
Buses	**7.23**	1136.41	649	1785.41	**9.63**
OTHER TRANSPORT					
Aviation/Shipping	**-**	-	96	96.00	**0.52**
Railways	**-**	-	642	642.00	**3.46**
AGRICULTURE					
Tractors	**6.09**	957.76	133	2125.36	**11.46**
Agri Implements	**3.39**	532.93			
Agri Pumpset	**4.04**	634.67			
OTHERS					
Industry - Genset	**4.46**	700.83	54	754.83	**4.07**
Industry - Other Purpose	**2.18**	342.49	687	1029.49	**5.55**
Mobile Tower	**2.05**	321.56	-	321.56	**1.73**
Others (Genset for non-industry purposes) & Others	**4.30**	675.26	692	1367.26	**7.38**
TOTAL	**100.00**	**15718.23**	**2953.00**	**18538.23**	**100.00**

For June-September 2012, nearly 36% of the total diesel consumed by Buses is directly supplied by Oil Marketing Companies (OMCs) to State Transport Corporations (STC).

October - December of 2012

For the period July-September 2012, diesel consumption in transport sector is about 70% and in non-transport sector it is about 30%. For this time period, diesel consumption is maximum in HCV/LCV at 27.06%, followed by private Cars and UVs at 13.42%.

Table 37: All India End-use Share (%) of Diesel in Retail and Direct: October - December of 2012

End Use Segment	Overall % (Only Retail)	Retail Sales Volume (TMT)	Direct Sales Volume (TMT)	Overall Volume (Retail and Direct) (TMT)	Overall % (Retail and Direct)
CARS/UVs					
Cars & UVs - Private	**15.74**	2769.76	-	2769.76	**13.42**
Cars & UVs - Commercial	**10.50**	1848.99	-	1848.99	**8.96**
3 Wheelers-Passenger/Goods	**7.35**	1294.16	-	1294.16	**6.27**
COMMERCIAL VEHICLES					
HCV/LCV	**31.74**	5586.92	-	5586.92	**27.06**
Buses	**8.84**	1555.86	660	2215.86	**10.73**
OTHER TRANSPORT					
Aviation/Shipping	-	-	99	99.00	**0.48**
Railways	-	-	634	634.00	**3.07**
AGRICULTURE					
Tractors	**8.05**	1417.17	221	2744.58	**13.29**
Agri Implements	**2.69**	473.02			
Agri Pumpset	**3.60**	633.40			
OTHERS					
Industry - Genset	**3.84**	676.17	54	730.17	**3.54**
Industry - Other Purpose	**2.08**	366.39	734	1100.39	**5.33**
Mobile Tower	**1.57**	275.86	-	275.86	**1.34**
Others (Genset for non-industry purposes) & Others	**4.00**	704.31	640	1344.31	**6.51**
TOTAL	**100.00**	**17602.01**	**3042.00**	**20644.01**	**100.00**

For October-December 2012, nearly 30% of the total diesel consumed by Buses is directly supplied by Oil Marketing Companies (OMCs) to State Transport Corporations (STC).

April – June of 2013

For the period April-June 2013, diesel consumption in transport sector is 70.63% and in non-transport sector it is 29.37%. For this time period, diesel consumption is maximum in HCV/LCV at 29.16%, followed by private Cars and UVs at 13.56%.

Table 38: All India End-use Share (%) of Diesel in Retail and Direct: April – June of 2013

