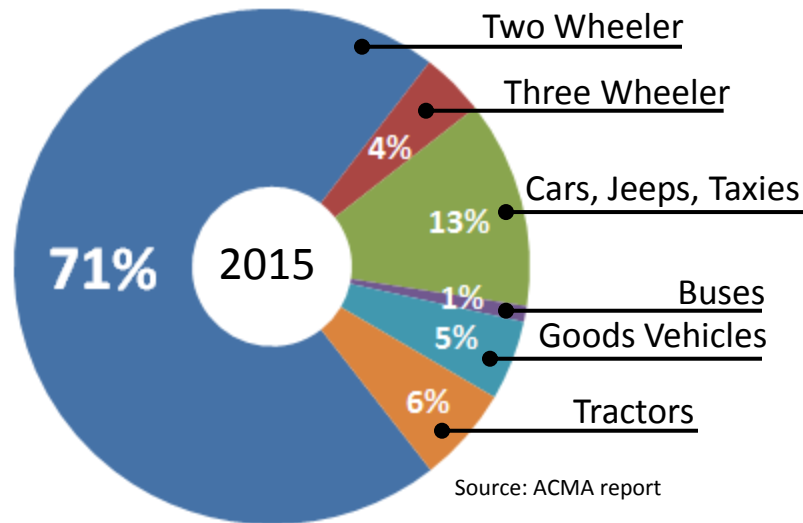


Automotive market India



Road transport categorised by vehicle segment

Two wheeler count in Road transport

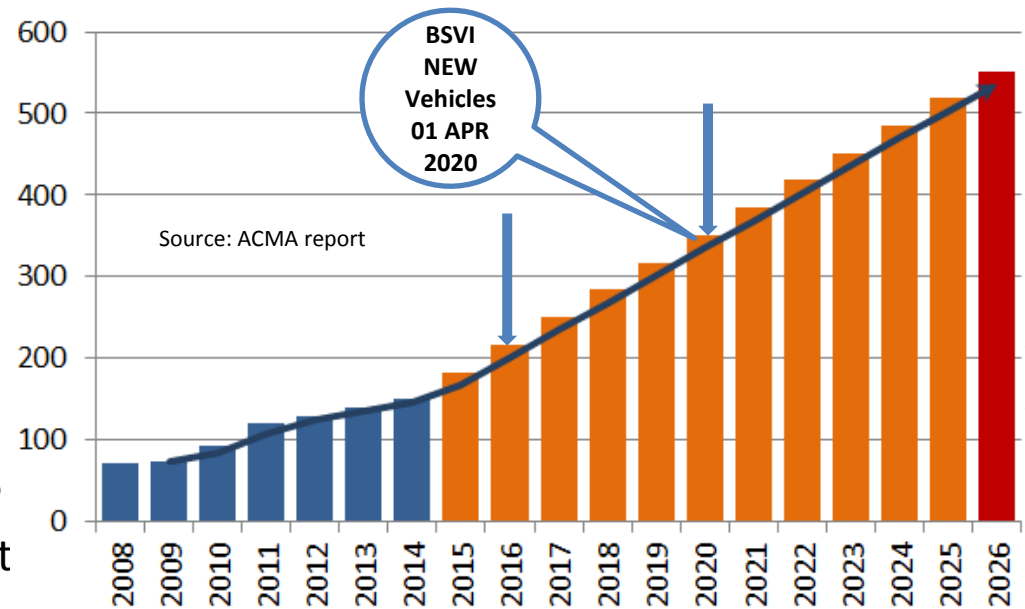


Why to focus on Two wheeler Segment ?

Sales Volume expected to grow significant being:

- Biggest road transport segment
- Affordable to majority of population
- Better fuel economy
- Quick means of transport for short distances
- less competition over other segments

Two Wheeler sales Actuals and Projection (Million vehicles)



Which technology to focus in Two wheeler segment?

