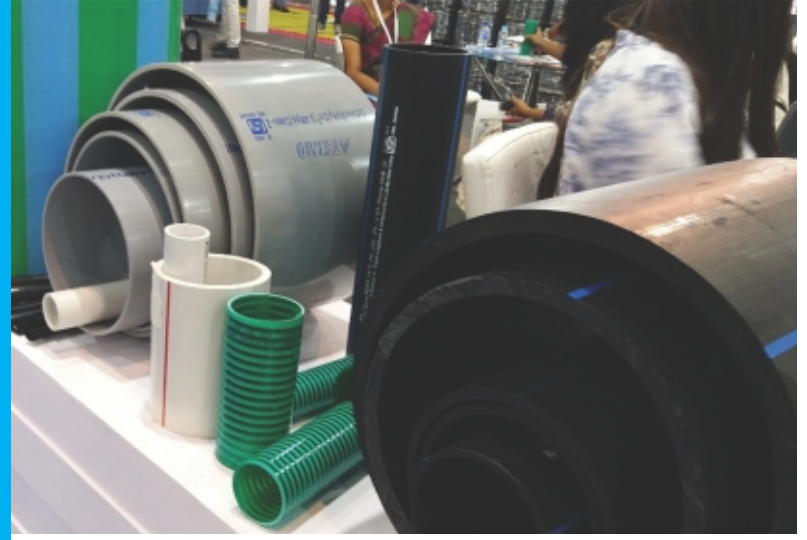
PROGRESS THROUGH PLASTICS

PLASTINDIA FOUNDATION®

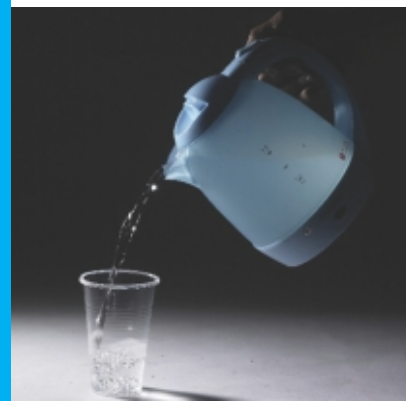
ISO 9001-2015 certified

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

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16	Mr . Vinod Kumar R.	Member
17	Mr . T.K. Bandopadhyay	Member

INDEX

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- Growth Opportunities
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- Manpower
- Recycling
- India... It's Happening
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INDIA OVERVIEW



INDIA SNAPSHOT

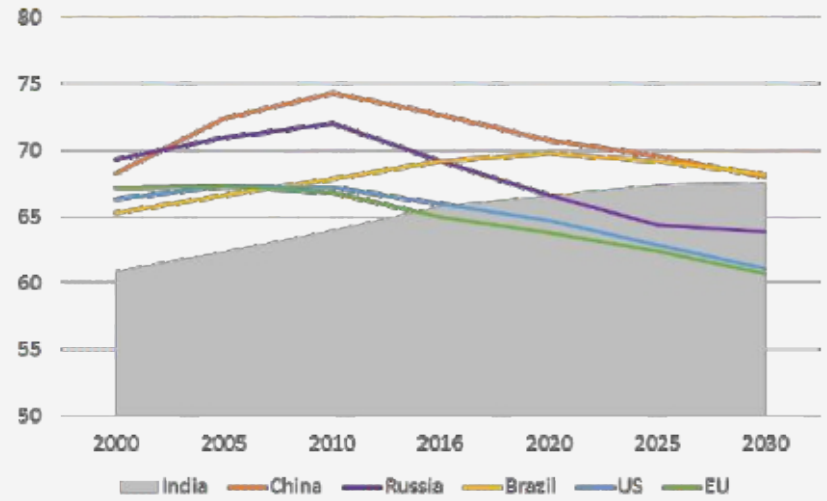
Population	**1.353 Billion in 2018**
Democracy	**World's largest**
Annual GDP growth	**6% (2019)**
Economy on PPP basis	**Third largest (~USD 9.3 Trillion in 2018)**
Prospects	**To become a 5 Trillion Dollar Economy by 2024**
Official Languages	**23 (English predominantly the business language)**
Social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

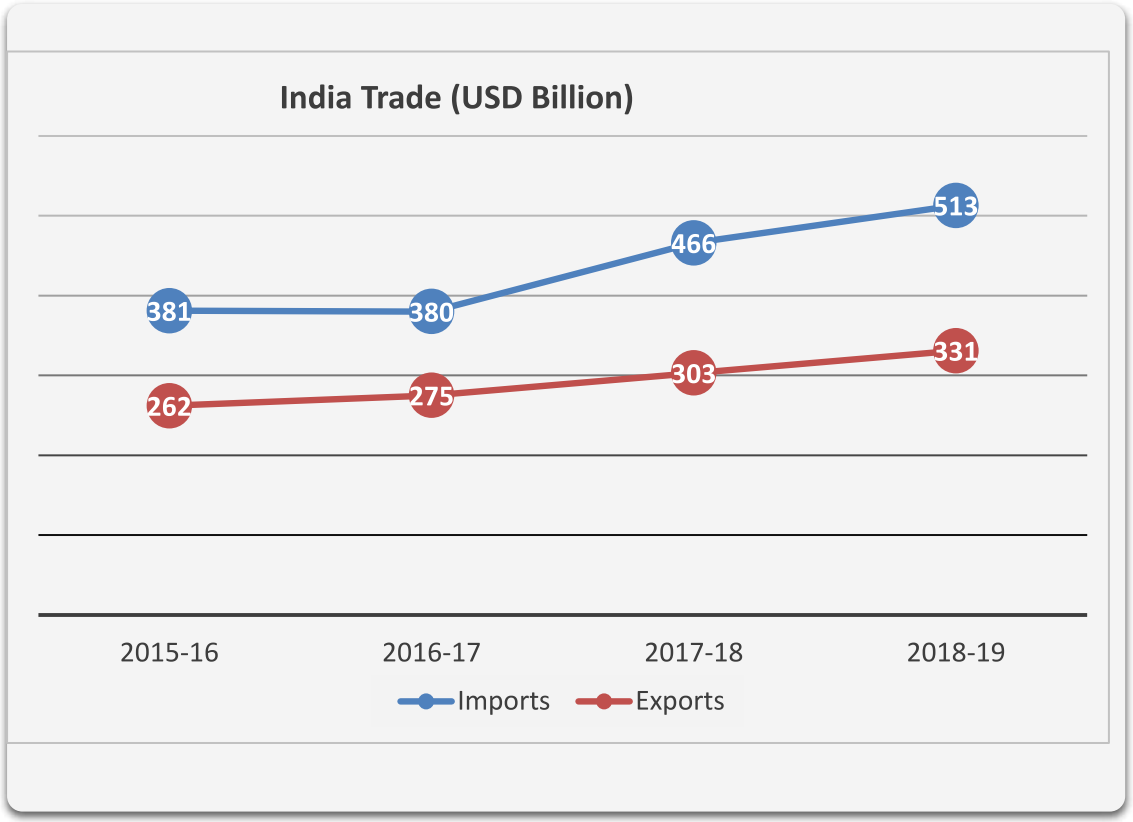
INDIA - KEY ECONOMIC INDICATORS

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

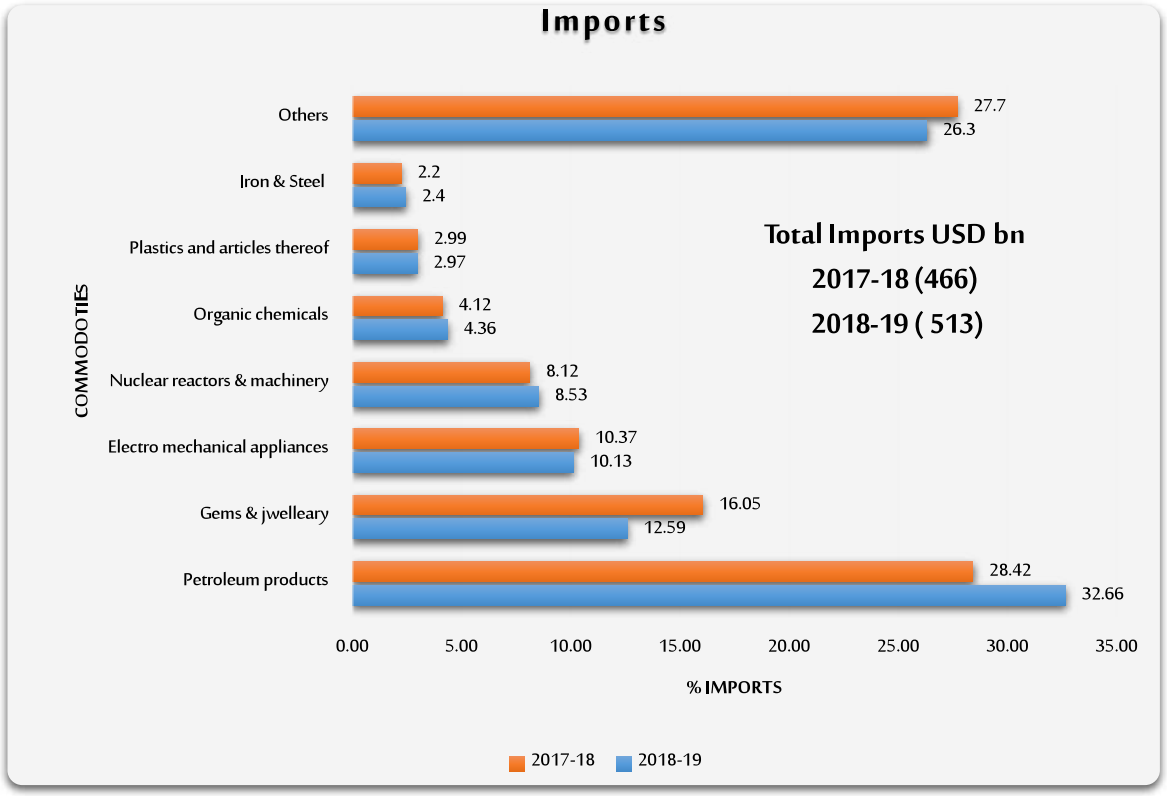


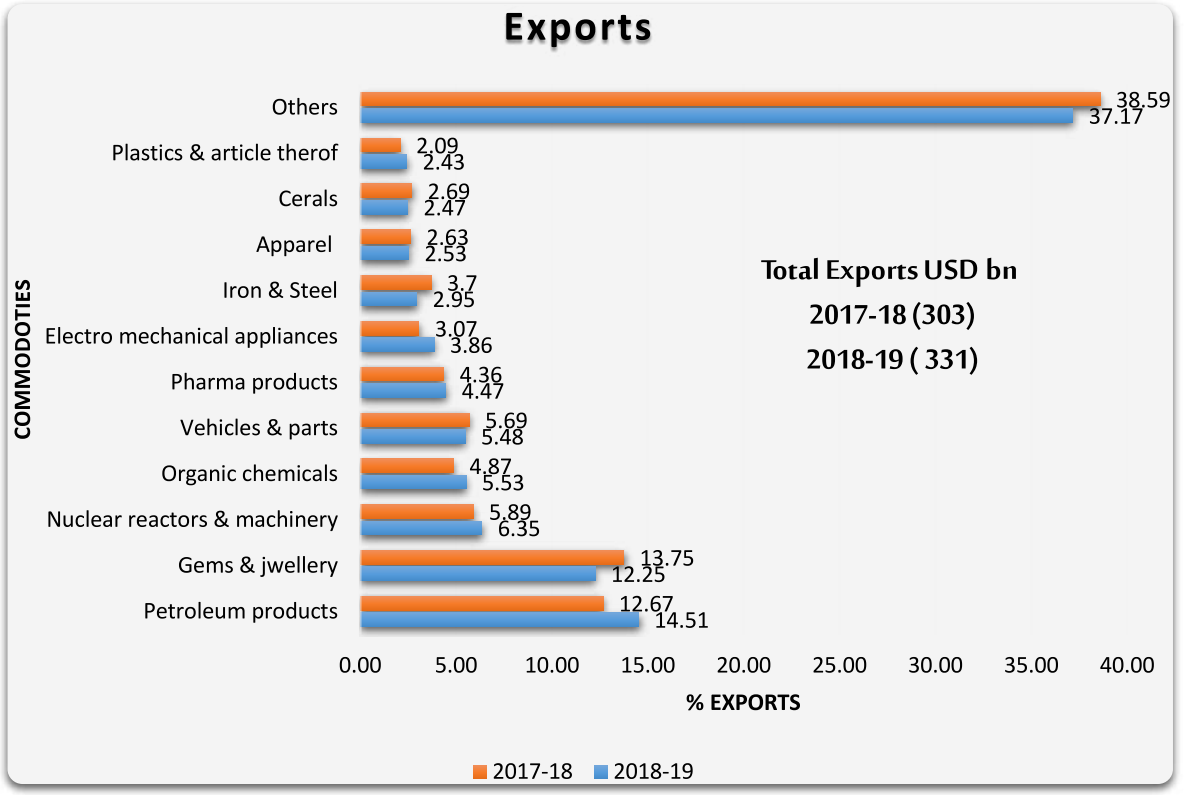


India – The Vibrant Economy

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

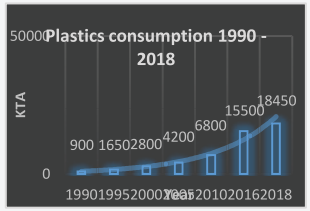
18.45 MMT vis-a-vis 0.9 million ton in 1990.

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

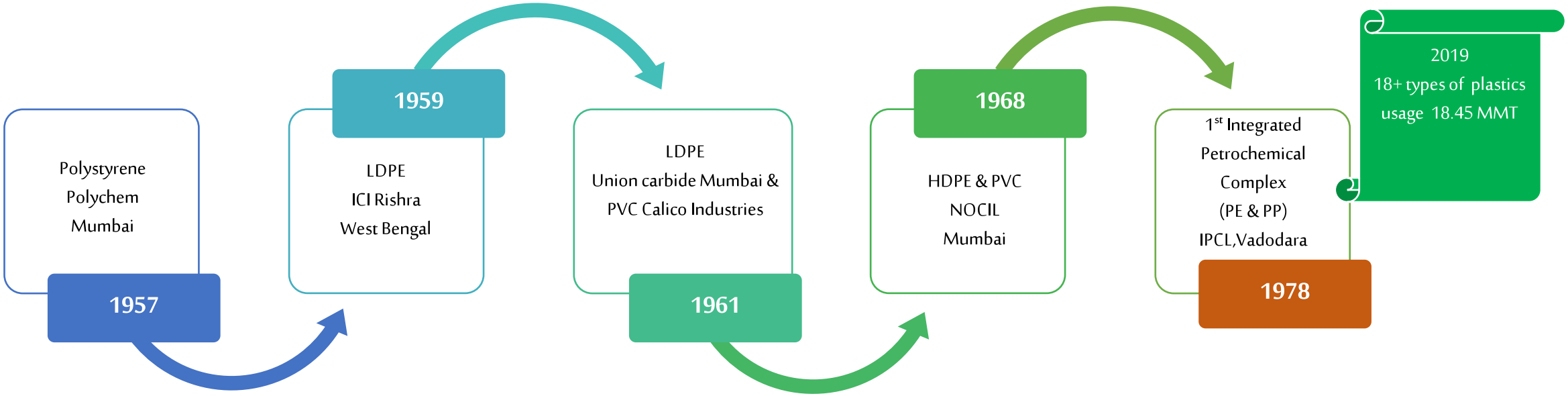
INDIA STEPS INTO PLASTIC AGE....



2020 Platinum Jubilee year for the Indian Plastics Industry

Humble Beginning In 1945 - Phenolics By Tipco At Mumbai

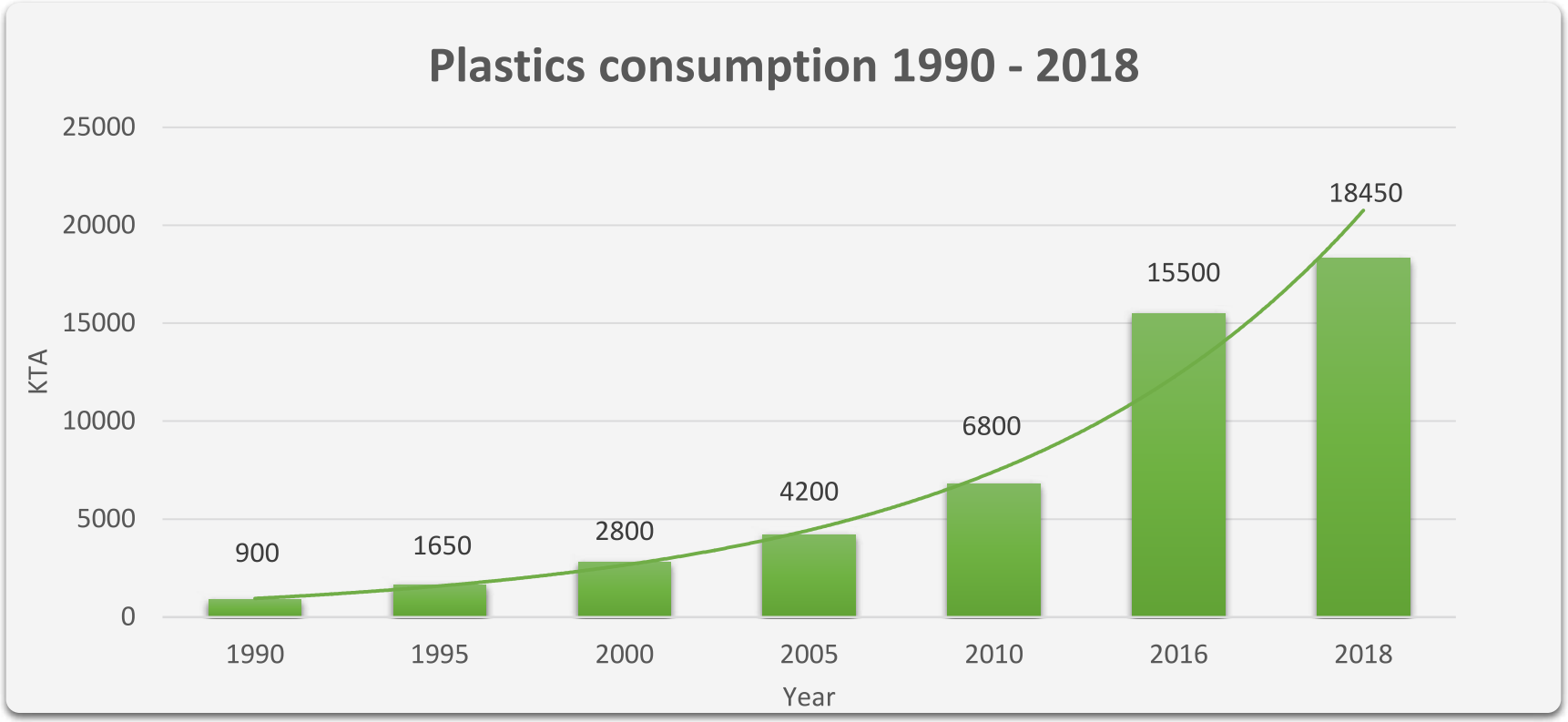
INDIA STEPS INTO PLASTICS AGE...



2018-19 Production ~ 17 MMT Consumption ~ 18.45 MMT

Source: PLASTINDIA FOUNDATION /Industry Estimate

GROWTH OF PLASTICS CONSUMPTION....

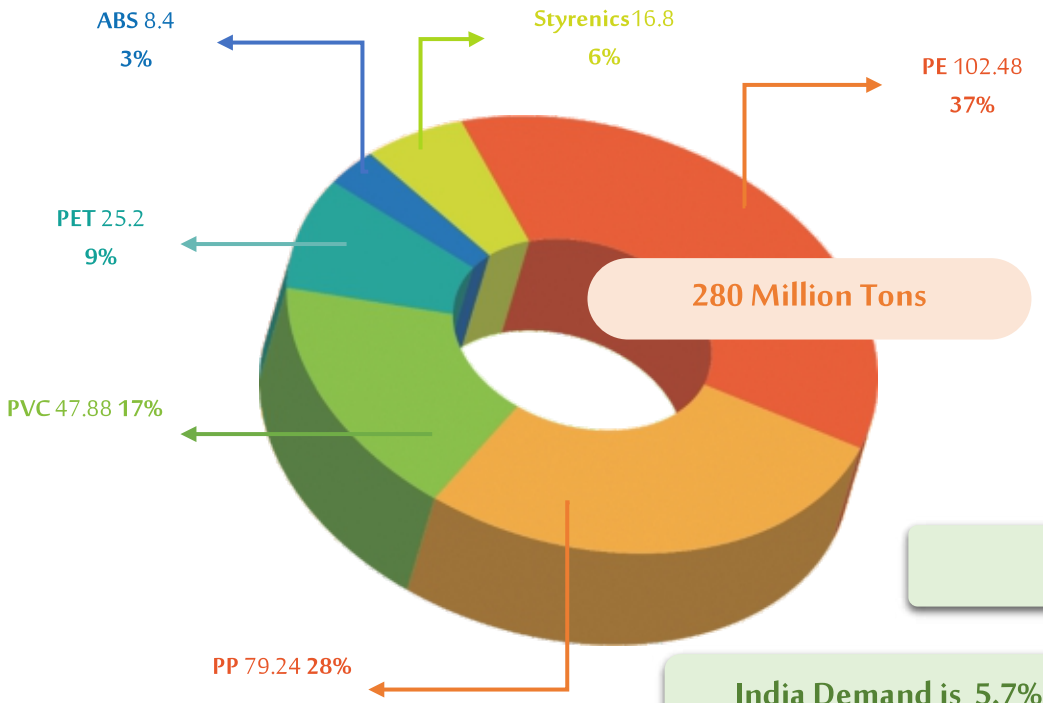


Grown 20 times since 1990....

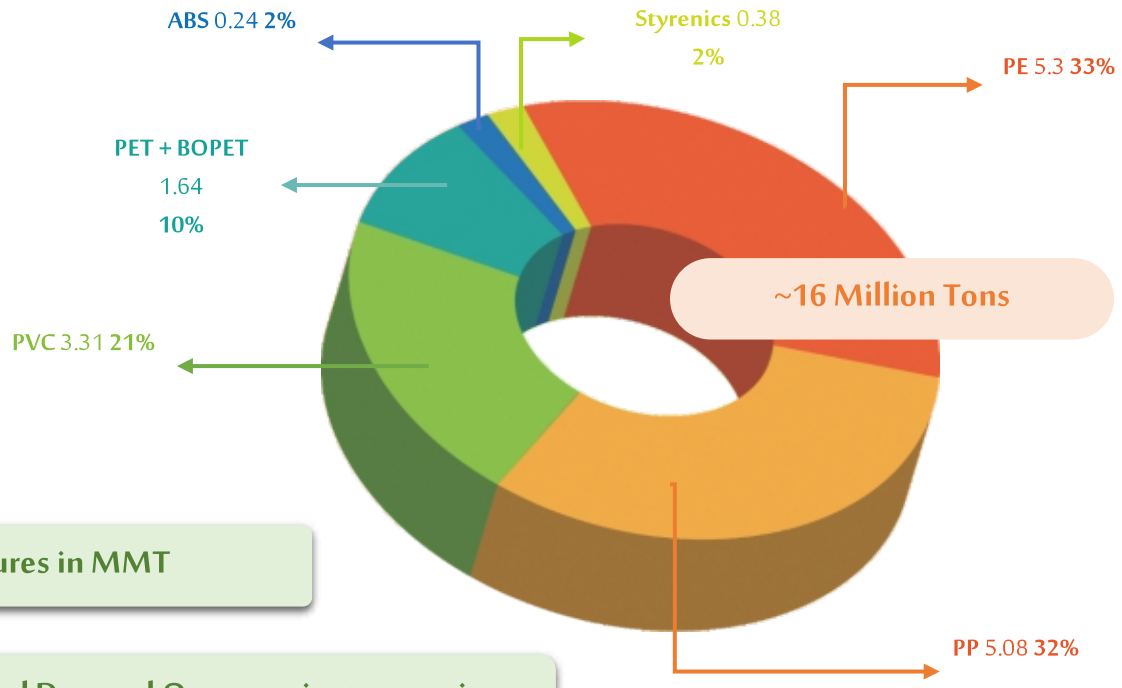
Source: PLASTINDIA FOUNDATION /Industry Estimate

