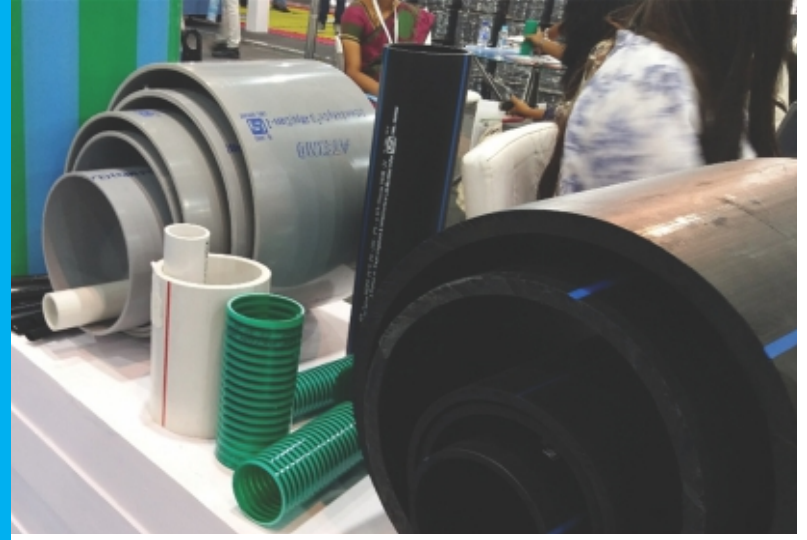
PROGRESS THROUGH PLASTICS

# PLASTINDIA FOUNDATION®

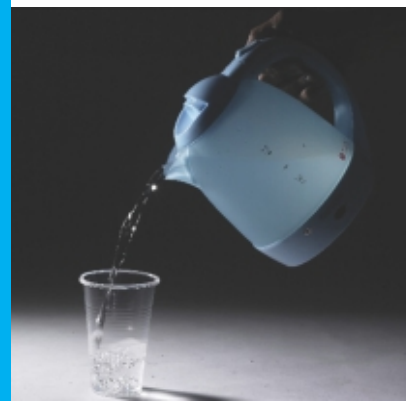
ISO 9001-2015 certified

*The apex body of major Associations, Organizations, and Institutions connected with Plastics in India to promote the growth of Indian Plastics Industry within India and across the world.*

# Indian Plastics Industry Report 2019







# PRESIDENT'S MESSAGE- PLASTINDIA FOUNDATION

I am happy to present the "**Indian Plastics Industry Report 2019**"

The is one significant contribution by **PLASTINDIA FOUNDATION**, to provide statistical data from across the board, encapsulating all aspects of Polymers, Machinery, Plastics Processing and Finished Good Segments for the Indian Plastic Industry, in the backdrop of the Global Plastics Scenario.

This report will be of great relevance with first-hand information on the Indian Plastic Industry.

It will catalyze the Growth of the Industry by empowering it with relevant facts and figures.

Best Wishes,

**Jigish Doshi**
**President**
**PLASTINDIA FOUNDATION**

# CHAIRMAN'S MESSAGE-NATIONAL EXECUTIVE COUNCIL

I am pleased to present herein the "**Indian Plastic Industry Report 2019**"

It would be the endeavor of **PLASTINDIA FOUNDATION** to continuously improve this report and also present it on an annual basis for the use and development of the plastics industry.

There has been tremendous amount of work together with inclusion of new applications and sectors in this edition of the report for which I would specially thank Mr. V. Kannan. He has been well guided by the team led by Mr. Francis Pinto.

This report would undoubtedly be guiding document to put the Indian Plastic Industry in perspective and for the future growth of this industry.

Best wishes,

**Ajay Shah**
**Chairman, N.E.C., PLASTINDIA 2021**
**PLASTINDIA FOUNDATION**

# PLASTINDIA MANAGING COMMITTEE 2018-21

| President | Vice President | Hon. Treasurer |
|---|---|---|
| Mr. Jigish Doshi | Mr. Ravish Kamath | Mr. Jayesh Rambhia |
| Imm. Past President | Member | Member |
| Mr. K. K. Seksaria | Mr. Mahavir Khatang | Mr. Pradip Thakkar |
| Member | Member | Member |
| Dr. Raju D. Desai | Mr. Ashok Jajodia | Mr. Alok Tibrewala |
| Member | Member | Member |
| Mr. V. K. Taparia | Mr. Gautam H. Gandhi | Mr. V. Sekar |
| Member | Member | Member |
| Mr. Mihir Banerji | Prof. (Dr.) S. K. Nayak | Dr. Lalit Guglani |
| Member | Member | |
| Mr. Kamal P. Nanavaty | Mr. Mahendra N. Patel | |

# PLASTICS INDUSTRY STATUS REPORT COMMITTEE

| Sr No | Name | Committee |
|---|---|---|
| 1 | Mr. Ajay Shah | Convenor |
| 2 | Mr . Francis Pinto | Chairman |
| 3 | Mr . Prem Manghani | Co Chairman |
| 4 | Mr . V Kannan | Member |
| 5 | Mr . Sachin Unde | Member |
| 6 | Mr . J. R Shah | Member |
| 7 | Mr. Vijay Merchant | Member |
| 8 | Mr . Dhananjay Sahoo | Member |
| 9 | Dr . E . Sundaresan | Member |
| 10 | Mr. Hemant Minocha | Member |
| 11 | Mr . Achal Thakkar | Member |
| 12 | Mr. N. K . Balgi | Member |
| 13 | Mr. Rajiv Trivedi | Member |
| 14 | Mr . Rajendra Sharma | Member |
| 15 | Mr . Chanchal Dasgupta | Member |
| 16 | Mr . Vinod Kumar R. | Member |
| 17 | Mr . T.K. Bandopadhyay | Member |

# INDEX

# INDIA OVERVIEW

# INDIA SNAPSHOT

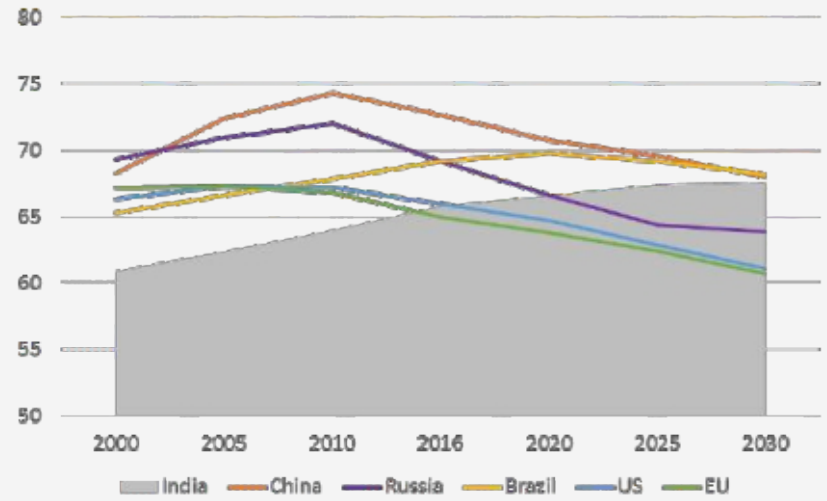
| | |
|---|---|
| Population | **1.353 Billion in 2018** |
| Democracy | **World's largest** |
| Annual GDP growth | **6% (2019)** |
| Economy on PPP basis | **Third largest (~USD 9.3 Trillion in 2018)** |
| Prospects | **To become a 5 Trillion Dollar Economy by 2024** |
| Official Languages | **23 (English predominantly the business language)** |
| Social infrastructure | **Excellent - Education, Healthcare, Travel & Recreation** |

**Land Of Unprecedented Opportunities....**

Source: https://www.worldbank.org/en/country/india/overview

# ADVANTAGE INDIA - DEMOGRAPHIC PROFILE

**Working Age Population as % of Total Population**
**(Age 15 – 64)**




- 66.42% in the working age group (2018)
- Median age – 28.7 years ( 2020 Est.)

**Large Potentially Productive Workforce**

Source: World Bank / CIA World Factbook

# INDIA AMONG BRICS

| Country | Area (Million Sq. KM) | Population (Million) 2018 | GDP Growth % 2018 | GDP (PPP current $ Billion USD) 2018 |
|---|---|---|---|---|
| Brazil | 8.52 | 209 | +1.1 | 1869 |
| Russia | 17.09 | 144 | +2.3 | 1658 |
| ndia | 3.29 | 1353 | + 6.8 | 2719 |
| China | 9.56 | 1393 | + 6.6 | 13608 |
| South Africa | 1.22 | 58 | +0.8 | 368 |

**India... Highest GDP Growth Rate among BRICS in 2018**

https://data.worldbank.org

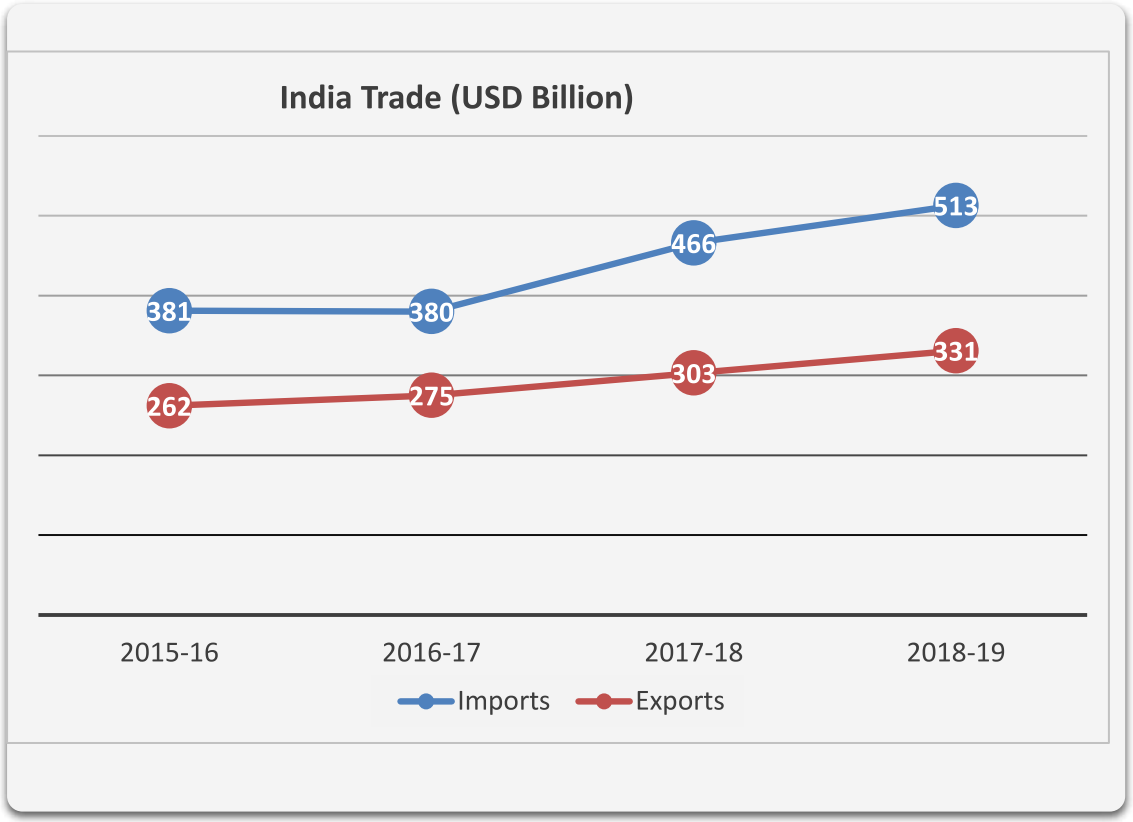
# INDIA - KEY ECONOMIC INDICATORS

| INDICATORS | PARAMETER | 2017-18 | 2018-19 |
|---|---|---|---|
| Growth Key sectors % (constant Price base 2011-12) | Agriculture | 5 | 2.9 |
| | Manufacturing | 5.9 | 6.9 |
| | All services | 8.1 | 7.5 |
| Inflation | WPI average (%) | 2.74 | 4.28 |
| Exchange rate | Rs/USD (average) | 64.4 | 70 |
| Fiscal deficit | as % of GDP | 3.5 | 3.4 |
| Monetary indicator % | Base rate | 9.6-9.45 | 9.45 |

**India – Growing Economy.....**

Source https://www.eaindustry.nic.in/download_data_1112.asp

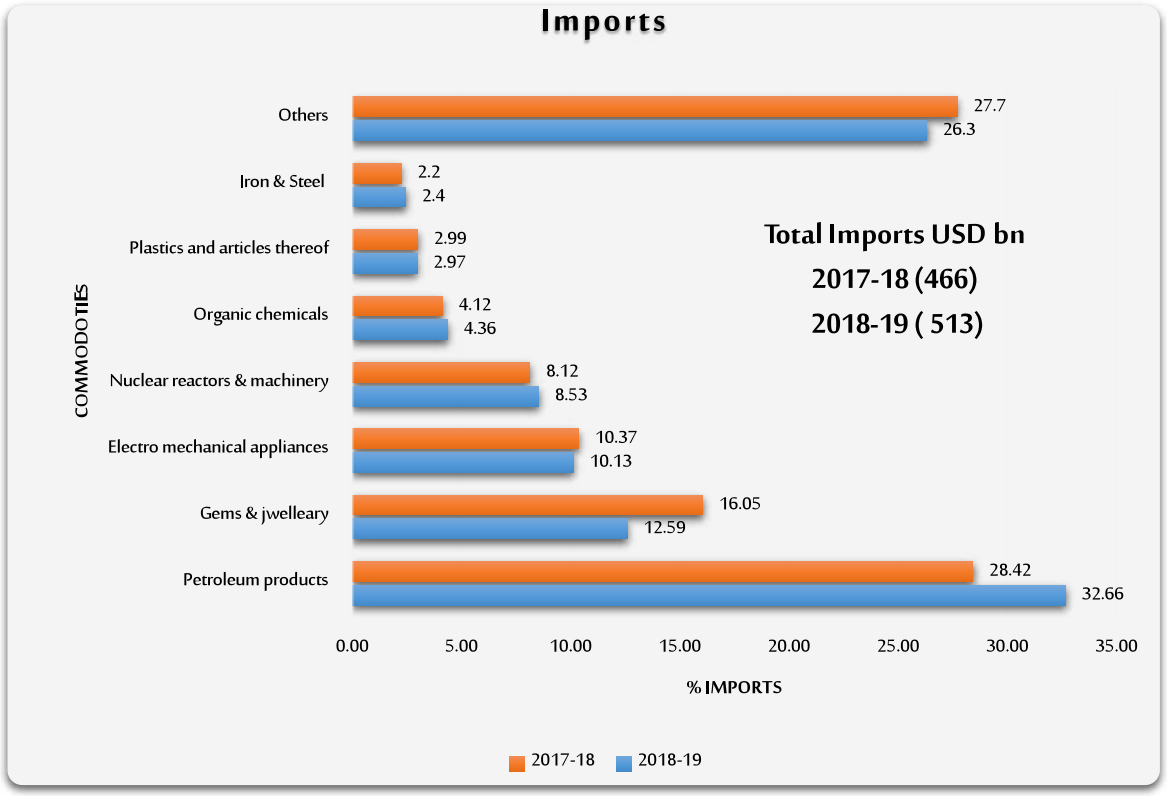
# INDIA'S INTERNATIONAL TRADE

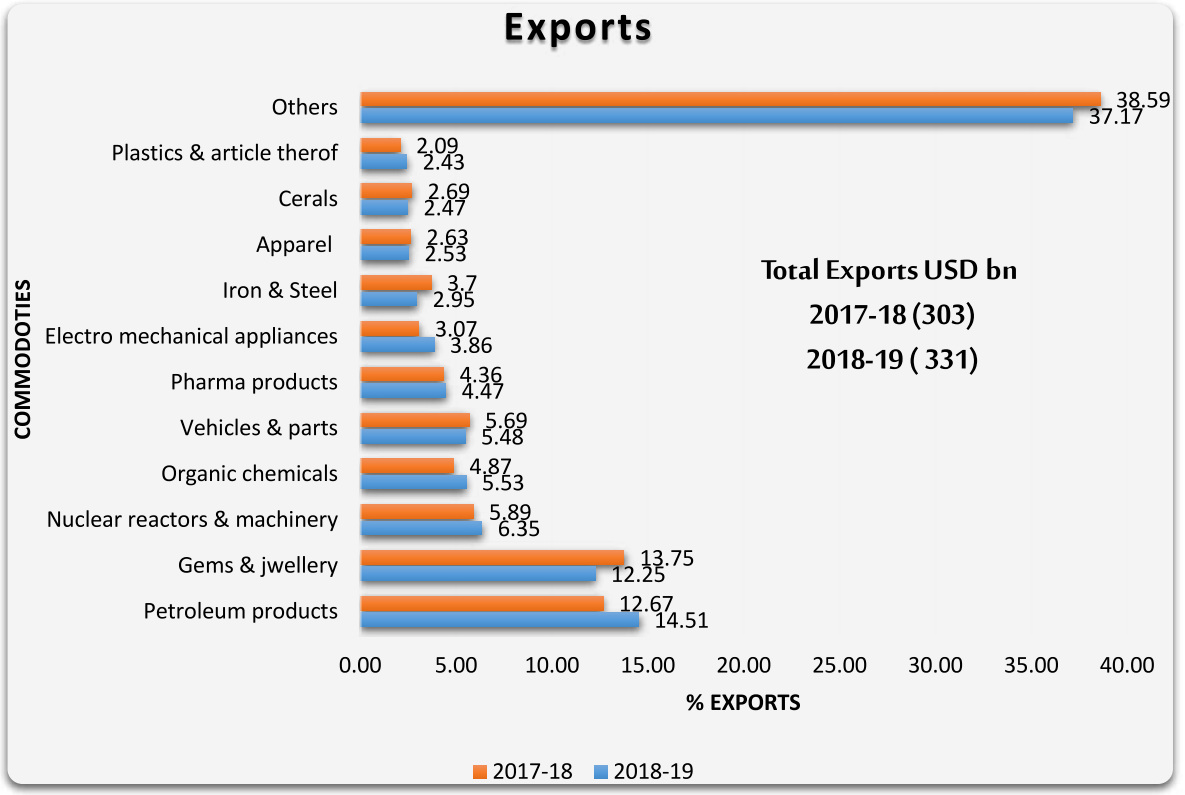



**India – The Vibrant Economy**

Source: https://dbie.rbi.org.in/DBIE/dbie.rbi?site=homeHome-> Statistics->External sector->International trade

# INDIA'S INTERNATIONAL TRADE




**Plastics – 6th Largest Imported Material**

**Plastics – Among Top 15 in Exports**

Source: Ministry of commerce and Industry. https://commerce-app.gov.in/eidb/ecomq.asp -

# ADVANTAGE INDIA

- **Economic Advantage**
  - 5th largest Economy Globally; 3rd Largest by PPP : Indian Equity Market is 7th Biggest in the World
- **Demographic Advantage**
  - Emergence of Middle Class : Rising Household Income
  - Growing Consumer Market : Booming Retail Sector
  - Large Workforce : Educated and Highly Skilled
  - Large English Speaking Population
- **Urbanization**
  - 34% -2017 to 45% - 2040 & Growth of Tier 1,2,3,4 Cities.

# INDIAN PLASTICS INDUSTRY SNAPSHOT

# INDIAN PLASTICS INDUSTRY SNAPSHOT

## HISTORY

1945 - Beginning of Plastics Industry – Phenolics

1957 – First thermoplastics – Polystyrene

## PRODUCTION 2018-19

~ 17 millions tons

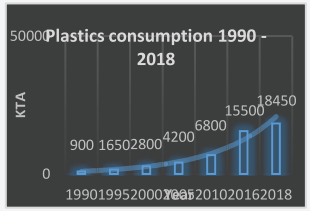
## CONSUMPTION 2018-19

18.45 MMT vis-a-vis 0.9 million ton in 1990.

20 times since then

## CONVERTING UNITS

~40000




## SIZE OF INDUSTRY

5.1 lakh crores

(73 Bn USD )

## % RECYCLED

70% on recycled Stream

## NO of RECYCLERS

Organised 100 +

Unorganised 10000 +

Source: PLASTINDIA FOUNDATION /Industry Estimate

# INDIAN PLASTICS INDUSTRY – FEW GLOBAL HIGHLIGHTS


| | |
|---|---|
| High lights 1 | Largest Manufacturers of Lami tubes |
| High lights 2 | Largest Manufacturers of BOPP film |
| High lights 3 | Largest Rotomolded Tank Market in the World |
| High lights 4 | 2nd Largest Exporter of FIBC Bags |
| High lights 5 | 5th Largest Producer of PP |

Polybenzemidazole (PBI) – Only Producer in the World

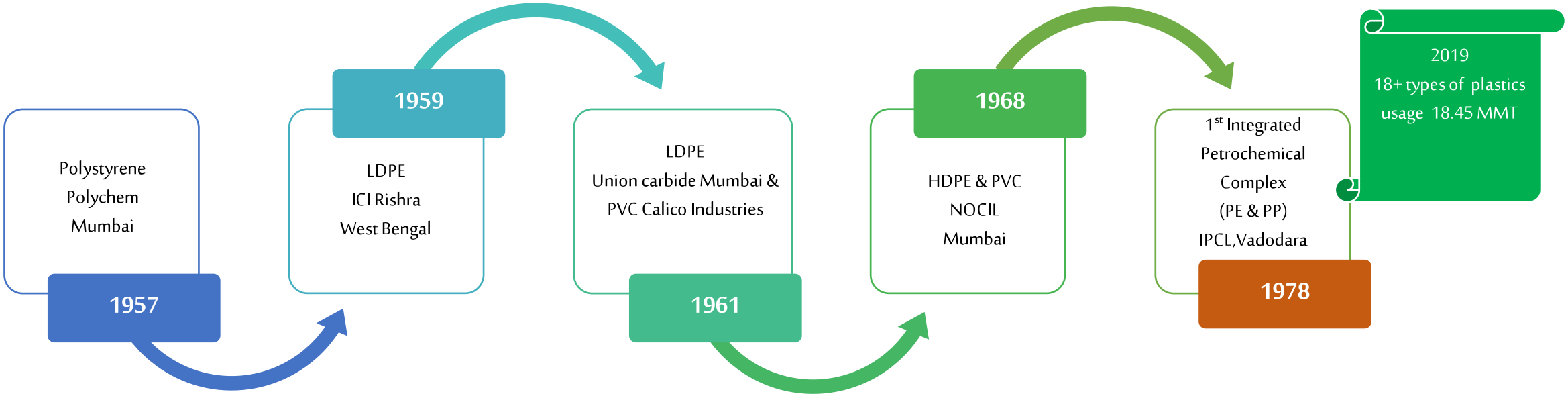
Source: PLASTINDIA FOUNDATION /Industry Estimate

# INDIA STEPS INTO PLASTIC AGE....


2020 Platinum Jubilee year for the Indian Plastics Industry

Humble Beginning In 1945 - Phenolics By Tipco At Mumbai

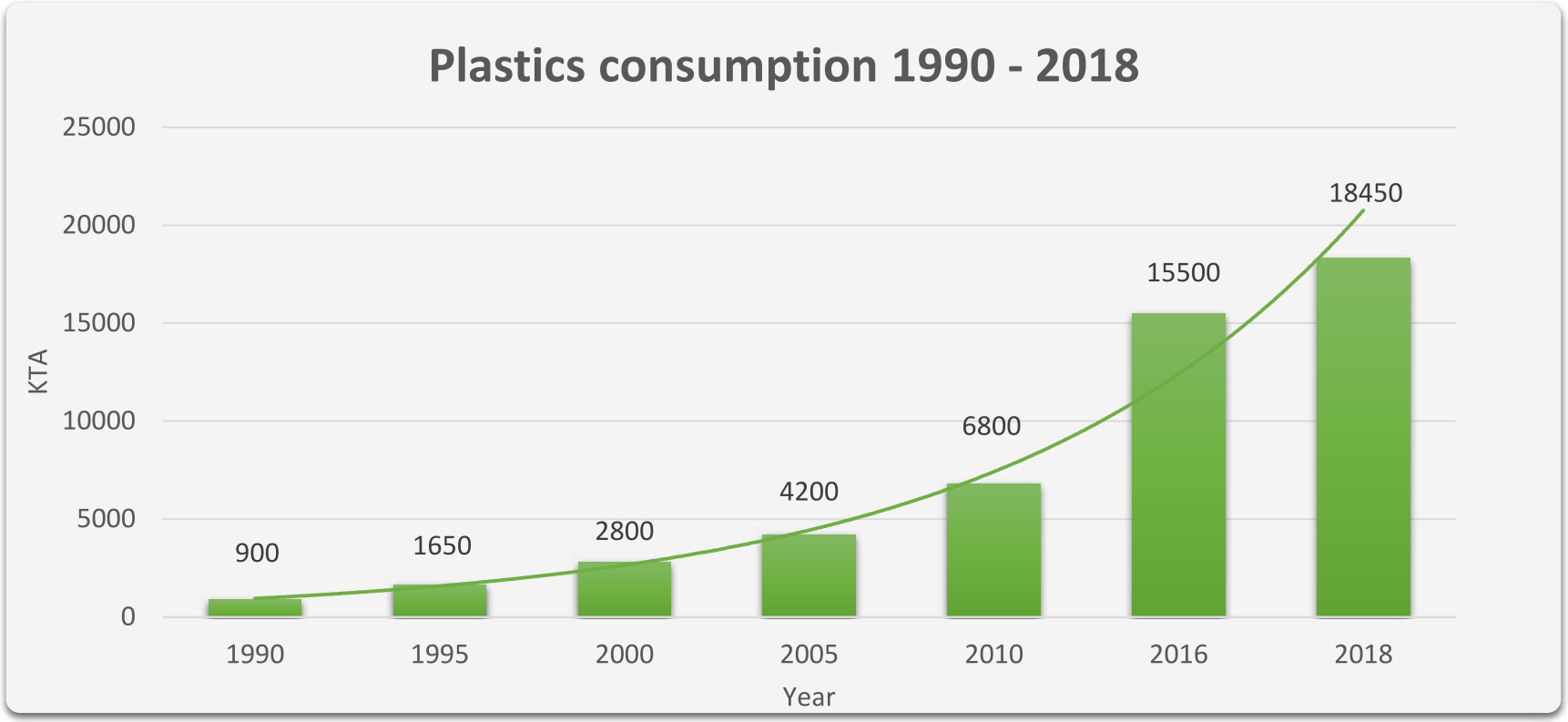
# INDIA STEPS INTO PLASTICS AGE...




**2018-19 Production ~ 17 MMT Consumption ~ 18.45 MMT**

Source: PLASTINDIA FOUNDATION /Industry Estimate

# GROWTH OF PLASTICS CONSUMPTION....

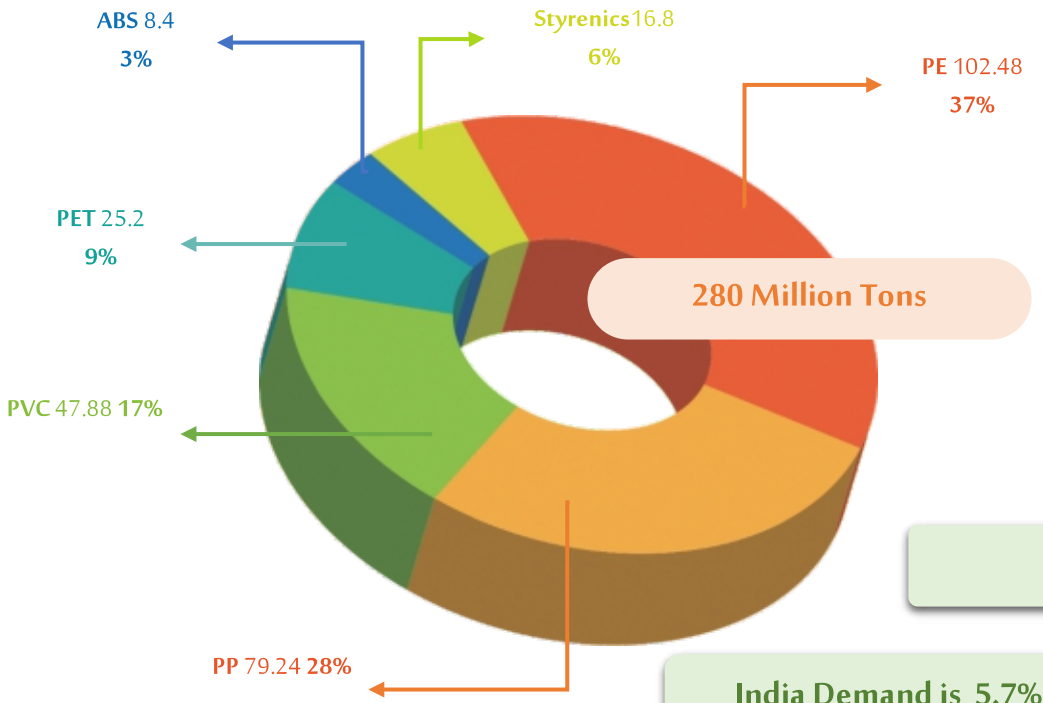



**Grown 20 times since 1990....**

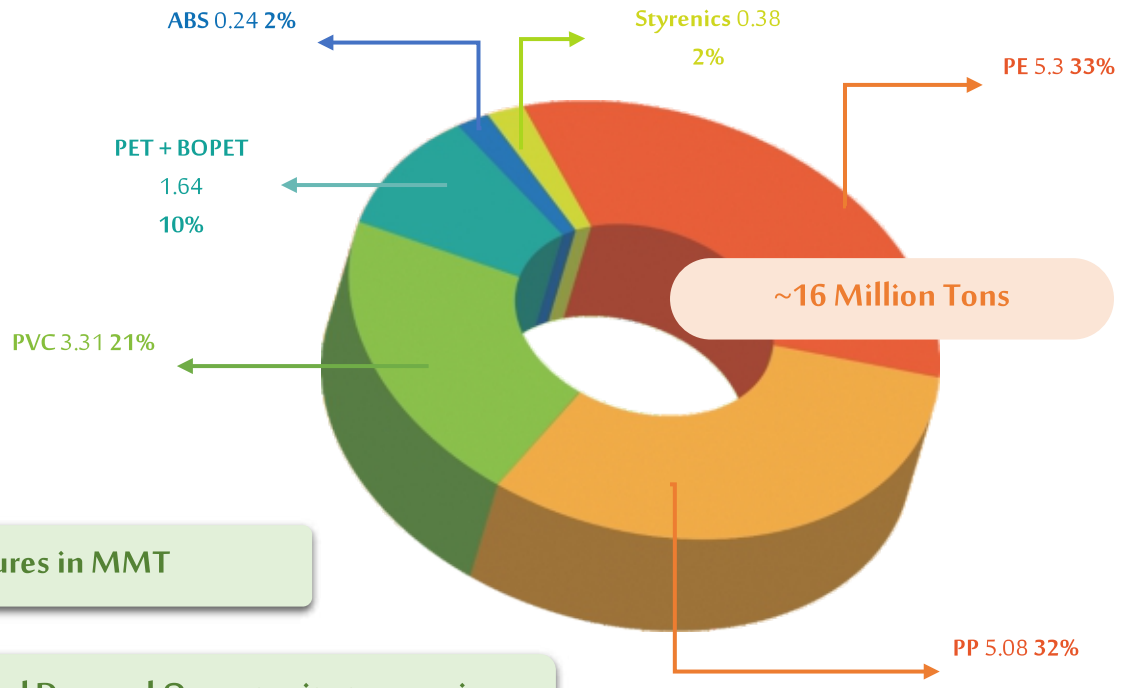
Source: PLASTINDIA FOUNDATION /Industry Estimate

# COMMODITY PLASTICS DEMAND

## Global Demand for Major Plastics 2018-19




## Indian Demand for Major Plastics 2018-19



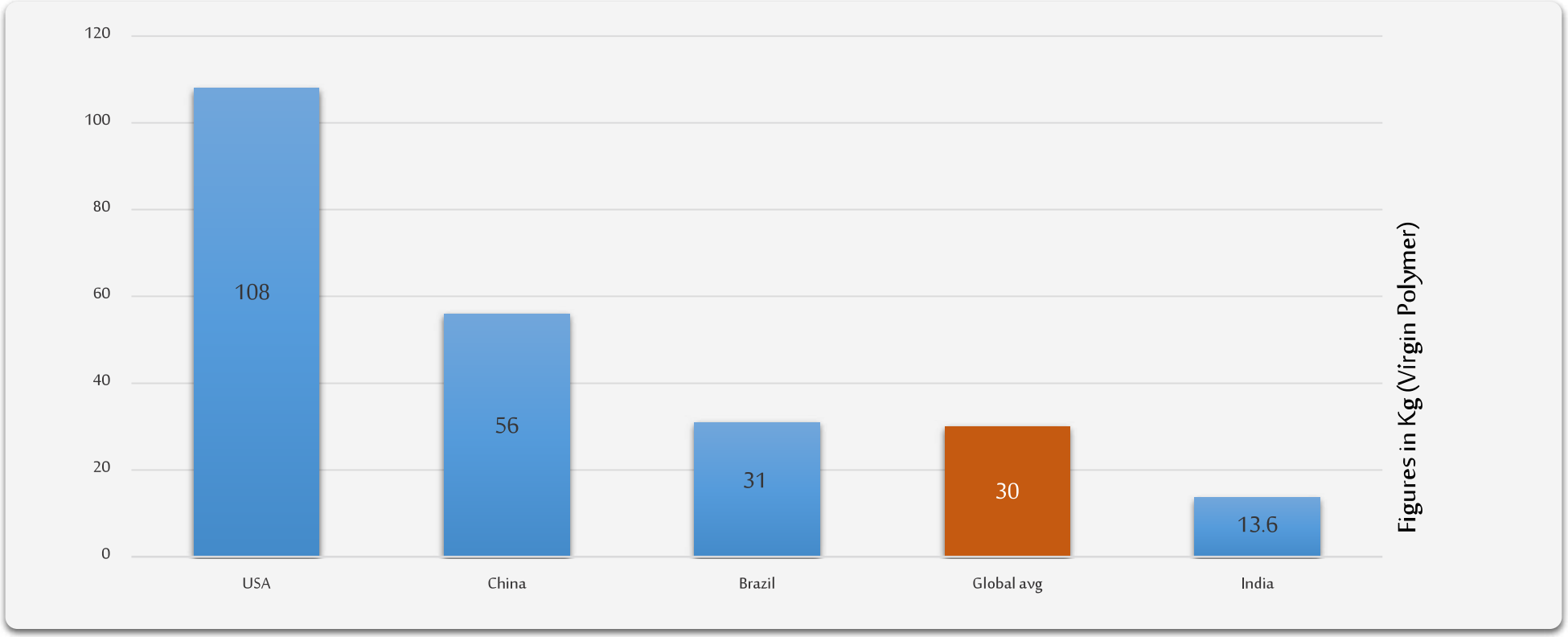

All Figures in MMT

India Demand is 5.7% of Global Demand Opportunity to grow in Styrenics

Source: PLASTINDIA FOUNDATION /Industry Estimate

Engineering plastics & Thermosets not included

# PER CAPITA CONSUMPTION




**Global Average is more than 2 times of India's per capita Consumption**

Source: PLASTINDIA FOUNDATION /Industry Estimate / CIPET

# INDIA - MANUFACTURING

# CAPACITY INDIA – POLYOLEFINS (2018-19)

| POLYOLEFIN | | | | | | |
|---|---|---|---|---|---|---|
| COMPANY | LDPE | LLDPE | HDPE | PP | TOTAL | % SHARE |
| Reliance Industries Ltd | 605 | 990 | 500 | 3165 | 5260 | 45 |
| Indian Oil Corp | | 350 | 300 | 1280 | 1930 | 16 |
| ONGC Petro Additions Ltd | | 360 | 700 | 340 | 1400 | 12 |
| Haldia Petrochemicals | | 210 | 500 | 390 | 1100 | 9 |
| GAIL (India) | | 350 | 570 | | 920 | 8 |
| Mangalore Refinery & Petrochemical | | | | 440 | 440 | 4 |
| HMEL | | | | 440 | 440 | 4 |
| Brahmaputra Cracker & Polymer | | 110 | 110 | 60 | 280 | 2 |
| **Total** | **605** | **2370** | **2680** | **6115** | **11770** | |