End Use Segment	Overall % (Only Retail)	Retail Sales Volume (TMT)	Direct Sales Volume (TMT)	Overall Volume (Retail and Direct) (TMT)	Overall % (Retail and Direct)
CARS/UVs					
Cars & UVs - Private	**14.90**	2751.15	-	2751.15	**13.56**
Cars & UVs - Commercial	**10.23**	1889.57	-	1889.57	**9.31**
3 Wheelers-Passenger/Goods	**7.24**	1336.18	-	1336.18	**6.58**
COMMERCIAL VEHICLES					
HCV/LCV	**32.05**	5918.44	-	5918.44	**29.16**
Buses	**8.63**	1593.49	98	1691.49	**8.33**
OTHER TRANSPORT					
Aviation/Shipping	-	-	93	93.00	**0.46**
Railways	-	-	655	655.00	**3.23**
AGRICULTURE					
Tractors	**8.71**	1608.46	78	2744.37	**13.52**
Agri Implements	**3.34**	616.61			
Agri Pumpset	**2.39**	441.30			
OTHERS					
Industry - Genset	**4.74**	875.87	59	934.87	**4.61**
Industry - Other Purpose	**2.08**	383.34	445	828.34	**4.08**
Mobile Tower	**1.72**	318.38	-	318.38	**1.57**
Others (Genset for non-industry purposes) & Others	**3.97**	732.20	403	1135.20	**5.59**
TOTAL	**100.00**	**18465.00**	**1831.00**	**20296.00**	**100.00**

For April-June 2013, only 6 % of the total diesel consumed by Buses is directly supplied by Oil Marketing Companies (OMCs) to State Transport Corporations (STC). This drop is presumably because STCs are bulk consumers of diesel and after partial deregulation in diesel prices (mid-January 2013 onwards), OMCs have started charging the market price from STCs. Now most of the STC buses are purchasing diesel from city ROs late at night.

b. All India Diesel Aggregated & Consolidated Findings – Retail + Direct Sales

At an aggregate all India level, diesel consumption in transport sector is 70% and in non-transport sector it is 30%. At an all India level, diesel consumption is maximum in HCV/LCV at 28.25%, followed by private cars and UVs at 13.15%. Buses consume about 9.55% and railways about 3.24% of total diesel consumption.

The agriculture sector is a major consumer of diesel with 13% of the total consumption accounted for by it.

Diesel consumption by other segments is 17 per cent. This comprises of industry 9.02% (of which gensets 4.06 % and others for industrial purposes 4.96%), mobile towers (1.54%) and others 6.45% comprising of gensets for non-industrial purposes, civil construction, etc.

Table 39: All India End-use Share (%) of Diesel in Retail and Direct – All India Aggregate

End Use Segment	Retail Sales Volume (TMT)	Direct Sales Volume (TMT)	Overall Volume (Retail and Direct) (TMT)	Overall % (Retail and Direct)
CARS/UVs				
Cars & UVs - Private	2612.06	-	2612.06	**13.15**
Cars & UVs - Commercial	1775.88	-	1775.88	**8.94**
3 Wheelers-Passenger/Goods	1269.21	-	1269.21	**6.39**
COMMERCIAL VEHICLES				
HCV/LCV	5613.35	-	5613.35	**28.25**
Buses	1428.59	469	1897.59	**9.55**
OTHER TRANSPORT				
Aviation/Shipping	-	96	96.00	**0.48**
Railways	-	644	643.67	**3.24**
AGRICULTURE				
Tractors	1327.80	144	2582.44	**13.00**
Agri Implements	540.85			
Agri Pumpset	569.79			
OTHERS				
Industry - Genset	750.96	56	806.63	**4.06**
Industry - Other Purpose	364.07	622	986.07	**4.96**
Mobile Tower	305.27	-	305.27	**1.54**
Others (Genset for non-industry purposes) & Others	703.92	578	1282.26	**6.45**
TOTAL	**17261.75**	**2608.67**	**19870.41**	**100.00**

10.0 Findings of the household / customer survey

During the study in all the rounds, in-depth survey had been carried out of those who are buying loose diesel i.e. in cans/ barrels, instead of taking fuel in the tanks of their vehicle. The survey had been carried out both in urban and rural outlet with a limited sample size. The total number of observations was 4000 i.e. 1000 in each round. The consumption in pump sets has seen a decline in certain pockets. Secondly the ROs surveyed in the outskirts have seen a great off take in terms of other activities such as road construction, gensets, and bakery applications. The all India major findings are enumerated below:

