

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.

Plastics Industry Status Report – India – 2021-22 & 1H 2022-23 Update



Content

S	Page No.		Page No.
India	7	Toolin	137
Overview		TH 2022-23 Update	139
India Global	16	Growth & Opportunities	155
Rankings		Mahpowe	218
India Polymer	37	Recyclin	220
Manufacturing		Summar	226
Project Beyond	48	Annexur	230
2021		Acknowledgeme	246
India Polymer	51	Disclaime	250
Demand			
Imports &	108		
Exports			
Masterbatches &	116		
Compounds			
Additive	120		
S			
Machiner	122		
Y			
Auxiliary	131		
Equipment			

INDIA OVERVIEW



INDIA SNAPSHOT



Democracy
World's largest



Population
1.39 Billion in 2021



Annual GDP growth
8.9 % (2021-22)



Life expectancy
69.8 years (2020)



Prospects
To become a 5 Trillion Dollar Economy in 2026-27



Official Languages
23 (English predominantly the business language)



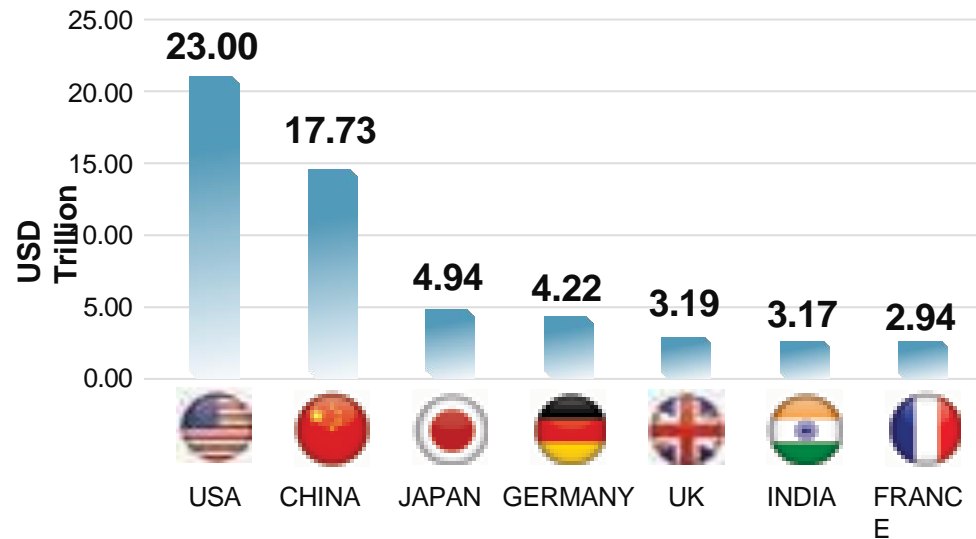
Social infrastructure
Excellent - Education, Healthcare, Travel & Recreation

Land Of Unprecedented Opportunities....

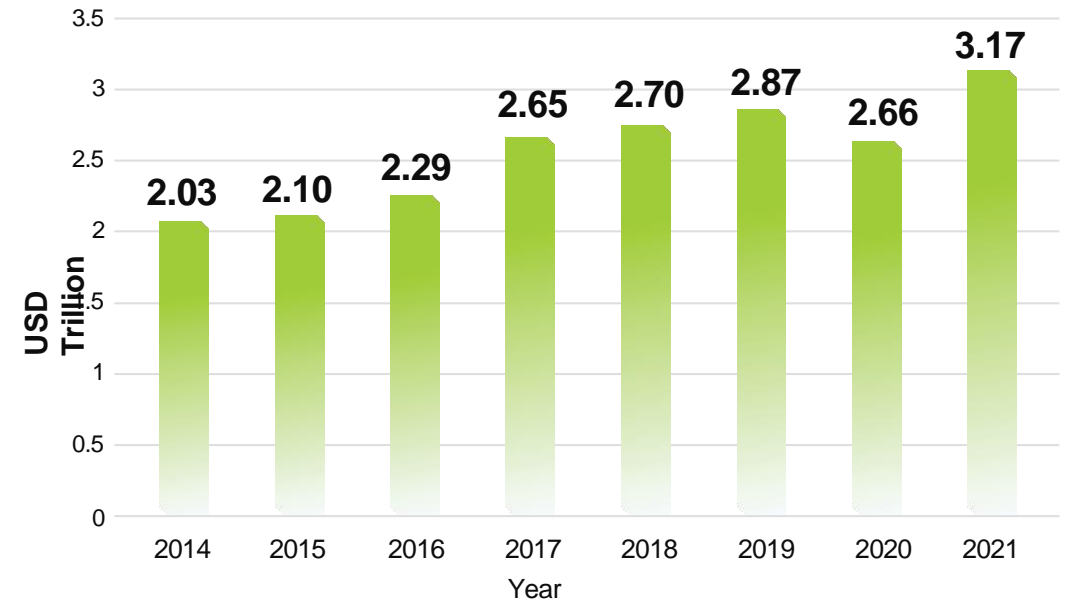
Source: <https://www.worldbank.org/en/country/india/overview/> <https://mospi.gov.in/>
<https://theprint.in/ani-press-releases/india-may-become-5-trillion-economy-by-2025-26-says-cea-nageswaran/818791/> <https://economictimes.indiatimes.com/news/economy/indicators/india-would-become-5-trillion-economy-by-2026-27-cea-v-anantha-nageswaran/articleshow/92205688.cms?from=mdr>

INDIA GDP

GDP 2021



India's Gross Domestic Production



In 2022, India surpassed UK in GDP and becomes the 5th Largest

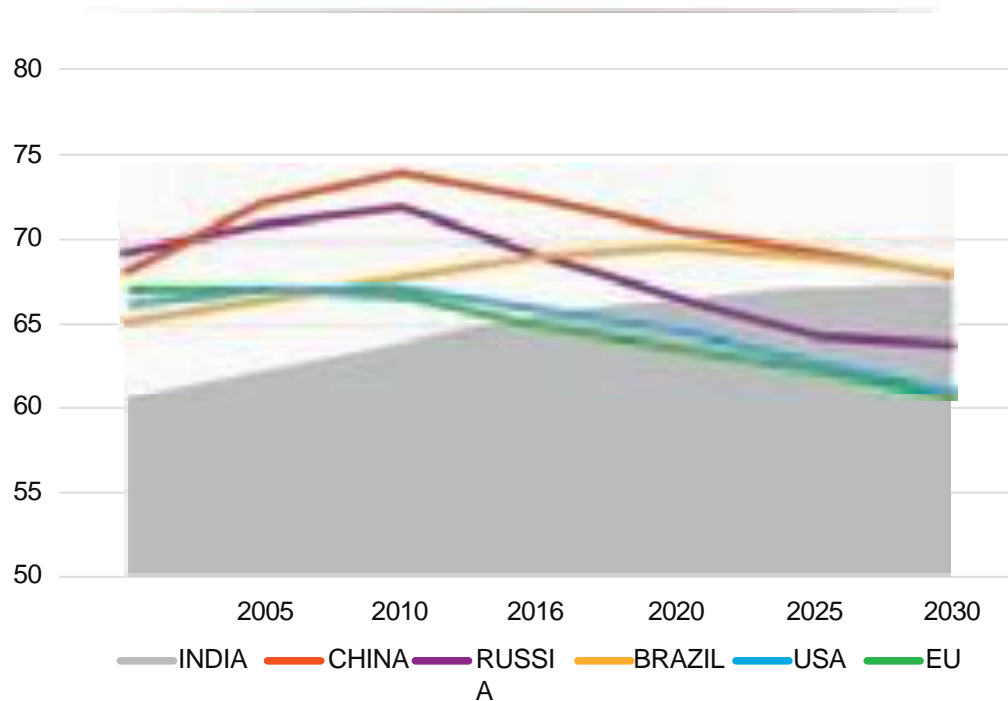
India Top 6 in GDP in 2021

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

<https://www.ibef.org/economy/>

ADVANTAGE INDIA DEMOGRAPHIC PROFILE

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





- 66.98% in the working age group (2020)
- 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) 2021	GDP (Million USD) 2021
 Brazil	8.52	213	1610
 Russia	17.09	144	1780
 India	3.29	1390	3170
 China	9.56	1410	17730
 South Africa	1.22	60	420

India - 2nd Highest GDP among BRICS in 2021



INDIA - KEY ECONOMIC INDICATORS

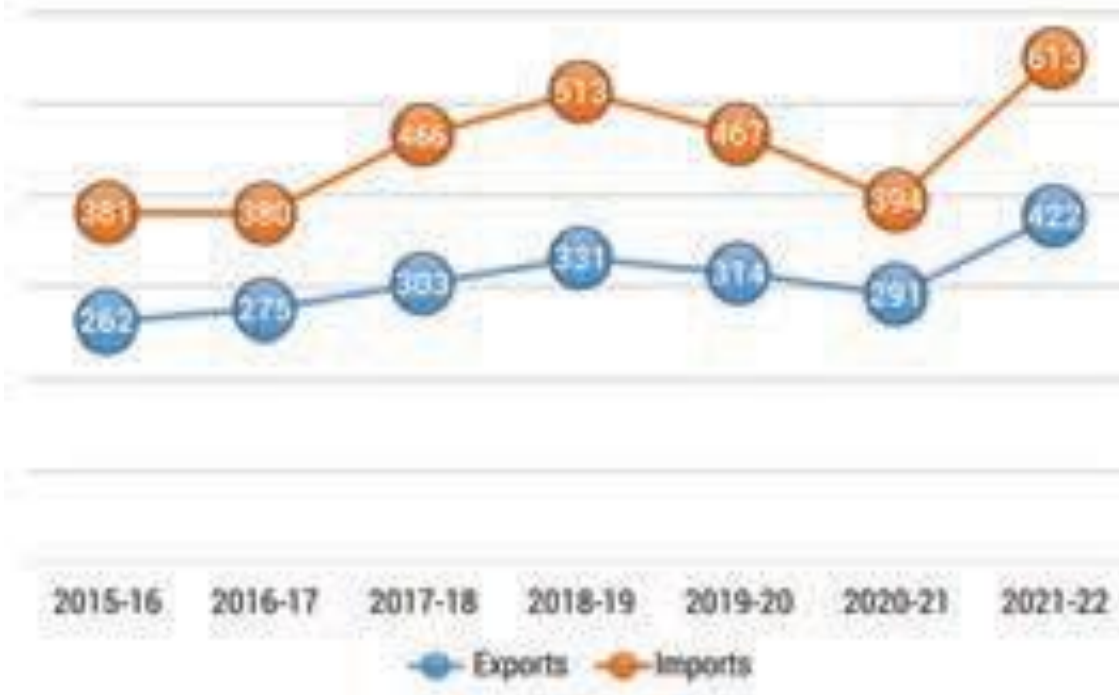
INDICATORS	PARAMETER	2019-20	2020-21
Growth Key sectors %	Agriculture	4.3	3
	Electricity, Gas & Water supply	2.1	1.8
Inflation	WPI average (%)	1.68	1.2
Exchange rate	Rs/USD (average)	70.9	74.23
Fiscal deficit	as % of GDP	3.4	9.2
Monetary indicator %	Base rate	9.4	7.4 to 8.8



Covid 19 Temporarily Impacted Growth Trajectory

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

INDIA'S INTERNATIONAL TRADE



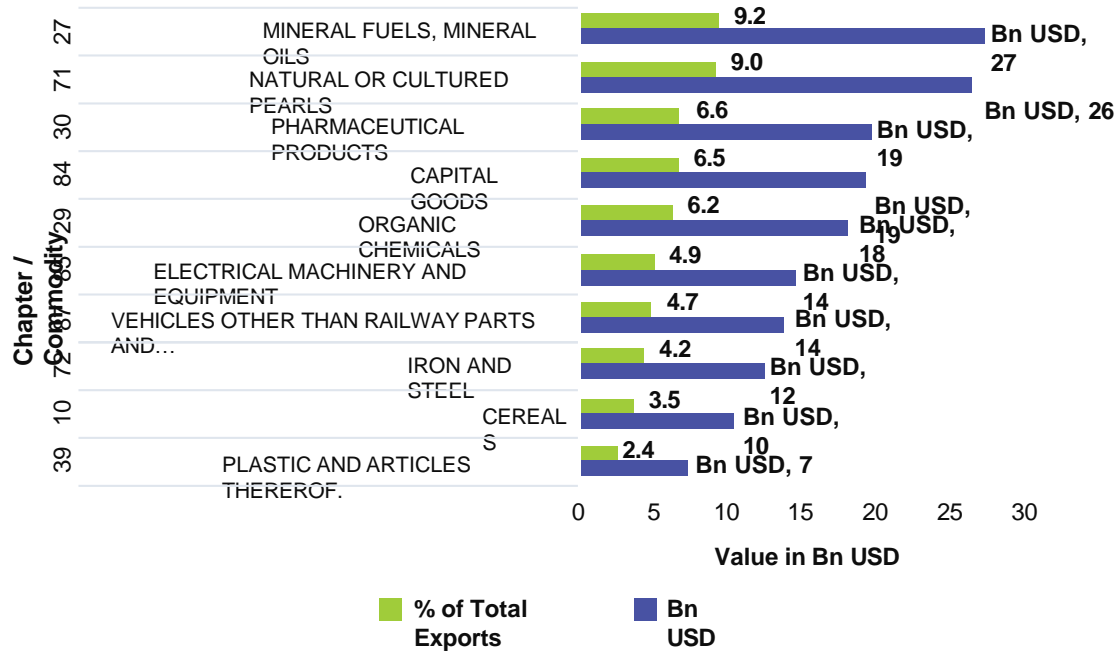
Value in Bn
USD



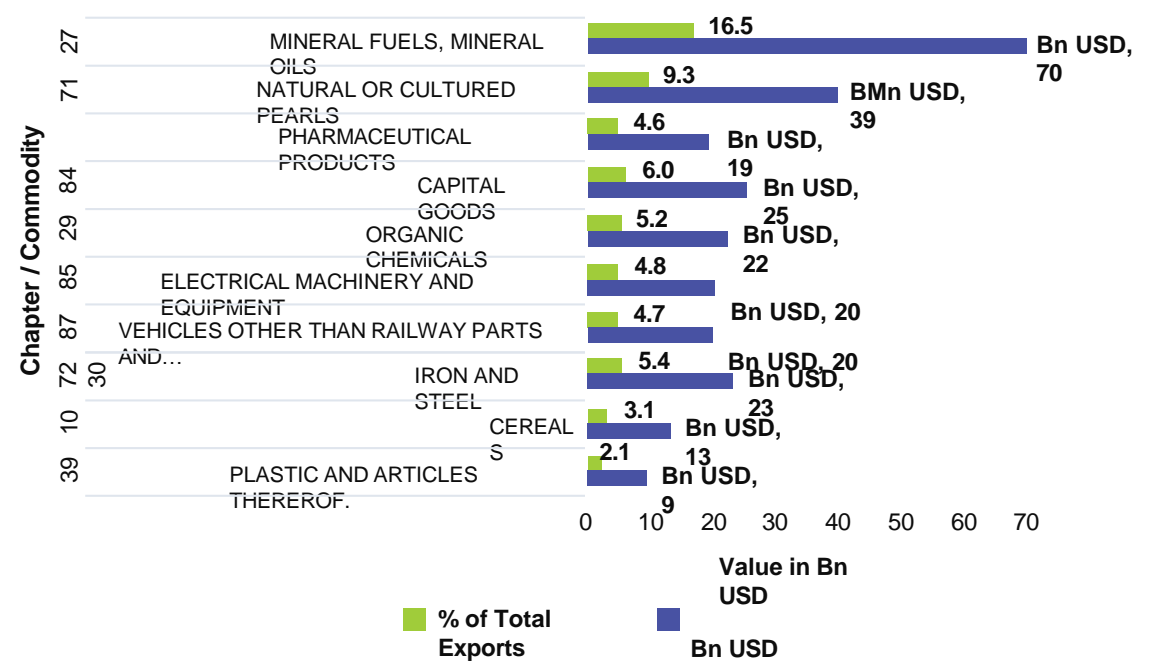
India – The Vibrant Economy - Highest Import & Export in the last 7 Years

Source: <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=home> Ministry of commerce and Industry. <https://commerce-app.gov.in>

INDIA'S MAJOR EXPORT COMMODITIES



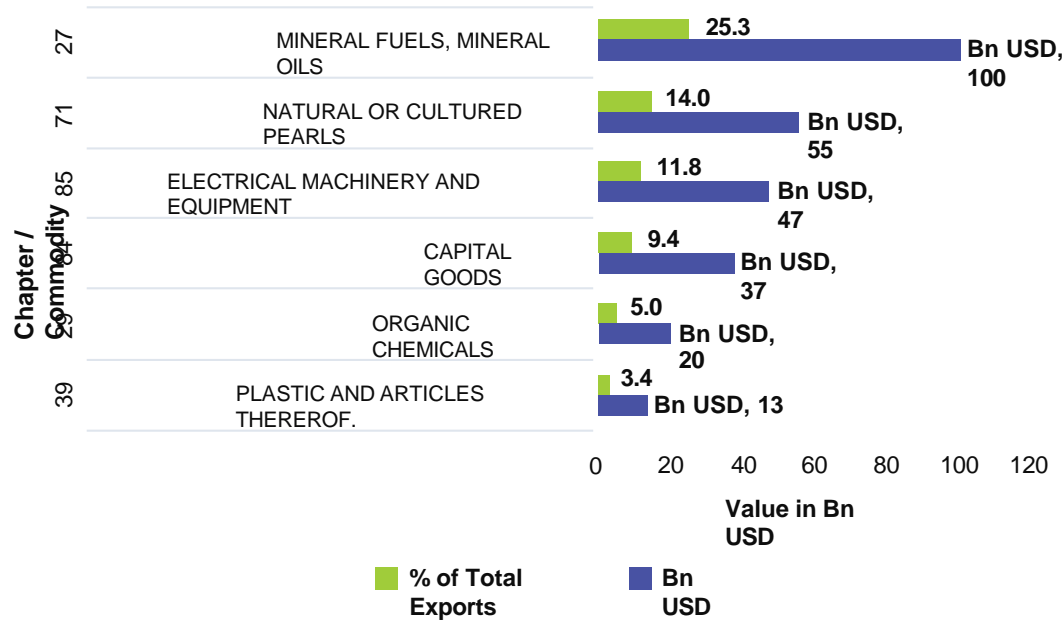
Total Exports 291 Bn USD 2020-21



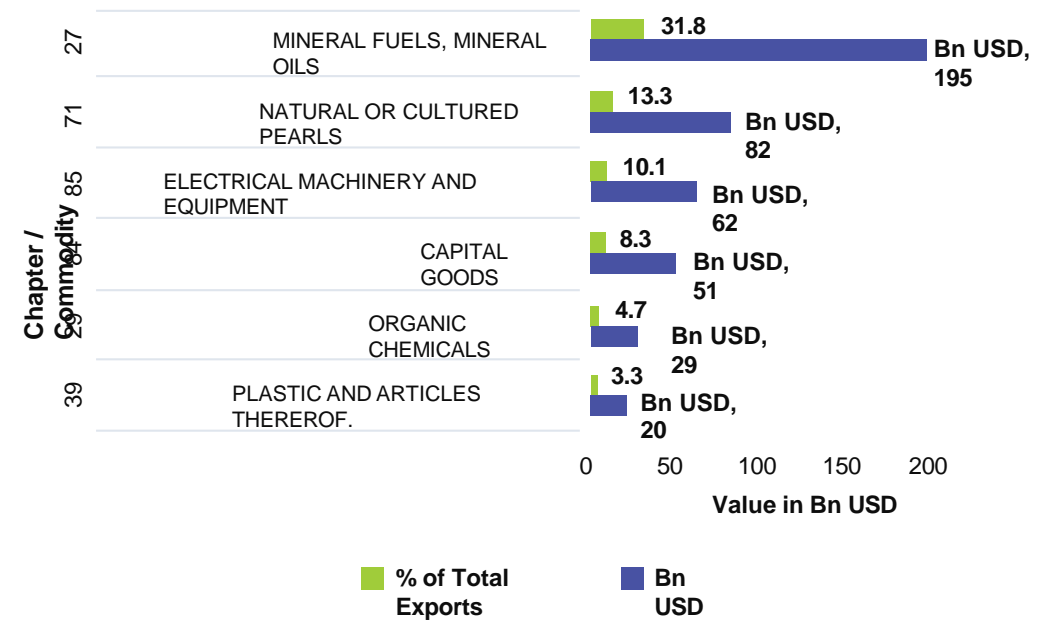
Total Exports 422 Bn USD 2021-22

Plastics – Among Top 10 in Exports

INDIA'S MAJOR IMPORT COMMODITIES



Total Imports 394 Bn USD 2020-21



Total Imports 613 Bn USD 2021-22

Plastics – Among Top 6 in Imports

Source: Ministry of commerce and Industry. <https://commerce-app.gov.in> -

INDIA – FEW GLOBAL INDUSTRY RANKINGS



World's Largest 2 & 3
Wheeler manufacturers . 29
Two wheelers sold every
minute



World's largest tractor
manufacturer and second
largest bus manufacturer



World's largest
vaccine maker



World's largest virtual
incubator



2nd largest producer of
PPE kits in the world



2nd largest smartphone
manufacturer



2nd largest steel
manufacturers with
111+ MMT capacity



4th largest producer of
agrochemicals in the world

ADVANTAGE INDIA

ECONOMIC ADVANTAGE

- Fastest Growing G20 Economy
- 3rd Largest Economy in terms of GDP (PPP)
- 3X increase in Average Household Income from \$6,393 in 2010 to \$18,448 in 2020
- Fastest Growing e-Commerce Market at 30% CAGR, USD 200 Bn by 2027



Growth Fueled by Domestic Demand

ADVANTAGE INDIA CONTD...

DEMOGRAPHIC ADVANTAGE

- 900 million Internet Users by 2025
 - Large English - Speaking Population
 - 1.4 Tn USD to be Invested in Infrastructure in the next 5 years
Bharatmala, Sagarmala, Freight corridor, Udaan, Jal Jeevan Mission
-

URBANIZATION

- Road Connectivity, Internet Usage & Household Connection for Gas and Water to accelerate Urbanization
- 34% - 2017 to 45% - 2040 –Est. Growth of Tier 1,2,3,4 cities

India to become the youngest nation by 2025 with an average age of 25 years

GoI Initiative of 100 SMART Cities and 500 AMRUT Cities Under Implementation



ADVANTAGE INDIA CONTD...

INVESTMENT ECOSYSTEM

- 20% Global working population by 2030
- 87% - Highest Fintech adoption rate globally
- 3rd Largest Startup Nation in the World 62000+ registered Startup in 2021-22
- Fastest Growing Startup Ecosystem
- 3rd Highest number of Unicorns Globally
- India improved its Ease of Doing Business Ranking from 142 in 2014 to 63 in 2019, a jump of 79 positions



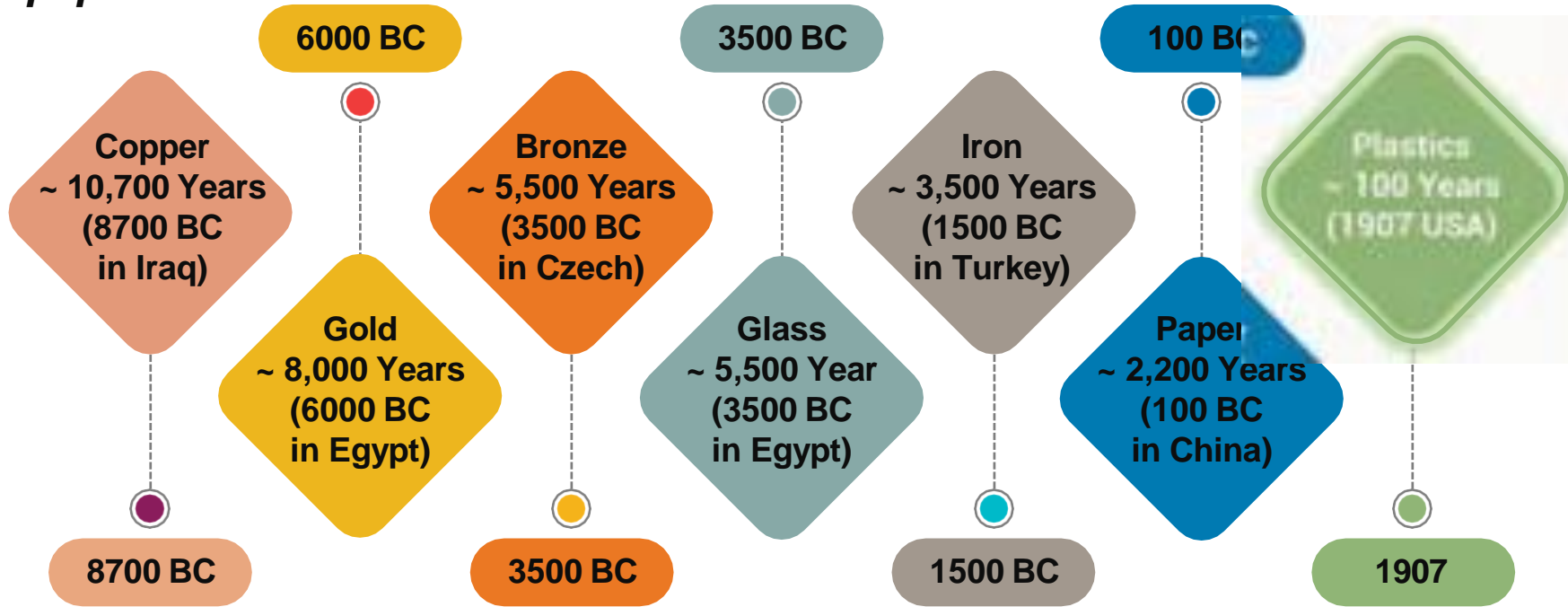
**Favorable Investment
Ecosystem**



GLOBAL POLYMER INDUSTRY SNAPSHOT

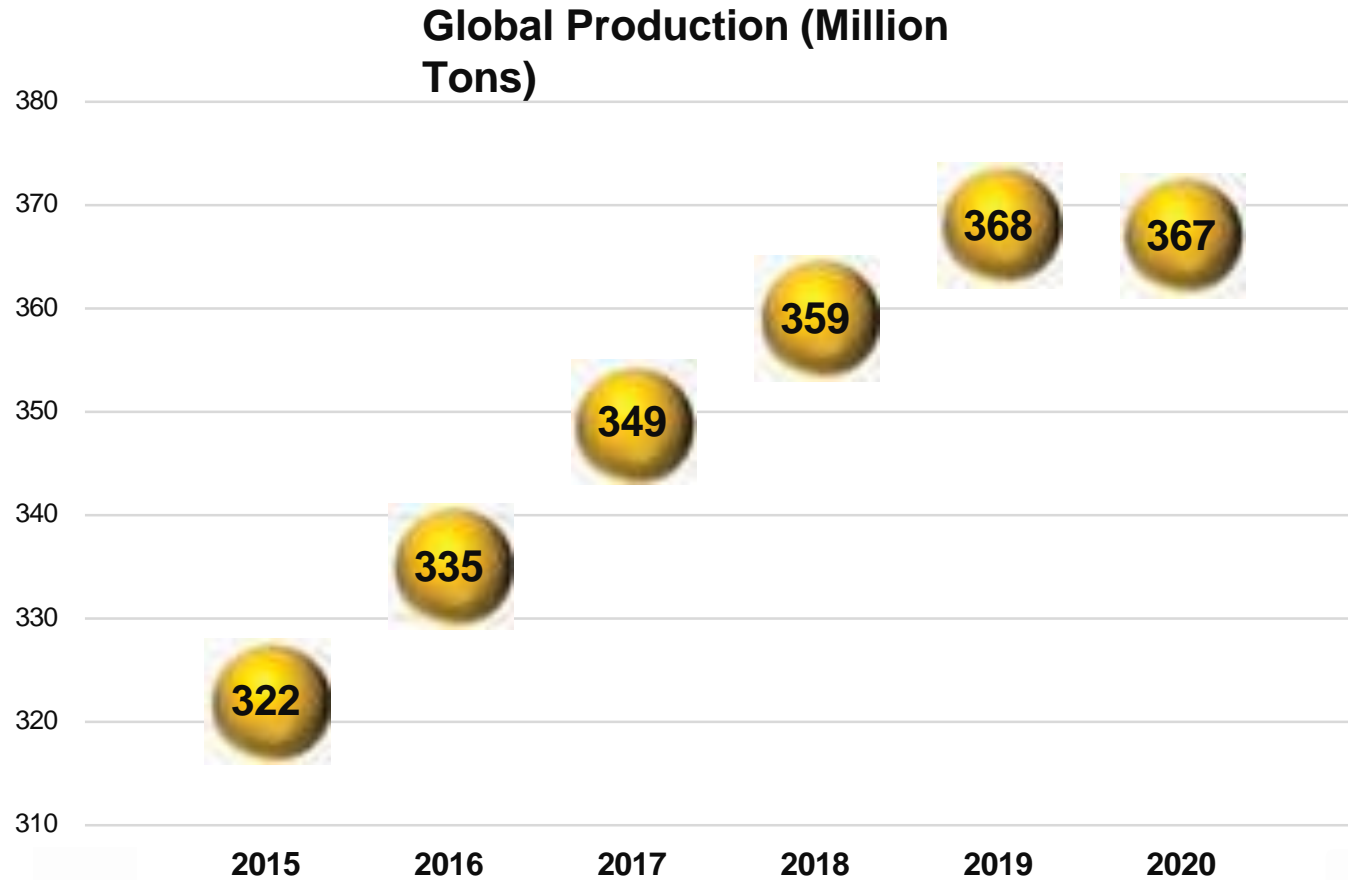
HISTORY OF MATERIALS

*Metal age, glass,
paper...*



Traditional materials > Thousand years- Plastics ~ 100 years young

GLOBAL PRODUCTION OF POLYMERS



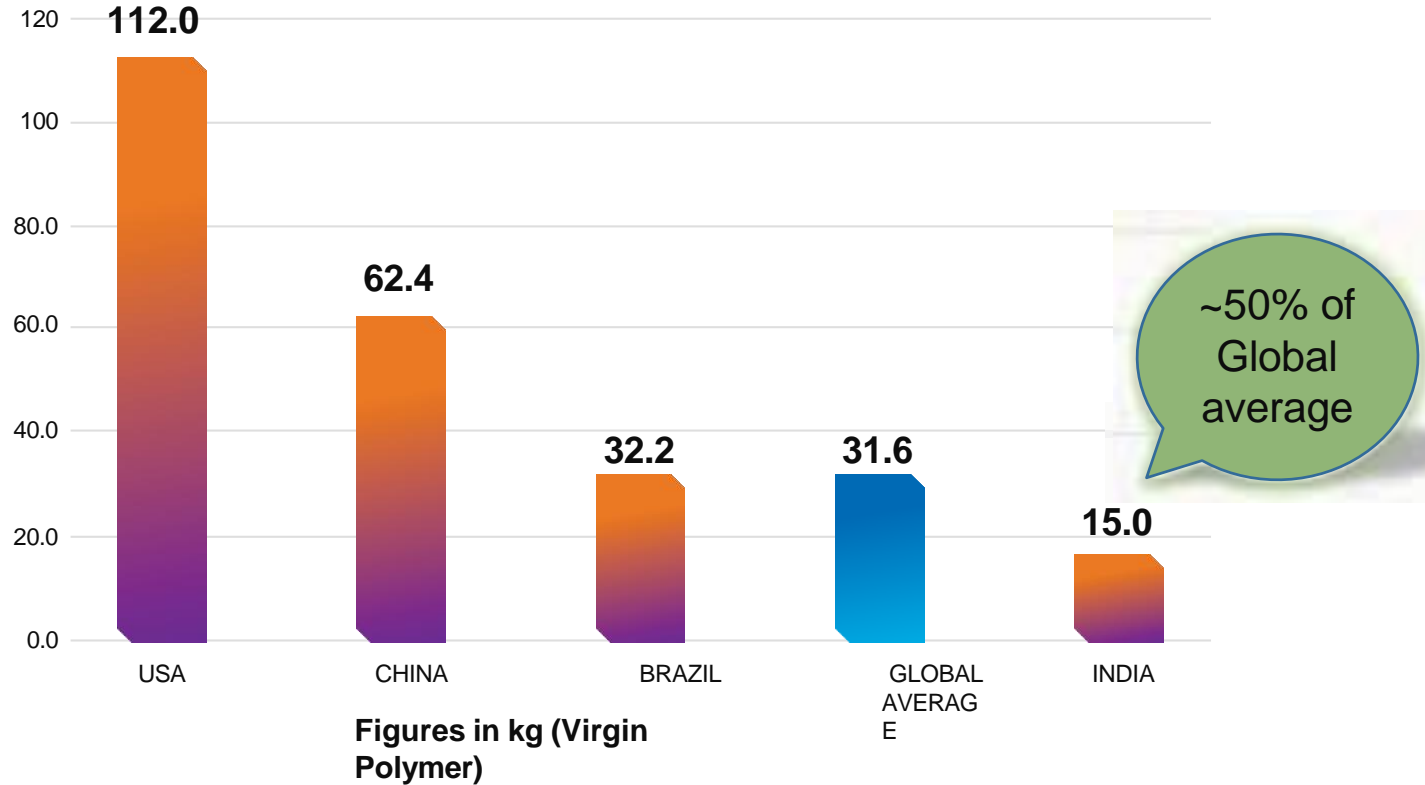
Includes Thermoplastics, Polyurethanes, Thermosets, Elastomers, Adhesives, Coating and Sealants and PP-Fibers.
Not included PET-, PA- and Polyacryl-Fibers.

GLOBAL CONSUMPTION OF PLASTICS



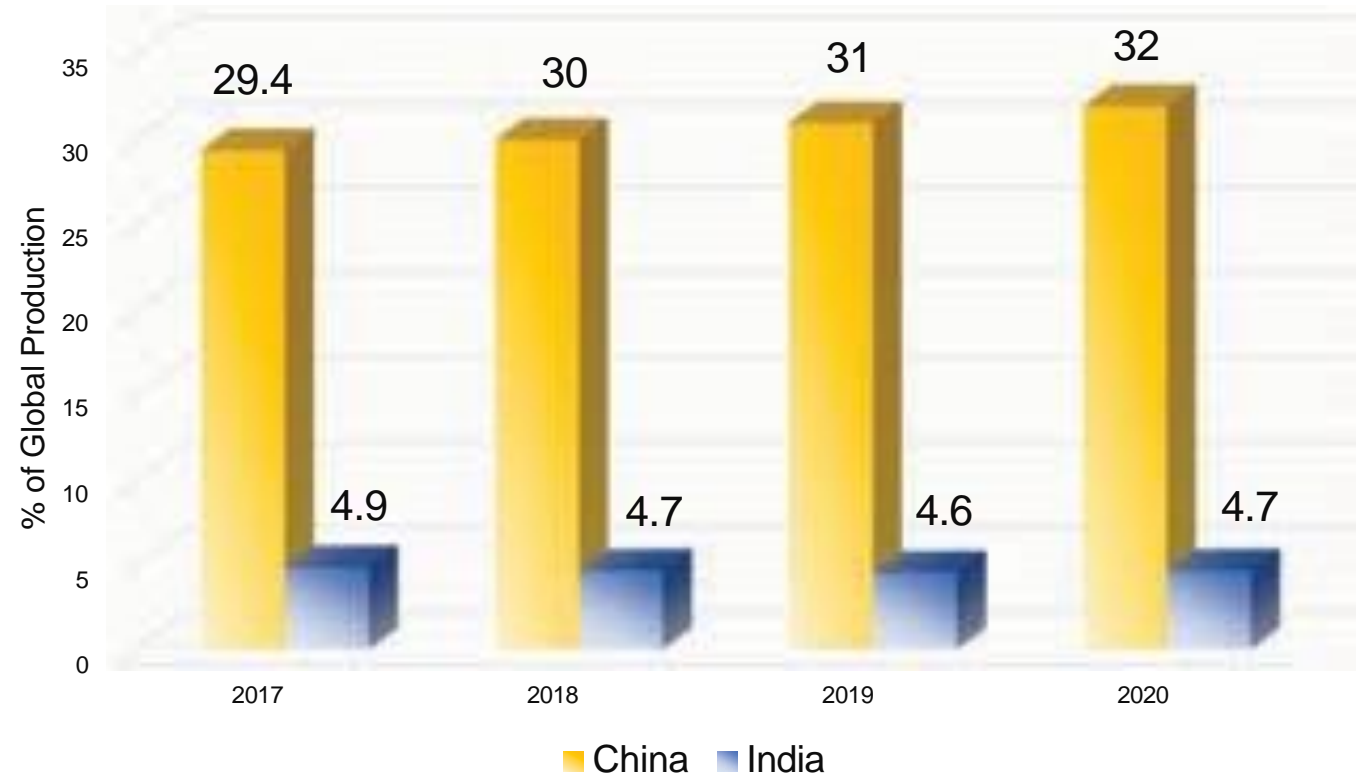
Source: <https://www.investindia.gov.in/sector/chemicals>

PER CAPITA CONSUMPTION 2021-22



Low per Capita Consumption : Potential for Growth

GLOBAL PRODUCTION CHINA VS INDIA

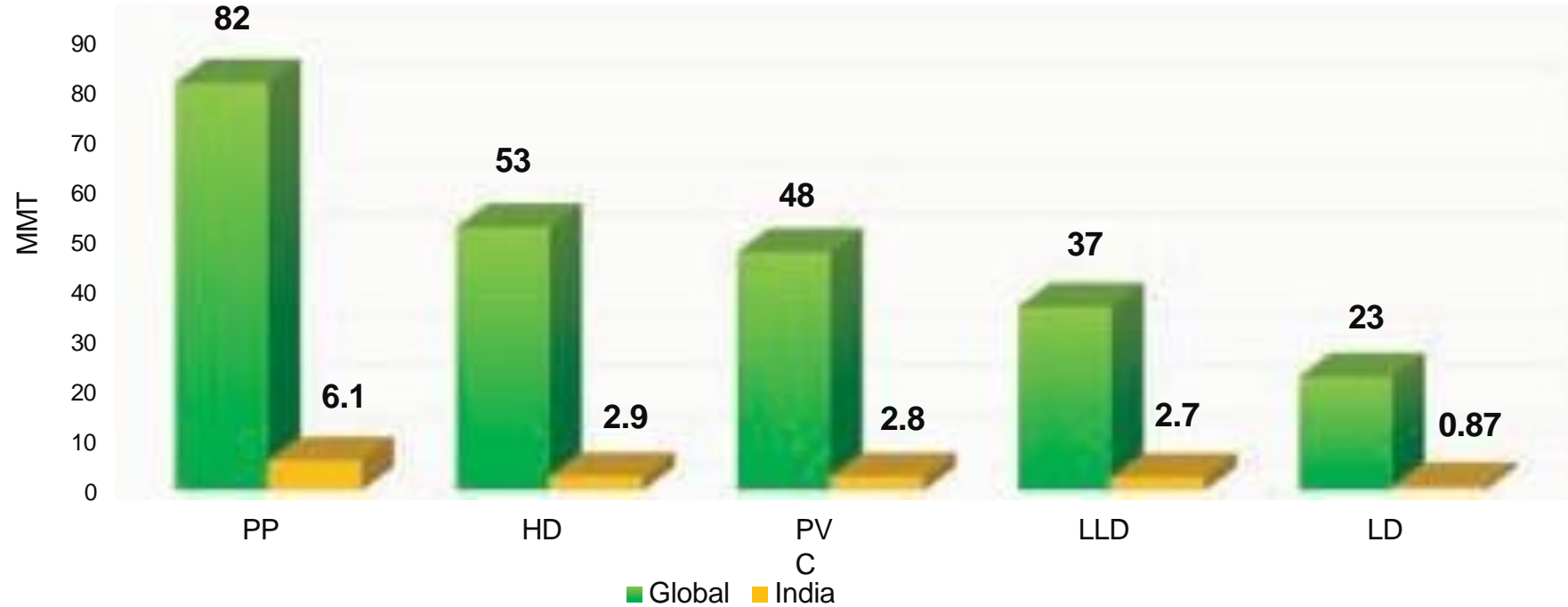


All Fig in %

China ~ 7 times larger than India in terms of Production...