COMMODITY PLASTICS DEMAND

Global Demand for Major Plastics 2018-19



Indian Demand for Major Plastics 2018-19



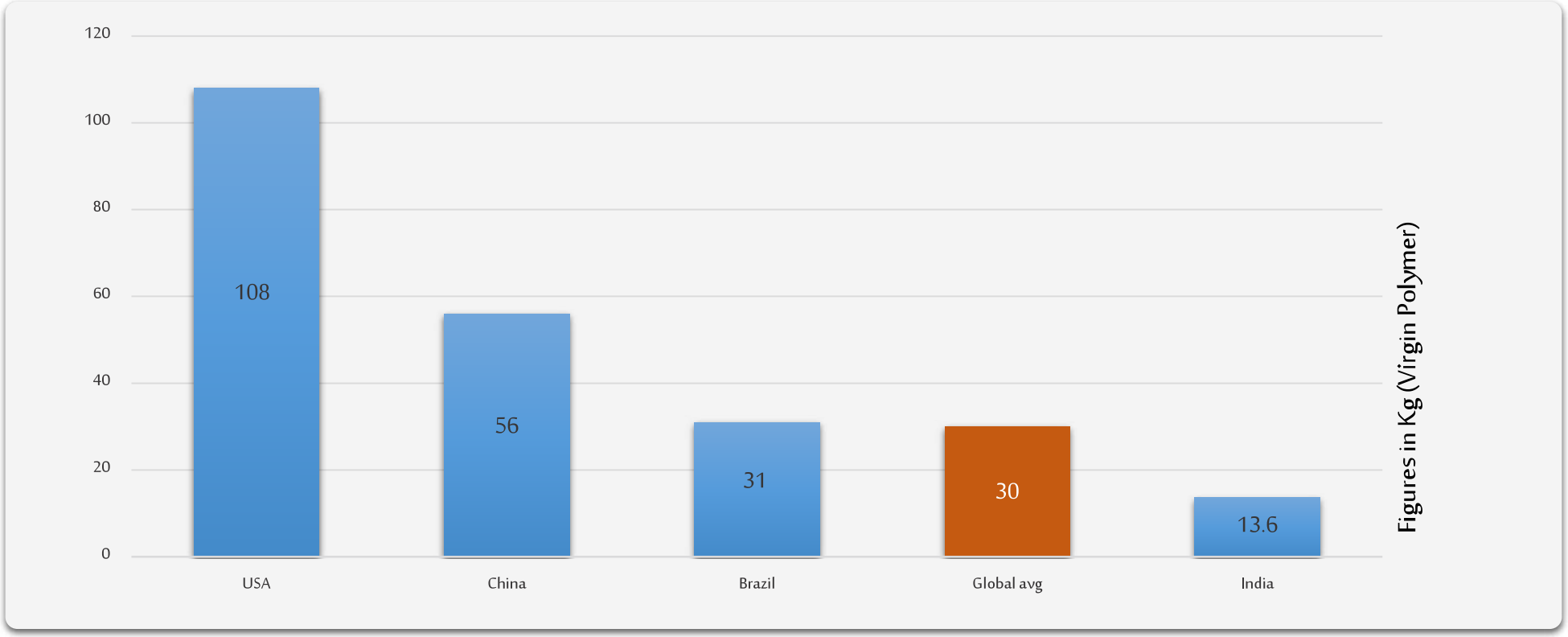
All Figures in MMT

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)

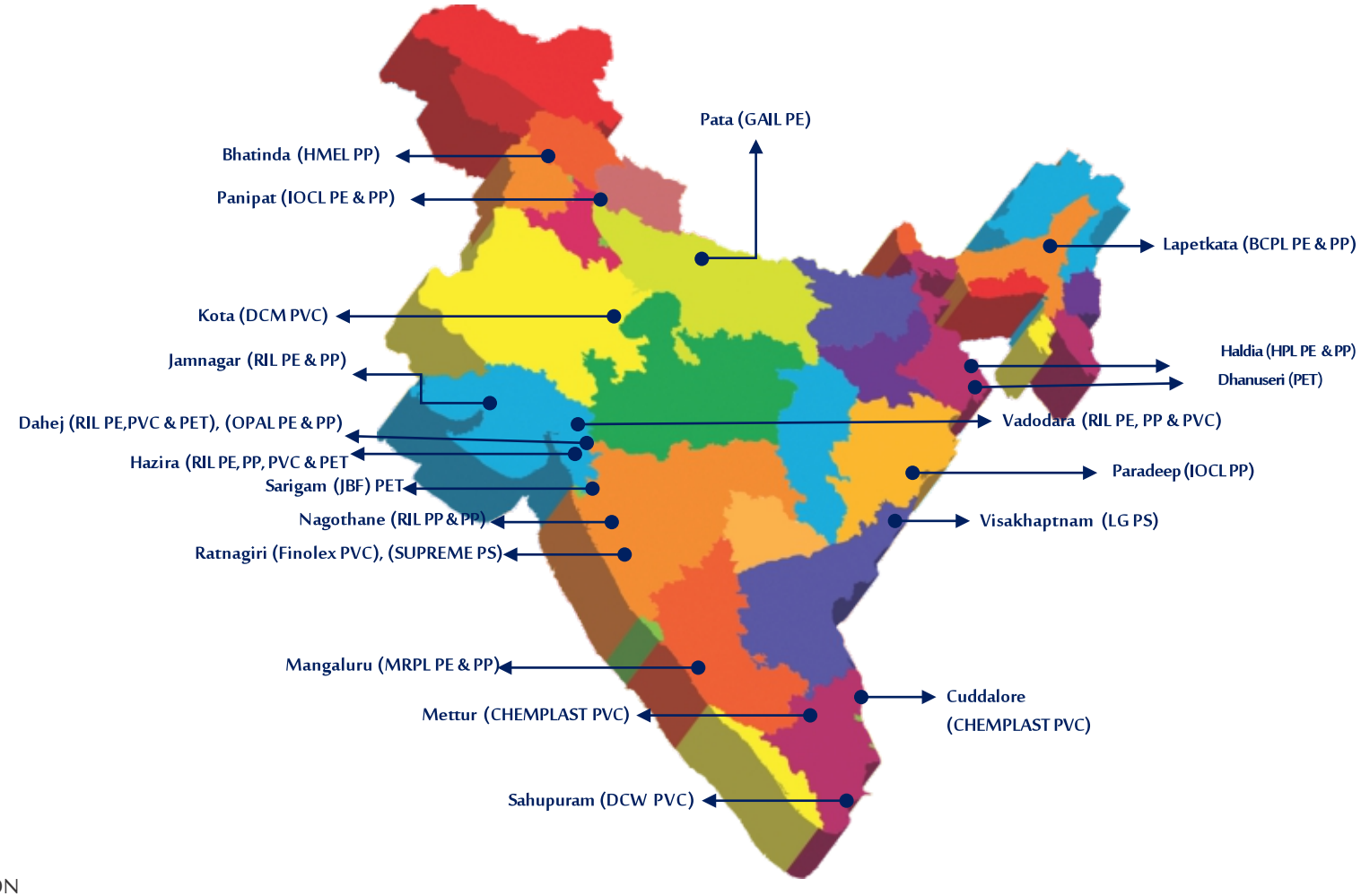
MANUFACTURER	PLASTICS	CAPACITY (TPA)	MAJOR APPLICATIONS
Solvay Specialties (Panoli)	Polyether Sulfone (PES)	2000	Chip Trays, Electricals, Membranes
	Polyether Ether Ketone (PEEK)	1000	Stock Shapes, E&E, Cables, Gen. Engineering, Oil & Gas
Solvay/Rallis (Ankleshwar)	Polyether Ketone Ketone (PEKK)	110	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

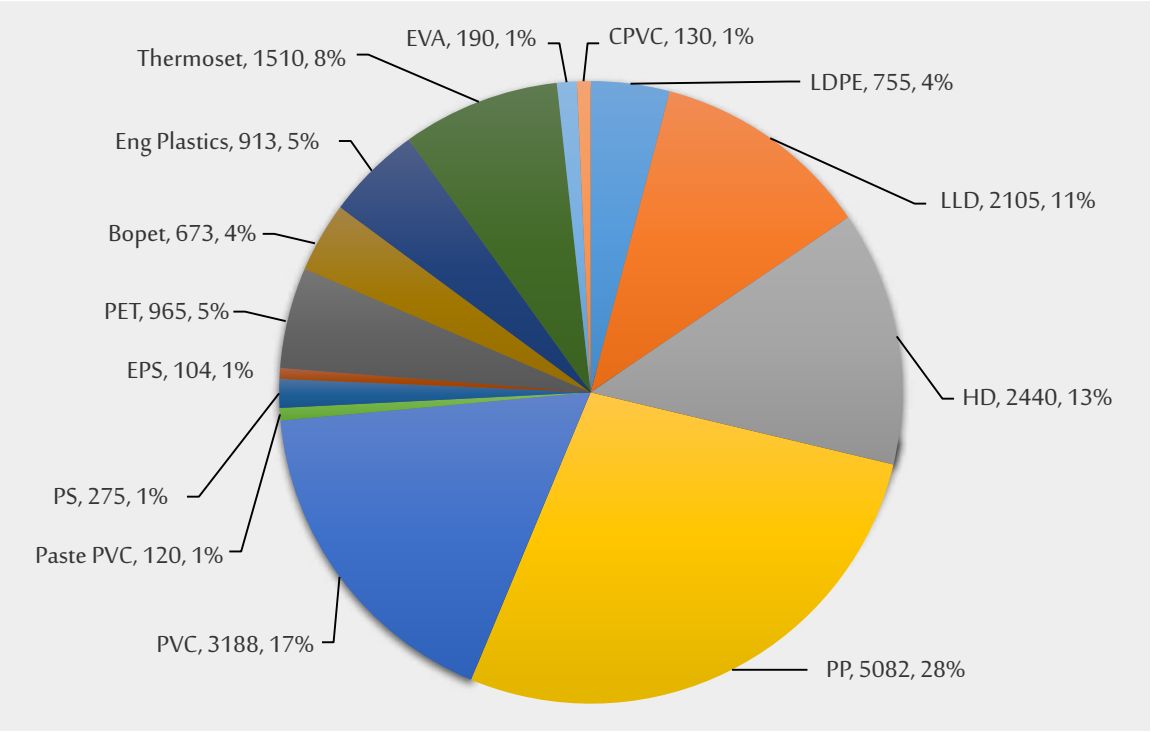






INDIA'S SCENARIO ON PLASTICS CONSUMPTION (2018-19)

THERMOPLASTICS & THERMOSET



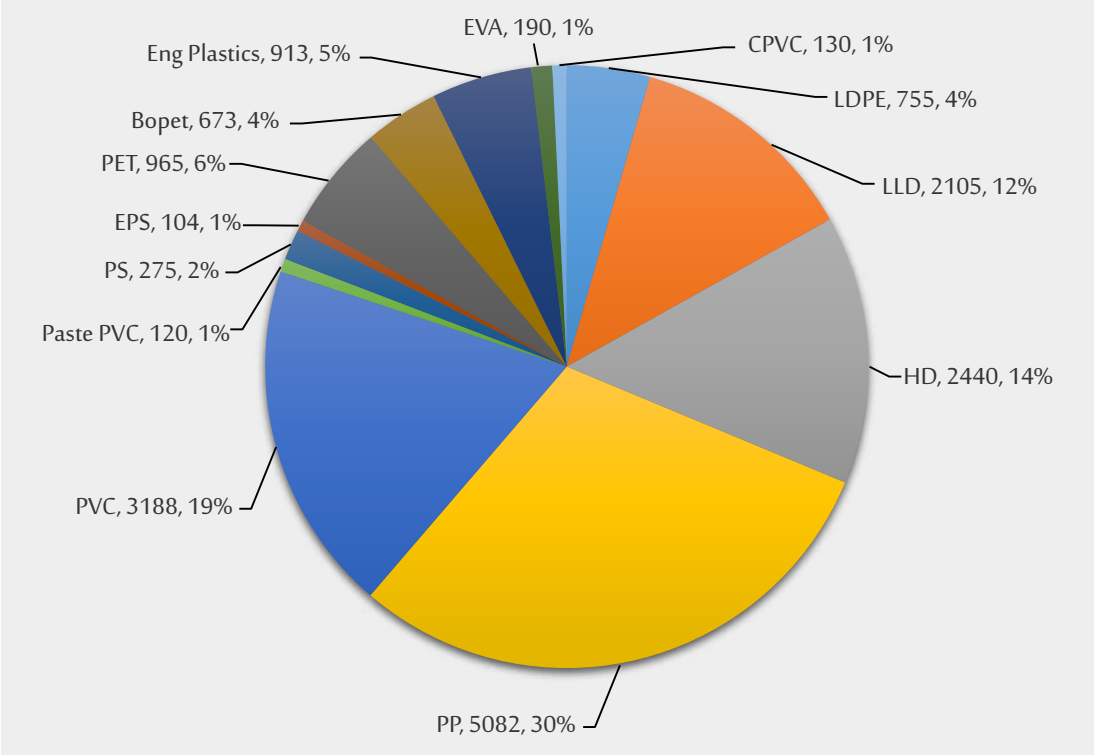
All Fig in KT

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

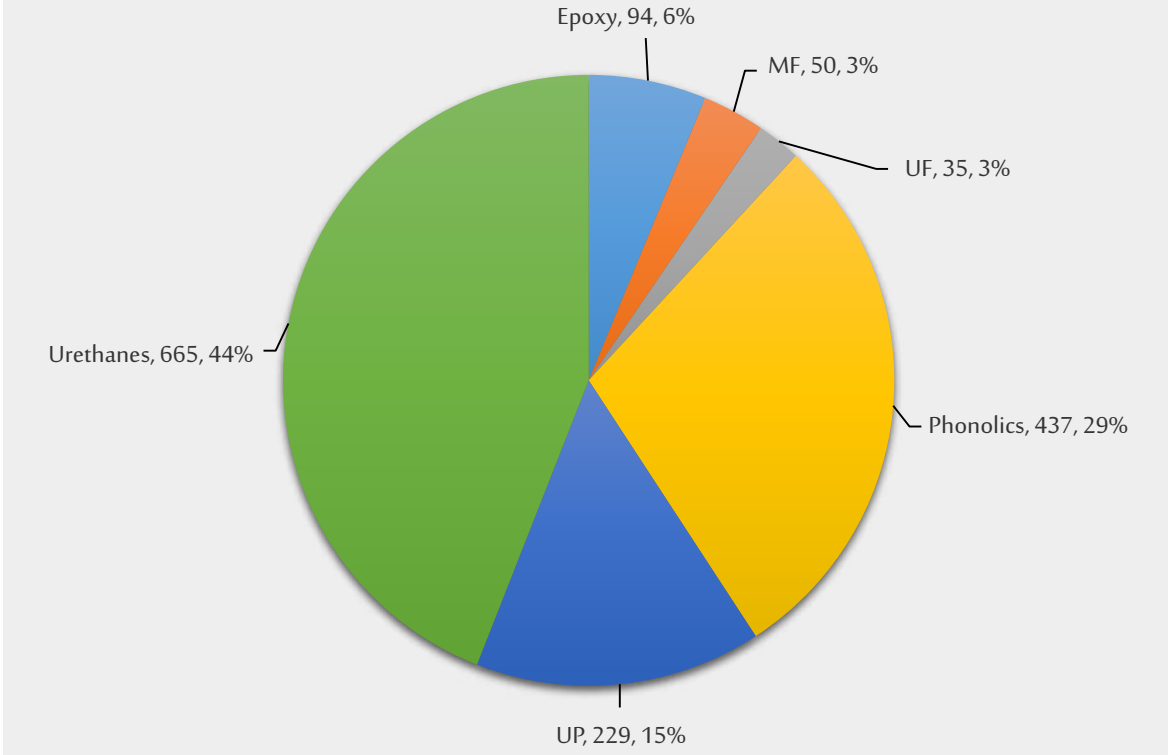
Source: PLASTINDIA FOUNDATION /Industry Estimate

PLASTICS CONSUMPTION (2018-19) - INDIA

THERMOPLASTICS



THERMOSETS

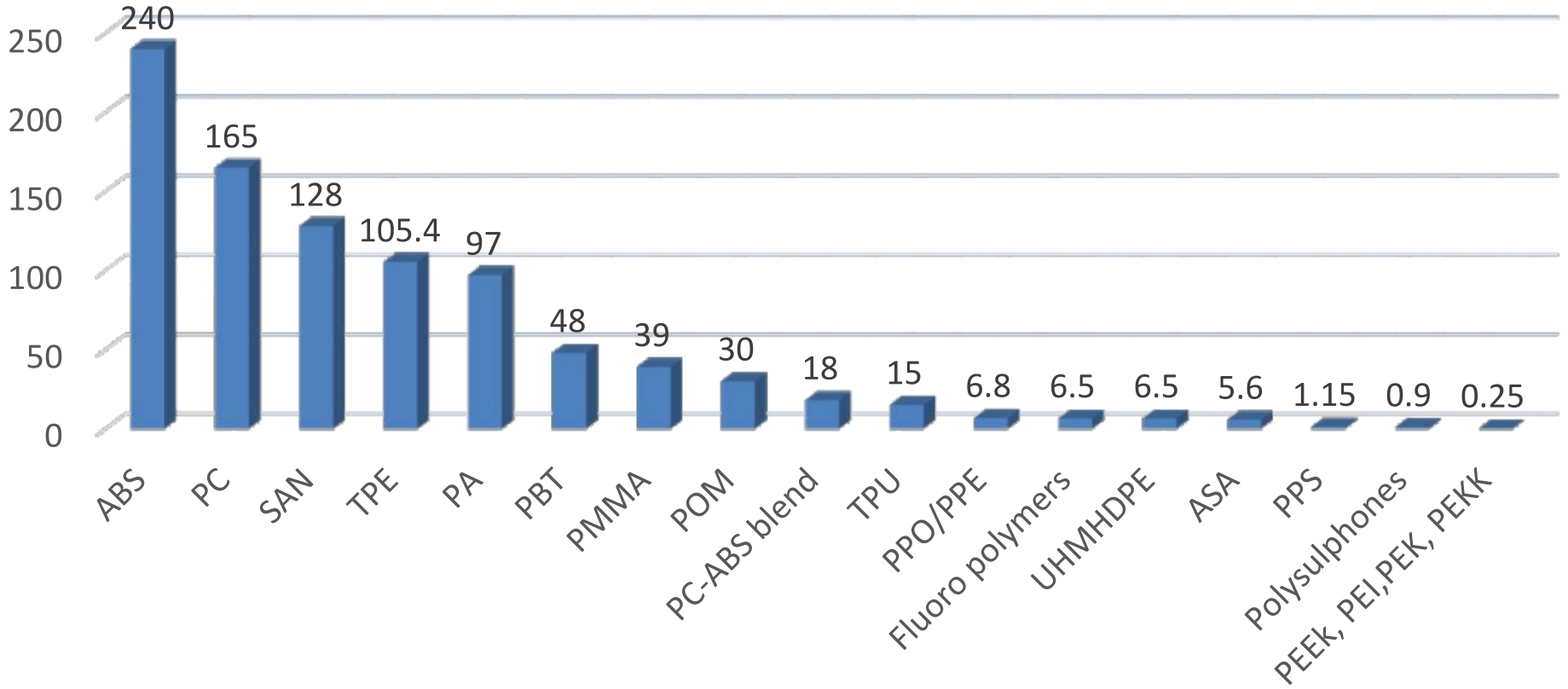


All Fig in KT

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

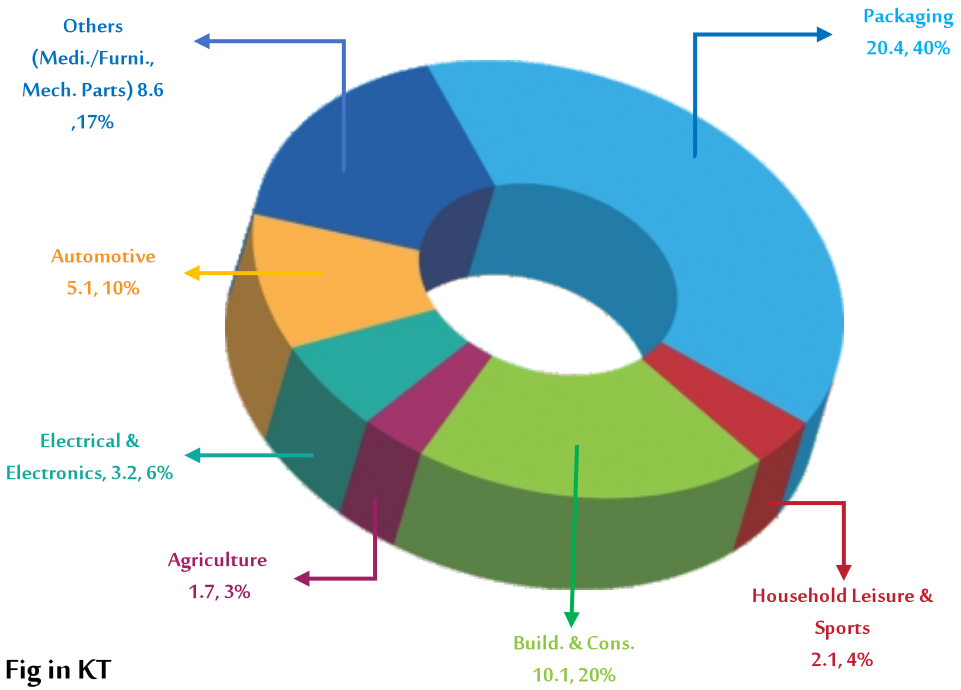
Commodity Plastics



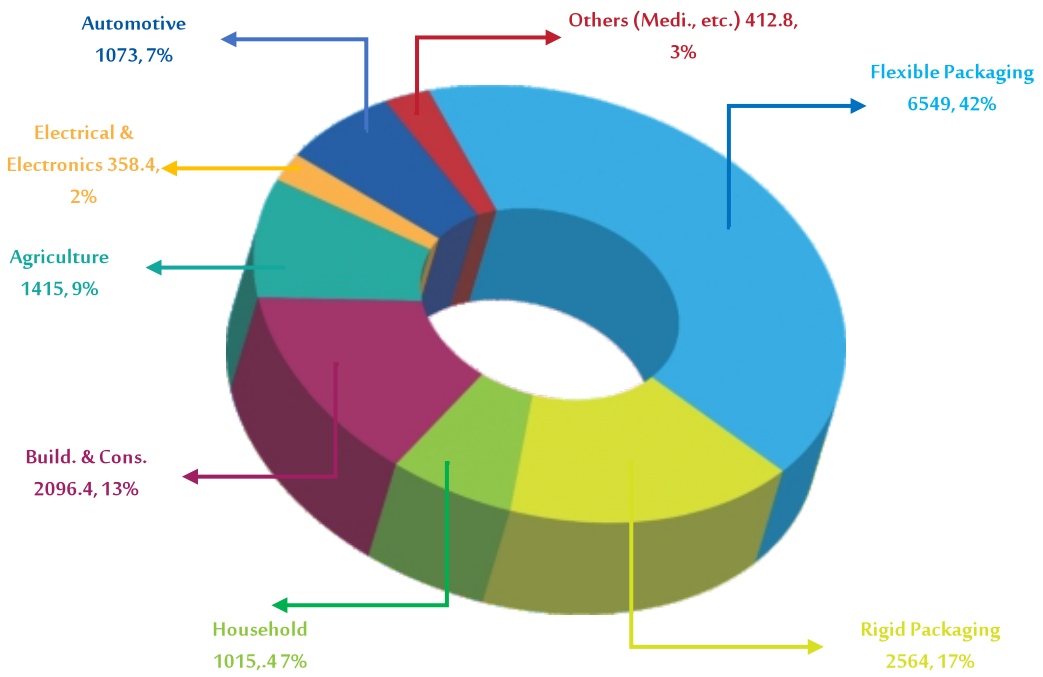


MAJOR PLASTICS SECTOR WISE CONSUM. EUROPE VS INDIA

Europe – 2018 – 51.2 MMT



India – 2018 ~ 15.4 MMT



All Fig in KT

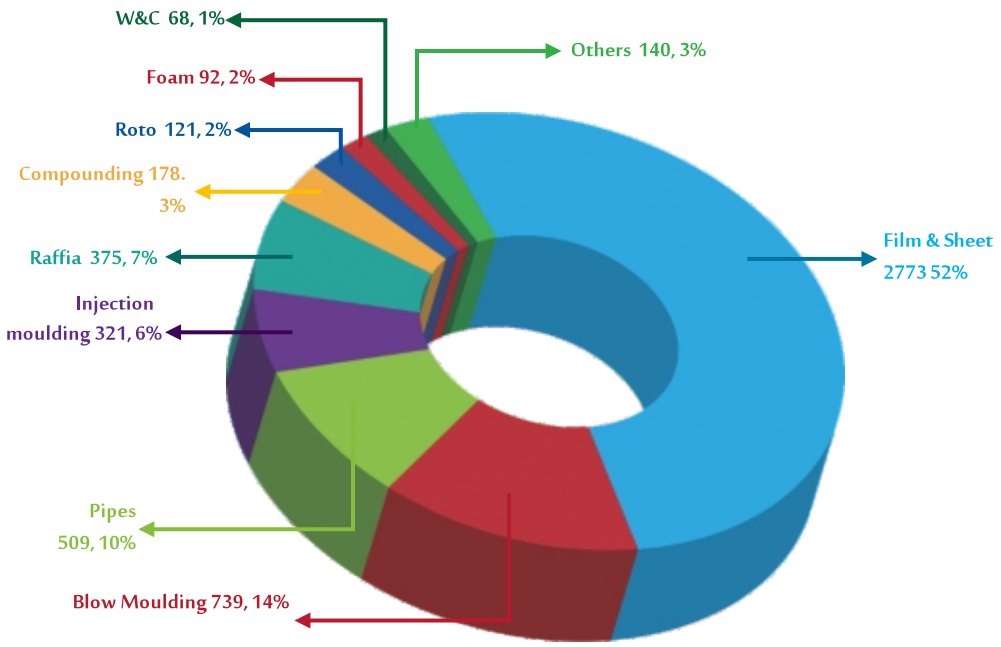
PE/PP/PVC/PET+BOPET/PS/Eng. plastics

PE/PP/PVC/PET+BOPET/PS

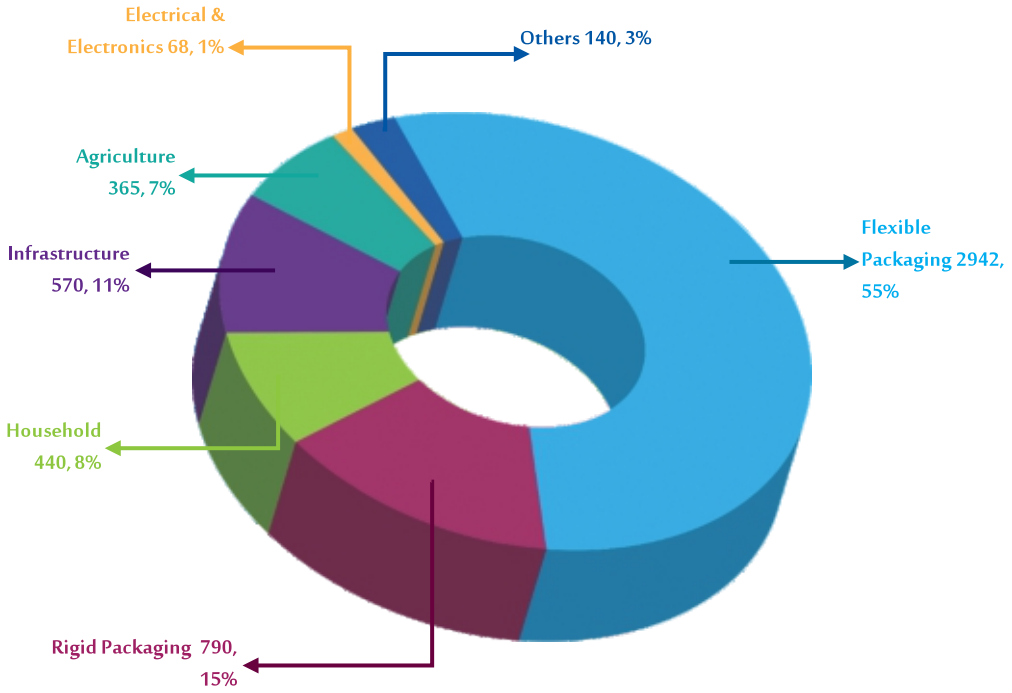
Source: PLASTINDIA FOUNDATION /Industry Estimate