**All Fig in KT**

**All Major Thermoplastics Capacity 2018-19 ~ 17 MMT**

Source: PLASTINDIA FOUNDATION /Industry Estimate

# CAPACITY INDIA – PVC (2018-19)

| PVC | | |
|---|---|---|
| COMPANY | CAPACITY | % SHARE |
| Reliance Industries Ltd | 750 | 48.1 |
| Finolex Industries Ltd | 285 | 18.3 |
| Chemplast | 365 | 23.4 |
| DCW | 90 | 5.8 |
| DCM Shriram | 70 | 4.5 |
| **Total** | **1560** | |

**All Fig in KT**

**All Major Thermoplastics Capacity 2018-19 ~ 17 MMT**

Source: PLASTINDIA FOUNDATION /Industry Estimate

# CAPACITY INDIA – PET & STYRENICS (2018-19)

| PET | |
|---|---|
| COMPANY | PET |
| Reliance Industries Ltd | 1000 |
| IVL Dhunseri | 696 |
| JBF | 220 |
| Chirpal | 140 |
| Others for BOPET | 674 |
| Total | 2730 |

| STYRENICS | |
|---|---|
| COMPANY | PS/EPS |
| Supreme Petrochem Ltd | 272 |
| LG Polymers India Pvt Ltd | 110 |
| Ineos Styrolution | 75 |
| Total | 457 |

**All Fig in KT**

**All Major Thermoplastics Capacity 2018-19 ~ 17 MMT**

Source: PLASTINDIA FOUNDATION /Industry Estimate

# CAPACITY INDIA –MAJOR ENGINEERING PLASTICS (2018-19)

| MANUFACTURER | PLASTICS | CAPACITY |
|---|---|---|
| Inoes/Bhansali | ABS | 260 |
| Ineos Styrolution | ASA | 25 |
| GSFC | Polyamides | 31 |
| Ineos /Bhansali | SAN | 160 |
| GFLC/HFCL | Fluoro Ploymers | 16.5 |
| Covestro | TPU | 6 |
| Grand Total | KTA | 498.5 |

**All Fig in KT**

**All Major Thermoplastics Capacity 2018-19 ~ 17 MMT**

Source: PLASTINDIA FOUNDATION /Industry Estimate

# CAPACITY INDIA – PERFORMANCE PLASTICS (2018-19)

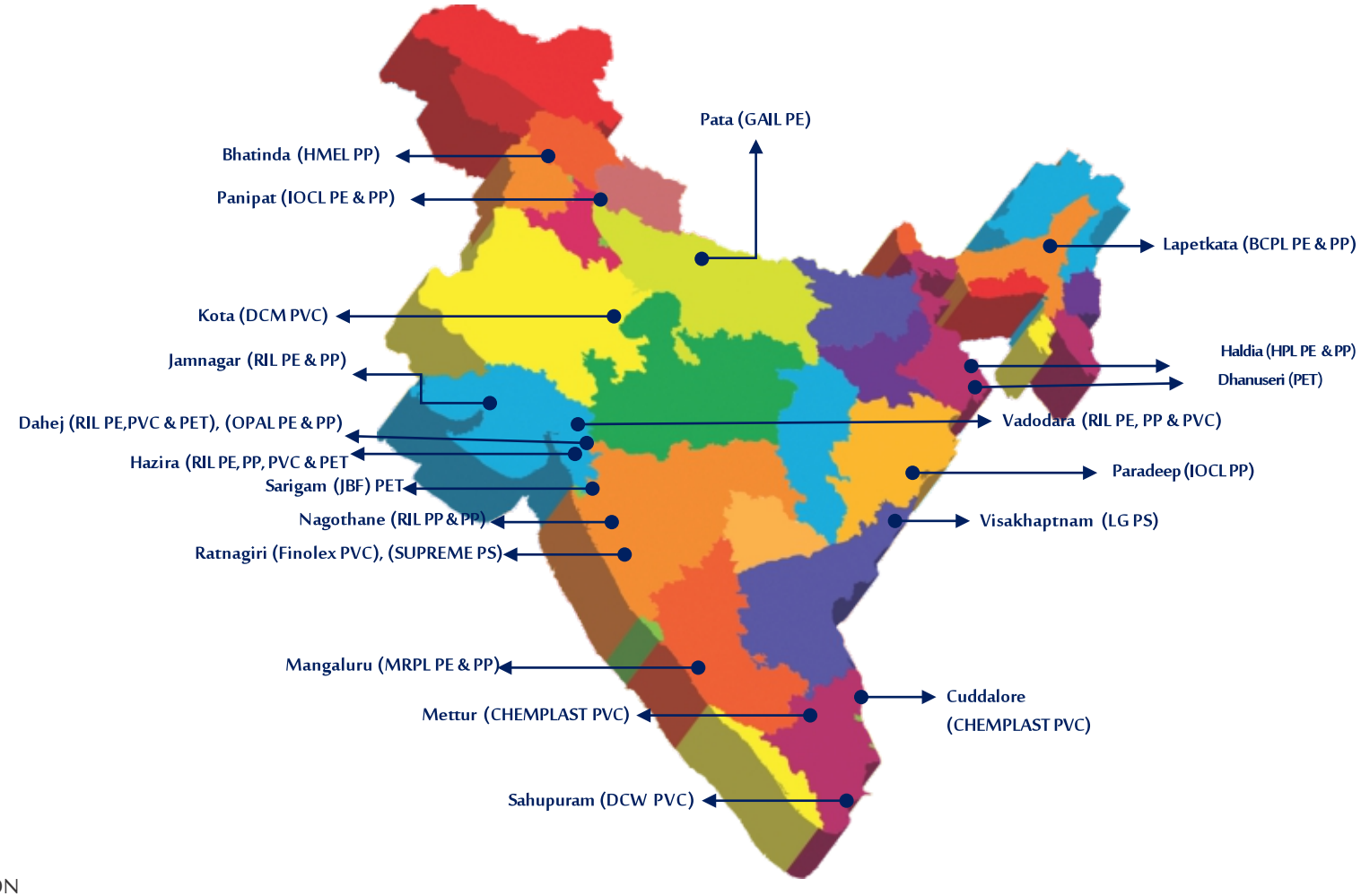
| MANUFACTURER | PLASTICS | CAPACITY (TPA) | MAJOR APPLICATIONS |
|---|---|---|---|
| Solvay Specialties (Panoli) | Polyether Sulfone (PES) | 2000 | Chip Trays, Electricals, Membranes |
| | Polyether Ether Ketone (PEEK) | 1000 | Stock Shapes, E&E, Cables, Gen. Engineering, Oil & Gas |
| Solvay/Rallis (Ankleshwar) | Polyether Ketone Ketone (PEKK) | 110 | CF Composites for Aerospace |
| Gharda Chemicals (Ankleshwar) | Polyether Ketone (PEK) | 100 | Stock shape, Cable, Gen. Engineering |
| | Polyether Ketone Ketone (PEKK) | 50 | Electronics, Oil Fields, Gen. Engineering, 3D Printing |
| | PolyBenzimidazole (ABPBI) | 25 | Blends with PEK, Fire Resistant Fiber, Membranes for High Temp Fuel Cells |
| | Total Capacity | 3285 TPA | |

*All Major Thermoplastics capacity 2018-19 ~ 17 MMT*

Source: PLASTINDIA FOUNDATION /Industry Estimate

Note: Mainly for export; Local Consumption only 10-15% of Capacity

# PLANT LOCATIONS OF MAJOR COMMODITY PLASTICS




Source: PLASTINDIA FOUNDATION

# PROJECTS BEYOND 2020-21 (MAJOR THERMOPLASTICS)

**Project planned / Proposed**

| COMPANIES | HMEL | HRRL-HPCL | GAIL | CPPL | IOCL | IOCL | RRPCL | HPCL/GAIL | HMEL | HMEL | RRPCL | HPCL/GAIL | CHEMPLAST | RRPCL | HPCL/GAIL | RIL | MRPL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Location | Bhatinda | Barmer | USAR | Nagapatinam | Barauni | Baroda | MAHARASHTRA | KAKINADA | Bhathinda | Bhathinda | MAHARASHTRA | KAKINADA | Tamil Nadu | MAHARASHTRA | KAKINADA | DAHEJ | MANGALORE |
| Plastics | PP | PP | PP | PP | PP | PP | PP | PP | HDPE | LLD/HD swing | PE | PE | CPVC | PVC | PVC | PVC | EVA |
| Capacity (KTA) | 500 | 980 | 500 | 475 | 220 | 440 | 4511 | 315 | 500 | 800 | 5813 | 450 | 22 | 1500 | 300 | 1200 | 30 |
| Year | 2021 | 2024 | 2024 | 2025 | 2022 | 2024 | 2025 | NA | 2021 | 2022 | 2025 | NA | 2021 | 2025 | NA | NA | NA |

Source: PLASTINDIA FOUNDATION /Industry Estimate

# INDIAN PLASTICS INDUSTRY GROWTH VS GDP GROWTH

| YEAR | GDP GROWTH | POLYMER CONSUMPTION GROWTH | IMPORT DUTY |
|---|---|---|---|
| 1990-1995 | 5.0% | 12.9% | 50%+ |
| 1995-2000 | 6.5% | 14.6% | 40% |
| 2000-2005 | 5.9% | 5.8% | 45%-15% |
| 2005-2012 | 8.7% | 10.9% | 12.5%-5% |
| 2012-2017 12th plan | 7.2% | 10.6% | 7.5%-5% |
| 2017-2022 | ~6% | ~10% | 7.5%-0% |

*GDP Growth Strong Relation to Petrochemical Growth*

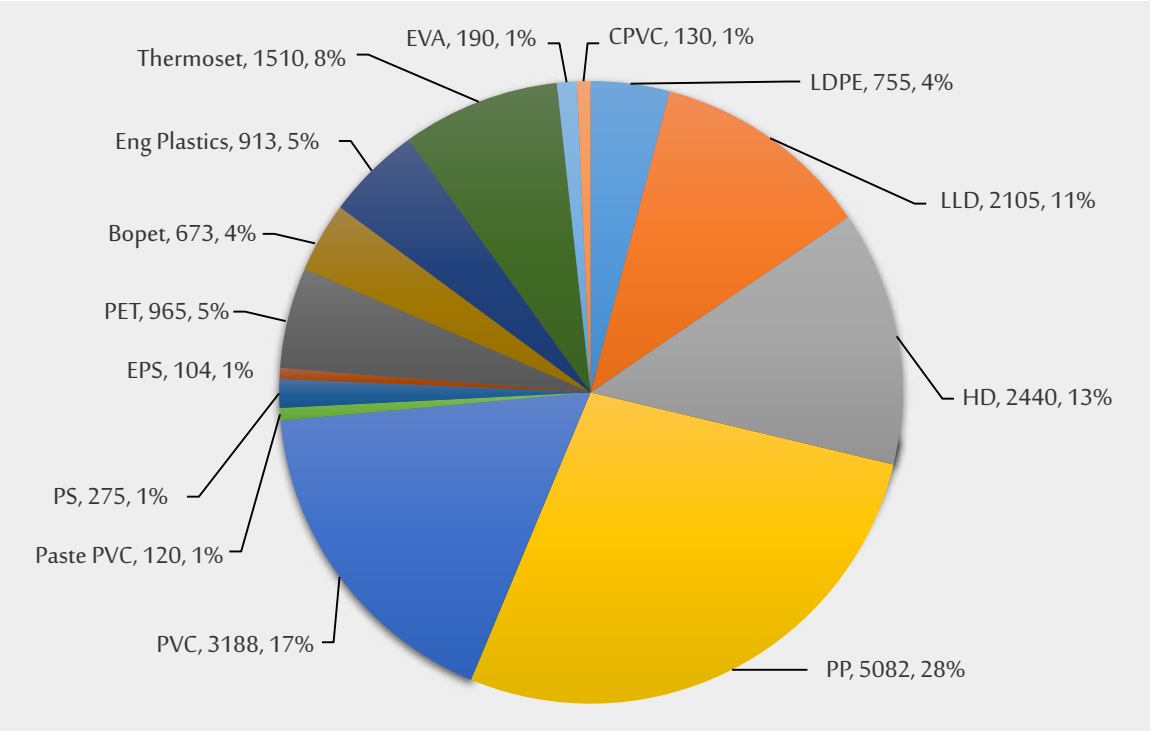
Source: PLASTINDIA FOUNDATION /Industry Estimate

# INDIA – PLASTICS CONSUMPTION



# INDIA'S SCENARIO ON PLASTICS CONSUMPTION (2018-19)

## THERMOPLASTICS & THERMOSET



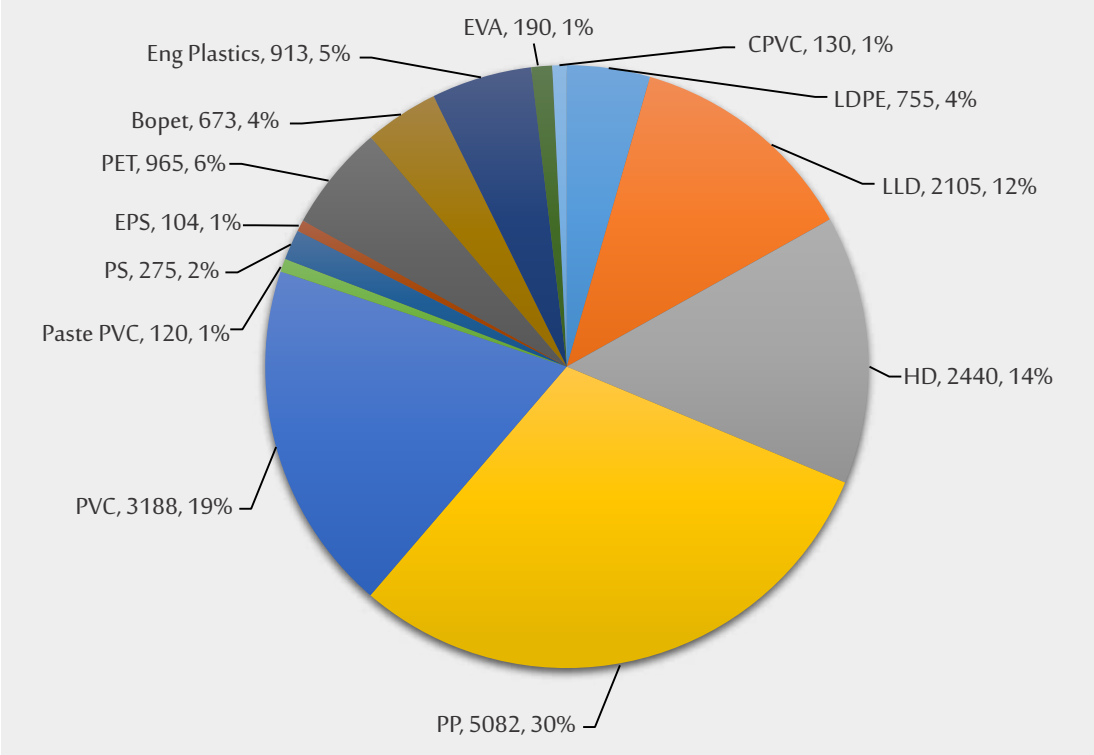

**All Fig in KT**

*2018-19 Consumption 18450 KT* *2019-20 Est. 19567 KT, YoY Growth ~ 6 %*

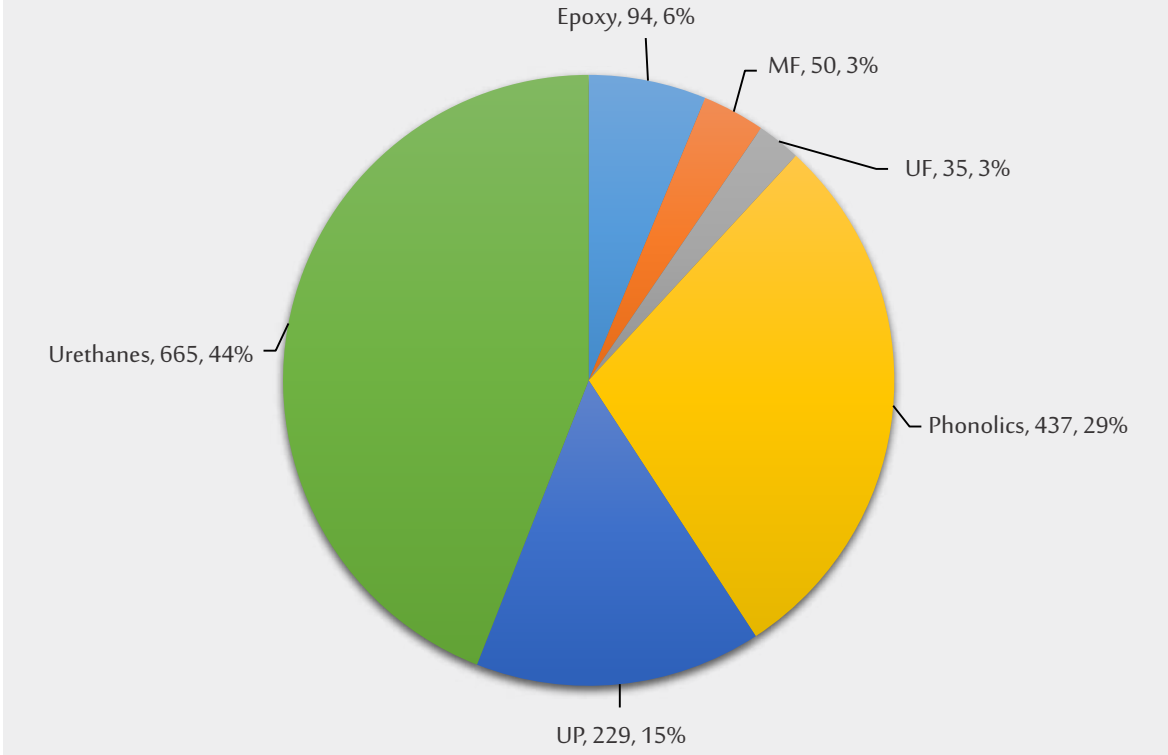
Source: PLASTINDIA FOUNDATION /Industry Estimate

# PLASTICS CONSUMPTION (2018-19) - INDIA

## THERMOPLASTICS




## THERMOSETS



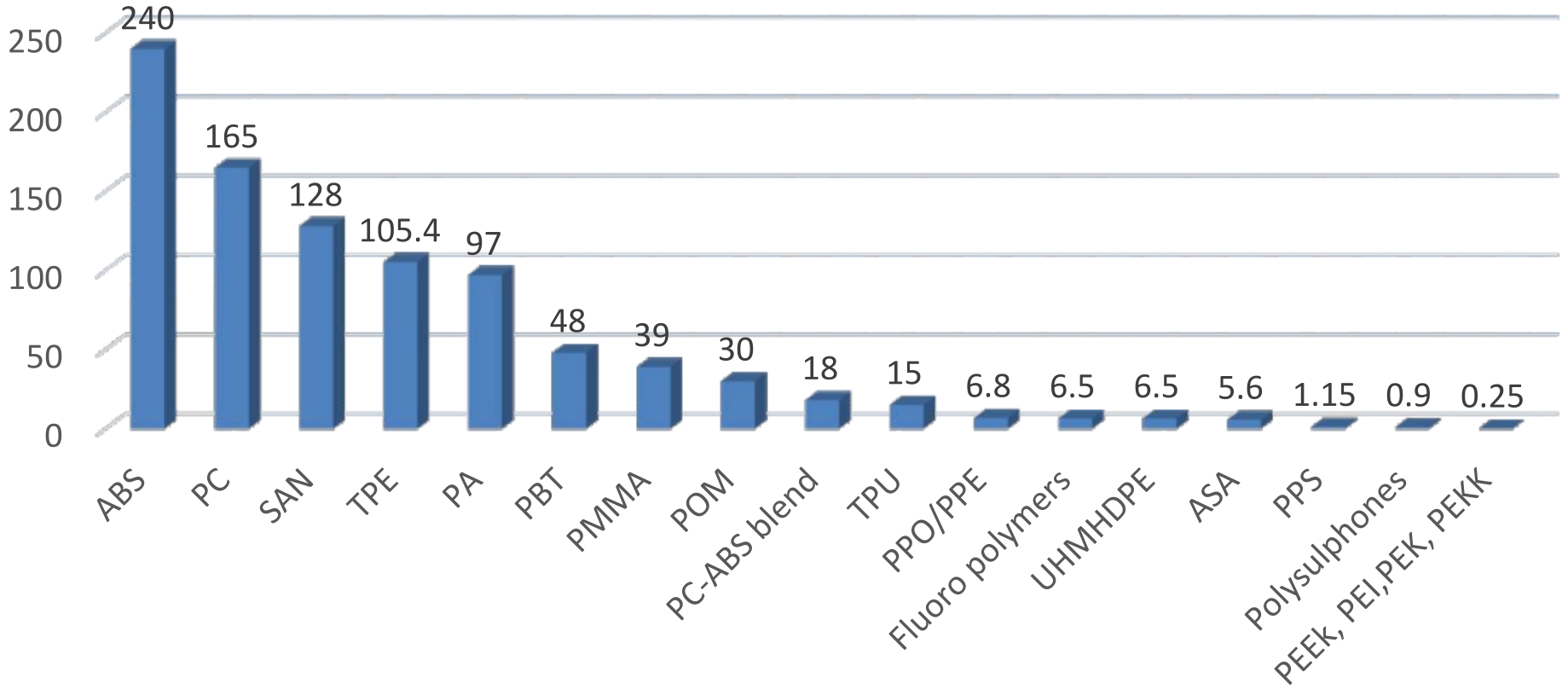

**All Fig in KT**

*2018 -19 Consumption - 16940 KT*
*2019- 20 Est. - 17989 KT, YoY Growth ~ 6.2%*

*2018-19 Consumption - 1510 KT*
*2019-20 Est. -1578 KT, YoY Growth ~ 4.5%*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# ENGINEERING & PERFORMANCE PLASTICS CONSUMP. (2018-19)




**All Fig in KT**

*2018-19 Consumption - 913 KT  2019-20 Est. - 964 KT  YoY Growth ~ 5.5%*

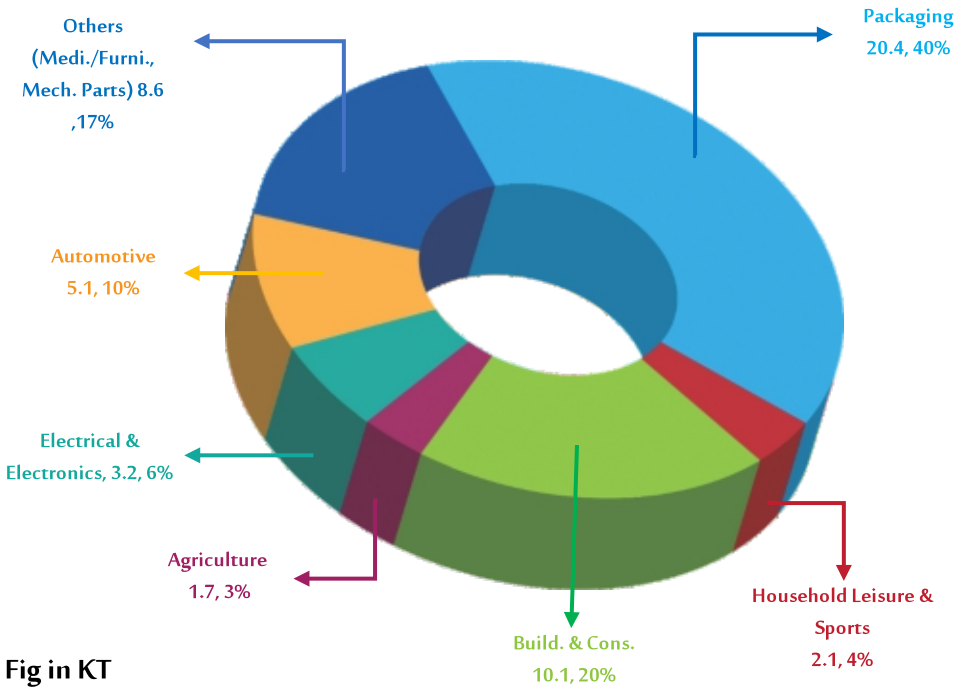
Source: PLASTINDIA FOUNDATION /Industry Estimate

# SECTOR WISE POLYMER CONSUMPTION

## Commodity Plastics


# MAJOR PLASTICS SECTOR WISE CONSUM. EUROPE VS INDIA

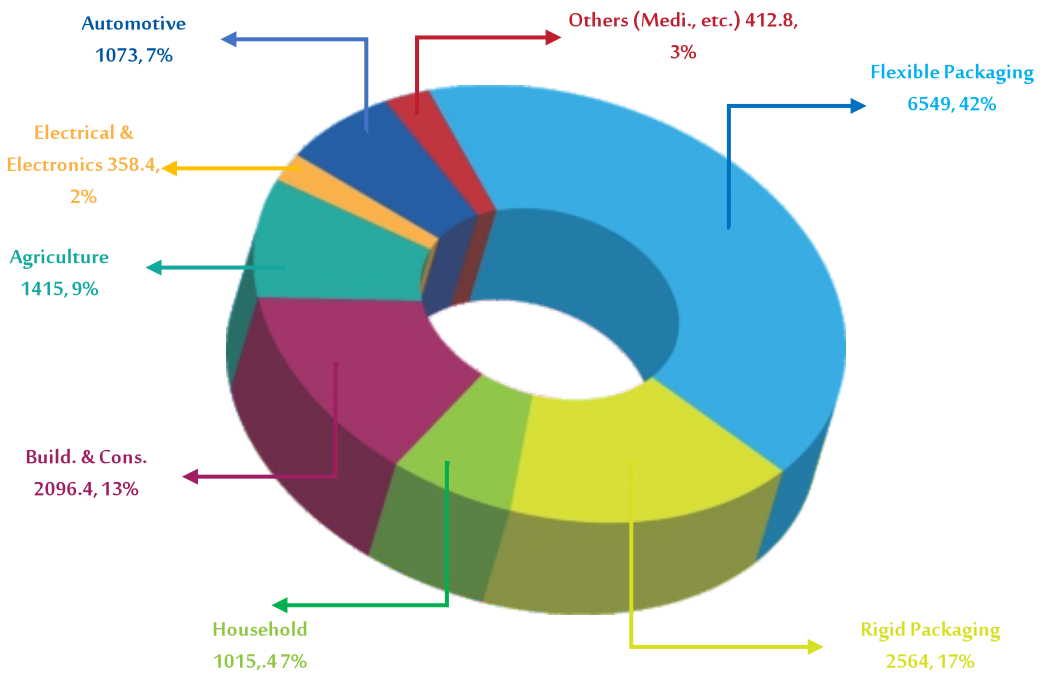
## Europe – 2018 – 51.2 MMT




All Fig in KT

*PE/PP/PVC/PET+BOPET/PS/Eng. plastics*

## India – 2018 ~ 15.4 MMT

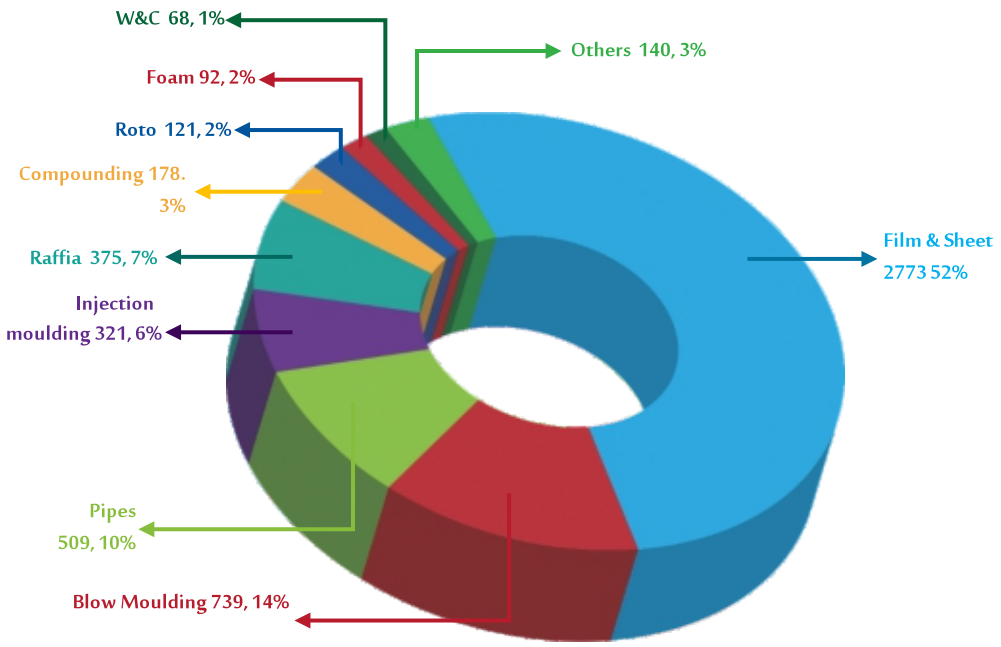



*PE/PP/PVC/PET+BOPET/PS*

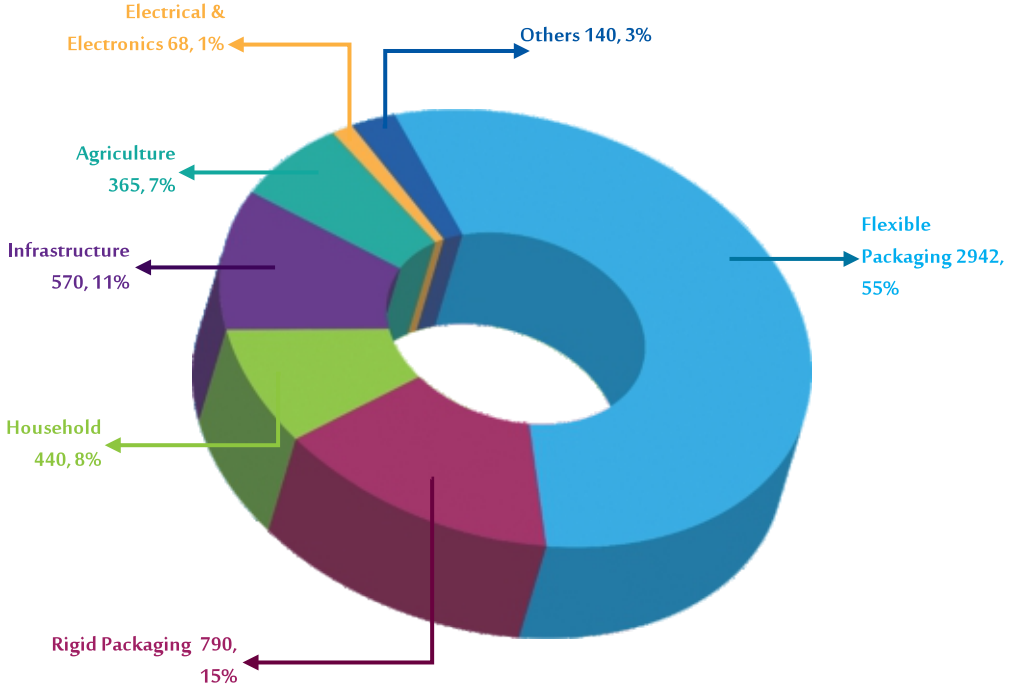
Source: PLASTINDIA FOUNDATION /Industry Estimate

# PE SECTOR WISE CONSUMPTION (2018-19) - INDIA

## PE Sector wise Break up 2018-19 - 5300 KT




## PE Application wise Breakup 2018-19-5300 KT




All Fig in KT

*2018-19 Consumption – 5300 KT 2019-20 Est. - 5670 KT YoY Growth ~ 7%*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# PP SECTOR WISE CONSUMPTION (2018-19) - INDIA

Raffia
1677, 33%

Others
120 2%

F&F
440, 9%

Extrusion
100, 2%

BOPP
595, 12%

RCP
215, 4%

ICP
785, 15%

IM HP
895, 18%

TQ
255 5%

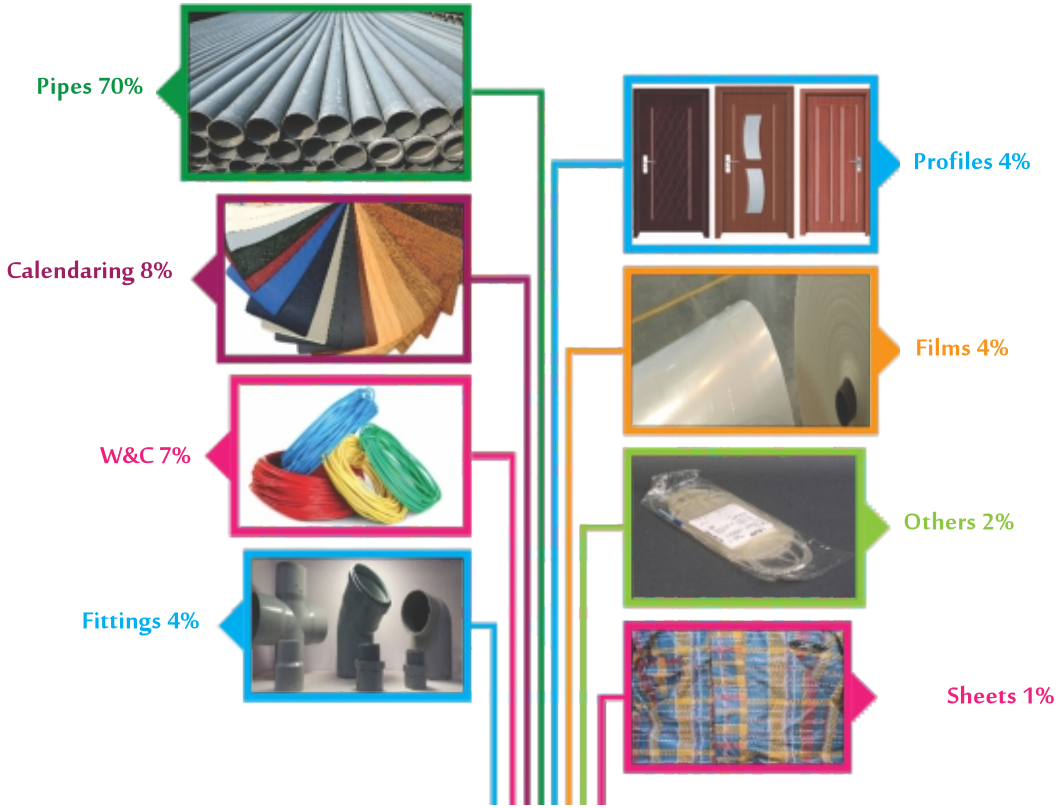

All Fig in KT

*2018-19 Consumption – 5082 KT  2019-20 Est. 5335 KT  YoY Growth ~ 5 %*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# PVC SECTOR WISE CONSUMPTION (2018-19) - INDIA

| SECTORS | 18-19 | % Share |
|---|---|---|
| Pipes | 2240 | 70% |
| Fittings | 142 | 4% |
| Calendaring | 249 | 8% |
| W&C | 225 | 7% |
| Films | 131 | 4% |
| Profiles | 113 | 4% |
| Sheets | 36 | 1% |
| Others | 52 | 2% |
| **TOTAL** | **3188** | **100%** |