- In majority of the cases, bearer of the can / barrels simply asks for certain quantity of diesel, with less knowledge about exact application of that diesel. The tracer survey reveals that majority is getting consumed to run generator sets under different application areas, e.g. running gen set at mobile tower, running gen set at the factory/ office, running gen set for hotels, hospitals as well as for commercial and housing complex. This kind of activity is very much rampant in case of urban outlet. Whereas in case of highway or rural outlets, it is mainly consumed for running pump set & other agri equipment as an alternative to electricity. Even in case of rural areas, they carry diesel to nearby villages for storage and consumption whenever needed.
- In urban areas, one of the interesting applications is to use diesel as fuel especially for bakery and sweetmeat industry.
- The average purchase per transaction varies widely in the range of 25 to 200 litters. There is no consistency in terms of frequency of purchase.

11.0 Conclusion

Following conclusions can be made from the data collected during the field work:

Diesel

- At an aggregate all India level, under the transport sector, diesel consumption is maximum in HCV/LCV and Buses followed by private Cars and UVs. The large number of additions of the modern and improved technology diesel vehicles on the roads during the past couple of years may have contributed to the higher trend in consumption of diesel in private cars and UVs. Whereas in non-transport sector, diesel consumption is maximum in tractors segment followed by industry generators. This is apparently because tractors are not necessarily used only for agricultural purpose, but they are also used for commercial purposes and as a means for transporting people.
- In North Zone, under transport sector, diesel consumption is maximum in HCV/LCV and Buses at 35.72%, followed by Private Cars and UVs at 13.73%. Whereas under non-transport sector, diesel consumption in tractors, agri implements and agri pump sets congregated together is approximately 22% of the total diesel consumption in North zone. This is perhaps because agriculture is the main activity in North India.
- In East zone, under transport sector, diesel consumption is maximum in HCV/LCV and Buses at 37.5%, followed by Private Cars and UVs at 17.79%. Whereas under non-transport sector, diesel consumption for running of mobile towers is very significant at 2.6%. This is probably due to the lack of power source at high altitudes because of hilly terrain and low density rural areas. In such a case, generators remain to be the only option for mobile service providers to keep the BTS operational.
- In West zone, under transport sector, diesel consumption is maximum in HCV/LCV and Buses at 47.35%, followed by Private Cars and UVs at 14.4%. Whereas, diesel consumption is only 12.3% in non-transport sector, excluding diesel consumption in tractor. For North, East and South zones, the diesel consumption in non-transport sector (excluding diesel consumption in tractor) is 24.4%, 19.9% and 18.7% respectively.

- In South zone, under transport sector, diesel consumption is maximum in HCV/LCV and Buses at 41.6%, followed by Private Cars and UVs at 17.13%. Whereas, under non-transport sector, South zone is the only zone where diesel consumption in Industry genset (5.58%) is more than the diesel consumption in tractors (5.03%). This presumably may be because of huge power deficit in the Southern states.

Petrol:

- At an aggregate all India level, North zone has the lowest consumption of petrol in terms of volume for 2-wheelers, and highest consumption of petrol by 4 wheelers.
- In North zone, the state of Rajasthan leads in consumption of petrol by 2-wheelers, whereas Delhi leads in consumption of petrol in cars.
- In East zone, the state of Orissa leads in East zone in consumption of petrol by 2- wheelers, whereas West Bengal leads in consumption of petrol in cars. This is presumably because West Bengal is more urban than Orissa and has one of the metropolitan cities (Kolkata) of India as its capital.
- In West zone, the state of Madhya Pradesh leads in the consumption of petrol by 2- wheelers, whereas the state of Maharashtra leads in the consumption of petrol in cars.
- In South zone, the state of Andhra Pradesh leads in consumption of petrol by 2- wheelers, whereas Karnataka leads in consumption of petrol in cars.