Source: <https://plasticseurope.org/Industry> estimate

MAJOR PLASTICS DEMAND 2021 GLOBAL VS INDIA



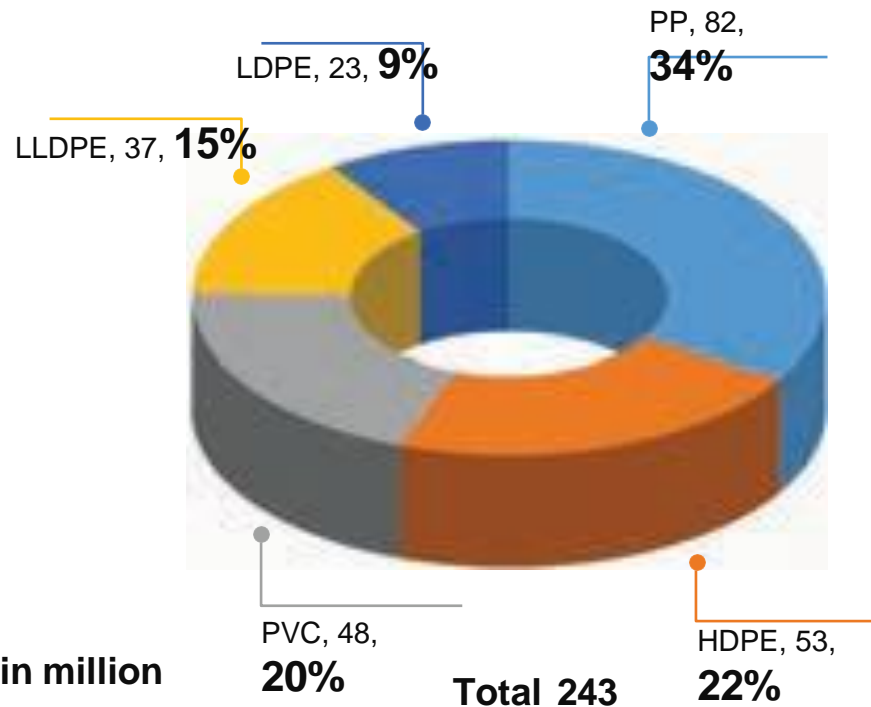
	PP	HD	PVC	LLD	LD
India's demand of Global %	7.4	5.5	5.8	7.3	3.8

All Fig in million tons

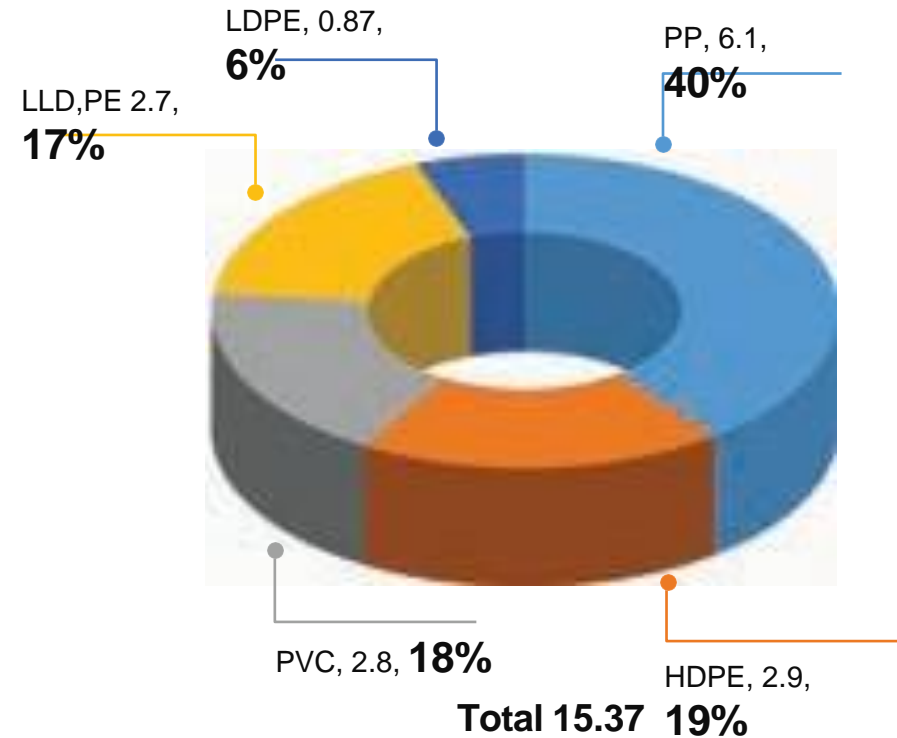
Source: PLASTINDIA FOUNDATION /Industry Estimate

COMMODITY PLASTICS DEMAND*

Global Demand for Major Plastics 2021



Indian Demand for Major Plastics 2021-22



All Fig in million tons
Engineering plastics & Thermosets not included

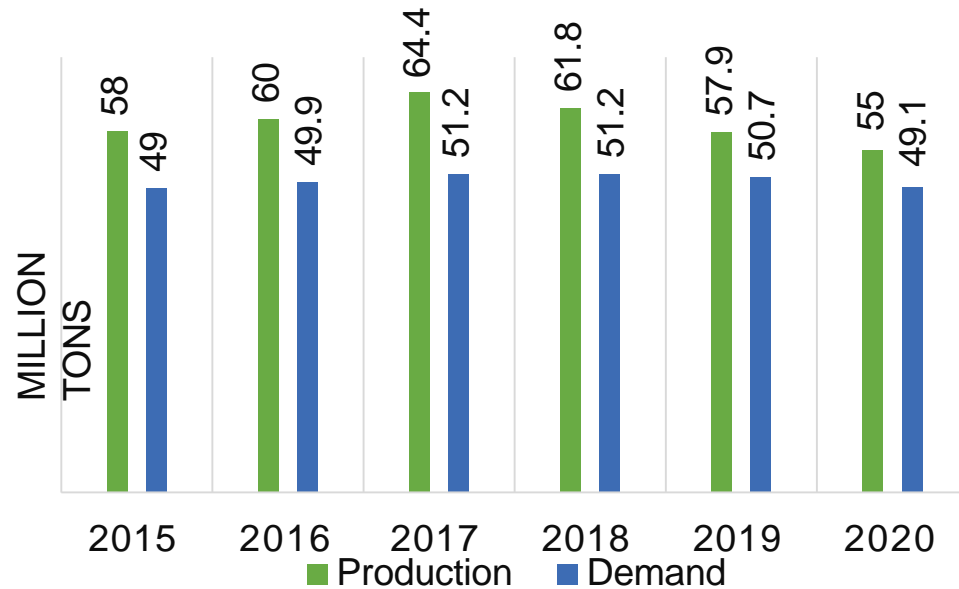
India Demand is 6.3% of Global Demand

The demand pattern close to Global

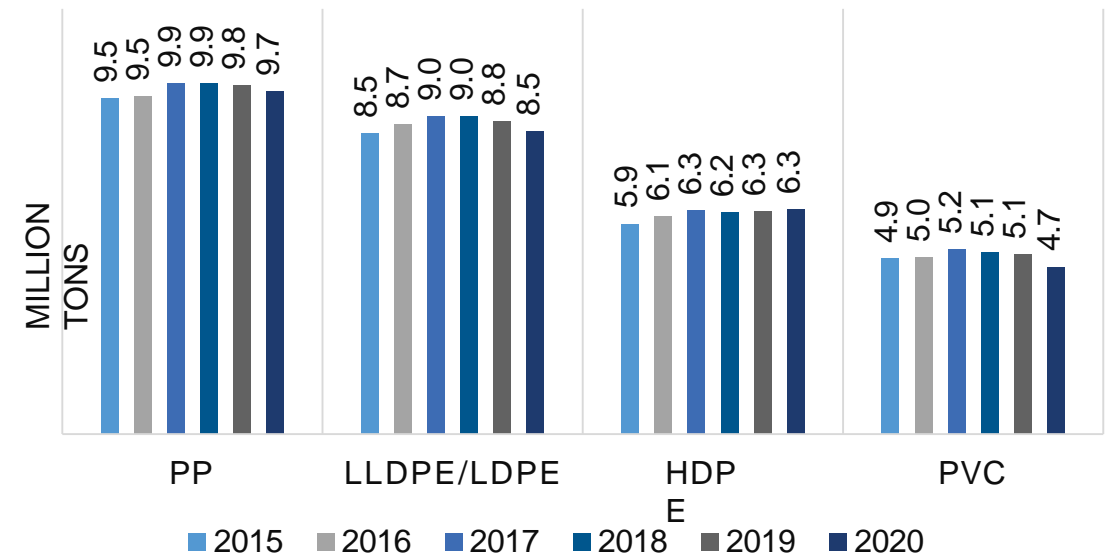
Source: PLASTINDIA FOUNDATION /Industry Estimate

European Countries (EU27+3) Production/Demand/Growth

European countries (EU27+3) Production Vs Demand



European Demand - Plastics Type wise



All Fig in million tons

Includes Thermoplastics, Polyurethanes, Thermosets, Elastomers, Adhesives, Coating and Sealants and PP-Fibers.
Not included PET-, PA- and Polyacryl-Fibers.

Demand remains stagnant in the last 6 years...

INDIAN POLYMER INDUSTRY SNAPSHOT

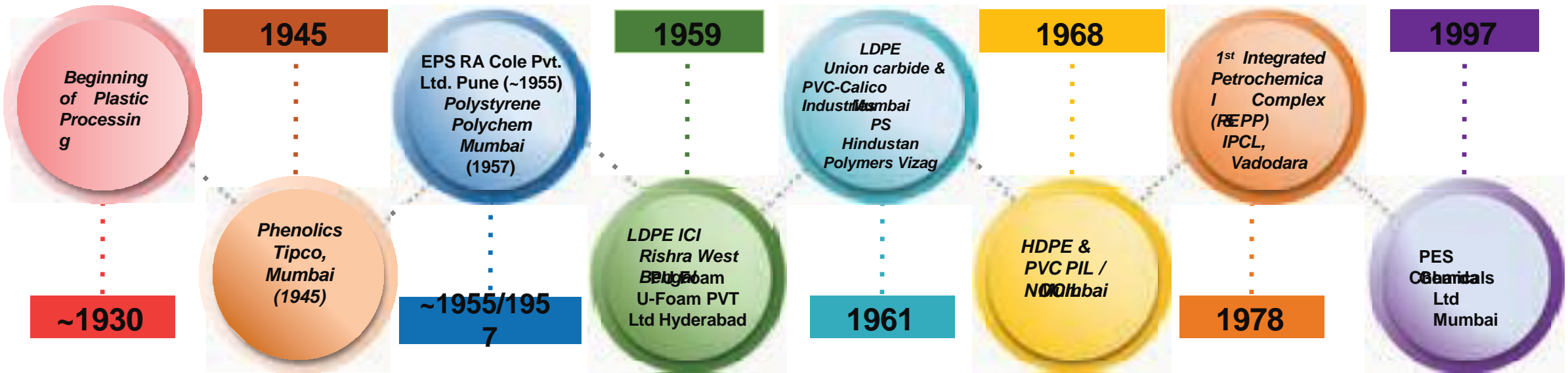


LOOKING BACK IN HISTORY - INDIA



Humble Beginning In 1945 - Phenolics By Tipco at Mumbai

INDIA STEPS INTO PLASTIC AGE...



Journey Continues... 34+ types of Plastics being Processed

Source: PLASTINDIA FOUNDATION /Industry Estimate

INDIAN POLYMER INDUSTRY SNAPSHOT



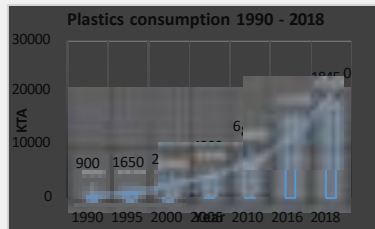
**THERMOPLASTICS
CAPACITY 2021-
22**

18.19 millions tons



**DEMAND
ALL
PLASTICS
2021-22**

20.89 million tons vis-a-
vis
0.9 million tons in 1990.
23 times since then



**SIZE OF
INDUSTRY**

7.1 lakh crores
(96 Bn USD)



**RECYCLIN
G 2021-
22**

~60% of Post
Consumer Plastics

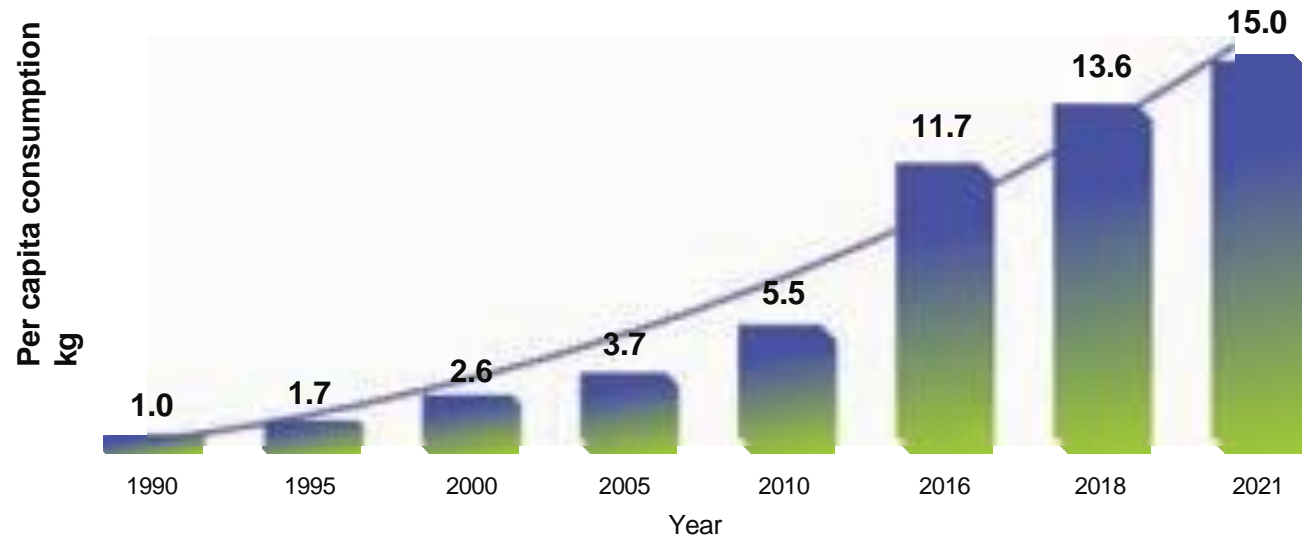
THE INTEGRATED PLASTICS VALUE CHAIN – INDIA



Others include Testing laboratories, Bureau of Indian Standards , R & D Centres, Industry & Trade Associations, 3rd largest Plastics Exhibition Organizer

INDIA PER CAPITA CONSUMPTION YEARWISE TREND

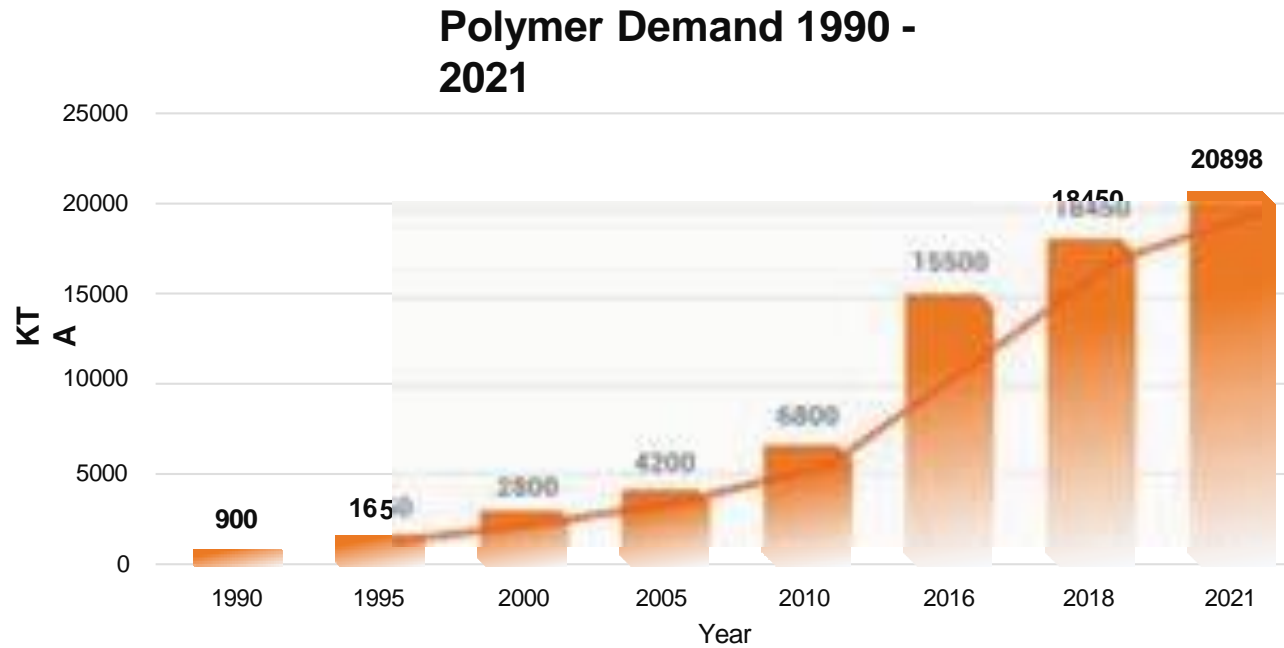
Polymer Demand 1990 -
2021



Polymer Consumption Growing Steadily...yet to Catch up with Developed Countries

Source: PLASTINDIA FOUNDATION /Industry Estimate / CIPET

GROWTH OF POLYMER DEMAND



All Fig in
KT

Steady Growth in Saving Natural Resources & Energy...

INDIAN POLYMER INDUSTRY GLOBAL HIGHLIGHTS



POLYOLEFINS CAPACITY (2021-22) - INDIA

Polyolefin Capacity 2021-22

COMPANY	LDPE	LLDPE	HDPE	PP	TOTAL	% SHARE
Reliance Industries Ltd.	650	1230	600	3165	5645	46.9
Indian Oil Corporation		350	300	1280	1930	16
ONGC Petro Additions Ltd.		340	720	340	1400	11.6
Haldia Petrochemicals		200	500	390	1090	9.1
GAIL (India)		310	500		810	6.7
Mangalore Refinery & Petrochemical				440	440	3.7
HMEL				440	440	3.7
Brahmaputra Cracker & Polymer			220	60	280	2.3
Total	650	2430	2840	6115	12035	100

All Fig in
KT

All Major Thermoplastics Capacity 2021-22 **18.19 million tons**

Source: PLASTINDIA FOUNDATION /Industry Estimate

PVC/CPVC CAPACITY (2021-22) - INDIA

PVC (Suspension Resin)

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	

CPVC

COMPANY	CAPACITY	% SHARE
DCW (Incl. Compounding)	12	29
Meghmani	30	71

All Fig in
KT

**All Major Thermoplastics Capacity 2021-
22 18.19 millions
tons**

Source: PLASTINDIA FOUNDATION /Industry
Estimate

PET & STYRENICS CAPACITY (2021-22) - INDIA

PET Capacity	
COMPANY	2021-22
Reliance Industries Ltd.	1008
IVL Dhunseri	720
JBF	183
Chirpal	144
Others for BOPET	1400
Total	3455

Styrenics Capacity		
COMPANY	PS	EPS
Supreme Petrochem Ltd.	272	72
Ineos Styrolution	78	
Ratan Polymers		6.6
RQS Engineering		25
Styricchem		62
Total	350	165.6

All Fig in
KT

**All Major Thermoplastics Capacity 2021-22 18.19 million
tons**

Source: PLASTINDIA FOUNDATION /Industry
Estimate

MAJOR ENGINEERING PLASTICS CAPACITY (2021-22) - INDIA

MANUFACTURER	PLASTICS	CAPACITY
Inoes/Bhansali	ABS	260
Ineos Styrolution	ASA	25
GSFC	Polyamides	25
Ineos /Bhansali	SAN	160
GFL/HFCL	Fluoro Polymers	25.1
Covestro	TPU	6
Grand Total		501.1

All Fig in
KT

**All Major Thermoplastics Capacity 2021-22 18.19 million
tons**

Source: PLASTINDIA FOUNDATION /Industry
Estimate

HIGH PERFORMANCE PLASTICS CAPACITY (2021-22) - INDIA

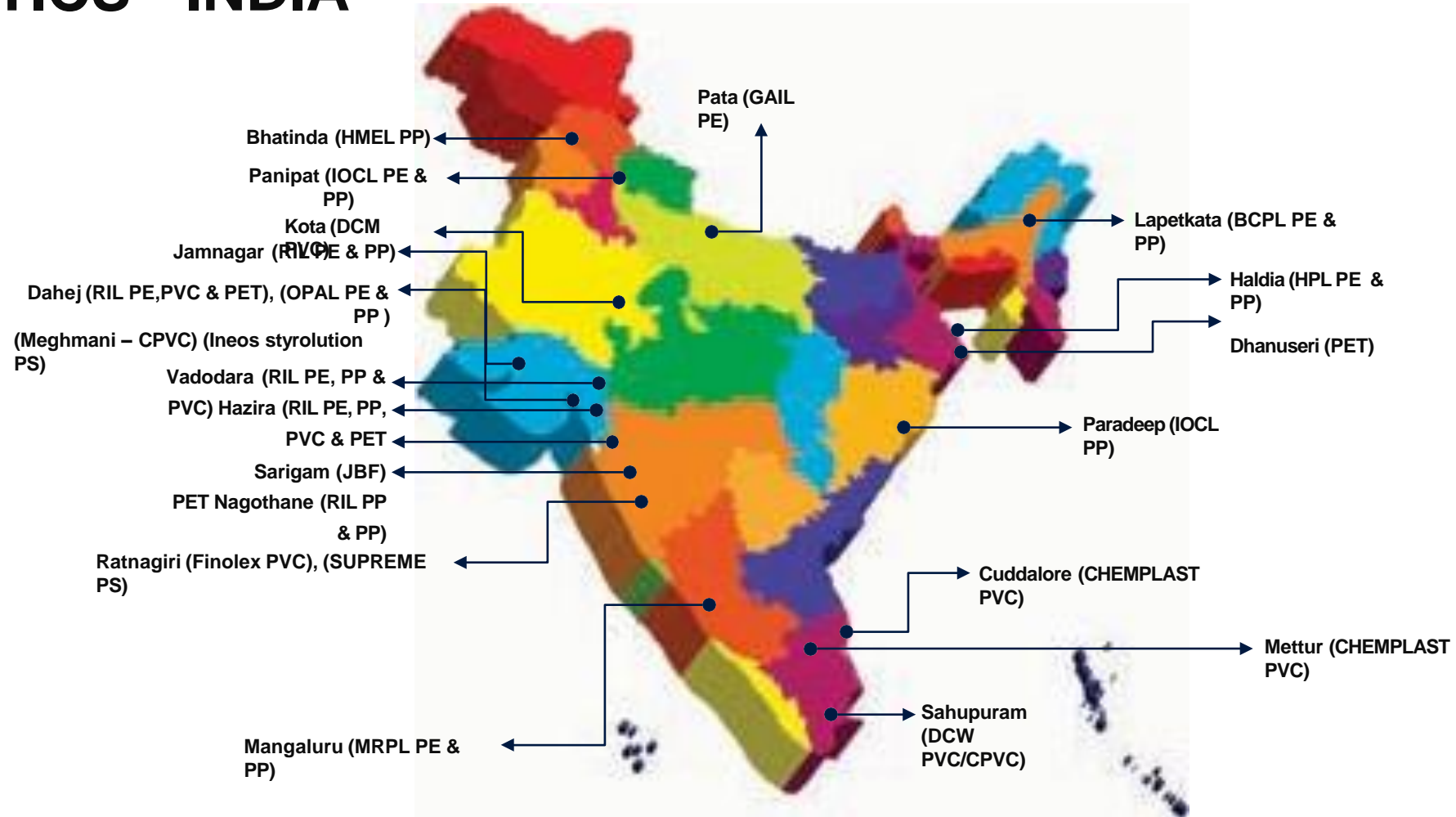
MANUFACTURER	PLASTICS	CAPACITY (TPA)	MAJOR APPLICATIONS
Solvay Specialties (Panoli)	Polyether Sulfone (PES)	3000	Chip Trays, Electricals, Membranes
	Polyether Ether Ketone (PEEK)	2000	Stock Shapes, E&E, Cables, Gen. Engineering, Oil & Gas
Solvay/Rallis (Ankleshwar)	Polyether Ketone Ketone (PEKK)	110	CF Composites for Aerospace
Gharda Chemicals (Ankleshwar)	Polyether Ketone (PEK)	100	Stock shape, Cable, Gen. Engineering
	Polyether Ketone Ketone (PEKK)	100	Electronics, Oil Fields, Gen. Engineering, 3D Printing
	PolyBenzimidazole (ABPBI)	25	Blends with PEK, Fire Resistant Fiber, Membranes for High Temp Fuel Cells

Total Capacity 5335 TPA

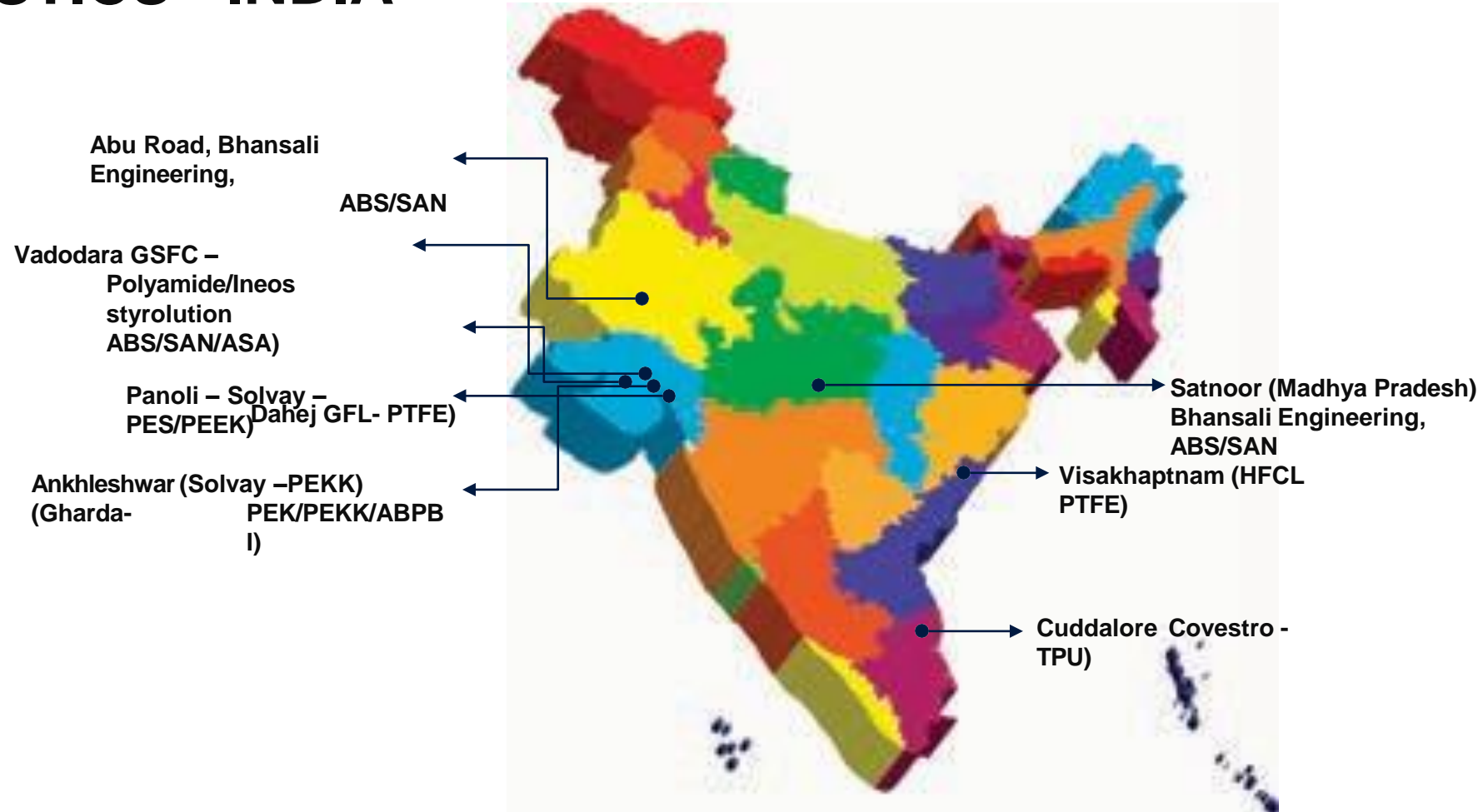
**Demand 2021-22 530
Tons**

**Remaining
exported**

PLANT LOCATIONS OF MAJOR COMMODITY PLASTICS - INDIA



PLANT LOCATIONS OF ENGINEERING/HIGH PERFORMANCE PLASTICS - INDIA



CAPACITY - DEMAND SUMMARY THERMOPLASTICS (2021-22) - INDIA

PLASTICS	No. of PLANTS	CAPACITY KT	DEMAND KT
PE	6	5920	6447
PP	7	6115	6089
PVC	5	1560	2833
CPVC	2	42	182
Emulsion PVC	2	78	142
PET	4	2055	1182
BoPET Chips	17	1400	832
PS	2	350	301
EPS	4	166	117
ABS	2	260	240
ASA	1	25	7.5
PA	1	25	195
SAN*	2	160	27
PTFE	2	25	7.5
TPU	1	6	17.5
High Performance Plastics	2	5.3	11.1
Total	59	18192	18630**

*used for ABS production

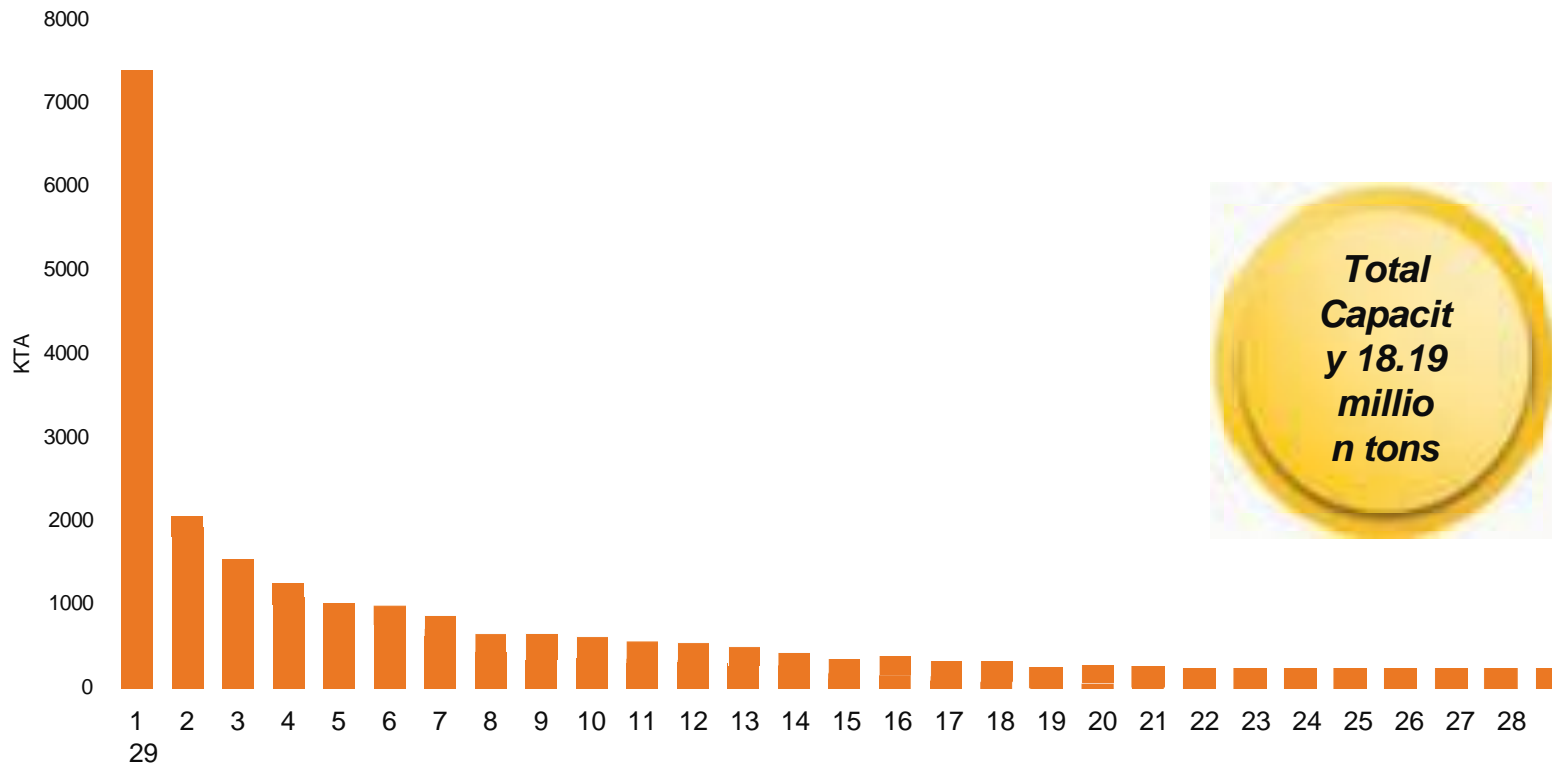
** With TPE the Thermoplastics Consumption is 19270 KT

DEMAND MET BY IMPORTS	
Major Plastics	KT
EVA	182
PC	229
POM	44
PMMA	20
PBT	32
UHMHDPE	8.6
Total	515.6

Note: TPE, PC-ABS blend & Thermosets not included

44 Manufacturer with Capacity of 18.19 million Tons – about 34 types of Thermoplastics

MANUFACTURERS CAPACITY THERMOPLASTICS (2021-22) - INDIA

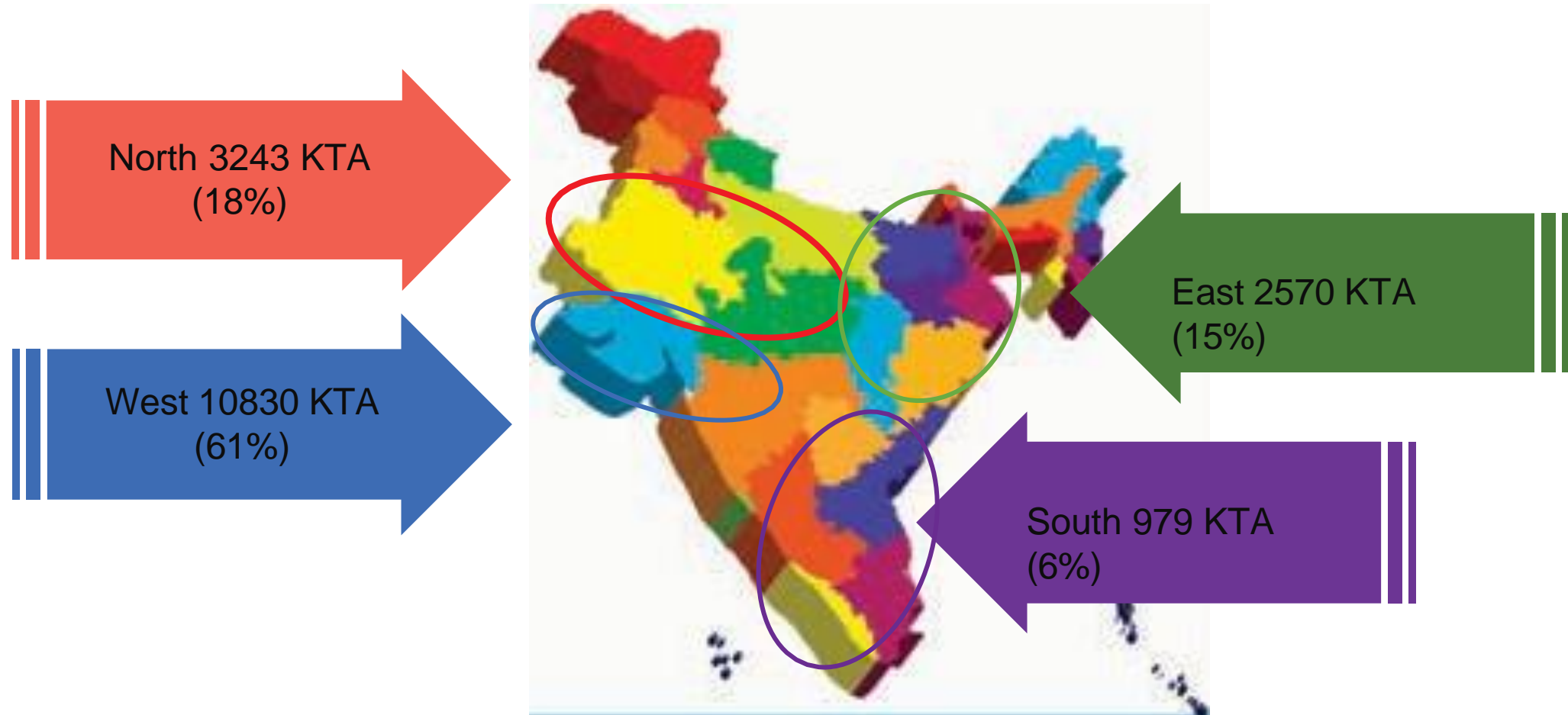


Sl.No	Manufacturers	Product	Capacity KTA
1	Reliance Industries	PE,PP,PVC,PET	7403
2	Indian Oil Corp	PE,PP	1930
3	ONGC PetroAdditions	PE,PP	1400
6	Pet chips manufacturers for BoPET	PET	1400
4	Haldia Petrochemicals	PE,PP	1090
5	GAIL (India)	PE	810
7	IVL Dhunseri	PET	720
8	Mangalore Refinery & Petrochemical	PP	440
9	HPCL Mittal Energy	PP	440
10	Chemplast	PVC, Paste PVC	431
11	Ineos styrolation	PS,HIPS,ABS,ASA,SAN	360
12	Supreme	PS,EPS,HIPS	344
13	Finolex	PVC, Paste PVC	300
14	Bhramaputra Cracker & Polymer	PE,PP	280
15	JBF	PET	183
16	Bhansali	ABS,SAN	160
17	Chirpal	PET	144
18	DCW	PVC,CPVC	102
19	DCM Shriram	PVC	70
20	Styricchem	EPS	62
21	Meghmani	CPVC	30
22	RQS Engineering	EPS	25
23	GSFC	PA	25
24	GFL	PTFE	24.6
25	Ratan Polymers	EPS	6.6
26	Covestro	TPU	6
27	Solvay Specialties	PES,PEEK,PEKK	5.1
28	HFCL	PTFE	0.5
29	Gharda Chemicals	BEK,PEKK,ARPI	0.225

Note: TPE, PC-ABS blend & Thermosets not included

Reliance Industries is the largest manufacturer in India with 7.4 million Tons

POLYMER MANUFACTURING LANDSCAPE (2021-22) - INDIA



Western India is leading in the Manufacturing...