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%



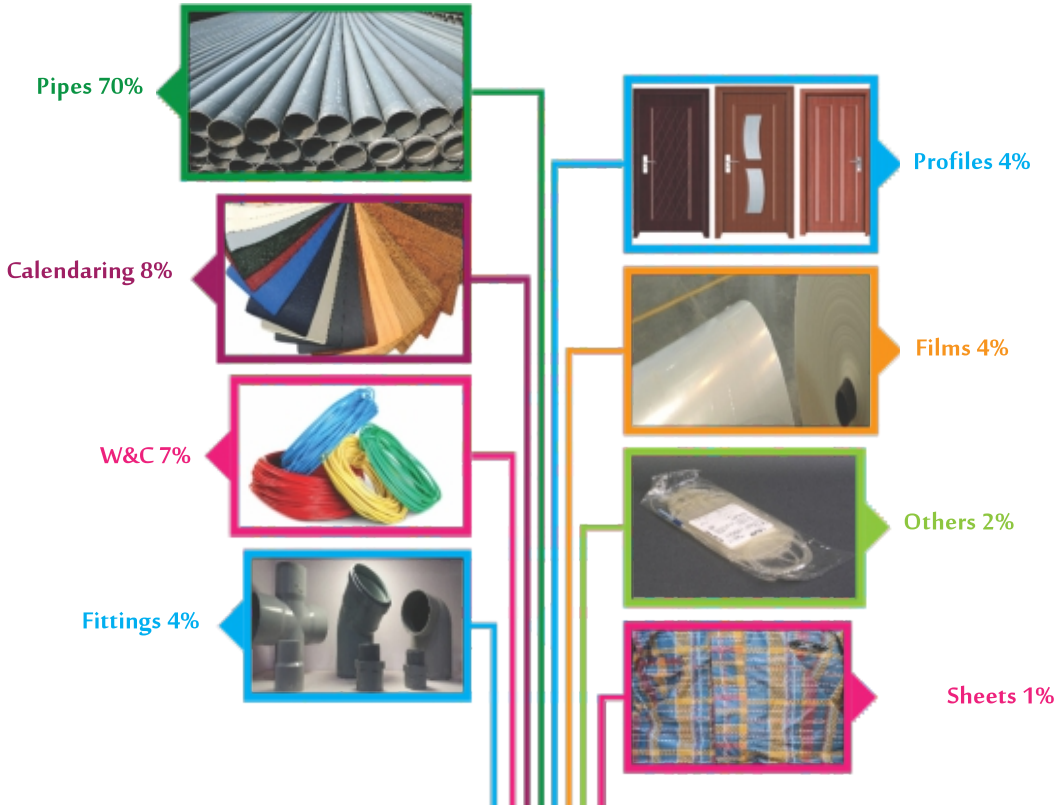
All Fig in KT

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%**

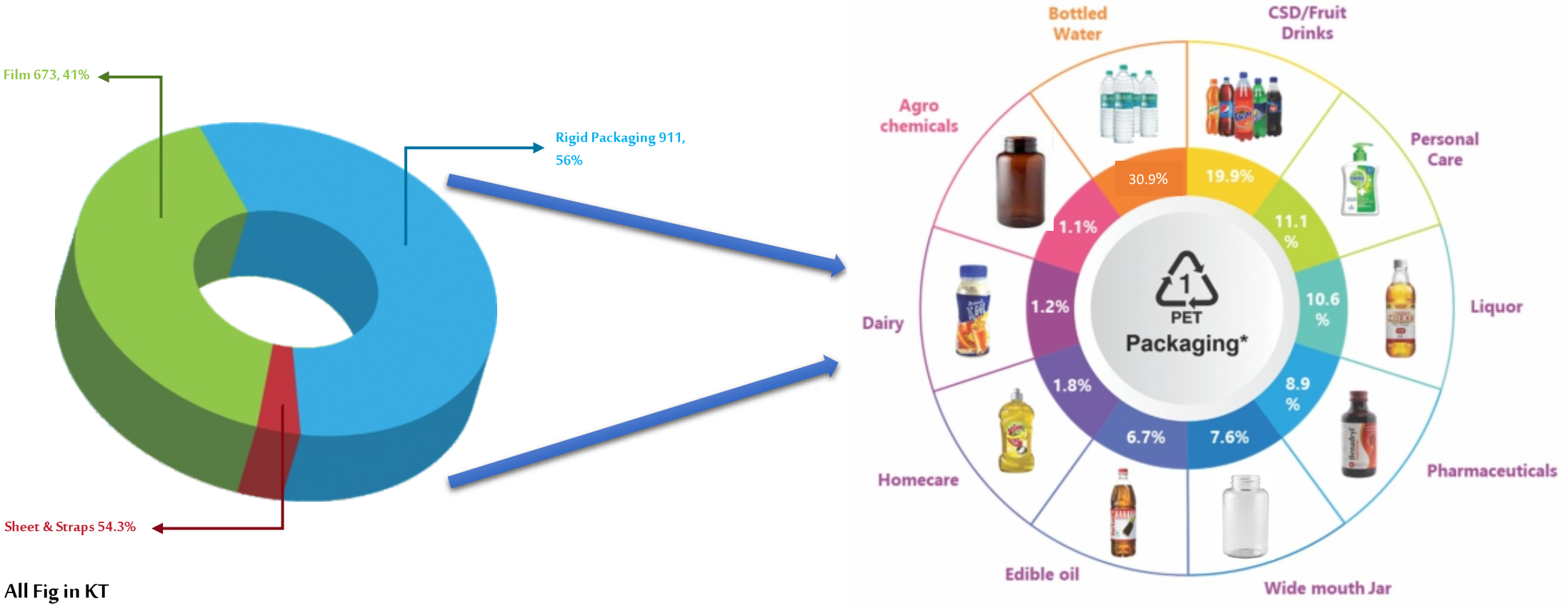


All Fig in KT

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



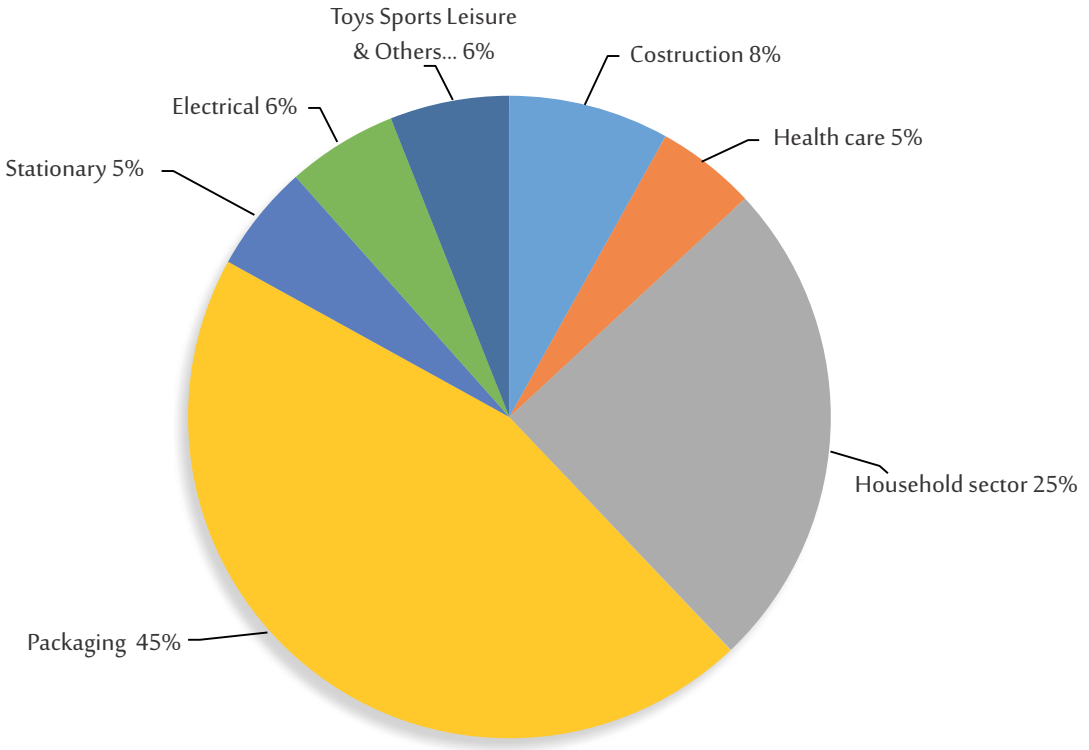
All Fig in KT

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

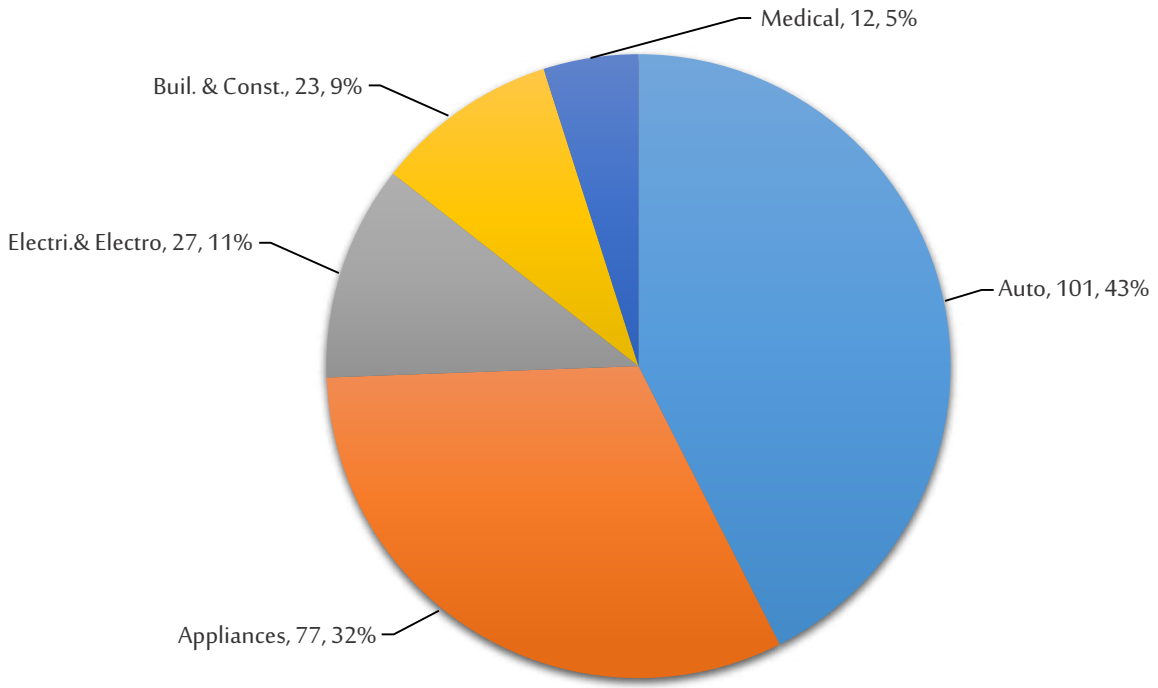
Engineering Plastics





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

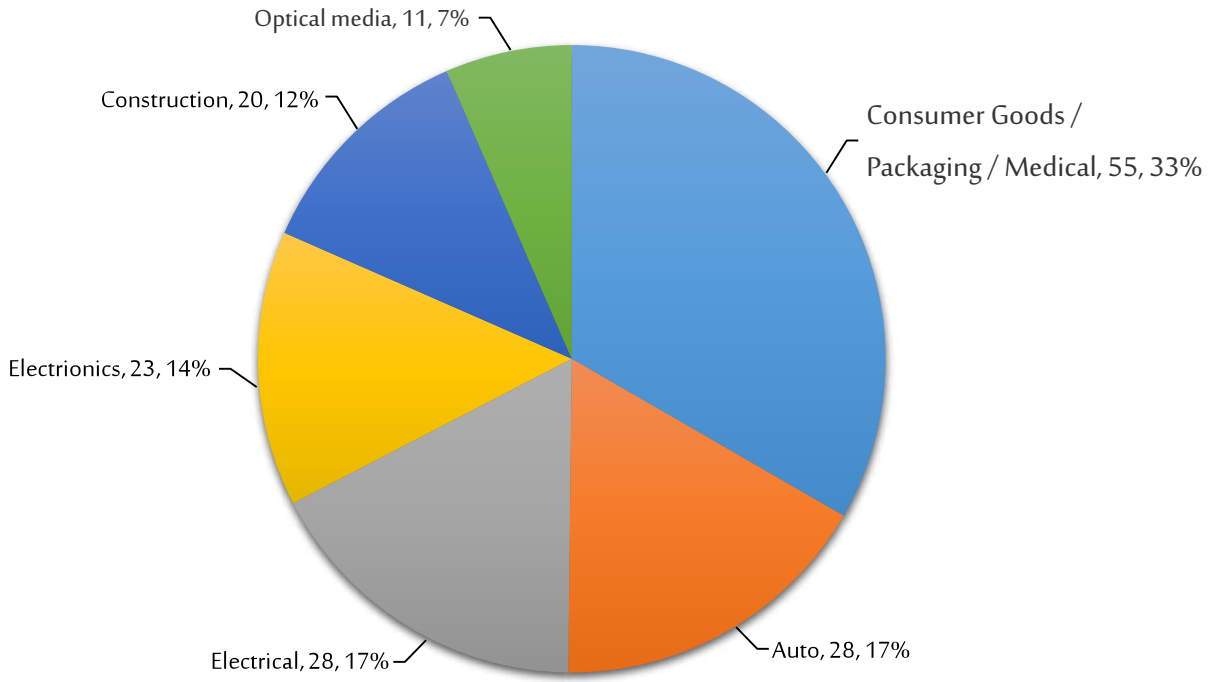
2018-19 Consumption - 240 KT 2019-20 Est. - 250 KT YoY Growth ~ 4.2%

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

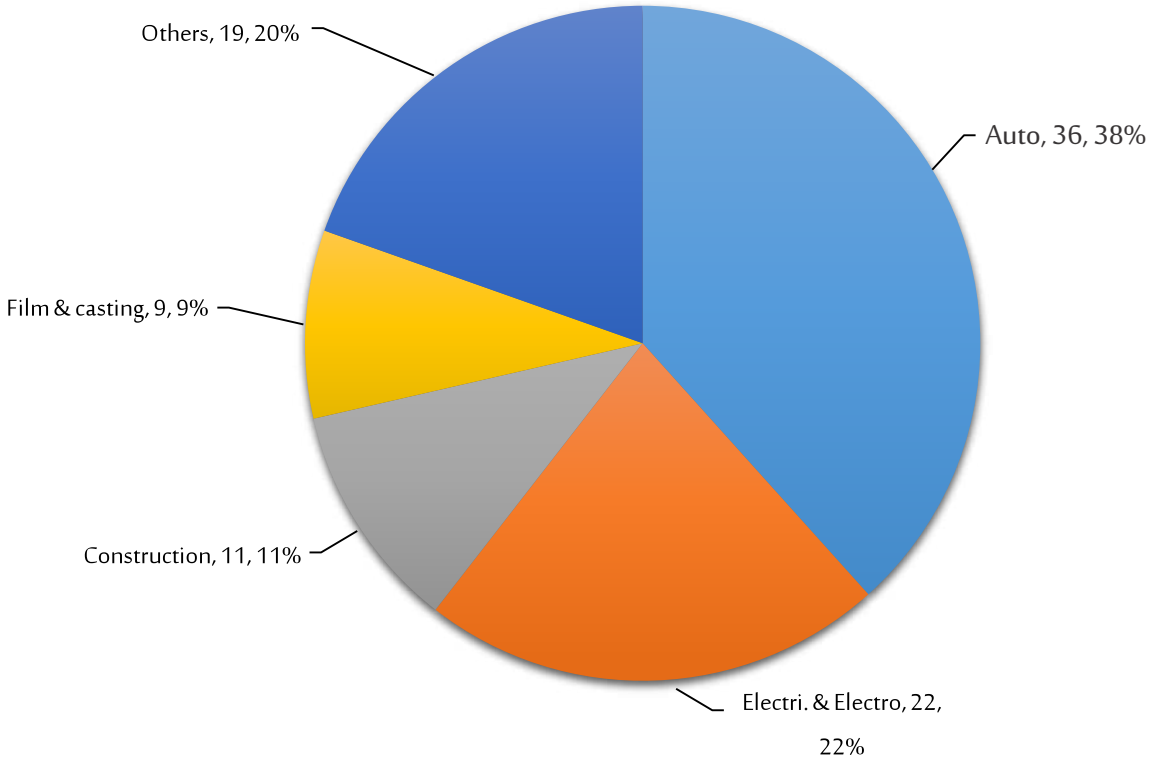


2018-29 Consumption -165 KT 2019-20 Est. 173 KT YoY Growth ~ 5%

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



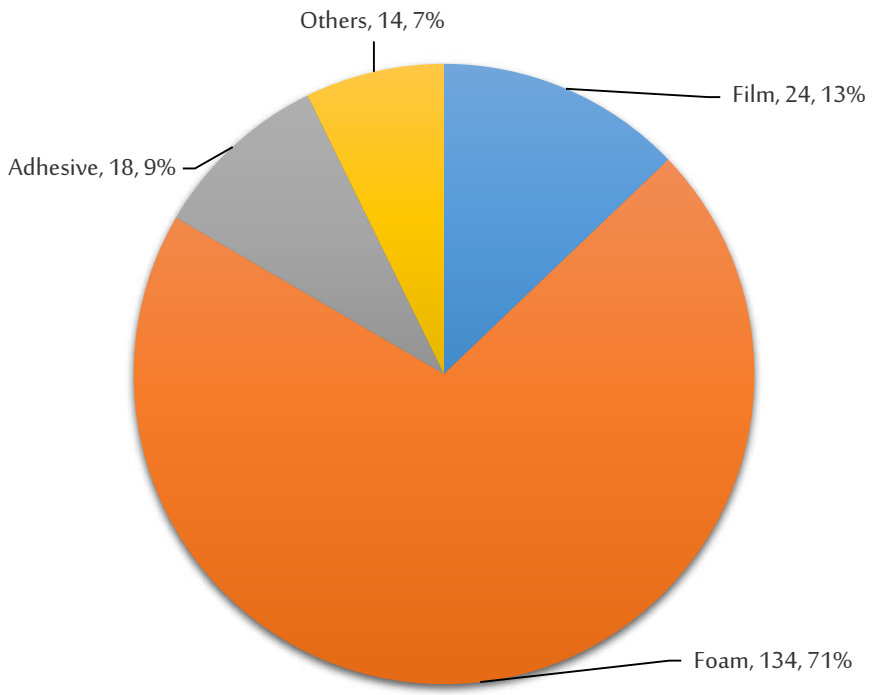
All Fig in KT

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



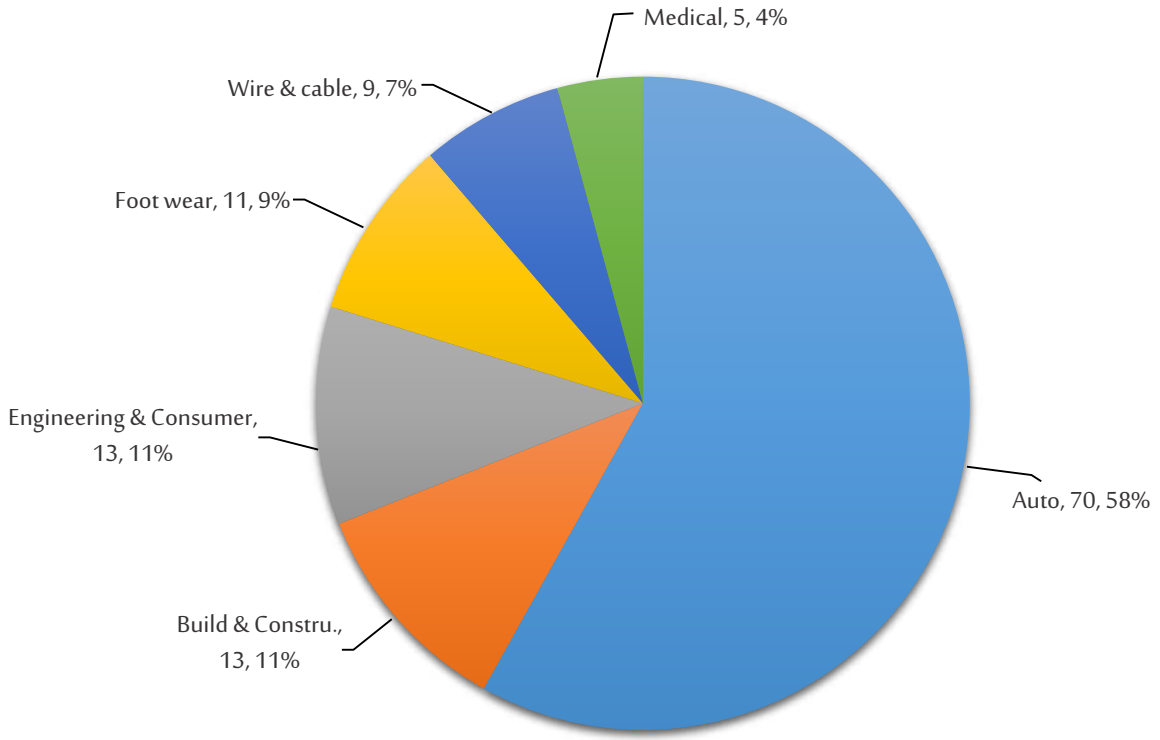
All Fig in KT

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

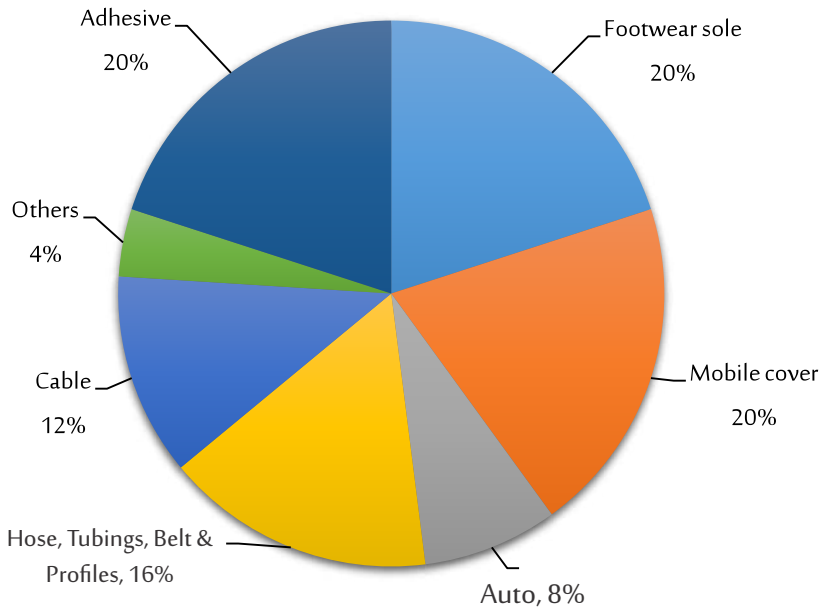
2018-19 Consumption 121 KT 2019 -20 Est. 129 KT YoY Growth ~ 6.5%