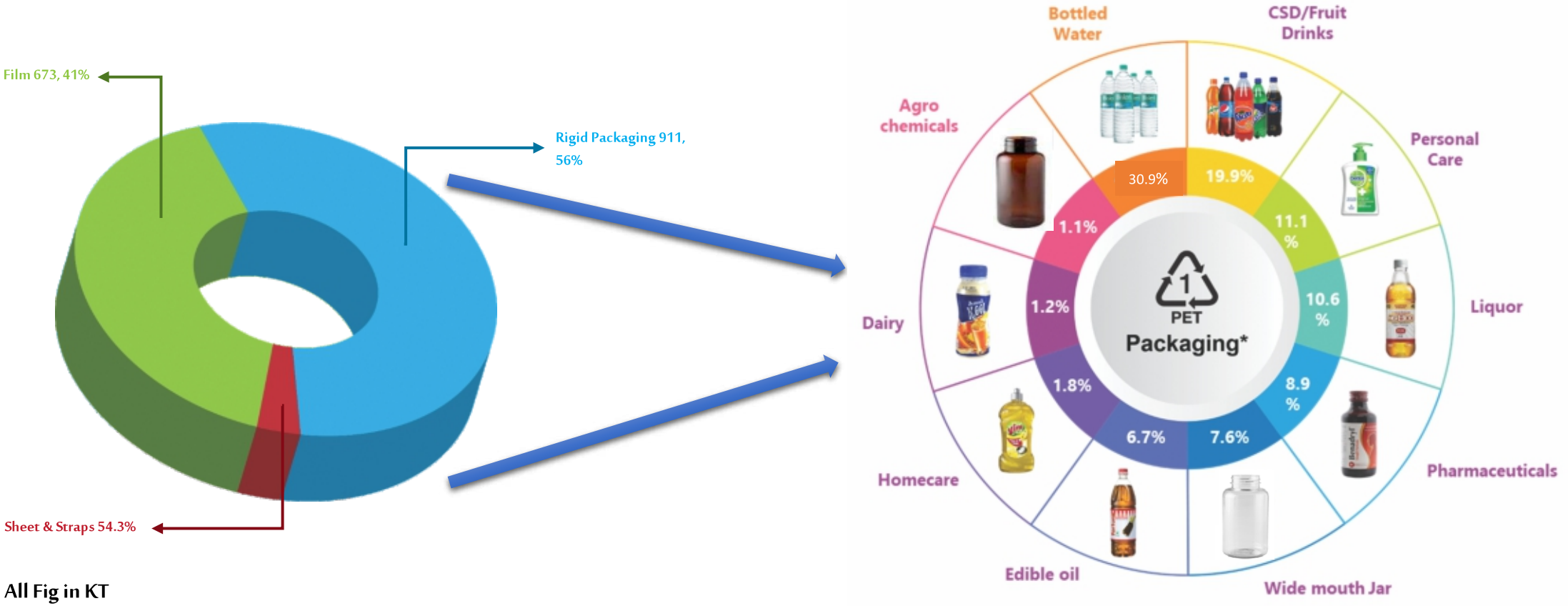



All Fig in KT

*2018-19 Consumption 3188 KT  2019-20 Est. 3400 KT  YoY Growth ~ 6.6 %*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# PET & BOPET SECTOR WISE CONSUM. (2018-19) - INDIA



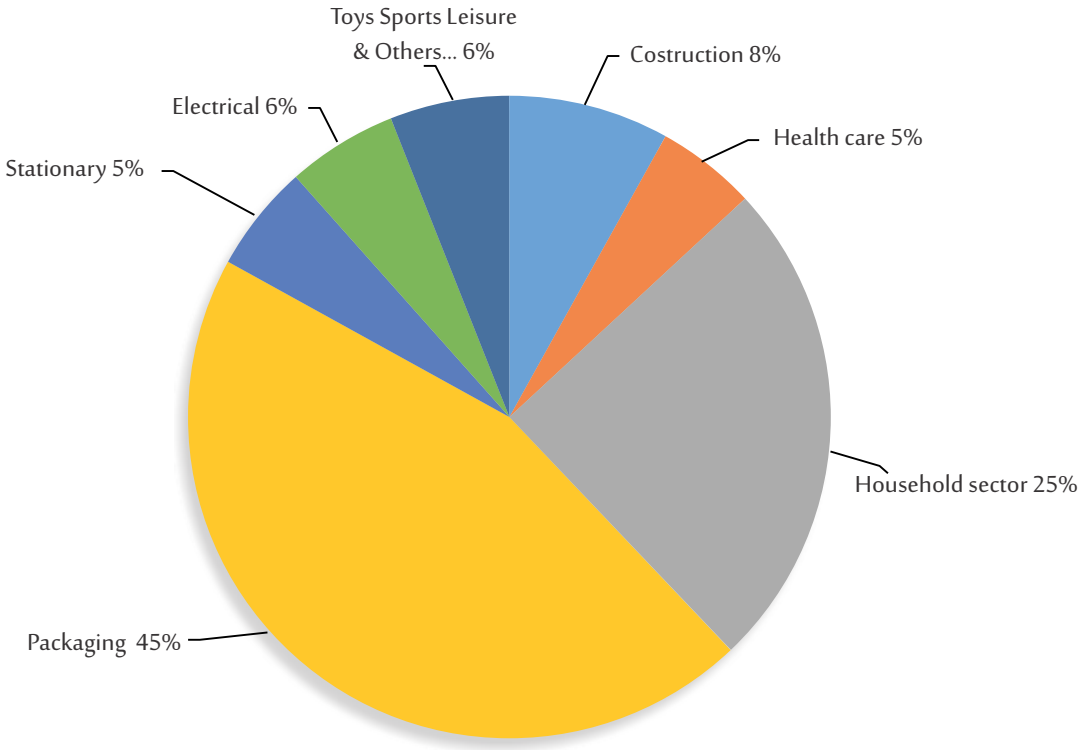

All Fig in KT

*2018-19 Consumption –1638 KT 2019-20 Est. 1794 KT YoY Growth ~ 9.5%*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# GPPS/HIPS SECTOR WISE CONSUMPTION

| SECTOR | FEW MAJOR APPLICATIONS | CONSUMPTION |
|---|---|---|
| Construction | Partition walls | 21 |
| Health care | Lab ware, Petri dishes | 13 |
| Household sector | Geometry Box items, Bangles/Beads etc. | 70 |
| Packaging | Sealed Containers, Disposables | 125 |
| Stationary | Boxes, Memento etc., | 15 |
| Electrical | Switches, Panels | 14 |
| Others | Toys, Sports wear | 17 |
| TOTAL | | 275 |




**All Fig in KT**

**2018-19 Consumption – 275 KT  2019 -20 Est.- 285 KT  YoY Growth ~3.6%**

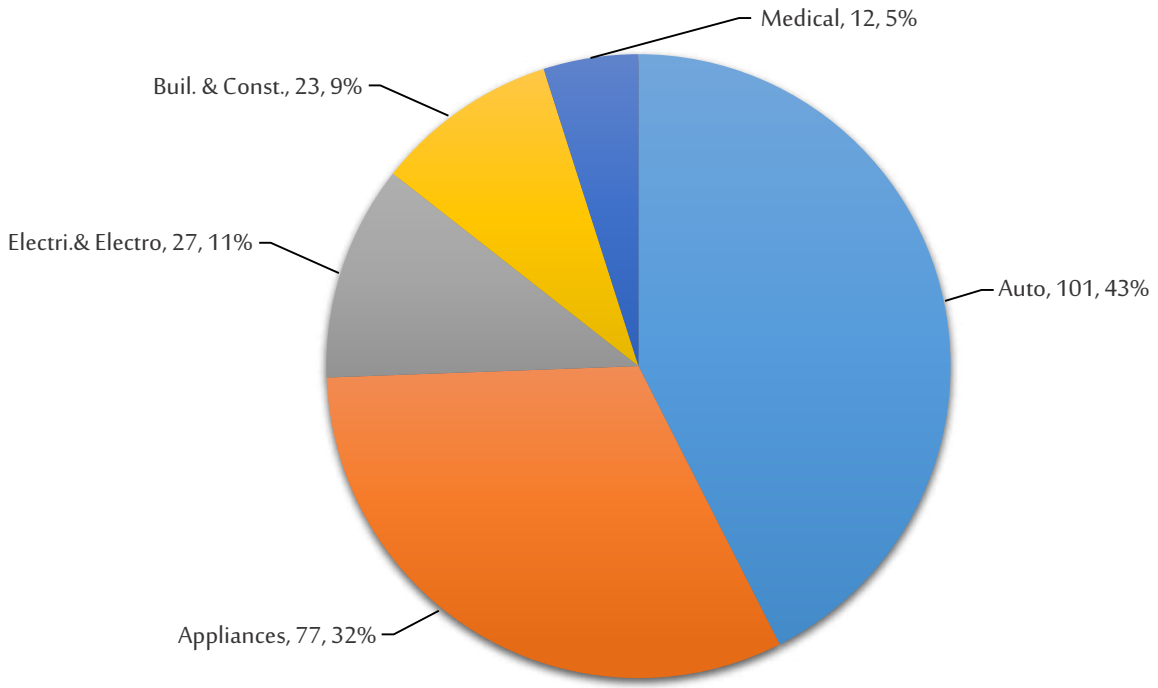
Source: PLASTINDIA FOUNDATION /Industry Estimate

# SECTOR WISE POLYMER CONSUMPTION

## Engineering Plastics

# ABS SECTOR WISE CONSUMPTION (2018-19) - INDIA

| SECTOR | CONSUMPTION |
|---|---|
| Auto | 101 |
| Appliances | 77 |
| Electrical & Electronics | 27 |
| Building & Construction | 23 |
| Medical | 12 |
| TOTAL | 240 |




**All Fig in KT**

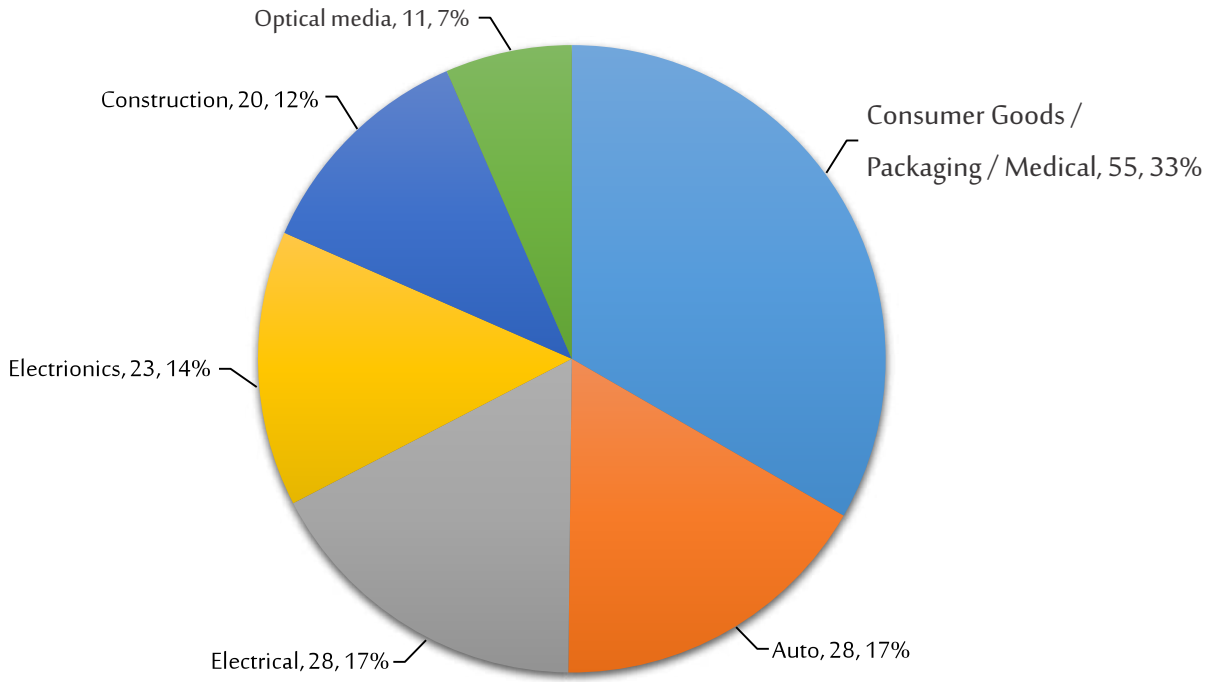
*2018-19 Consumption - 240 KT  2019-20 Est. - 250 KT  YoY Growth ~ 4.2%*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# PC SECTOR WISE CONSUMPTION (2018-19) - INDIA

| SECTOR | CONSUMPTION |
|---|---|
| Consumer Goods, Packaging, Medical | 55 |
| Auto | 28 |
| Electrical | 28 |
| Electronics | 23 |
| Construction | 20 |
| Optical media | 11 |
| TOTAL | 165 |

**All Fig in KT**

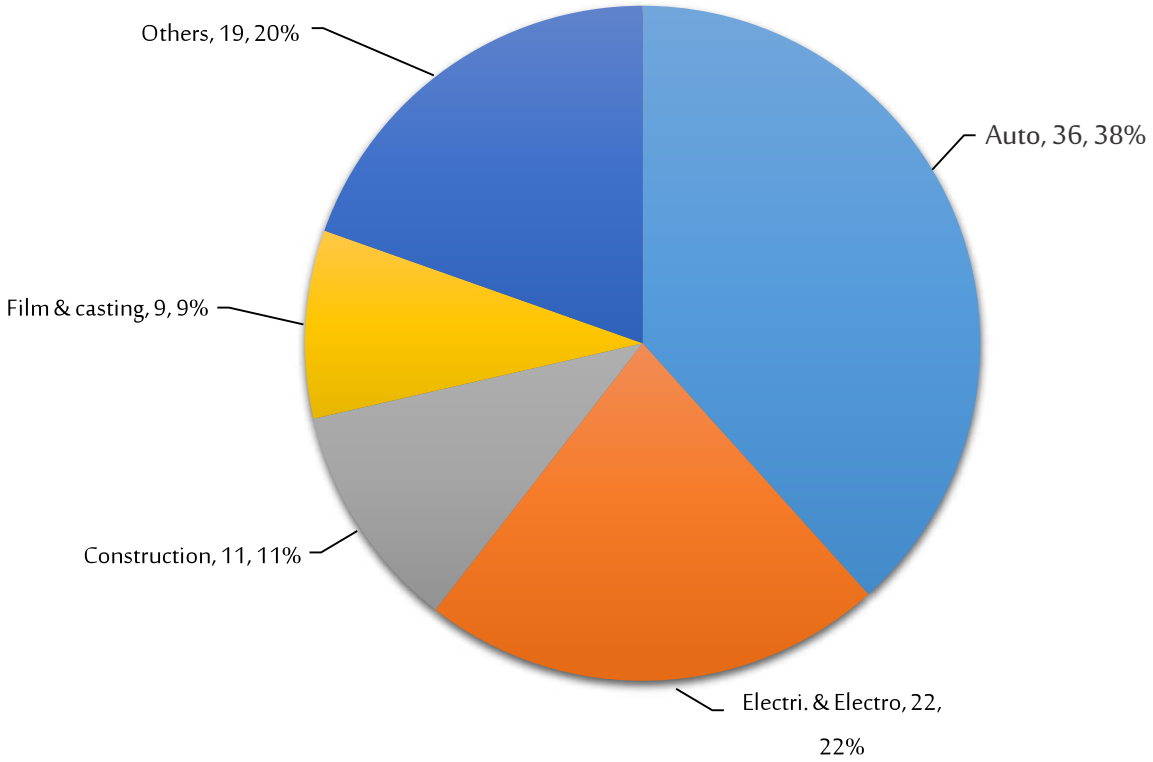



*2018-29 Consumption -165 KT  2019-20 Est. 173 KT  YoY Growth ~ 5%*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# PA/PA COMPOUND SECTOR WISE CONSUM. (2018-19) - INDIA

| SECTOR | CONSUMPTION |
|---|---|
| Auto | 36 |
| Electrical & Electronics | 22 |
| Construction | 11 |
| Film & Casting | 9 |
| Others including Mono/Multi filament | 19 |
| TOTAL | 97 |



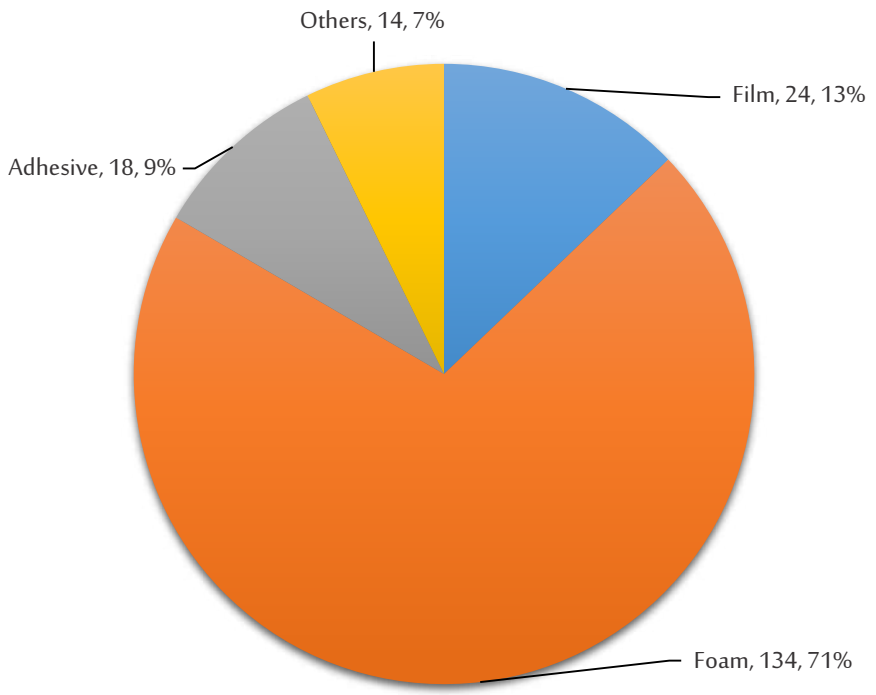

**All Fig in KT**

*2018-19 Consumption - 97 KT  2019-20 Est.- 103 KT  YoY Growth ~ 6.5%*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# EVA SECTOR WISE CONSUMPTION (2018-19) - INDIA

| SECTOR | CONSUMPTION |
|---|---|
| Footwear /Foam | 134 |
| Film | 24 |
| Adhesive | 18 |
| Others | 14 |
| TOTAL | 190 |



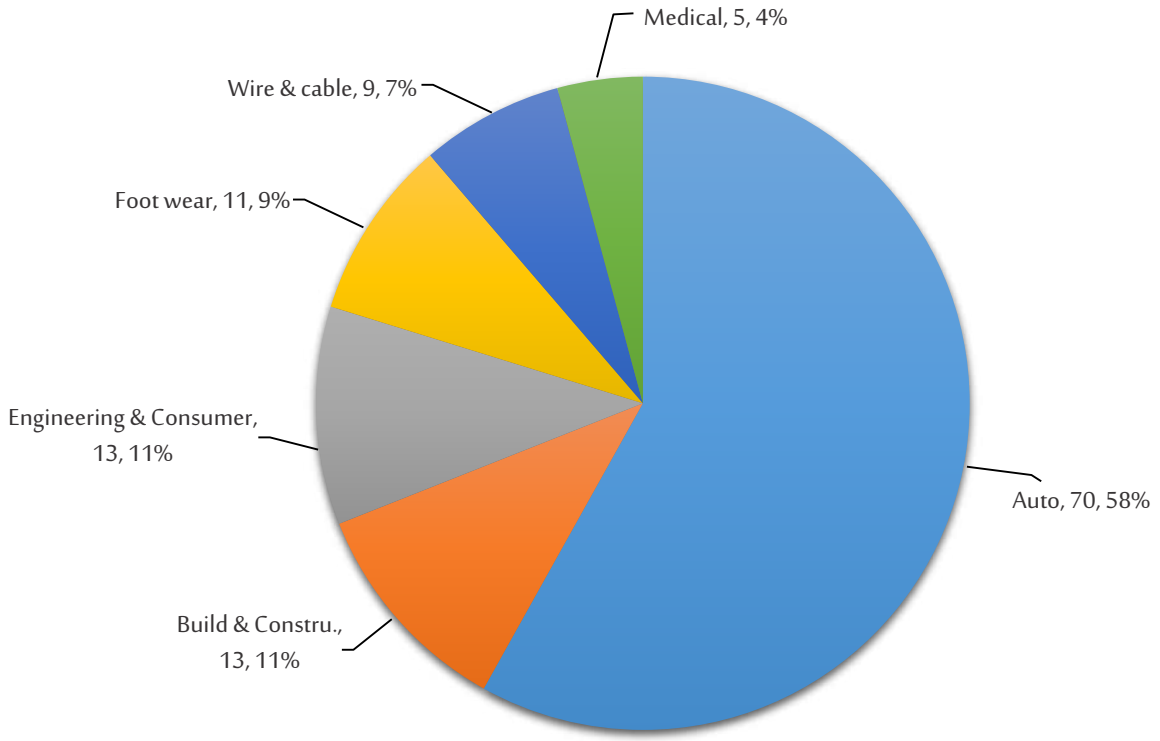

**All Fig in KT**

*2018-19 Consumption 190 KT 2019-20 Est. 195 KT YoY Growth ~2.6%*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# TPE - SECTOR WISE CONSUMPTION (2018-19) - INDIA

| SECTOR | CONSUMPTION |
|---|---|
| Auto | 70 |
| Building & Construction | 13 |
| Engineering & Consumer | 13 |
| Foot wear | 11 |
| Wire & cable | 9 |
| Medical | 5 |
| TOTAL | 121* |




**All Fig in KT** *Including TPU

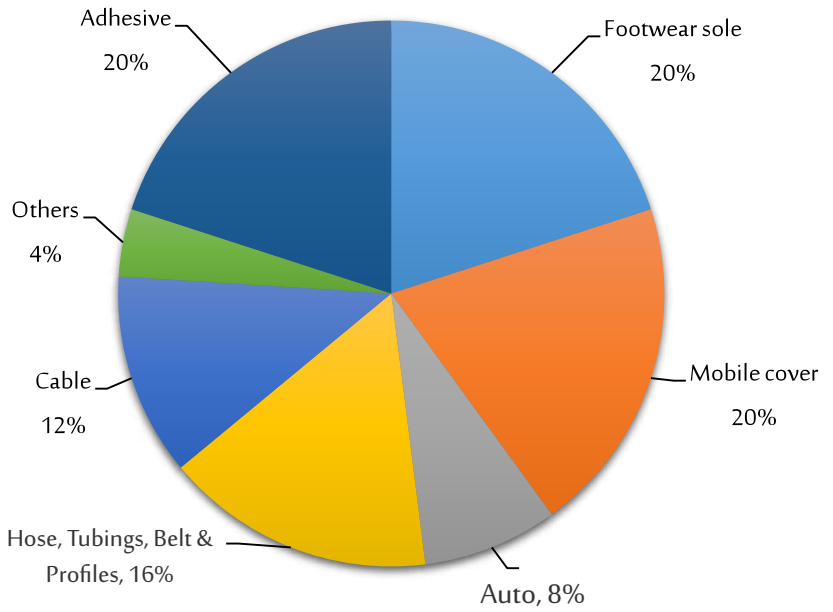
*2018-19 Consumption 121 KT 2019 -20 Est. 129 KT YoY Growth ~ 6.5%*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# TPU INDUSTRY 2018-19 - INDIA

| INDUSTRY SNAPSHOT | |
|---|---|
| India Capacity | 6000 Tons per annum |
| Imports | ~ 9000 Tons |
| Raw Material | Isocyanates (MDI),Polyol + additives |
| Growth | ~20% |
| Growth Driver | Foot wear/ Auto/ Mobile etc., |

## APPLICATIONS BREAKUP 2018-19 - 15 KT




**All Fig in KT**

*2018-19 Consumption 15 KT 2019-20 Est. 18 KT YoY Growth ~20%*

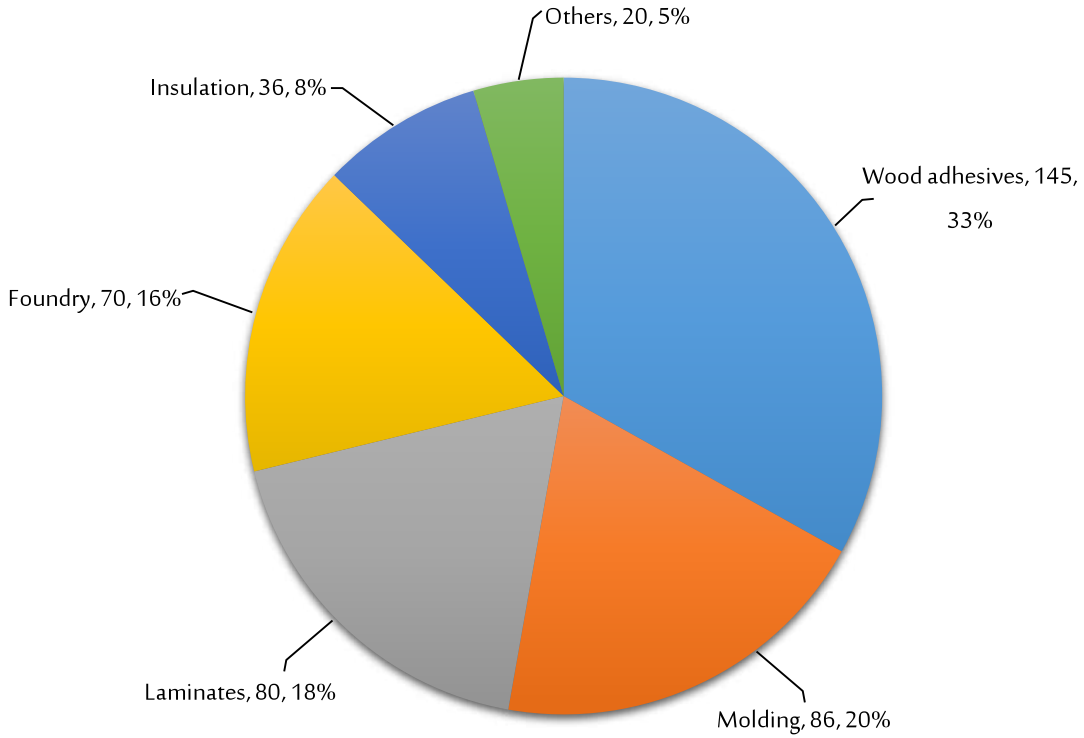
Source: PLASTINDIA FOUNDATION /Industry Estimate

# SECTOR WISE POLYMER CONSUMPTION

## Thermosets

# PHENOLICS - SECTOR WISE CONSUMPTION (2018-19) - INDIA

| SECTOR | CONSUMPTION |
|---|---|
| Wood adhesives | 145 |
| Molding | 86 |
| Laminates | 80 |
| Foundry | 70 |
| Insulation | 36 |
| Others | 20 |
| TOTAL | 437 |



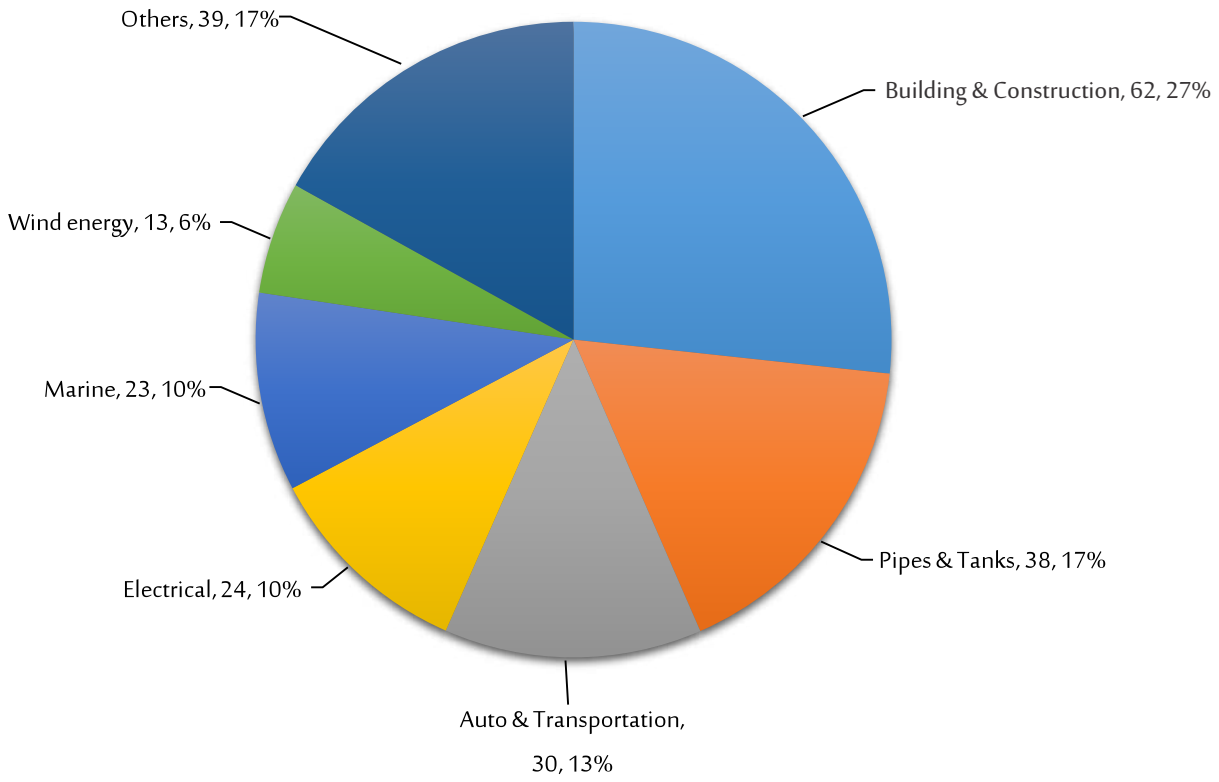

**All Fig in KT**

*2018-19 Consumption 437 KT  2019-20 Est. 448 KT  YoY Growth ~2.5%*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# UNSATURATED POLYESTER CONSUMPTION – 2018-19 -INDIA

| SECTOR | CONSUMPTION |
|---|---|
| Build. & Construction | 62 |
| Pipes & Tanks | 38 |
| Auto & Transportation | 30 |
| Electrical | 24 |
| Marine | 23 |
| Wind energy | 13 |
| Others | 39 |
| TOTAL | 229 |



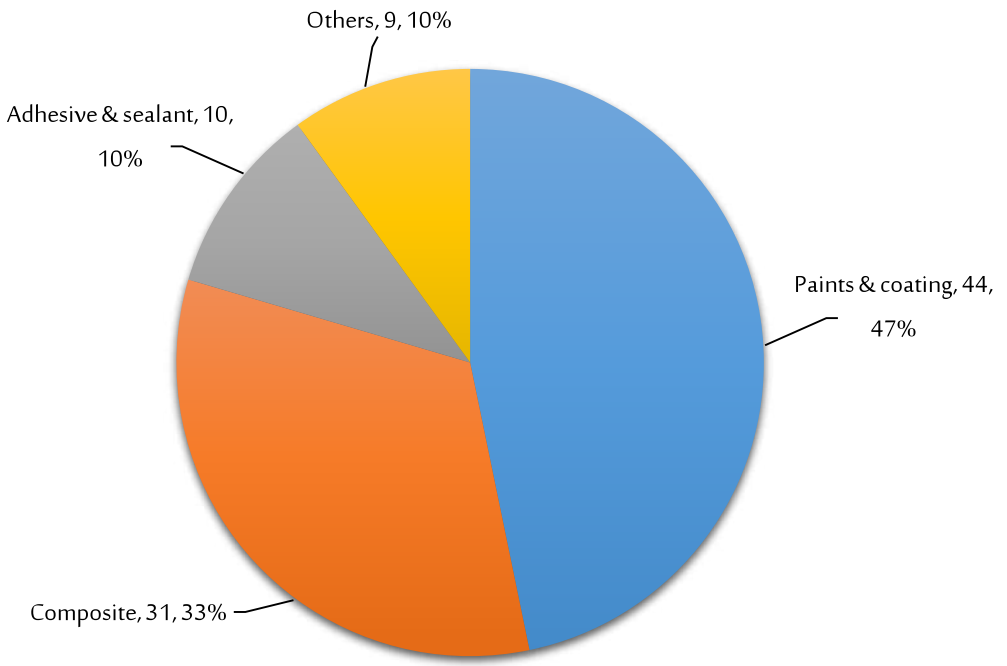

**All Fig in KT**

*2018-19 Consumption 229 KT  2019-20 Est. 231.3 KT  YoY Growth ~1%*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# EPOXY - SECTOR WISE CONSUMPTION (2018-19) - INDIA

| SECTOR | CONSUMPTION |
|---|---|
| Paints & coating | 44 |
| Composite | 31 |
| Adhesive & sealant | 10 |
| Others | 9 |
| TOTAL | 94 |