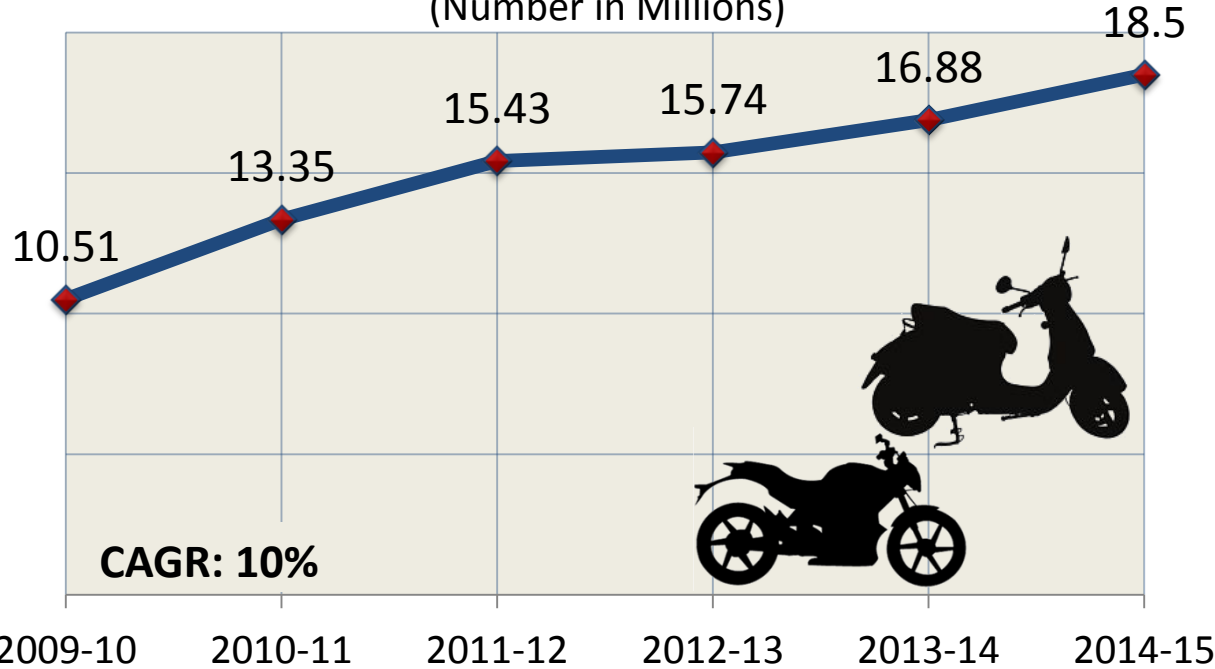
- Electronic Fuel Injection system --- E-FI
- Antilock braking system
- Anti-theft and immobiliser