PROJECTS BEYOND (2021-22) PE/PP - INDIA

PROJECT PLANNED / PROPOSED

P

COMPANY	HMEL	HMEL	HRRL-HPCL	HPCL/GAIL	RRPCL
Location	Bhathinda	Bhathinda	Barmer	Kakinada	Maharashtra
Plastics	HDPE	HD/LL Swing	HD/LL Swing	PE	PE
Capacity (KTA)	450	800	800	450	1030
Timeline	2022	2022	2025	2025	2027

PP

COMPANY	HMEL	NAYARA ENERGY	IOCL	IOCL	HRRL-HPCL	GAIL	CPPL	HPCL/GAIL	RRPCL
Location	Bhatinda	Vadinar	Barauni	Baroda	Barmer	USAR	Nagapatnam	Kakinada	Maharashtra
Plastics	PP	PP	PP	PP	PP	PP	PP	PP	PP
Capacity (KTA)	500	450	220	440	980	500	475	315	4150
Timeline	2022	2023	2023	2024	2024	2024	2025	2025	2027

PROJECTS BEYOND (2021-22)

PVC/PET/ABS - INDIA

PROJECT PLANNED / PROPOSED

PVC/CPV

COMPANY	Grasim Lubrizo /	RRPCL	Adani	CHEMPLAST	RIL	HPCL/GAIL	CHEMPLAST
Location	Gujarat	Maharashtra	Gujarat	Tamil Nadu	Gujarat	Kakinada	Tamil Nadu
Plastics	CPVC	PVC	PVC	EPVC	PVC	PVC	CPVC
Capacity (KTA)	100	1500	2000	35	1500	300	22
Timeline	2023	2025	2025	2025	NA	NA	NA

PET

ABS

COMPANY	IVL Nagpur	Jindal Polymer	Garden	Sumilon Industrie s	Chiripal
Location	Nagpur	Nashik	Surat	Ahmedabad	Ahmedabad
Plastics	PET	PET	PET	PET	PET
Capacity (KTA)	252	92	238	270	216
Timeline	2023	2023	Planning	Planning	NA

COMPANY	Supreme Petrochem
Location	Maharashtra
Plastics	ABS
Capacity (KTA)	70
Year	2024

Source: PLASTINDIA FOUNDATION /Industry Estimate

INDIAN PLASTICS INDUSTRY GROWTH VS GDP GROWTH

YEAR	GDP GROWTH	POLYMER DEMAND GROWTH	IMPORT DUTY
1990-1995	5.0%	12.9%	50%+
1995-2000	6.5%	11.2%	40%
2000-2005	5.9%	8.5%	45%-15%
2005-2012	8.7%	10.9%	12.5%-5%
2012-2017	7.2%	10.6%	7.5%-5%
2016-2022*	4.9%	6.5%	7.5%-0%

*The GDP growth in 2020 was minus 6.6

GDP Growth in Relation to Petrochemical Growth

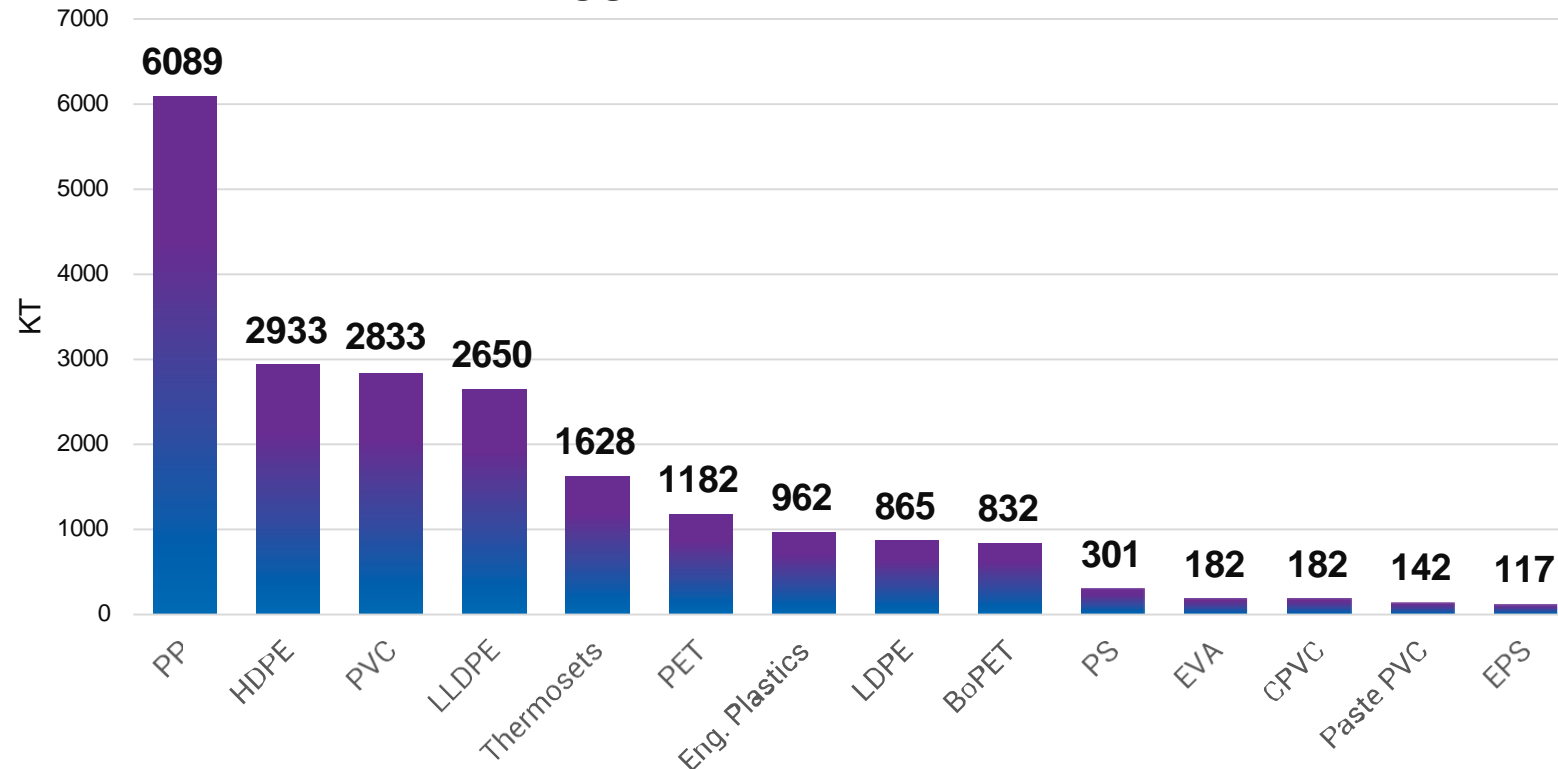
Source: PLASTINDIA FOUNDATION /Industry Estimate/<https://stats.oecd.org/Index.aspx?QueryId=72656>

INDIA – POLYMER DEMAND



INDIA'S SCENARIO ON POLYMER DEMAND (2021-22)

THERMOPLASTICS & THERMOSET



All Fig in
KT

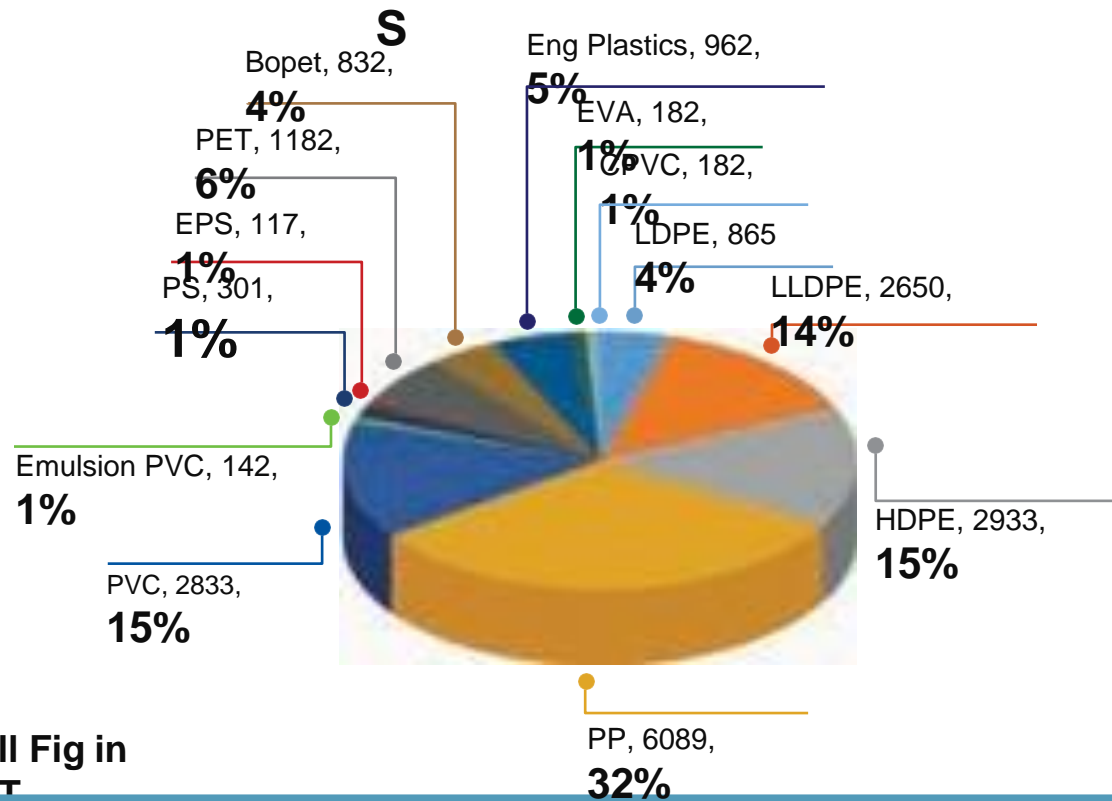
**2021-22 Demand 20898
KT**

**2022-23 Est. 22152 KT YoY Growth ~ 6
%**

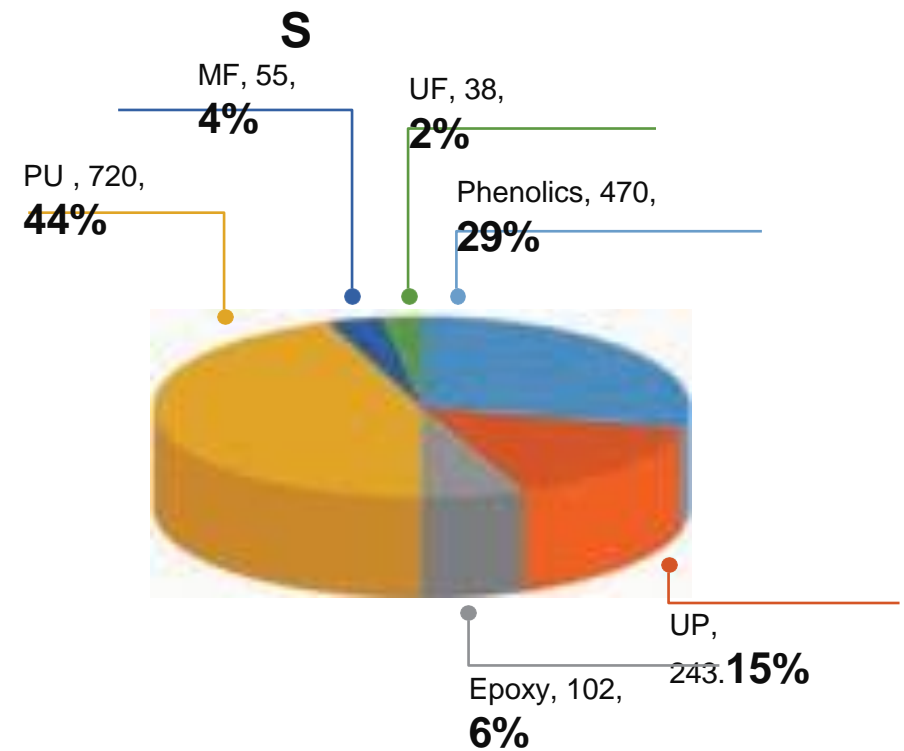
Source: PLASTINDIA FOUNDATION /Industry
Estimate

COMMODITY & THERMOSET PLASTICS DEMAND (2021-22) - INDIA

THERMOPLASTIC



THERMOSET



All Fig in KT

2021-22 Thermoplastic Demand 19270 KT

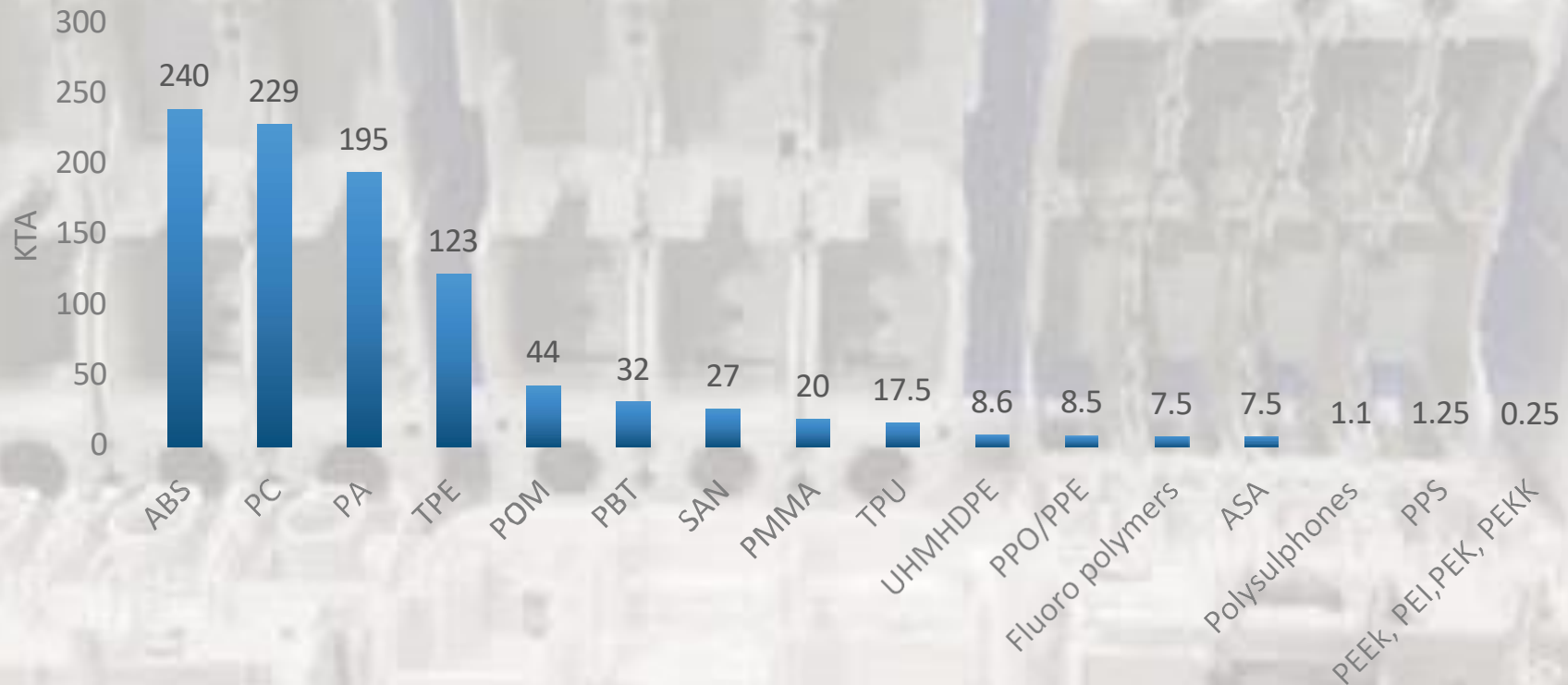
2022-23 Est. 20426 KT YoY Growth ~ 6%

2021-22 Thermoset Demand 1628 KT

2022-23 Est. 1701 KT YoY Growth ~ 4.5%

Source: PLASTINDIA FOUNDATION /Industry Estimate

ENGINEERING & HIGH PERFORMANCE PLASTICS DEMAND (2021-22) - INDIA



Note: Only the resin demand captured/SAN figure revalidated

All Fig in
KT

2021-22 Demand 962

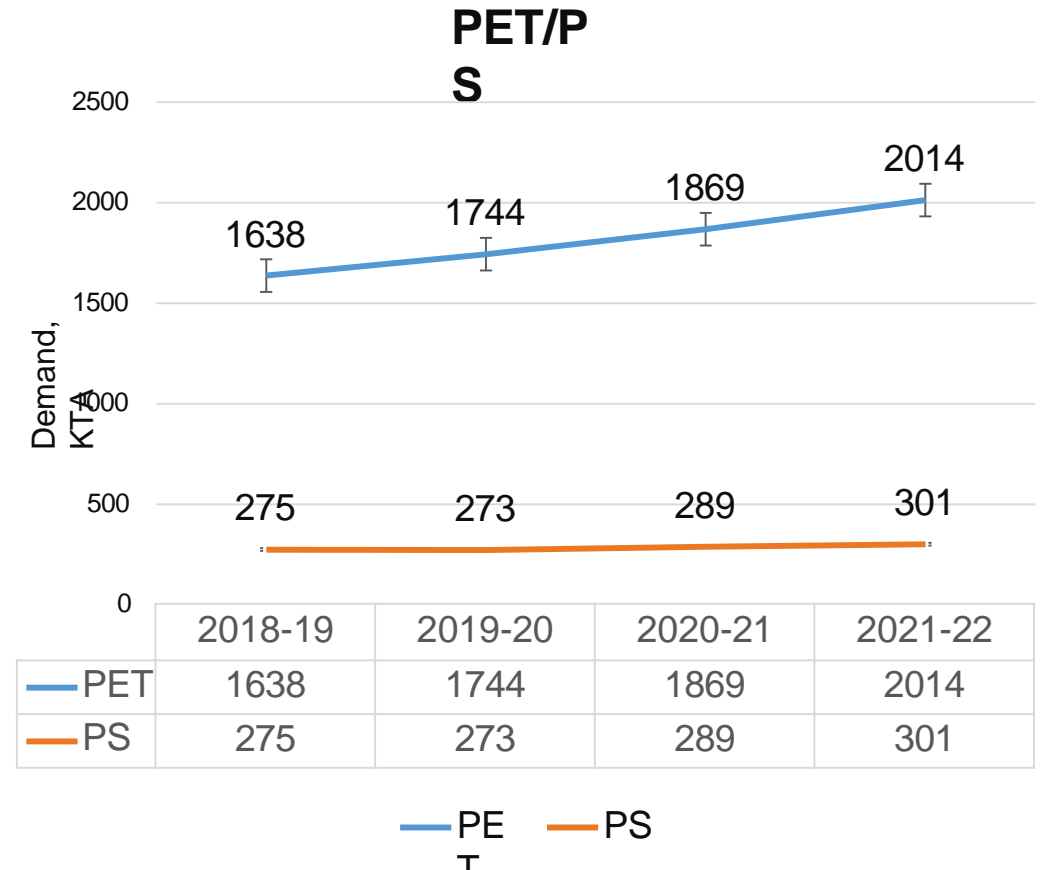
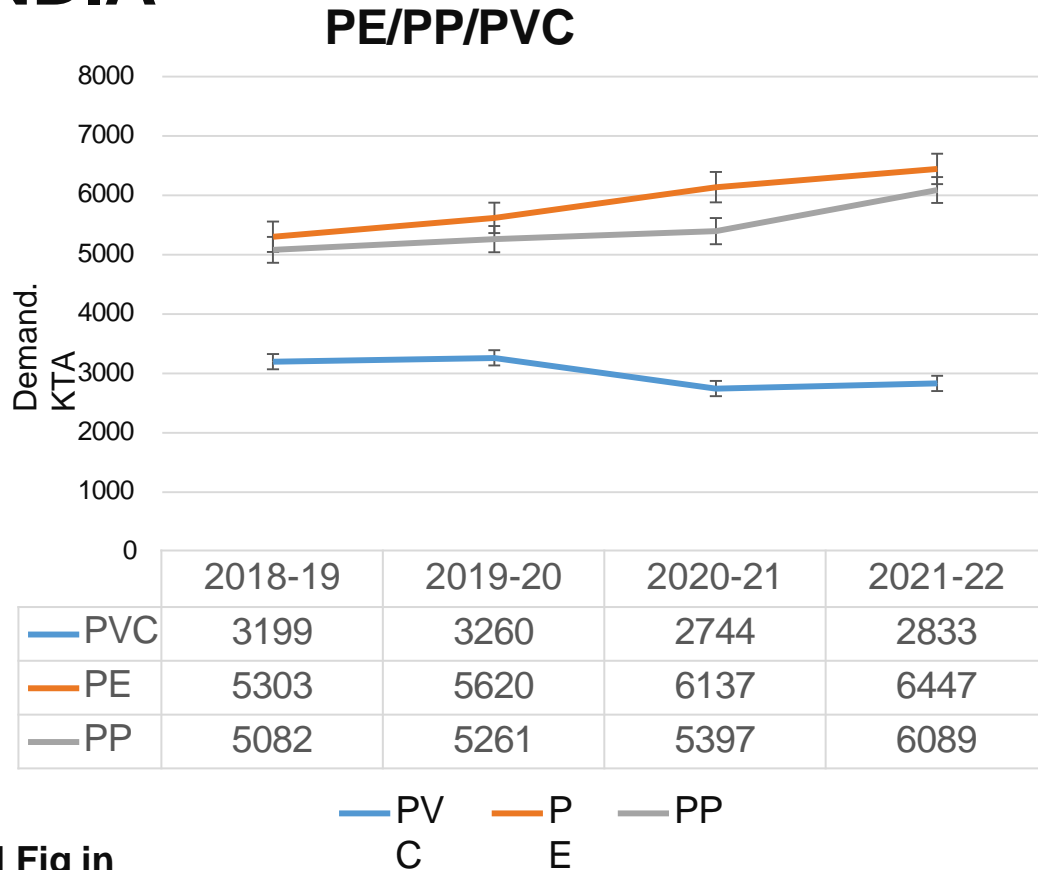
KT

2022-23 Est. 1010 KT YoY Growth ~

5%

Source: PLASTINDIA FOUNDATION /Industry Estimate

INCREASED PLASTICS DEMAND IN COUNTERING SPREAD OF COVID19 - INDIA



All Fig in KTA

International Supply In Marginal / Open Demand for one year.

Continuous Growth in PET

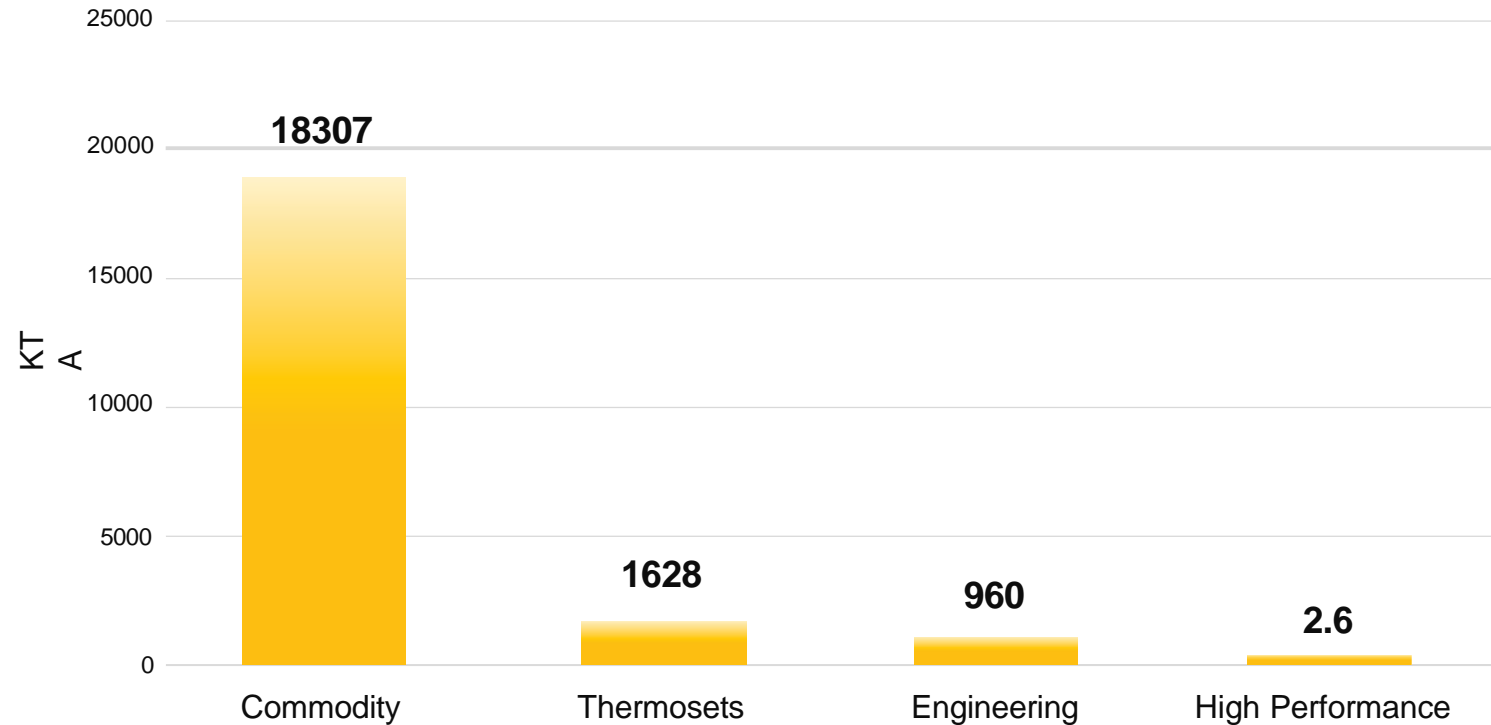
Source: PLASTINDIA FOUNDATION /Industry Estimate

SECTORWISE DEMAND

Commodity Plastics

ent

DEMAND BREAK UP OF ALL PLASTICS (2021-22) - INDIA



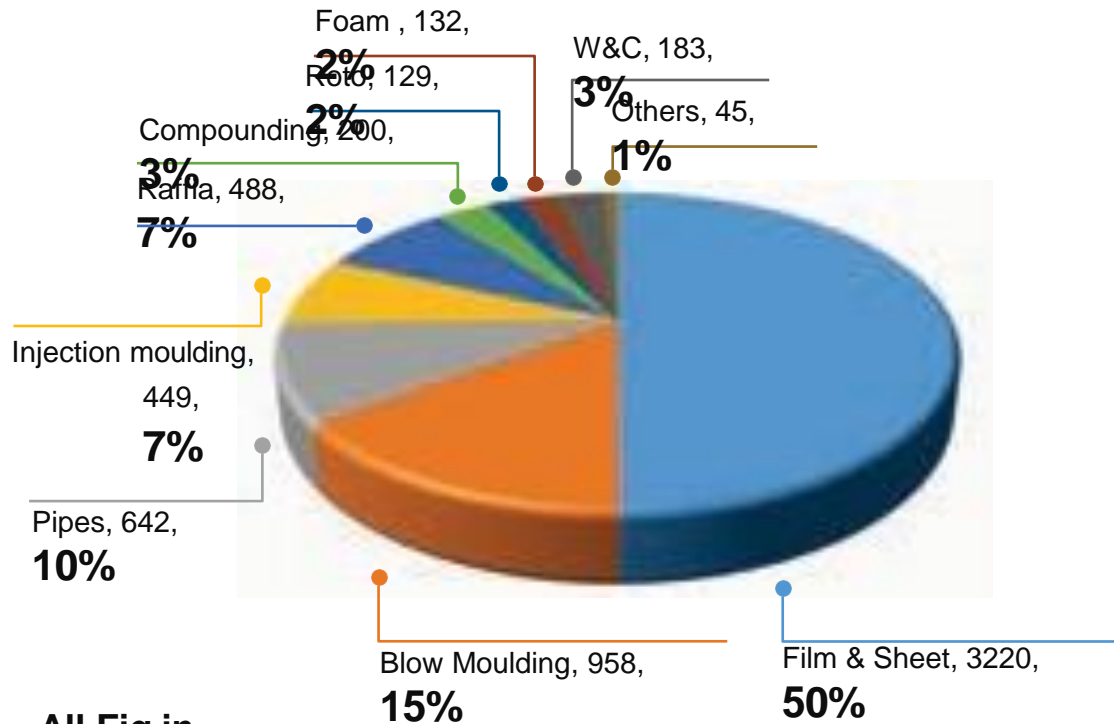
All Fig in KT

The Commodity Plastics Usage is ~ 19 times Larger than Engineering Plastics & 11 times of Thermosets

Source: PLASTINDIA FOUNDATION/Industry Estimate

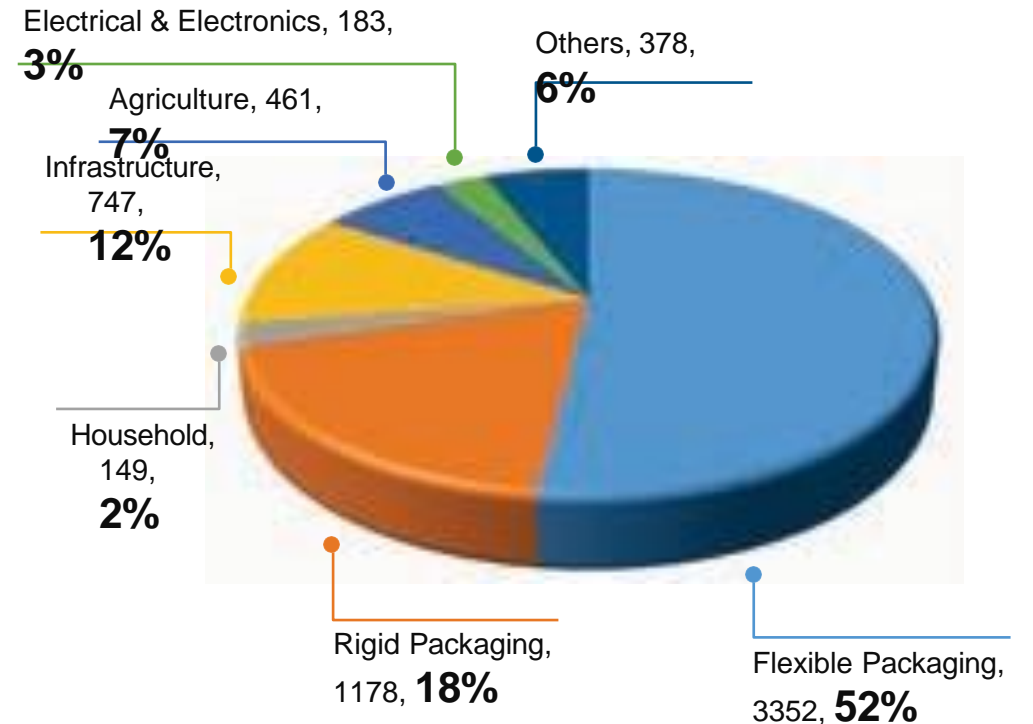
PE SECTORWISE DEMAND (2021-22) - INDIA

PE Sector wise Break up 2021-22 - 6447 KT



All Fig in KT

PE Application wise Breakup 2021-22- 6447 KT



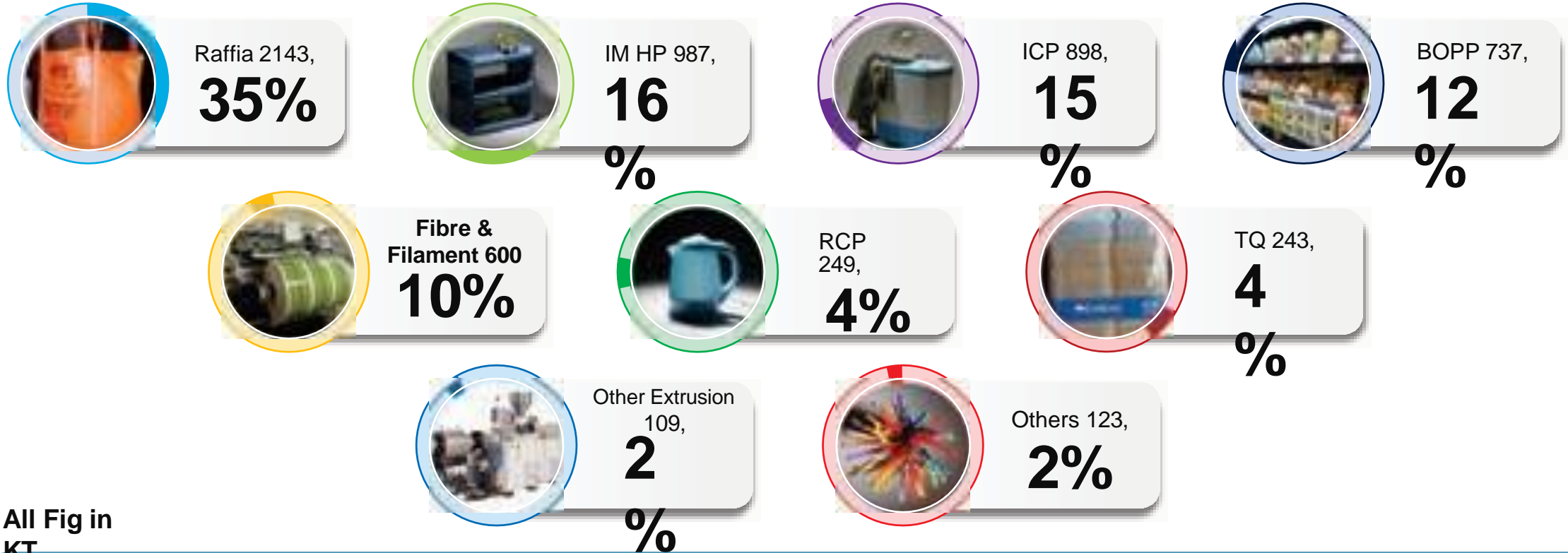
2021-22 Demand 6447 KT

2022-23 (E) 6770 KT YoY Growth ~ 7%

Source: PLASTINDIA FOUNDATION/Industry Estimate

PP SECTORWISE DEMAND (2021-22) - INDIA

PP Sector wise Break up 2021-22 - 6089 KT

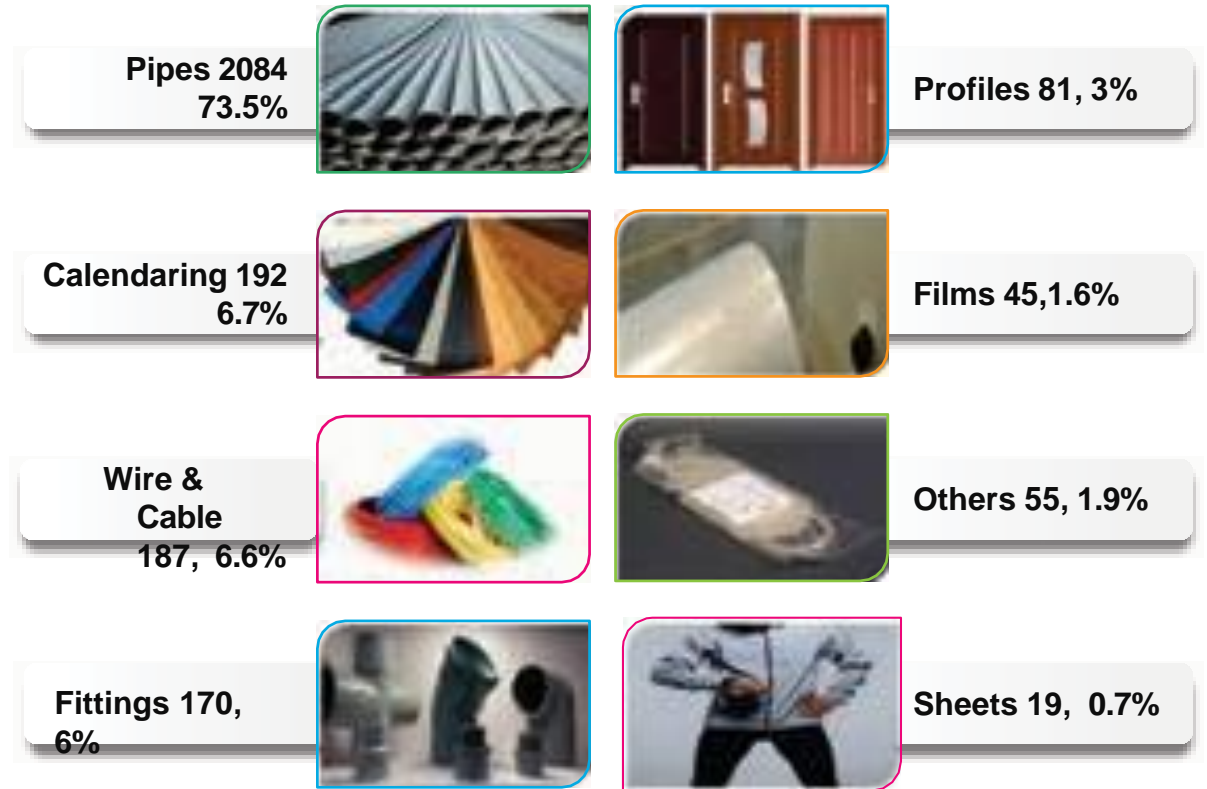


All Fig in KT

2021-22 Demand 6089 KT

2022-23 (E) 6515 KT YoY Growth ~ 7%

SUSPENSION PVC SECTORWISE DEMAND (2021-22) - INDIA



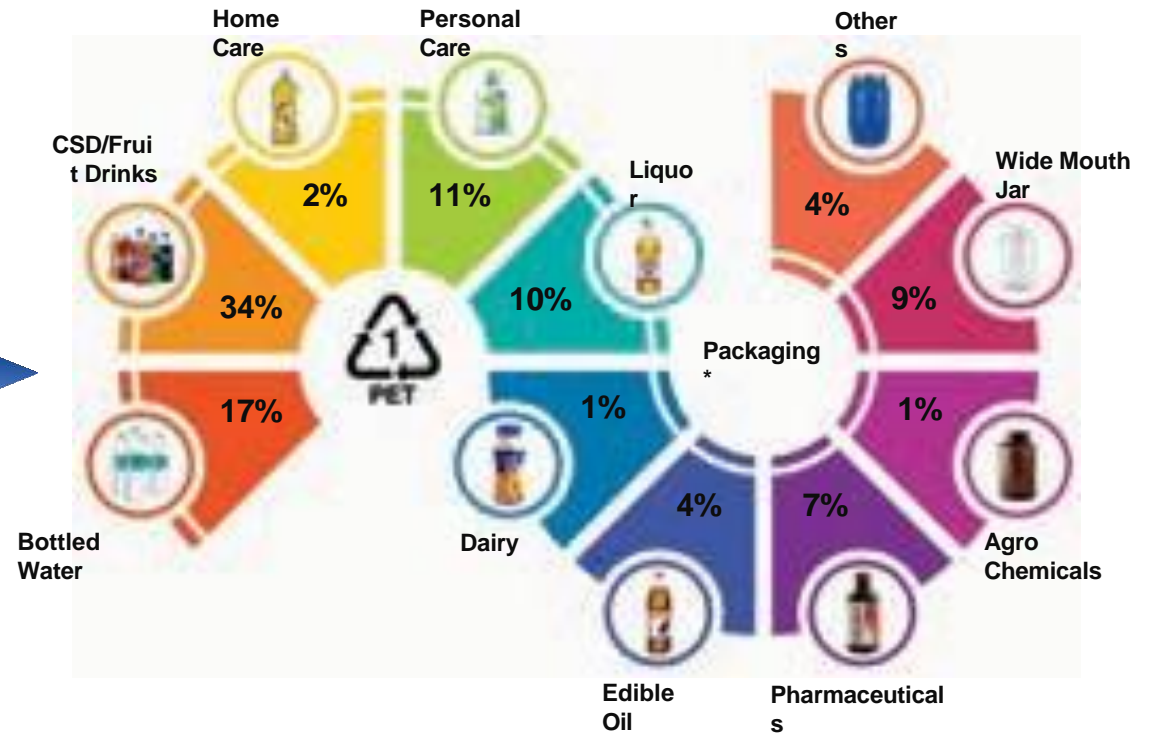
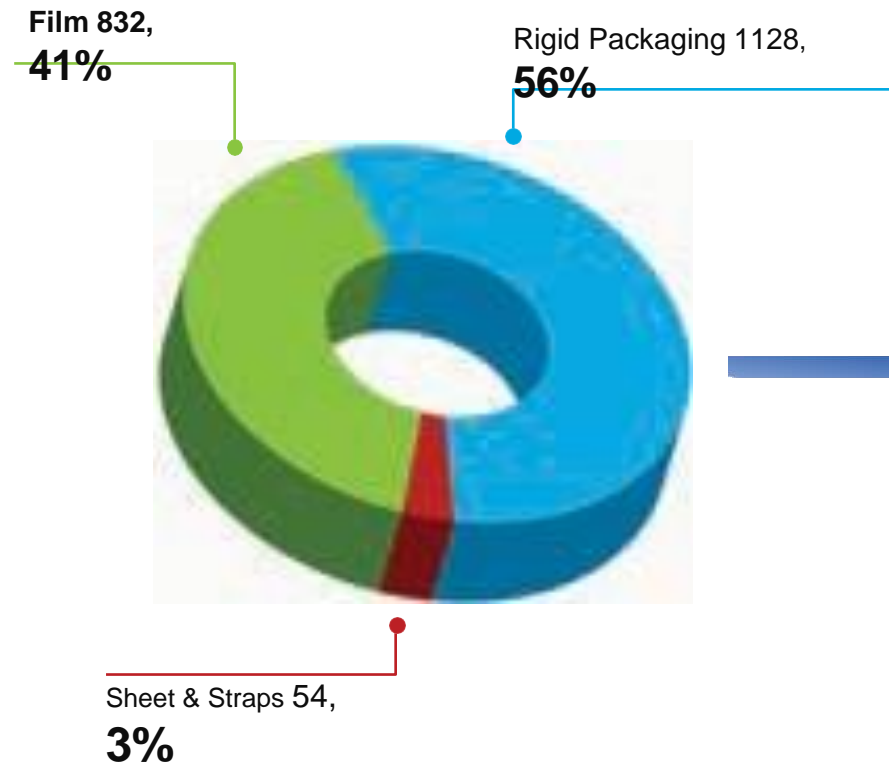
All Fig in
KT