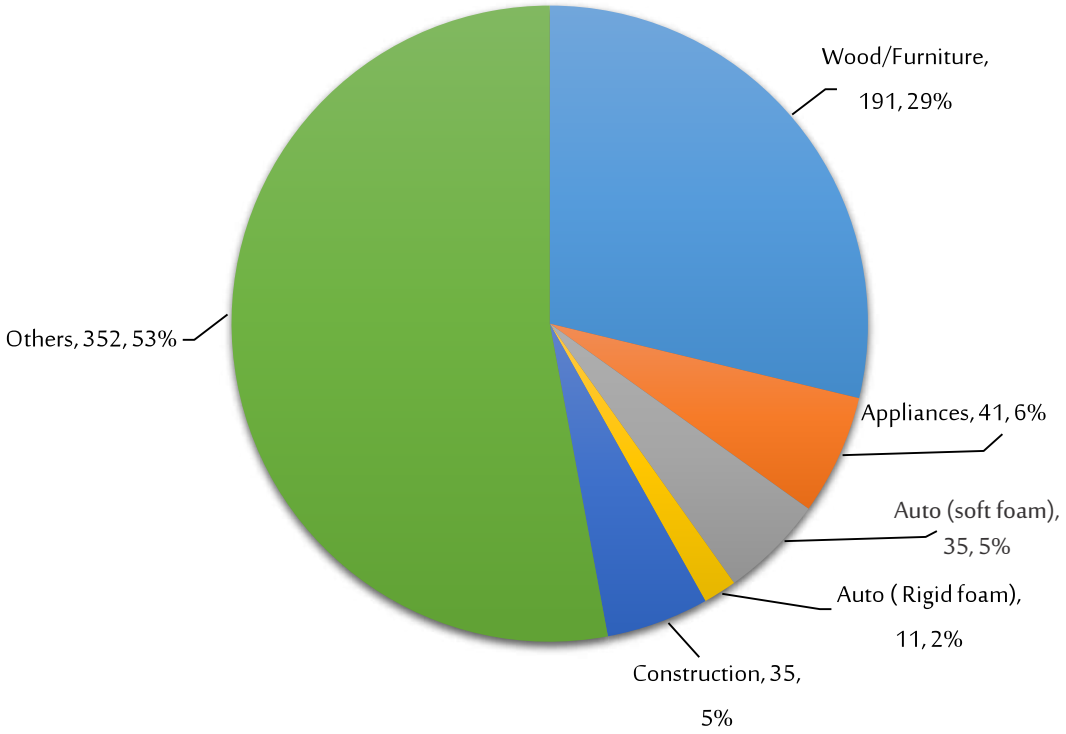

**All Fig in KT**

*2018-19 Consumption 94 KT  2019-20 Est. 97 KT  YoY Growth ~ 3%*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# PU INDUSTRY (2018-19) - INDIA

| INDUSTRY SNAPSHOT | |
|---|---|
| Product | Flexible foam/ Rigid Foam/ Adhesive/ Sealant/ Elastomer |
| Raw Material | Isocyanates ( TDI & MDI),Polyol + additives like catalysts cross linking agent, surfactants, blowing agent etc., |
| Raw Material | Import dependent ( ~80%) |
| Growth | 9% |
| Growth Driver | Appliances, Auto & Loco/ Mattresses, Insulation |



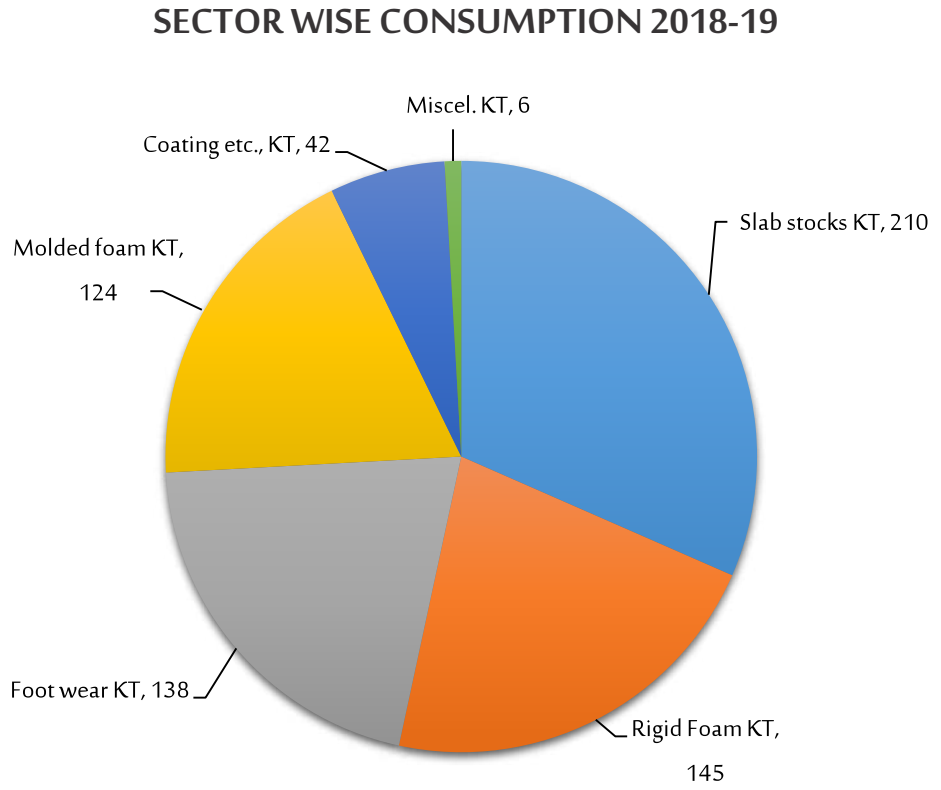

**All Fig in KT**

***2018-19 Consumption 665 KT  2019-20 Est. 725 KT YoY Growth ~9%***

Source : PLASTINDIA FOUNDATION /Indian Polyurethane Association

# PU INDUSTRY (2018-19) - INDIA CONTD...

| SECTORWISE CONSUMPTION 2018-19 | | |
|---|---|---|
| Slab stocks | Mattresses & Furniture foam | 210 |
| Rigid Foam | Thermoware, Hot water geyser/Integral skin foam for steering wheel and arm rests, Continuous and discontinuous panel in Refrigerator, Appliances, Spray foam etc | 145 |
| Footwear | Formal, Casual, Beach, Sports footwear | 138 |
| Molded Foam | For all auto, locomotive, office furniture | 124 |
| Coating etc. | Coating, Adhesive, Sealant, Elastomer | 42 |
| Misc. | Others | 6 |
| Total | | 665 |




**All Fig in KT**

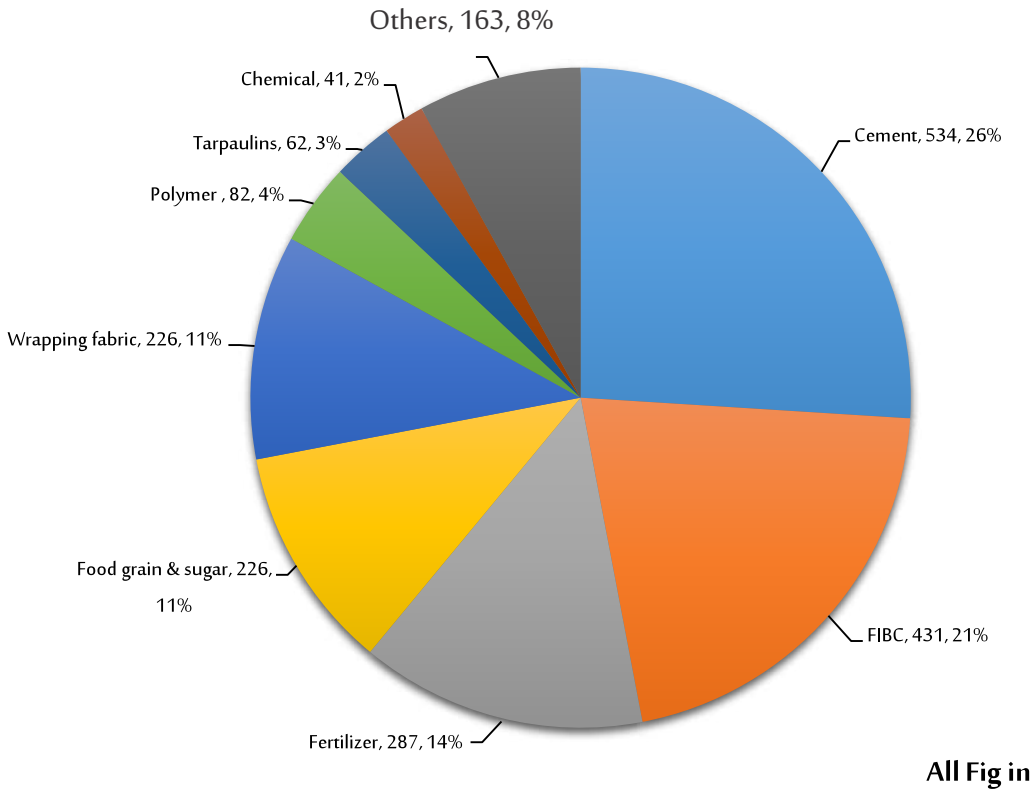
Source : Indian Polyurethane Association

# SECTOR WISE POLYMER CONSUMPTION

## Major End Products

# WOVEN SACK – RAFFIA SECTOR (2018-19) - INDIA

| RAFFIA INDUSTRY SNAPSHOT | |
|---|---|
| Global | |
| Consumption MMT | 16.1 |
| Market Size | 40 Billion USD |
| Growth % | 4.8 |
| India | |
| *Consumption MMT | 2.0 |
| Market Size | Rs 30,000 Crore (4.28 Billion USD) |
| Growth % | 9.0 |
| No of units | 1272 |
| Processing Capacity KTA | 2871 |
| Capacity Utilization | 71% |
| PP/ HD Consumption ratio | 82/18 |




* Based on virgin polymer

*2018-19 Consumption 2052 KT  2019-20 Est. 2237 KT  YoY Growth ~9%*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# FIBC INDUSTRY (2018-19) - INDIA

| INDUSTRY SNAPSHOT | |
|---|---|
| No of manufacturers: | Fully integrated 30 + small players ~25 |
| Growth Driver | Steady Economy, Skilled Workforce, Increased Productivity, Penetration into wide number of other applications areas<br>Better Equipment & Machinery, Acceptance By International Buyers |

*India Ranks no 2 in Global FIBC market*

*2018-19 Consumption 431 KT 2019-20 Est. 517 KT YoY Growth ~ 20%*

Source : IFIBCA /Industry estimate

# FIBC INDUSTRY (2018-19) - INDIA CONTD..

## INDUSTRY SNAPSHOT CONTD.,

Minimum and max size of the bag: 100 Kgs to 5000 Kgs

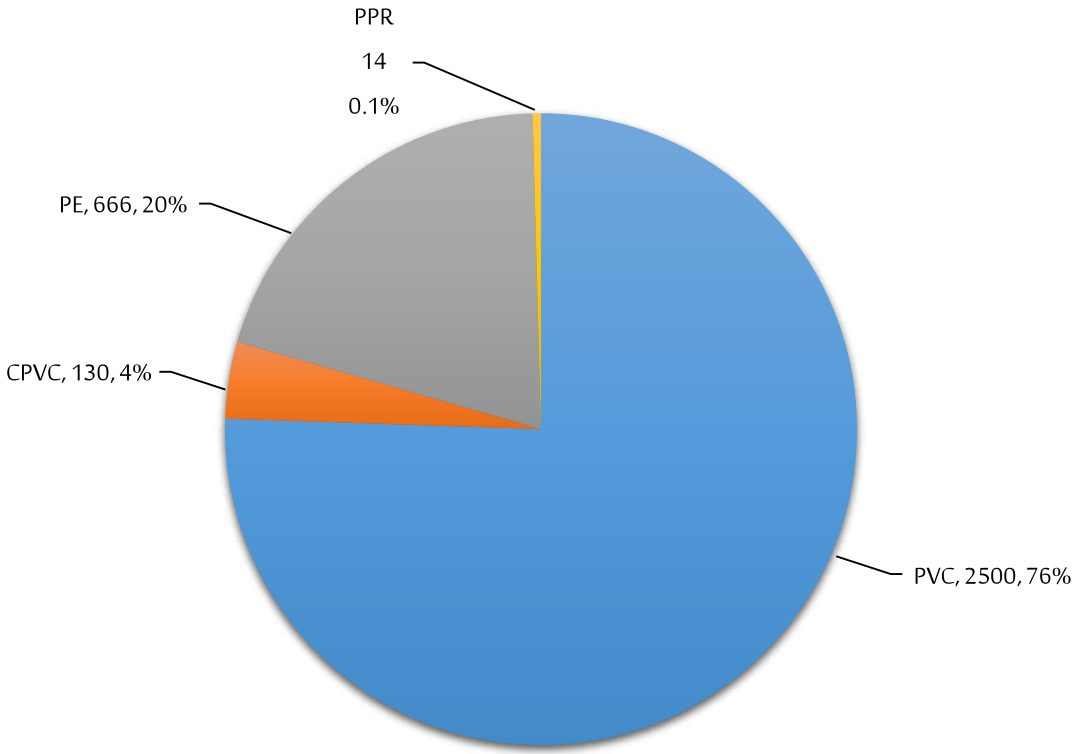
Applications – For packing

- Stones & Minerals (Builder bags)
- Bulk chemicals
- Pharmaceuticals
- Agriculture products
- Sea food products
- Food products
- Hazardous products and chemicals (UN Certified bags)
- Plastic granules and resins


Source : IFIBCA/Industry Estimate

# PIPE SECTOR (2018-19) – INDIA

| INDIA PIPE MARKET 2019 ( PVC /CPVC//PE/PP) | | |
|---|---|---|
| Segment | Market (KT) | Growth % |
| PVC (SWR + Plumbing+ Fittings) | 2500 | 5 |
| **HDPE Water Distribution + Industrial Pipe | 276 | 7.5 |
| *MD/HDPE Gas Distribution Network | 15 | 10 |
| HDPE Optical Fibre Duct + Sprinkler | 130 | 3 |
| Sprinkler | 55 | 7.5 |
| CPVC | 130 | 6.5 |
| HDPE Corrugated pipe (sewage + OFD + Cable duct) | 40 | 15 |
| LLDPE drip irrigation | 150 | 5 |
| Hot water pipe PPR | 14 | 5 |
| Total Market (virgin polymer) | 3310 | |
| * compounded ** partly compounded | | |




All Fig in KT

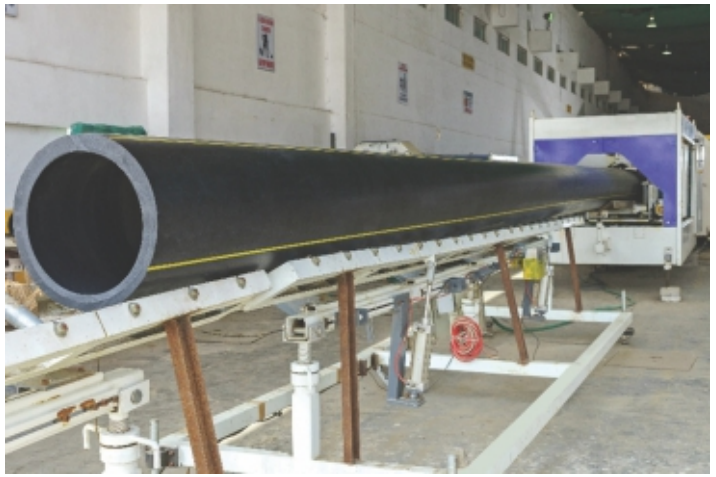
*2018-19 Consumption - 3310 KT 2019-20 Est. 3502 KT YoY Growth ~ 5.8%*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# PIPE SECTOR 2018-19 – INDIA contd..

## Growth Driver

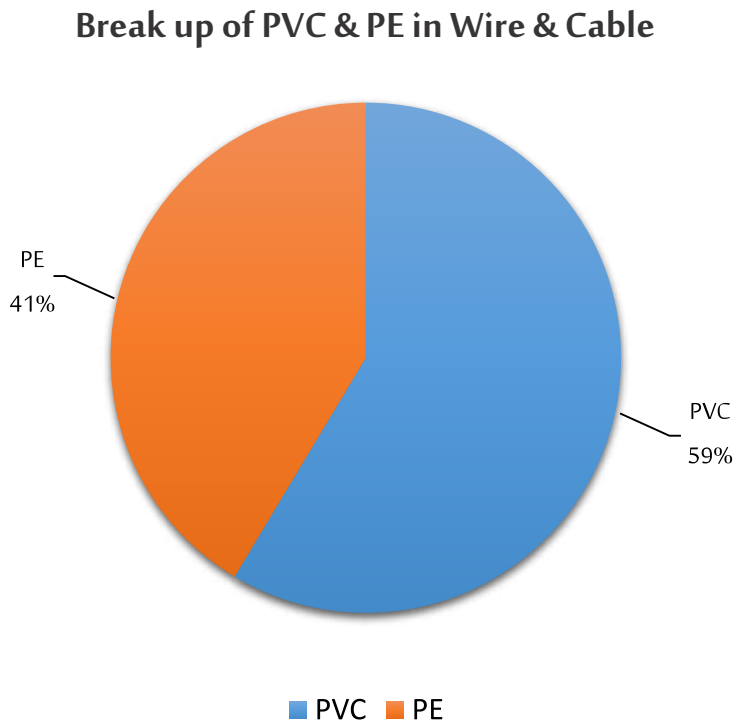
- Large diameter PE pipes for water / Industrial/ Desalination applications
- Oriented PVC pipes (OPVC) replacing DI pipes.
- PP silent pipes for Drainage
- Double wall corrugated (DWC) pipes replacing metal and stone ware pipes for sewage network
- PE pipes for gas distribution



Source: PLASTINDIA FOUNDATION /Industry Estimate

# WIRE & CABLE SECTOR (2018-19) - INDIA

| PE & PVC in Wire & Cable applications 2018-19 | | | |
|---|---|---|---|
| **Plastics type** | **Segment** | **Market (KT)** | **Growth %** |
| PE | L T cables( 1.1KV TO 11KV) SIOPLAS XLPE | 73 | 7.5 |
| | Medium voltage cables (11 to 66 KV ) – Peroxide XLPE + Semicon | 40 | 10 |
| | High & Extra High voltage cables ( 110KV TO 400KV) – Peroxide XLPE + Semicon | 5 | 9 |
| | Optical fiber cables (HDPE Jacketing) | 30 | |
| | Power cable PE Jacketing | 4 | |
| | Solar cables + Flame retardant specialty cables | 3 | 15 |
| | Data cables, RF Cables & other specialty cables | 4 | 6.5 |
| PVC | PVC wire & Cable ( Sheathing & Insulation) | 225 | 12 |
| Total | | 384 | |




*2018-19 Consumption – 384 KT  2019-20 Est. 422 KT  YoY Growth ~ 9.9%*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# CAPS & CLOSURE (2018-19) - INDIA

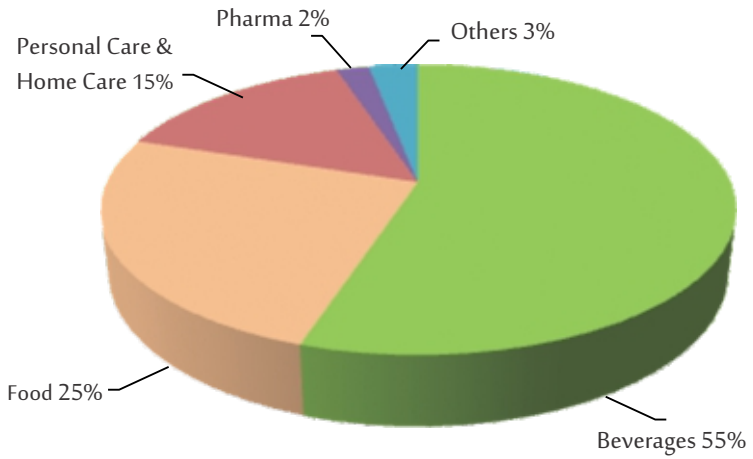
## Major Caps & Closures Industries:

- Food
- Beverages
- Personal & Household care
- Pharmaceuticals

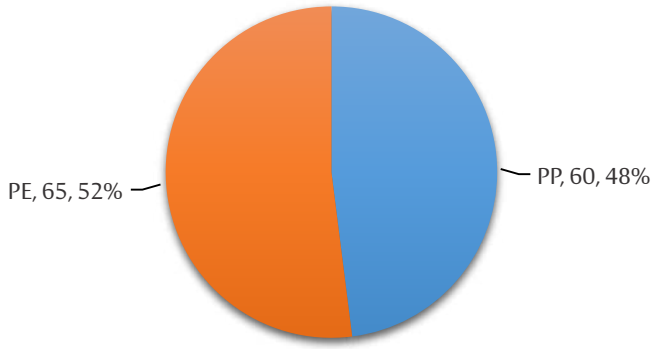
## Material Wise Market Share:

- Plastics: 90%, CAGR- 4.8%
- Metals: 7-8%, CAGR- 2%
- Others (Glass, Elastomers, Cork, Rubber etc.,): 2-3%

### Applicationwise market share




### PP & PE consumption KT 2018-19




*2018-19 Consumption - 125 KT  2019-20 Est. 140 KT  YoY Growth ~ 12%*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# CAPS & CLOSURE (2018-19) - INDIA CONTD....

## Major Growth Drivers:

- Increasing Hygiene Awareness
- Pharmaceutical Market
- Increasing use of Cosmetics & Body Care Products
- Standardised Caps

## Benefits of PE/PP Caps:

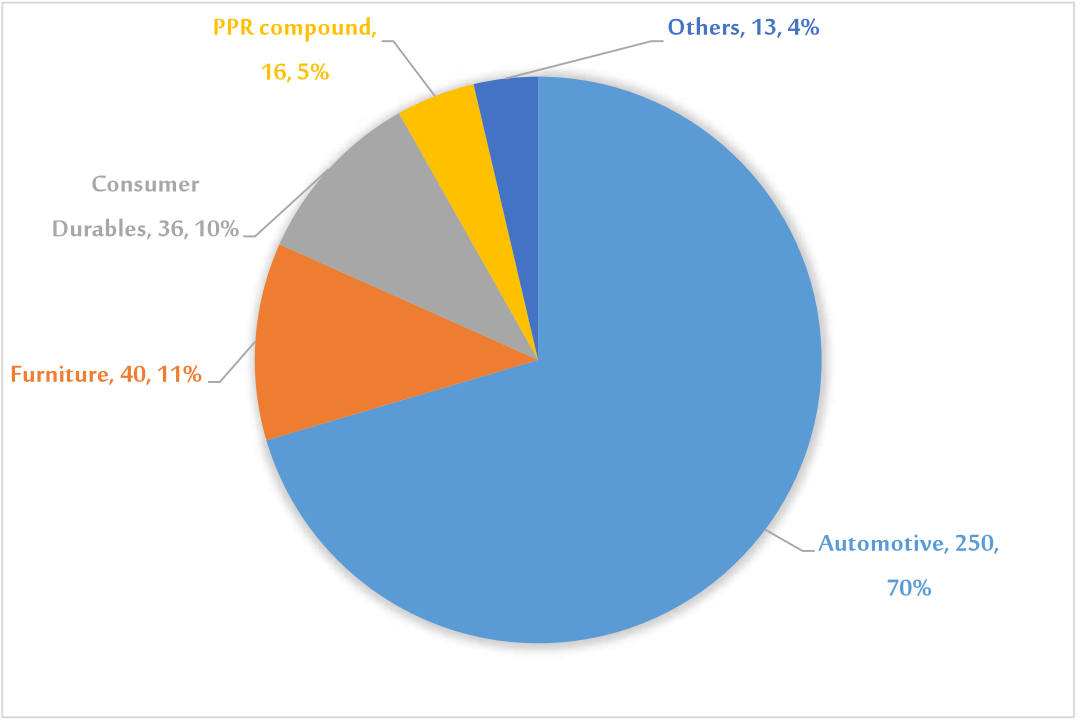
- Optical Characteristics (Transparency and Gloss)
- Leak Proof
- Faster Production Rate
- Lower Cost
- Recycle-ability
- Higher Productivity



Source: PLASTINDIA FOUNDATION /Industry Estimate

# PP COMPOUNDING SECTOR (2018-19) - INDIA

| SECTOR | MAJOR PRODUCT | CONSUMPTION |
|---|---|---|
| Automotive | Bumper /Facia/ Trims etc., | 250 |
| Furniture | Moulded Chairs/ Tables etc., | 40 |
| Consumer Durables | Washing Machine parts/ Aircooler parts etc., | 36 |
| PPR Compound | Hot water piping / fittings/Industrial products | 16 |
| Others | Automotive battery / Electrical products etc., | 13 |
| TOTAL | | 355 |

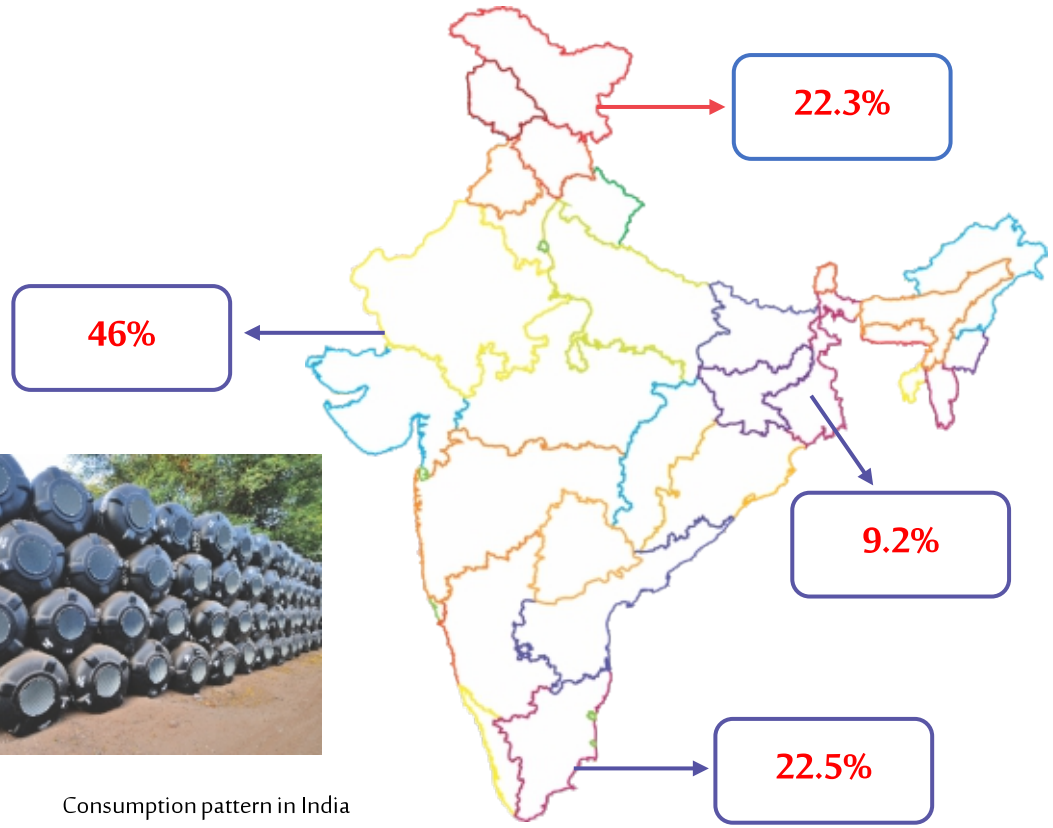



*2018-19 Consumption – 355 KT  2019-20 Est. 373 KT  YoY Growth ~ 5%*

Source: PLASTINDIA FOUNDATION /Industry Estimate

# ROTOMOULDING SECTOR – MARKET SNAPSHOT

- Installed Capacity: ~360KTA
- Market size : ~250KTA
- Multi-arm Biaxial machines :~1200
- Organised Sector Players : ~270
- Percentage growth in 2018-19 around 8.1%
- Polymers used - PE, EVA, PP, PVC, XLPE
- Share of PE - 90%
- Overhead tank : Loft tank ratio : 70:30
- ~80% of tanks demand is for < 2000 litres




Consumption pattern in India

***World's largest Rotomoulded Water Tank Market***

Source : Rotomoulding Association (ROMA)

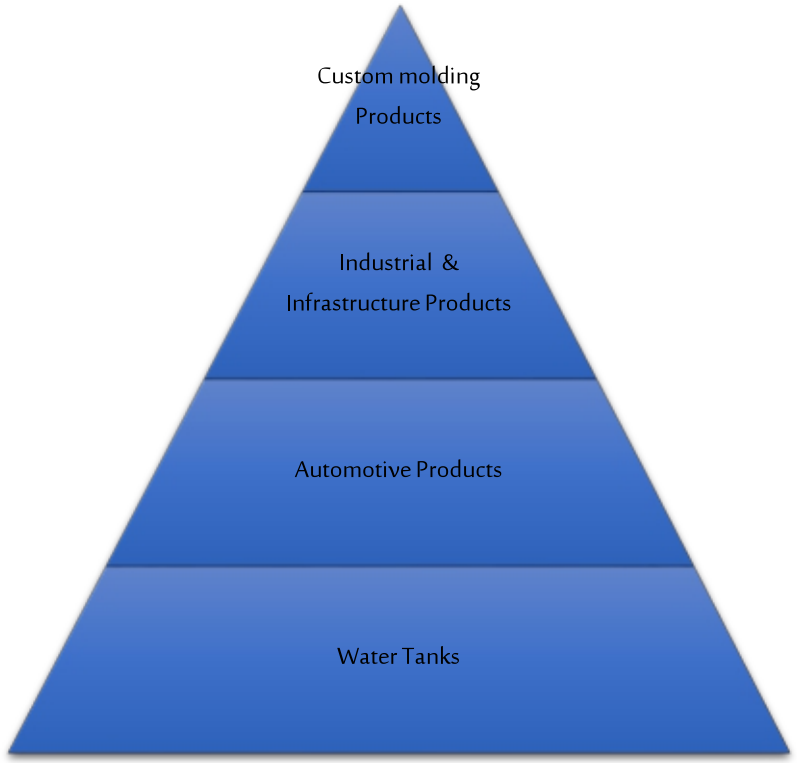
# ROTOMOULDING SECTOR – MARKET SNAPSHOT CONTD..

- Mumbai, Ahmedabad , Kolkata, Chennai & Delhi-NCR comprise 65% of All India Rotomoulding Market
- Top 10 Rotomoulders accounts for 50% of Industry Consumption
- Indian Applications – 70% Tanks & 30% Non-Tanks
- Global Applications –. 70% Non Tanks & 30% Tanks
- Minimum Size of tank manufactured in India – 200 litres
- Maximum Size of tank manufactured in India – 25,000 litres
- Emerging Trends – Material handling, Pallets, Clean India Mission
- Underground products, Automotive Commercial Vehicle Products etc.