12.0 Appendix

- **Details of Retail Sales of Diesel – Zone wise**

The following table shows the diesel consumption across categories for each zone:

Table 40: Zone-wise – Aggregate consumption of diesel - Retail Sales

End Use Segment	North	East	West	South	Overall
	(%)				
CARS/UVs					
Cars & UVs - Private	13.73	17.79	14.40	17.13	15.13
Cars & UVs - Commercial	10.02	9.37	11.17	9.96	10.29
3 Wheelers-Passenger/Goods	3.83	8.47	10.48	7.65	7.36
COMMERCIAL VEHICLES					
HCV/LCV and Buses	35.72	37.50	47.35	41.60	40.80
AGRICULTURE					
Tractors	12.32	7.04	4.27	5.03	7.65
Agri Implements	5.09	2.28	1.88	2.26	3.13
Agri Pumpset	4.55	4.33	2.26	1.98	3.33
OTHERS					
Industry - Genset	6.42	2.82	2.18	5.58	4.34
Industry - Other Purpose	3.17	1.72	0.98	2.44	2.11
Mobile Tower	1.82	2.57	1.45	1.60	1.77
Others (Genset for non-industry purposes) & Others	3.35	6.11	3.59	4.77	4.08

HIGHEST LOWEST

- In **North** zone, in the transport sector, diesel consumption is maximum in Heavy or Light Commercial Vehicles and Buses (35.72%) followed by Private Cars and UVs (13.73%), whereas in the non-transport sector, diesel consumption is the maximum in Tractors (12.32%). The diesel consumption in Tractors is the highest in North zone compared to all other zones.
- In **East** zone, in the transport sector, diesel consumption is maximum in Heavy or Light Commercial Vehicles and Buses (37.5%) followed by Private Cars and UVs (17.79%) whereas in the non-transport sector, diesel consumption is the maximum in Tractors (7%). %). The diesel consumption in Private Cars and UVs is the highest in East zone compared to all other zones.
- In **West** zone, in the transport sector, diesel consumption is maximum in Heavy or Light Commercial Vehicles and Buses (47.35%) followed by

Private Cars and UVs (14.4%) whereas in the non-transport sector, diesel consumption is the maximum in Tractors (4.3%). The diesel consumption in HCV/LCV and Buses is the highest in West zone compared to all other zones.

- In **South** zone, in the transport sector, diesel consumption is maximum in Heavy or Light Commercial Vehicles and Buses (41.6%) followed by Private Cars and UVs (17.13%) whereas, in the non-transport sector, diesel consumption is the maximum in Industry genset (5.6%).

- **Details of Retail Sales of Petrol – Zone wise**

The following table shows the petrol consumption across categories for each zone:

Table 41: Zone-wise – Aggregate consumption of Petrol - Retail Sales

	North Zone	East Zone	West Zone	South Zone	All India
Cars	40.17%	27.39%	34.72%	27.71%	34.33%
UVs	2.94%	2.79%	0.43%	3.77%	1.51%
2-Wheelers	54.72%	61.66%	63.70%	60.76%	61.42%
3-Wheelers	1.84%	6.48%	1.10%	6.53%	2.34%
Others	0.33%	1.69%	0.06%	1.22%	0.39%

HIGHEST LOWEST

- In **North** zone, petrol consumption is maximum in 2 wheelers (54.72%) followed by Cars (40.17%). The petrol consumption in Cars is the highest in North zone and in 2-wheelers it is the lowest compared to all other zones.
- In **East** zone, petrol consumption is maximum in 2 wheelers (61.66%) followed by Cars (27.39%). The petrol consumption in Cars is the lowest in East zone compared to all other zones.
- In **West** zone, petrol consumption is maximum in 2 wheelers (63.7%) followed by Cars (34.72%). The petrol consumption in 2-wheelers is the highest in West zone compared to all other zones.
- In **South** zone, petrol consumption is maximum in 2 wheelers (60.76%) followed by Cars (27.71%). The petrol consumption in 3-wheelers is the highest in South zone compared to all other zones.