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

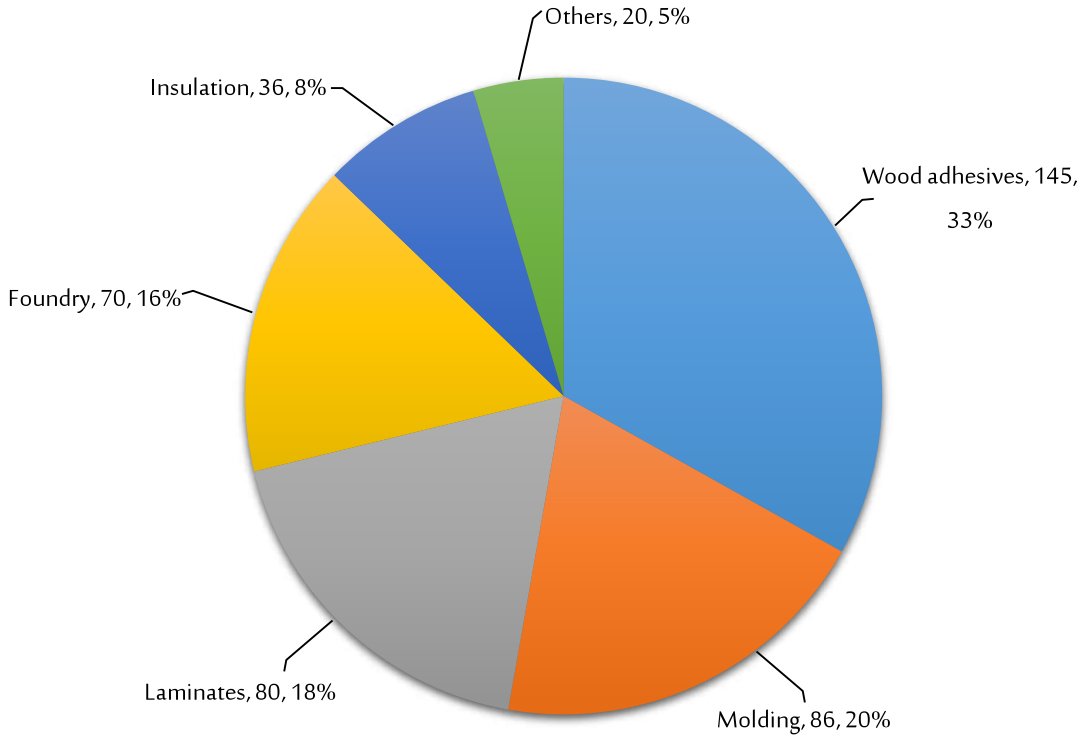






PHENOLICS - SECTOR WISE CONSUMPTION (2018-19) - INDIA

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



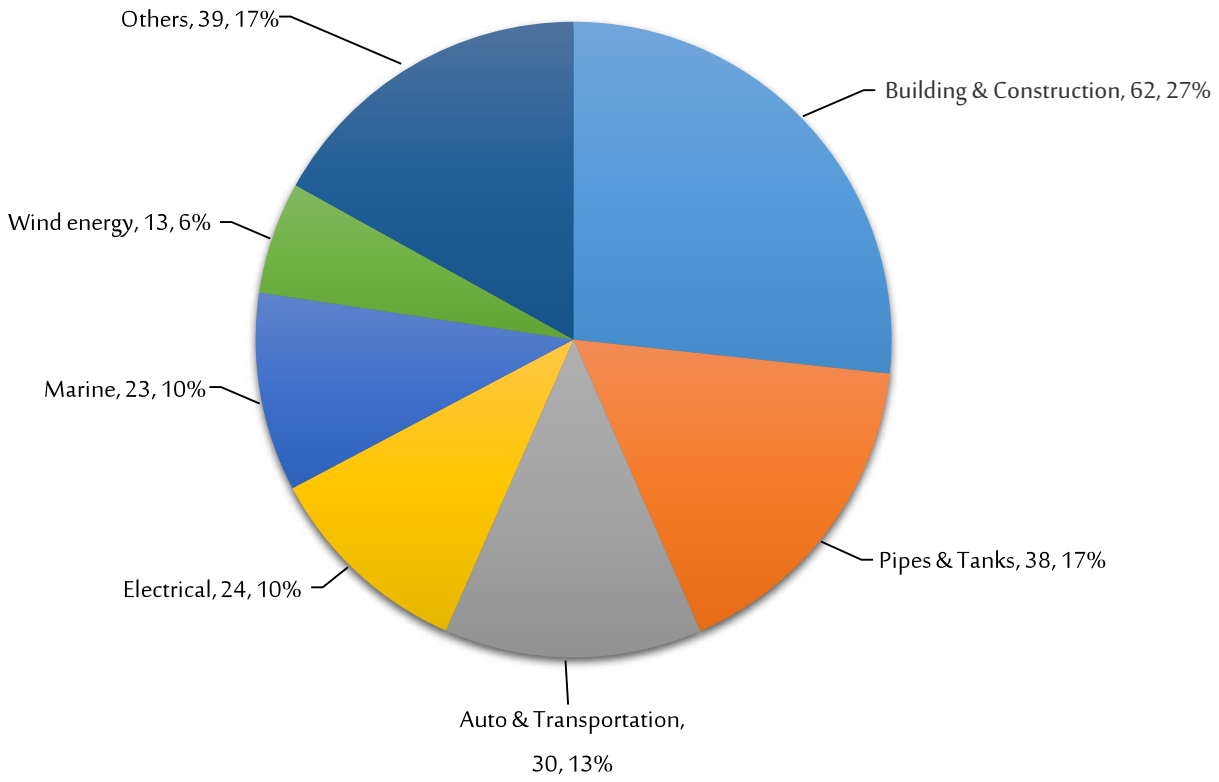
All Fig in KT

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



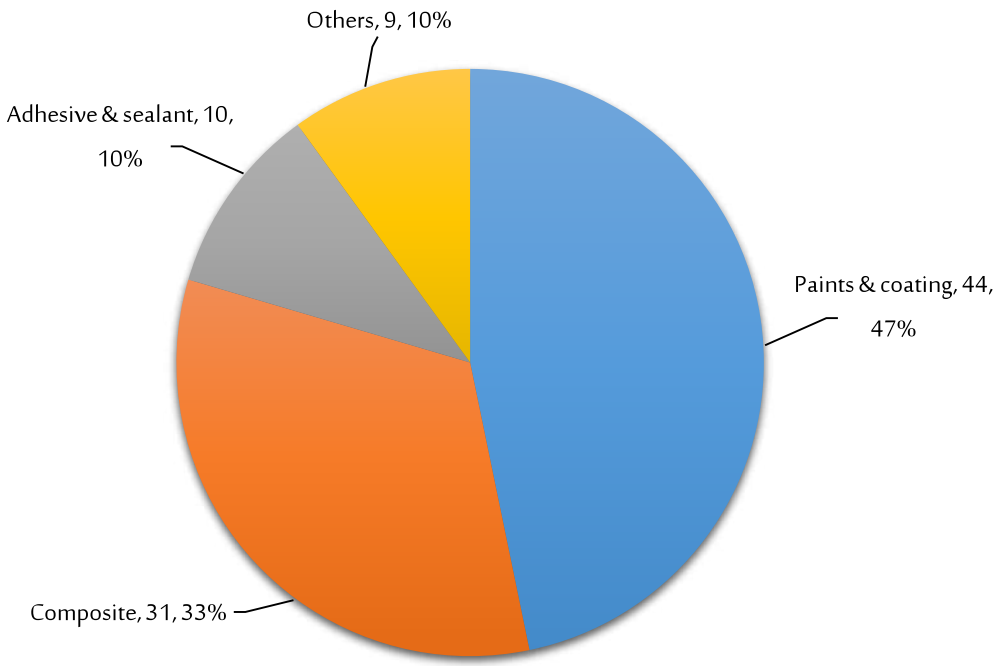
All Fig in KT

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



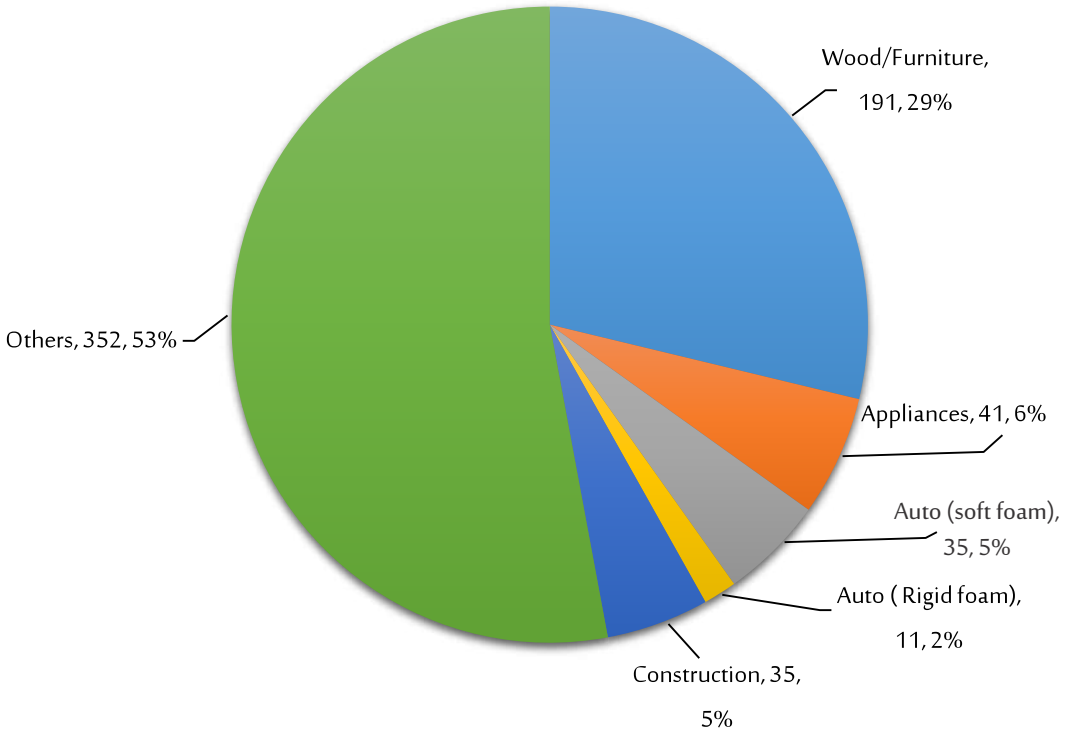
All Fig in KT

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



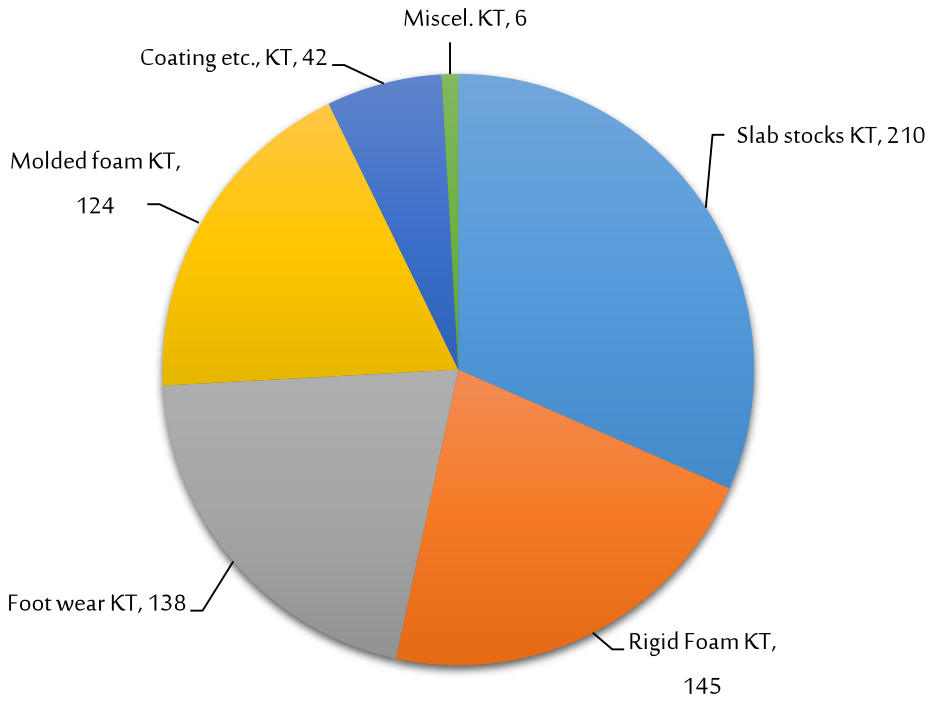
All Fig in KT

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

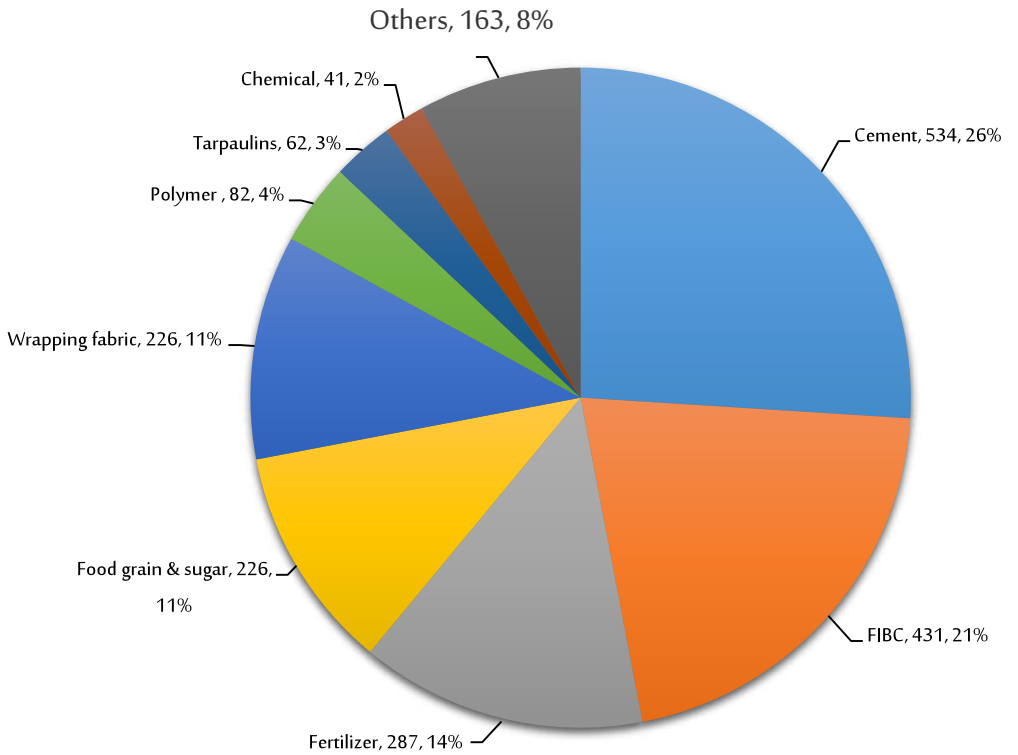
SECTOR WISE POLYMER CONSUMPTION

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



All Fig in KT

* 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 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

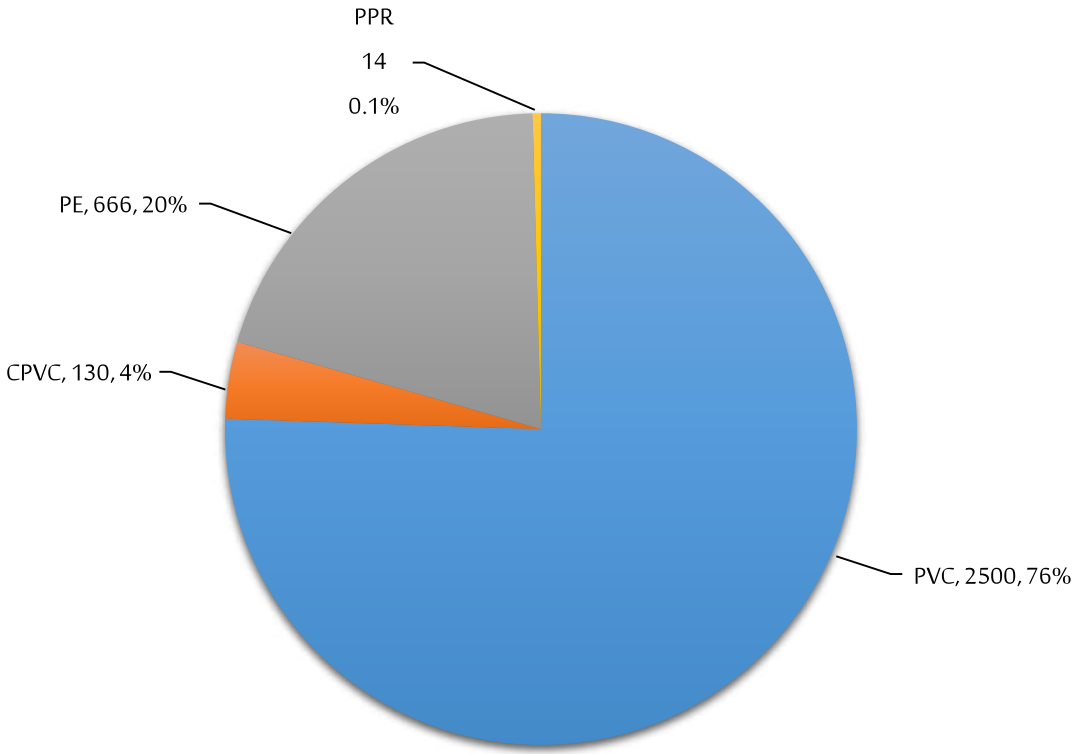
- Stones & Minerals (Builder bags)
- Bulk chemicals
- Pharmaceuticals
- Agriculture products
- Sea food products
- Food products
- Hazardous products and chemicals (UN Certified bags)
- Plastic granules and resins



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

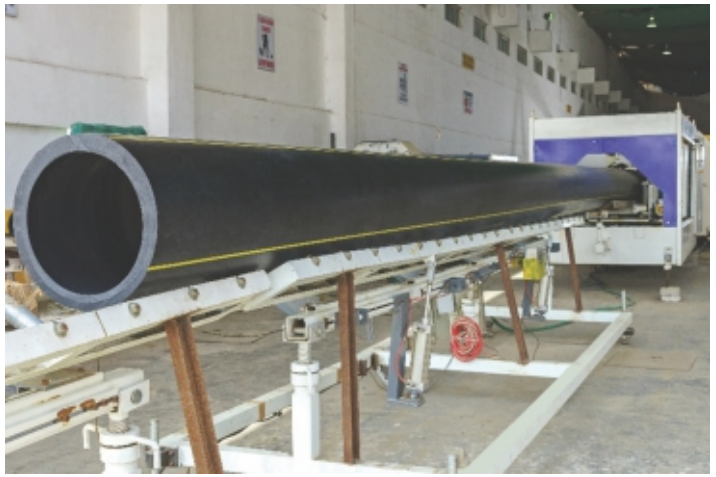
2018-19 Consumption - 3310 KT 2019-20 Est. 3502 KT YoY Growth ~ 5.8%

Source: PLASTINDIA FOUNDATION /Industry Estimate

PIPE SECTOR 2018-19 – INDIA contd..

Growth Driver

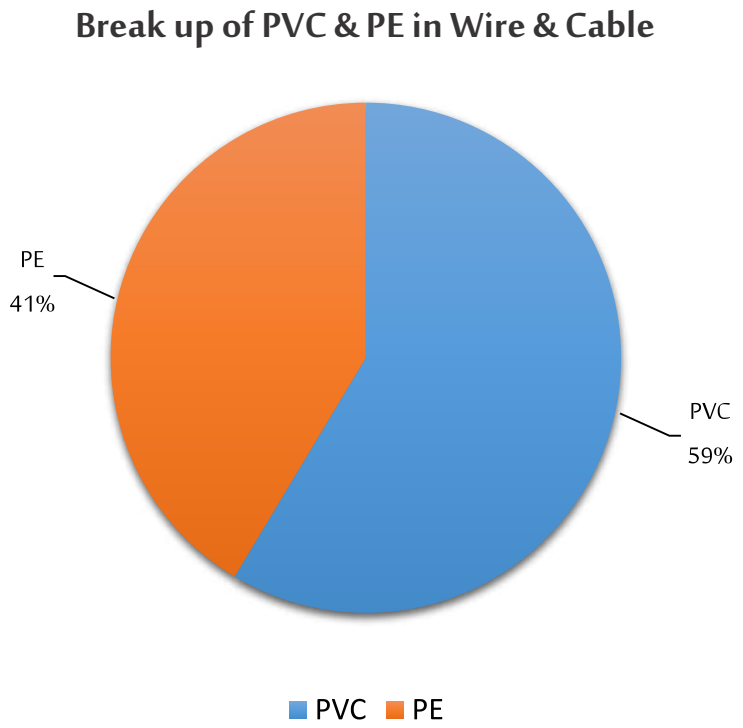
- Large diameter PE pipes for water / Industrial/ Desalination applications
- Oriented PVC pipes (OPVC) replacing DI pipes.
- PP silent pipes for Drainage
- Double wall corrugated (DWC) pipes replacing metal and stone ware pipes for sewage network
- PE pipes for gas distribution



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

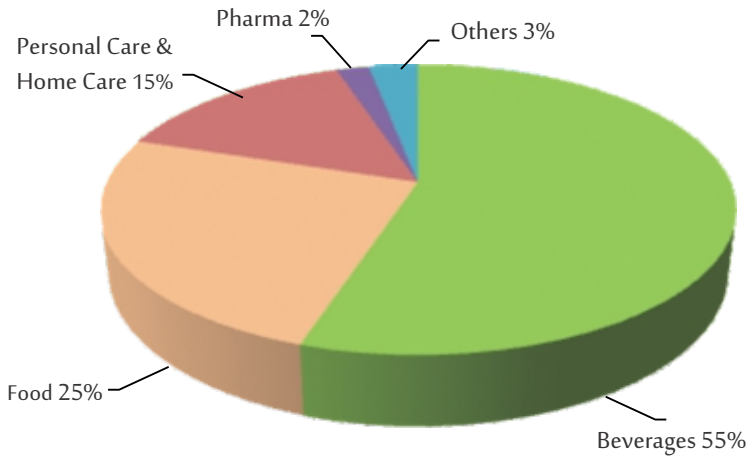
Major Caps & Closures Industries:

- Food
- Beverages
- Personal & Household care
- Pharmaceuticals

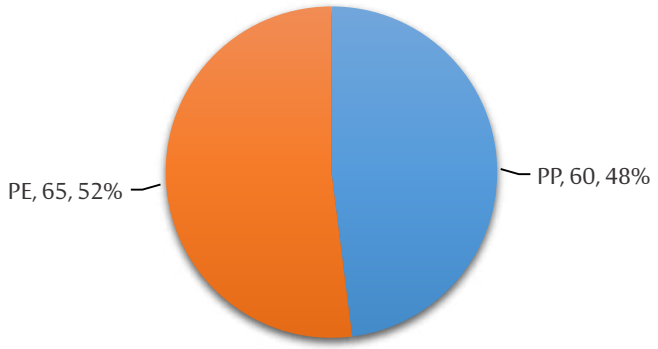
Material Wise Market Share:

- 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



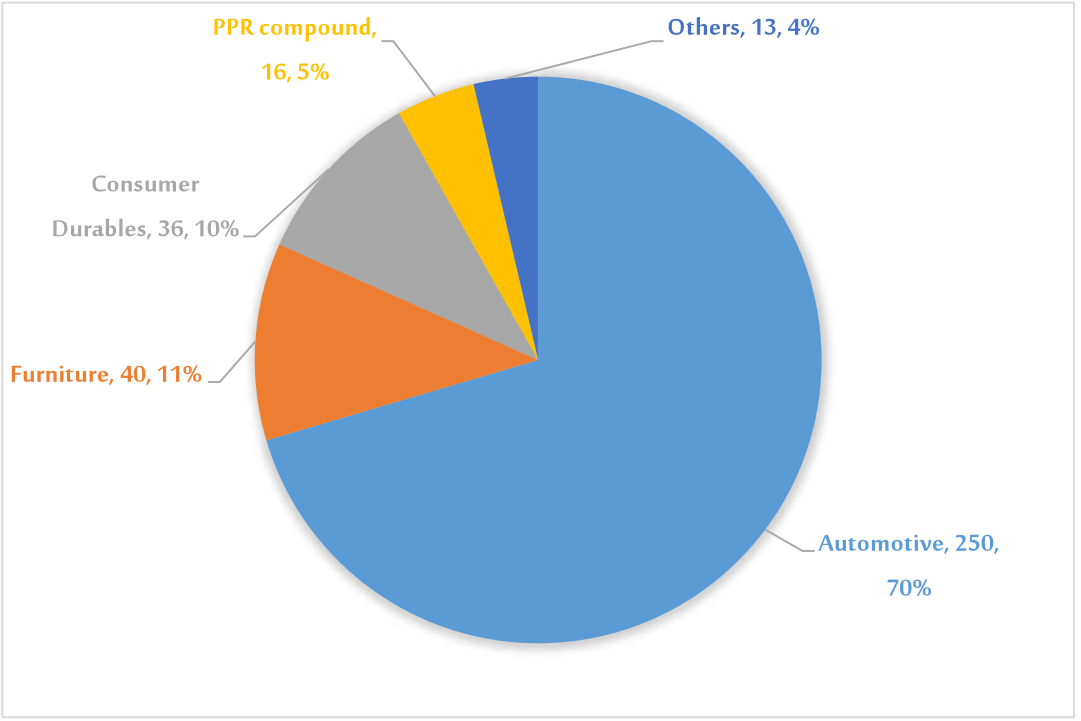




Source: PLASTINDIA FOUNDATION /Industry Estimate

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



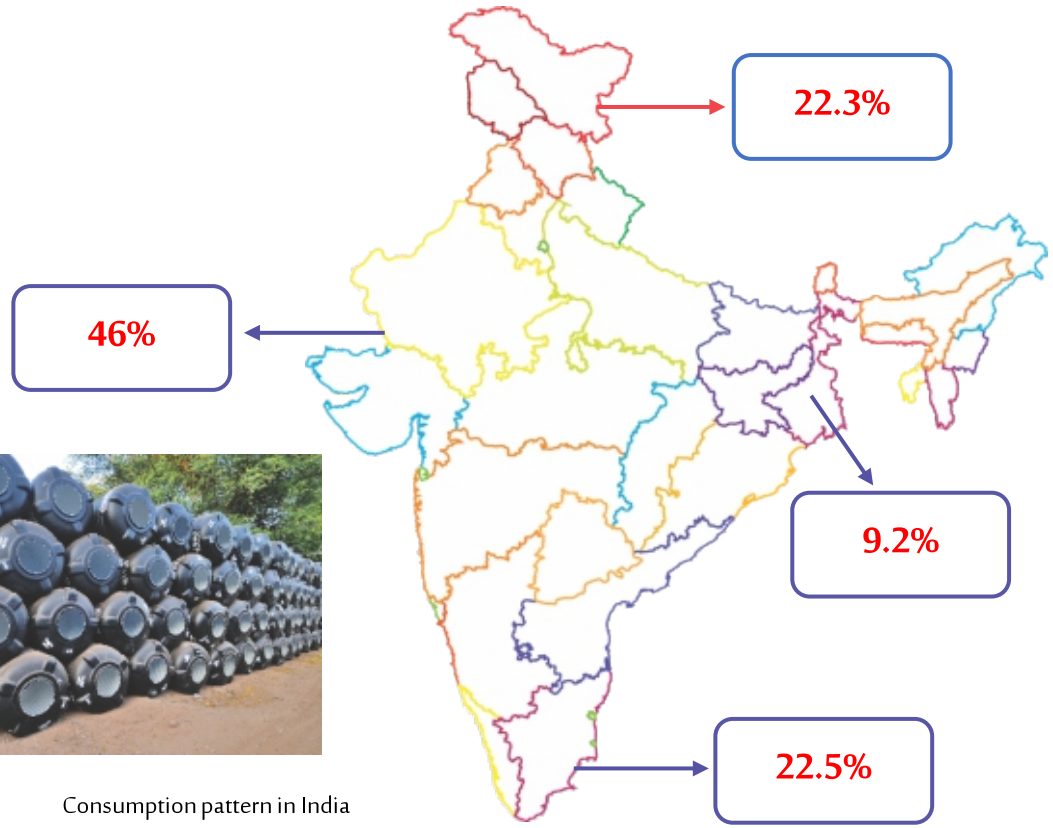
2018-19 Consumption – 355 KT 2019-20 Est. 373 KT YoY Growth ~ 5%

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..