*Water tank upto 3000 litres capacity are being made by Blow Moulding Process also*

Source : Rotomoulding Association (ROMA)

# LANDSCAPE OF ROTO PRODUCTS




Increase in Value Addition

*Market Drivers : Industrial & Automotive Products*

Source : Rotomoulding Association (ROMA)

# FRP INDUSTRY (2018-19) – INDIA

**Industry snapshot**

- Market size : ~ Rs.15000 crore

- **No of manufacturers :** 4000 +
- **Major Raw material ;** Thermoset resin like Unsaturated polyester/Epoxy/Phenolics with glass fibre/Carbon fibre/Aramid fibre reinforcements

- **The per capita usage India :** ~0.3 kg
- **The Per capita usage USA :** ~ 12 kg

**Growth Driver**

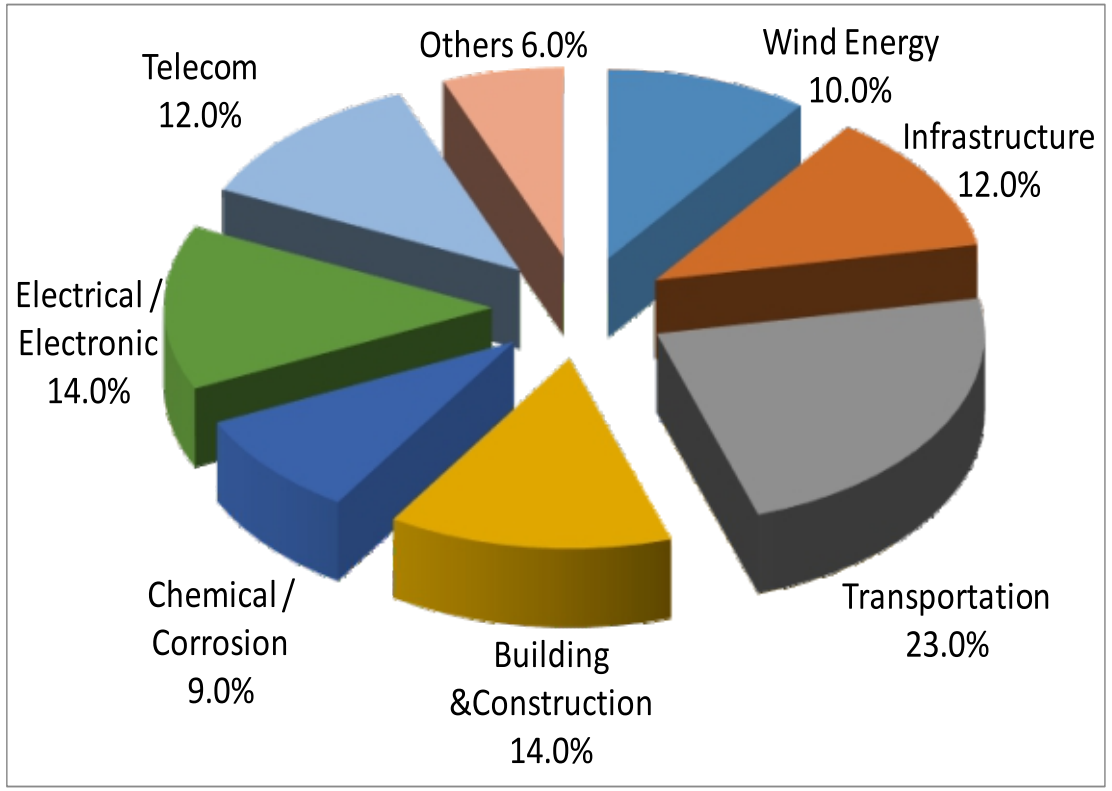
- High growth potential in renewable energy sector
- Growing Infrastructure needs
- Growing Aerospace/Defence Requirements

*2018-19 Consumption - 380 KT 2019-20 Est. 410 KT YoY Growth ~ 8%*

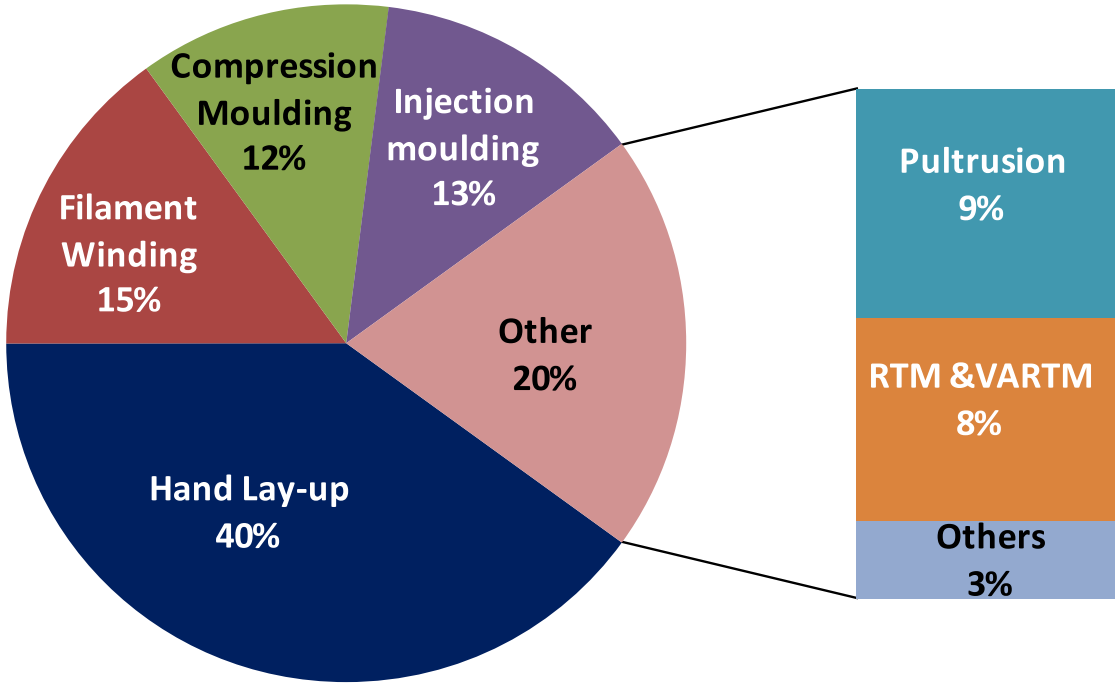
Source : PLASTINDIA FOUNDATION / FRP Institute

# FRP INDUSTRY (2018-19) - INDIA CONTD..

## APPLICATION BREAK UP



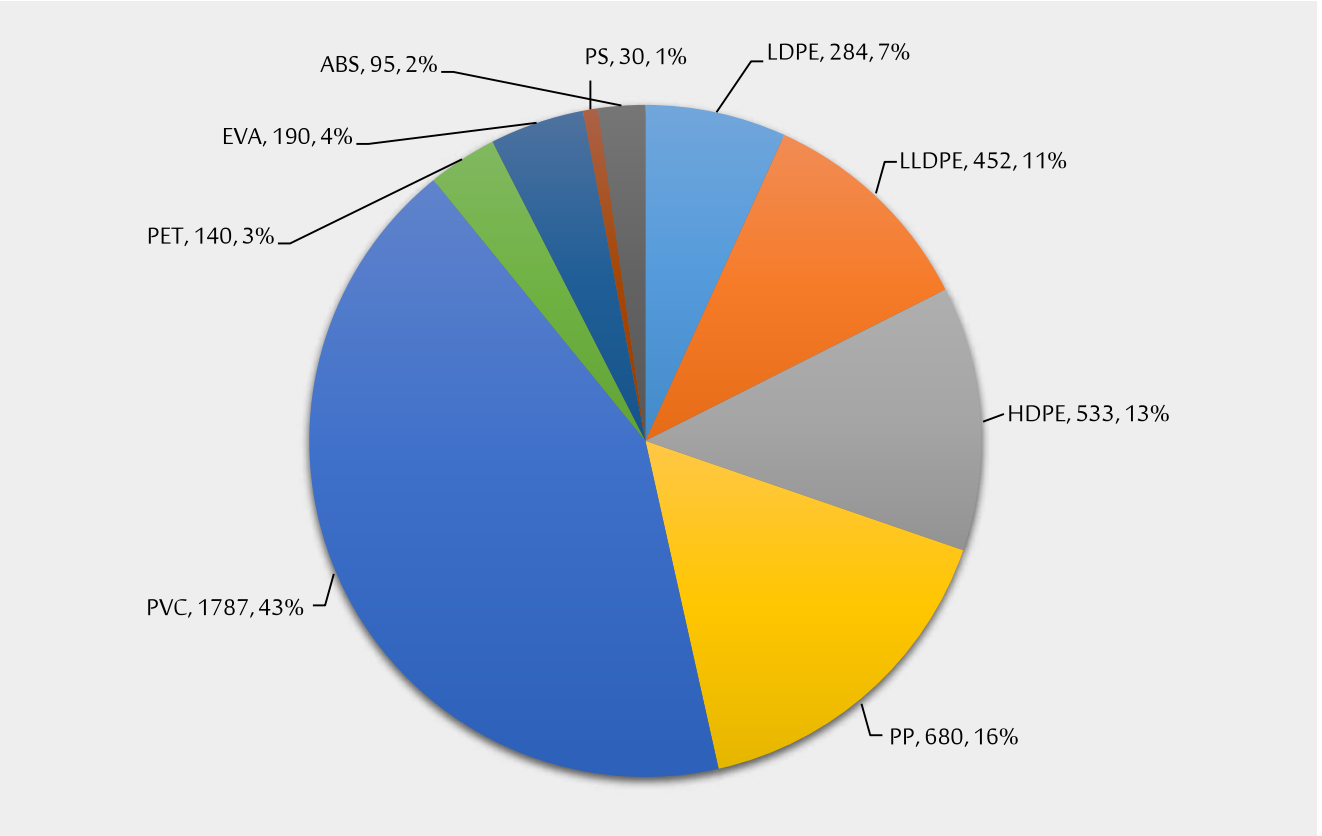

## MARKET DISTRIBUTION BY MANUFACTURING PROCESS




Source : FRP Institute

# IMPORT & EXPORT

# MAJOR PLASTICS RAW MATERIAL (2018-19) - IMPORTS

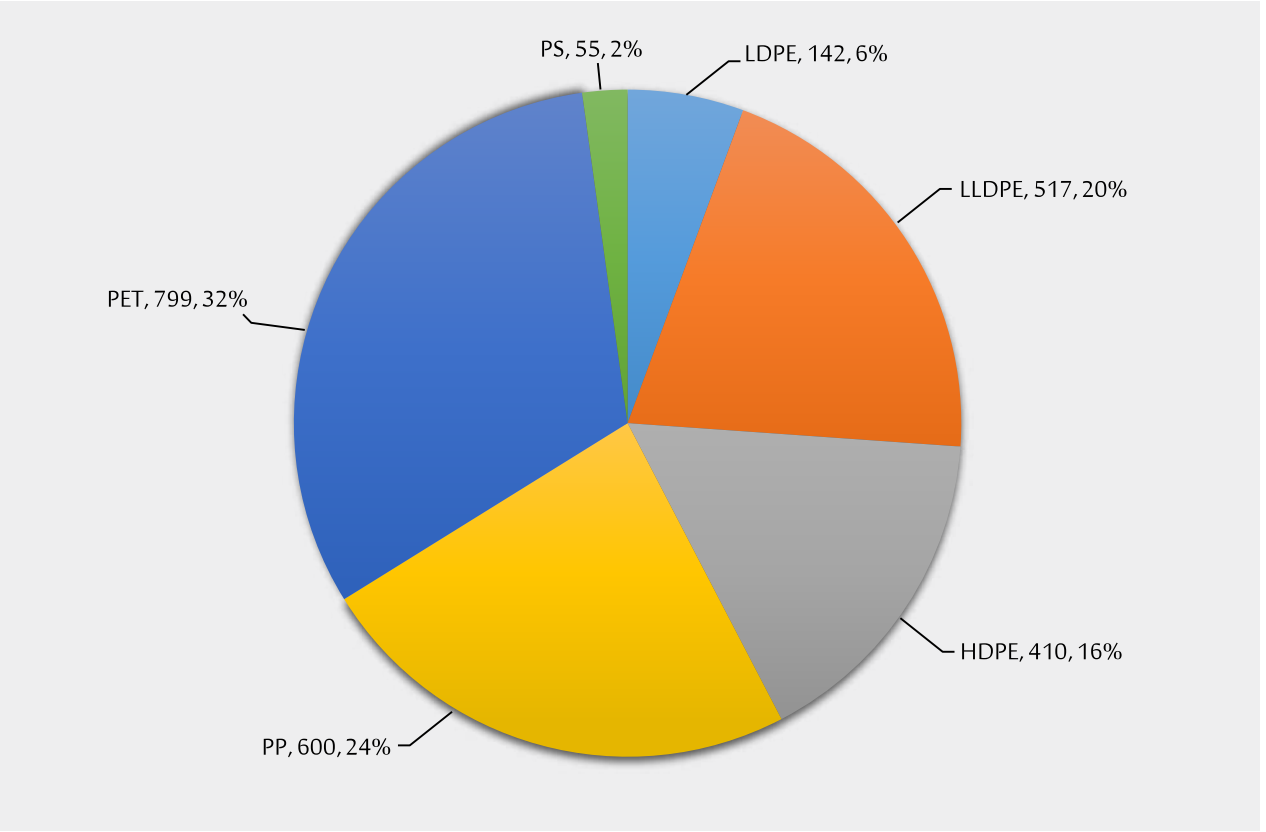



**(All Figs in KT)**

*Polymer Imports 2018-19 - 4191 KT*

Source : CPMA

# MAJOR PLASTICS RAW MATERIAL (2018-19) - EXPORTS

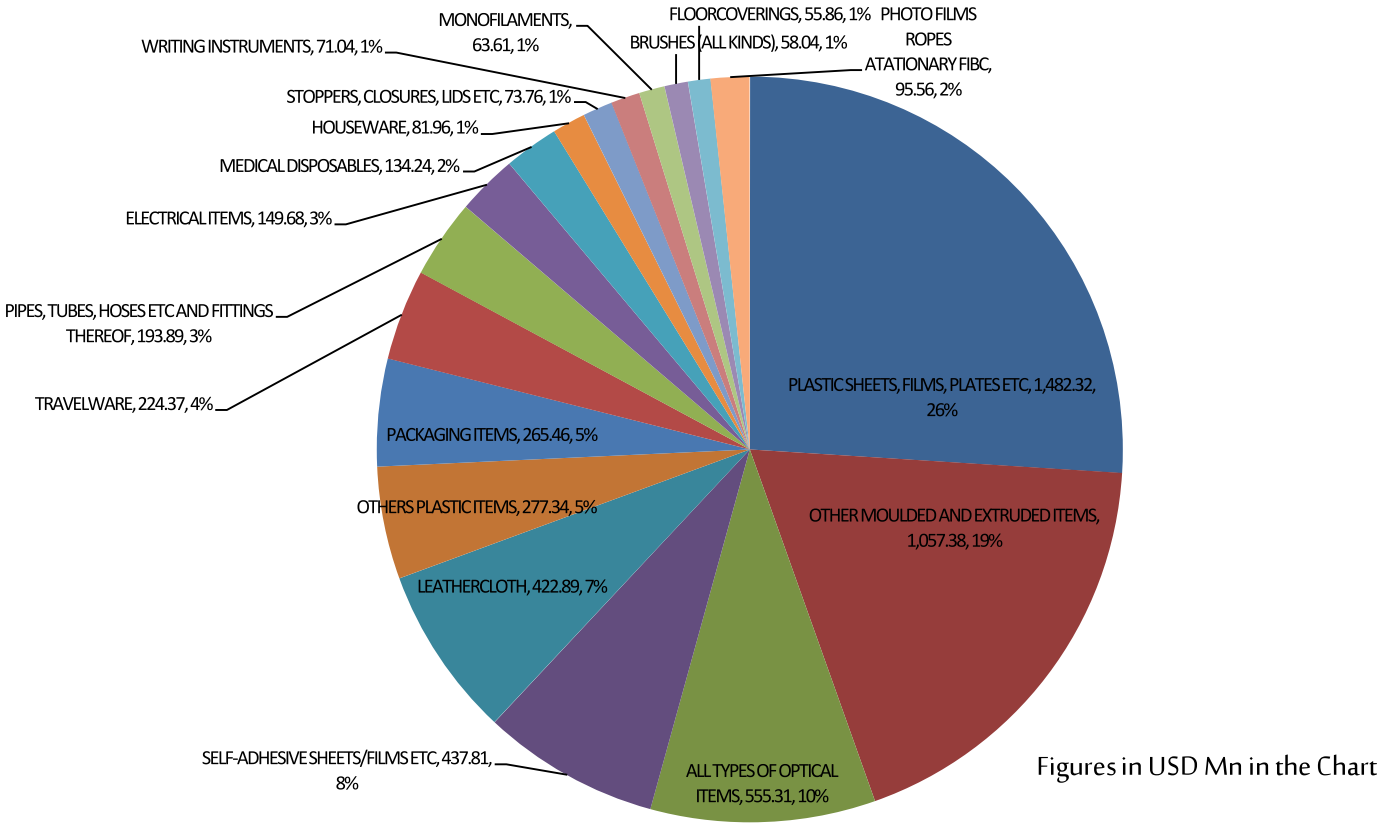



**(All Figs in KT)**

*Total Exports of Polymers 2018-19 - 2523 KT*

Source : CPMA

# IMPORTS OF FINISHED GOODS (2018-19)

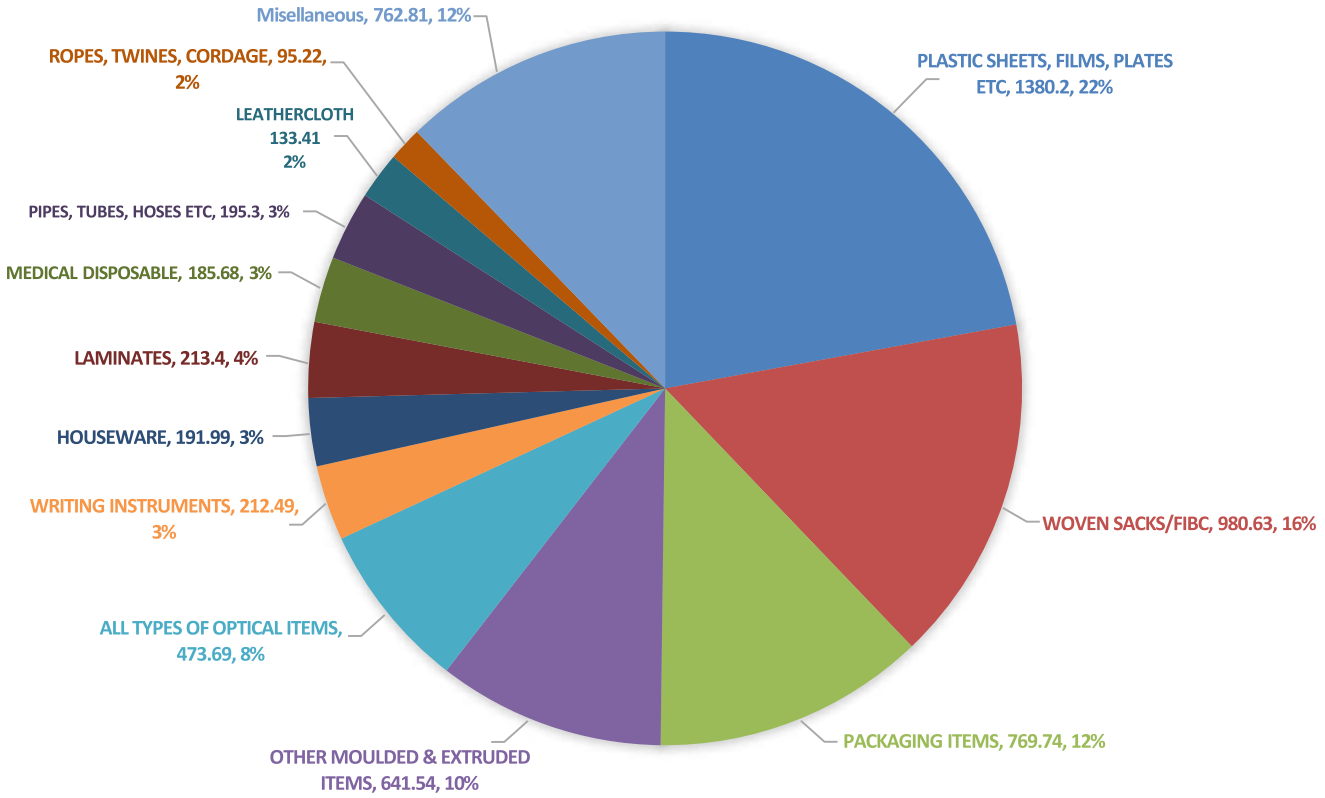



Figures in USD Mn in the Chart

*Total Imports 2018-19 - USD 5.7 bn*

Source Plexconcil

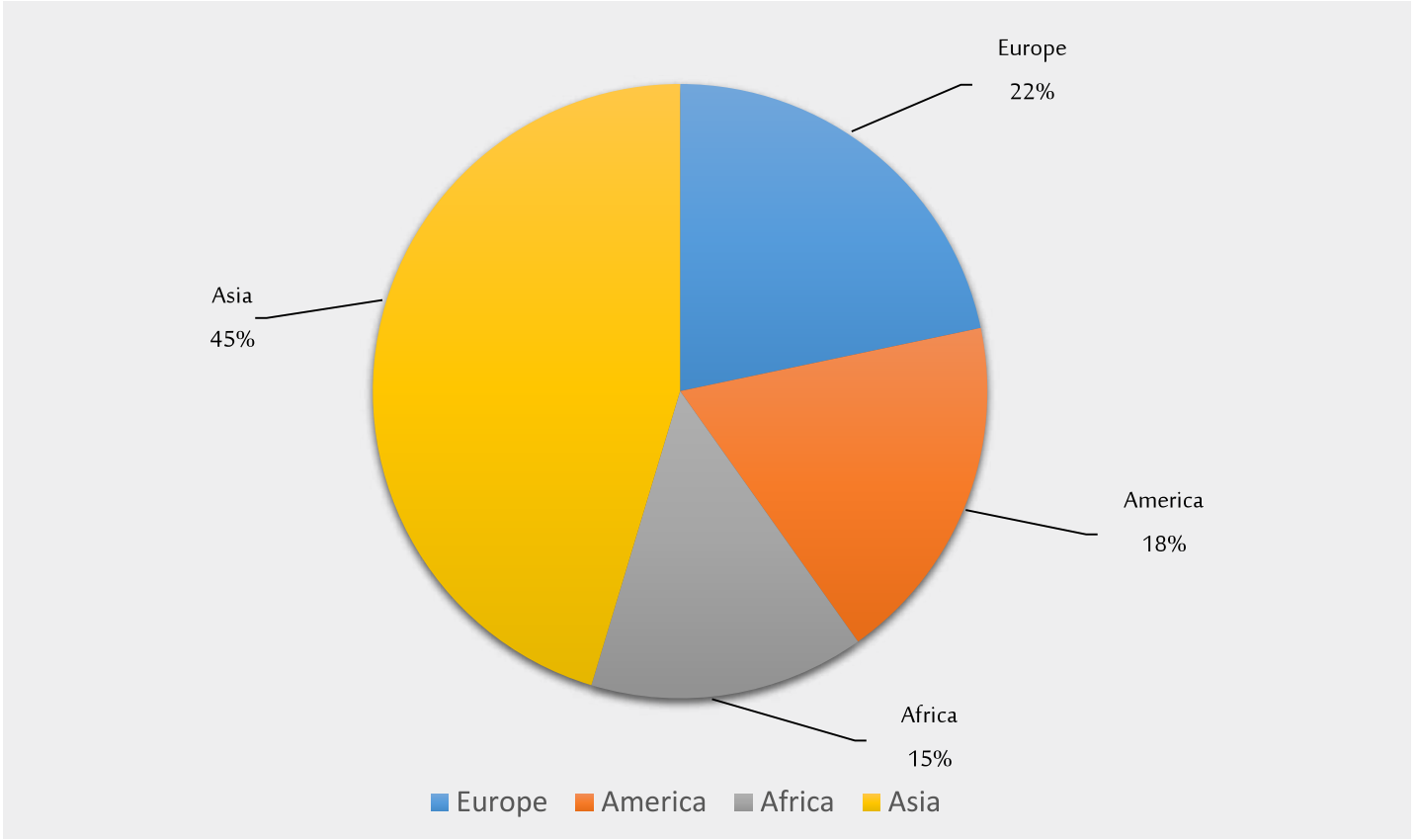
# EXPORTS OF FINISHED GOODS (2018-19)




*Total Exports 2018-19 - USD 6.2 Bn*

Source Plexconcil

# REGION WISE EXPORTS (2018-19)




Source : Ministry of commerce

# Masterbatches

# MASTERBATCH – CURRENT SCENARIO

**Growth Drivers**

Performance Masterbatches;

- cling, anti-bacterial, anti-static, anti-fog,

Foaming agents, bio-degradable etc.

**Sectors**

- Infrastructure
- Raffia
- Plasticulture
- Appliance

**INDIA Masterbatch Market**

| Masterbatch | Demand 2018-19 | Est. 2019-20 |
|---|---|---|
| White/Black/Colour/Additive | 400 | 422 |
| Filler Masterbatch | 921 | 1011 |
| Total | 1321 | 1433 |

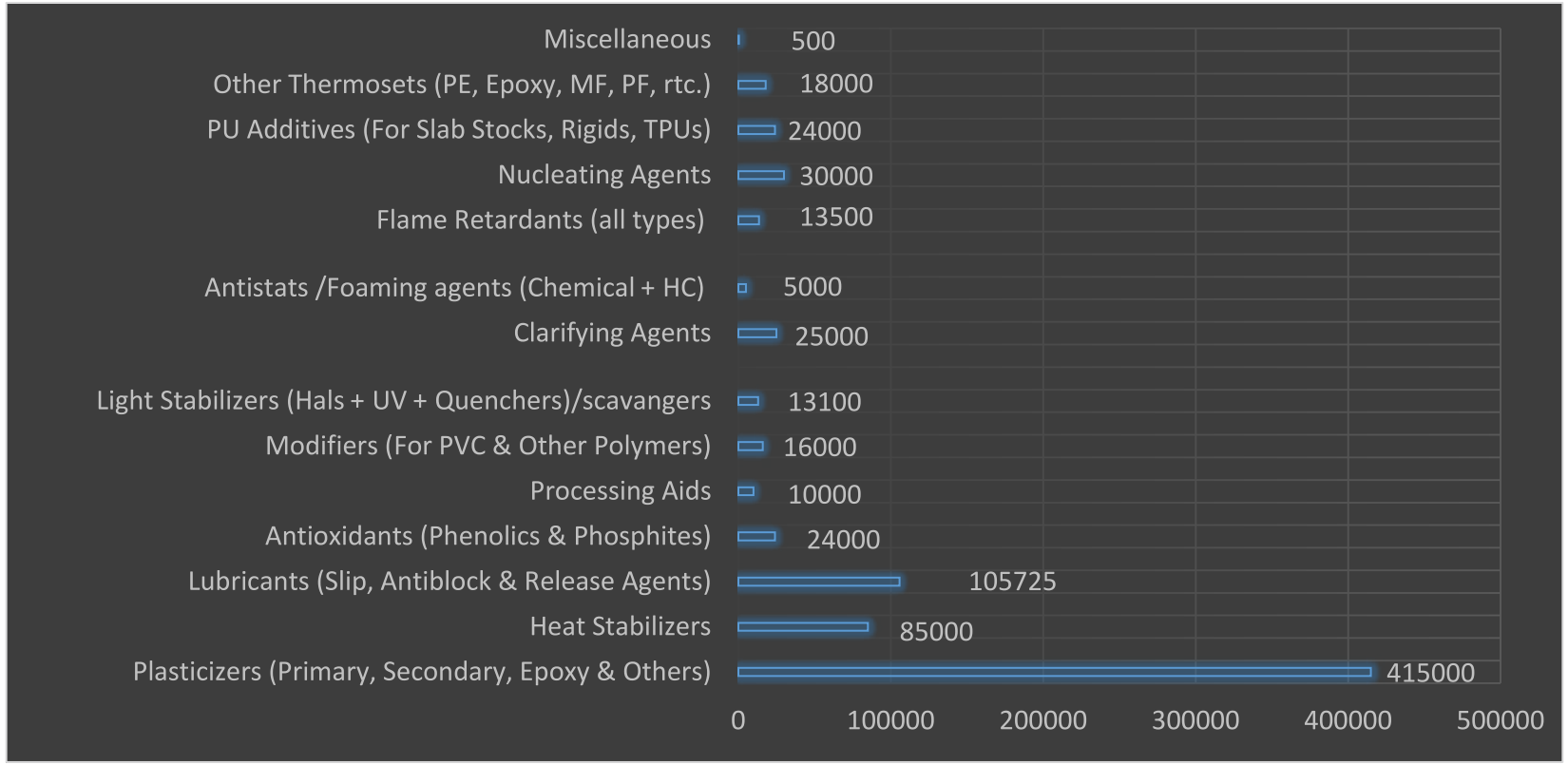
**(All Figs in KT)**

*Masterbatch Manufacturing Units in India ~ 250 nos*

Source : PLASTINDIA FOUNDATION/Industry Estimate

# ADDITIVES

# MAJOR POLYMER ADDITIVE EST. DEMAND (2018-19) - INDIA




**(All Figs in Tons)**

*2018-19 Consumption 785 KT  2019-20 Est. 832 KT  YoY Growth ~6%*

Source : PLASTINDIA FOUNDATION/Industry Estimate

# MACHINERY MANUFACTURING INDUSTRY

Blown Film Extrusion

Blow Moulding

Injection Moulding

Printing

# POLYMER PROCESSING INDUSTRY OVERVIEW

| | |
|---|---|
| Virgin Polymer consumption in 2018-19 | 18450 KT |
| India Per Capita Consumption (Virgin Polymer) | 13.63 kg |
| No of Processing units | ~40,000 |
| No of processing Machines | ~165,000 |
| Processing Capacity | ~50050 KT |
| Processing Capacity CARG | 12.5% last 5 years |
| No. of plastics machinery manufacturing units | ~250 |
| Investment in Machinery, Moulds & Converting lines ( last 5 years) | USD 6.5 Bn |
| Investment required for next 5 years | ~USD 8 Bn (Projected) |

Source : Industry Estimate /PMMAI

# PLASTICS MACHINERY INDUSTRY – PRESENT SCENARIO

- No. of plastic machinery manufacturing units : ~250
- Domestic market Core machinery : ~USD 765 Million in 2018-19
- Machines installed till Mar 2019 : ~165,000
- Installed processing capacity : 50.05 MMT
- Employment : 1.7 Million (direct + indirect)
- Growth in machinery CARG for last 5 years : 13.9%

Source : Industry Estimate /PMMAI

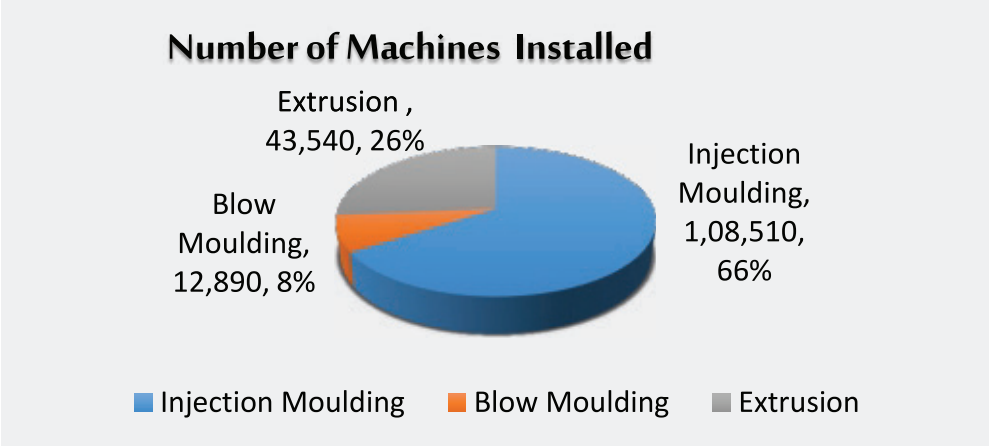
# PRIMARY MACHINERY ADDITIONS – UP TO MARCH 2019

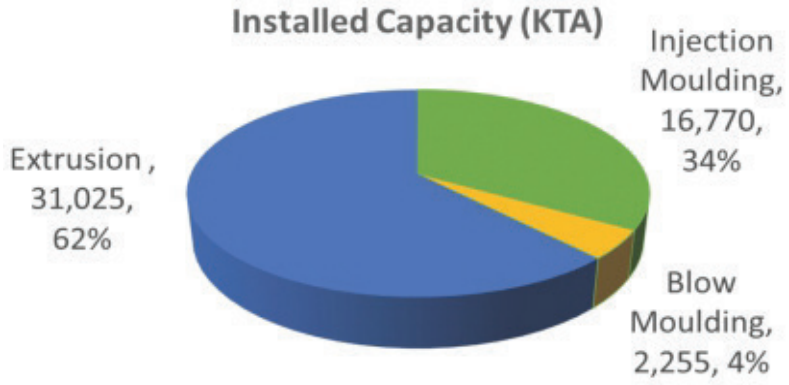
| Process | Segment | 2015-16 | 2016-17 | 2017-18 | 2018-19 | Upto 2018-19 |
|---|---|---|---|---|---|---|
| Extrusion | Machines Added (Nos.) | 1,580 | 1,625 | 3,080 | 2,460 | 43,540 |
| | Installed Capacity (KTA) | 1,610 | 1,710 | 2,678 | 2,345 | 31,025 |
| Injection Moulding | Machines Added (Nos.) | 5,050 | 5,300 | 7,360 | 9,150 | 1,08,510 |
| | Installed Capacity (KTA) | 1,035 | 1,105 | 1,440 | 1,830 | 16,770 |
| Blow Moulding | Machines Added (Nos.) | 490 | 770 | 790 | 840 | 12,890 |
| | Installed Capacity (KTA) | 135 | 145 | 160 | 195 | 2,255 |
| Total | Machines Added (Nos.) | 7,120 | 7,695 | 11,230 | 12,450 | 1,64,940 |
| | Installed Capacity (KTA) | 2,780 | 2,960 | 4,278 | 4,370 | 50,050 |

**(Excludes mortality)**

Source : Industry Estimate /PMMAI

# MACHINERY ADDITIONS – UP TO MARCH 2019




| Machine Type | No. of Machines Installed | *Installed name plate Capacity (KT) |
|---|---|---|
| Injection Moulding | 108,510 | 16,770 |
| Blow Moulding | 12,890 | 2,255 |
| Extrusion Total | 43,540 | 31,025 |
| Monolayer Film | 13,010 | 2,670 |
| Multilayer | 1,690 | 1,795 |
| BOPP | 40 | 900 |
| PPTQ Film | 3745 | 995 |
| Raffia | 2,290 | 4,140 |
| PO Pipes | 1,960 | 2,965 |
| RPVC Pipe | 6,960 | 8,075 |
| Others | 13,845 | 9,485 |
| Total | 164,940 | 50,050 |

*Based on Highest output rate

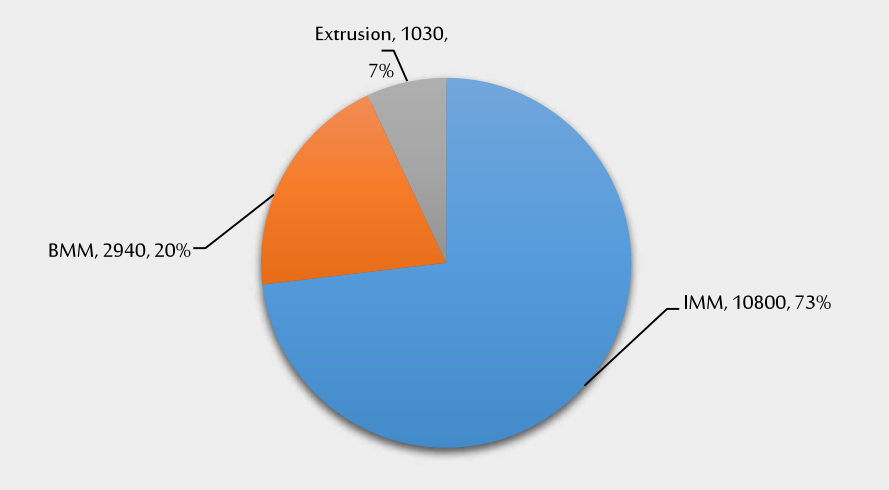
(Excludes mortality)

*Installed Capacity being ~ Double the Quantity Processed!*

Source : Industry Estimate /PMMAI

# PLASTICS MACHINERY DEMAND & GROWTH PROJECTIONS

| Description | 2018-19 | 2019-20(E) | 2020-21(E) | 2021-22(E) |
|---|---|---|---|---|
| IMM | 9,150 | 9,250 | 10,000 | 10,800 |
| Extrusion | 2,460 | 2,610 | 2,770 | 2,940 |
| BMM | 840 | 900 | 970 | 1,030 |
| Total machines | 12,450 | 12,760 | 13,740 | 14,770 |




*Projection for 2021-22 - 5.9%, IMM - 5.7%, Extrusion - 6.1%, BMM - 7%*

Source : Industry Estimate /PMMAI

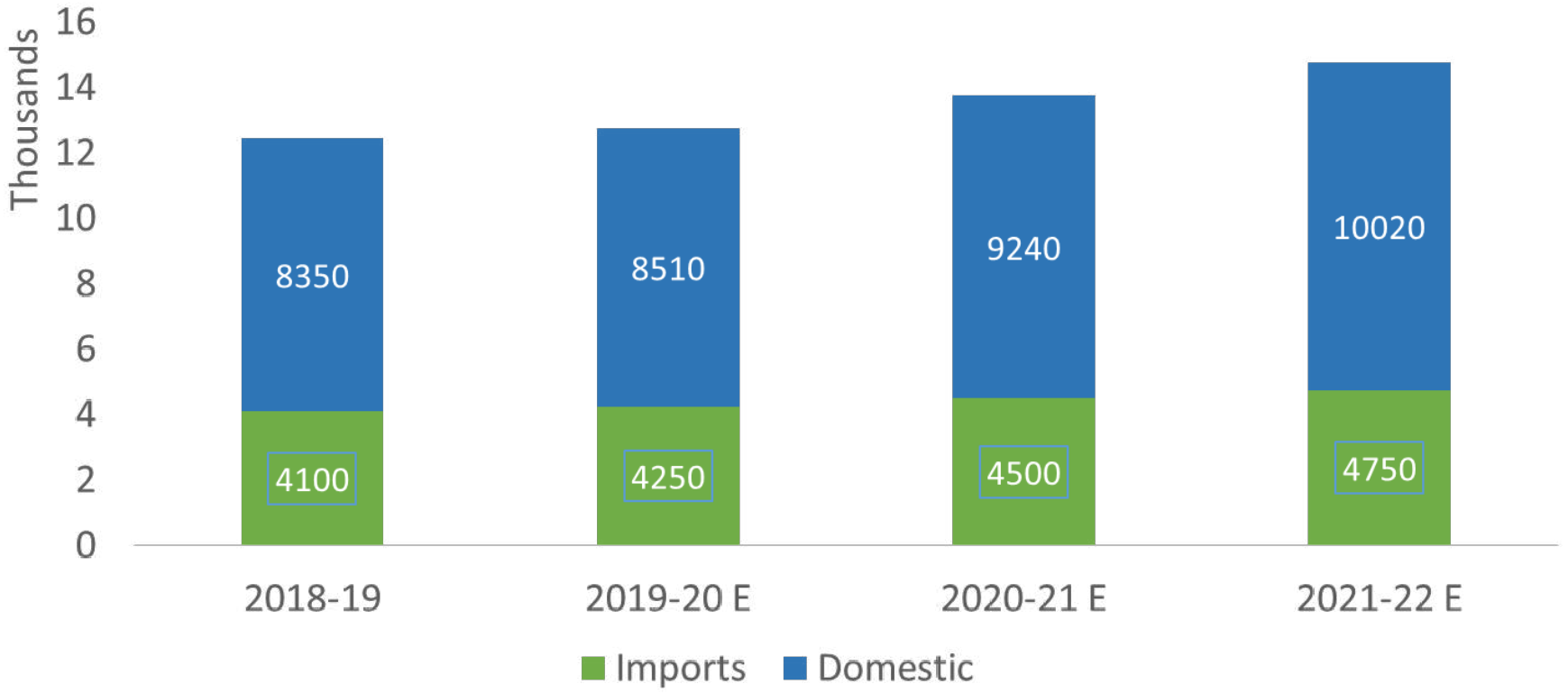
# INJECTION MOULDING MACHINERY CAPACITY ADDITION

| Tonnage Range | 2018-19 | 2019-20 Est. | 2020-21 Est. | 2021-22 Est. |
|---|---|---|---|---|
| Upto 110 T | 3160 | 3,175 | 3,350 | 3,585 |
| 120-275 T | 4240 | 4285 | 4715 | 5000 |
| 300 -450 T | 1025 | 1,060 | 1,150 | 1350 |
| 500-950 T | 618 | 630 | 675 | 750 |
| > 1000 T | 107 | 100 | 110 | 115 |
| Total | 9150 | 9250 | 10000 | 10800 |