- **Details of Retail Sales of Diesel – State wise**

The following table shows the diesel consumption across transport categories for all 16 states:

Table 42: State-wise – Consumption of Diesel in Transport Sector - Retail Sales

S. No.	States	Diesel Transport			
		Cars & UVs Private	Cars & UVs Commercial	HCV/LCV & Buses	3 Wheelers-Passenger/Goods
		(%)			
1	Andhra Pradesh	16.99	7.16	42.24	7.47
2	Assam	17.77	15.47	29.12	15.74
3	Bihar	16.18	3.67	27.14	8.05
4	Delhi	34.69	18.43	18.49	0.29
5	Gujarat	15.65	11.11	47.04	11.68
6	Haryana	7.56	4.46	50.54	1.99
7	Karnataka	18.62	9.87	42.02	5.92
8	Kerala	16.22	8.26	41.94	9.63
9	Madhya Pradesh	13.93	12.93	32.75	8.34
10	Maharashtra	13.10	10.53	53.64	9.94
11	Orissa	16.21	11.12	45.29	9.37
12	Punjab	14.15	9.75	26.49	2.48
13	Rajasthan	15.61	16.82	39.58	4.83
14	Tamil Nadu	16.71	11.81	41.00	8.12
15	Uttar Pradesh	14.67	9.33	25.72	5.88
16	West Bengal	20.06	10.47	45.80	5.00
All India		**15.13**	**10.29**	**40.80**	**7.36**

- Diesel consumption by private cars & UVs is maximum in Delhi (34.69%) followed by West Bengal (20.06%) and lowest in Haryana (7.56%)
- Diesel consumption by commercial cars & UVs is again maximum in Delhi (18.43%) and lowest in Bihar (3.67%)
- In the states like Maharashtra and Haryana the diesel consumption by Heavy or Light commercial vehicles and buses is more than 50%.
- Diesel consumption by 3 Wheelers-Passenger/Goods is maximum in Assam (15.74%).

The following table shows the diesel consumption across non-transport categories for all 16 states:

Table 43: State-wise – Consumption of Diesel in Non-Transport Sector - Retail Sales

S. No.	States	Diesel Non-Transport						
		Tractors	Agri Implements	Agri Pumpset	Industry - Genset	Industry - Other Purpose	Mobile Tower	Others (Genset for non-industry purposes) & Others
		(%)						
1	Andhra Pradesh	6.70	1.96	2.56	5.59	3.09	1.09	5.17
2	Assam	3.75	2.57	3.89	4.87	1.36	3.32	2.14
3	Bihar	14.15	3.28	8.71	1.51	1.19	3.59	12.53
4	Delhi	0.65	0.00	0.21	9.84	7.53	0.02	9.85
5	Gujarat	2.96	2.40	1.22	1.61	0.92	0.97	4.44
6	Haryana	10.20	7.29	3.26	8.24	2.52	0.43	3.49
7	Karnataka	4.98	3.88	2.16	4.49	2.03	1.57	4.47
8	Kerala	3.76	2.15	1.43	5.57	2.14	1.24	7.65
9	Madhya Pradesh	11.85	2.72	6.23	3.63	0.81	1.63	5.17
10	Maharashtra	2.73	0.91	1.88	2.26	1.11	1.95	1.95
11	Orissa	4.84	0.69	0.61	1.68	0.61	1.13	8.45
12	Punjab	17.69	8.58	7.02	6.19	2.56	2.01	3.09
13	Rajasthan	12.42	2.50	1.87	3.20	1.25	0.87	1.05
14	Tamil Nadu	4.48	1.69	1.72	6.08	2.36	1.95	4.07
15	Uttar Pradesh	14.00	4.29	7.27	6.45	4.61	3.92	3.86
16	West Bengal	3.72	2.18	2.87	3.65	2.97	2.17	1.11
All India		**7.65**	**3.13**	**3.33**	**4.34**	**2.11**	**1.77**	**4.08**