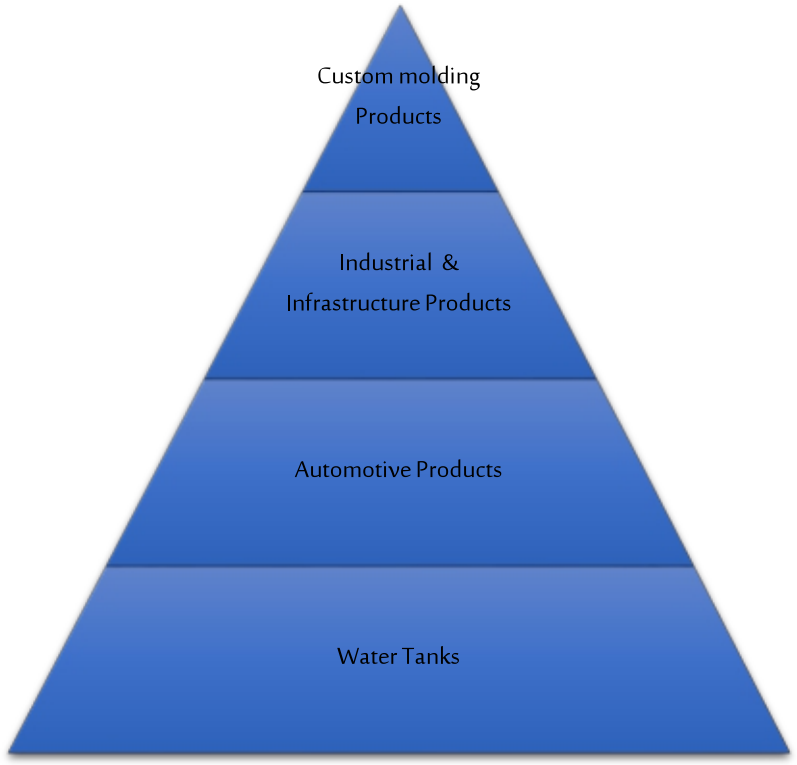
- Mumbai, Ahmedabad , Kolkata, Chennai & Delhi-NCR comprise 65% of All India Rotomoulding Market
- Top 10 Rotomoulders accounts for 50% of Industry Consumption
- Indian Applications – 70% Tanks & 30% Non-Tanks
- Global Applications –. 70% Non Tanks & 30% Tanks
- Minimum Size of tank manufactured in India – 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



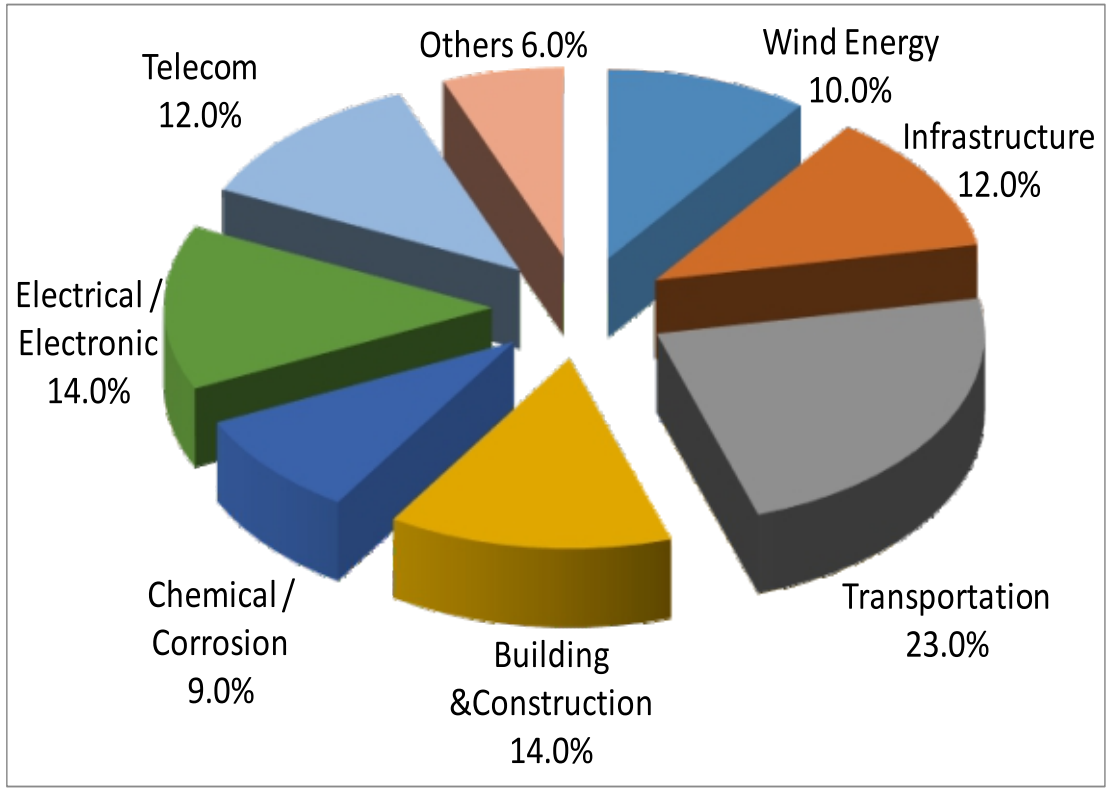


2018-19 Consumption - 380 KT 2019-20 Est. 410 KT YoY Growth ~ 8%

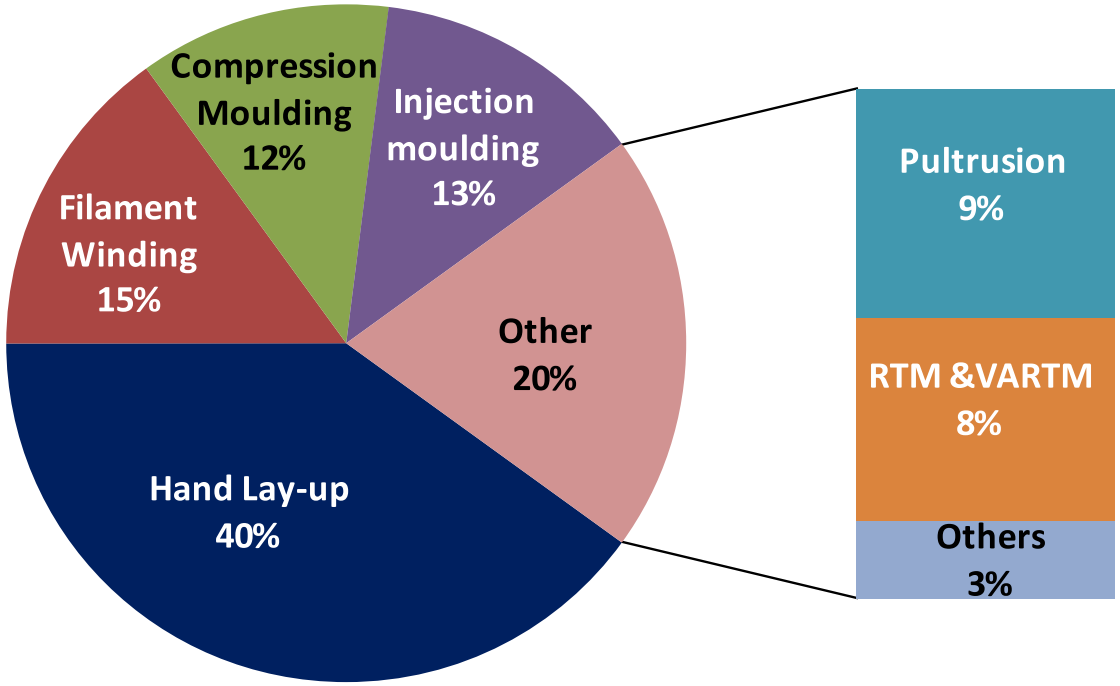
Source : PLASTINDIA FOUNDATION / FRP Institute

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

APPLICATION BREAK UP



MARKET DISTRIBUTION BY MANUFACTURING PROCESS

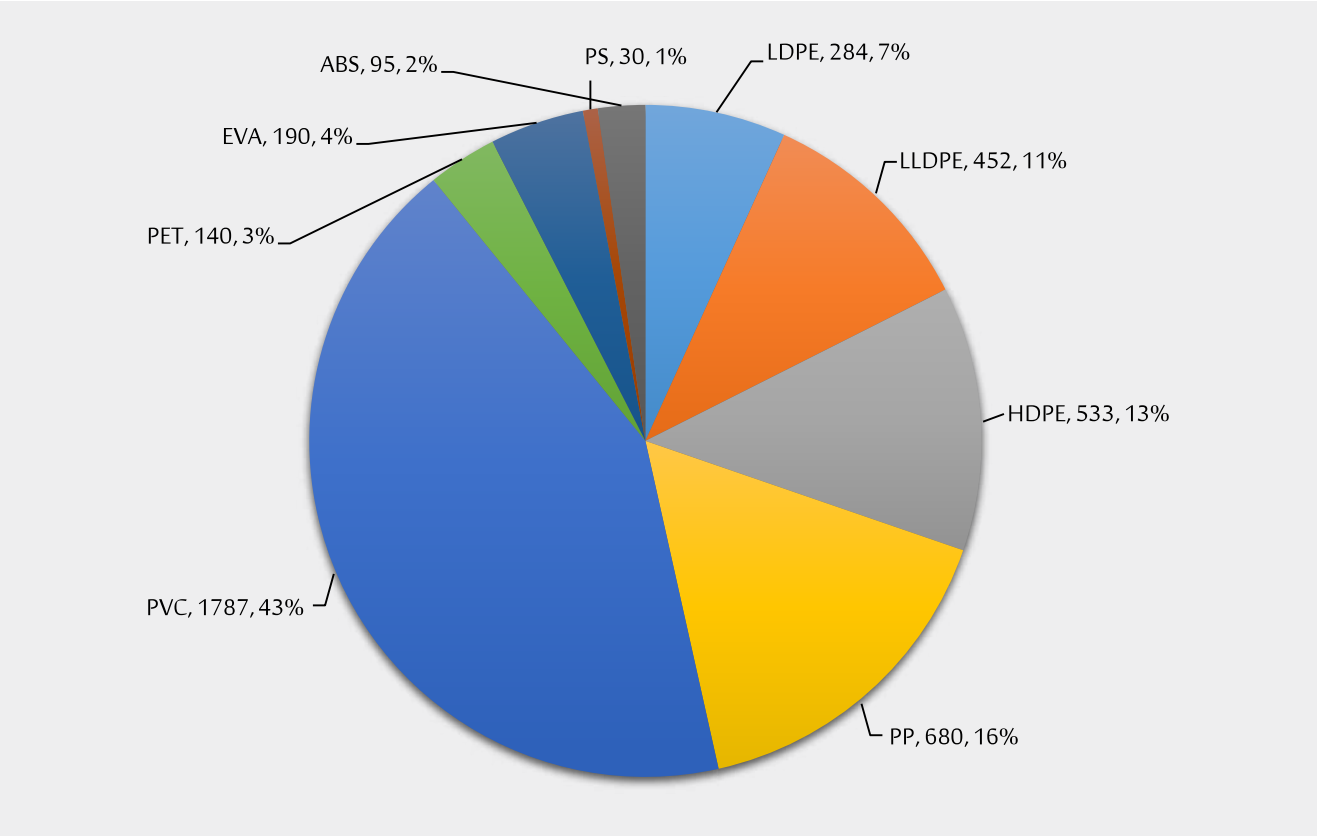


Source : FRP Institute

IMPORT & EXPORT



MAJOR PLASTICS RAW MATERIAL (2018-19) - IMPORTS

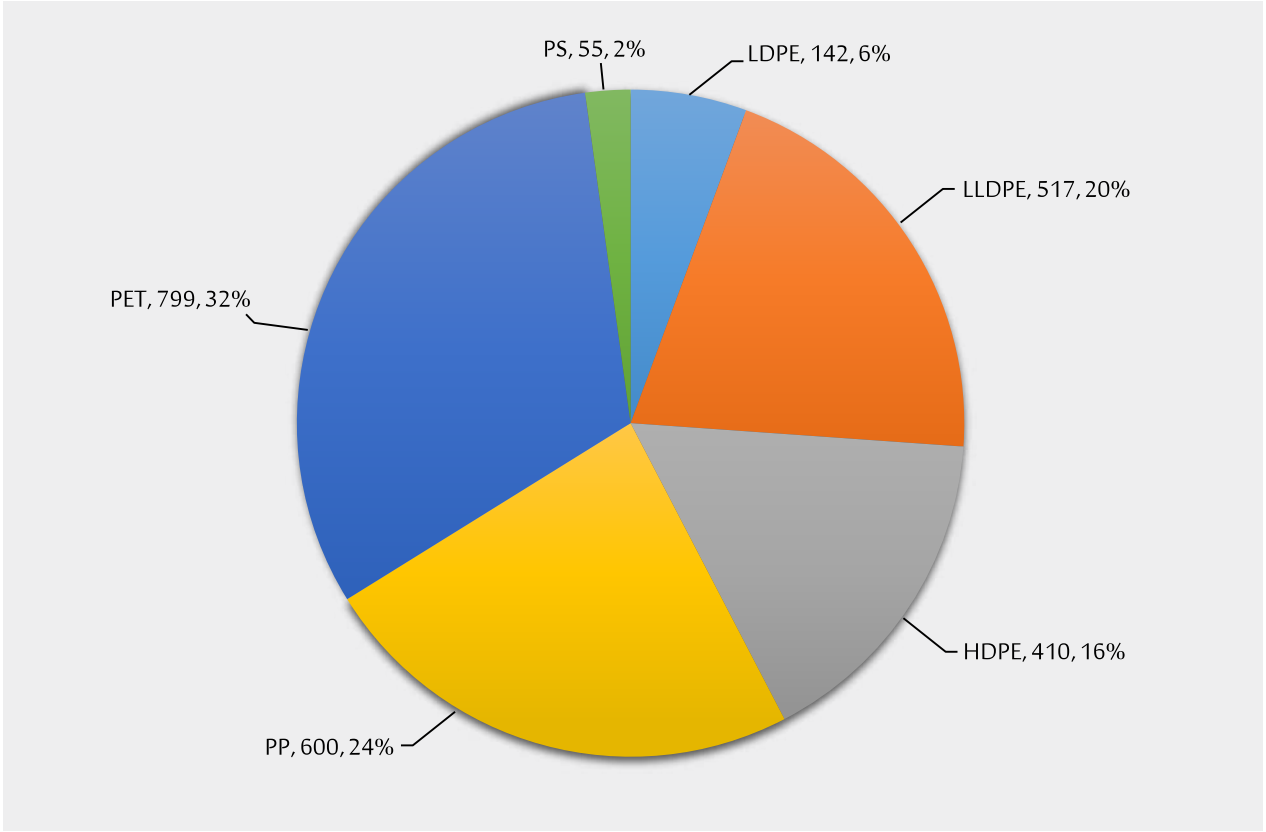


(All Figs in KT)

Polymer Imports 2018-19 - 4191 KT

Source : CPMA

MAJOR PLASTICS RAW MATERIAL (2018-19) - EXPORTS

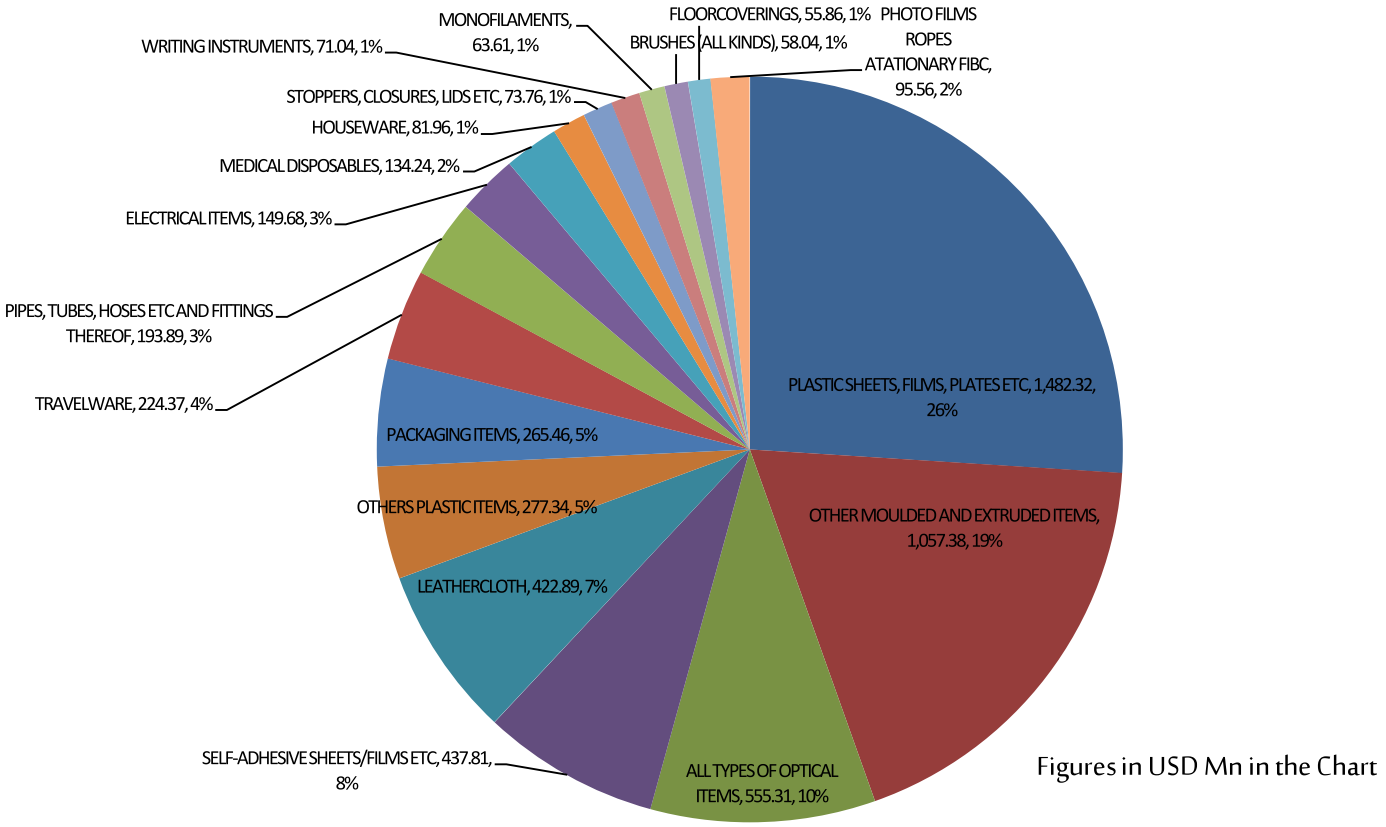


(All Figs in KT)

Total Exports of Polymers 2018-19 - 2523 KT

Source : CPMA

IMPORTS OF FINISHED GOODS (2018-19)

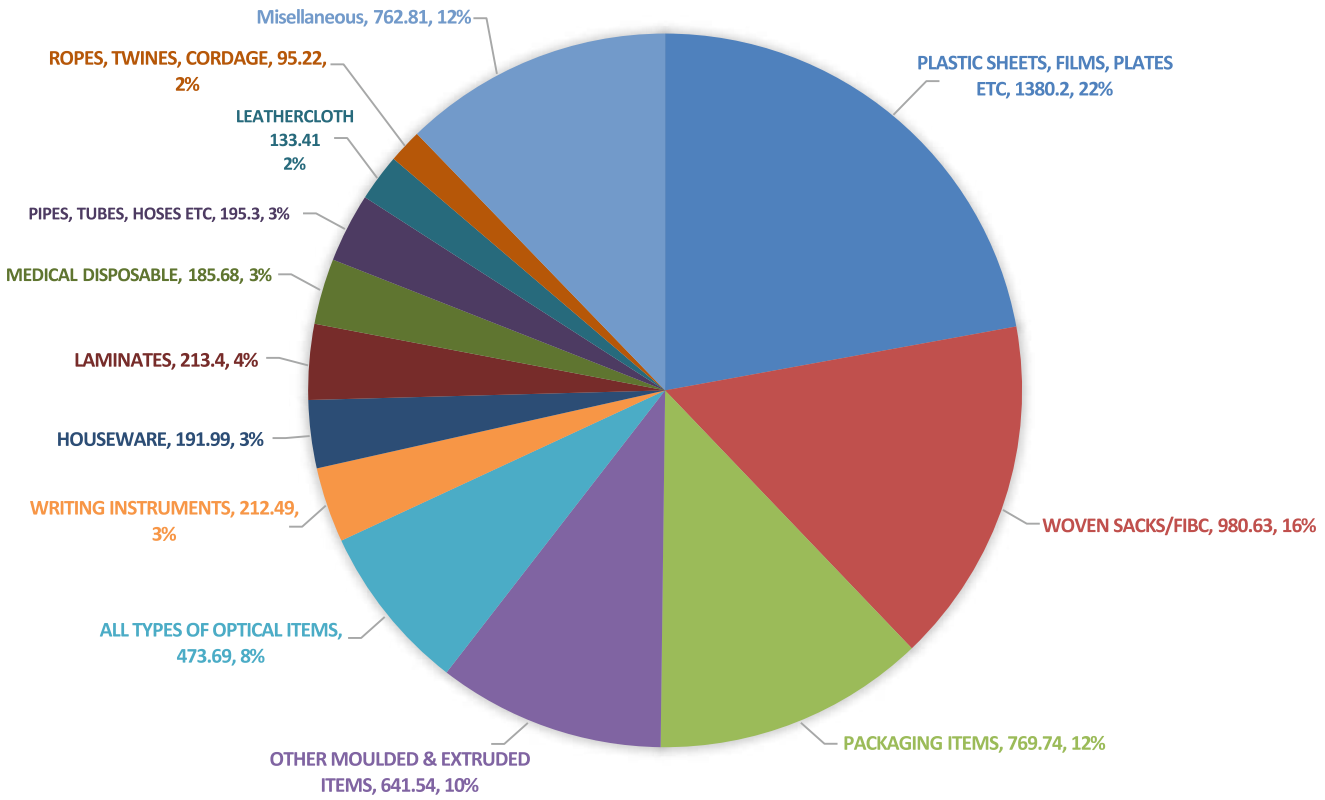


Figures in USD Mn in the Chart

Total Imports 2018-19 - USD 5.7 bn

Source Plexconcil

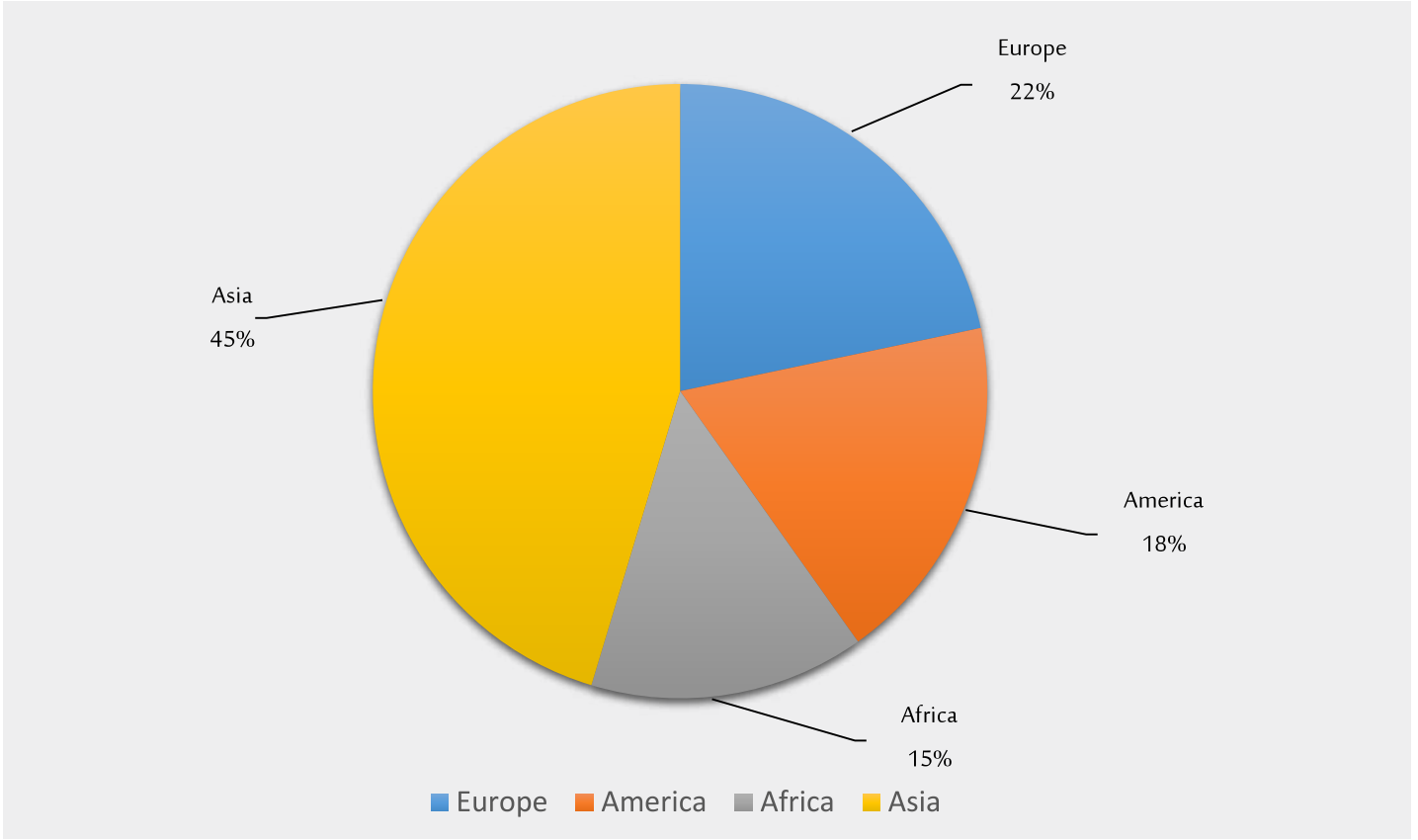
EXPORTS OF FINISHED GOODS (2018-19)