2021-22 Demand 2833
KT

2022-23 (E) 3031 KT YoY Growth ~ 7
%

Source: PLASTINDIA FOUNDATION/Industry
Estimate

PET & BOPET SECTORWISE DEMAND (2021-22) - INDIA



All Fig in KT

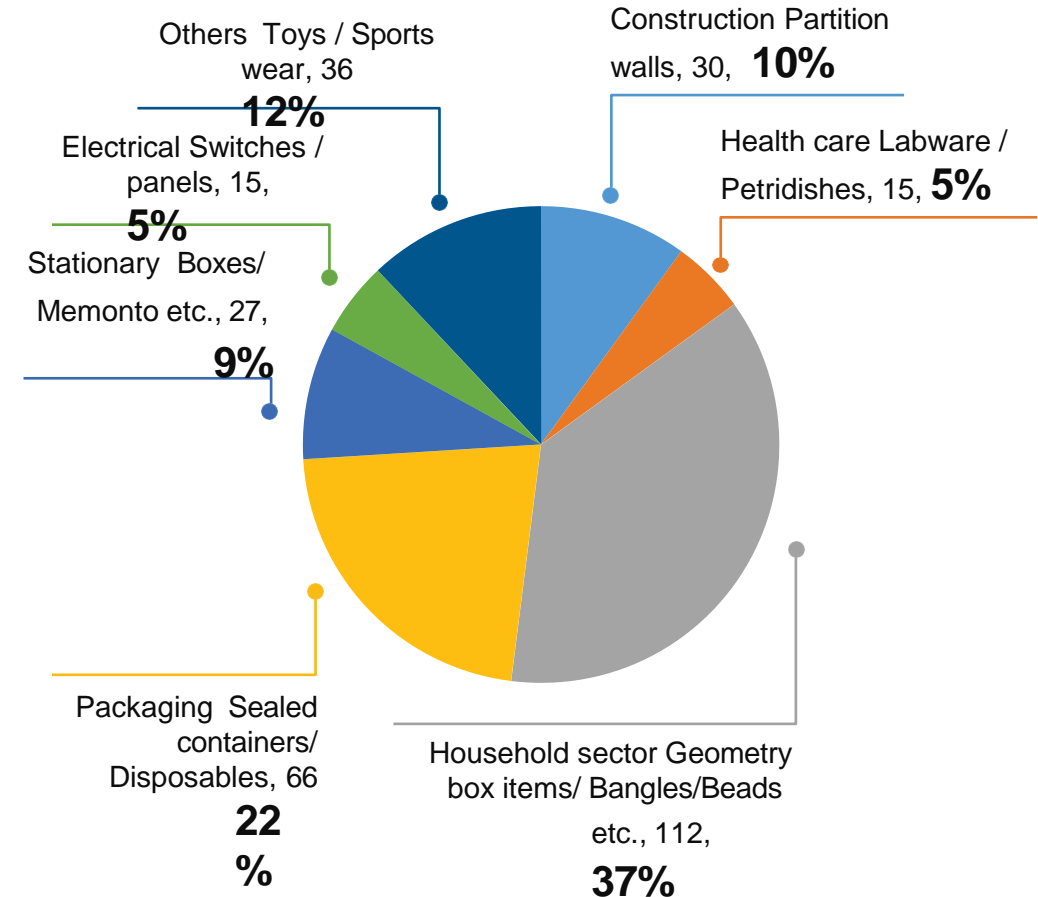
2021-22 Demand 2014
KT

2022-23 Est. 2195 KT YoY Growth ~ 9%

Source: PLASTINDIA FOUNDATION/Industry Estimate

GPPS/HIPS SECTORWISE DEMAND (2021-22) - INDIA

SECTOR	MAJOR APPLICATIONS	KT
Construction	Partition walls	30
Health care	Labware / Petridishes	15
Household sector	Geometry Box items / Bangles / Beads etc.,	112
Packaging	Sealed Containers / Disposables	66
Stationary	Boxes/ Memento etc.,	27
Electrical	Switches / Panels	15
Others	Toys / Sports wear	36
Total		301



All Fig in
KT

**2021-22 Demand 301
KT**

**2022-23 (E) 313 KT YoY Growth
~4%**

Source: PLASTINDIA FOUNDATION/Industry Estimate

EPS SECTORWISE DEMAND (2021-22) - INDIA

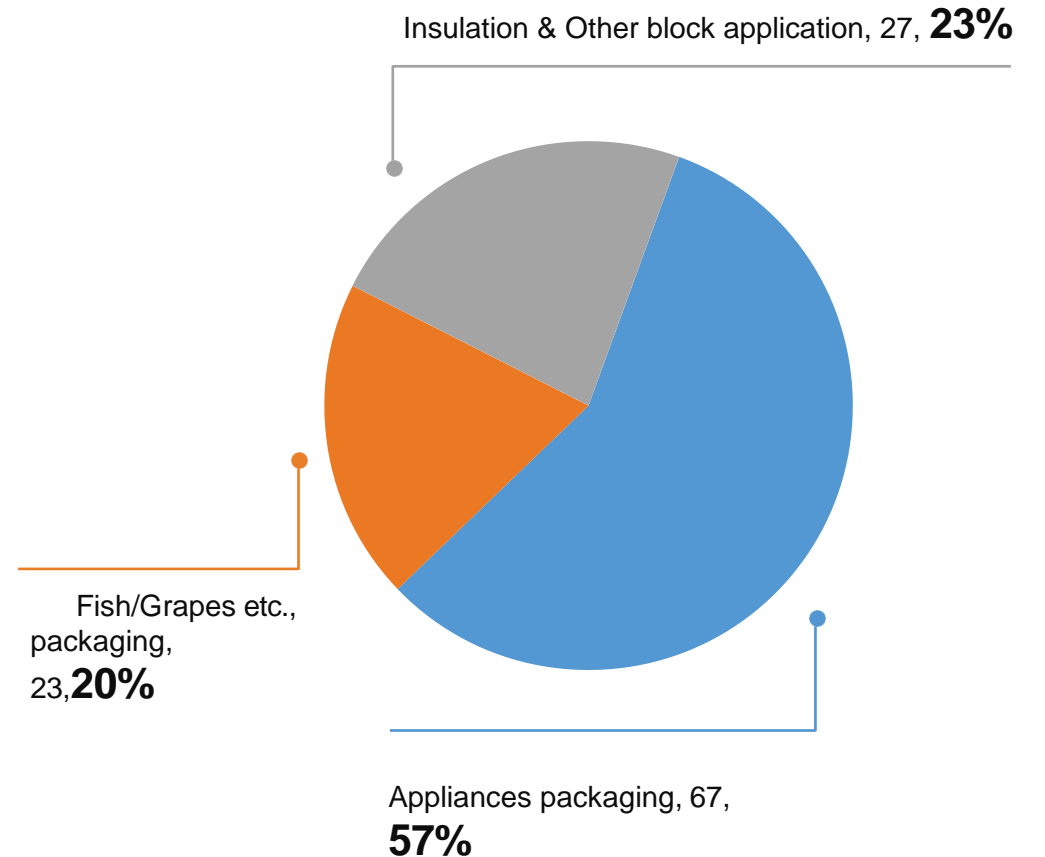
SECTOR	MAJOR APPLICATIONS	KT
Packaging	Appliances	67
	Fish/ Grapes etc.,	23
Construction	Insulation & Other block application	27
Total		117



All Fig in
KT

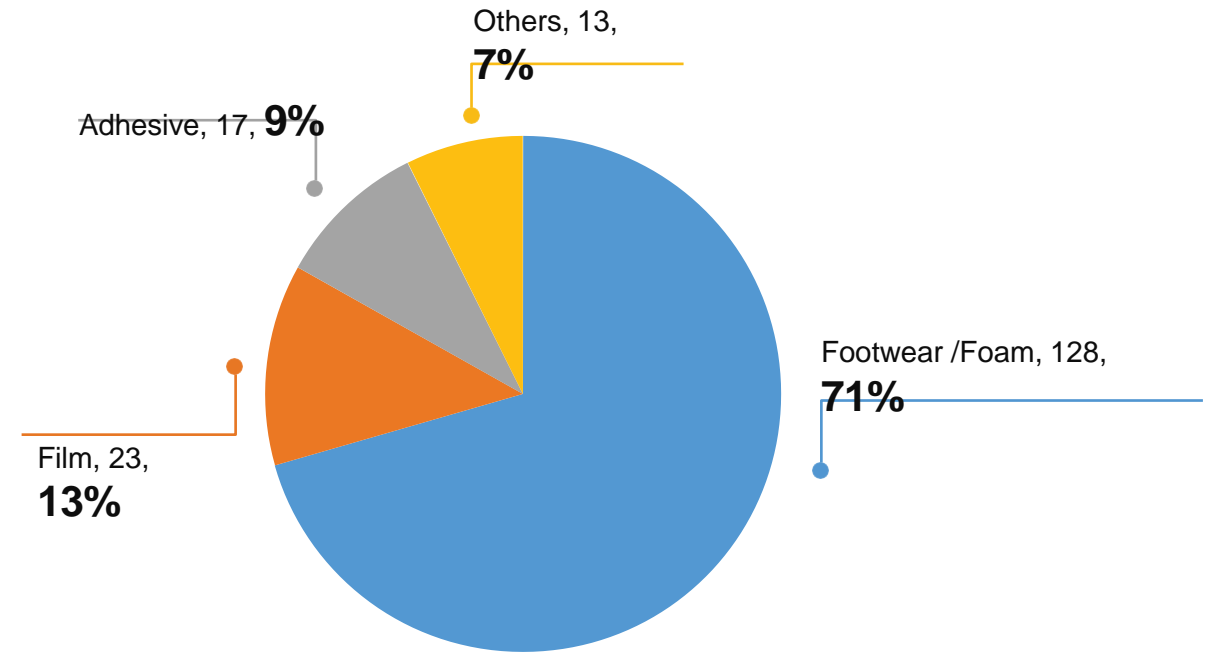
2021-22 Demand 117 KT 2022-23 (E) 121 KT YoY Growth ~4%

Source: PLASTINDIA FOUNDATION/Industry Estimate



EVA SECTORWISE DEMAND (2021-22) - INDIA

SECTOR	KT
Footwear /Foam	128
Film	23
Adhesive	16
Others	13
TOTAL	182



All Fig in
KT

**2021-22 Demand 182
KT**

**2022-23 (E) 187 KT YoY Growth ~
2.6%**

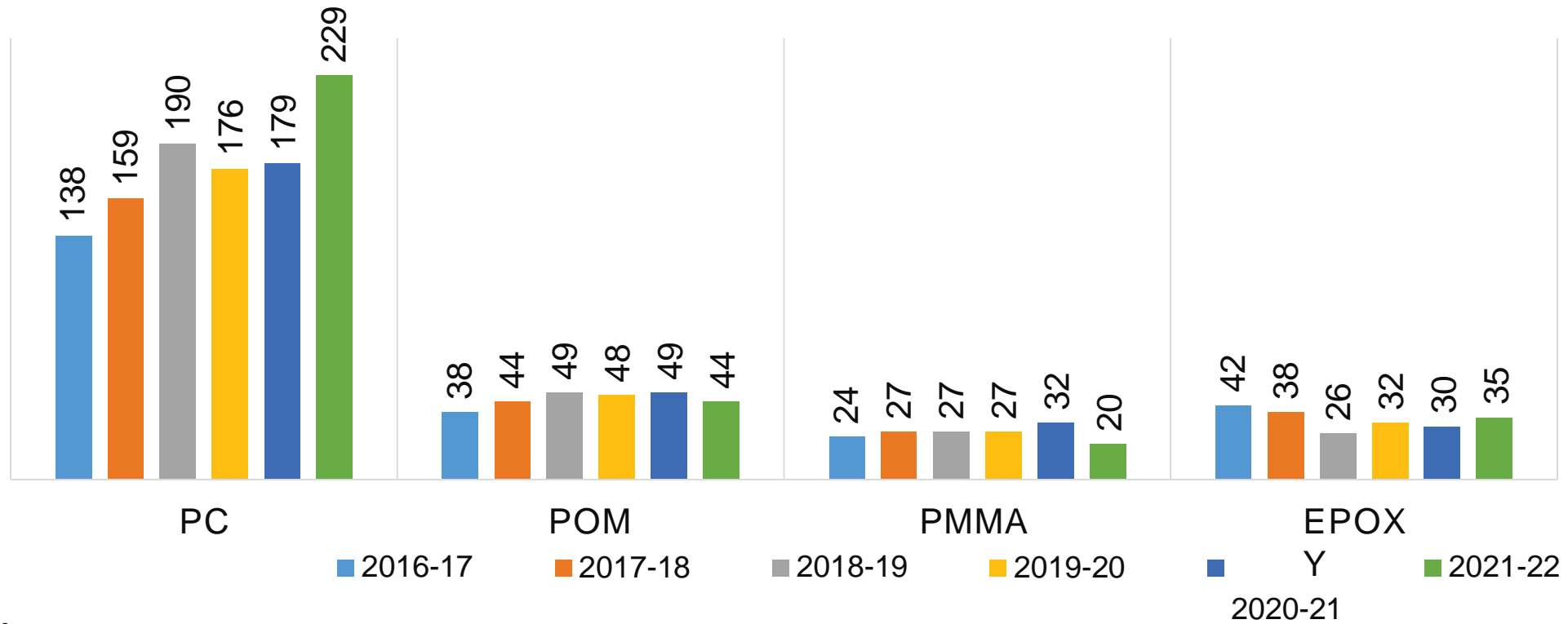
Source: PLASTINDIA FOUNDATION/Industry Estimate

SECTORWISE DEMAND

Engineering Plastics



ENGINEERING PLASTICS IMPORTS (2016 -22) - INDIA



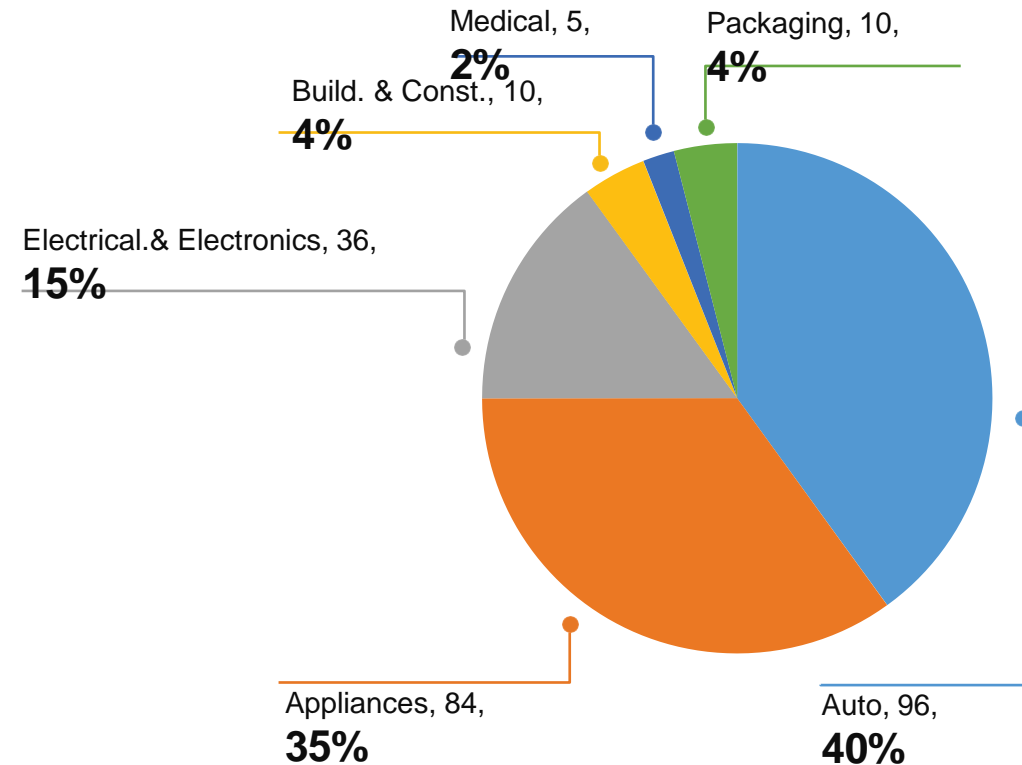
All Fig in
KT

**Overall Growth in Engineering
Plastics**

Source: <https://tradestat.commerce.gov.in/eidb/default.asp> / Industry Estimate

ABS SECTORWISE DEMAND (2021-22) - INDIA

SECTOR	KT
Auto	96
Appliances	84
Electrical.& Electronics	36
Building & Construction	10
Medical	5
Packaging	10
Total	240



All Fig in
KT

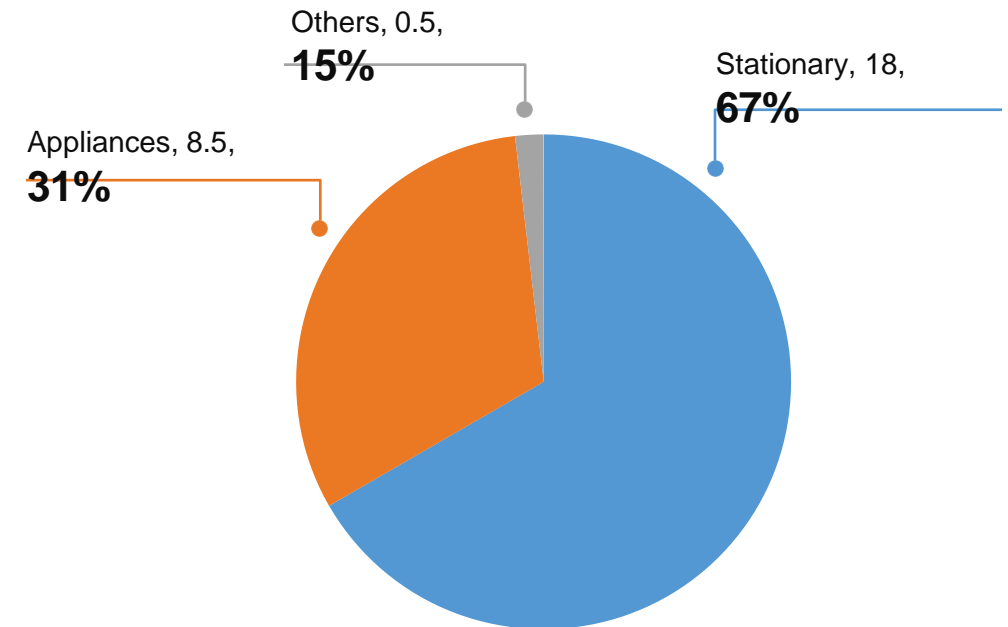
2021-22 Demand 240
KT

2022-23 (E) 253 KT YoY Growth ~
5.5%

Source: PLASTINDIA FOUNDATION/Industry
Estimate

SAN SECTORWISE DEMAND (2021-22) - INDIA

Applications	KT
Stationary	18
Appliances	8.5
Others	0.5
Total	27*



GRADES AVAILABLE – VIRGIN (90%) AND REMAINING GLASS FIBER FILLED

All Fig in KT
*revalidated figure

**2021-22 Demand 27
KT**

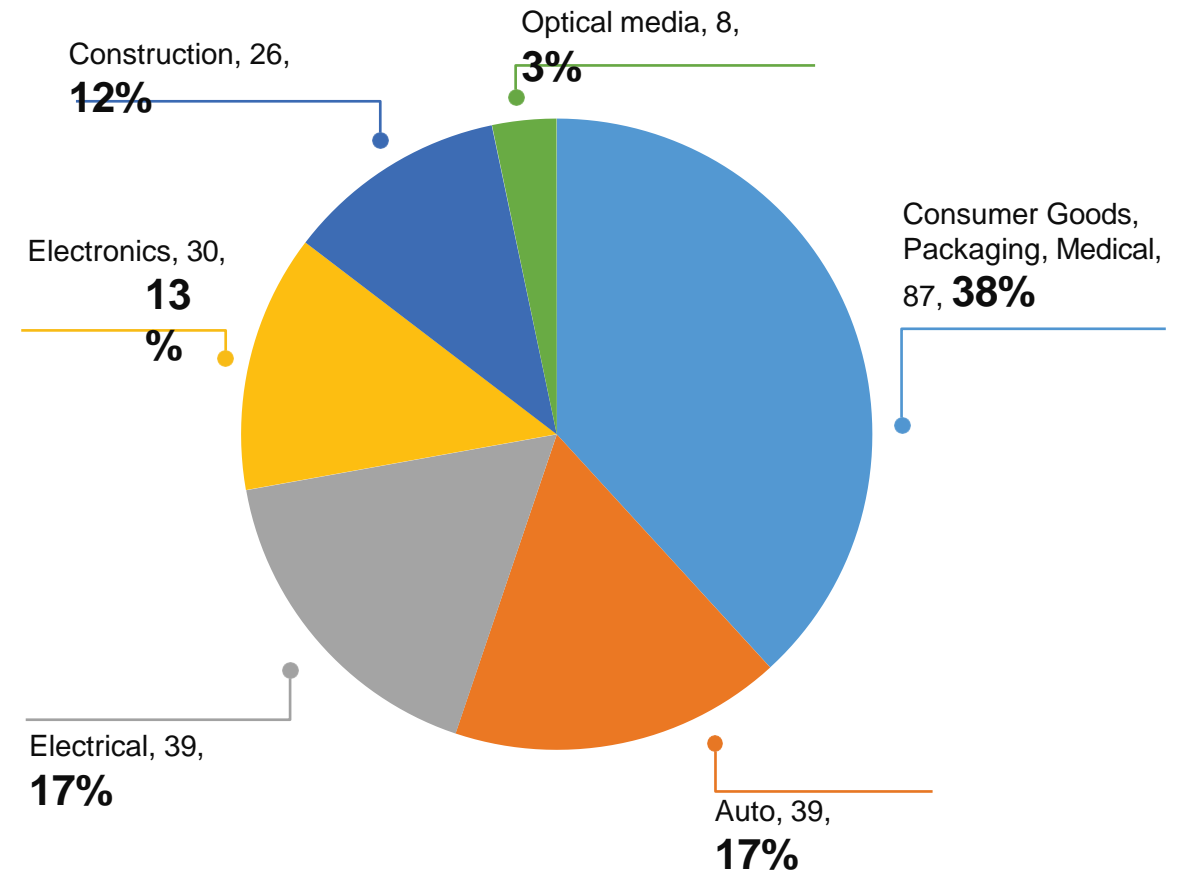
2022-23 (E) 28 KT

**YoY Growth ~
3%**

Source: PLASTINDIA FOUNDATION/Industry Estimate

PC SECTORWISE DEMAND (2021-22) - INDIA

SECTOR	KT
Consumer Goods, Packaging, Medical	87
Auto	39
Electrical	39
Electronics	30
Construction	26
Optical Media	8
TOTAL	229



All Fig in
KT

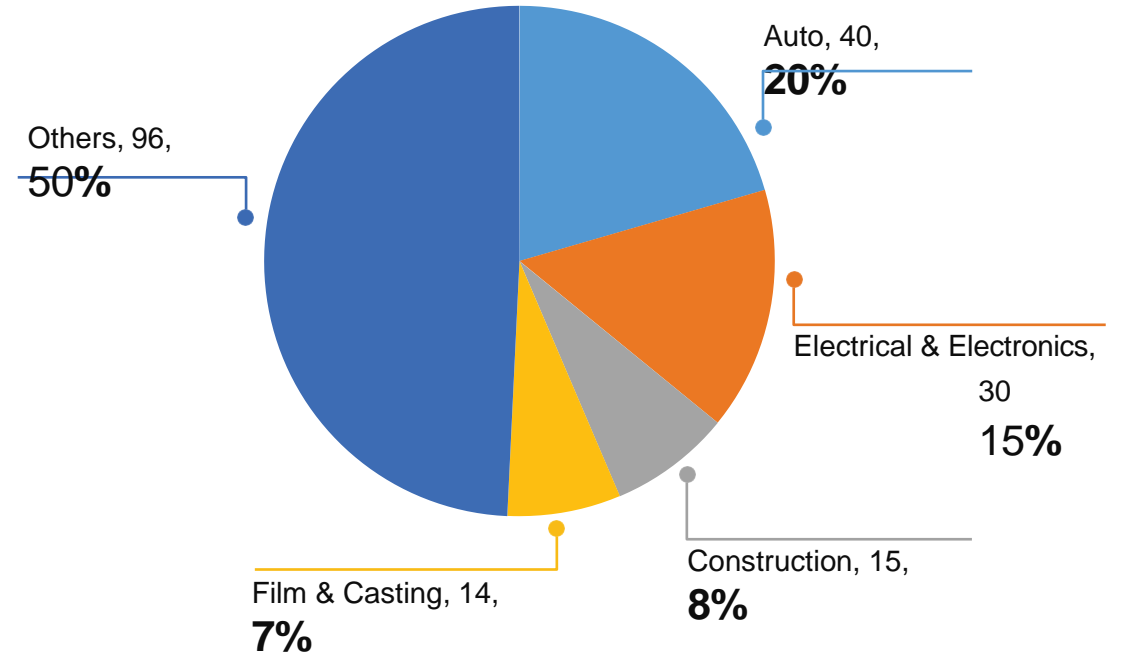
**2021-22 Demand 229
KT**

**2022-23 (E) 242 KT YoY Growth ~
5.5%**

Source: PLASTINDIA FOUNDATION/Industry Estimate

PA SECTORWISE DEMAND (2021-22) - INDIA

SECTOR	KT
Auto	40
Electrical & Electronics	30
Construction	15
Film & Casting	14
Others including Mono/Multi filament*	96
TOTAL	195



BREAK UP OF VARIOUS TYPES OF PA
 PA PA6 : 177 KTPA, PA66 : 16 KTPA
 OTHER PA: ~2 KT : TOTAL 195 KT

All Fig in KT
 *revalidated
 figure

**2021-22 Demand 195
 KT**

2022-23 (E) 207 KT YoY Growth ~ 6.4%

SNAPSHOT OF POM (2021-22) - INDIA

Requirement	All met by Imports
Demand	44 KTA
Types	Copolymer & Homopolymer
Major Type	Copolymer
Major Sectors	Automotive
	Electronics
	Industrial like Gears
	Healthcare
	Construction etc.,



*Rear view mirrors,
Sun visors, Trim clips,
Switches, Retractors,
Seat levers, Window
regulator handle,
Rotary connector,
Pedals, ventilators,
Door locks, window
regulator, shift gears,
etc.,*

All Fig in
KT

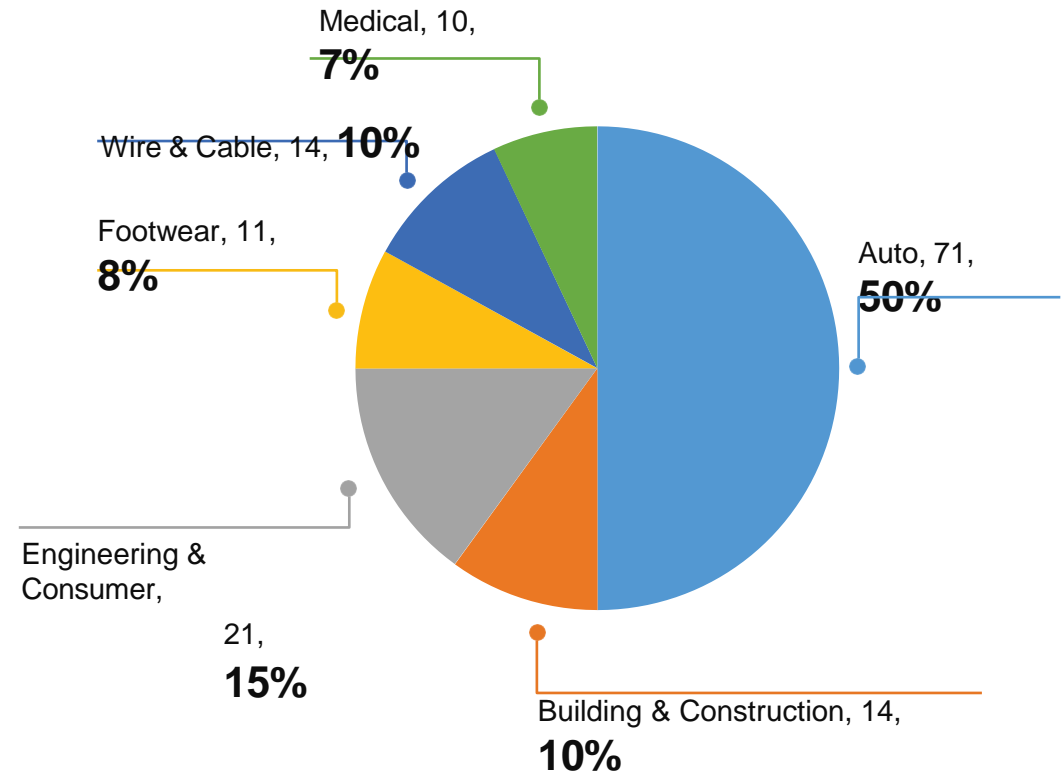
**2021-22 Demand 44 KT 2022-23 (E) 46 KT YoY Growth ~
3%**

Source: PLASTINDIA FOUNDATION/Industry
Estimate

TPE SECTORWISE DEMAND (2021-22) - INDIA

SECTOR	KT
Auto	71
Building & Construction	14
Engineering & Consumer	21
Footwear	11
Wire & cable	14
Medical	10
TOTAL	*141

*Including TPU



All Fig in
KT

TPE-Thermoplastic Elastomers

2021-22 Demand 141
KT

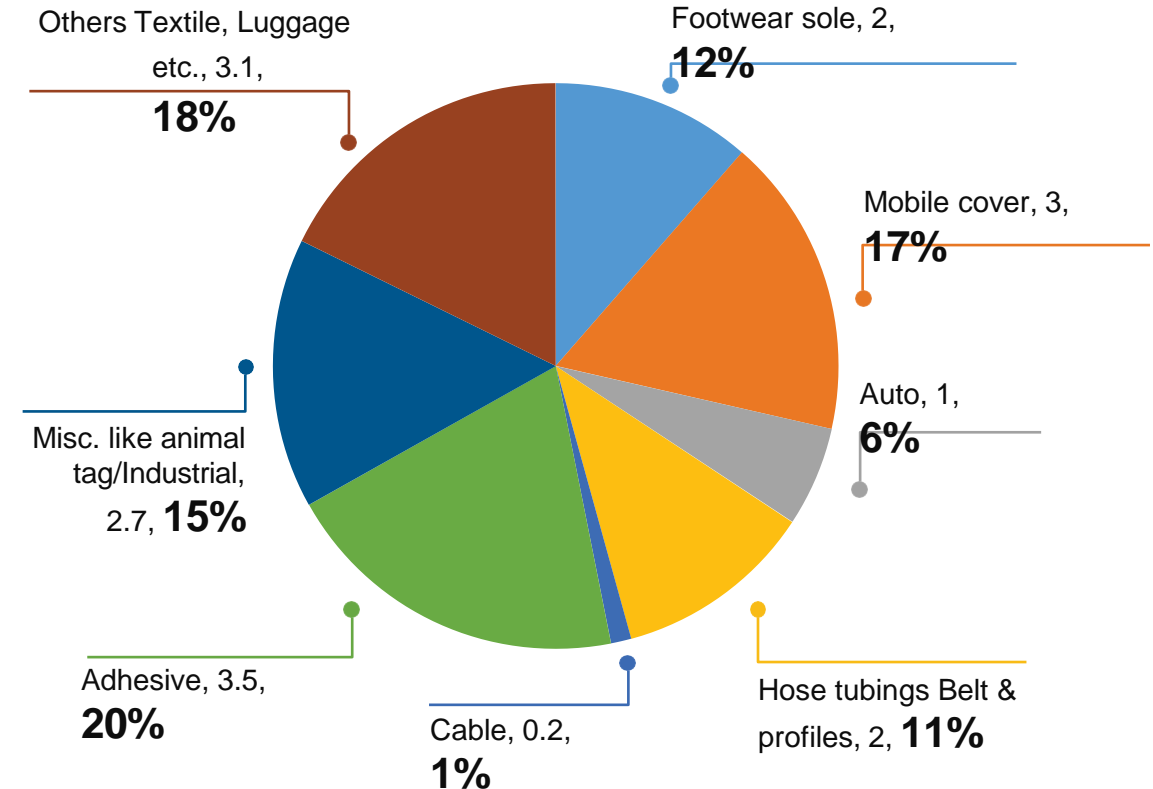
2022-23 (E) 150 KT

YoY Growth ~
6.5%

TPU* INDUSTRY (2021-22) - INDIA

INDUSTRY SNAPSHOT	
India Capacity	6000 Tons per annum
Imports	~ 11500 Tons
Raw Material	Isocyanates (MDI), Polyol + additives
Growth	~10%
Growth Driver	Footwear/ Auto/ Mobile etc.,

TPU APPLICATION BREAK UP 2021-22 KT



All Fig in
KT

*Thermoplastic Polyurethane

**2021-22 Demand 17.5
KT**

2022-23 (E) 19.3 KT

**YoY Growth ~
10%**

Source: PLASTINDIA FOUNDATION/Industry Estimate

TPU INDUSTRY (2021-22) – INDIA CONTD..