- Diesel consumption by Tractors is maximum in Punjab (17.69%) followed by Bihar (14.15%) and lowest in Delhi (0.65%).
- Diesel consumption by Industry genset is maximum in Delhi (9.84%) followed by Haryana (8.24%).
- Diesel consumption by Mobile tower is maximum in Bihar (3.59%) followed by Assam (3.32%).

- **Details of Retail Sales of Petrol – State wise**

Table 44: State-wise – Consumption of Petrol - Retail Sales

S. No.	States	Petrol				
		Cars	UVs	2-Wheelers	3-Wheelers	Others
		(%)				
1	Andhra Pradesh	26.04	3.26	65.19	4.33	1.17
2	Assam	36.24	2.84	42.61	16.02	2.29
3	Bihar	18.24	0.85	75.18	5.41	0.32
4	Delhi	56.94	1.20	41.80	0.07	0.00
5	Gujarat	34.92	0.05	64.45	0.58	0.01
6	Haryana	54.83	0.59	44.44	0.14	0.00
7	Karnataka	29.24	4.73	59.81	5.15	1.07
8	Kerala	27.36	2.62	60.33	7.93	1.77
9	Madhya Pradesh	24.64	1.66	69.28	4.16	0.26
10	Maharashtra	38.33	2.30	55.94	3.10	0.32
11	Orissa	11.66	2.55	82.28	0.89	2.62
12	Punjab	56.63	0.91	40.81	1.65	0.00
13	Rajasthan	18.58	5.15	73.85	2.22	0.19
14	Tamil Nadu	27.90	4.01	58.77	8.25	1.07
15	Uttar Pradesh	31.74	4.14	60.19	3.20	0.73
16	West Bengal	44.42	4.48	45.40	4.67	1.03
All India		**34.33**	**1.51**	**61.42**	**2.34**	**0.39**

- Petrol consumption by cars is maximum in Delhi (56.94%) and closely followed by Punjab (56.63%), while it is minimum in Orissa (11.66%).
- In the states like Orissa and Bihar, the petrol consumption by 2-wheelers is more than 75%.
- Petrol consumption by 3-Wheelers is maximum in Assam (16.02%).
- Petrol consumption by UVs is maximum in Rajasthan (5.15%) and minimum in Gujarat (0.05%).

The questionnaires used for the study are as follows:

1. QUESTIONNAIRE FOR RETAIL OUTLET

Retail Outlet Number ☐☐☐☐ **No. of Hours of Operation _From_____To____**

Qtr. No. ☐ **State Code** ☐☐ **District** ☐☐ **Oil Co.: BPC/HPC/IOC**

Name of Retail Outlet				
Address				
Contact Details	*Proprietor Name*		FAX No.	
	Phone no.			

1. Type of retail outlet

Type	Code (1/2/3/4)	Class of Market : A/B/C/D/E (Pl Tick)	
COCO (1)/ 'A' Site RO(2)/Regular Outlet(3) / Rural Outlet (4)		No: of Dispensers –MS	
		No: of Dispensers -HSD	

2. Average monthly sales: (a)Petrol ☐☐☐ kL (b)Diesel ☐☐☐☐ kL
3. Is there any seasonality in sales of HSD (Diesel) at your RO? YES ☐ NO ☐
4. If yes, please specify the peak, lean and average months for sale of Diesel:

S No.	Months	Peak Months (Yes/No)	Lean Months (Yes/No)	Average Sales
1	April			
2	May			
3	June			

5. Is there any seasonality in sales of MS (Petrol) at your RO? YES ☐ NO ☐
6. If yes, please specify the peak, lean and average months for sale of MS (Petrol):