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)

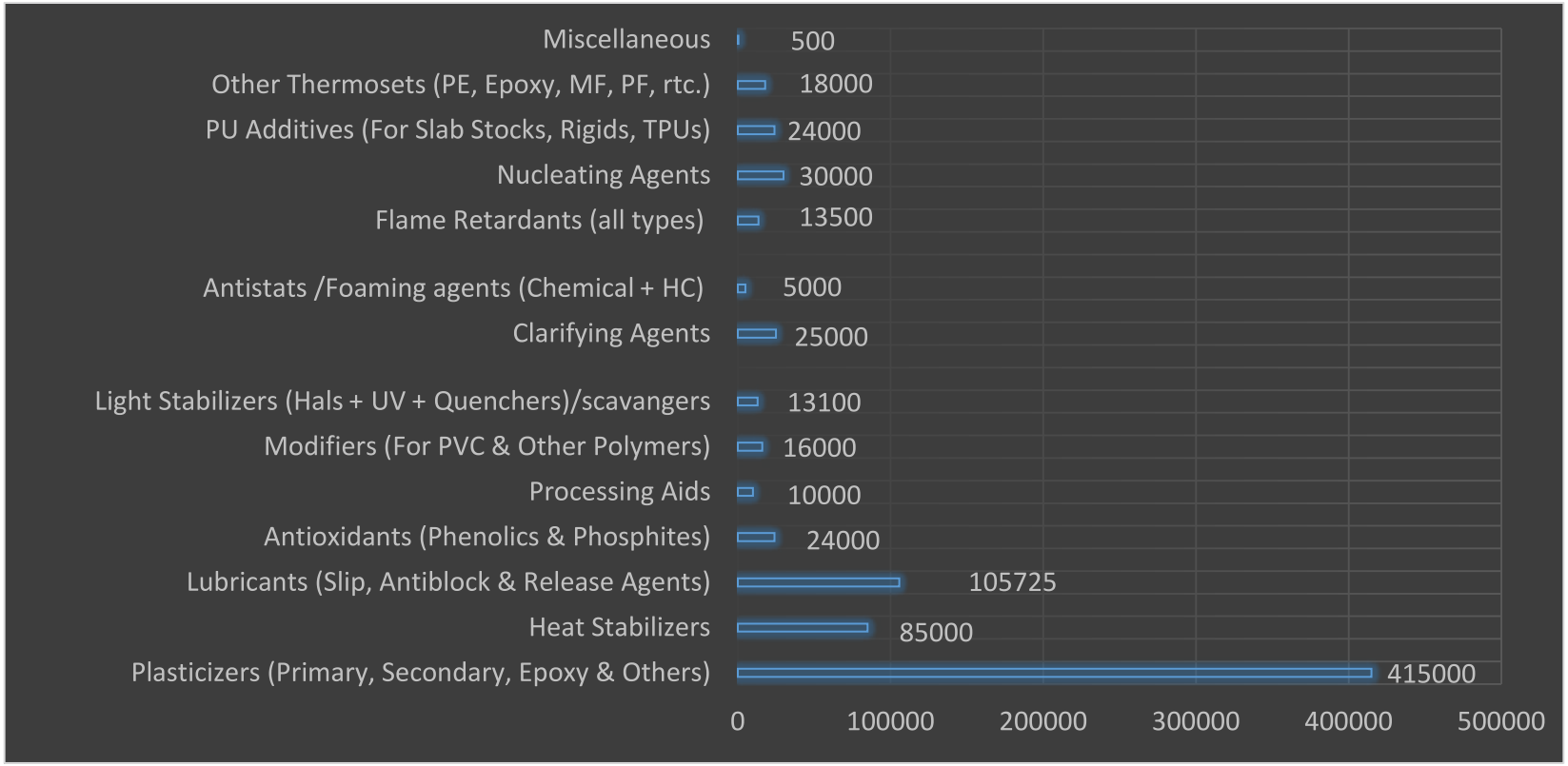
Masterbatch Manufacturing Units in India ~ 250 nos

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

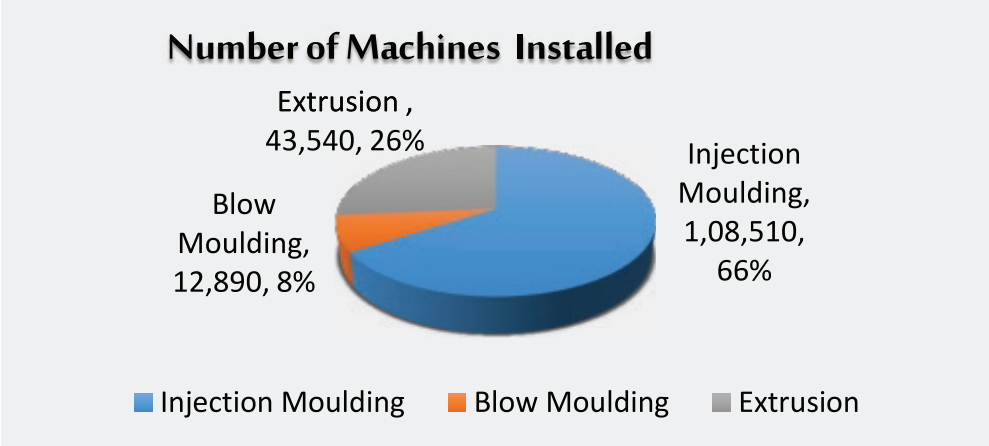
PRIMARY MACHINERY ADDITIONS – UP TO MARCH 2019

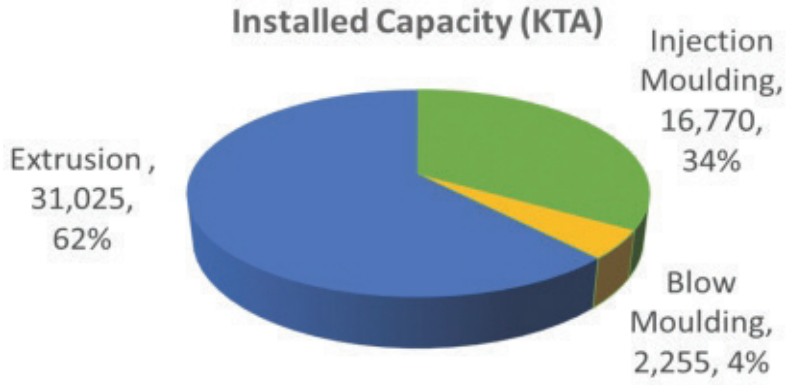
Process	Segment	2015-16	2016-17	2017-18	2018-19	Upto 2018-19
Extrusion	Machines Added (Nos.)	1,580	1,625	3,080	2,460	43,540
	Installed Capacity (KTA)	1,610	1,710	2,678	2,345	31,025
Injection Moulding	Machines Added (Nos.)	5,050	5,300	7,360	9,150	1,08,510
	Installed Capacity (KTA)	1,035	1,105	1,440	1,830	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

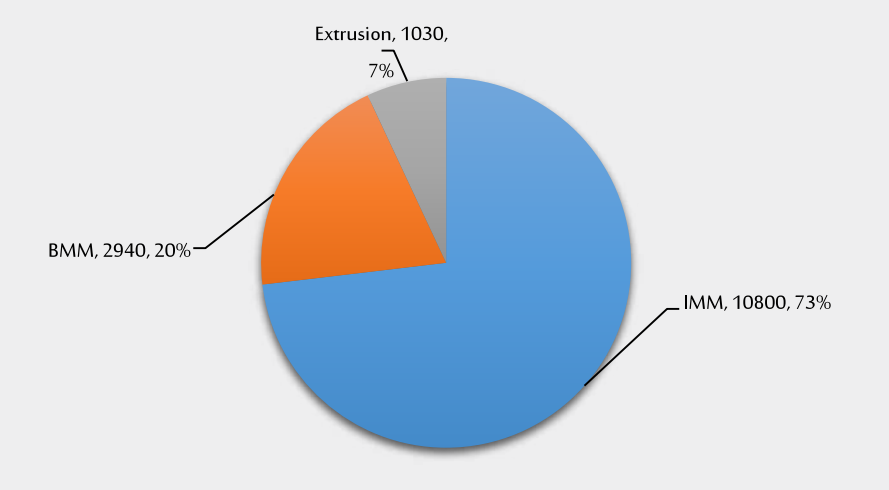
(Excludes mortality)

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

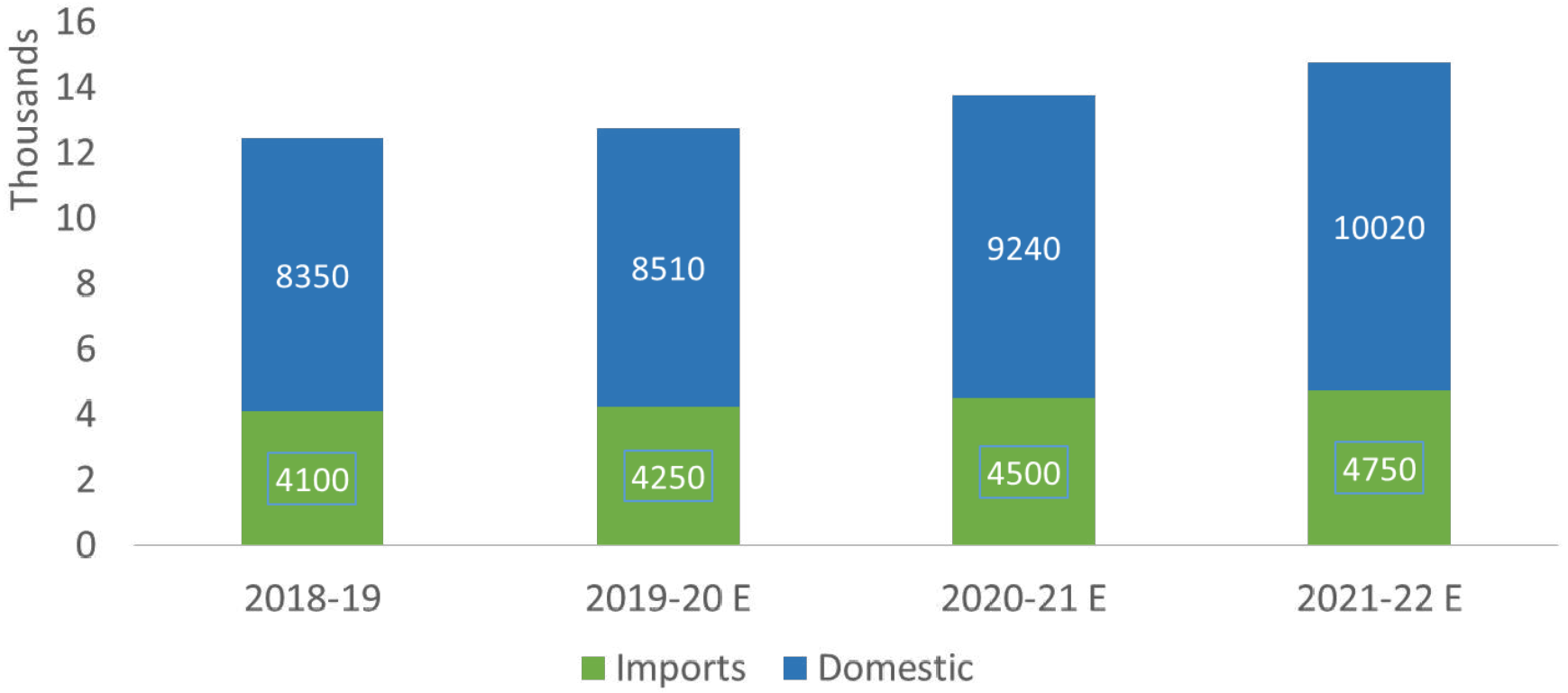
INJECTION MOULDING MACHINERY CAPACITY ADDITION

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

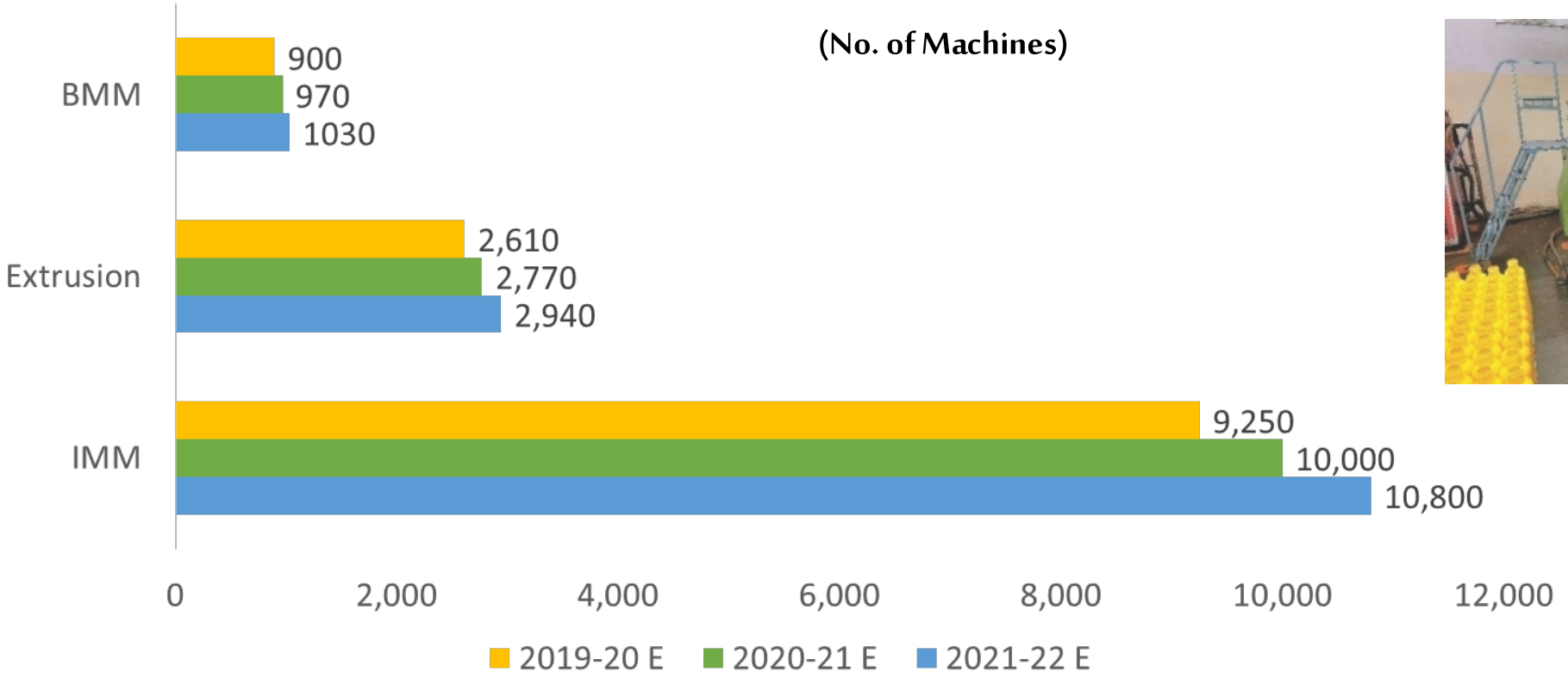
- Injection Moulding Machines
- Compounding Lines
- Tape Lines and looms
- Multilayer Film plants
- Lamination Plants
- Pipe / Drip extrusion lines
- Recycling

- 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







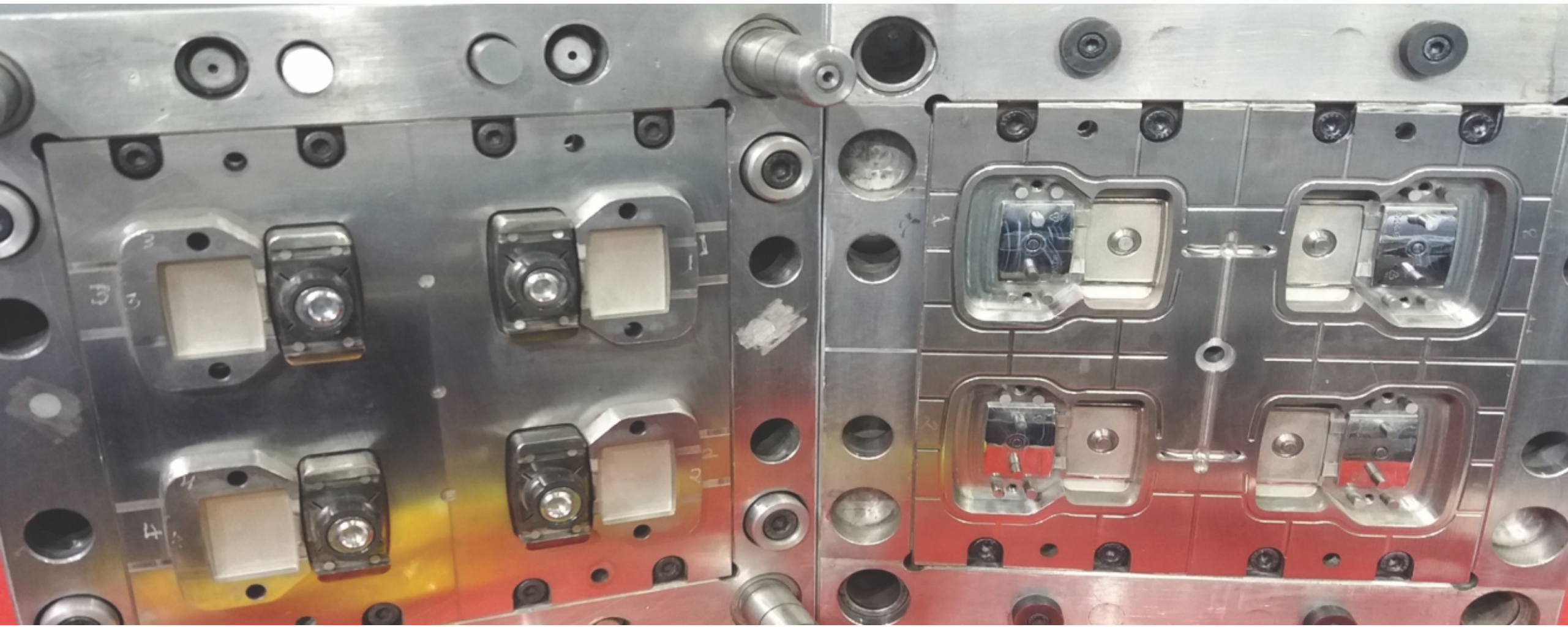
AUXILIARY EQUIPMENT INDUSTRY (2018-19)

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

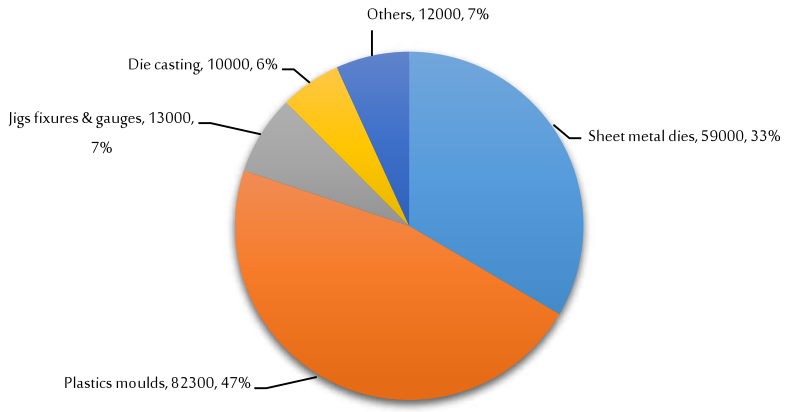
TOOLING INDUSTRY



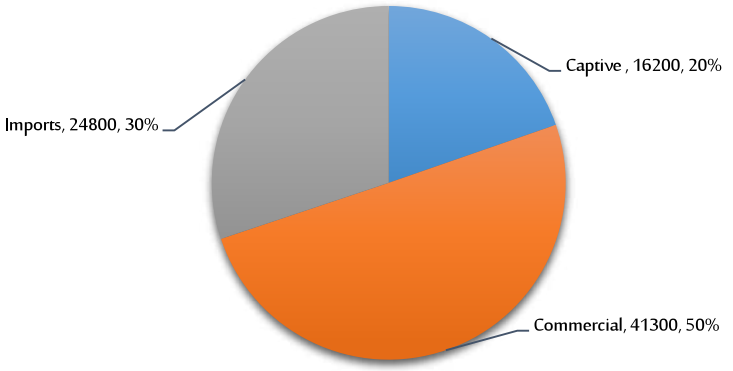
INDIAN PLASTICS TOOLING INDUSTRY (2018-19)

- 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



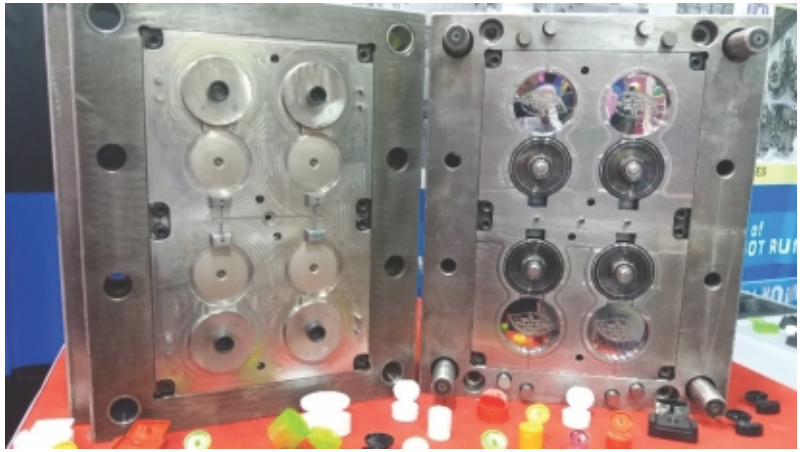
All Fig. in graphs are in Rs million

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 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..