Two wheeler Market in India – current scenario

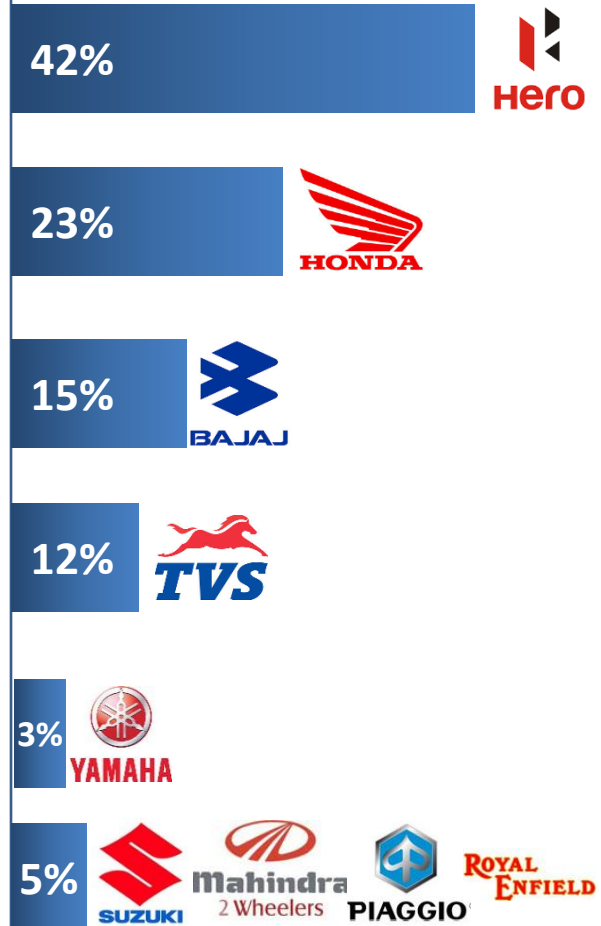


Two wheeler vehicle production in India

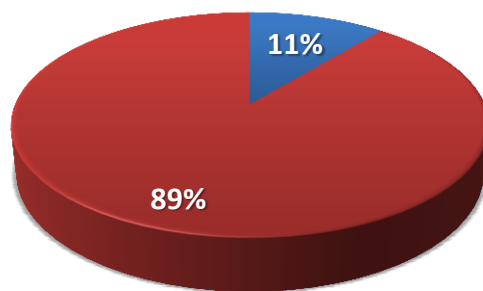
(Number in Millions)