S No.	Months	Peak Months (Yes/No)	Lean Months (Yes/No)	Average Sales
1	April			
2	May			
3	June			

7. What are the Peak Hours and Lean Hours in a day for

S No.	FUEL	Peak Hrs	Lean Hours
1	MS		
2	HSD		

8. In HSD sales what is the ratio of Transport ☐ Non Transport ☐

9. In your opinion /perception what is the % share of fuel from your RO (who are the user of fuel)

DIESEL Bought For	Share (%)	PETROL Bought for	Share (%)
Tractors		Cars	
Agri-implements		SUVs	
Agriculture Pump sets		2 wheeler	
Cars – Private Vehicles		3 –wheeler	
Cars- Commercial Vehicles		Others (Pls. specify)	
SUVs – Private Vehicles			
SUVs – Commercial Vehicles			
Comm. Vehicles- LCVs/HCVs			
Industry – Gensets			
Industry – Other Purposes			
Gensets (for non-industry - commercial or household use)			
Buses			
3 wheelers – passenger/goods			
Mobile Towers			
Others (Please Specify)			
Total	**100%**		**100%**

10. Average Number of vehicles of each type coming to your RO in one day : HSD _____MS_____

Signature of Field Investigator: _____Signature of RO Dealer: _____

2. OBSERVATION STUDY

(RETAIL OUTLET)

Retail Outlet Number | | | | |

NAME & address of RO : _____ **OIL COM: BPC/HPC/IOC (PL TICK)**

State | | |

District | | | Date:_____

Qtr No. | | **DAY** | | **(1)/Tue(2)/Wed(3)/Thu(4)/Friday(5)/Sat(6)/Sun(7)**

	Fuel Petrol 1 Diesel 2	Excl. 2 whlr (Y/N)						Fuel Petrol 1 Diesel 2	Excl. 2 whlr (Y/N)				
TOT-1			OPEN		CLOSE		TOT-17			OPEN		CLOSE	
TOT-2			OPEN		CLOSE		TOT-18			OPEN		CLOSE	
TOT-3			OPEN		CLOSE		TOT-19			OPEN		CLOSE	
TOT-4			OPEN		CLOSE		TOT-20			OPEN		CLOSE	
TOT-5			OPEN		CLOSE		TOT-21			OPEN		CLOSE	
TOT-6			OPEN		CLOSE		TOT-22			OPEN		CLOSE	
TOT-7			OPEN		CLOSE		TOT-23			OPEN		CLOSE	
TOT-8			OPEN		CLOSE		TOT-24			OPEN		CLOSE	
TOT-9			OPEN		CLOSE		TOT-25			OPEN		CLOSE	
TOT-10			OPEN		CLOSE		TOT-26			OPEN		CLOSE	
TOT-11			OPEN		CLOSE		TOT-27			OPEN		CLOSE	
TOT-12			OPEN		CLOSE		TOT-28			OPEN		CLOSE	
TOT-13			OPEN		CLOSE		TOT-29			OPEN		CLOSE	
TOT-14			OPEN		CLOSE		TOT-30			OPEN		CLOSE	
TOT-15			OPEN		CLOSE		TOT-31			OPEN		CLOSE	
TOT-16			OPEN		CLOSE		TOT-32			OPEN		CLOSE	

Note : Totalizer Opening and Closing reading should be for the duration of the Survey done during that day and not for full working hours of the Retail Outlet

Survey Time From _____hrs to _____hrs

Veh_Model	Fuel Petrol 1 Diesel 2	Qty	Veh_Model	Fuel Petrol 1 Diesel 2	Qty	Veh_Model	Fuel Petrol 1 Diesel 2	Qty

Survey Time From _____hrs to _____hrs

Veh_Model	Fuel Petrol 1 Diesel 2	Qty	Veh_Model	Fuel Petrol 1 Diesel 2	Qty	Veh_Model	Fuel Petrol 1 Diesel 2	Qty