Trends

- Paint protective Film for Automobiles
- Bio based polyol for manufacture of TPU

Impact of Covid Pandemic

- Low Demand in Auto, Luggage and Footwear sectors



**2021-22 Demand 17.5
KT**

**2022-23 (E) 19.3 KT YoY Growth ~
10%**

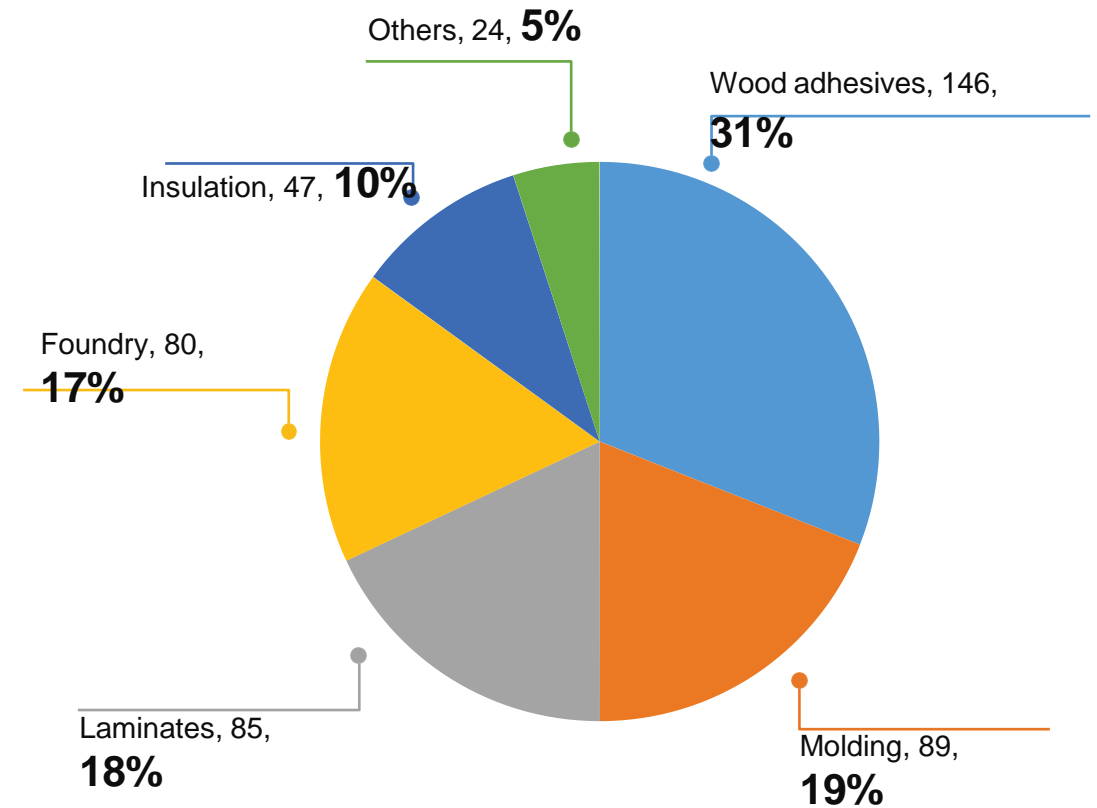
SECTORWISE DEMAND

Thermosets



PHENOLICS - SECTOR WISE DEMAND (2021-22) - INDIA

SECTOR	KT
Wood adhesives	146
Molding	89
Laminates	85
Foundry	80
Insulation	47
Others	24
Total	470



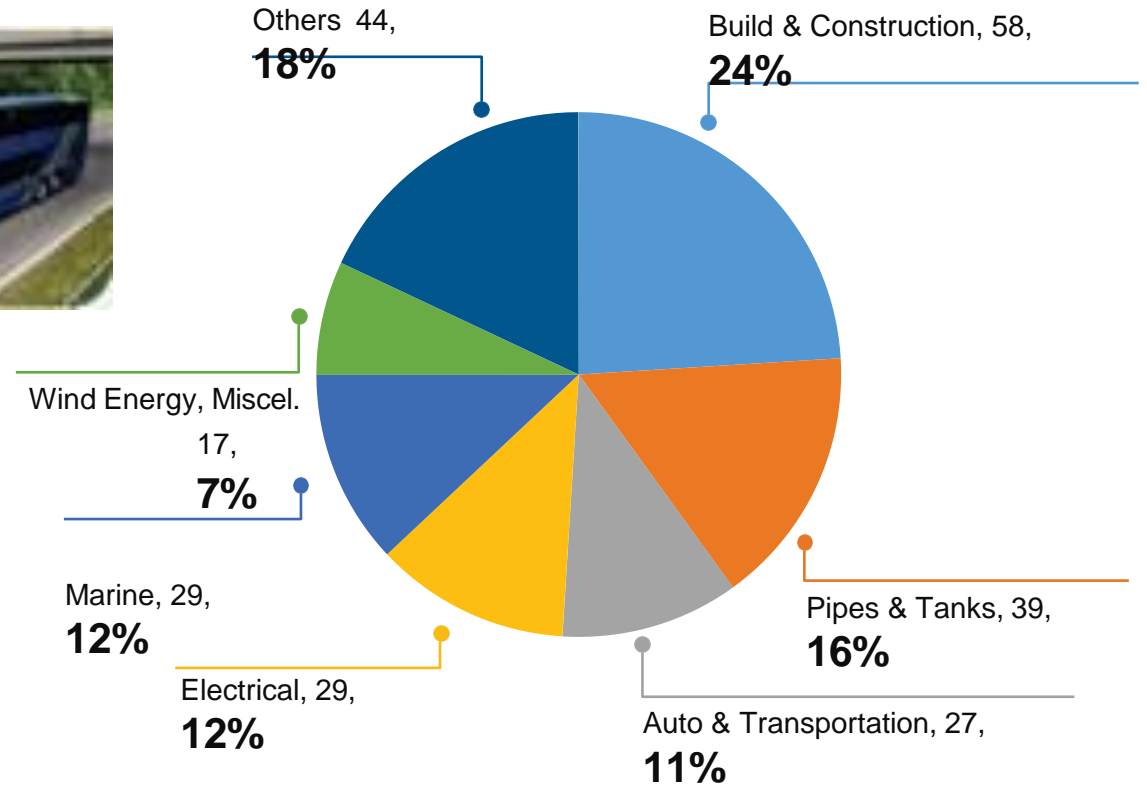
All Fig in
KT

**2021-22 Demand 470
KT**

**2022-23 (E) 494 KT YoY Growth
~5%**

UNSATURATED POLYESTER SECTOR WISE DEMAND (2021-22) - INDIA

SECTOR	KT
Build. & Construction	58
Pipes & Tanks	39
Auto & Transportation	27
Electrical	29
Marine	29
Wind Energy/Miscellaneous	17
Others	44
Total	243



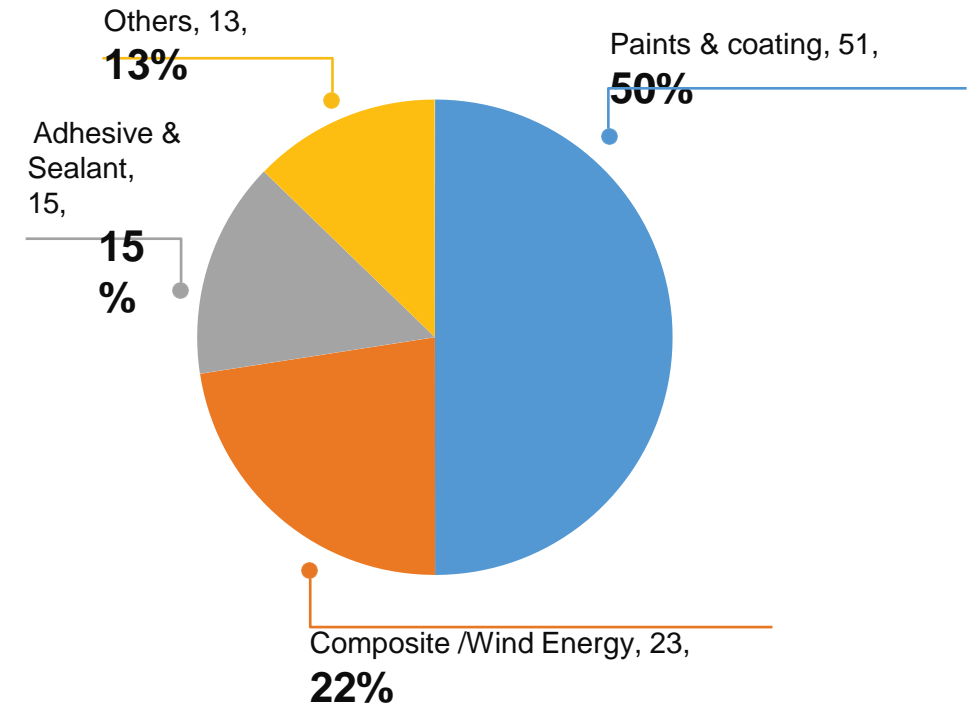
All Fig in
KT

**2021-22 Demand 243
KT**

**2022-23 (E) 255 KT YoY Growth
~5%**

EPOXY SECTORWISE DEMAND (2021-22) - INDIA

SECTOR	KT
Paints & coating	51
Composite/Wind energy	23
Adhesive & sealant	15
Others	13
Total	102



All Fig in
KT

2021-22 Demand 102 KT 2022-23 (E) 105
KT

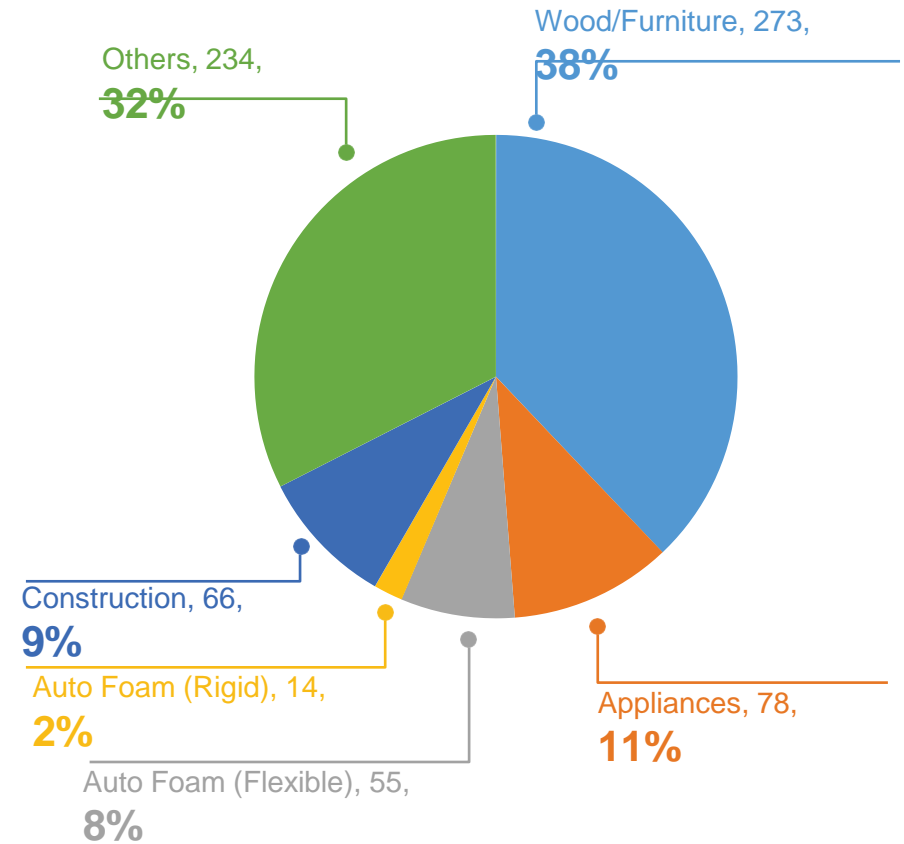
YoY Growth ~
3%

PU INDUSTRY (2021-22) - INDIA



PU INDUSTRY (2021-22) - INDIA

INDUSTRY SNAPSHOT	
Product	Flexible foam/ Rigid Foam/ Molded Foam/Adhesive/ Sealant/ Elastomer
Raw Material	Isocyanates (TDI & MDI), Polyol + additives like catalysts extender, surfactants, colourants, blowing agent etc.,
Raw Material	Import dependent (~80%)
Growth	9%
Growth Driver	Bedding, Furniture, Automotive, Insulation, Appliances, Construction etc.,



All Fig in
KT

2021-22 Demand 720
KT

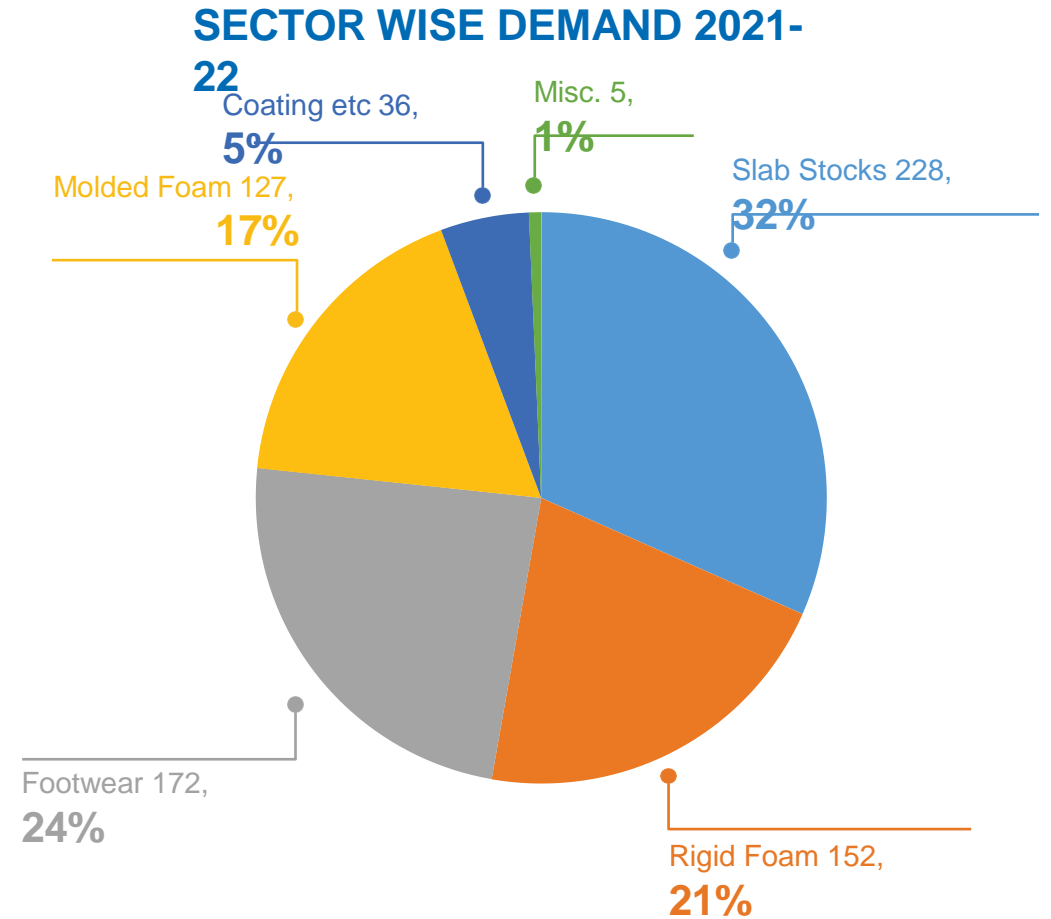
2022-23 (E) 785 KT YoY Growth ~
9%

PU INDUSTRY DEMAND (2021-22) – INDIA

SECTORWISE DEMAND	PRODUCT	KT
Slab stocks	Mattresses & Furniture foam	228
Rigid Foam	Thermo ware, Hot water geyser/Integral skin foam for steering wheel and arm rests, Continuous and discontinuous panel in Refrigerator, Appliances, Spray foam etc.,	152
Footwear	Formal, Casual, Beach, Sports footwear	172
Molded Foam	For all auto, Transportation, office furniture etc.,	127
Coating etc.	Coating, Adhesive, Sealant, Elastomer	36
Misc.	Others	5
Total		720

All Fig in
KT

Source : Indian Polyurethane Association



PU INDUSTRY (2021-22) – INDIA CONTD... PU APPLICATIONS

Increased demand

- The home furniture and bedding Industry
- Casual Sports Shoe
- Shortage of Imports

New trends

- Work from Home brings new application for Comfort products
- Automotive Shift to EV in 2-Wheeler Segment, low weight per vehicle Make in India for Import substitution
- Automotive Weight Reduction with increase in overall volume



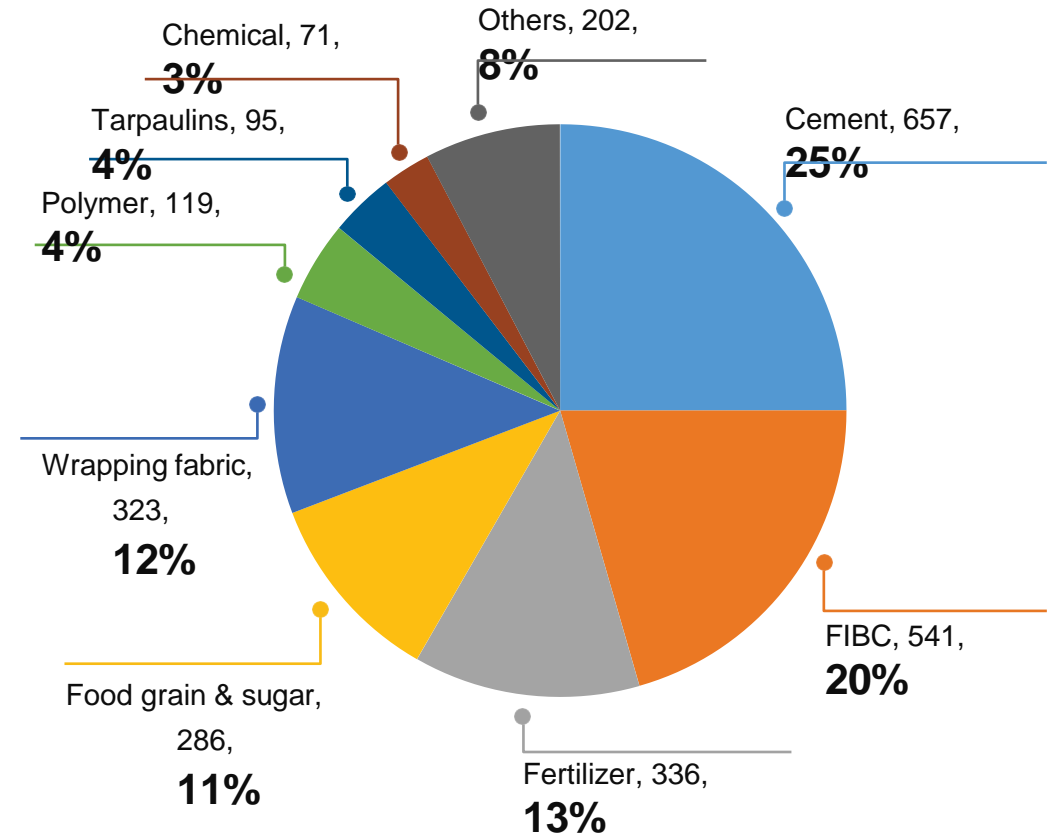
DEEP DIVE INTO MAJOR END USE SEGMENTS



RAFFIA SECTOR (2021-22) - INDIA

INDUSTRY SNAPSHOT	
Demand KT	2631
Growth %	8.6
Processing Capacity KTA	3705
Capacity Utilization	71%
PP/ HD Demand ratio	81/19

* Based on virgin polymer



**2021-22 Demand 2631
KT**

**2022-23 (E) 2858 KT YoY Growth
~8.6%**

FIBC INDUSTRY (2021-22) - INDIA

INDUSTRY SNAPSHOT	
No of manufacturers:	Fully Integrated 40 + Small players ~60
Typical Bag Sizes	100 to 2000 Kg.
Type of Bags	Type A to Type D and Customized Big Bags
Export to domestic use ratio	90 to 10%
Growth Driver	Technical Expertise, Skilled Workforce, Raw material availability, Economical labour, Acceptance by International players

Manufacturers
Distribution in India

West
50%



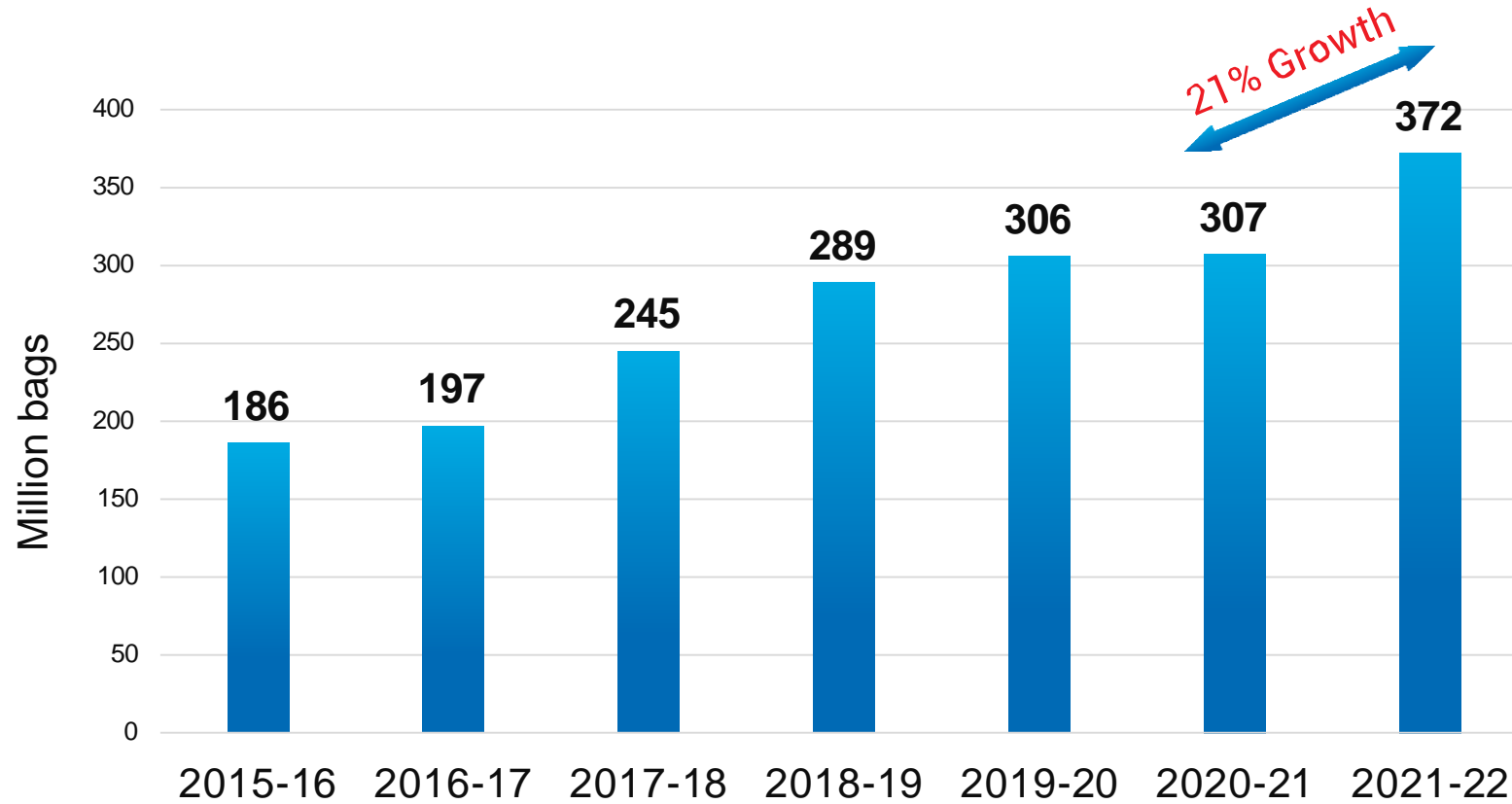
SOUTH

**2021-22 Demand
541KT**

**2022-23 (E) 609 KT YoY Growth ~
12.5%**

Source : IFBCA /Industry estimate

FIBC EXPORTS FROM INDIA (Chapter 63)

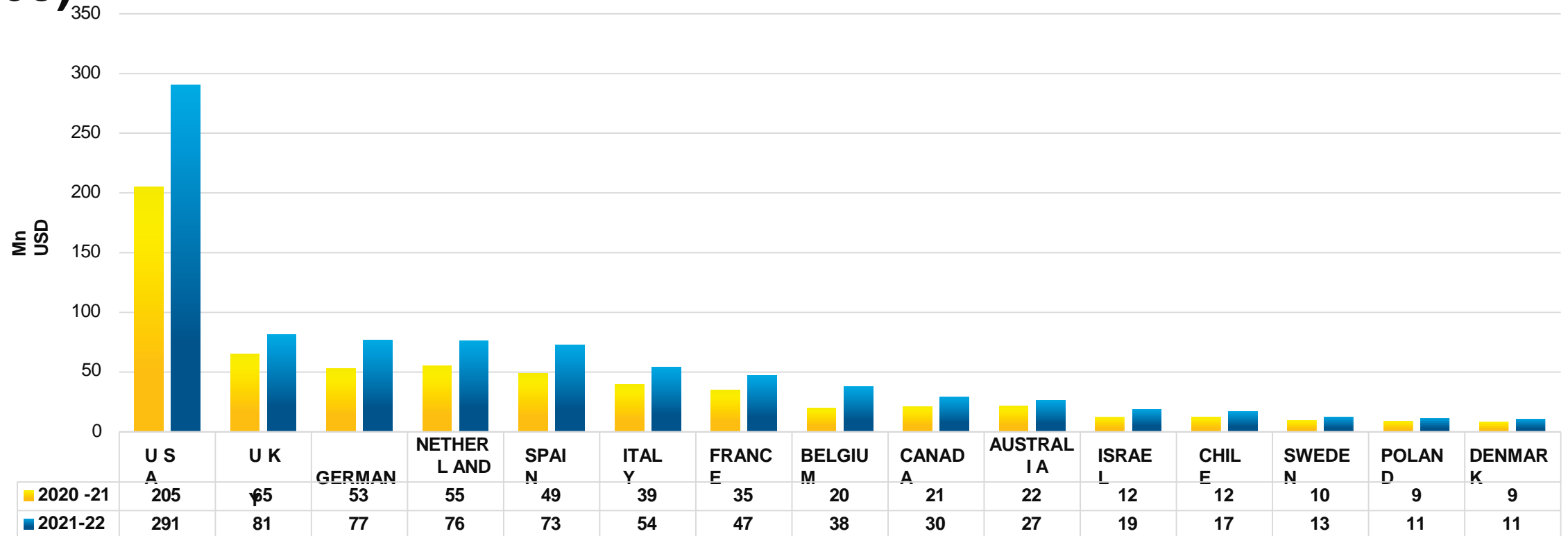


CAGR in the last 6 years
12.5%

Growth renewed post covid

FIBC EXPORTS FROM INDIA

Top 15 COUNTRIES (Chapter 63)



Total exports in Mn USD 2020-21 / 2021-22 708 / 1000

Top 15 Countries accounts for 85% of Exports

FIBC INDUSTRY (2021-22) - INDIA CONTD...

Applications – For

packing

- Plastics granules /powders/resins such as PET and PVC etc.,
- Stones and Mines /Building & Construction Materials
- Wood and paper transportation
- Chemicals, such as Carbon Black, dyes & intermediates and fertilizers, Hazardous Products
- Minerals such as bentonite, alumina, ebonite, magnetite and mineral ores like nickel /Ferro alloys
- Oil cakes (powder form), Detergents (UN Certified Bags)
- Pharmaceuticals & APIs
- Agro & Processed Food Products
Dairy products / Fish meal /Animal feed

India ranks no 1 in Global FIBC Market

PIPE SECTOR DEMAND (2021-22) - INDIA

PIPE DEMAND (PVC/CPVC/PE/PP)		
SEGMENT	2021-22	
	KT	Growth %
PVC (SWR + Plumbing+ Fittings)	2254	7.0
**HDPE Water Distribution + Industrial Pipe	343	7.5
*MD/HDPE Gas Distribution Network	28	25.0
HDPE Optical Fibre Duct	87	- 5.0
Sprinkler (HDPE)	74	10.0
CPVC plumbing pipe	182	6.0
HDPE Corrugated pipe (Sewage + Cable Duct)	61	15.0
LLDPE drip irrigation	165	5.0
Plumbing pipe PPB / PPR	27	10.0
Total Market (Virgin Polymer)	3221	

* compounded ** partly compounded

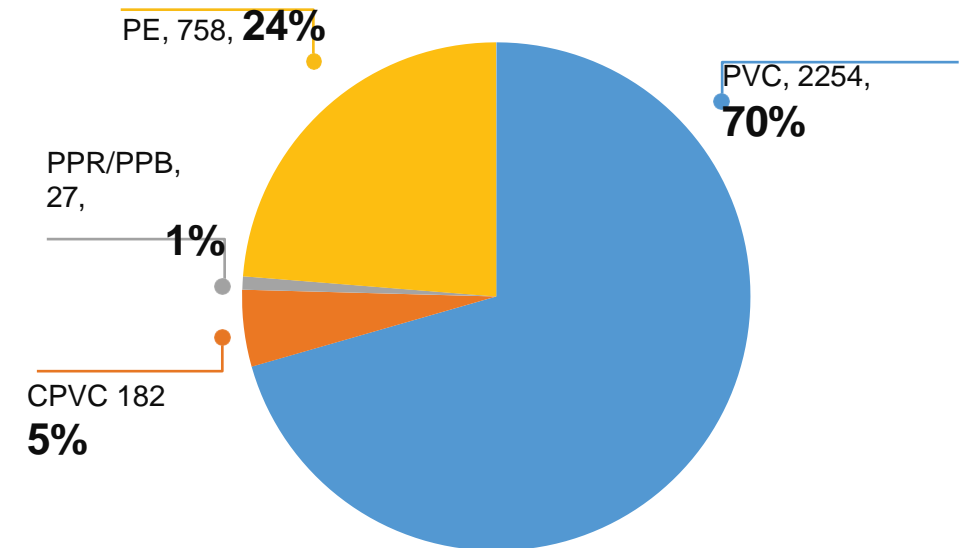
All Fig in
KT

2021-22 Demand 3221
KT

2022-23 (E) 3446 KT

YoY Growth ~
7%

BREAK UP OF PLASTICS DEMAND IN PIPE SECTOR



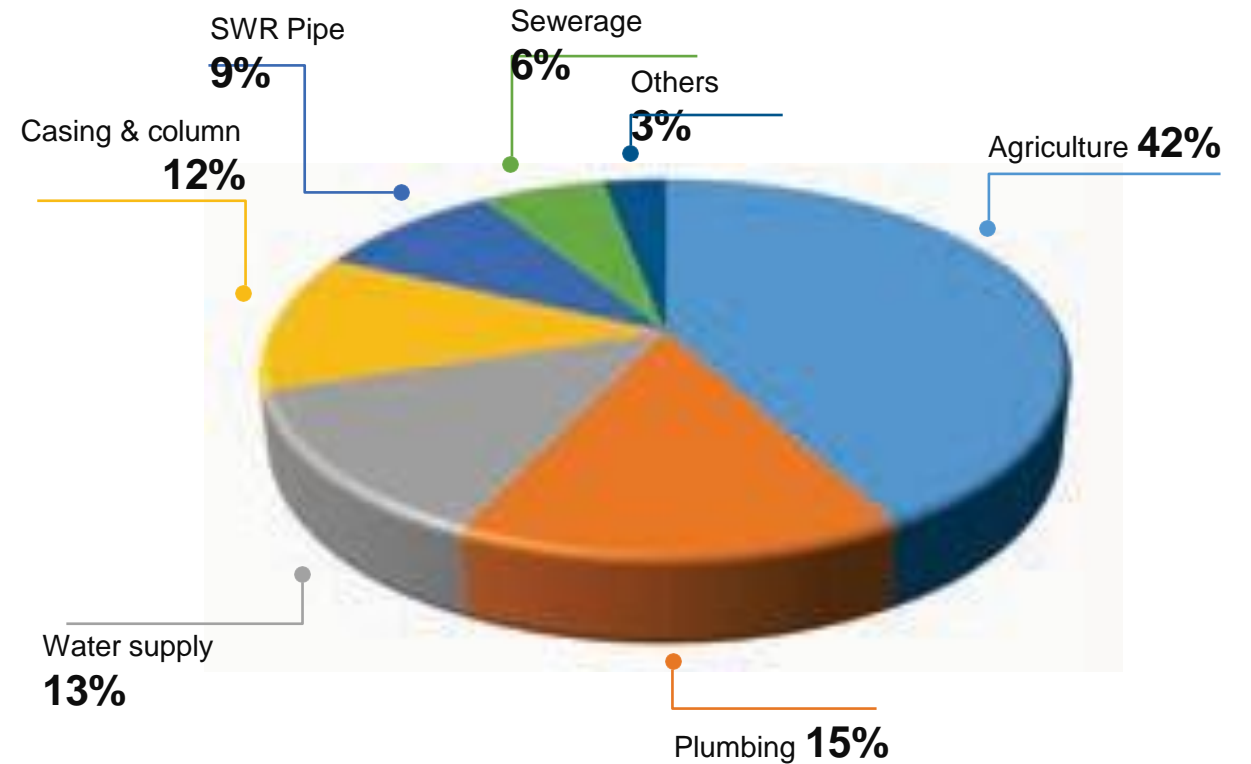
PIPE SECTOR (2021-22) - INDIA CONTD...

Growth Driver

- City gas Distribution Networks PAN India
- Jal Jeevan and Har Ghar Jal Mission of Gol
- Sewage / Water pipe networks in SMART and AMRUT
- Cities Desalination projects
- Agriculture sector – for more crop per drop of water.
- 5G networks



PVC PIPE SECTOR DEMAND (2021-22) - INDIA

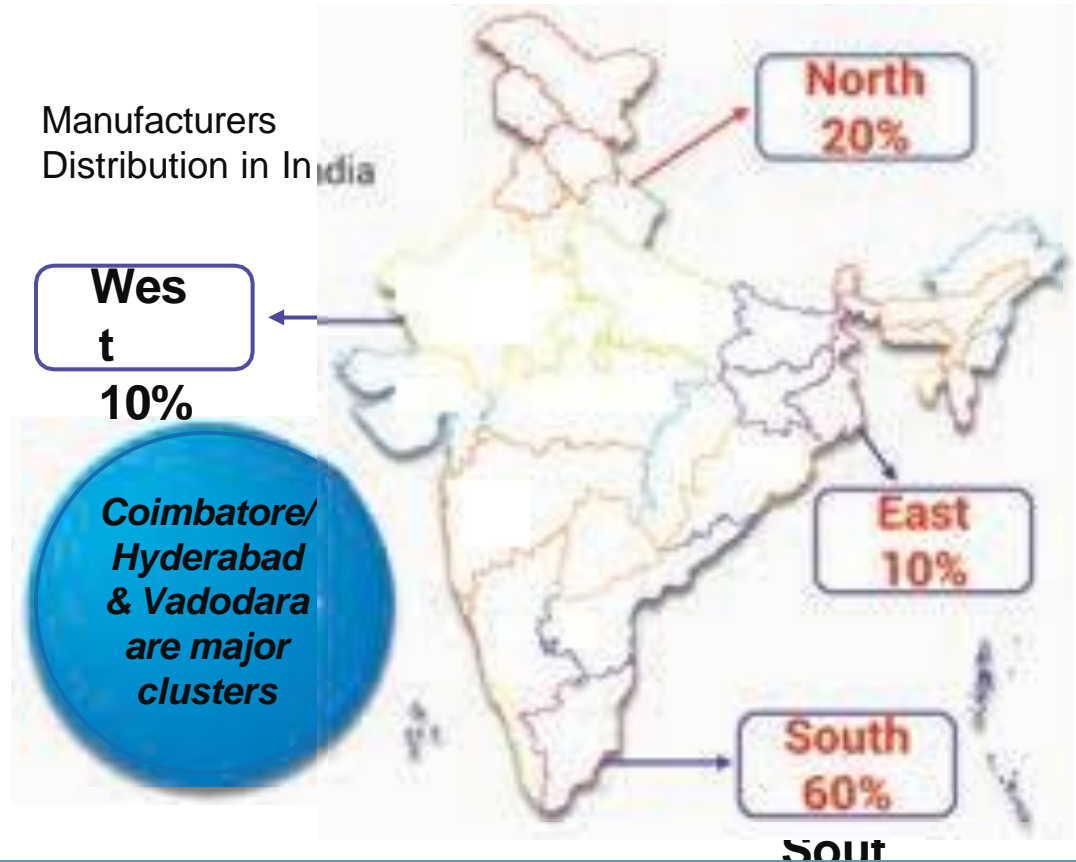


70% of Plastics Pipe Market Constituted by PVC Pipes

Source: PLASTINDIA FOUNDATION/Industry Estimate

PVC PROFILE SECTOR DEMAND (2021-22) – INDIA

INDUSTRY SNAPSHOT	
No of manufacturers	86
Manuf. Capacity	155 KT
Capacity utilization %	52%
Estimated growth 2022-23	10%
No. of fabricators	950+
Hardware manuf/ operators	35+
Market size	Rs.6400 Crs



~ 10 Manufacturers Exports PVC Profiles from India...

PVC PROFILE SECTOR DEMAND (2021-22) - INDIA CONTD...

Benefit of PVC

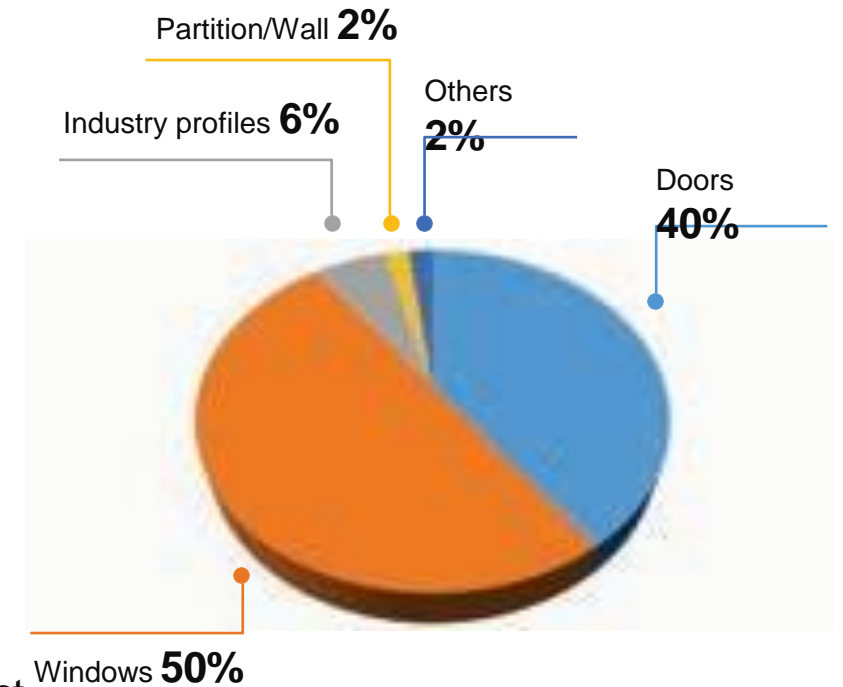
profile

- Energy saving - Power cost will reduce by 30%,
- Maintenance free - resistance to corrosion and warping
- Longer life
- Noise reduction
- Saving trees

Growth Drivers

- India expected to become world's largest construction market by 2025.
- Highest FDI in construction.
- Govt promotion of energy saving products,
- The Govt initiatives like PMAY, Light house project giving boost to the product.
- The platinum and gold rated buildings have uPVC windows.

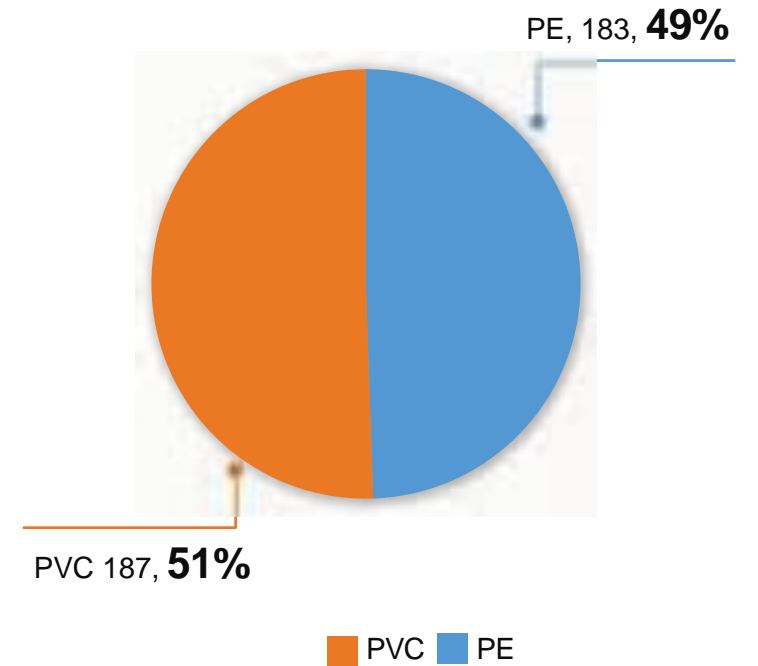
APPLICATION BREAKUP OF PVC PROFILE



PVC & PE WIRE & CABLE SECTOR DEMAND (2021-22) - INDIA

WIRE & CABLE DEMAND			
PLASTICS TYPE	SEGMENT	KT	GROWTH %
PE	L T cables(1.1KV TO 11KV) SIOPLAS XLPE	86	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	4	9
	Optical fiber cables (HDPE Jacketing)	40	7
	Power cable PE Jacketing	4	9
	Solar cables + Flame retardant specialty cables	5	15
	Data cables, RF Cables & other specialty cables	5	6.5
PVC	PVC wire & Cable (Sheathing & Insulation of low and medium voltage cables and white goods cables)	187	9
Total		370	

BREAK UP OF PVC & PE



2021-22 Demand 370 KT 2022-23 (E) 407 KT

YoY Growth ~ 10%

Source: PLASTINDIA FOUNDATION/Industry Estimate

WIRE & CABLE SECTOR (2021-22) - INDIA CONTD...