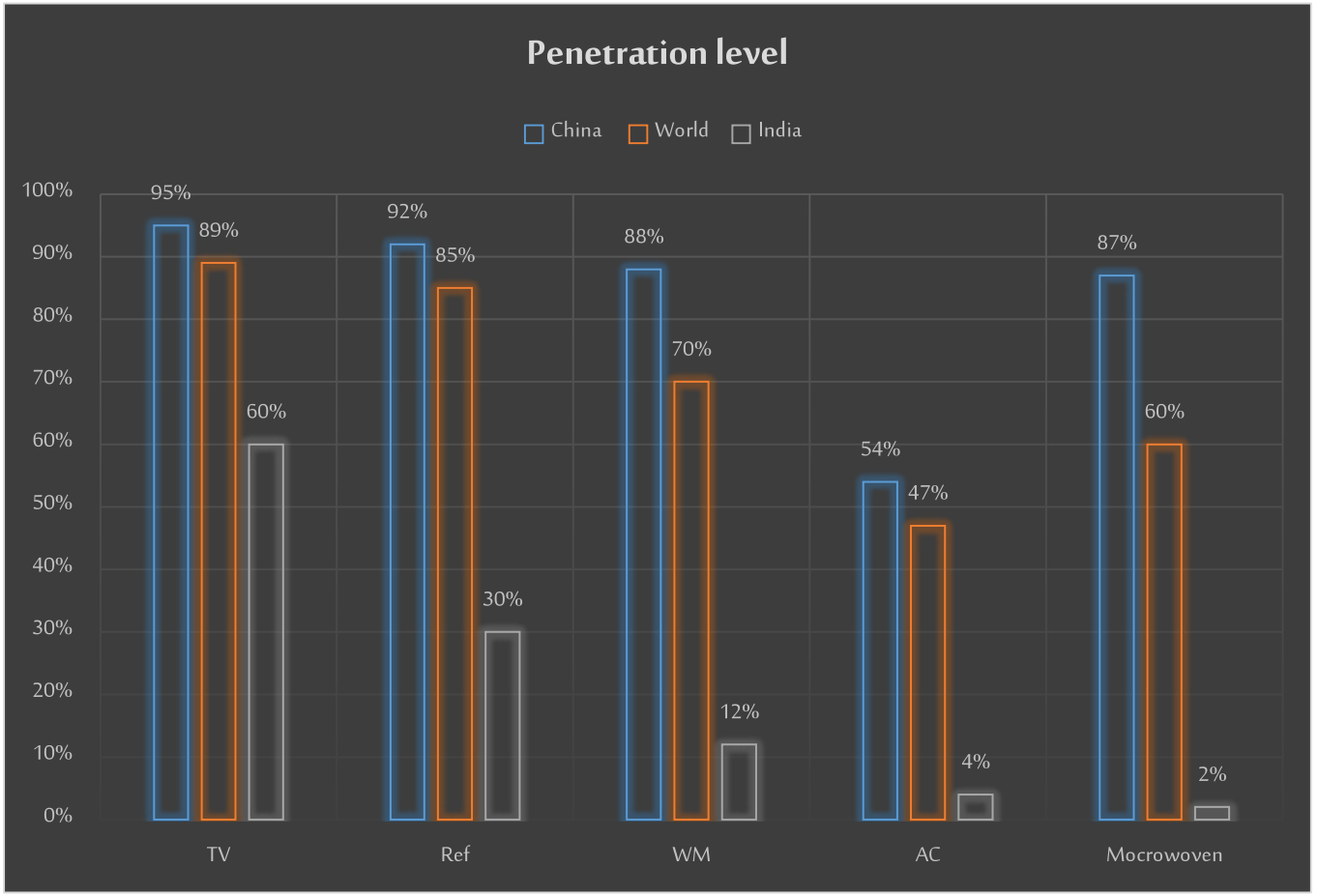
- **Major Plastics Types–** ABS, HIPS,PP, PE, POM, PA, PVC, PC, PU etc.
- **Why plastics ?**
  - ✓ Aesthetics
  - ✓ Light weight
  - ✓ Ease of processing
  - ✓ Part consolidation
  - ✓ Functional – Resistance to heat and electricity
  - ✓ Corrosion resistance
- **Major processing-** Majorly Injection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

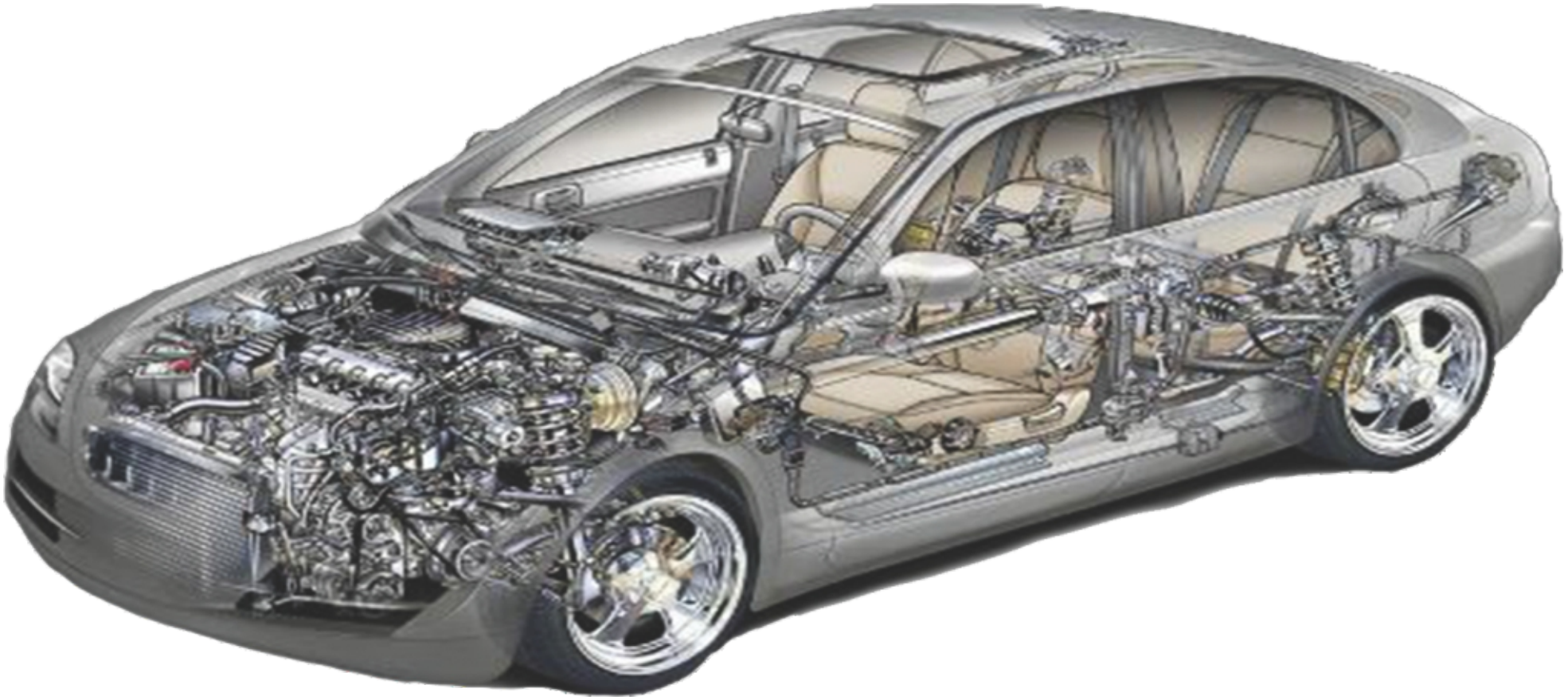
❖ **Major Growth Drivers**

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



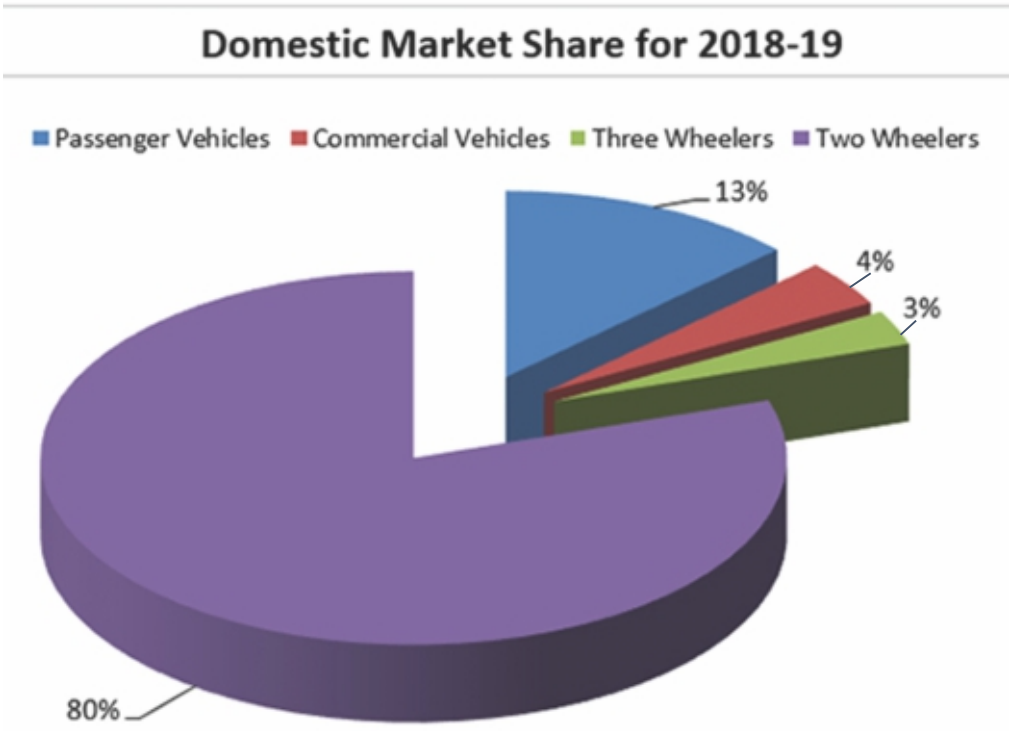
Source: CEAMA/PWC report on –Future of Electronics & Consumer durable in India – Changing land scape

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,

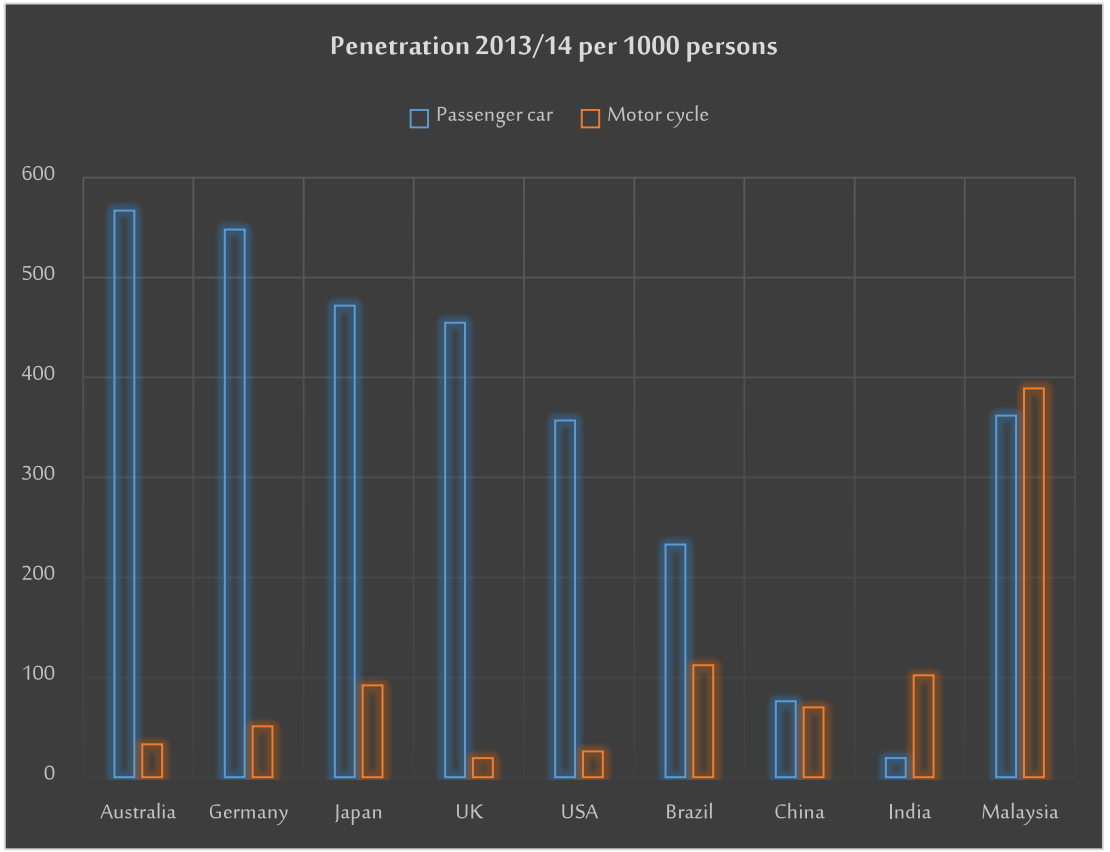




AUTOMOTIVE CONTD....

❖ **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%

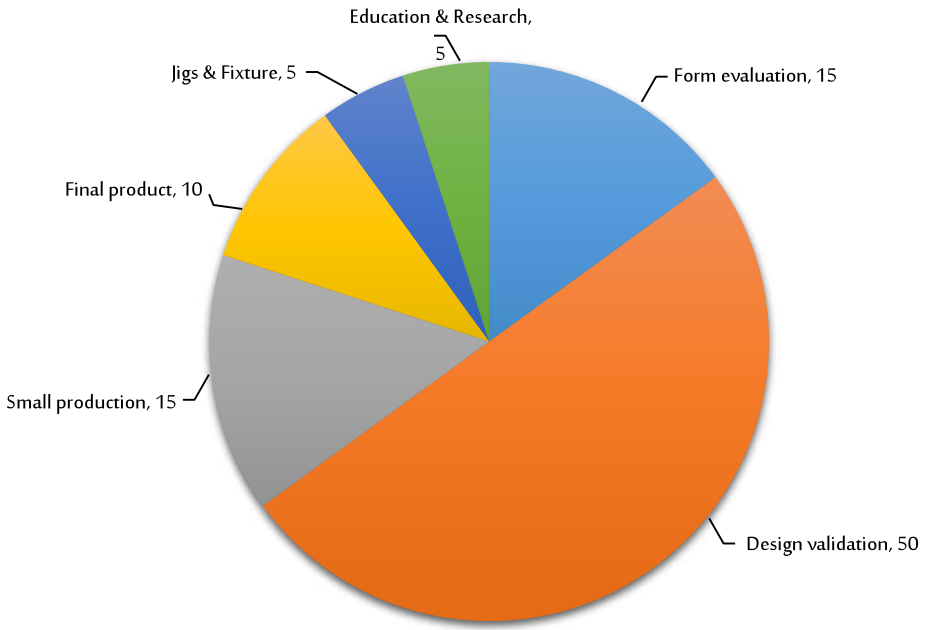
No. of manufacturers in India - 40 +

❖ **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

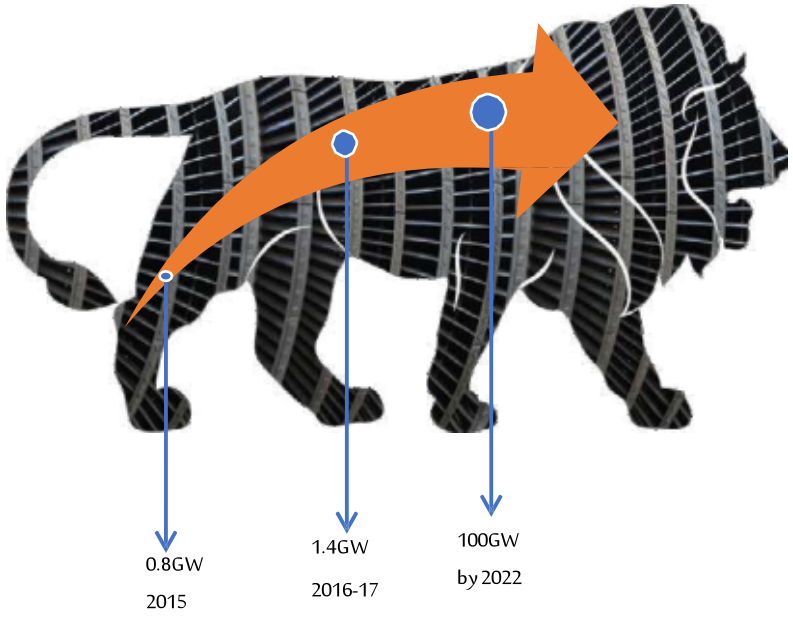
Application break up



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..

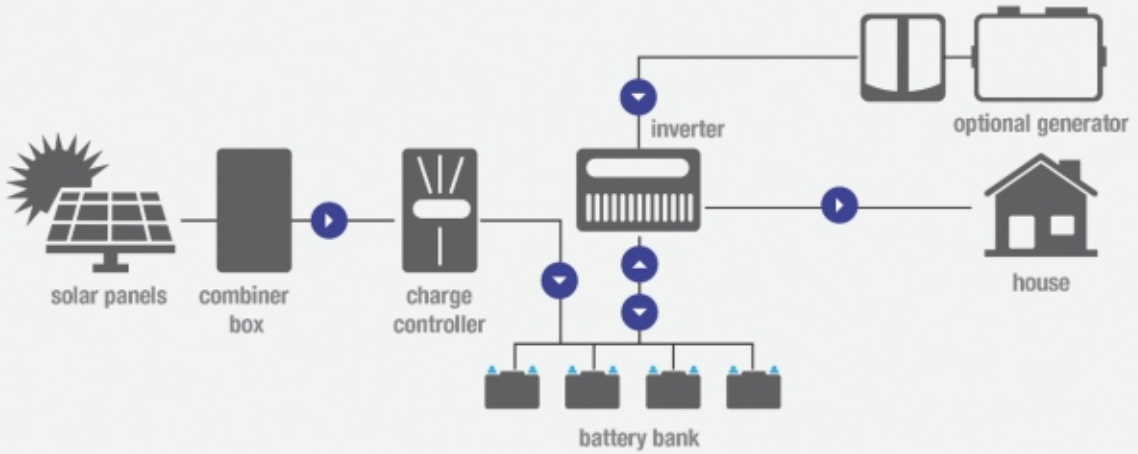
Plastic Parts

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



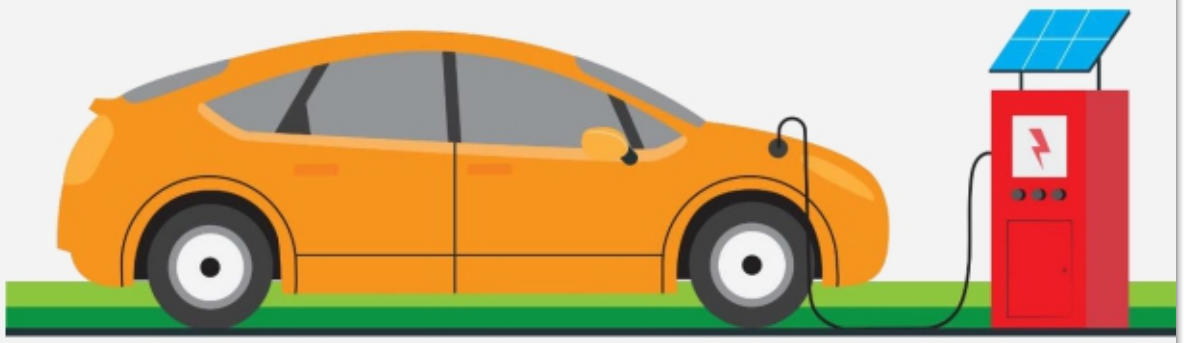
- Launched in 2015, the Unnat Jyoti by Affordable LEDs for All (UJALA)
- In a short span of three years, has emerged as the world's largest domestic lighting programme.
- Government aggressively driving projects/specifications &
- Implementing standards.
- In a span of five years, the Indian LED market 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



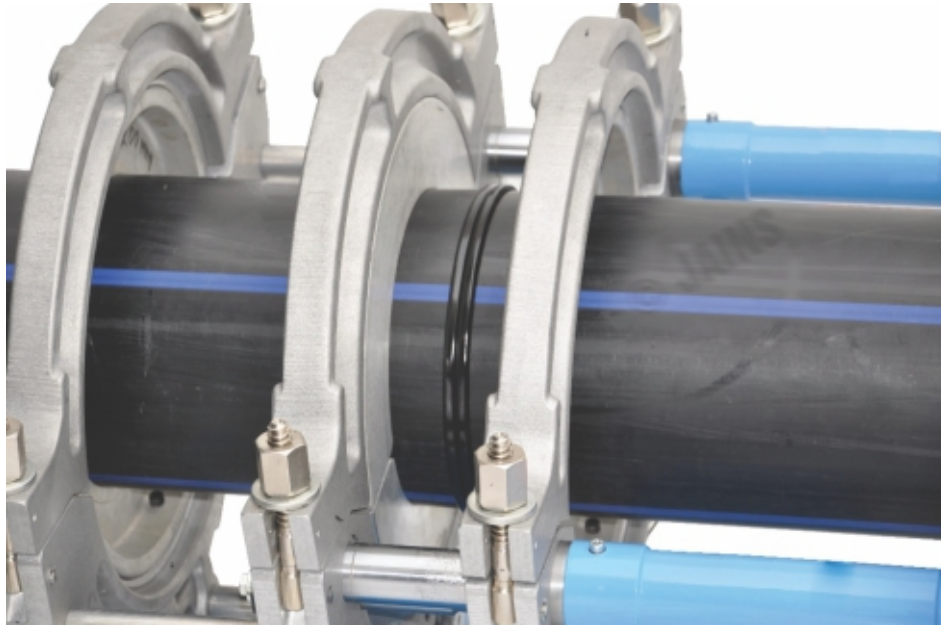




Source : Industry Estimate

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..