Survey Time From _____hrs to _____hrs

Veh_Model	Fuel Petrol 1 Diesel 2	Qty	Veh_Model	Fuel Petrol 1 Diesel 2	Qty	Veh_Model	Fuel Petrol 1 Diesel 2	Qty

Survey Time From _____hrs to _____hrs

Veh_Model	Fuel Petrol 1 Diesel 2	Qty	Veh_Model	Fuel Petrol 1 Diesel 2	Qty	Veh_Model	Fuel Petrol 1 Diesel 2	Qty

2. Containers Sales

Fuel Petrol 1 Diesel 2	Qty	Purpose * (refer code/ sub code below)	**Fuel** Petrol 1 Diesel 2	Qty	Purpose* (refer code/ sub code below)	**Fuel** Petrol 1 Diesel 2	Qty	Purpose* (refer code/ sub code below)

Purpose*	**Code**	**Sub code**	**Purpose***	**Code**
GENERATOR	**1**	0	HARVESTOR	3
AGRICULTURE/PUMP SET	**1**	**1**	FISHING	4
INDUSTRIAL	**1**	**2**	TRACTORS	5
MOBILE TOWER	**1**	**3**	RE SALES	6
UNREGISTERED VEHICLE (JUGGAD)	2		OTHERS	7

3. On an avg what has been the mileage for different category of vehicles:

Bikes_____ Scooters _____ Cars _____ JV _____ Trucks _____ Bus _ _____ 3 Wheeler

In case of Tractors

Make of Tractor	Average Hours of Operation	Make of Tractor	Average Hours of Operation

Name & Signature of Field Investigator_____**Name & Signature of Outlet Dealer**_____

3. CHECK LIST FOR HOUSEHOLD SURVEY

District: _____

City: _____

Name: _____

Add: _____

1. Do you purchase loose HSD in containers /barrels : Yes / No: _____
2. What is the average quantity of HSD purchased in last month: _____
3. For What purpose have you purchased:

Purpose*	**Code**	**Sub Code**	**Purpose***	**Code**
GENERATOR	**1**	0	HARVESTOR	3
AGRICULTURE/PUMP SET	**1**	**1**	FISHING	4
INDUSTRIAL	**1**	**2**	TRACTORS	5
MOBILE TOWER	**1**	**3**	RE SALES	6
UNREGISTERED VEHICLE (JUGGAD)	2		OTHERS	

4. Frequency of Purchase: _____

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- http://carimg.sulekha.com/automotive-albums/default/original/india_petrol_pump.jpg
- http://im.rediff.com/money/2010/oct/27diesel4.jpg
- http://media2.intoday.in/indiatoday/images/stories/petrol_350_102712035348.jpg
- http://newsimg.bbc.co.uk/media/images/44800000/jpg/_44800641_trucklineap466.jpg
- http://static.indianexpress.com/m-images/wed%20jul%2025%202012,%2017;25%20hrs/M_Id_303775_Petrol,_diesel,_LPG_prices.jpg
- http://india.air1.info/en/Images/get_quote_330_190.jpg
- http://www.theguardian.com/global-development/2012/mar/01/gaza-energy-crisis-risk-hardship
- http://static.panoramio.com/photos/large/37541231.jpg
- http://www.autojunction.in/wcsstore/AJeRetailstore/images/content/features/Photo-25.jpg
- http://surajyadavopinion.blogspot.in/2011/06/does-reliance-have-role-in-fluctuating.html
- http://uk.reuters.com/article/2009/01/09/uk-india-strike-sb-idUKTRE5084C220090109
- http://www.team-bhp.com/forum/route-travel-queries/53117-cng-filling-pumps-pune-2.html
- http://kanglaonline.com/2012/11/no-shortage-of-fuel-oken/
- http://www.bcmtouring.com/forum/itinerary-f10/mumbai-kolhapur-belgaum-bangalore-best-route-hotels-bangalore-t40394/

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