Growth Drivers

- GOI focus on rural electrification. Focus on power distribution network strengthened.
- Urban areas to move from open overhead cables to underground cable network.
- Expansion of Regional grids for easy transmission of Power.
- Big expansions in solar Energy fields.
- Upgrading of telecom infrastructure to 5G network



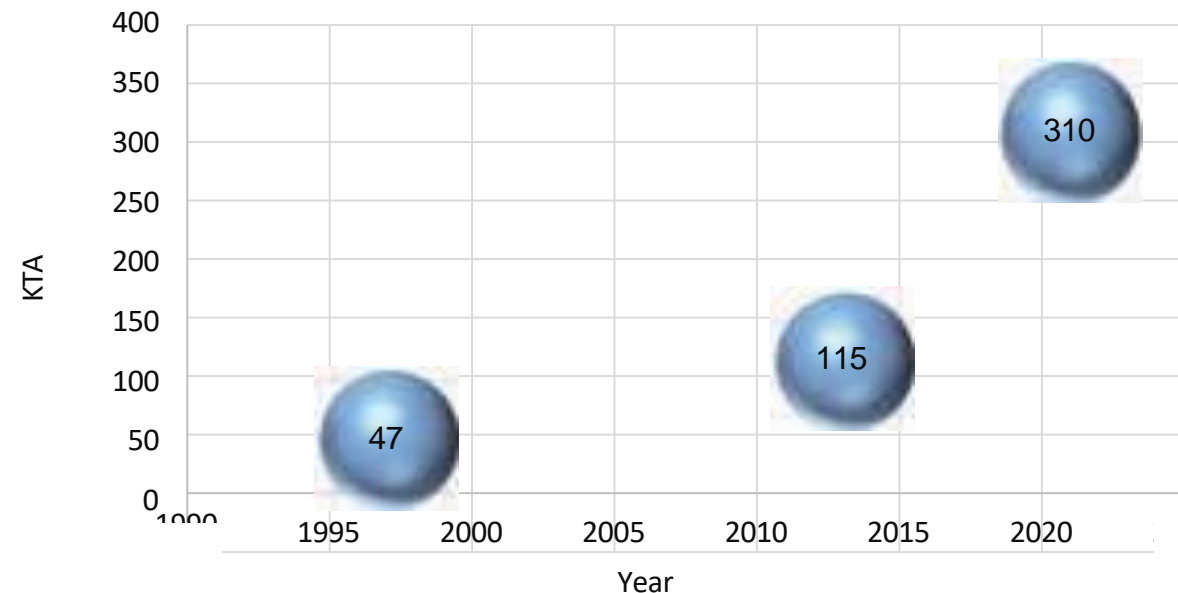
**Potential for Double Digit
Growth**

ROTOMOULDING SECTOR SNAPSHOT (2021-22) - INDIA

- Installed Capacity: ~410 KTA
- Market size : ~310 KTA*
- Multi-arm Biaxial machines :~1300
- Organised Sector Players : ~310+
- Percentage growth in 2021-22 around
- 11% Polymers used - PE, EVA, PP, PVC,
- XLPE Share of PE 90%
- Overhead tank : Loft tank ratio : 75:25
- ~80% of tanks demand is for < 2000 litres

*includes imported Powder resin and compounded material

Resin Market Growth KT

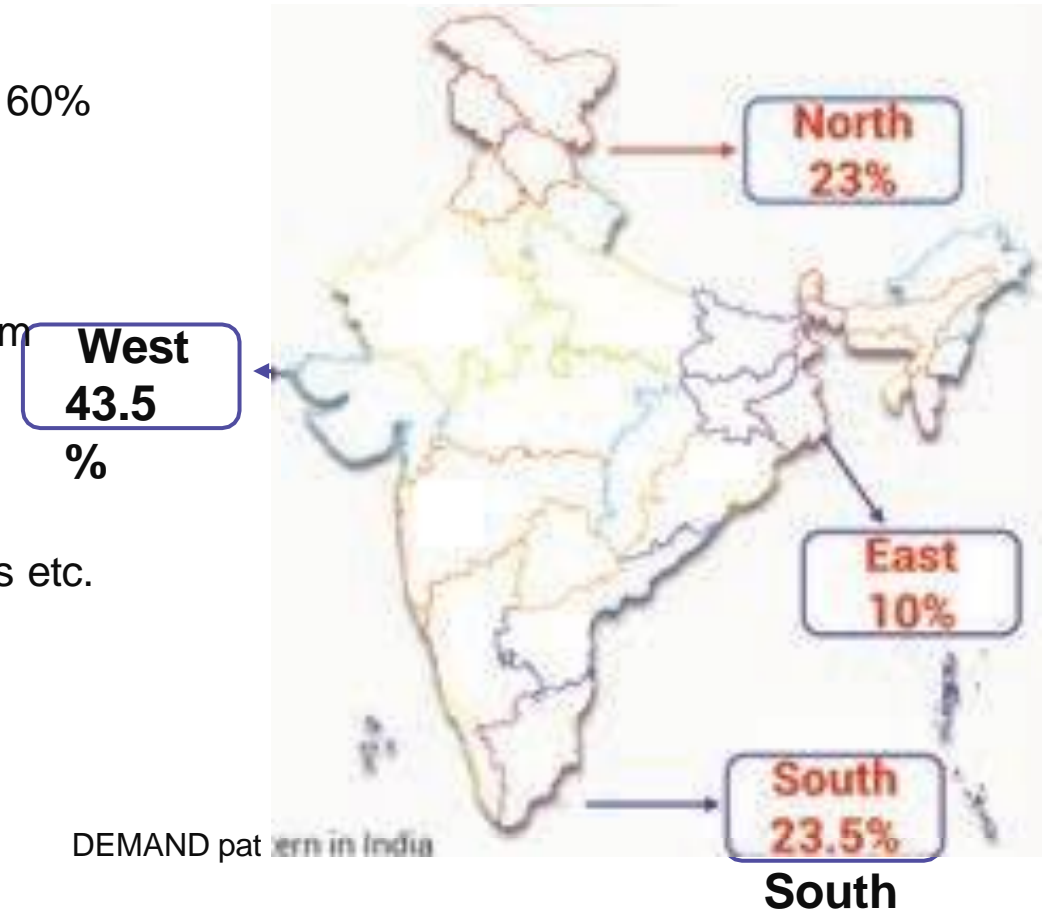


**World's largest Roto Moulded Water Tank
Market**

Source : Rotomoulding Association (ROMA) / Industry estimate

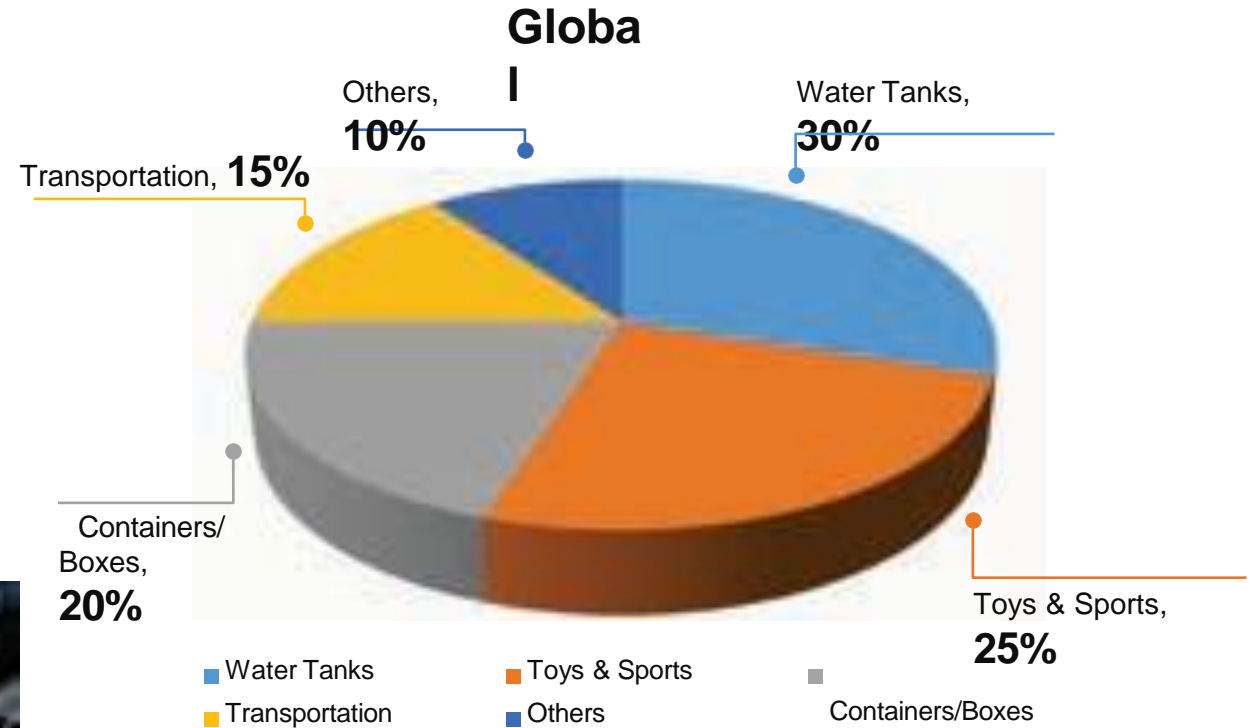
ROTOMOULDING SECTOR SNAPSHOT (2021-22) - INDIA CONTD...

- Mumbai, Ahmedabad , Kolkata, Chennai & Delhi-NCR comprise 60% of all India rotomoulding market
- Top 20 Rotomoulders account for 60% of industry demand
- 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.



Big Players are entering into Roto Moulding Sector...

ROTOMOULDING SECTOR END USE SEGMENTS



India has a Major Potential for Other Applications...

Source : Rotomoulding Association (ROMA)/ Industry estimate

IMPACT OF COVID 19 PANDEMIC

- Declared as 'Essential service Industry' and hence uninterrupted production and issued business pass during lockdown.
- Many rotomolded products were on high demand like Waste Bins, Water Storage Tanks, Portable Mobile Toilets, Hand wash cabinet, Urinals, Covid inspection chambers, Stretchers etc.,
- Few innovative products like Isolation bed, stretcher etc., made.
- The industry hit by Manpower shortages, Less demands, Restrictions in Supply chains, Fund shortages, and Health problems of labour/staff.
- Big players entered into rotomolded business.

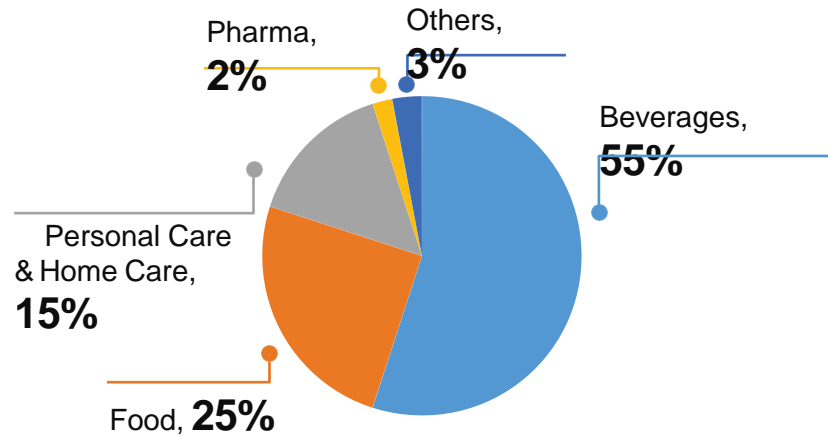


CAPS & CLOSURE DEMAND (2021-22) - INDIA

Major Caps & Closures

Industries:

- Beverages
- Food
- Personal & Household care
- Pharmaceuticals

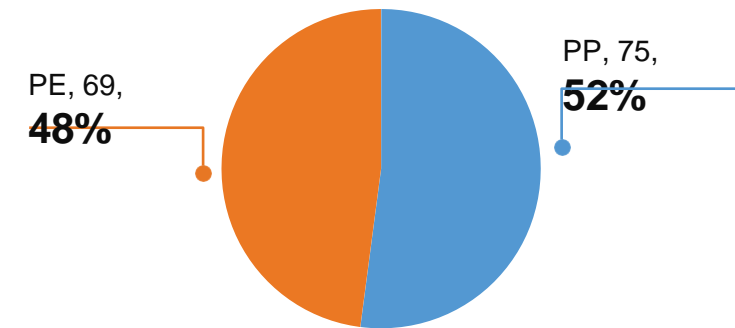


Application wise Market Share

Material Wise Market

Share:

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



PP & PE DEMAND KT

2021-22 Demand 144 KT 2022-23 (E) 151 KT YoY Growth ~ 5%

Source: PLASTINDIA FOUNDATION/Industry Estimate

CAPS & CLOSURE (2021-22) - INDIA

CONTD.

Benefits of PE/PP Caps:

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

Major Growth Drivers:

- Increasing Hygiene Awareness
- Pharmaceutical Market
- Increasing use of Cosmetics & Body Care Products
- Huge market of standardized caps in water and CSD market
- Flip top, spout and other types of non standardized caps.



Both Compression moulded PP and Injection moulded PP and PE Caps are being made...

Source: PLASTINDIA FOUNDATION/Industry Estimate

FRP INDUSTRY DEMAND (2021-22) - INDIA

Industry snapshot

- Market size : ~ 1.26 Bn USD
- 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** : ~0.37 kg
The Per capita usage USA : ~ 12 kg

Growth Driver

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

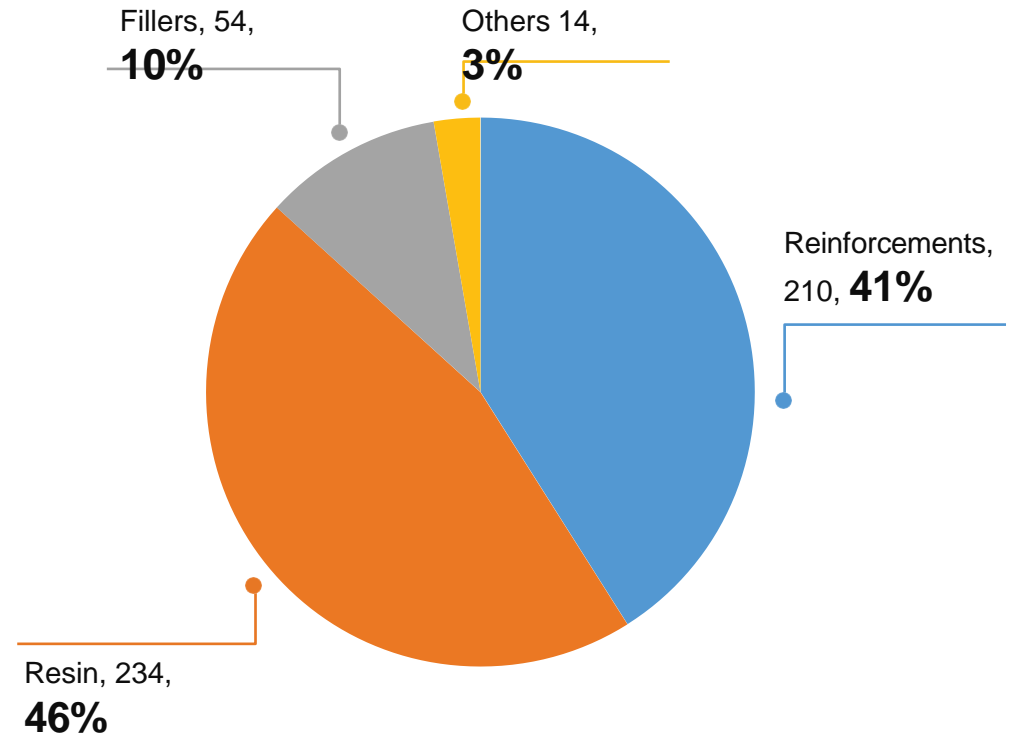


**2021-22 Demand 512 KT 2022-23 (E) 572 KT YoY Growth ~
11.7%**

FRP INDUSTRY (2021-22) - INDIA CONTD...

MATERIAL BREAK UP

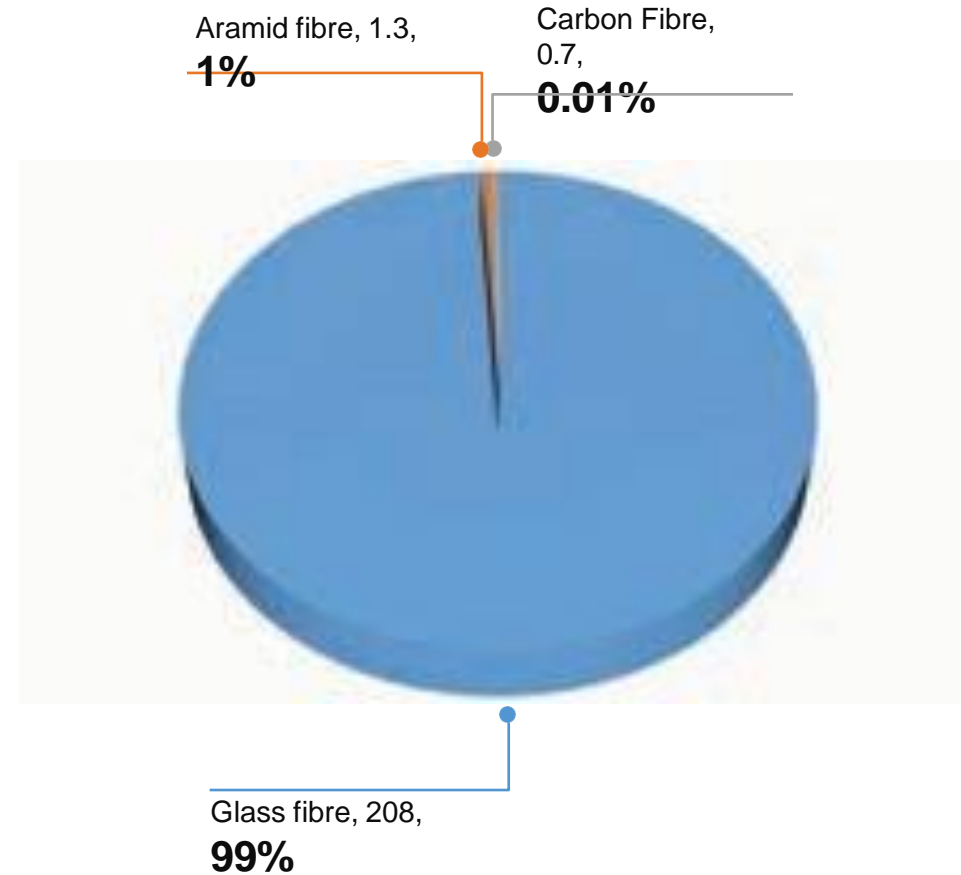
MATERIAL	KT
Reinforcements	210
Resin	234
Fillers	54
Others	14
	512



FRP INDUSTRY (2021-22) - INDIA CONTD...

REINFORCEMENT BREAK UP

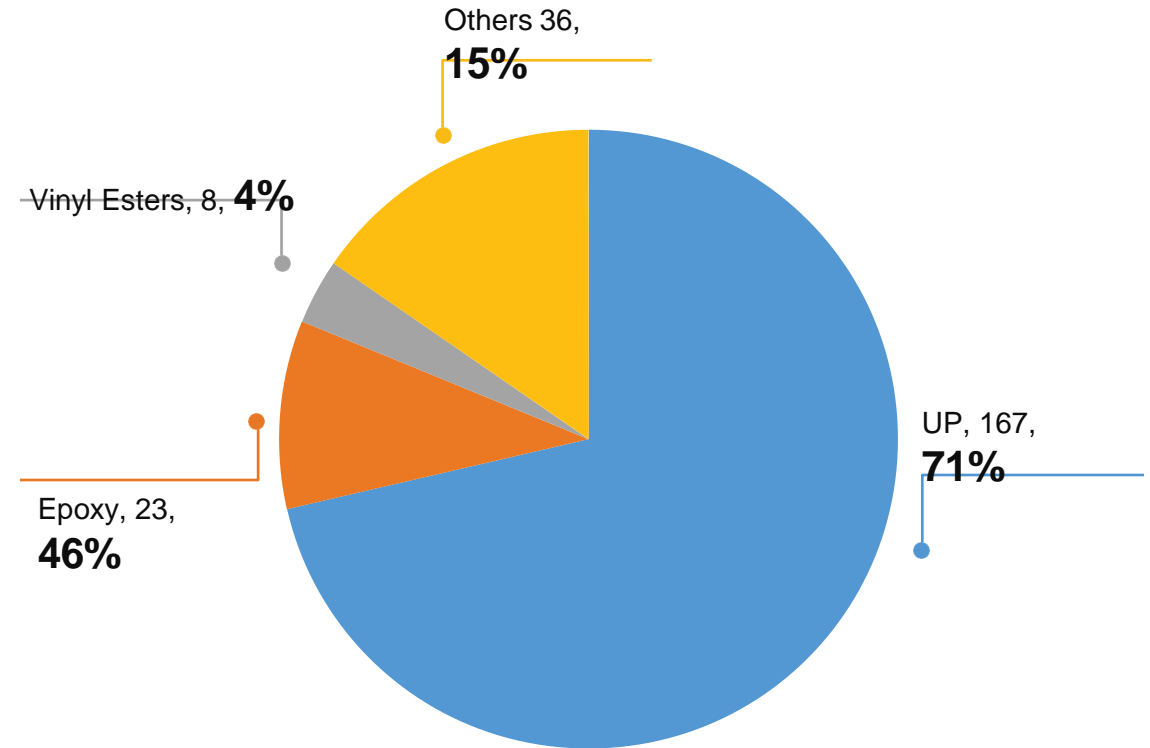
MATERIAL	KT
Glass fibre	208
Aramid fibre	1.3
Carbon Fibre	0.7
Total	210



FRP INDUSTRY (2021-22) - INDIA CONTD...

RESIN BREAK UP

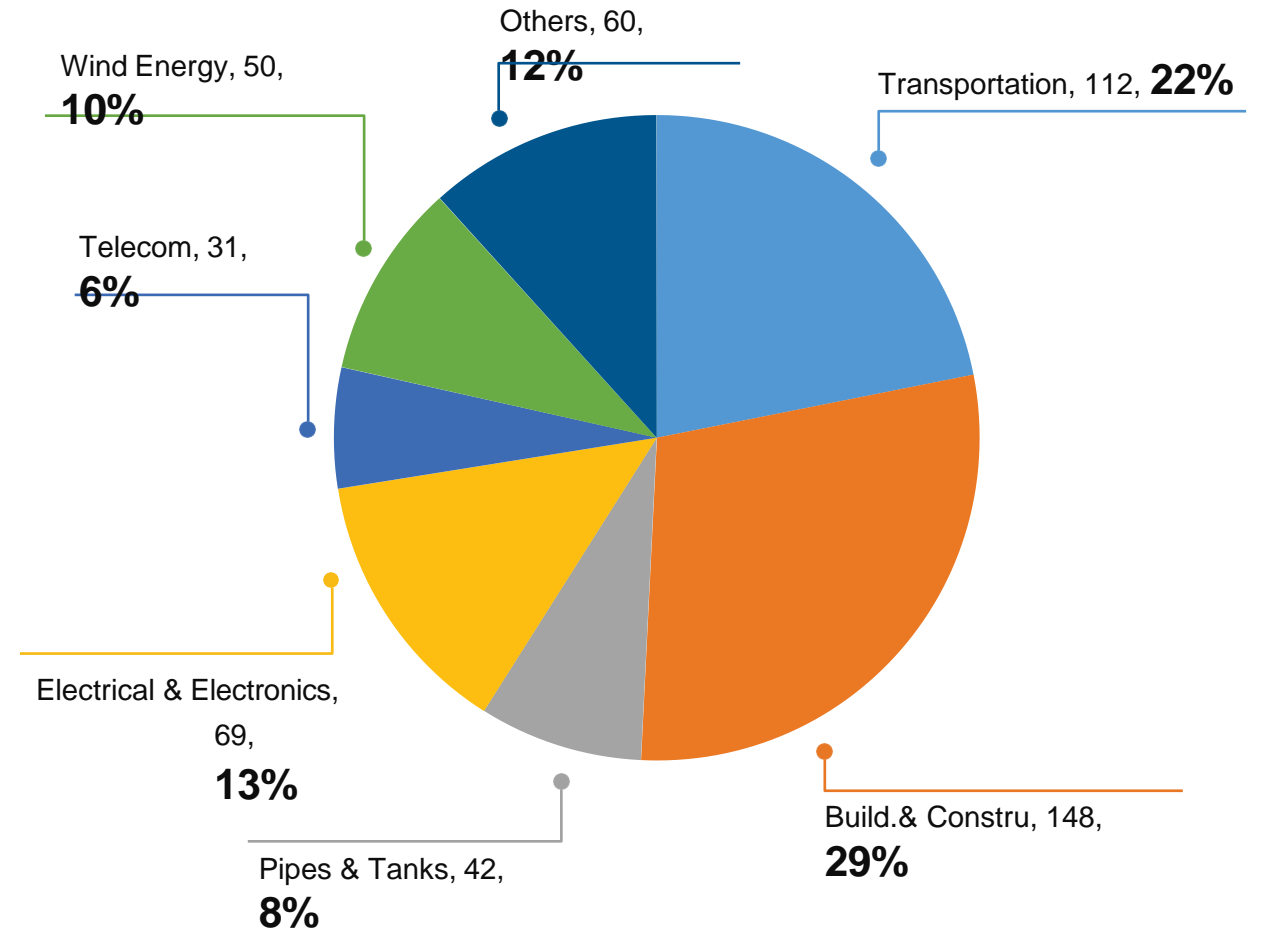
MATERIAL	KT
Unsaturated Polyester	167
Epoxy	23
Vinyl Esters	8
Others	36
Total	234



FRP INDUSTRY (2021-22) - INDIA CONTD...

APPLICATION BREAK UP

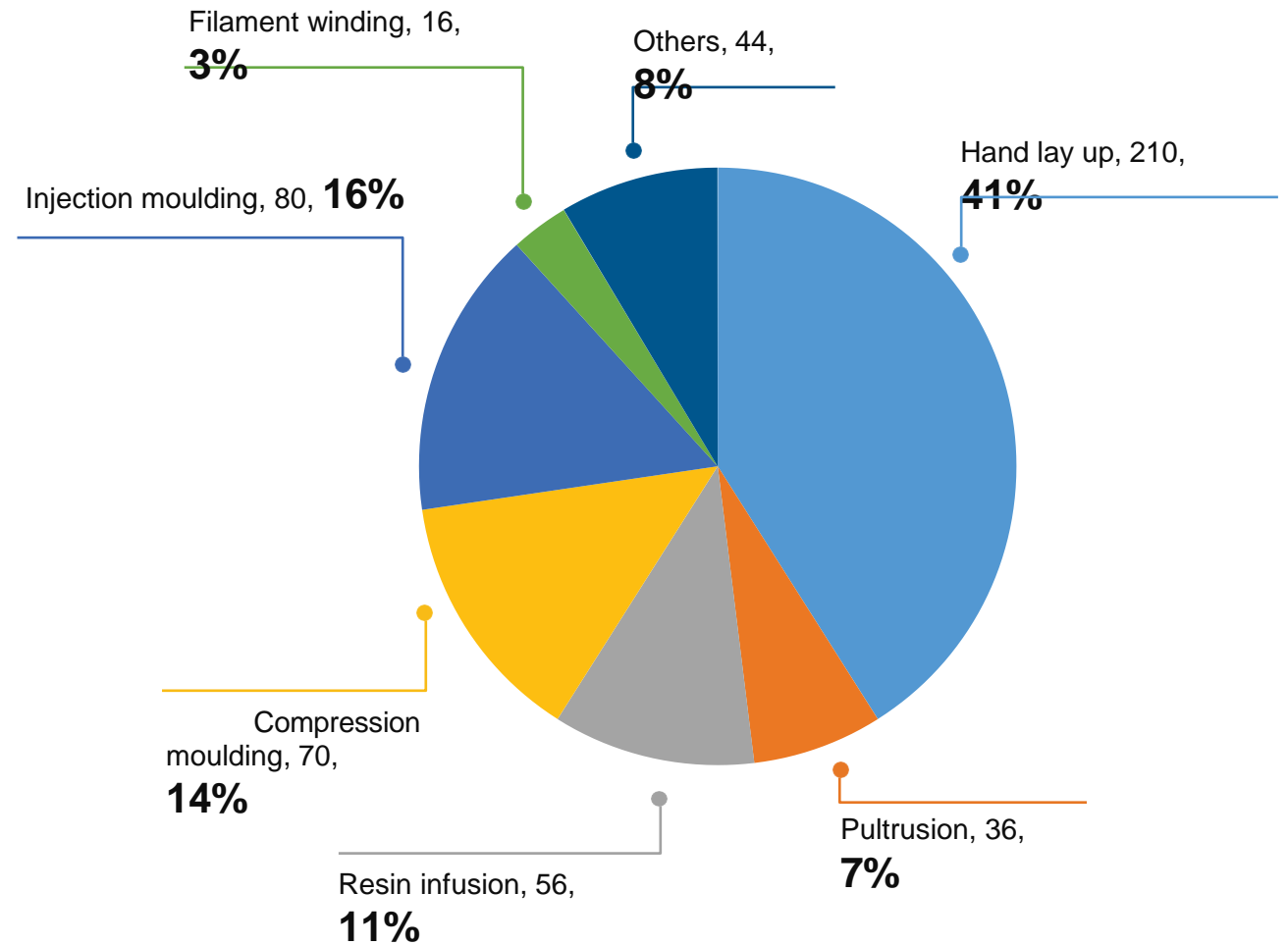
APPLICATIONS	KT
Transportation	112
Building.& Construction	148
Pipes & Tanks	42
Electrical & Electronics	69
Telecom	31
Wind Energy	50
Others	60
Total	512



FRP INDUSTRY (2021-22) - INDIA CONTD...

PROCESS BREAK IIP

PROCESS TYPE	KT
Hand lay up	210
Pultrusion	36
Resin infusion	56
Compression moulding	70
Injection moulding	80
Filament winding	16
Others	44
Total	512

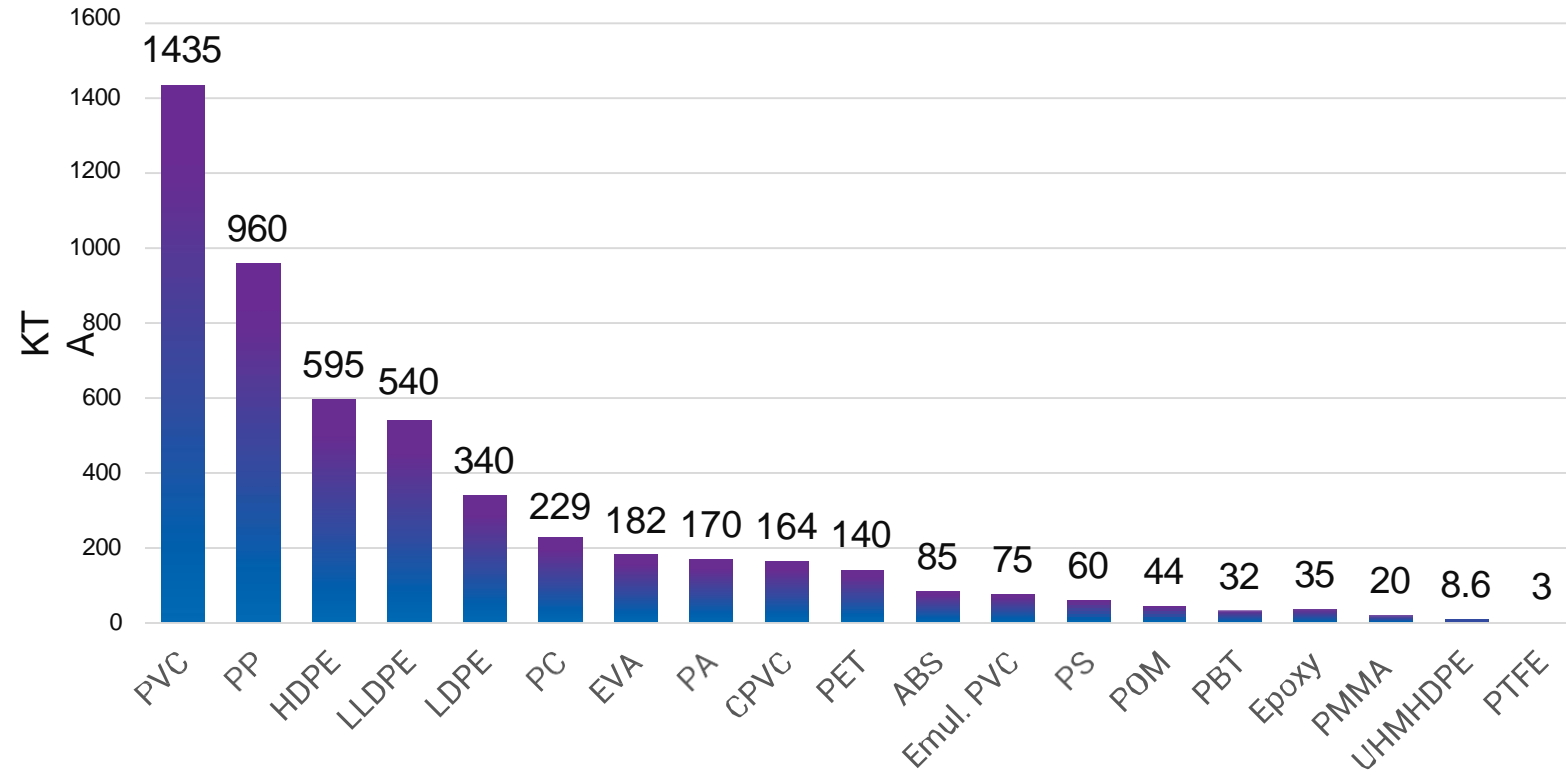


Source : FRP Institute/Stratview Research

IMPORTS & EXPORTS



MAJOR PLASTICS RAW MATERIAL (2021-22) - IMPORTS

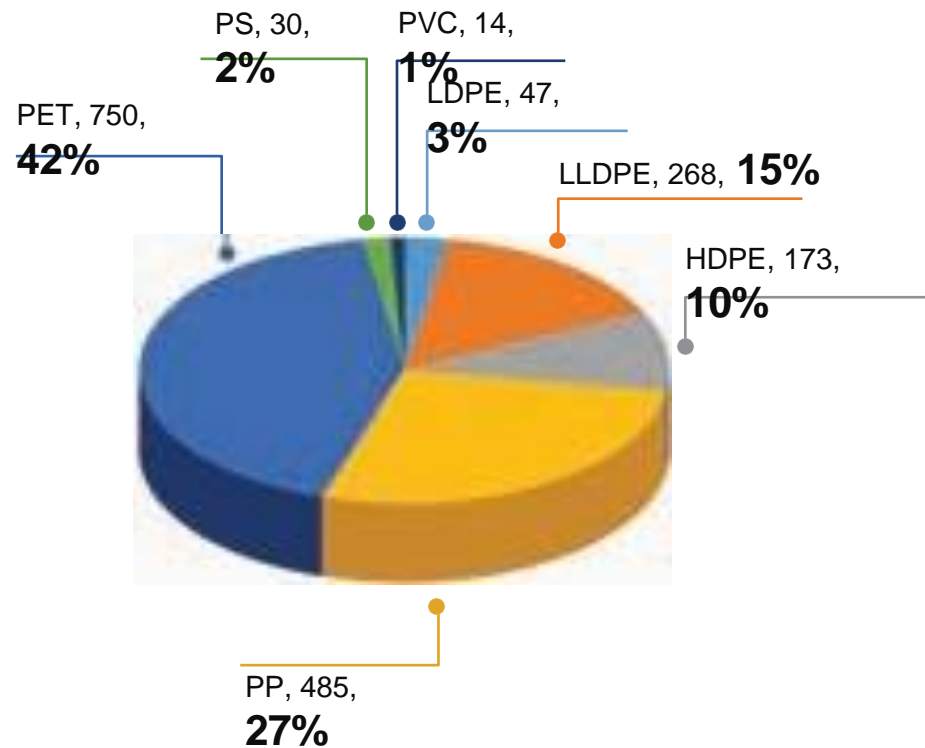


All Fig in
KT

**~19 types of Plastics Imported in 2021-22 5118
KT**

Source : CPMA [https://tradedstat.commerce.gov.in/eidb/default.asp/Industry Estimate](https://tradedstat.commerce.gov.in/eidb/default.asp/Industry%20Estimate)

MAJOR PLASTICS RAW MATERIAL (2021-22) - EXPORTS



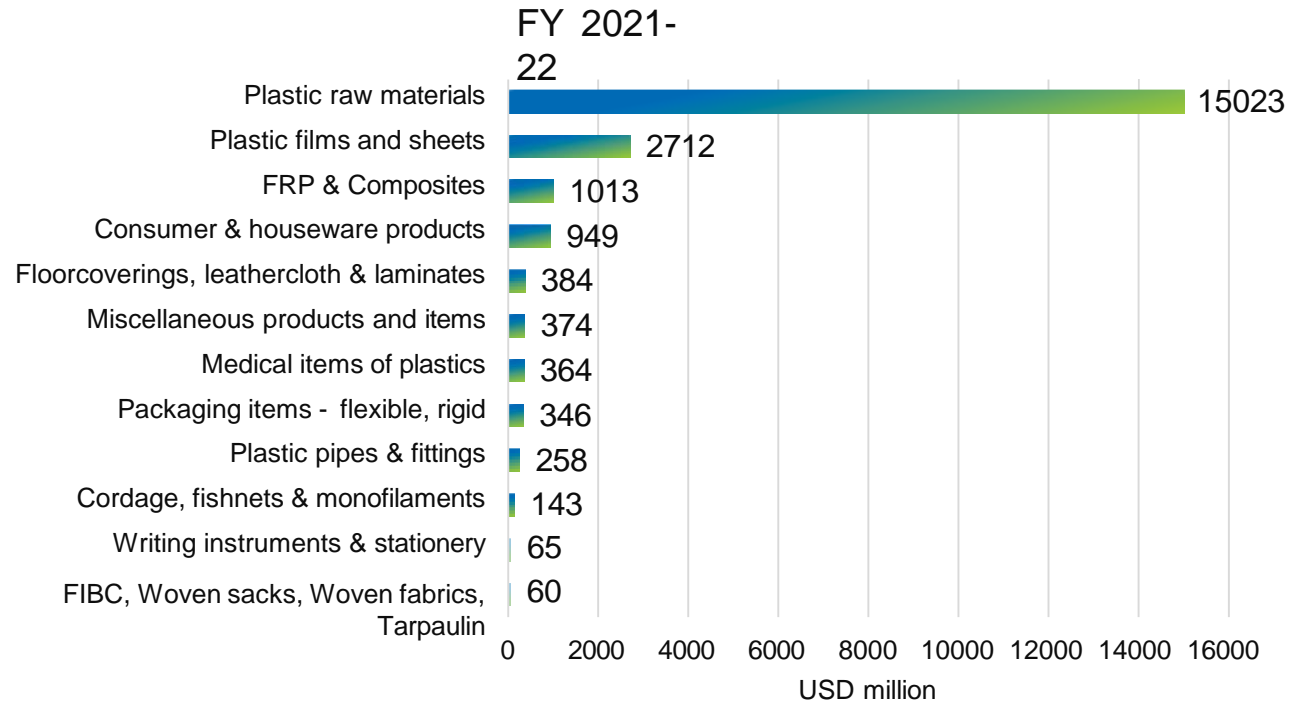
All Figs in KT

Major Plastics Total Exports 2021-22

1767 KT, Highest PET - 750 KT

Source : CPMA [https://tradedstat.commerce.gov.in/eidb/default.asp/Industry Estimate](https://tradedstat.commerce.gov.in/eidb/default.asp/Industry%20Estimate)