*Projection for 2021-22 - 5.7% CAGR*

Source : Industry Estimate /PMMAI

# PLASTICS MACHINERY : DECLINING SHARE OF IMPORTS




*Growth in Domestic Machinery Sales - 6.3%, Imports - 5.0%*

Source : Industry Estimate /PMMAI

# INDIAN TECHNOLOGY COMPETES GLOBALLY

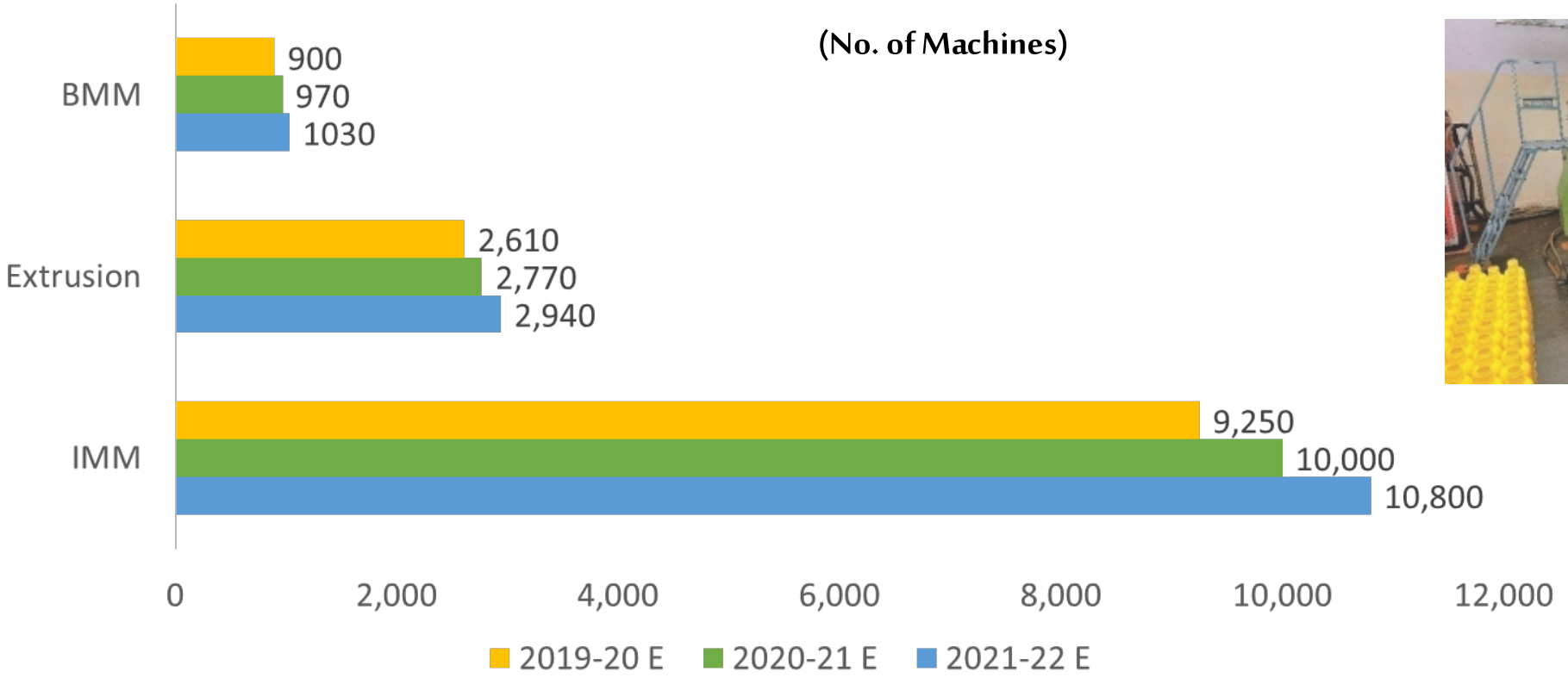
- Injection Moulding Machines
- Compounding Lines
- Tape Lines and looms
- Multilayer Film plants
- Lamination Plants
- Pipe / Drip extrusion lines
- Recycling

- Blow moulding Machines
- Rotomoulding Machines
- Thermoforming Machines
- Thermosetting Presses
- Compression Presses
- Sheet lines
- Auxiliary equipment

- Machinery manufactured to current technologies of energy efficiency, high productivity and through-put.
- Leading Global brands from Europe, USA, Japan, China and Taiwan have manufacturing presence in India, through Joint Ventures or fully owned subsidiaries
- Machineries are produced with automation adaptabilities and Industry 4.0 capability
- Indian manufacturers export to 50 countries across the globe, to developing and developed nations.

Source : Industry Estimate /PMMAI

# OPPORTUNITIES BY 2021.....




*Project Investment to the tune of USD 16 Bn in next 5 years*

*IM, BM, Pipes, Raffia are Growth Drivers*

Source : Industry Estimate /PMMAI

# AUXILIARY EQUIPMENT

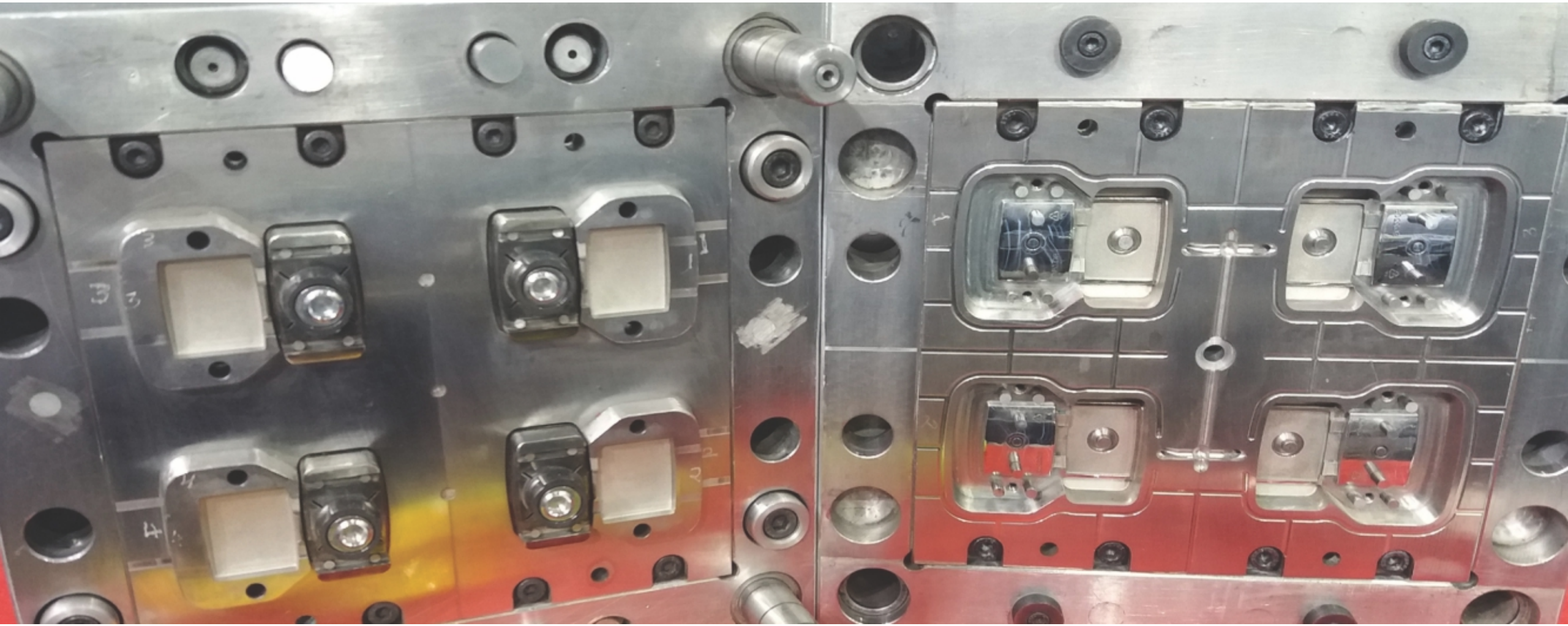
# AUXILIARY EQUIPMENT INDUSTRY (2018-19)

| Auxiliary Equipment's in Plastics Industry | |
|---|---|
| **Product** | **Units** |
| Chilling plant | 9000 |
| Mould temp. Controller | 1500 |
| Drying System | |
| - Hot Air Dryer | 6000 |
| - Dehumidified Air Dryer | 1200 |
| Raw Material ConveyingSystem | |
| - Hopper Loader | 12000 |
| - Central ConveyingSystem | 250 |
| Volumetric/Gravimetric Blending System | 1200 |
| ConveyorBelt with Coumting System | 1000 |
| Granulator | 5000 |
| Robot | 500 |
| Hot Runners | 1200 |

*Auxiliary Equipment Share - 10-15% of Machinery Business*

Source : Industry Estimate

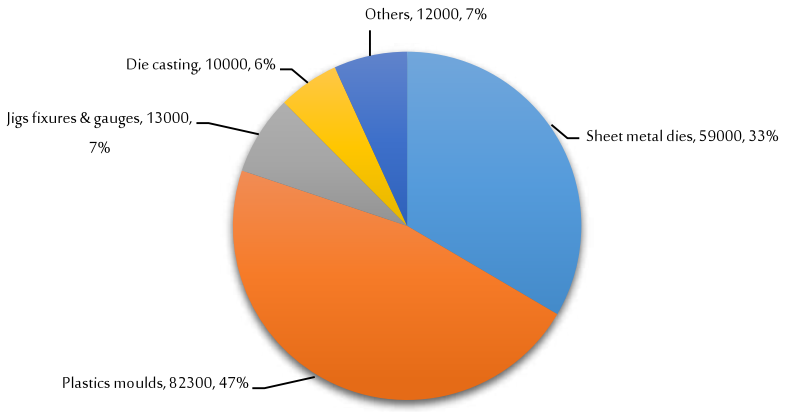
# TOOLING INDUSTRY



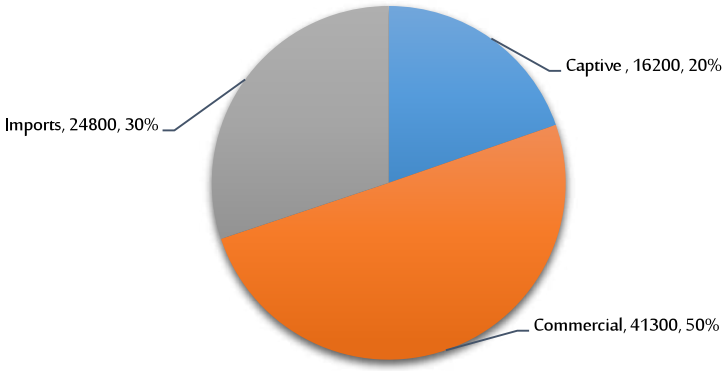
# INDIAN PLASTICS TOOLING INDUSTRY (2018-19)

- Comprising : In-house Tool Rooms (Captive) - Mostly with Automotive OEM's & Tier 1 Suppliers.
- Commercial Tool Rooms (Manufacturers of Plastics Moulds) - 580 nos.
- Estimated Total Domestic market of tooling for FY 2018-19 : INR 176.3 Billion
- Estimated Plastics mould market INR 82.3 Billion

**Total Domestic Tooling Market 2018-19 Rs 176.3 Billion**




**Plastic mould market 2018-19 Rs 82.3 Billion**



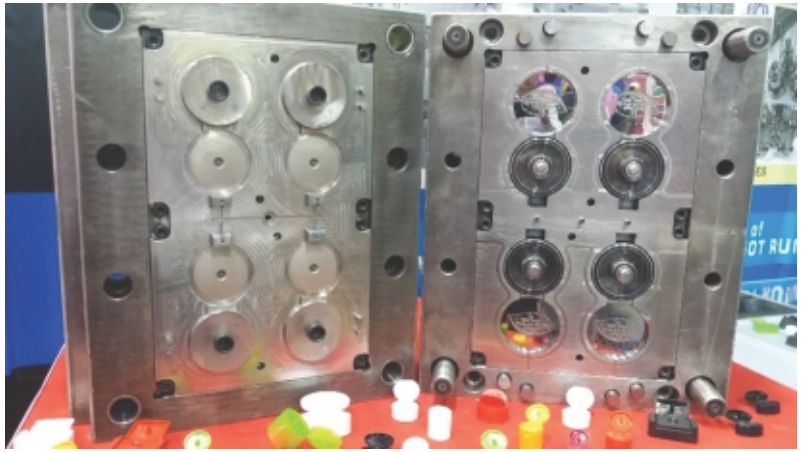

All Fig. in graphs are in Rs million

***Plastics Moulds Cater to Automotive, Appliances, Houseware, Furniture, Packaging, Electric & Electronics***

Source : Industry Estimate /TAGMA

# INDIAN PLASTICS TOOLING INDUSTRY

| Industry Vertical | Rs million |
|---|---|
| Automotive | 25246 |
| Plastics Products for Market | 24865 |
| Consumer Applications | 16077 |
| Electricals | 5332 |
| Packaging | 5077 |
| Electronics | 3779 |
| General Engineering | 359 |
| Others | 1565 |
| Total | 82300 |



Source : Industry Estimate /TAGMA

# ESTIMATED VALUE OF INDIAN PLASTICS INDUSTRY 2018-19


# EST. INDIAN PLASTICS INDUSTRY MARKET SIZE

| Est. Market Size of Plastics Industry (2018-19) - India | |
|---|---|
| **Description** | **Value in Rs Lakh Crore** |
| Plastics Products Manufactured | 2.64 |
| Plastics Raw Material Exported | 0.21 |
| Plastics Finished Goods Imported | 0.4 |
| Recycled Plastics Products Manufactured | 0.35 |
| Additives, Fillers, Colour Masterbatches etc. | 0.2 |
| All Machinery (cumulative) & Moulds | 1.2 |
| Miscellaneous like Test Equipment etc. | 0.1 |
| Total Value (Rs in Lakh Crore) | 5.1 |
| Value (USD in Billion) | 73 |

*Estimated 2018-19 Market Size ~Rs 5.1 lakh Crore (~USD 73 Bn)*

Source : Industry Estimate / Mr. Jayesh Rambhia

# SECTOR WISE GROWTH OPPORTUNITIES

# PACKAGING

# PACKAGING

## Major Products

**Flexible**

Plain Covers For Grocery, Textile, Barrier Film Pack For Oil, Chemical, Confectionary, Chocolate, Snacks, Processed Food, Marine Products, Toiletries Etc., Pouches, Laminates, Zip Lock Bags, Bubble Film & PE Foam For Safe Transportation of Machine Parts, Fragile Products, Mail Cover, Blister Packs for Medicine, Stretch Cling Film For Food Products, Heat Shrink Film For Books, Tamper-proof, Cement, Fertilizer, Sugar & Commodities Packaging, FIBC for Larger Packing etc.

**Rigid**

Containers for Oil, Water, Beverages, Cosmetics, Medicine, Pesticides, Paints, Lube Oils, Large Barrels for Oils Chemicals, Pharma intermediates, EPS Foam for Electronics Goods etc.

*Estimated Growth - 9%*

# PACKAGING CONTD..

## Major Plastics Types – PE, PP, PVC, PET, PA, EVOH....

### Why Plastics

Protects & Keep Food Fresh Longer, Hygiene, Tamper-proof,

Shatter-proof Reduces Potential of Injury, Light Weight,

Amenable to High Speed Packing, Economical

Major Processing - Extrusion, Injection, Blow Moulding,

Thermoforming etc

### Major Growth drivers

- Cost Effectiveness
- Functional Features
- Ease of Availability
- Increased Shelf Life
- Increased Distribution Radius
- Availability of Seasonal Products throughout the year

# PACKAGING CONTD....

| Flexible | Major Plastics |
|---|---|
| Plain film | TQPP, PE blown film, BOPP, PP cast film, BOPET |
| Multilayer film | PE/PP/PA/EVOH & combination |
| Laminates | PE/PP( including cast and Biaxially oriented) as such or in combination with Aluminium and or Paper etc,., |
| Blister packing | PVC/PET /PP |
| Cement, fertilizer , sugar rice etc | PP/PE woven sacks, PP Non Woven bags |
| FIBC | PP with PE liner optional |

| Rigid | Major Plastics |
|---|---|
| LARGE BARREL PACKING | PE |
| Cosmetic, Toiletries , Pesticides, Other Small Packs | PP/PE |
| Paint Pail, Lube oil | PP |
| Secondary Packing for Electronic Goods | EPS Foam, PE Bubble film, PE Foam |
| Water bottle, Smaller Oil Container, Beverages, Water Can etc. | PET |

# INFRASTRUCTURE

# INFRASTRUCTURE

## MAJOR PRODUCTS

- Pipes for (gas, water supply, sewerage, OFD, plumbing, Agri& Industrial piping )

  Doors & windows profile, window panels, laminates, wood plastics, foam insulation, Geo synthetics, Expansion joints sealants, floor protective sheets, wall panels, Industrial & hospital floorings, plastics parts in water taps & flushes, toilet seats, submersible pump parts, synthetic tiles & marbles, roto molded water & chemical tanks, buried roto molded /FRP septic tank, ducts wire & cable etc.,

## MAJOR GROWTH DRIVERS

- Govt. Projects ( Roads/ airports/ ports/railways/ electrification etc.,)
- Durable & Long life.
- Ease of transportation
- Lowering dependence of fossil fuel thru gas based economy with PE pipes for distribution

Estimated Growth - 8%

# INFRASTRUCTURE CONTD..

- **Major Plastics Types**– PE, PP, PVC, PET, PC, PA
- **Why plastics ?**
  - ✓ Safe Water transportation - Pipes
  - ✓ Resistant to corrosion , moisture, chemical & termite – Doors window profile/ tanks etc.,
  - ✓ Heat & noise Insulation - Foam & window profile
  - ✓ Industrial /hospital floor protection from dusting, chemicals & abuse
  - ✓ Geo synthetics for drainage & road reinforcements
  - ✓ Expansion joint protection
  - ✓ Long lasting – Almost all the products, much more
- **Major processing-** Extrusion Injection, thermoforming, compression moulding, rotomoulding, casting, etc.,

| Types | Major Plastics |
|---|---|
| Pipes | PE, PVC, PP, FRP etc. |
| Door & window profile | PVC, Wood Plastics, Laminates etc. |
| Industrial/ hospital floorings | Epoxy, PVC etc. |
| Others | FRP, Engineering plastics like PPO, POM, PC, Polyester, Styrenics including all Commodity Plastics |

# AGRICULTURE

# AGRICULTURE

## HIGHLIGHTS

- Second In Fruits And Vegetables Production In The World
- Production - 90.2 MMT Fruits & 169.1 MMT Vegetables ( 2016-16)
- Largest Producer Of Ginger And Okra And Ranks Second In Production Of Potatoes, Onions, Cauliflowers, Brinjal, Cabbages, Etc
- First In Production Of Bananas (25.7%), Papayas (43.6%), Mangoes and Guavas (40.4%)




**During 2018-19, India exported fruits worth of 692.01 USD Millions and vegetables worth 777.25 USD Million**

*Estimated Growth - 4 %*

Source: http://apeda.gov.in/apedawebsite/six_head_product/FFV.htm

# AGRICULTURE CONTD..

- **Major Plastics Products**

  Greenhouse films, Low tunnels, Micro irrigation, Drip/Sprinkler, Mulch films, Crates, Pallets, bird net, fruit cover, pond lining etc.,

- **Major Plastics Types–** PE,PP,PVC,PC Non woven, PA,

- **Why plastics ?**
  - ✓ Water conservation
  - ✓ Weed control
  - ✓ Preventing insect/ bird attack
  - ✓ Controlled atmosphere for growth
  - ✓ Yield improvement
  - ✓ Safe transportation
  - ✓ Waste reduction of produce
  - ✓ Soil solarisation

- **Major processing-** Majorly Extrusion followed by Injection, Thermoforming etc.,

| Types | Major Plastics Products |
|---|---|
| Green house | PE film, PC sheets, PP trays, PE drip lateral, Plastics pipes etc. |
| Drip lateral | PE drip lateral piles, PP dripper, PVC/ PE pipes system, PP disc filter etc. |
| Nets / cover | Fruit cover (Nonwoven & PE film), Bird nets |
| Sprinkler | PVC / PE pipes for water transportation |
| Others | PE mulch film, PP leno bags, PE raschel bags, PP/PE woven sack bags, PE/PP crates, Rotomolded tanks, Thermoform trays etc. |

*India's share in the global market is still nearly 1% only…… more potential exist*

# AGRICULTURE CONTD..

**Major Benefits of Plasticulture**

- Water Conservation
- Yield Improvements
- Govt. subsidy/Initiatives
- Ease of product availability
- Wastage reduction
- Free from insect bite and uniformity in size of produce.
- Food security for 1.3 billion people thru enhancing food production with Plastics

# AGRICULTURE CONTD..

| Product | Drip | Sprinkler | Mulch | Shade net | Greenhouse films | Pond lining | Bale Silage | Leno Bags | Fruit & Crop Cover |
|---|---|---|---|---|---|---|---|---|---|
| Plastics | PE | PE | PE | PE | PE | PE | PE | PP | PP non woven |
| Approx. Consumption (in KTA) | 115 | 75 | 35 | 13 | 5 | 72 | 9 | 94 | 3 |
| Usage level India (Penetration) | 15% | 11% | 3% | 3% | 3% | 10% | 3% | 70% | 85% |
| Life of the product | Minimum 5 Years | Minimum 5 Years | 9-12 months | 3-5 Years | Minimum 3 years | Minimum 5 Years | 1 year | 1 year | 1 year |
| Recovery of Product | Recycled | Recycled | Recycled | Recycled | Recycled | Recycled | Recycled | Recycled | Recycled |
| Present usage for most common crops | Orchard Plants, Cotton, Flowers, Vegetables | Cereal Crops, Oilseed, Pulses | Orchard Plants, Cotton, Flowers, Vegetables | Vegetables | Flowers and Vegetables, Nursery plantation | Farm ponds, Fishery ponds | Fodder | Fruits & Vegetables | Fruits & Vegetables |
| Govt support for promotion | Subsidy from Central & State Govts. | | | | | | State subsidy in few states | | |
| Yield improvement for certain crops | up to 20% in some crops | | up to 40% in majority crops | up to 50% in majority crops | 3 to 4 to times in majority crops | -- | -- | -- | up to 20% in some crops for crop covers |
| Future trends | Contract farming is coming up with private investments<br>usage of drip lateral in sugarcane | | | | | | | | |

Source : Industry Estimate

# APPLIANCES & CONSUMER ELECTRONICS (ACE)

- **Major Products**
  - ✓ TV/WM/Refrigerator/AC/ Microven/
  - ✓ Smart phones/ other brown goods like
  - ✓ Fan / Iron box/Mixer/Dryer etc
- **Industry Size in 2018-19 ~10 bn USD***

*Mobiles and Brown Goods not included*

**Growth 2018-19**

| | |
|---|---|
| Microwave | 6% |
| Air Conditioner | 7% |
| Washing Machine | 9.5% |
| Refrigerator | 9.5% |
| Television | 10.5% |

***Estimated Growth - 9.5%***

Source: CEAMA

# APPLIANCES & CONSUMER ELECTRONICS (ACE) CONTD..

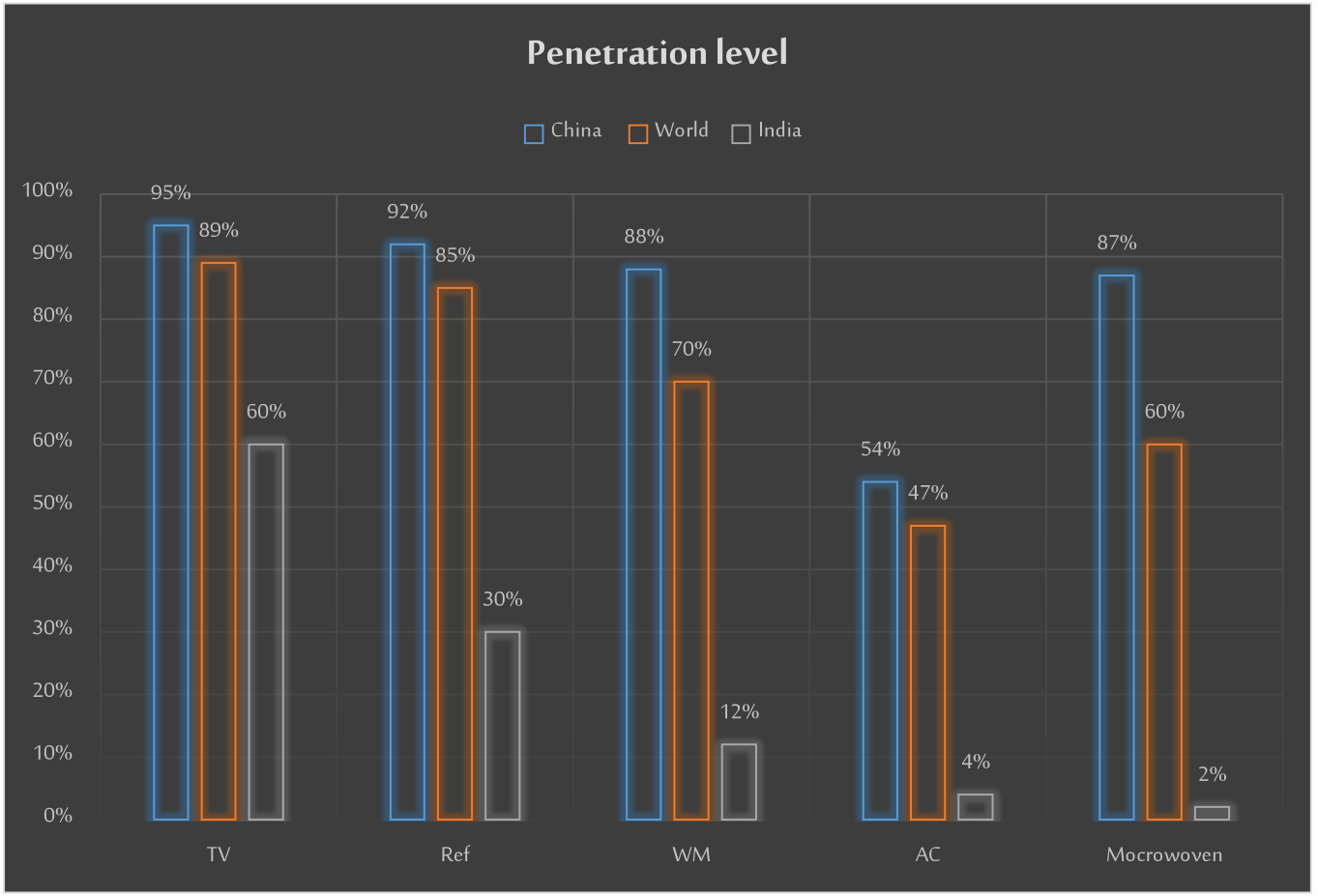
- **Major Plastics Types–** ABS, HIPS,PP, PE, POM, PA, PVC, PC, PU etc.
- **Why plastics ?**
  - ✓ Aesthetics
  - ✓ Light weight
  - ✓ Ease of processing
  - ✓ Part consolidation
  - ✓ Functional – Resistance to heat and electricity
  - ✓ Corrosion resistance
- **Major processing-** Majorly Injection moulding followed by Extrusion, Thermoforming etc.

| Types | Major Plastics Products |
|---|---|
| WM | Outer body/Tub/ Pulsator/Top lid/Drainage pipe/ Inner drum/dryer cap/PCB etc., |
| Refrigerator | Liner/vegetable Trays/ Handle/ ice cube holder/Table top/ Lamp holder etc., |
| AC | Indoor unit cover/ Louver/ Remote control unit/ separator etc., |
| TV | Outer cabinet/ Back cabinet/ PCB/Remote control unit etc. |
| Mobile | Outer cover/ Charger/ PCB/ Earphone plug etc. |
| Mixer | Mixer body/ mixer unit cover etc. |

# APPLIANCES & CONSUMER ELECTRONICS (ACE) CONTD..

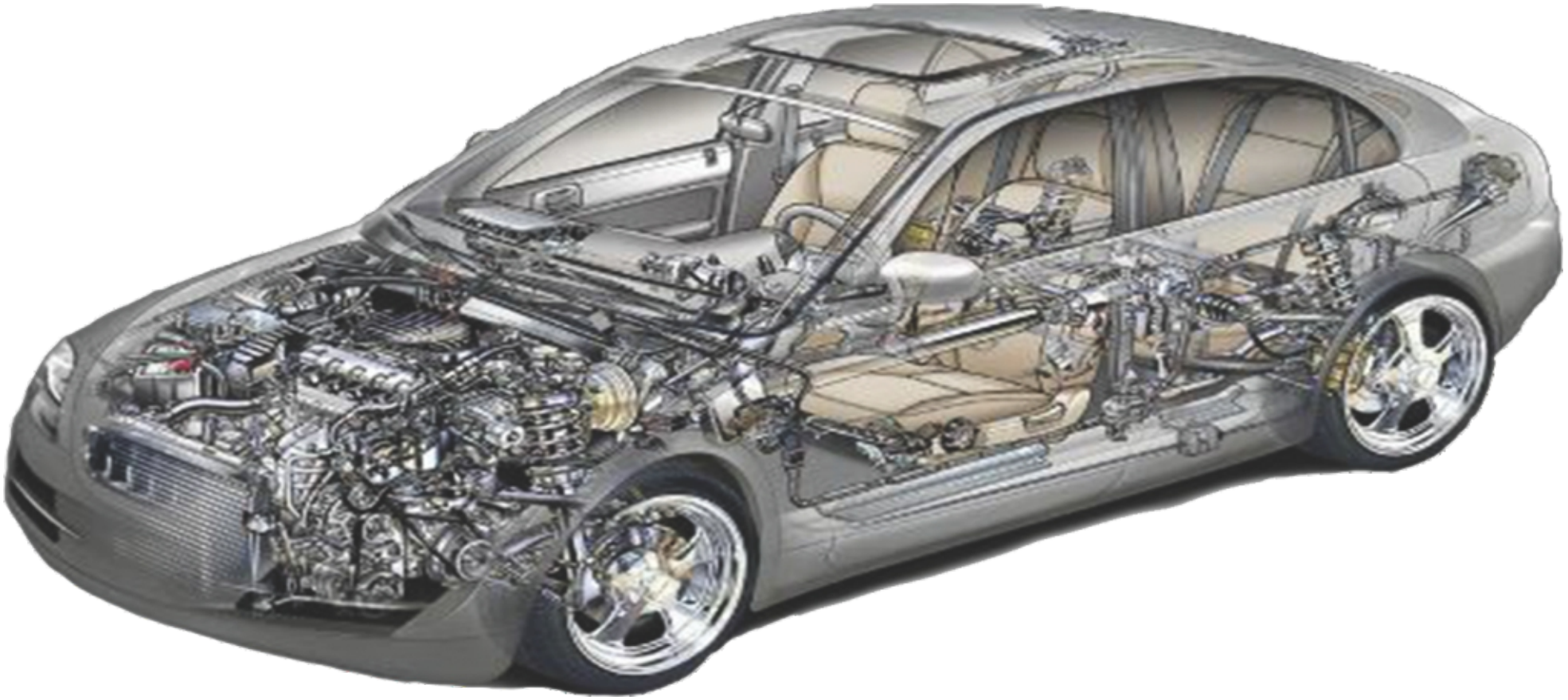
❖ **Major Growth Drivers**

- ✓ Low penetration India Vs Global
- ✓ Fast technology upgradation
- ✓ Low life cycle
- ✓ Economic growth



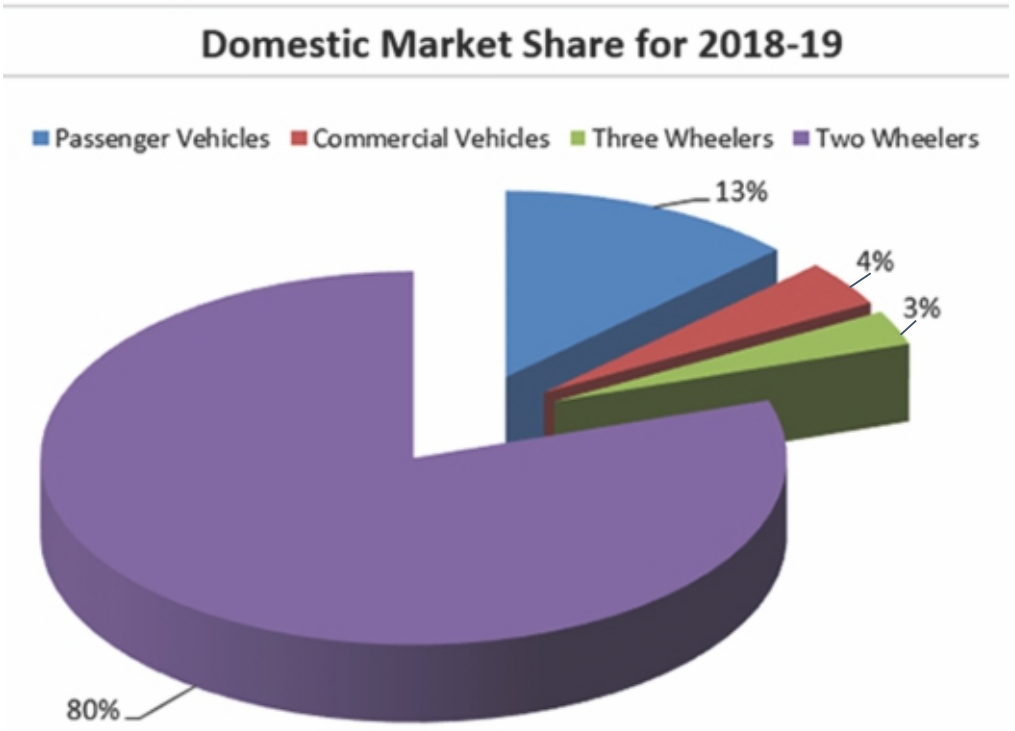

Source: CEAMA/PWC report on –Future of Electronics & Consumer durable in India – Changing land scape