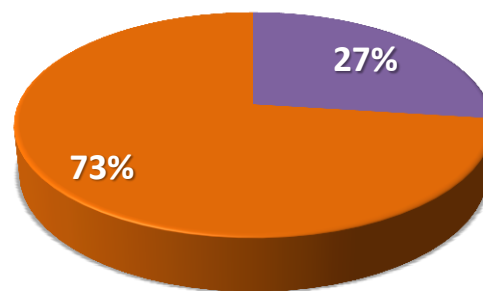
FY 2014-15 Market SOB



FY 2014-15 Volumes Breakup



Export Domestic

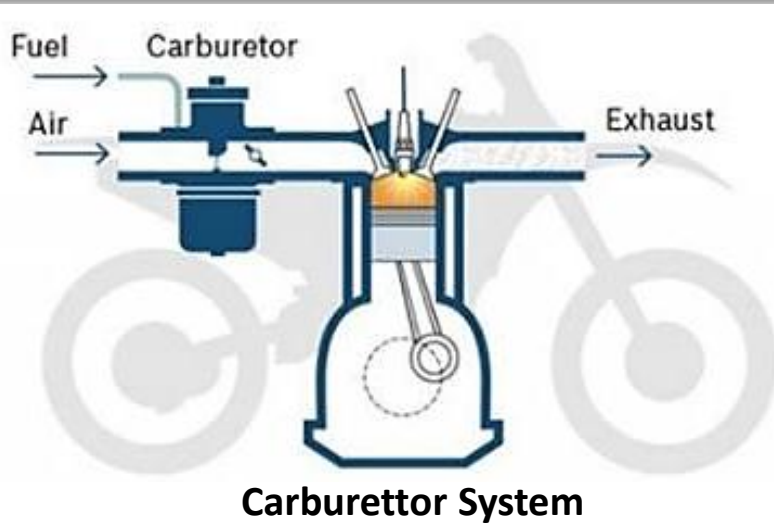


Scooter Motorcycles

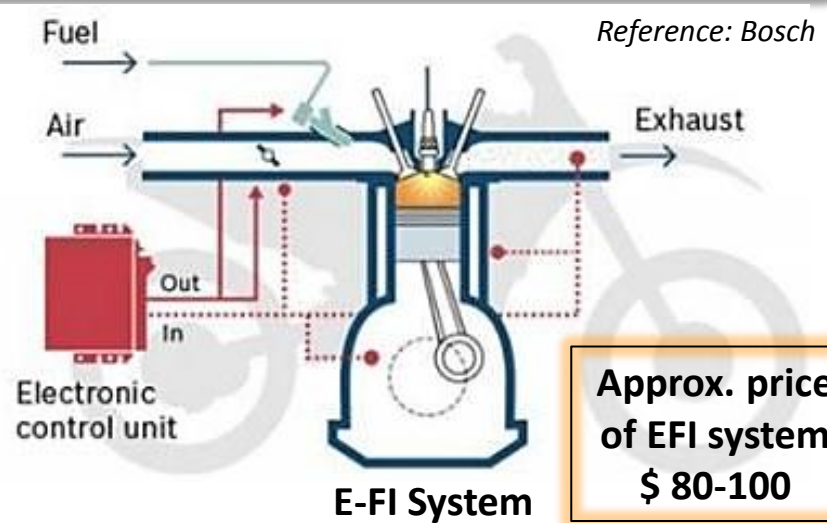
Source: <http://www.siamindia.com>

Electronic Fuel Injection (E-FI) Technology

- E-FI is very common in 4-wheelers. But, the 2-wheeler market in India is dominated by carburettor based system
- Electronic Fuel Injection System contains sensors, actuators and an Engine Control Unit.
- The sensors include Oxygen sensor, Throttle position sensor, Engine oil temperature sensor, crank shaft position sensor, etc...
- These sensors detect temperature, atmospheric pressure and engine parameters
- Based on this, ECU commands the optimal amount of fuel to the engine. The injector is placed in throttle body and it sprays the right amount of fuel at right time
- It contributes to increased mileage and cleaner emissions



VS.



Approx. price of EFI system \$ 80-100

Emission Norms for 2-wheelers in India

Emission Norms for 2-wheeler gasoline engine	Effective in India from year...
BS-I	2000
BS-II	2005
BS-III	2010
BS-IV	2016
Note: BS-IV norms to be applicable to all NEW vehicles manufactured from April 2016 & It will be compulsory to all vehicles from 2017 onwards.	
BS-V	2020
Skipped	
BS-VI	2020
Note: The Government has reviewed its vehicular emission norms road map and considered to skip BS-V and move to BS-VI standards, since the domestic oil companies can easily adopt the quality of fuel required in this time frame The petroleum sector wants straight way go to BS-6 to avoid investing twice on technology advancement	

Source: National Auto Fuel Policy document 2014, GOI

Adaptation of E-FI in Global 2-wheeler Market



- In 1993, the European Commission imposed a ban on carburetor and the market moved to EFI technology



- In Thailand, 100%



- Philippines, 100%



- 80% of 2 wheelers in Indonesia use EFI



- Recently, Carburettor is also banned in China
But China mostly use electric vehicles.



Adaptation of E-FI in Indian 2-wheeler Market



Launched Glamour vehicle with Honda Programmed Fuel Injection system



Glamour P-FI



Currently using **BOSCH** Fuel Injection system, 7.5% EFI



Pulsar RS200



KTM RC 200



Developed their own FI system



YZF R15



FZ S



Developed their own FI system



CBR 250 R



CBR 150 R



Currently using **Keihin** FI system



Thunderbird 500



Launched Apache RTR 160 with FI





Robert Bosch GmbH



Magneti Marelli S.p.A



Ucal Fuel systems Ltd.



Delphi Automotive PLC



Keihien Corporation



Mikuni Corporation



Synerject

Programmed Electronic Fuel Injection(PGM – FI) --- for the best drivability & lesser gear changes in traffic

Components:

- Electronic Fuel control unit – ECU
- Fuel Injectors
- Fuel pumps
- Sensors

Real time Mileage indicator (RTMI) --- for achieving optimum mileage

Bank Angle Sensor --- Cuts off fuel supplying case of a tip over - an industry first safety feature

Lowest Emissions --- Will meet even the most stringent emission norms of the future

No Carburetor --- less maintenance

Starts easily in all weather conditions --- Even in very low temperatures

Thank you

谢谢