RAW MATERIALS & FINISHED GOODS (2021-22) - IMPORTS



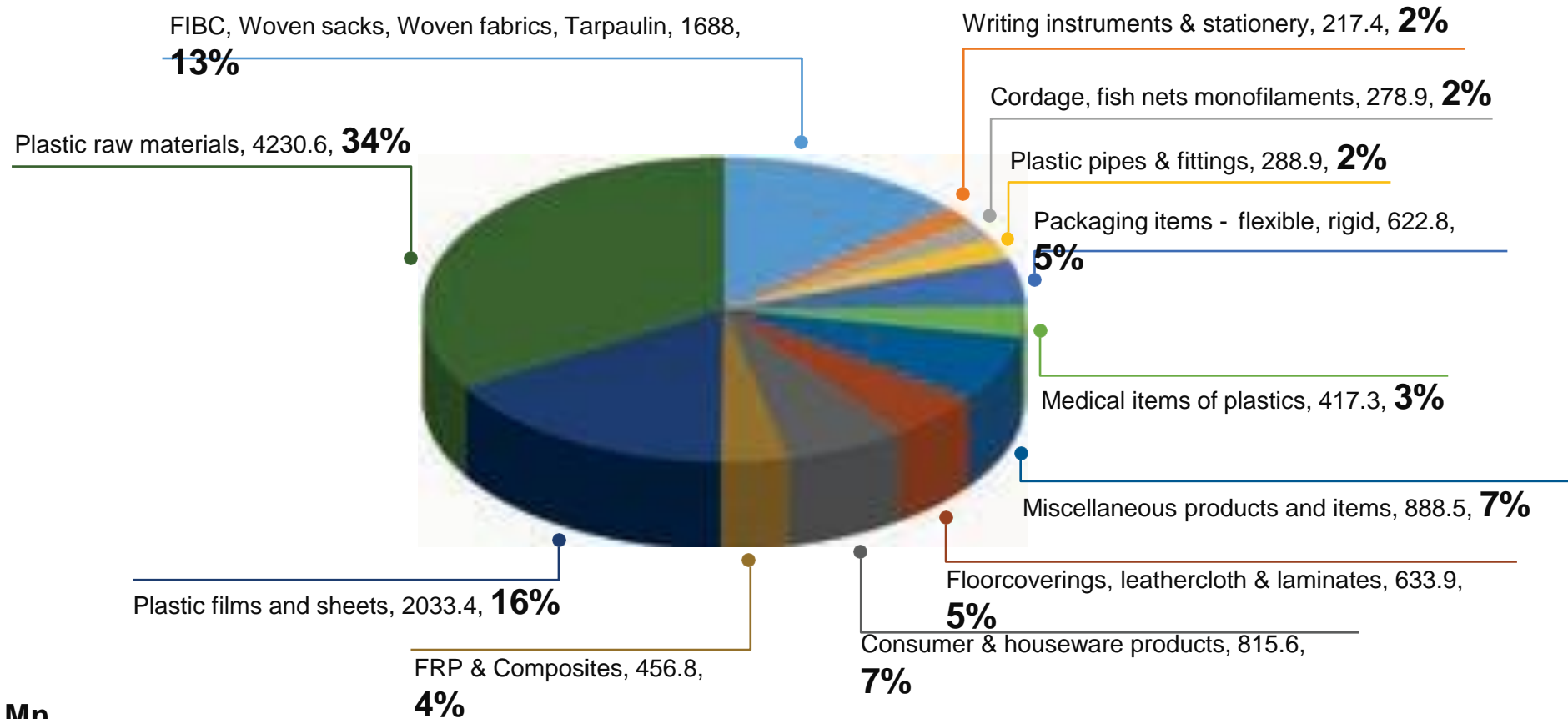
Value in Mn
USD

Total Imports 2021-22 USD 21.69 Bn

Growth of 48% over 2020-21

Source: Plexconcil

RAW MATERIAL & FINISHED GOODS (2021-22) - EXPORTS



Value in Mn
USD

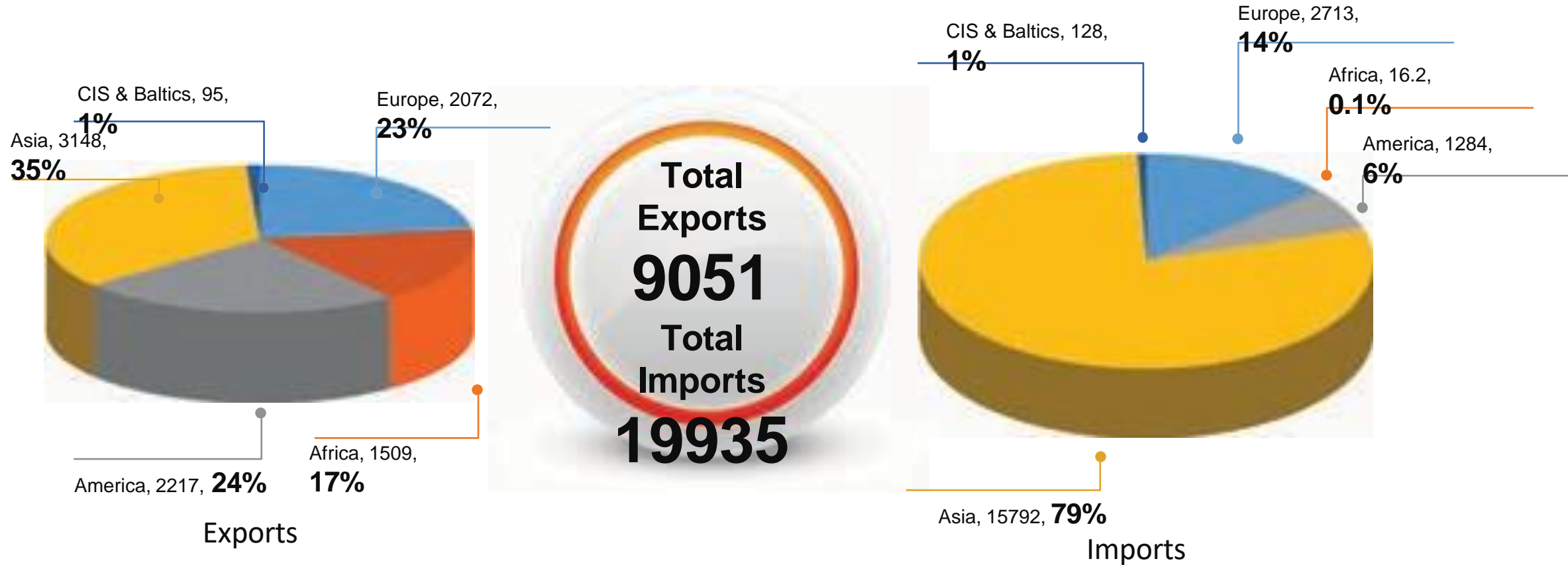
Total Exports 2021-22 USD 12.57 Bn

Growth of 33% over 2020-21

Source: Plexconcil

REGION WISE EXPORTS/IMPORTS

CHAPTER 39 - (2021-22)



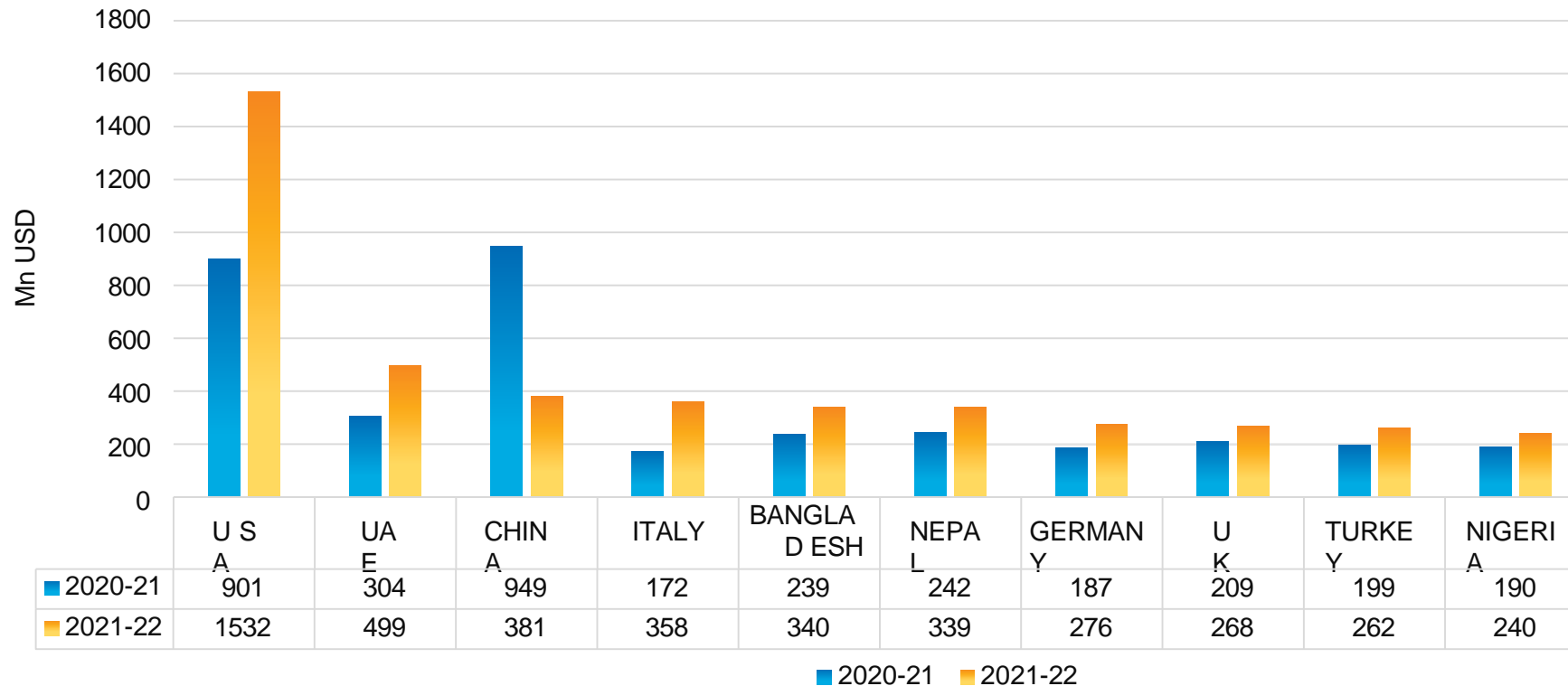
Value in Mn USD

Imports & Exports to Asia Highest

Source <https://tradestat.commerce.gov.in/eidb/default.asp>

COUNTRY WISE EXPORTS

CHAPTER 39 – (2020-21 Vs 2021-22)



Value in Mn USD

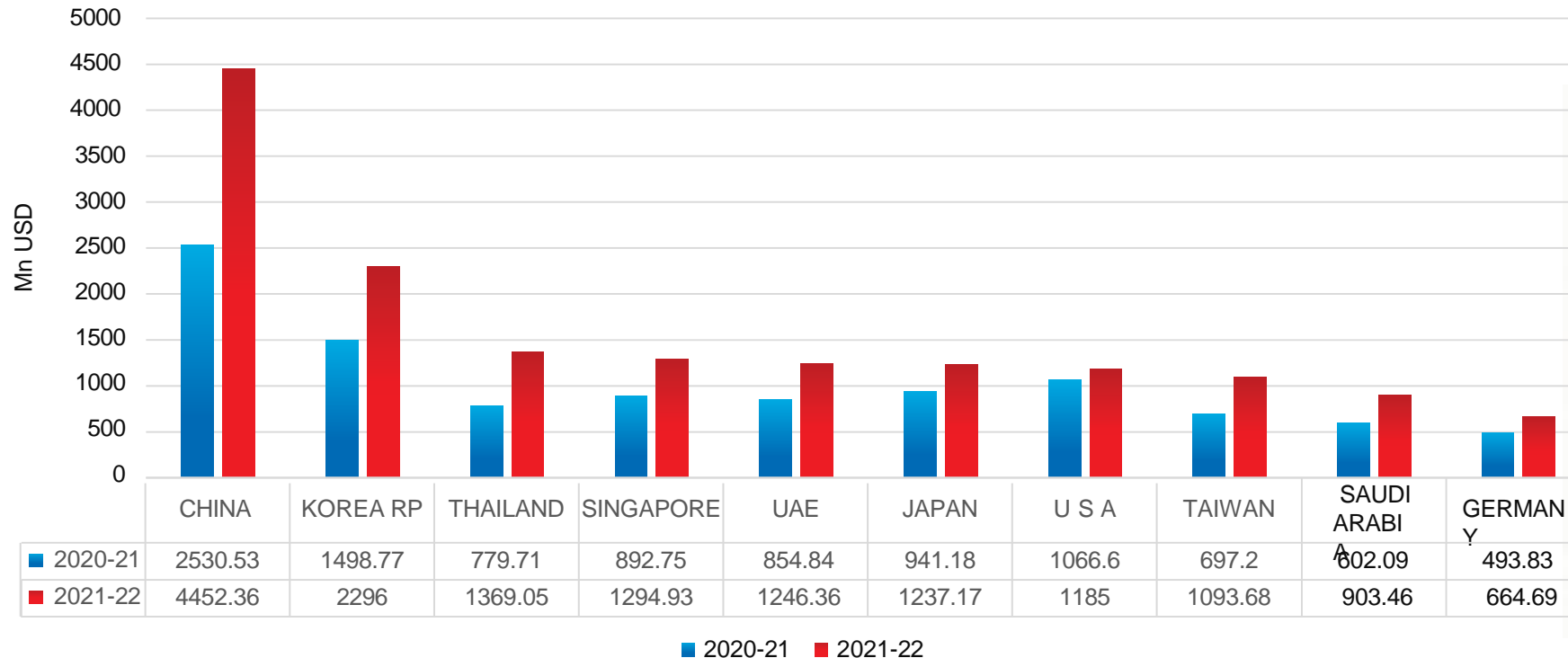
31% YoY increase in Exports

Export to 216 Countries, Top 10 Countries accounts 50%

Source : <https://tradestat.commerce.gov.in/eidb/default.asp>

COUNTRY WISE IMPORTS

CHAPTER 39 – (2020-21 Vs 2021-22)



Imports from 163 Countries, Top 10 Countries account for 78%, YoY growth 50%

Value in Mn USD

22% of Total Imports from China, YoY Growth 76%

Source : <https://tradestat.commerce.gov.in/eidb/default.asp>

MASTERBATCHES & COMPOUNDS



MASTERBATCH (2021-22) - INDIA

Growth Drivers

Performance Masterbatches; cling, Anti-bacterial, Anti-static, Anti-fog, Foaming agents, Bio-degradable, UV Masterbatches
Anti counterfeiting, Infrared Masterbatches, etc.

Sectors

- Automotive
- Agriculture
- Electrical & Electronic
- Appliances
- Consumer durables
- Infrastructures

Masterbatch Market	
TYPES	KT
White/Black/Colour/Additive	600
Filler Masterbatches	1023
Total	1623

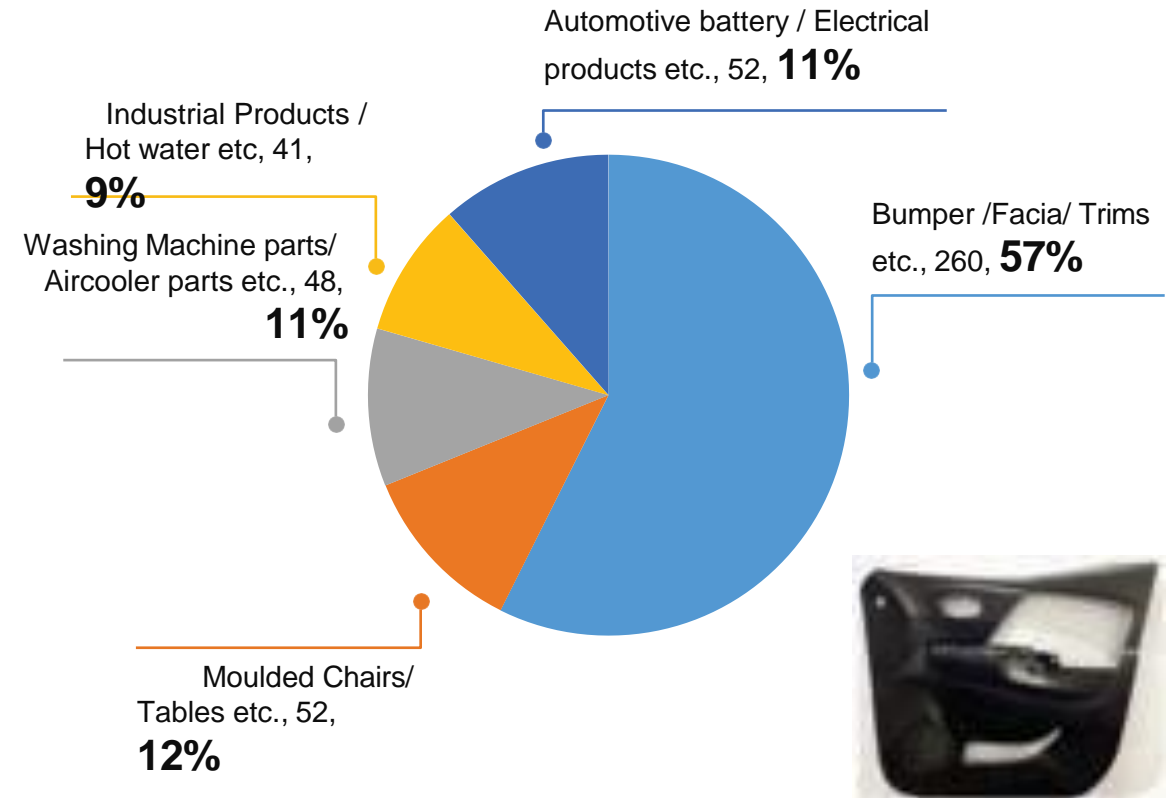


(All Figs in

**2021-22 Demand 1623 2022-23 (E) 1737 YoY growth
~7%**

PP COMPOUNDING SECTOR DEMAND (2021-22) - INDIA

SECTOR	MAJOR PRODUCT	KT
Automotive	Bumper/Facia/Trims etc.,	260
Furniture	Moulded Chairs/Tables etc.,	52
Consumer Durables	Washing Machine parts/ Aircooler parts etc.,	48
Industrial, PPR etc	Industrial Products / Hot water etc	41
Others	Automotive battery / Electrical products etc.,	52
TOTAL		453



**2021-22 Demand 453
KT**

2022-23 (E) 475 KT

**YoY Growth ~
5%**

PE COMPOUNDING SECTOR DEMAND (2021-22) - INDIA

Snap shot

Growth	10%
Major resin type	LDPE/LLDPE/HDPE/HMHDP E

SECTOR	MAJOR PRODUCT	KT
Wire & Cable	Tele communication, Power, Industrial, construction etc.,	228
Pipe & Fittings	Potable Water , waste water, agriculture, chemical Oil & Gas	16
Roto moulded products	Water tanks/ Industrial products/Floating solar base	310
Others	Bins etc.,	41
Total		595

**2021-22 Demand 595
KT**

2022-23 (E) 655 KT

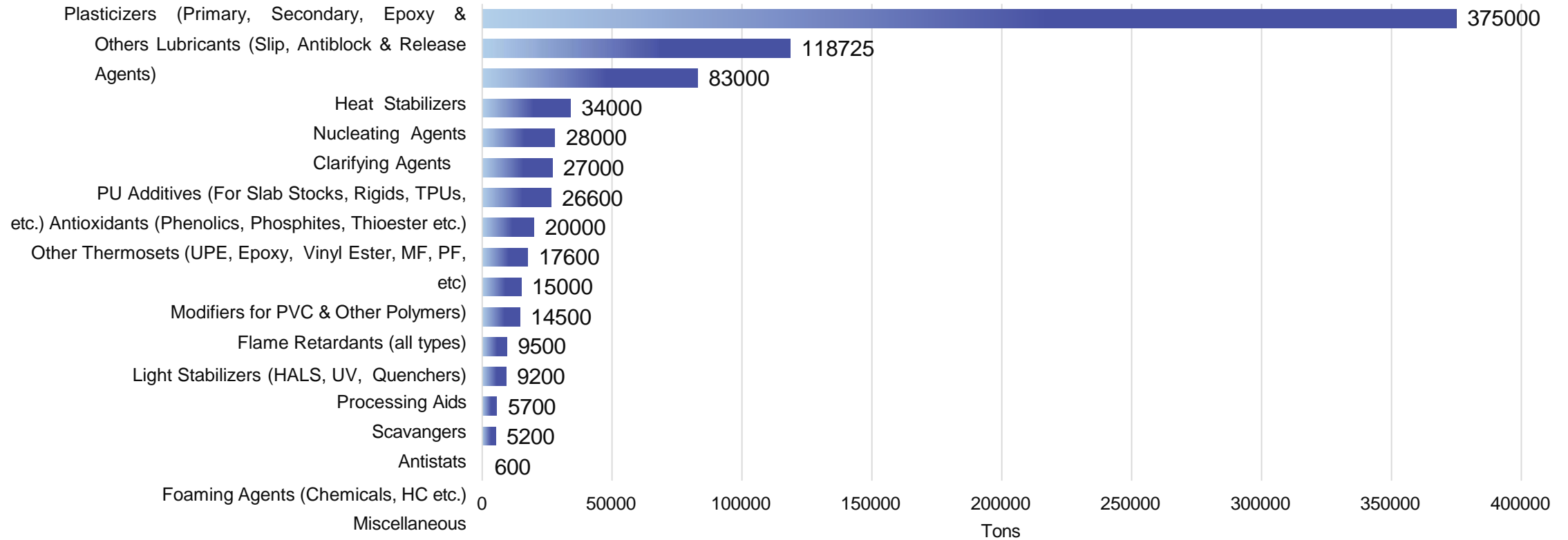
**YoY Growth ~
10%**

Source : PLASTINDIA FOUNDATION/Industry Estimate

ADDITIVE S



MAJOR POLYMER ADDITIVES EST. DEMAND (2021-22) - INDIA



(All Figs in

**2021-22 Demand 790
KT**

**2022-23 (E) 845 KT YoY Growth ~
7%**

Source : PLASTINDIA FOUNDATION / Industry
Estimate

MACHINERY MANUFACTURING INDUSTRY (2021-22) - INDIA



PLASTICS PROCESSING INDUSTRY OVERVIEW (2021-22) - INDIA

- Plastics Processing Industry is robust and has potential to become significant part of India's manufacturing economy as in industrialized countries like Germany, Italy, France, USA, Canada, Japan, China, Taiwan, South Korea.
- More than 2 lakh core machines are presently in operation producing various products adopting processes like Injection Moulding, Extrusion and Blow Moulding etc.,
- The machinery market is growing @ 8.5% over the last 4
- years. Processing Machinery Exported to over 50 countries
- Machinery Building activity remains quite labor intensive, while being highly technical.
- Industry employs different skill levels from the various strata of the society.
- There are 20+ major manufacturers of machinery and nearly 300+ small & medium manufacturers
- All Electric Injection Molding Machine is growing in the recent years. The application segment includes Medical, Packaging, Electrical & Electronics.



THERMOPLASTIC PROCESSING INDUSTRY OVERVIEW (2021-22) – INDIA CONTD

Details	2021-22
Virgin Polymer consumption in 2021-22	19,270 KT
Cumulative Core Processing Machines till March 2022 (Nos)	201,600+
Core Processing Machinery Growth - CARG for last 4 years	8.5%
Number of Core Processing Machines Installed in 2021-22	14,700
Estimated Investment in Core Machinery in 2021-22	USD 1.32 Bn
Total Processing Capacity*	~58,560 KT
Processing Capacity Addition Growth - CARG for last 4 years	9.00%
Number of Plastics Machinery Manufacturing Units	300+
Estimated Project Investment in Machinery, Moulds & Converting lines (Last 5 years)	~USD 9.1 Bn
Likely Project Investment in Machinery, Moulds & Converting lines (Next 5 years)	~USD 14 Bn

*Capacity includes Compounding & Major Recycling in addition to Virgin Polymer Processing

Source : Industry Estimate /PMMAI



CORE PROCESSING MACHINERY ADDITIONS LAST 4 YEARS

Description	No of machines					4 Years CAGR
	2017-18	2018-19	2019-20	2020-21	2021-22	
Injection Moulding	7,560	9,650	8,350	8,600	10,050	7.4%
Extrusion	2,400	2,950	3,100	3,200	3,700	11.4%
Blow Moulding	650	775	700	900	950	10.0%
Total	10,610	13,375	12,150	12,700	14,700	8.5%

Description	Investment in INR Crores					4 Years CAGR
	2017-18	2018-19	2019-20	2020-21	2021-22	
Injection Moulding	2,450	3,450	2,950	2,500	3,625	10.3%
Extrusion	2,300	2,850	3,625	3745	5,690	25.4%
Blow Moulding	425	500	490	630	640	10.7%
Total	5,175	6,800	7,065	6875	9,955	17.8%

Source : Industry Estimate /PMMAI

PLASTICS MACHINERY PROJECTIONS

Description	No of Machines				4 Years CAGR
	2022-23(E)	2023-24 (E)	2024-25 (E)	2025-26 (E)	
Injection Moulding	10,800	11,750	12,650	13,700	8.1%
Extrusion	3,950	4,200	4,450	4,700	6.2%
Blow Moulding	1,000	1,080	1,150	1,200	6.0%
Total	15,750	17,030	18,250	19,600	7.5%

Description	Investment (in INR Crores)				4 Years CAGR
	2022-23 (E)	2023-24 (E)	2024-25 (E)	2025-26 (E)	
Injection Moulding	4,000	4,400	4,850	5,350	10.20%
Extrusion	6,150	6,650	7,200	7,800	8.2%
Blow Moulding	690	750	800	870	8.00%
Total	10,840	11,800	12,850	14,020	8.9%

Investment in INR Crores

Estimated Project Investment USD 14 Bn in next 4 years

Tonnage Range	2021-22	2022-23 (E)	2023-24 (E)	2024-25 (E).	2025-26 (E)
Up to 110 T	2,550	2,600	2,700	2,800	2,850
120-275 T	4,950	5,350	5,800	6,300	7,000
300 - 450 T	1,750	1,900	2,150	2,350	2,550
500-950 T	700	825	965	1,055	1,150
> 1000 T	100	125	135	145	150
Total	10,050	10,800	11,750	12,650	13,700



**All Fig.
Numbers**

**Projection for 2025-
26 8.3%
CAGR**

Source : Industry Estimate /PMMAI

NEW TRENDS

Trends

- Mono Sandwich Injection Moulding Machines
- Multi Component Injection Moulding Machines

Impact of Industry during Covid 19

Pandemic Injection Moulding Machinery

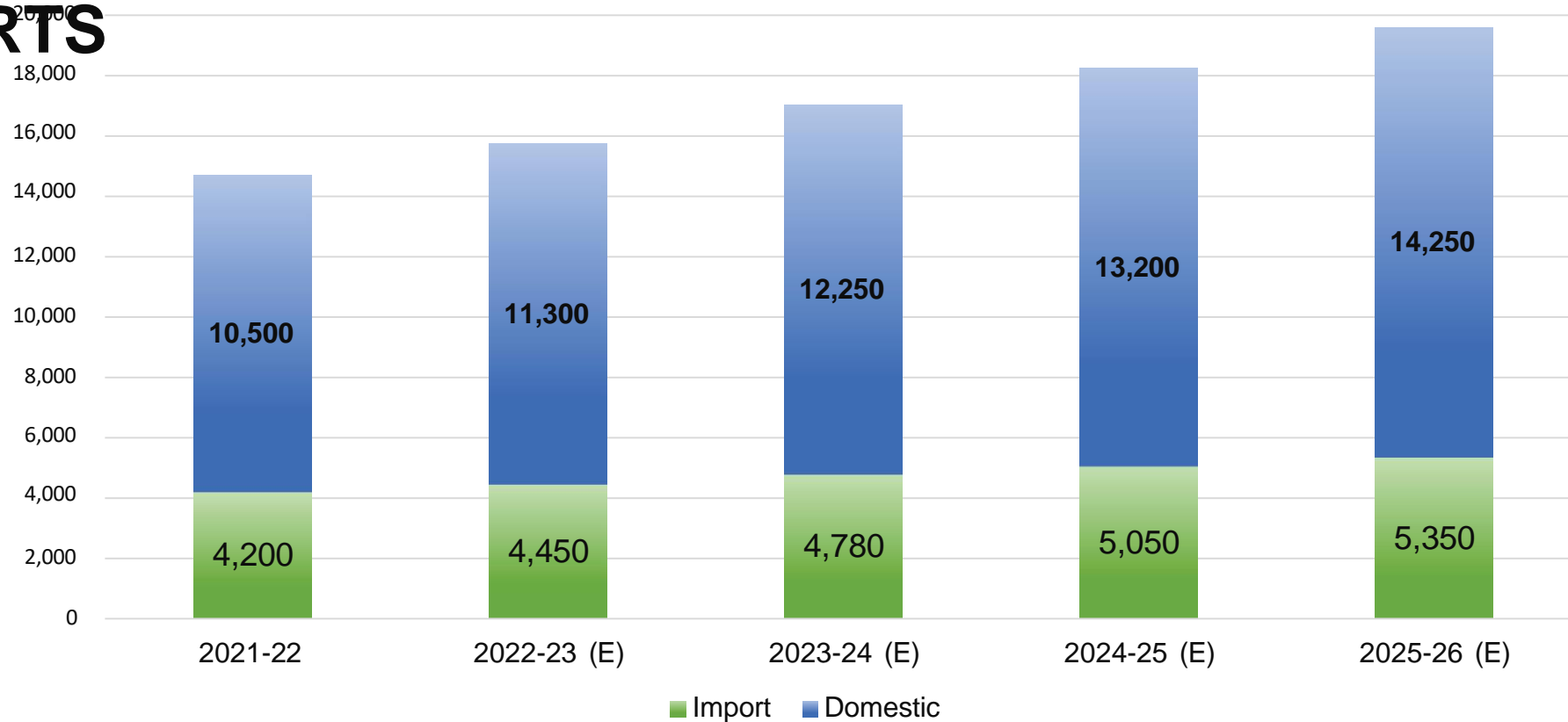
- Declined in 2019-20 & 2020-21
- FY 2021-22 Sales has crossed pre-covid level

Growth Driver

- Machinery manufacturers in India are increasing manufacturing capacity to cater demand
- Government focusing on make in India and PLI Scheme will Boost manufacturing in India
- Favourable FTA and CEPA will help Indian manufacturers



PLASTICS MACHINERY DOMESTIC & IMPORTS



All Fig. Numbers

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

Source : Industry Estimate/PMMAI

INDIAN TECHNOLOGY COMPETES GLOBALLY

- Injection Moulding Machines
- Mono Sandwich Injection Moulding Machines
- Multi Colour Injection Moulding Machines Multi
- Component Injection Moulding Machines All
- Electric Injection Moulding Machines
- Application Specific Injection Moulding Machines
- Blow moulding Machines
- Roto moulding 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.

AUXILIARY EQUIPMENT



AUXILIARY EQUIPMENT INDUSTRY (2021-22) - INDIA

Auxiliary Equipment's in Plastics Industry			
Product	Units	Product	Units
Chilling Plant	12000	Volumetric/Gravimetric Blending System	2000
Mould Temperature Controller	2000	Conveyor Belt with Counting System	1300
Drying System		Granulator	6000
- Hopper Dryer	9000	Robot	1000
- Dehumidified Air Dryer	1600	Hot Runners	1600
Raw Material Conveying System			
- Hopper Loader	16000		
- Central Conveying System	350		

Auxiliary Equipment for Improved Productivity and Reduced Wastages...

Source : Industry Estimate

AUXILLARY EQUIPMENTS – LATEST TRENDS

1. Centralized conveying system

For raw material storage silos & online counting for finished products
It reduces the labour, increases productivity, reduces wastage by spillages.

2. Conveyor belts with online sprue separators & counting system.

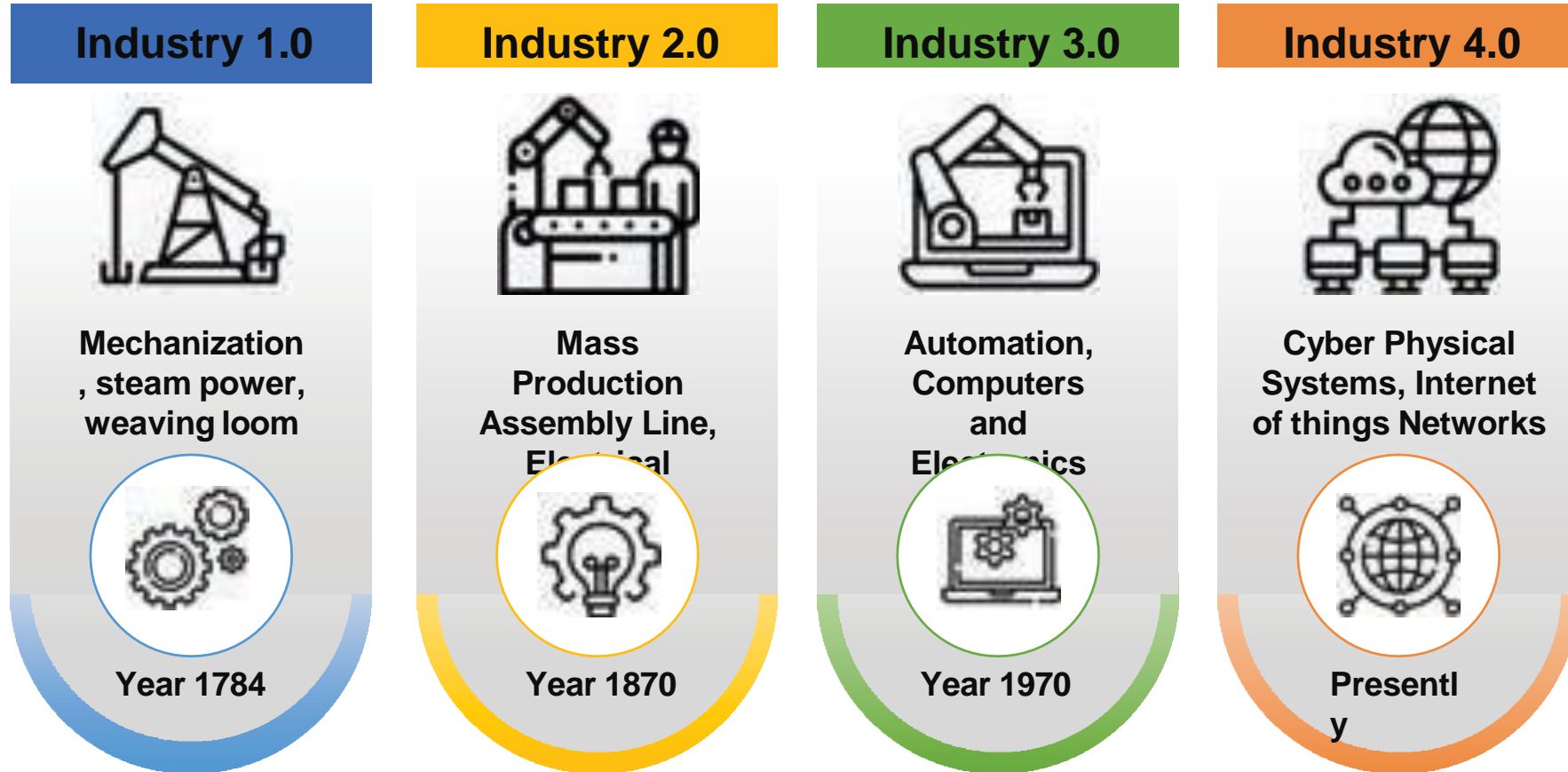
Widely used in Pharma Industry where in Hygiene plays a critical role

3. Robotics Sprue Peakers and Servo Robot.

- Sprue Peaker robots are now a days standard scope of supply, mainly in the automotive industry, white goods and packaging industries.
- 3/4 Axis Servo Robots gaining popularity, mainly in the automotive, White goods, Electronics and Thin Wall Containers applications.



INDUSTRY REVOLUTION



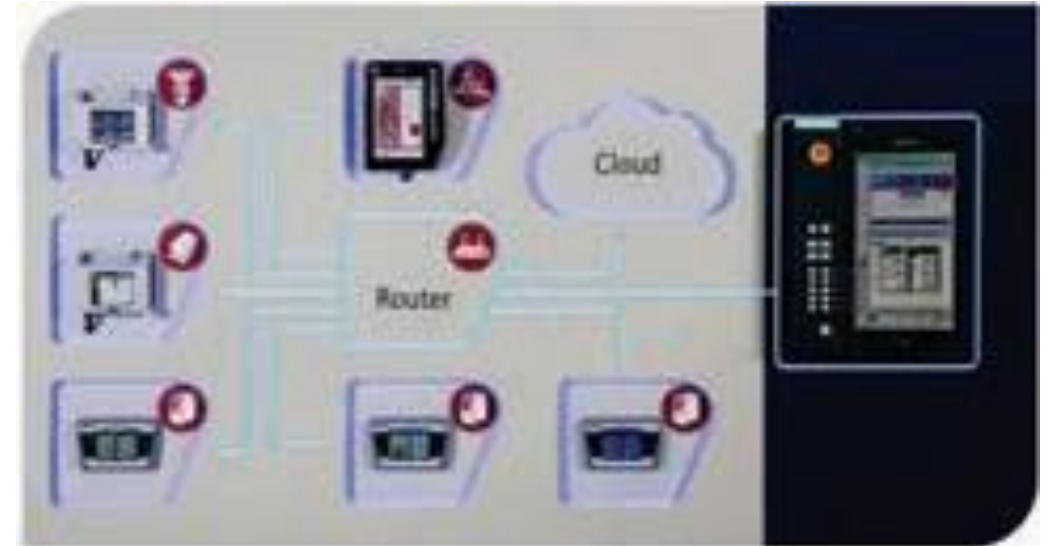
INDUSTRY REVOLUTION CONTD... SMART WORKCELL

- Integrated Auxiliary
- Data transfer
- Flexibility – Plug & Produce
- Security
- One display



INDUSTRY REVOLUTION CONTD... SMART USER INTERFACE

- One single central screen for all devices within the work-cell
- Visualisation and operation of all devices
- Centralised at the IMM
- Remote servicing
- Unified alarms
- Unified change of product
- Device adding
- Plug & Produce



TOOLING INDUSTRY- INDIA



INDIA TOOLING INDUSTRY (2021-22)

- Comprising : In-house Tool Rooms (Captive) - Mostly with Automotive OEM's & Tier 1
- Suppliers. Commercial Tool Rooms (Manufacturers of Plastics Moulds): 600+ nos.
- Moulds are exported to many countries
- Types includes Sheet Metal Dies, Plastics Moulds, Jigs , Fixtures & Gauges, Die Casting etc.,
- The sectors serviced are : Automotive, Consumer products, Electrical & Electronics, Packaging, General Engineering like Textile etc.,



Plastics Moulds are the 2nd Largest Category in Mould & Dies Industry...