# AUTOMOTIVE



# AUTOMOTIVE

- **Major Products**
  - ✓ Passenger vehicles(PV), Commercial vehicles(CV), Three wheelers(3W), Two wheelers(2W) and Quadricycle
  - ✓ Production 2018-19 - 30,915,420 vehicles
- **Overall Growth % - 5.15% Over 2017-18**
- **PV- 2.7%, CV-17.55%, 3W- 10.27%, 2W -4.86% Export – 14.5%**




*Fourth Largest in PV Production….*

Source: SIAM

# AUTOMOTIVE CONTD....

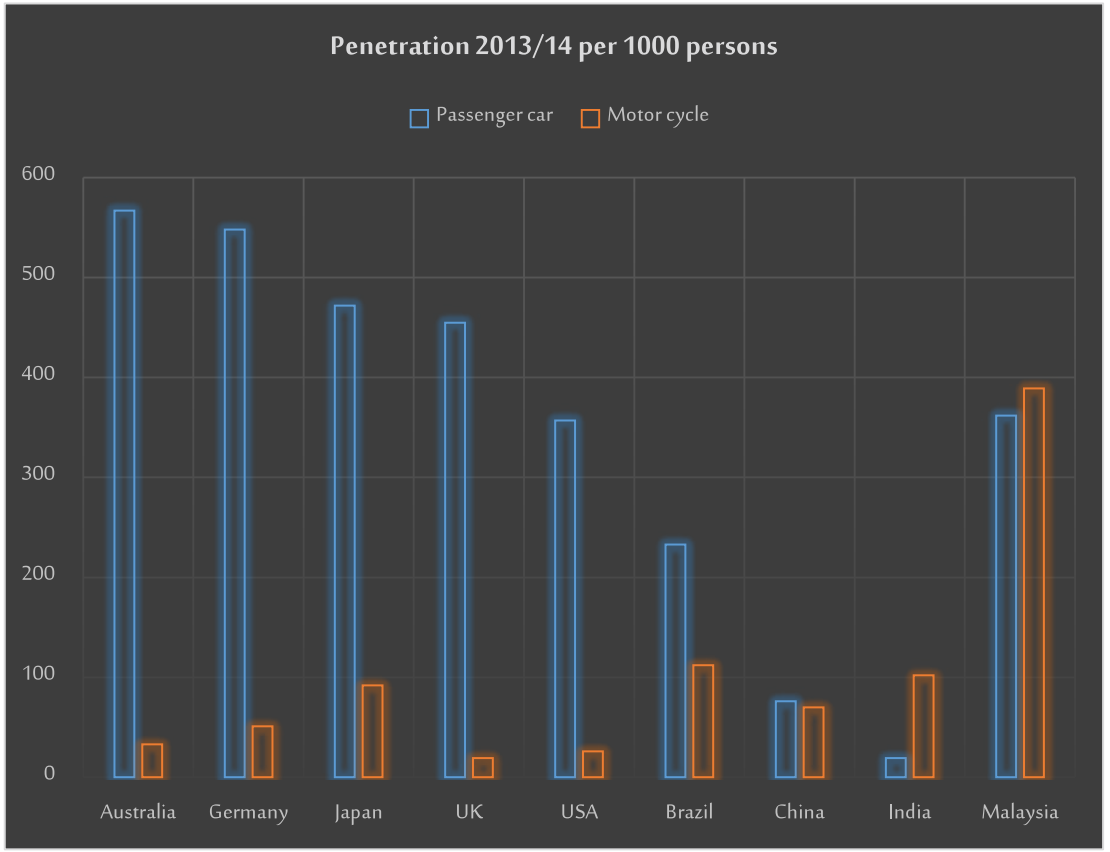
- **Major Plastics Types** PP/PE/ABS/POM/PA/PVC/PC/PU/FRP/PBT/PPS/ASA/PPO etc.
- **Major Advantages**
  - ✓ Light weighting – Fuel saving
  - ✓ Safety – seat belt / air bags/shatter resistant glass
  - ✓ Ease of processing
  - ✓ Part consolidation
  - ✓ Functional – Corrosion resistance etc.
  - ✓ Aesthetics
- **Major processing** - Injection Moulding, Blow Moulding, Extrusion, Rotomolding, Thermoforming etc.

| Types | Major Plastics Parts |
|---|---|
| PV | Bumper, Instrument Panel, Arm rest, Luggage trims, Pillar trims, Steering wheel cover, Fuel tank, engine parts, mirror housing, light housing.radiator grill, weathering strip , battery casing, side fenders Etc., |
| Two wheeler | Seat base, fenders, speedometer housing, mirror housing, helmet box, light housing, chain cover, grab handle wind shielder, fuel tank, air filter housing, battery casing, many engine parts etc., |
| Trucks | Dash board, bumper, front panel, coolant tank, mirror housing, battery tray & cover, air blower assy, foot rest, |

# AUTOMOTIVE CONTD....

❖ **Major Growth drivers**

- ✓ Low penetration
- ✓ Fast technology upgradation( fuel efficiency/ features)
- ✓ Economic growth




Automobile Production Trends

| Category | 2013-14 | 2014-15 | 2015-16 | 2016-17 | 2017-18 | 2018-19 |
|---|---|---|---|---|---|---|
| Passenger Vehicles | 3,087,973 | 3,221,419 | 3,465,045 | 3,801,670 | 4,020,267 | 4,026,047 |
| Commercial Vehicles | 699,035 | 698,298 | 786,692 | 810,253 | 895,448 | 1,112,176 |
| Three Wheelers | 830,108 | 949,019 | 934,104 | 783,721 | 1022,181 | 1,268,723 |
| Two Wheelers | 16,883,049 | 18,489,311 | 18,830,227 | 19,933,739 | 23,154,838 | 24,503,086 |
| Quadricycle* | | | 531 | 1,584 | 1,713 | 5,388 |
| **Grand Total** | **21,500,165** | **23,358,047** | **24,016,599** | **25,330,967** | **29,094,447** | **30,915,420** |

*Only Oct-March 2016 data is available for 2015-16

Source SIAM /Morth Road transport year book 2015-16

# HEALTH CARE

❖ **Major Products**

Syringes, IV bottles, Blood bags, IV cannula, masks, caps, protective gowns, Medical equipment parts, X ray sheet, heart valve parts, hearing aids, orthopaedic pads, prosthetics, spectacle frames and lenses, endoscope mouth piece, blood collection tubes, ECG electrodes, plastics tweezers, beakers, funnels, scoops and spoons etc.,

*Estimated Growth - 16.5%*

# HEALTH CARE CONTD..

- **Major Plastics Types–**PP/PE/ABS/POM/PA/PVC/PS/PET/PC/PU/PTFE/PPO/PEEK etc.
- **Why plastics ?**
  - ✓ Sterile free
  - ✓ Enhances Safety –
  - ✓ Cost effective
- **Major processing-** Injection moulding, Extrusion, Blow molding, Thermoforming, etc.,,

| Types | Major Plastics |
|---|---|
| Syringe parts | PP, PE |
| IV fluid bottles | PE |
| Blood / Urine bags/ Catheters / medicine blister bags etc. | PVC |
| Parts in heart valve/knee joints etc. | High Performance Plastics |

# HEALTH CARE CONTD..

❖ **Major Growth drivers**

- ✓ Medical Tourism
- ✓ Increased awareness on Hospital hygiene
- ✓ Innovative products/ Techniques
- ✓ Better protection to content spread of deceases.
- ✓ Immunization programme by Govt. Of India

***Ever green sector...***

# Trends

# 3D PRINTING

❖ **History**

- ✓ The 3D technology started with Plastic Output. Mr.Chuck Hull ( 1986) the US inventor of Stereo lithography ( SLA) with photopolymer & CAD inputs data.
- ✓ Dr. Carl Deckard of Texas University and Dr. Joe Beaman at the University of Texas at Austin in 1988- Selective Laser Sintering (SLS) with Nylon powder.
- ✓ Steven Scott Crump in 1989 -Used ABS filaments to build parts.
- ✓ Today, many options like Multi Jet Modelling (MJM), Multi Jet Fusion (MJF), Polyjet which is material jetting technology.


*Initial inventions of 3D printing used Polymers as building material*

Source: Imaginarium ( India ) Private Limited

# 3D PRINTING CONTD..

❖ **Applications**

Major industry segment such as Automotive, Aerospace, FMCG Packaging, White goods, Electrical – Electronics, Engineering, Tooling, Medical devices, Healthcare, Art, Architecture, Animation, Toys and Education / Research.

❖ **The major trends in material development has been in the areas of:**

1. Extreme Engineering needs such as high temperature, high strength applications.
2. Bio compatible, Bio absorbable and Bio implantable materials.
3. High refractive index materials
4. Smart Material
5. Micro electrical / sensing applications using Conductive polymers.
6. End user Applications

***Maximum size available - Printer with 1450 x 1110 x 1800 mm cube build area.***

Source: Imaginarium ( India ) Private Limited

# 3D PRINTING CONTD..

Est. Global market size USD 2018-19 : ~ US$2.7 billion
Est. India Market size USD 2018-19 : ~ US$ 0.4 billion
India Growth - 30%

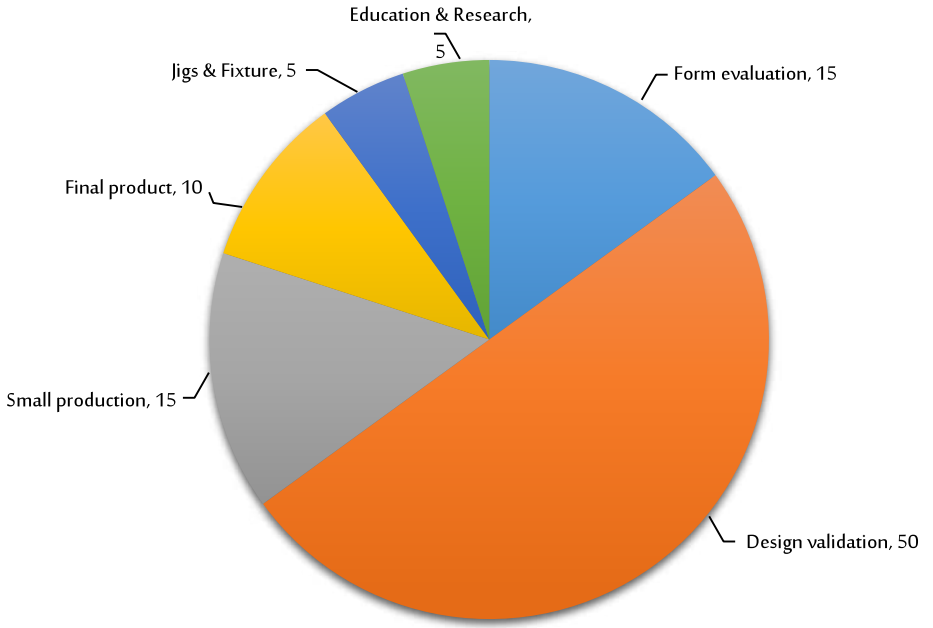
No. of manufacturers in India - 40 +

❖ **Major Materials - About 60 Tons**

1. Photopolymer
2. Powders
3. Filaments - ABS, PC,PC_ABS blends,PLA,PTFE,PEEK etc.,

Global trend : Agile Manufacturing, New Design Approach to create value through DfAM, End user applications, Customization, On-demand Spare parts

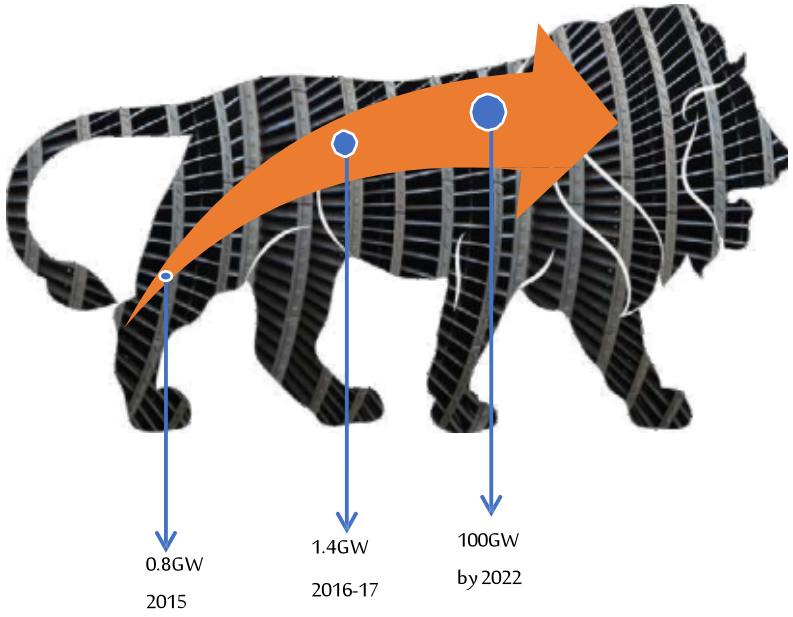
Application break up




*Photopolymers , Powders and 80% of filaments are currently being imported...*

Source: Imaginarium ( India ) Private Limited

# SOLAR PV – HIGH GROWTH OPPORTUNITY




- India ranks at 5th position with 32.9GW capacity in 2018-19
- Presently 95% Modules are imported from China
- "Make In India" is boosting local production & likely to increase polymer consumption.

Source : PLASTINDIA FOUNDATION

# SOLAR PV – HIGH GROWTH OPPORTUNITY CONTD..

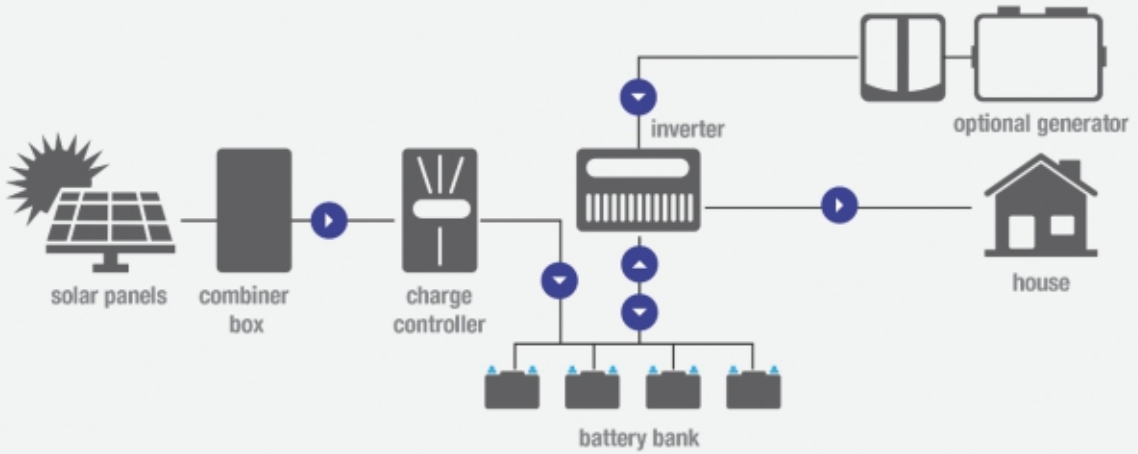
**Plastic Parts**

1. Junction box & Connectors: Back side of solar panel: mPPO, PA: 100 gm/solar panel
2. Combiner box: shown above: PC : 2 kg
3. Cables : XLPE
4. Batteries : FR ABS, PC or mPPO : 2~3kg

✓ Each solar panel of 300W is fitted with above parts (All plastics contribute 100 gm - except Inverter combiner boxes & battery)

✓ India has installed 32GW so far & plans to reach 100GW by 2022.

✓ Plastic consumption: >20KT required for 100GW, however presently Imported (95%).




Source : Industry Estimate

# LEDs

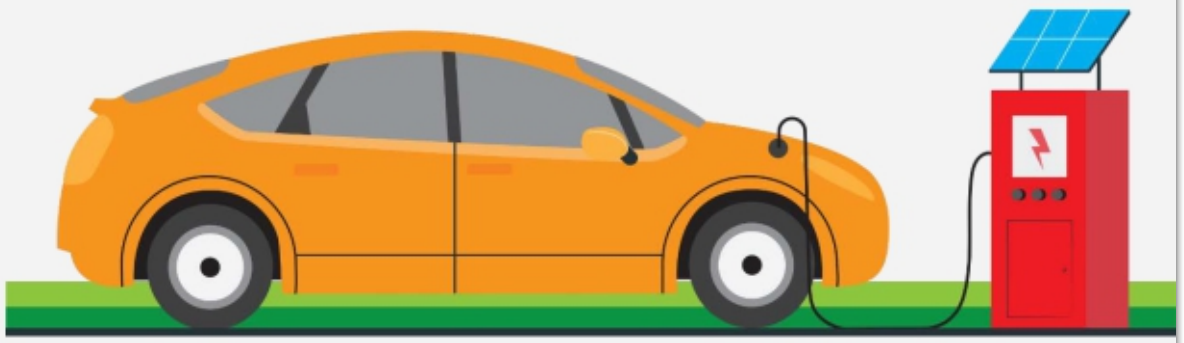
- Launched in 2015, the Unnat Jyoti by Affordable LEDs for All (UJALA)
- In a short span of three years, has emerged as the world's largest domestic lighting programme.
- Government aggressively driving projects/specifications &
- Implementing standards.
- In a span of five years, the Indian LED market value grew by 10 times and annual domestic production increased from approximately 30 lakh LED bulbs in 2013 to 62 million in 2015 (Elcoma)
- India is now the second largest LED market in the world, worth 2140 crore INR in revenues in 2015 (Frost & Sullivan). Sold 1116 million LED till march 2019.
- Bulk requirements for Railways, Airport authority, Highways & other large usage projects

- **Growth Drivers**
  - ✓ LED Bulbs (Retrofits )Tube lights Lamps for Engineering Plastics

Source : PLASTINDIA FOUNDATION

# EV

1. Globally the EV market estimated move from 5.5 M in 2018 to 60 M by 2030.
2. China takes the lead as largest country for EVs production.
3. In India Mahindra motors, Tata ,Hyundai, , etc., have taken the lead..
4. The car battery, connectors, charging components are some of the major components in EVs.
5. Materials used : PA66, mPPO, Long glass fibre reinforced Plastics (LFT), PC-ABS, PPS etc.,



*India Focuses on EV's : Aims having 30~40% of the car build by 2030*

Source : Industry Estimate

# INDIAN GOVERNMENT INITIATIVES

# SWACHH BHARAT MISSION

- Swachh Bharat Mission is a flagship program launched by Govt. Of India
- From 2nd Oct 2019, Swachh Bharat Mission 2.0 in progress
- Segregation of waste by color identified system is included in Swachh Bharat Mission
- Potential Plastic Usage in Mission
  - Bricks made up of recycled plastics for toilet construction.
    @1.2 tons / toilet – the potential of about 1800 KT
  - PVC doors for the toilets
    Potential ~37.5 KT per annum
  - Rotomolded tanks as overhead tanks for toilet
    potential ~ 37.5 KT per annum of LLDPE
  - Plastics Dustbins
    Potential – About 20 KT per annum of LLDPE



Source: https://www.dri-bharat.co.in/nrsodi/Industry Estimate

# SKILL INDIA

- Skill India was launched on 15 July 2015 which aims to train over 40 crore people in different skills by 2022

.

- Plastics Industry offers great potential to train people in the following machines
  - ✓ Injection moulding
  - ✓ Thermoforming
  - ✓ Blow moulding
  - ✓ Extrusion etc.,
- Potential envisaged for new Entrepreneurs as well as for the Machine Manufacturers

Source : Industry Estimate

# SMART CITIES

- Smart Cities Mission is a mechanism of urban renewal and retrofitting of the Government of India
- 100 smart cities as per the mission will be made citizen friendly and sustainable
- Various new infrastructure development and roads' construction are schemed under the mission
- Potential Plastic Usage in Mission
  - ✓ The benches and swings for kids playing area in parks (Potential ~ 25 KTA of LLDPE and ~ 25KTA of HDPE)
  - ✓ Rotomolded tanks as overhead tanks (Potential ~ 300 KTA of LLDPE)
  - ✓ Pipe and fittings of sanitary in infrastructure (Potential ~ 300 KTA of HDPE)
  - ✓ Optical fiber ducts laying (Potential ~ 60 KTA of HDPE)
  - ✓ Door, Window and Profiles (Potential ~ 375 KT of PVC)
  - ✓ Envisaged usage of 8-10% waste plastic in roads will lead to improved Plastic Waste Management

Source : Industry Estimate

# CLEAN GANGA RIVER MISSION

- Clean Ganga Mission aims at making Ganga pollutants free and to re-develop its ecological system
- Ganga Gram initiative will need sanitary pipe & fitting, overhead Roto tanks, doors, panels
- LLDPE Potential ~10 KTA, PVC Potential ~15 KTA and HDPE ~20 KTA
- River Clean up System (RCS) will generate Waste Plastics stream for recycling.

Source : Industry Estimate

# NATIONAL OFFSET POLICY FOR DEFENCE APPLICATIONS

- Government planned under this policy to bring in Global technologies with Indian counterparts for manufacturing of parts of aircrafts, electronics and communication systems for Defence
- This can lead to increase of engineered plastic products in India
- Multinational setting up a manufacturing unit in India for aircrafts which will lead the growth of engineered plastics market
- Overall Engineered Plastic estimated Potential ~ 250 KTA

Source : Industry Estimate

# DIGITAL INDIA

- Digital India campaign launched by the Government of India in 2015
- It aims at increased Internet connectivity and to make the country digitally empowered.
- Electronic communication medium and Money E-Transfers which will all lead the usage of more plastics as laptop, payment transaction cards, mobile, card swipe machines, PLB Ducts and Cables
- LLDPE market potential estimated to be for Cables ~100 KTA
- HDPE market potential for PLV Ducts ~150 KTA
- Other types of Engineering Plastics for various components required.

Source : Industry Estimate

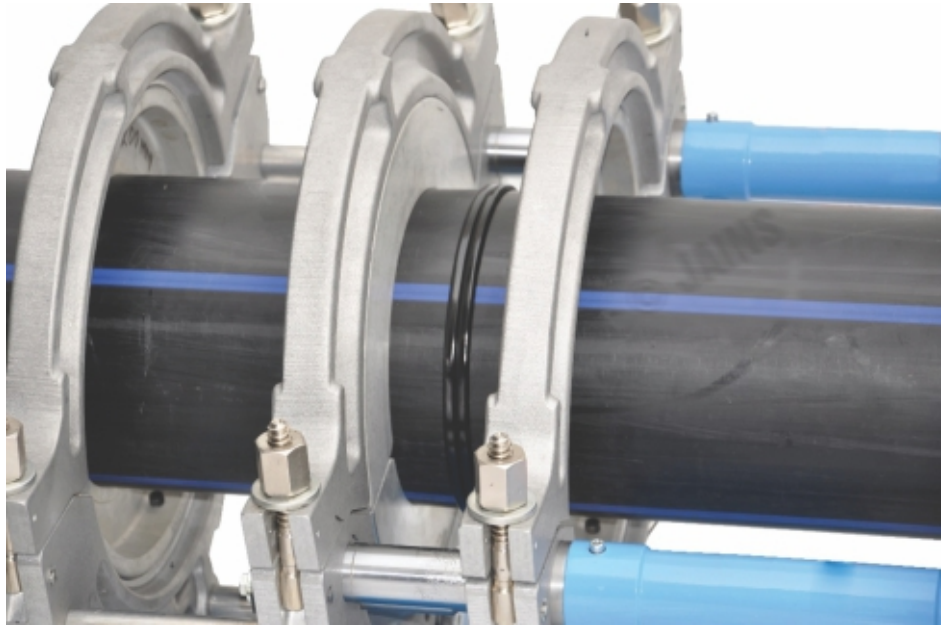
# MAKE IN INDIA

- Make in India launched by the Government of India in 2014 to encourage companies to manufacture their products in India
- Pharmaceutical Companies setting up manufacturing plant in India
  - ✓ Packaging (PP/PE/PVC/PET) – potential of about 200 KT/annum
- Automotive Components manufacturing getting boom out of this mission
  - ✓ Plastic Automotive Components of ~150KT/annum
- Food Processing Companies also setting up manufacturing plant in India
  - ✓ Enhanced Plastic packaging market potential - about 300 KT/annum
- India makes Combat aircraft, Defence parts, Satellite production & launching capabilities
  - ✓ Make use of advance Plastics


Source : Industry Estimate

# JAL JEEVAN MISSION (JJM)

- Announced in August 2019 to provide Piped Potable Water to household by 2024
- To cover 15 crore Rural Households in next 5 years
- Budget envisaged more than ₹3.5 lakh crore
- Under the Jal Jeevan Mission,
  - Govt. will focus on Rainwater Harvesting and Water Conservation in 256 districts in the first phase
- Other initiatives includes
  - ✓ Renovation of traditional water bodies and tanks,
  - ✓ Reuse of water and recharge structures,
  - ✓ Watershed Development and Intensive Afforestation



***Huge Potential for Plastics Pipes ……***

Source : Industry Estimate

# PLASTIC PARKS – EXISTING & PROPOSED

| Plastic Parks Existing | Area (Acres) |
|---|---|
| Sanand, Gujarat | 140 |
| Dahej, Gujarat | 100 |
| Narasapura, Karnataka | 100 |
| Auraiya, Uttar Pradesh | 225 |
| Tamot, Madhya Pradesh | 138 |
| Siju village, Odisha | 120 |
| Barjora, West Bengal | 496 |
| Ibrahimpatnam, Telangana | 500 |
| Kannur, Kerala | TBC |
| Tinsukia, Assam | 600 |
| Voyalur Village, DistrictThiruvullur Tamil Nadu | 306 |
| Panipat, Harayana | TBC |
| Plastic Parks New | |
| Billaua, Gwalior, Madhya Pradesh | 93 |
| Devipur, Deoghar Jharkhand | 93.09 |


*Total number of plots available– 632*

Source : Industry Estimate/ https://chemicals.nic.in/plastic-parks

# ESTIMATED TOTAL POTENTIAL ON GOVT. INITIATIVES

| Govt. Initiatives | Plastic Products | Est. Potential KTA |
|---|---|---|
| Swachh Bharat | Plastics Pipes & Fittings, dust bins, water tanks, optical fibre cable ducts, Cables, PLV ducts, Doors & windows, Engineering plastics components, pharma & Food packaging, Auto components etc. | 1895 |
| Smart Cities | | 1085 |
| Clean Ganga River Mission | | 45 |
| National Offset Policy for Defense Application | | 250 |
| Digital India | | 250 |
| Make In India | | 650 |
| Total | | 4175 |

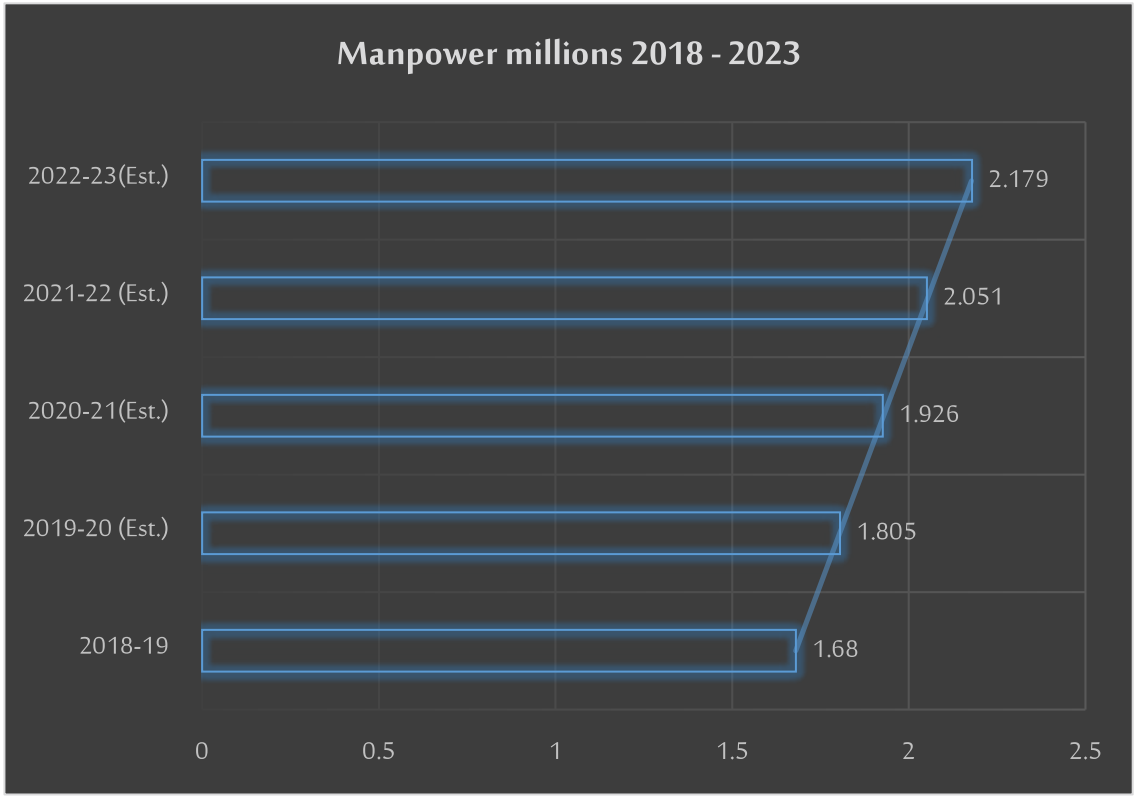
***Existing & New units from Plastics Parks will cater to the Expected Demand..***

# MAN POWER

# TECHNICAL MAN POWER

| Year | Manpower* (in Millions) | Manpower Growth % |
|---|---|---|
| 2018-19 | 1.68 | 7.44 |
| 2019-20 (E) | 1.81 | 6.70 |
| 2020-21(E) | 1.93 | 6.49 |
| 2021-22 (E) | 2.05 | 6.24 |

**Includes only Thermoplastics Industry + Secondary Converting operations. Unskilled labour not accounted..*




Source CIPET

# RECYCLING

# PLASTICS RECYCLING / RECOVERY (2018-19)

- Number of Organised Recycling Units : 100+ (42 in PET Recycling)
- Number of Unorganised Recycling Units : 10000+
- Manpower – Direct 100,000+
- Manpower – Indirect (includes Waste Pickers) : 1-1.5 Million
- Est. Quantum of Plastics Recycled : ~6 MMT

Source : Industry Estimate/ICPE

# PLASTICS RECYCLING / RECOVERY (2018-19) CONTD....

- Almost 100% Rigid Plastics Waste is Recycled
- >90% PET bottle waste is Recycled
- Recycling of Imported Plastics Scrap Banned as per the Notification
- In-house Plastics Scrap utilized in Production Process not included
- Feedstock Recycling (Pyrolysis) (50KT) and energy recovery through

  co-processing in Cement kiln (300KT) gained acceptance .
- Use of Plastics Waste in bitumen Road Construction made Mandatory

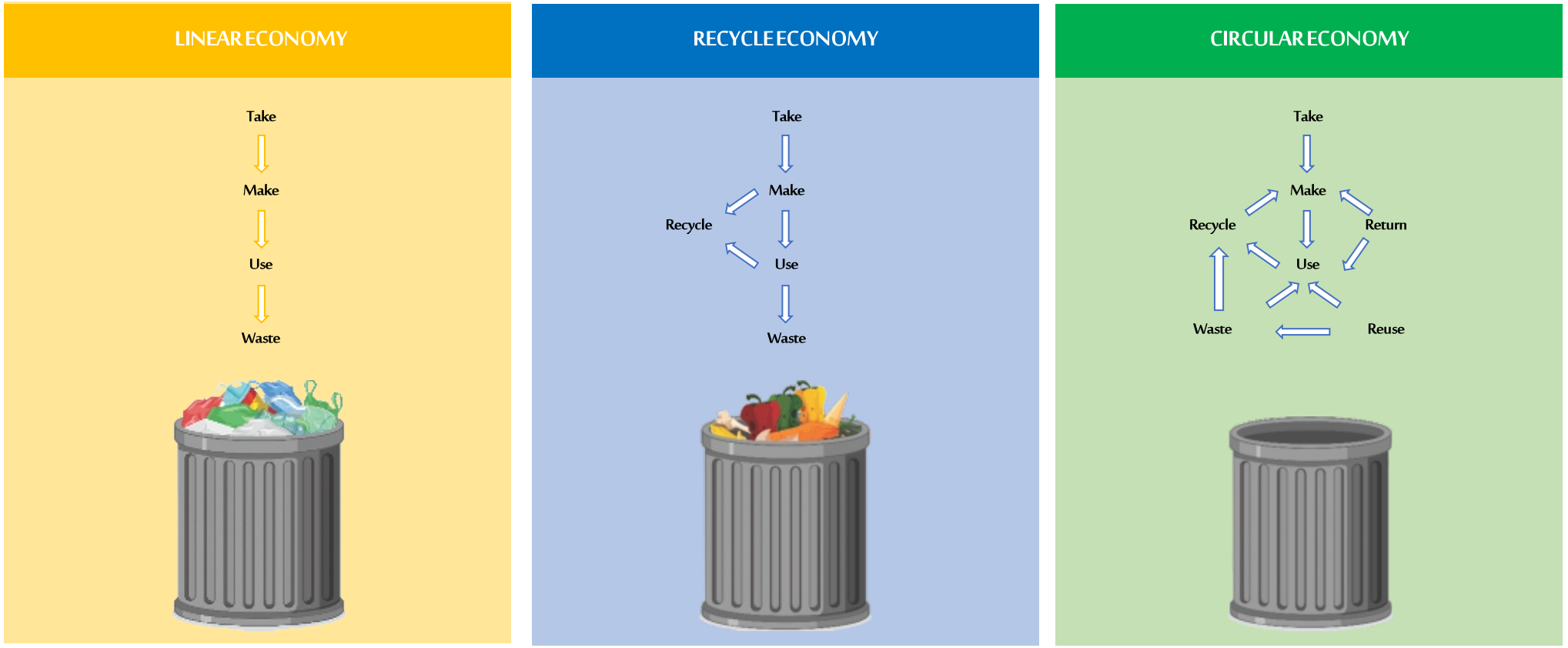
Source : Industry Estimate/ICPE

# PLASTICS RECYCLING/RECOVERY (2018-19) CONTD....

| S.No | State | Location | S.No | State | Location |
|---|---|---|---|---|---|
| 1 | Bihar | Patna | 26 | Maharashtra | Aurangabad |
| 2 | Chattisgarh | Raipur | 27 | Maharashtra | Solapur |
| 3 | Chattisgarh | Bilaspur | 28 | Maharashtra | Kolhapur |
| 4 | Daman | Daman | 29 | Odisha | Bhubaneswar |
| 5 | Delhi | Tikri Kalan | 30 | Odisha | Cuttack |
| 6 | Delhi | Kamruddin Nagar | 31 | Odisha | Balasore |
| 7 | Delhi | Vishwas Nagar | 32 | Punjab | Amritsar |
| 8 | Delhi | Shahdara | 33 | Punjab | Khanna |
| 9 | Gujarat | Dhoraji | 34 | Punjab | Dhuri |
| 10 | Gujarat | Ahmedabad | 35 | Punjab | Ludhiana |
| 11 | Gujarat | Bhavnagar | 36 | Punjab | Moga |
| 12 | Karnataka | Belgaum | 37 | Punjab | Jalandhar |
| 13 | Karnataka | Dharwad | 38 | Rajasthan | Jaipur |
| 14 | Karnataka | Shivamogga | 39 | Tamilnadu | Chennai |
| 15 | Karnataka | Mangaluru | 40 | Tamilnadu | Coimbatore |
| 16 | Karnataka | Davanagere | 41 | Tamilnadu | Madurai |
| 17 | Karnataka | Tumakuru | 42 | Tamilnadu | Tiruchirappalli |
| 18 | Karnataka | Bengaluru | 43 | Tamilnadu | Tirunelveli |
| 19 | Karnataka | Mysuru | 44 | Tamilnadu | Salem |
| 20 | Kerala | Kochi | 45 | Telangana | Hyderabad |
| 21 | Madhya Pradesh | Indore | 46 | Uttarpradesh | Kanpur |
| 22 | Madhya Pradesh | Bhopal | 47 | Uttarpradesh | Meerut |
| 23 | Maharashtra | Dharavi | 48 | Uttarpradesh | Lucknow |
| 24 | Maharashtra | Malegaon | 49 | West Bengal | Kolkata |
| 25 | Maharashtra | Jalgaon | | | |