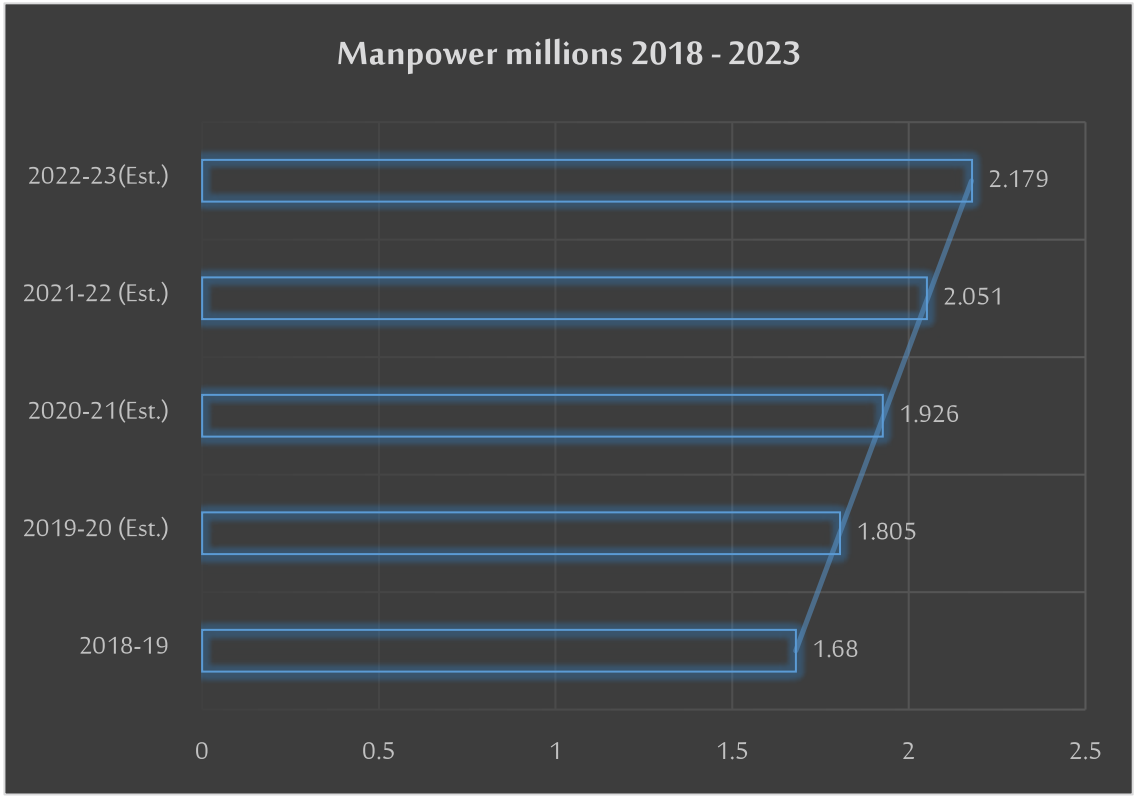
MAN POWER



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



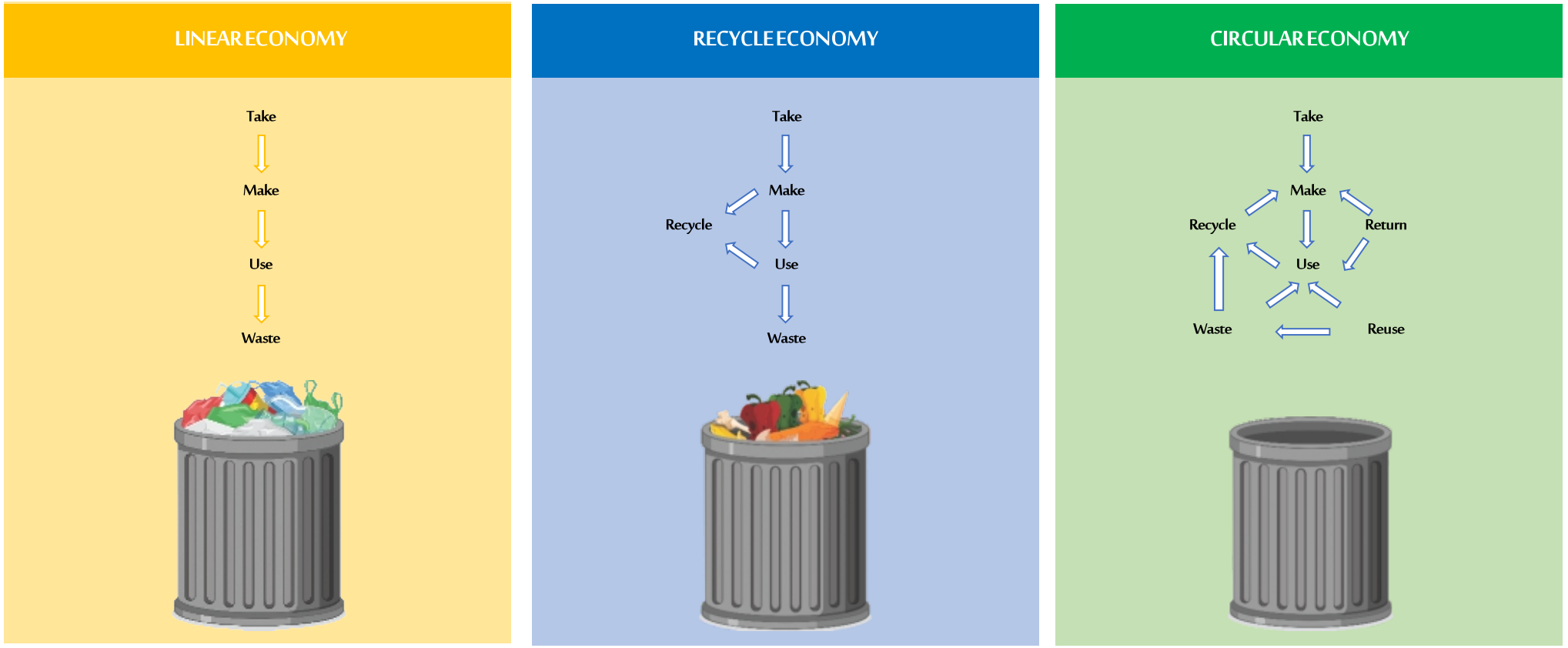
Source : Industry Estimate/ICPE

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

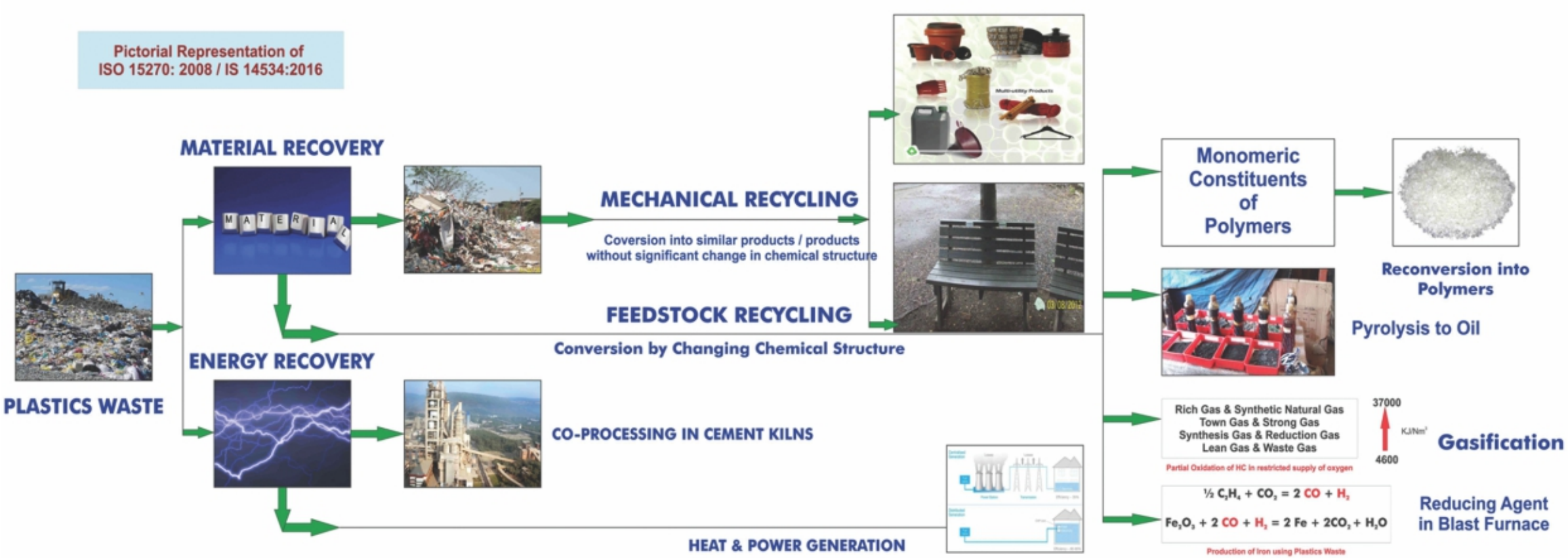
CIRCULAR ECONOMY



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

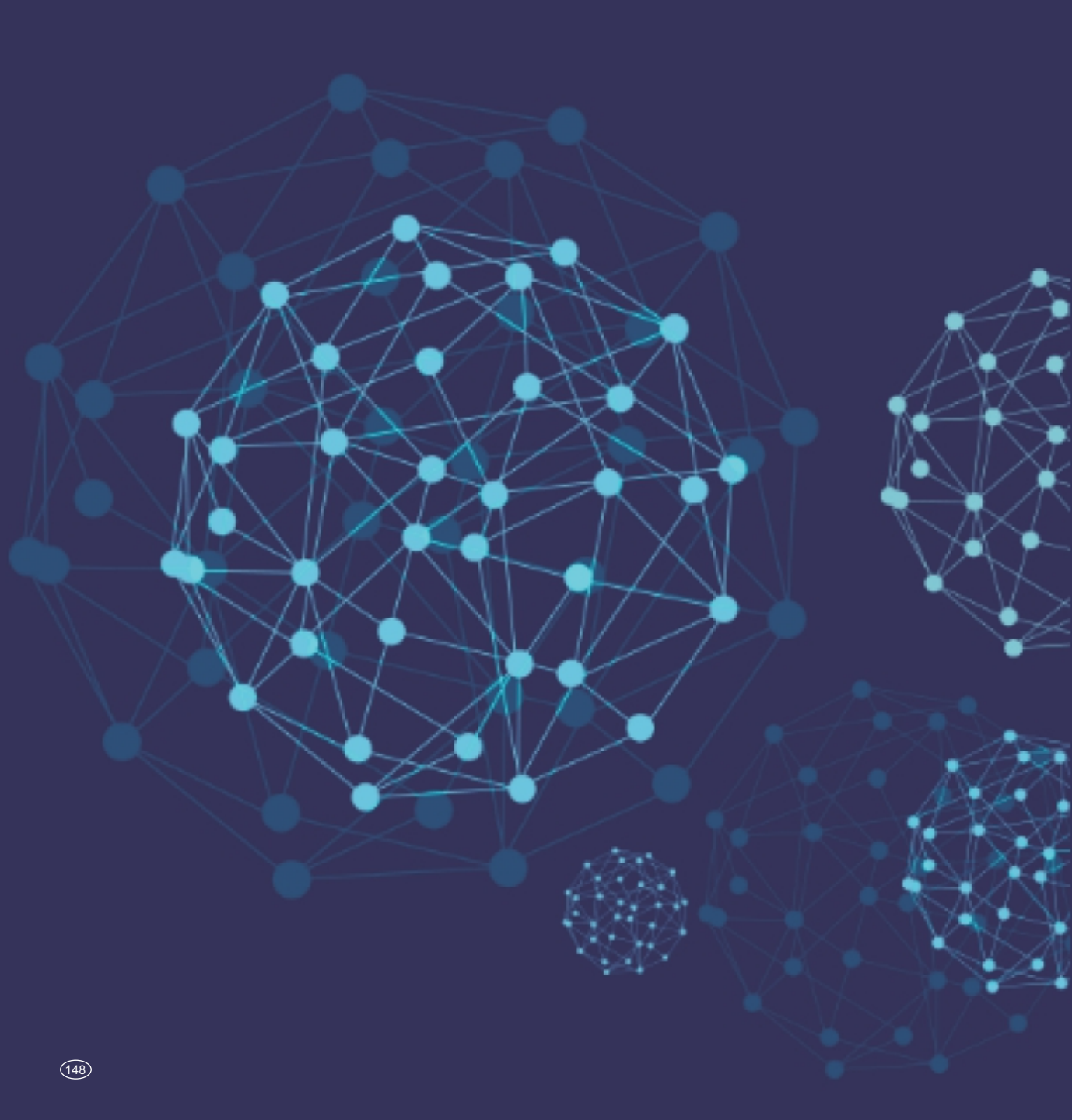
Summary	Qty in MMT
Commodity Plastics Consumption in 2018-19	15.71
Quantity entering Waste Stream from 2018-19 Consumption (~42%) within one year*	6.60
Quantity entering Waste Stream from previous 5 years to 2018-19	2.00
Total Quantity of Waste Plastics (2018-19)	8.60
Quantity recycled in 2018-19 (~70%)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







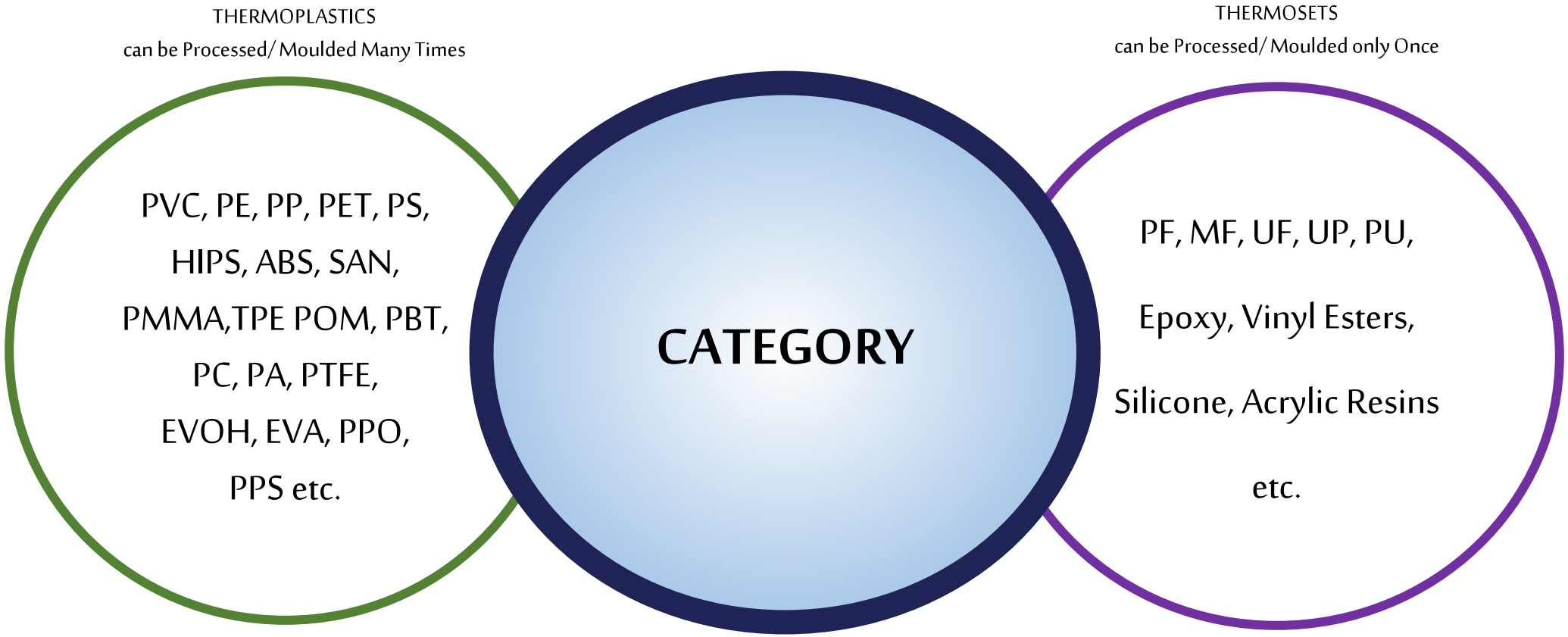






We are in Plastics Age....

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.

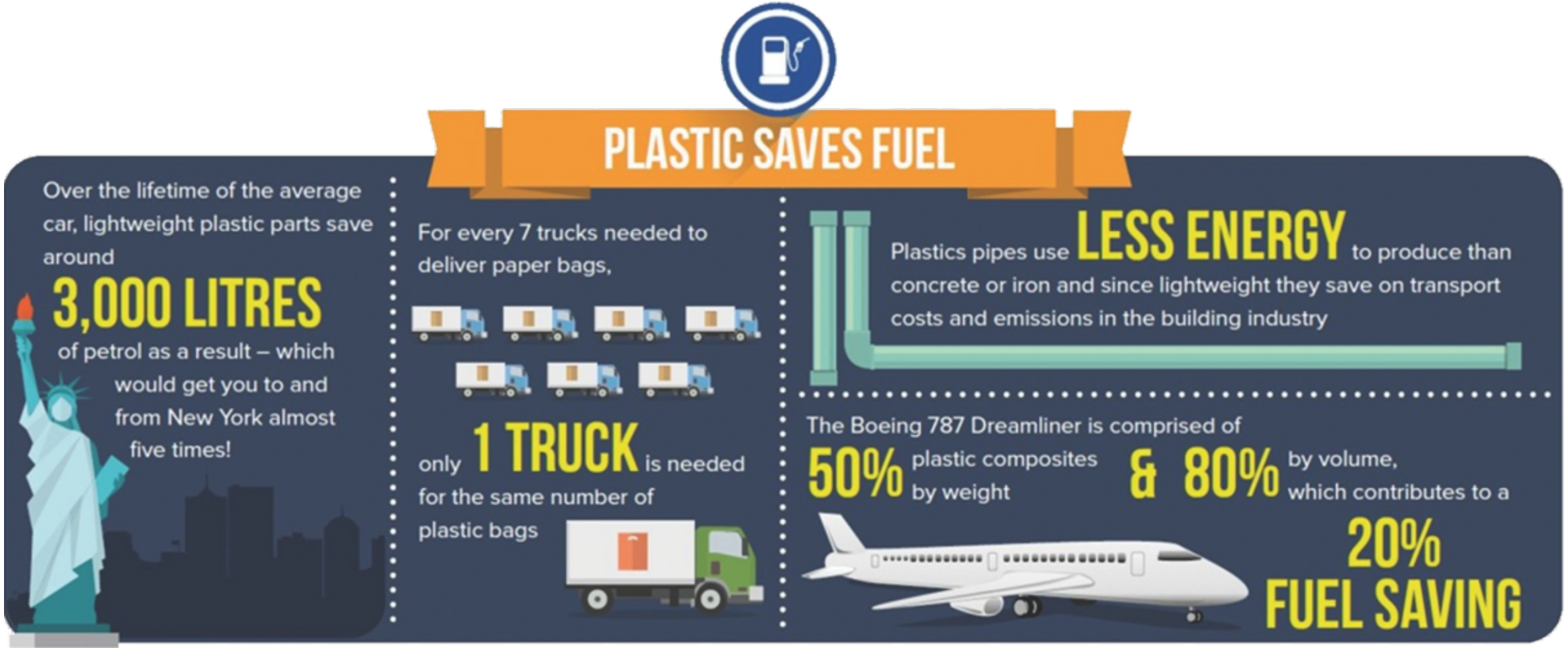
Conventional Automobiles use a lot of metals which are prone to corrosion and high energy for production and conversion. Plastics come as a sustainable alternative.

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

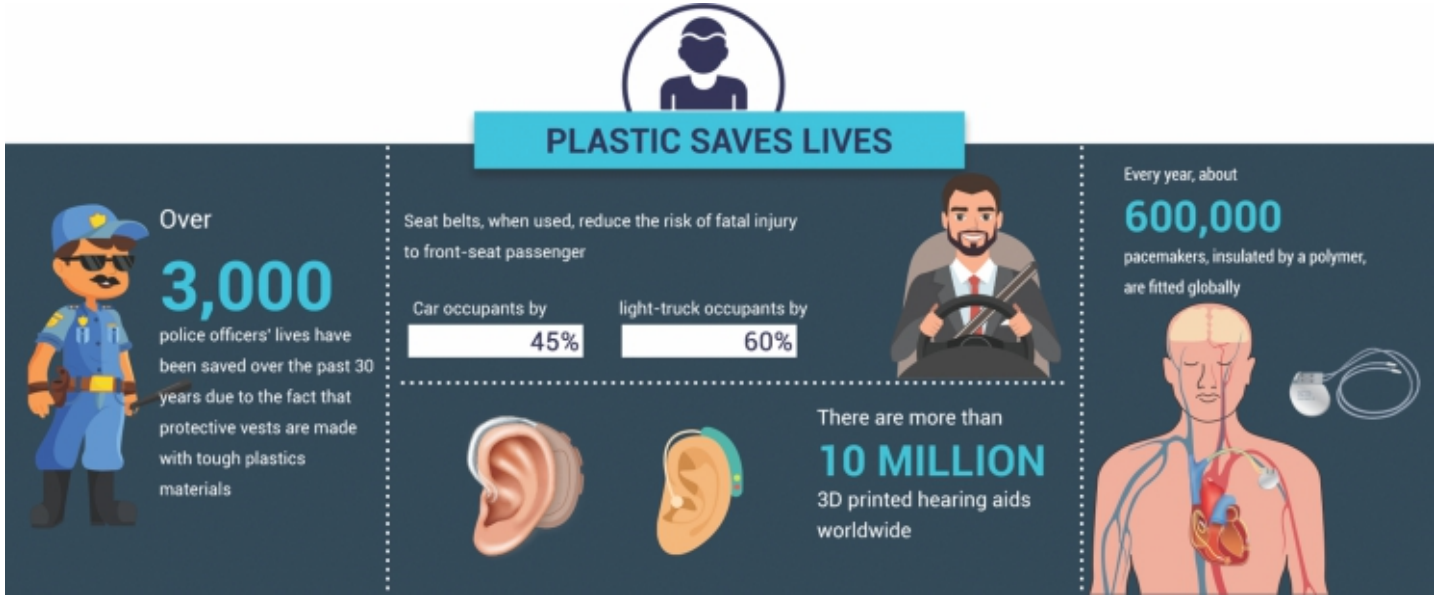
BENEFITS OF PLASTICS TO SOCIETY



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



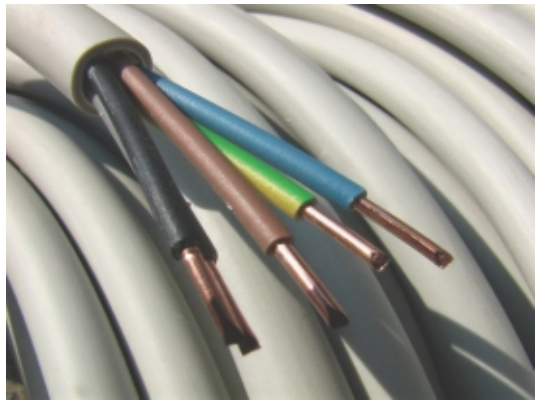
- Many Personal Protective Equipment (PPE) made out of Plastics
- Auto Safety features includes Seat Belts and Air bags made of Plastics
- Knee guards, Mouth guard, Foam pads protects players from Injury and much more

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





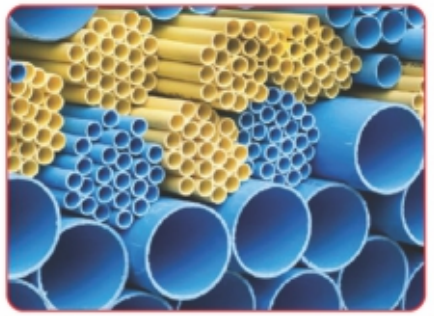
Plastics protects gadgets...

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







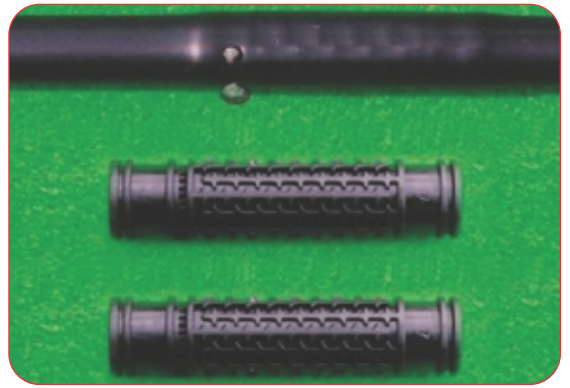
Plastics integral part of Infrastructure... including Smart Cities

BENEFITS OF PLASTICS TO SOCIETY — Food security

Agriculture, Horticulture, Water Management & Storage

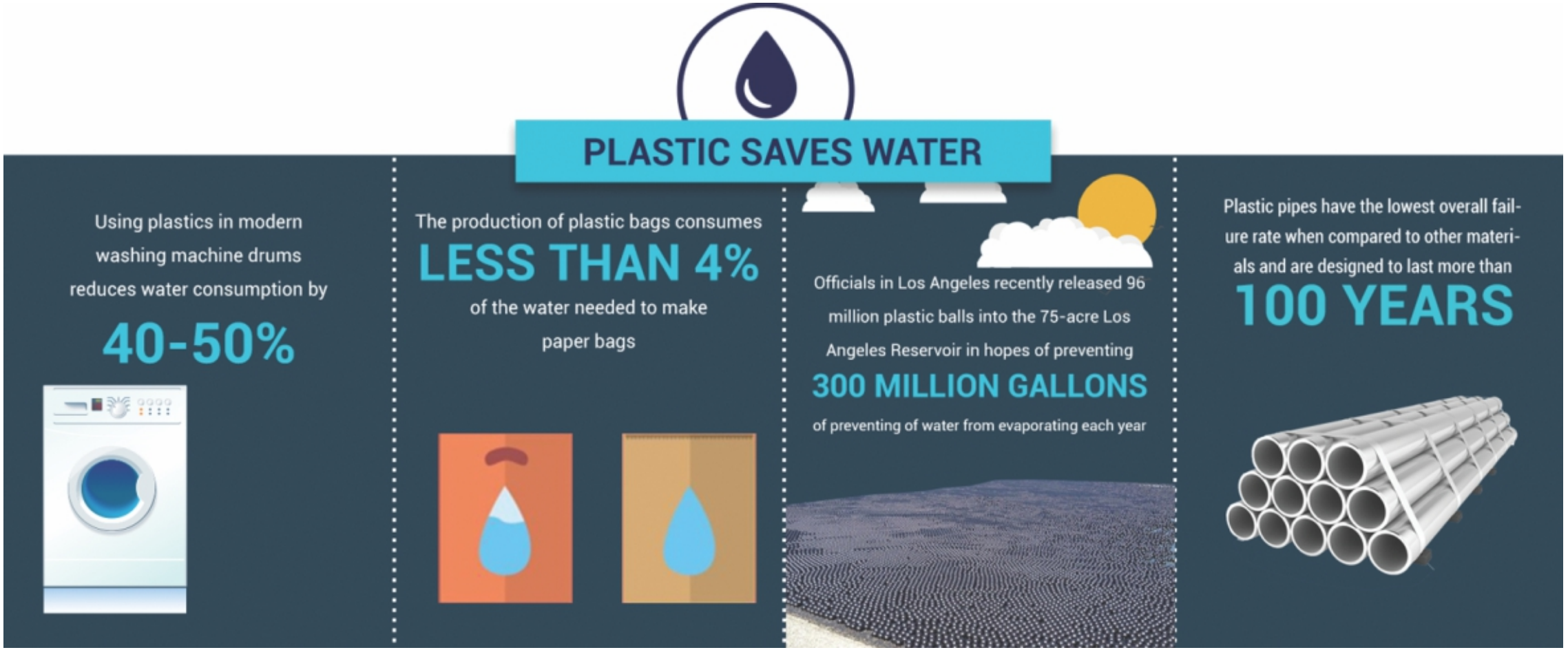
- Water Scarcity is biggest Global issue facing mankind.
- Agriculture for food protection consumes 75 to 80% of Global water usage
- Drip and sprinkler irrigation helps saving water to the tune of 40 to 70% in Agriculture
- Mulch Film prevents weed growth and conserves soil
- Green House helps in higher 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

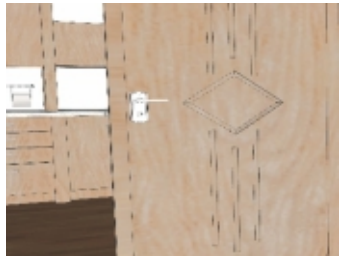
- Alternative to wood : Furniture, Railway Sleepers, Doors and Windows, Crates for Vegetables and Milk , Pallets etc.
- Glass replacement : Milk sachet, Food Containers, Medicine Bottles, Syringes, IV fluid Bottles etc.

PAPER METAL WOOD

Plastics

SACKS CONTAINERS DRUMS DOORS

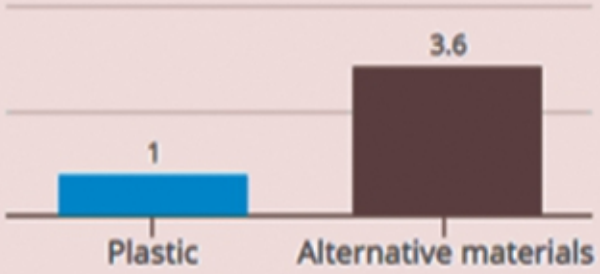


BENEFITS OF PLASTICS TO SOCIETY

Packaging mass

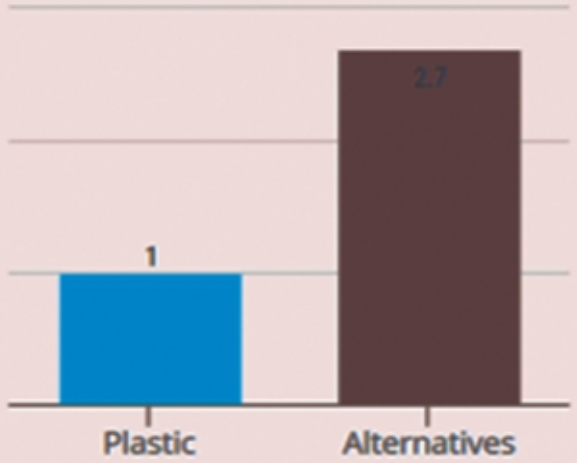
Alternative materials would be 3.6 times heavier than plastic packaging.



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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- Mamata Machinery Pvt Ltd
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- OK Play
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- PMMAI
- Prasad Koch
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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

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

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