Source : Industry Estimate/ICPE

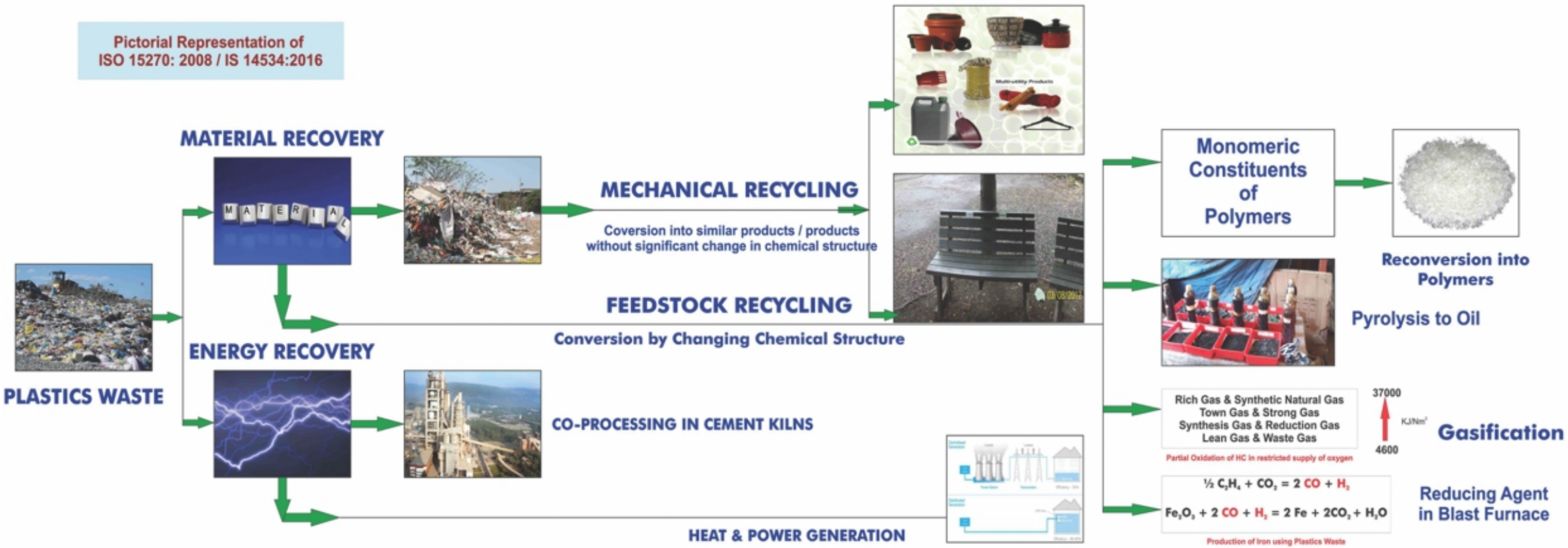
# CIRCULAR ECONOMY




An Economic System focused at Eliminating Waste and the continual use of Resources

Source : ICPE

# PLASTICS RECYCLING / RECOVERY OPTIONS




Source : ICPE

# EST. % OF PLASTICS RECYCLED 2018-19

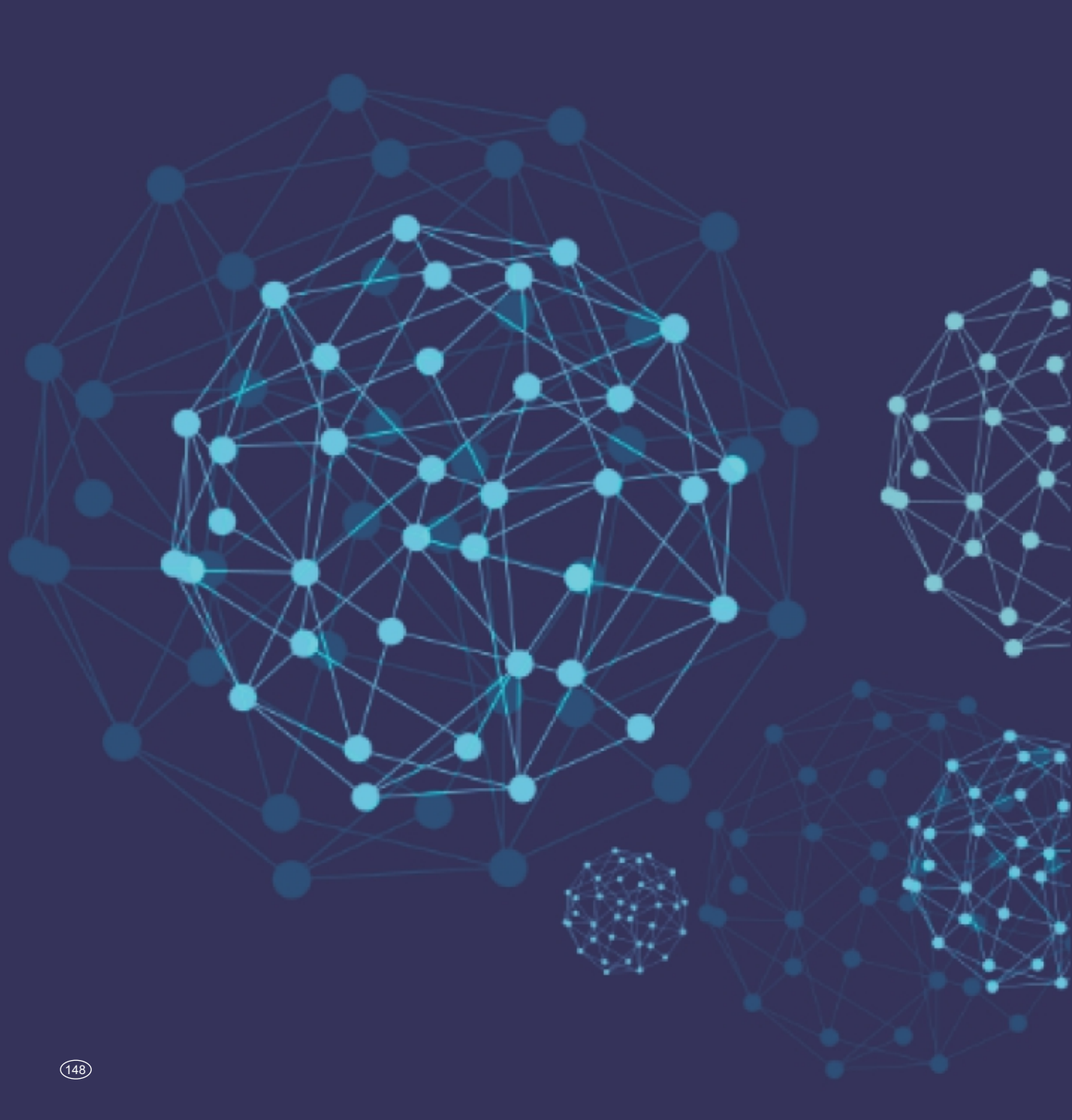
| Summary | Qty in MMT |
|---|---|
| Commodity Plastics Consumption in 2018-19 | 15.71 |
| Quantity entering Waste Stream from 2018-19 Consumption ( ~42%) within one year* | 6.60 |
| Quantity entering Waste Stream from previous 5 years to 2018-19 | 2.00 |
| Total Quantity of Waste Plastics (2018-19) | 8.60 |
| Quantity recycled in 2018-19 (~70%) | 6.02 |

**remaining 9 million tons are in long term usage*

***~6 million Tons Recycled in 2018-19 which is ~70% on Waste Stream***

Source : Industry Estimate / ICPE

# SUMMARY



# INDIA..... it's HAPPENING

## Plastics Industry

- Indian Plastics Industry is one of the oldest (1945) and is approaching Platinum Jubilee by 2020.
- India is 5th largest producer of Polypropylene in the world.
- India is in top 10 in the innovation & commercial production of High end polymers.
- Indian Companies are world's Largest Manufacturers of Lambitubes and BOPP films
- Two Largest Drip Lateral Manufacturer have major production base in India
- India is the 2nd largest exporters of FIBC bags (Flexible Intermediate Bulk container)
- The largest rotomolded tank market is in India
- India is 4th largest producer of cars & 2nd in Two wheeler in the world. Major plastics parts for car are made in India.

# INDIA..... it's HAPPENING

## Plastics Industry Contd...

- Growth of Machinery Industry – Installed Capacity CARG of 12.5%
- Current Polymer Consumption is 18.45 MMT and Projected to exceed 20 MMT by 2021
- Global Companies Investing in India
- Lower Import Duties on Polymer Raw Materials
- Proposed Government Policies to help Growth of Plastic Industry
  - Technology Upgradation Fund Scheme (TUFS)
  - Plastic Parks
  - MSME & Skill Development
  - Many Government Initiatives (Swatch Bharat/Make in India, Skill India, Digital India, Smart & AMRUT Cities, Clean Ganga River Mission , Jal Jivan Mission, Defence products etc.)

# INDIA..... it's HAPPENING

## Economy & Demography

- Established Democracy & Stable Democratic Government with favourable Economic Policies
- Young Population, median age of 28.7 years
- Setting up of SEZs to overcome bottlenecks of Infrastructure and create Business Friendly Policies
- Large pool of scientific and technically trained Manpower
- India, the largest market in South Asia. Robust Domestic Demand

# INDIA..... it's HAPPENING

## Economy Contd...

- Rising Income Levels and changing Lifestyles driving demand for Plastics
- Indian Economic Fundamentals are robust and continuing amidst uncertainty in Global Economy
- Huge Growth Opportunities in India for Plastics due to Lower per capita Consumption as compared to world average
- Planned Infrastructure Projects are driving Growth in India which are ably supported by the Current and Upcoming Domestic Capacities

Progress through Plastics

# ANNEXURES

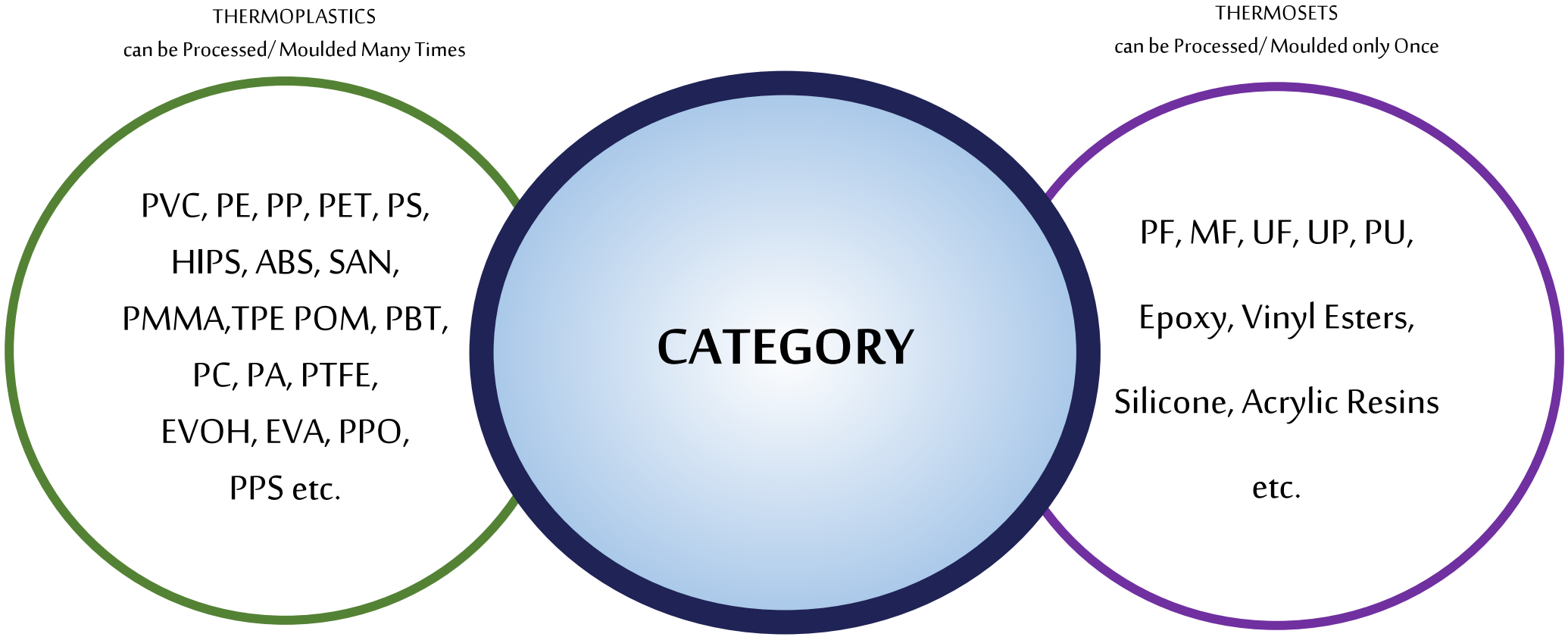
# IMAGINE LIFE WITHOUT PLASTICS....

# HOW PLASTICS PENETRATES OUR LIVES....

- A wonder material came into existence largely in 20th Century
- Strong, lightweight, and mouldable - Plastics are used in millions of Products
- Adds Comfort, Convenience, Functional and Safety to our everyday lives
- Today, Plastics are an integral part of the Life

*We are in Plastics Age....*

# TYPES OF PLASTICS




*Many Types ……. Diversified Applications*

# BENEFITS OF PLASTICS TO SOCIETY– Saves Fossil Fuel + Added Safety


Fossil Fuels Sources are limited and may be exhausted in a few decades. The use of Fossil Fuels cause major emission and Global warming.

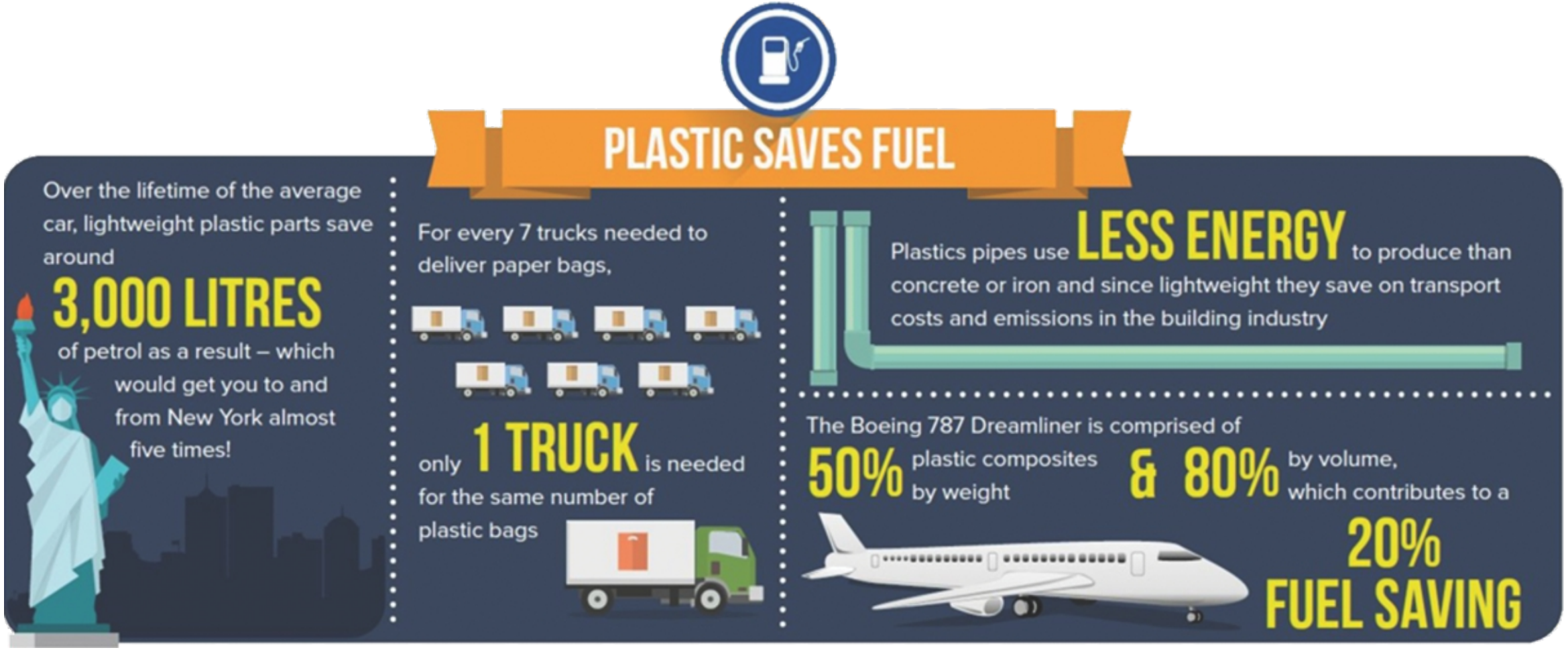
Conventional Automobiles use a lot of metals which are prone to corrosion and high energy for production and conversion. Plastics come as a sustainable alternative.

According to the U.S. Department of Energy advanced Plastic Composite Materials could reduce the weight of Passenger Cars by half and improve Fuel Efficiency by ~35% reduction in Carbon dioxide Emissions

***Often Recycled Fibres from discarded PET Bottles are Used as Carpets in Cars…***

https://www.plasticsmakeitpossible.com/whats-new-cool/automotive/fuel-efficiency/improving-fuel-efficiency-made-possible-with-plastics/

# BENEFITS OF PLASTICS TO SOCIETY




Source: British Plastics Federation

# BENEFITS OF PLASTICS TO SOCIETY – Saves Food

- Preserves food longer
- Keeps food Hygienic
- Tamper-proof
- Shatter-proof - Reduces potential injury
- Minimises wastages in storage
- Increases Distribution Radius
- Economical


*Plastics plays a significant role in Food Preservation*

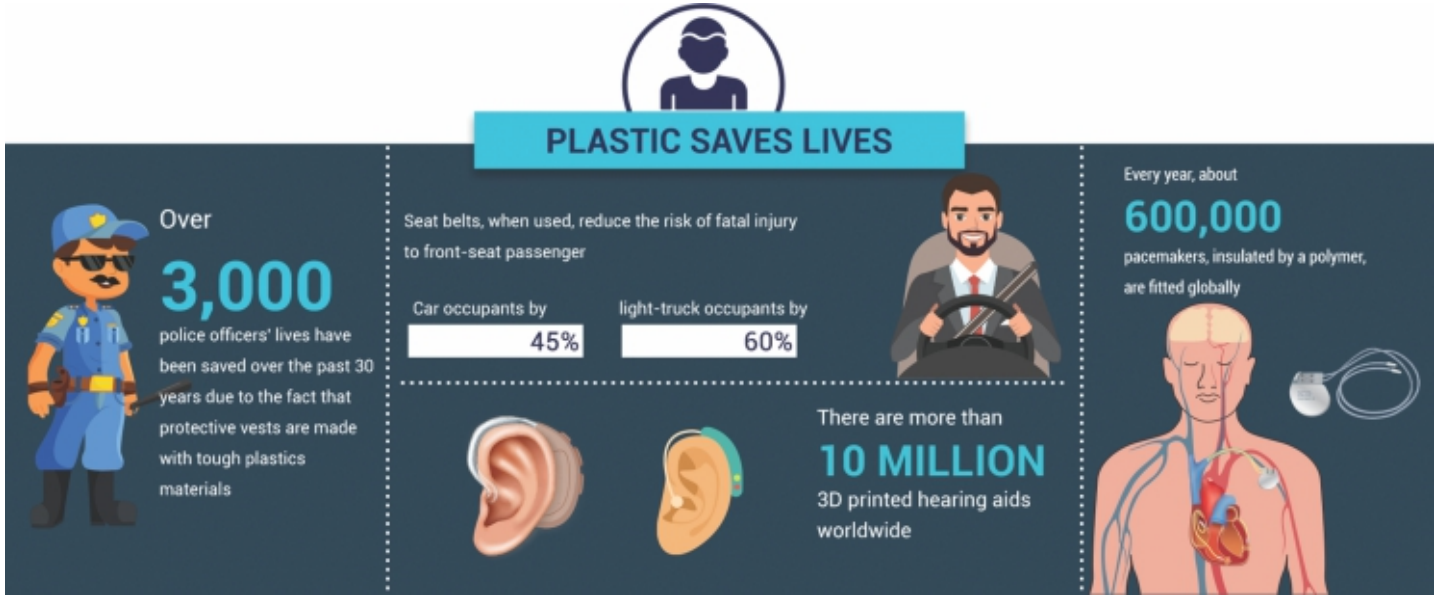
Source: British Plastics Federation

# BENEFITS OF PLASTICS TO SOCIETY


Source: British Plastics Federation

# BENEFITS OF PLASTICS TO SOCIETY – Saves Life

- Syringes And Tubing Reduces Disease Transmission
- Plastic Heart Valves, Knee and Hip Joints save Lives
- Plastic Prosthesis Help Amputees Regain Function
- Plastic Eyeglass Lenses, Frames, Contact Lenses help Victims Of Eye Injuries Or Disease Regain Vision.
- Silicone Artificial Corneas for Vision Restoration ..... Much More

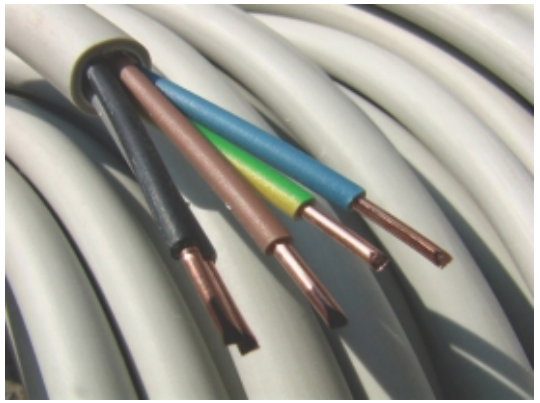



- Many Personal Protective Equipment (PPE) made out of Plastics
- Auto Safety features includes Seat Belts and Air bags made of Plastics
- Knee guards, Mouth guard, Foam pads protects players from Injury and much more

Source: British Plastics Federation

# BENEFITS OF PLASTICS TO SOCIETY — Powering & Protection

- Plastic Wire & Cables and Cords Powering Every Home, Office and all Electronics Gadgets
- House Hold Appliances, Mobiles, MCBs Etc. are Protected with Plastics and Added Aesthetics
- Reduce Transmission Loss of Electricity

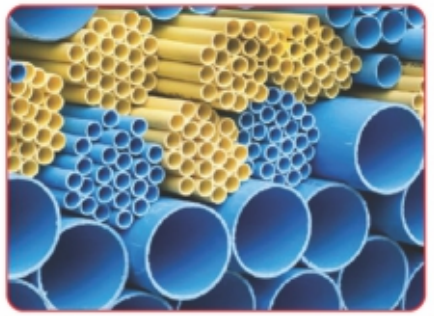


*Plastics protects gadgets...*

# BENEFITS OF PLASTICS TO SOCIETY — Prevent Corrosion & Energy Efficient

- Plastic Piping Systems For Water, Gas And Sewage Do Not Corrode And Provide Long Service Life
- Doors And Window Profiles Provide Energy Efficiency And Saves Cutting Of Trees
- Water Tanks For Hygienic Water Storage.
- Geo Synthetics For Preventing Soil Erosion And For Long Lasting Roads and Many More Applications In

Railways, Airports, Construction

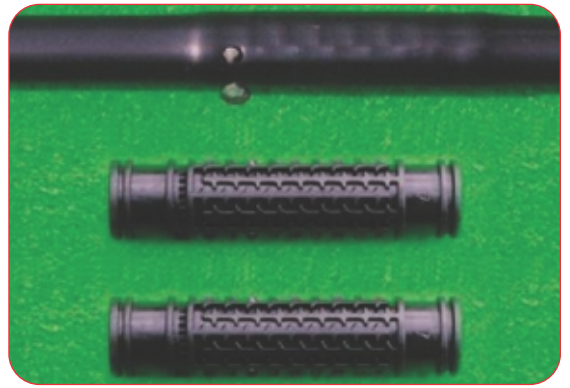


*Plastics integral part of Infrastructure... including Smart Cities*

# BENEFITS OF PLASTICS TO SOCIETY — Food security

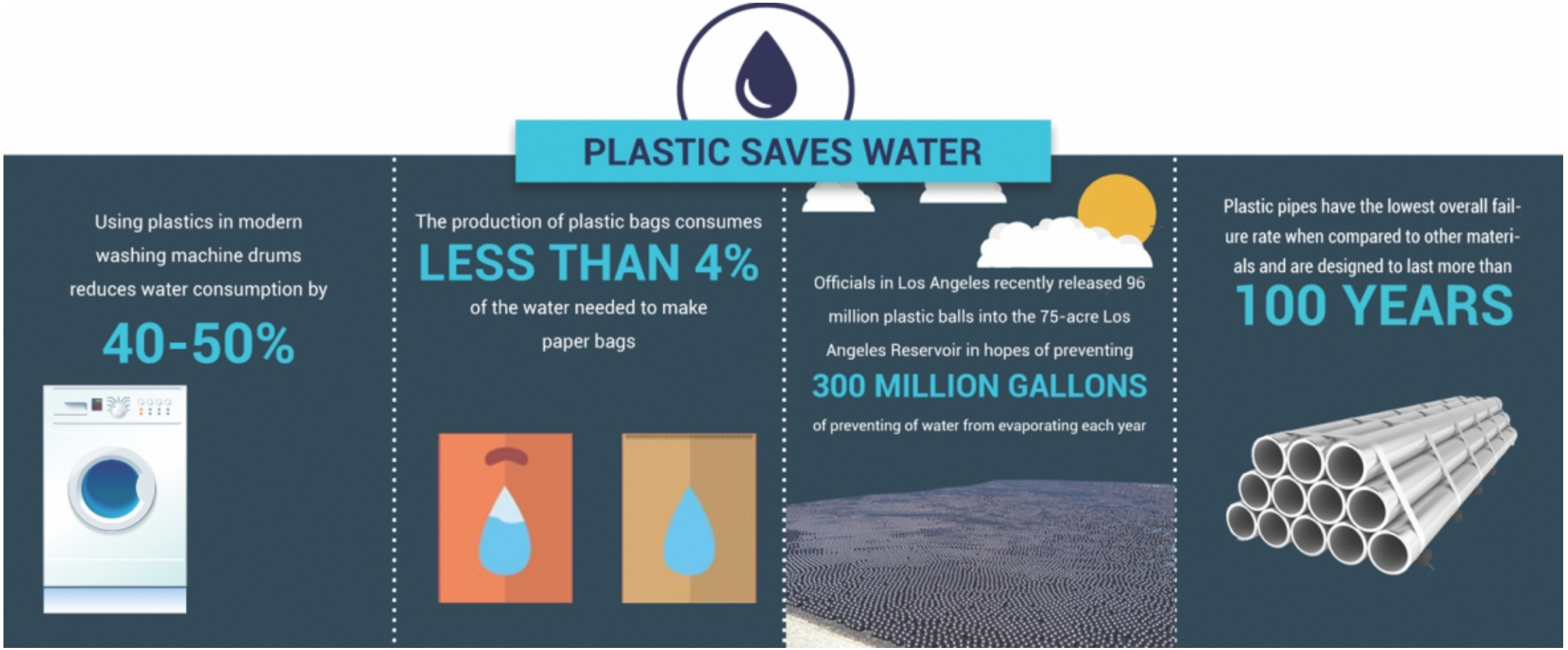
**Agriculture, Horticulture, Water Management & Storage**

- Water Scarcity is biggest Global issue facing mankind.
- Agriculture for food protection consumes 75 to 80% of Global water usage
- Drip and sprinkler irrigation helps saving water to the tune of 40 to 70% in Agriculture
- Mulch Film prevents weed growth and conserves soil
- Green House helps in higher yield and better Crop Quality even in harsh Environment
- Plastics Pipes provide efficient water management
- Tarpaulins, Bags, Crates for Storage and Transportation



*Enhancing crop yield up to 60 % & conserving water up to 70%*

# BENEFITS OF PLASTICS TO SOCIETY




Source: British Plastics Federation

# BENEFITS OF PLASTICS TO SOCIETY

**SAVES NATURAL RESOURCES**

- Alternative to wood : Furniture, Railway Sleepers, Doors and Windows, Crates for Vegetables and Milk , Pallets etc.
- Glass replacement : Milk sachet, Food Containers, Medicine Bottles, Syringes, IV fluid Bottles etc.

PAPER METAL WOOD

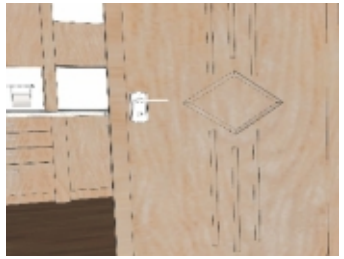
Plastics

SACKS

CONTAINERS

DRUMS

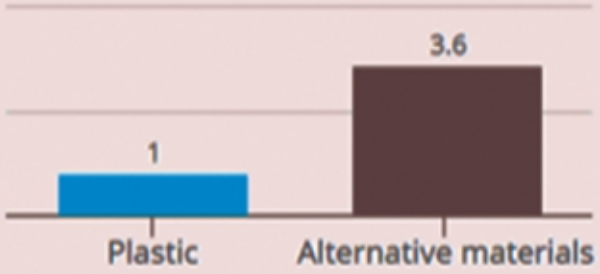
DOORS



# BENEFITS OF PLASTICS TO SOCIETY

## Packaging mass

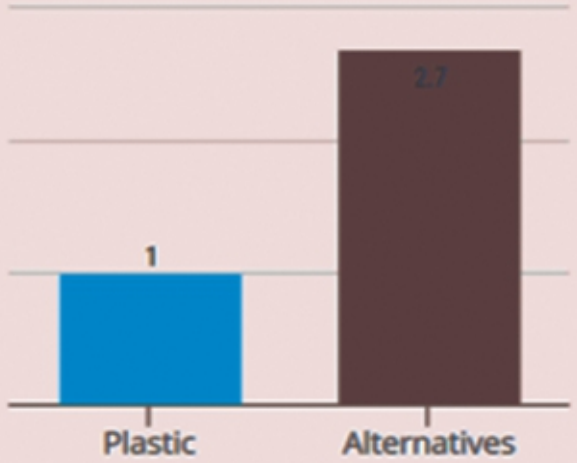
Alternative materials would be 3.6 times heavier than plastic packaging.




Source: The impact of plastic packaging on life cycle energy consumption and greenhouse gas emissions in Europe: Executive Summary July 2011, Bernd Brandt and Harald Pilz

## Greenhouse Gas Emissions

Alternative materials to plastic would result in 2.7 times more greenhouse gases emissions over their life time.




Source: The impact of plastic packaging on life cycle energy consumption and greenhouse gas emissions in Europe: Executive Summary July 2011, Bernd Brandt and Harald Pilz

## Energy

It would take around **twice** as much energy to use alternative materials to plastic packaging.


Source: The impact of plastic packaging on life cycle energy consumption and greenhouse gas emissions in Europe: Executive Summary July 2011, Bernd Brandt and Harald Pilz

Source: British Plastics Federation

# ABBREVIATION

- PVC- Poly Vinyl Chloride
- PE- Polyethylene
- PP- Polypropylene
- PS- Polystyrene
- ABS- Acrylonitrile- Butadiene- Styrene
- PMMA- Poly methyl methacrylate
- PET – Polythelene terephthalate
- PF - Phenolic Resin
- PUR – Poly urethanes
- POM – Poly oxy methylene
- PPS – Polypropylene sulphide
- TPU – Thermoplastics polyurethane
- PC – Polycarbonate
- PTFE- Polytetrofluoroethylene
- SAN – Styrene Acrylonitrile
- PBT – Polybutylene terepthlate
- PA- Polyamide
- EVOH – Ethylene Vinyl Alcohol
- MF- Melamine Formaldehyde
- UF- Urea Formaldehyde
- UP – Unsaturated Polyester
- PPO – Polyphenylene Oxide
- TPE – Thermoplastics Elastomer
- PEEK – Poly Ether Ether Ketone

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- GSFC
- ICIS
- ICPE
- IFIBCA
- Imaginarium India Pvt Ltd
- Indian PU association
- IOCL
- IPI
- Jagmohan PlaMach Pvt Ltd
- Jayvee Organics & Polymers
- Kolsite
- Lohia Corp Limited
- Mamata Machinery Pvt Ltd
- Milacron
- OK Play
- OPPI
- Plexconcil
- PMMAI
- Prasad Koch
- Rajiv Plastics
- Reliance Industries Limited
- ROMA – Rotomoulding association
- SABIC GE Innovative polymers
- Sai Machine Tools
- SIAM
- SK Global
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- TIPCO

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# ACKNOWLEDGEMENT – FOUNDER MEMBERS & CONSTITUENT MEMBERS

AIPMA

The All India Plastics Manufacturers' Association, Mumbai

OPPI

Organization of Plastics Processors of India, Mumbai

IPI

Indian Plastics Institute, Mumbai

IPF

Indian Plastics Federation, Kolkata

GSPMA

Gujarat State Plastic Manufacturers Association, Ahmedabad

PLEXCONCIL

The Plastics Export Promotion Council, Mumbai

CIPET

Central Institute of Plastics Engineering & Technology, Chennai

Chemicals & Petrochemicals Manufacturers' Association, India

*Acknowledging all Founder Members & Constituent Members in bringing out this report*

# PLASTINDIA FOUNDATION

The apex body of major plastics Associations in India that promotes growth of Indian Plastics Industry within India and across the world

PROGRESS THROUGH PLASTICS


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