Source : Industry Estimate /TAGMA



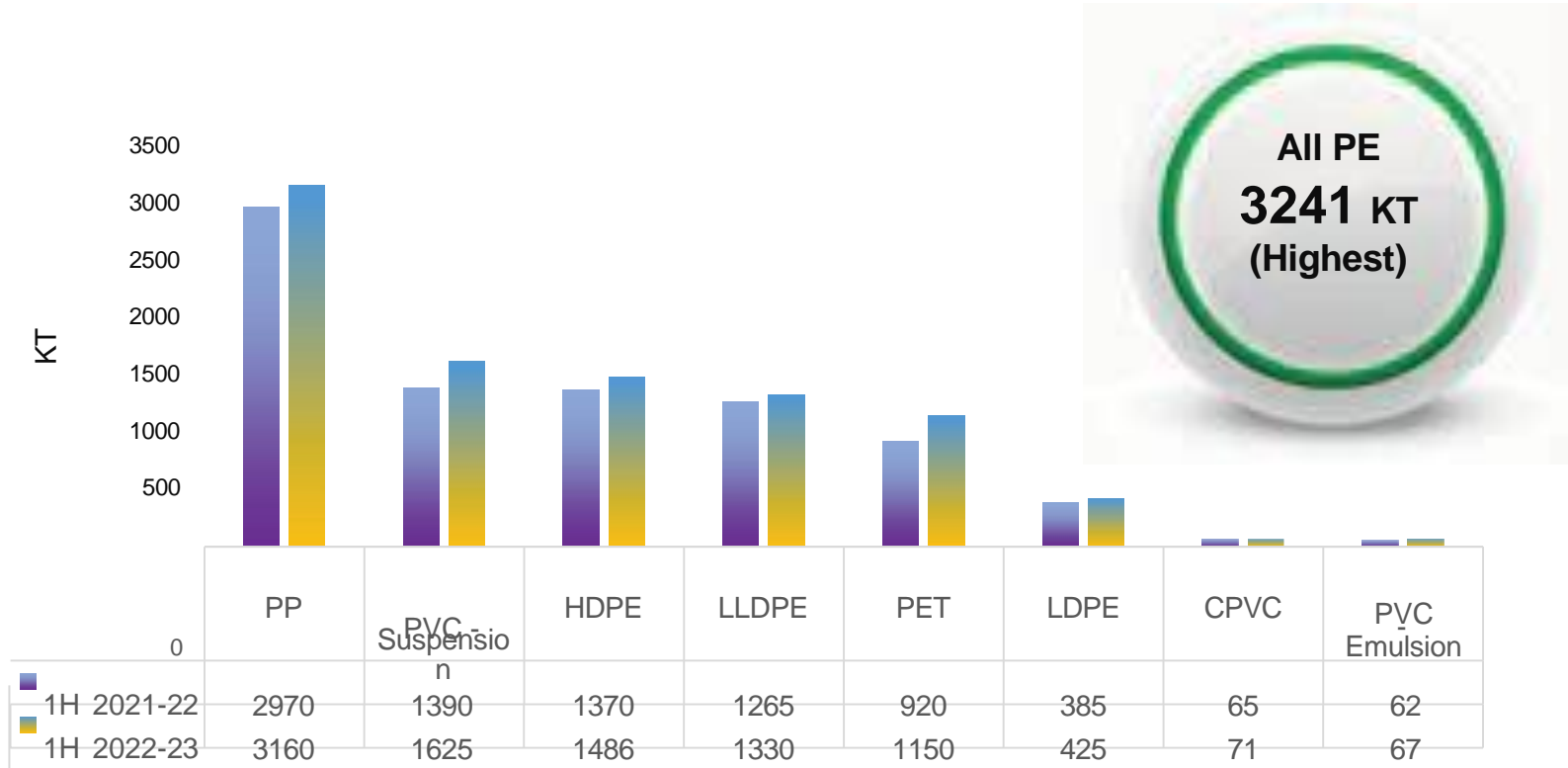
PLASTINDIA FOUNDATION
ISO 9001:2015 certified

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.

Plastics Industry Status Report – India 1H 2022-23 Update



MAJOR COMMODITY PLASTICS DEMAND – INDIA (1H 2022-23 Vs 1H 2021-22)

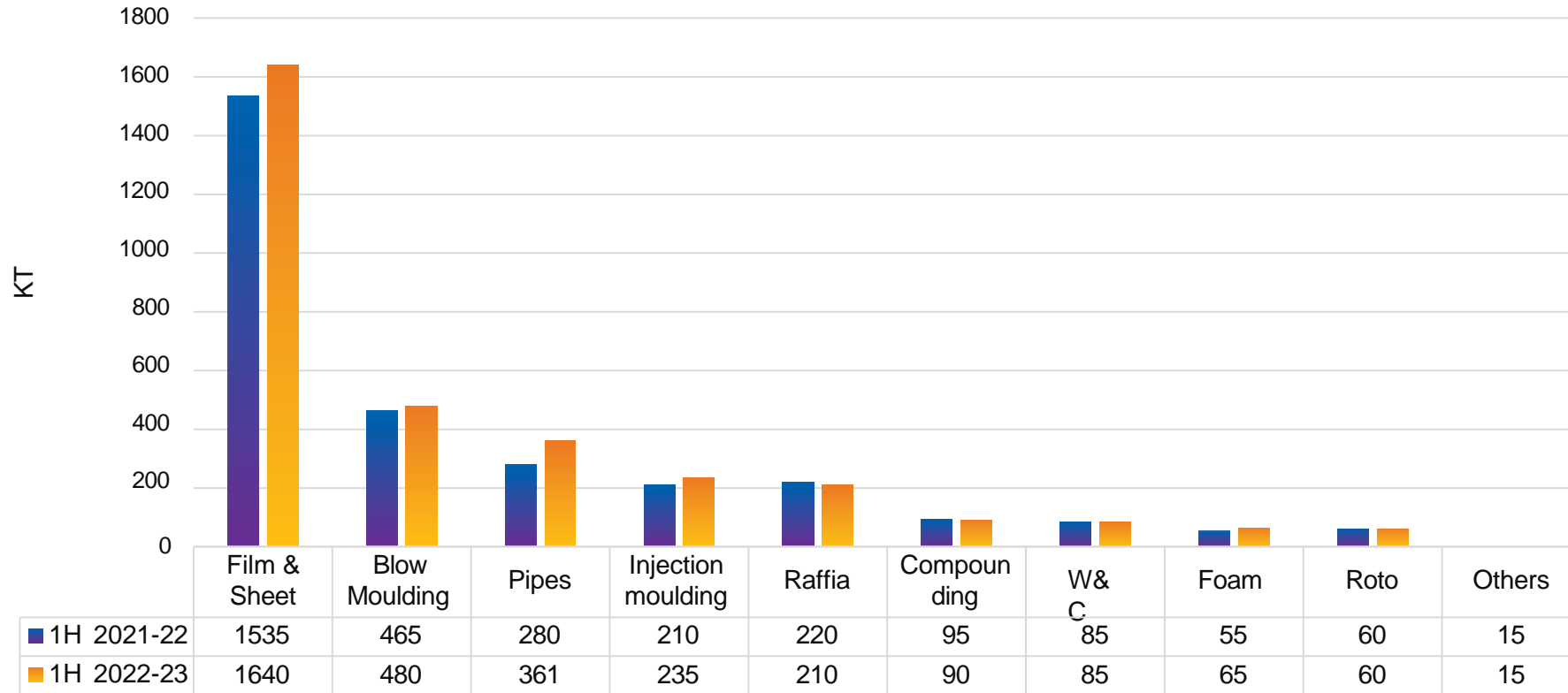


Plastics	Growth % 1H 2022-23
PP	6.4
PVC - Suspension	16.9
HDPE	8.5
LLDPE	5.1
PET	25.0
LDPE	10.4
CPVC	9.2
PVC - Emulsion	8.1

All Fig in KT

Overall growth of 10.5%, with PVC and PET leading

PE SECTORWISE DEMAND - INDIA (1H 2022-23 Vs 1H 2021-22)

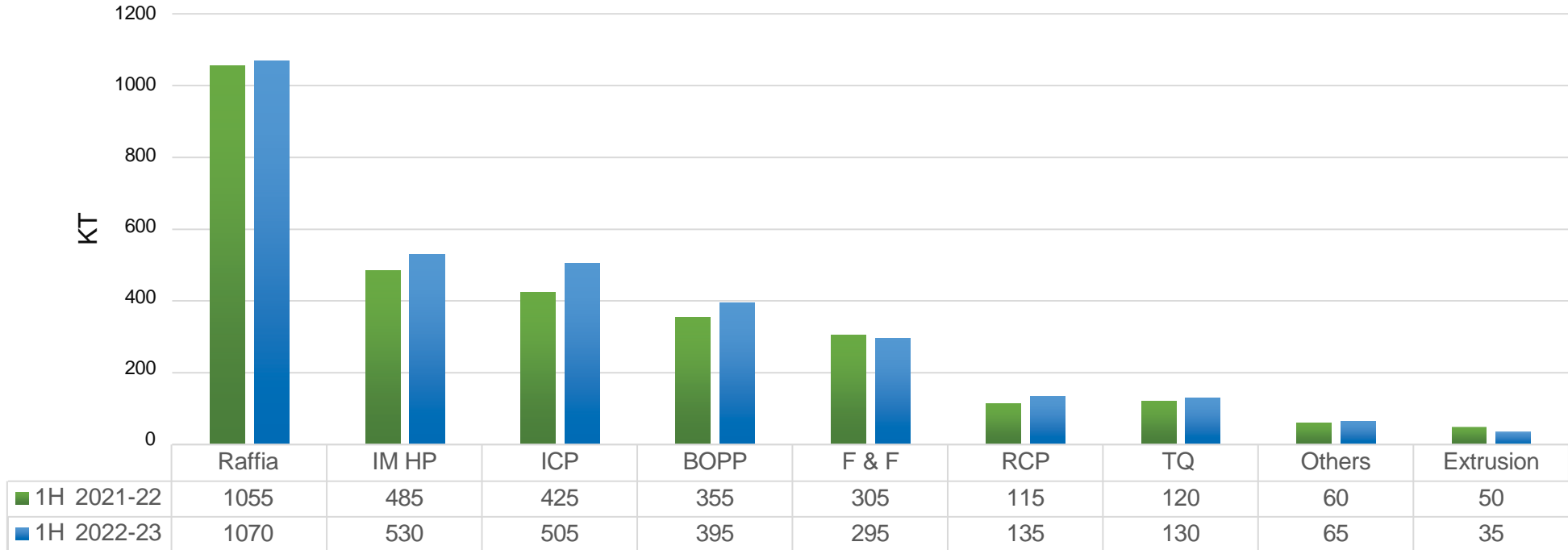


All Fig in
KT

**1H 2022-23 Demand 3241 KT, Growth ~
7.3%**

Source: PLASTINDIA FOUNDATION/Industry
Estimate

PP SECTORWISE DEMAND - INDIA (1H 2022-23 Vs 1H 2021-22)

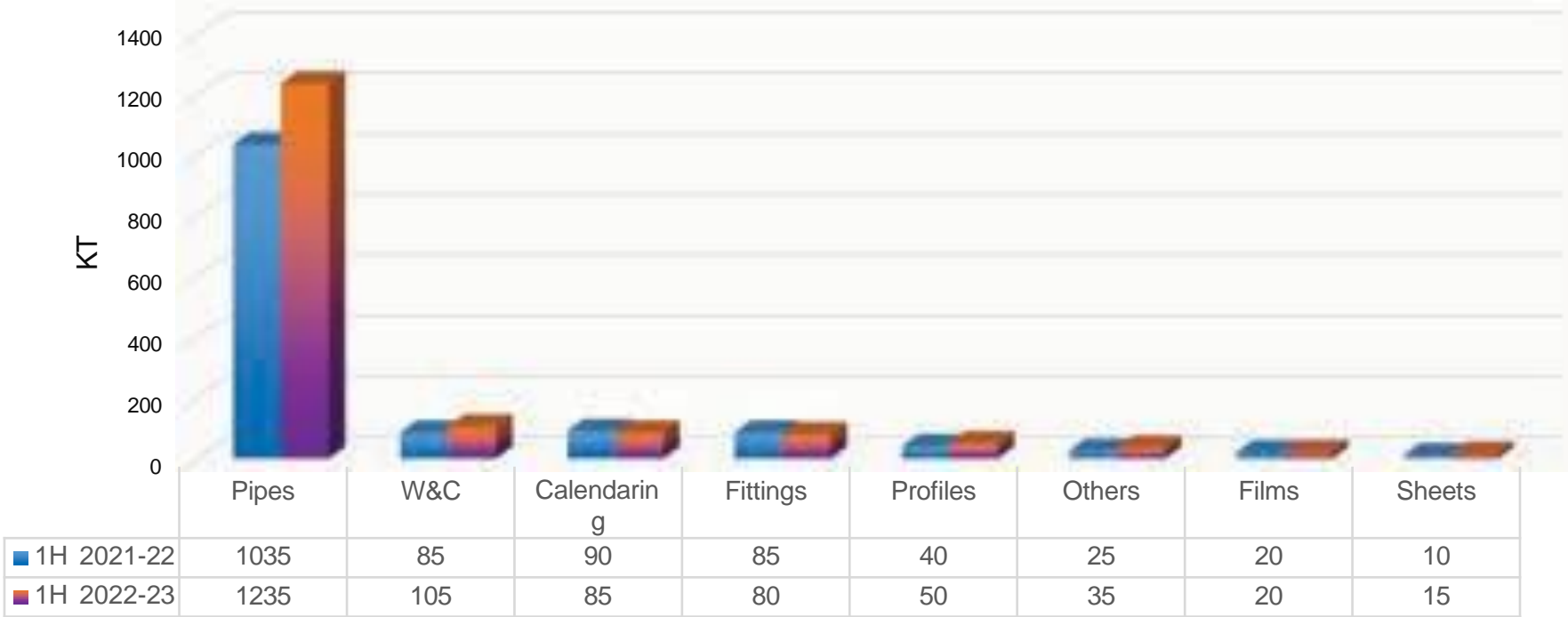


All Fig in
KT

**1H 2022-23 Demand 3160 KT, Growth ~
6.4%**

Source: PLASTINDIA FOUNDATION/Industry
Estimate

SUSPENSION PVC SECTORWISE DEMAND – INDIA (1H 2022-23 Vs 1H 2021-22)

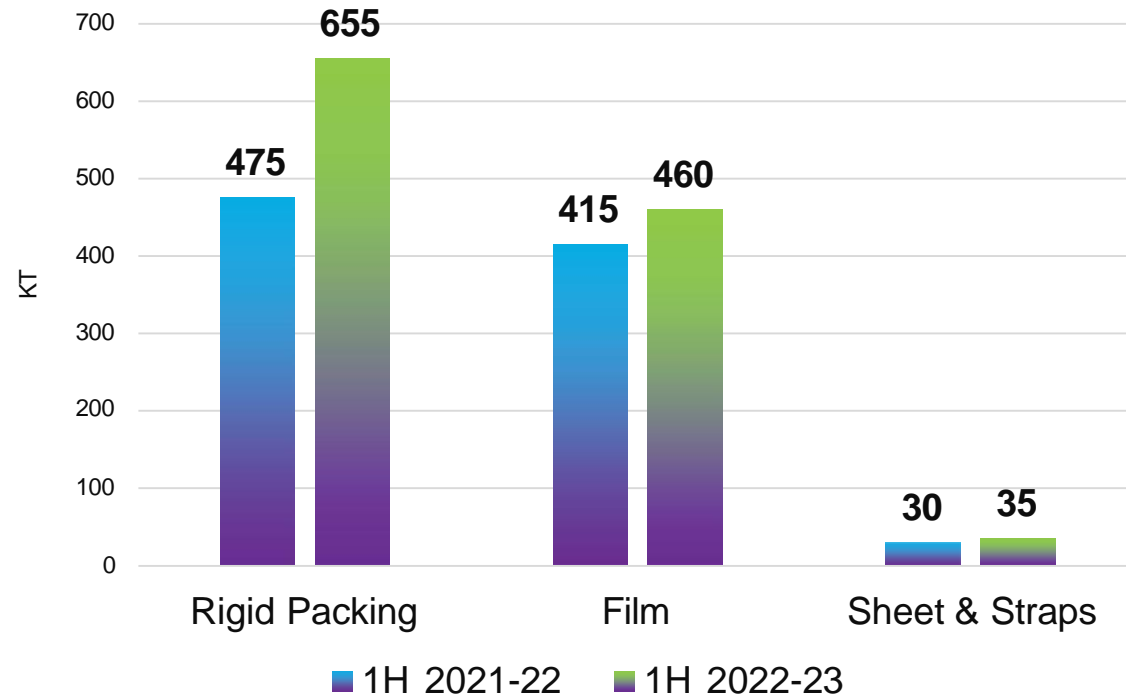


All Fig in
KT

1H 2022-23 Demand 1625 KT, Growth ~ 16.9 %

Source: PLASTINDIA FOUNDATION/Industry Estimate

PET & BOPET SECTORWISE DEMAND – INDIA (1H 2022-23 Vs 1H 2021-22)



All Fig in KT

PET Rigid Packing Breakup		
Sector	1H 2021-22	1H 2022-23
CSD /Fruit drinks	180	225
Personal care	16	13
Liquor	50	70
Pharmaceuticals	45	63
Wide mouth jar	27	45
Edible oil	42	50
Home care	14	23
Dairy	5	8
Agro chemicals	3	3
Bottled Water	72	120
Others	21	35
Total	475	655

1H 2022-23 PET & BoPET Demand 1150 KT, Growth ~ 25%

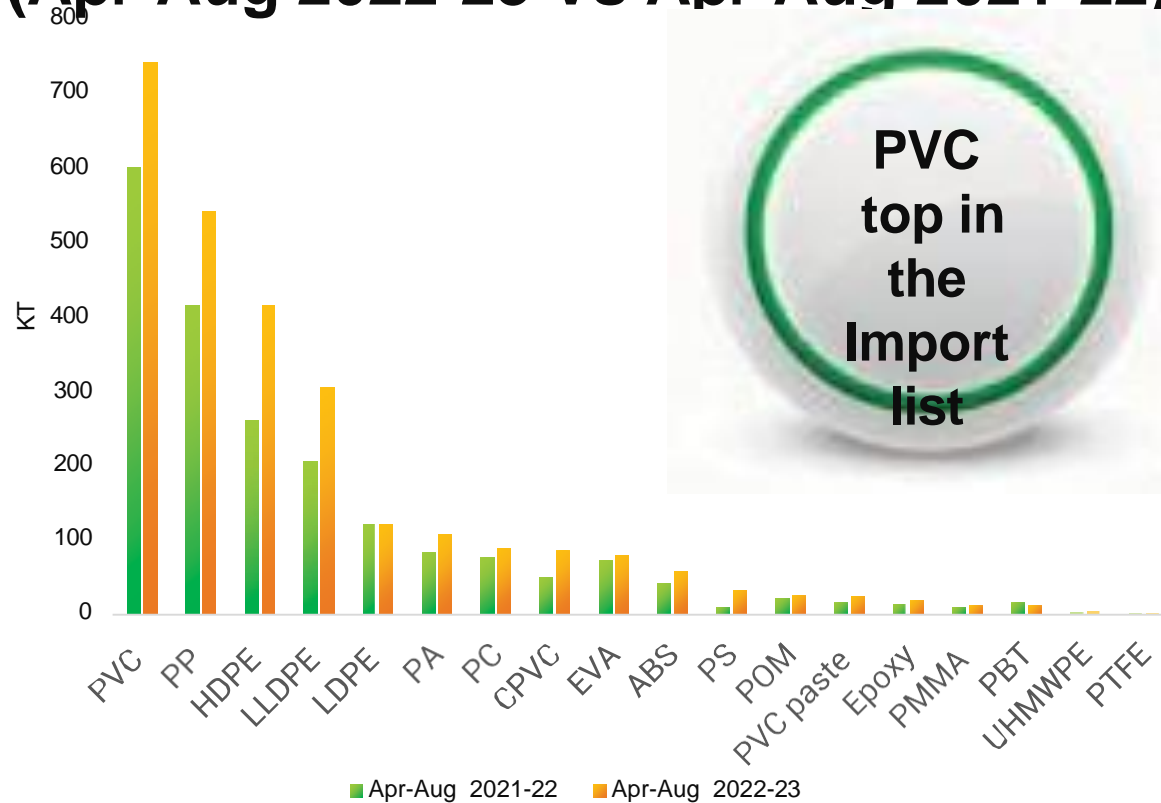
IMPORTS & EXPORTS 1H 2022-

23



MAJOR PLASTICS RAW MATERIAL – IMPORTS

(Apr-Aug 2022-23 Vs Apr-Aug 2021-22)



Plastics	Apr-Aug 2021-22	Apr-Aug 2022-23	% change
PVC	600	740	23.3
PP	415	540	30.1
HDPE	260	415	59.6
LLDPE	205	305	48.8
LDPE	121	122	0.7
PA	84.3	108	28.1
PC	77.3	88.4	14.4
CPVC	49.6	87	75.4
EVA	72.4	79	9.1
ABS	42.4	57.7	36.1
PS	10	35.8	258
POM	21.6	25.9	19.9
PVC paste	16	25.2	57.5
Epoxy	14	18.4	28.7
PMMA	10	12.8	28.0
PBT	16	12.2	-23.8
UHMWPE	3.0	4.2	40.0
PTFE	1	1.8	38.5

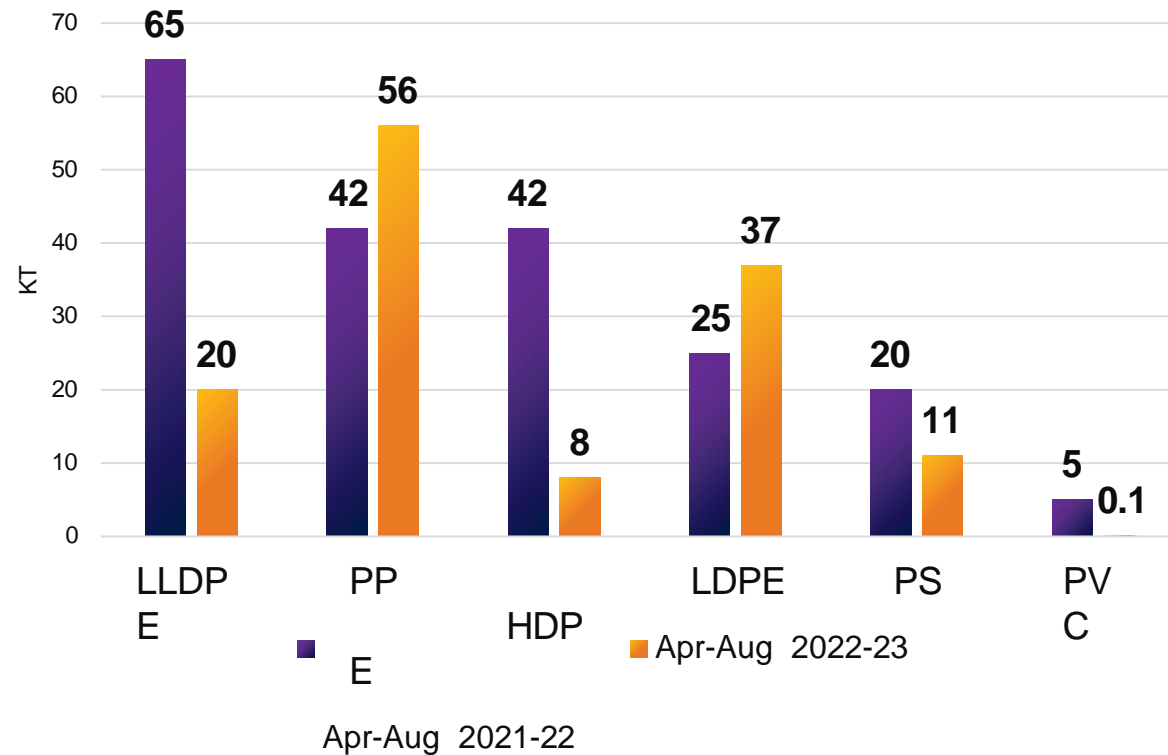
All Fig in
KT

**Surge in the Imports of Raw
Materials**

Source: <https://tradedat.commerce.gov.in/meidb/default.asp/Industry Estimate>

MAJOR PLASTICS RAW MATERIAL – EXPORTS

(Apr-Aug 2022-23 Vs Apr-Aug 2021-22)

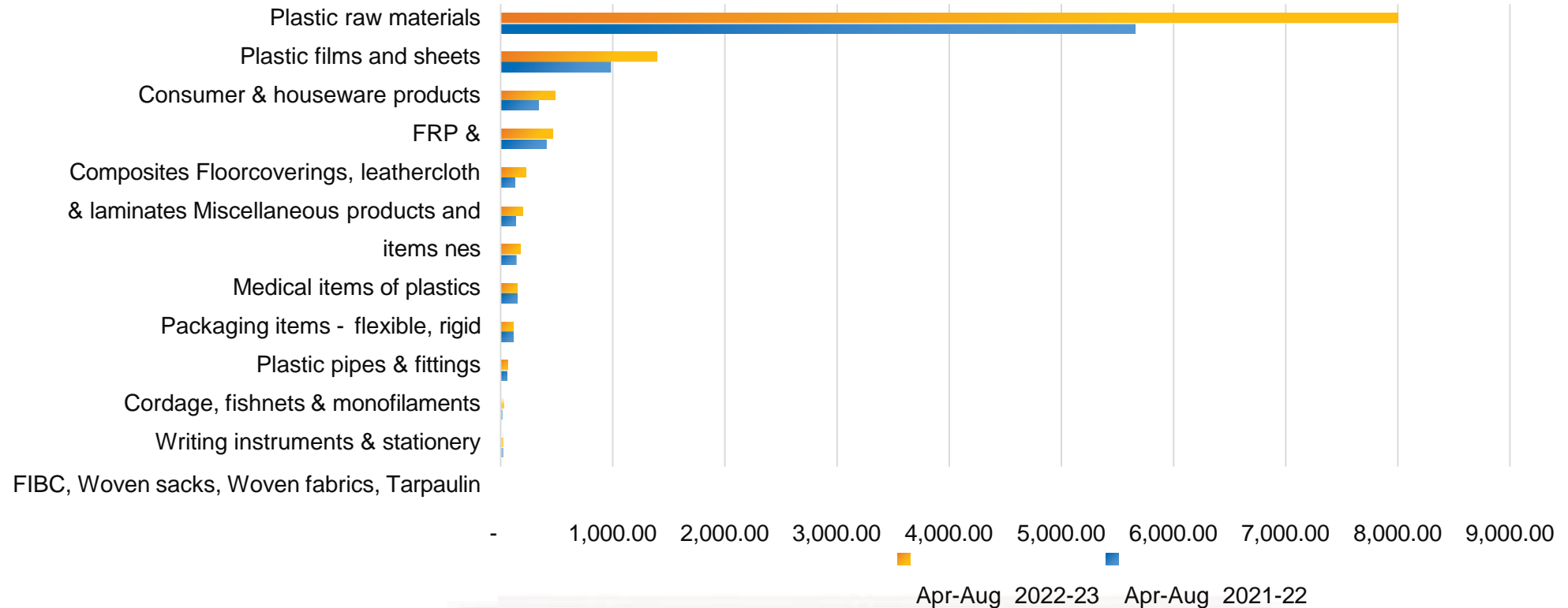


All Figs in KT

Major Plastics Exports in Apr - Aug 2022-23 Lower than 2021-22 Same Period

Source: <https://tradedat.commerce.gov.in/meidb/default.asp/Industry Estimate>

RAW MATERIALS & FINISHED GOODS – IMPORTS (Apr-Aug 2022-23 vs Apr-Aug 2021-22)



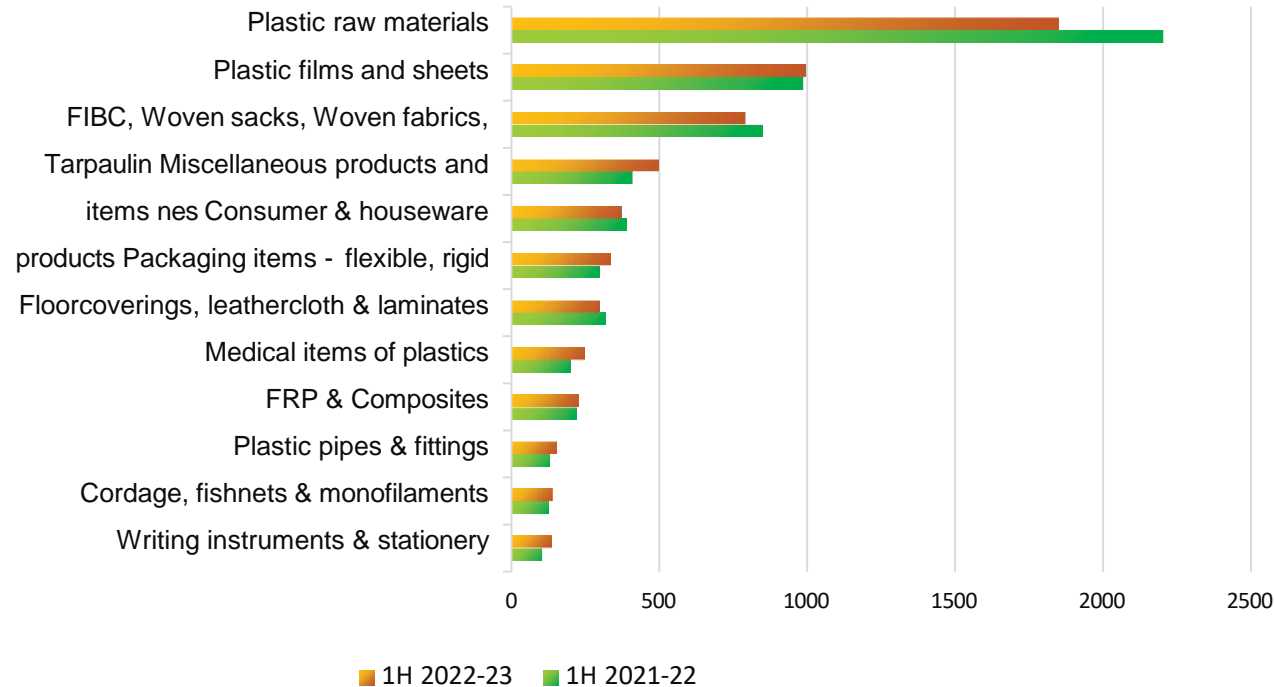
Plastics Raw Material Imports grown by 41%

Value in Mn USD

APR-AUG 2022-23 Total Imports USD 11.34 Bn, 39% Growth over Apr-Aug 2021-22

Source: Plexconcil

RAW MATERIAL & FINISHED GOODS – EXPORTS (1H 2022-23 Vs 1H 2021-22)



16% decline in Raw material Exports in value terms in 1H 2022-23 Over 1H 2021-22

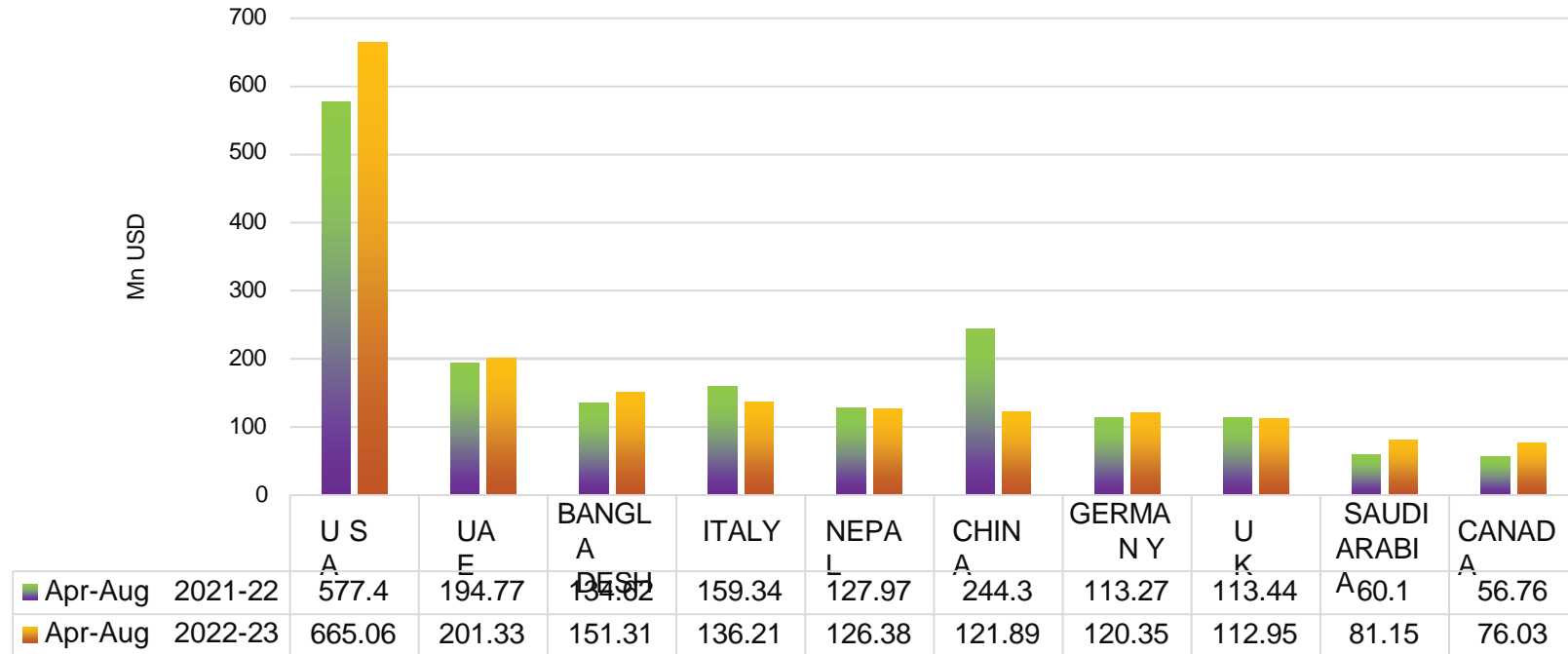
Value in Mn USD

Total Exports 1H 2022-23 USD 6.04 Bn, 3% Decline over 1H 2021-22

Source: Plexconcil

CHAPTER 39 COUNTRY WISE – EXPORTS

(Apr-Aug 2022-23 Vs Apr-Aug 2021-22)



Exports to 189 Countries and top 10 accounts for 50%

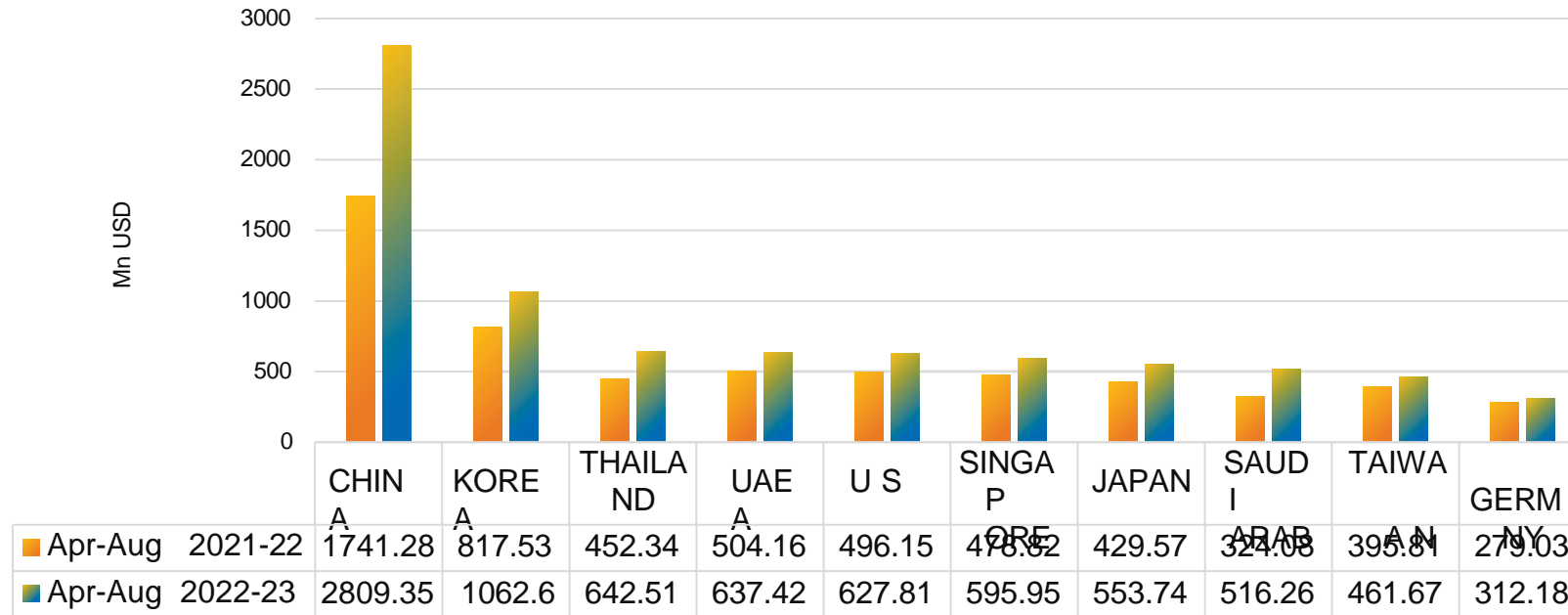
Value in Mn USD

5% Decline in Exports in Value Terms



Source: <https://tradestat.commerce.gov.in/meidb/default.asp/Industry Estimate>

CHAPTER 39 COUNTRY WISE – IMPORTS (Apr-Aug 2022-23 Vs Apr-Aug 2021-22)



Imports from 103 Countries, Top 10 Countries account for 79%, 38% overall growth in 5-month

Value in Mn USD

27% of Imports from China, 61% Growth

Source: <https://tradedat.commerce.gov.in/meidb/default.asp/Industry Estimate>

PLASTICS MACHINERY DEMAND – INDIA

(1H 2022-23 Vs 1H 2021-22)

Description	No. of Machines		
	1H 2021-22	1H 2022-23	Growth %
IMM	5,105	5,075	- .0.6%
Extrusion	1,748	1,910	9.3%
BMM	447	480	7.4%
Total	7,300	7,465	2.3%

Description	Investment in INR Crores		
	1H 2021-22	1H 2022-23	Growth %
IMM	1,833	1,900	3.7%
Extrusion	2,225	2,329	4.7%
BMM	267	270	1.2%
Total	4325	4,500	4%

Demand for Machinery was flat

Source : Industry Estimate/PMMAI

AUXILIARY EQUIPMENT INDUSTRY – INDIA

(1H 2022-23 Vs 1H 2021-22)

Auxiliary Equipment's in Plastics Industry			
Machinery	1H 2021-22	1H 2022-23	Growth %
Chilling plant	6000	7200	20.0
Mould temp. Controller	1000	1250	25.0
Drying System			
- Hopper Dryer	4500	6000	33.3
- Dehumidified Air Dryer	700	950	35.7
Raw Material Conveying System			
- Hopper Loader	8000	11000	37.5
- Central Conveying System	150	200	33.3
Volumetric/Gravimetric Blending System	900	1200	33.3
Conveyor Belt with Counting System	700	1000	42.9
Granulator	3500	4400	25.7
Robot	550	600	9.1
Hot Runners	800	1000	25

All in Fig.

Good Growth due to Automation and Industry 4.0 Demand

Source : Industry Estimate

1H 2022-23 Plastics Industry Trend

Plastics Industry

- Commodity and Engineering Plastics are witnessing Growth.
- Imports of Plastics Raw Materials having double digit growth while exports have declined
- China continue to be largest for imports and USA is largest destination for exports.
- Masterbatch / Additive Industry is in line with Industry growth.
- Thermoset plastics is having moderate growth over last year H1.
- Sectors like Automotive, Appliances, Infrastructure, Electrical & Electronics are experiencing Good Growth.
- Order booking for machinery and moulds are good and in line with Plastics Industry. All Electric Injection Moulding Machines are gaining Market Share.
- Auxiliary Industry is having High Growth due to Automation and Industry 4.0 requirements.

Plastics Industry in 1H 2022-23 is in Growth Trajectory as Estimated

SECTOR WISE GROWTH OPPORTUNITIES- INDIA



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 7%

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 Driver

- 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/PET(including cast and Biaxially oriented) as such or in combination with Aluminum 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/PE
Secondary Packing for Electronic Goods	EPS Foam, PE Bubble film, PE Foam
Water bottle, Smaller Oil Container, Beverages, Water Can /Medicine etc.	PET

PACKAGING CONTD...

TECHNOLOGICAL DEVELOPMENTS IN PACKAGING

INDUSTRY

- Specialty film and laminates
- Multi-layer films
- Multi-layer blow moulded containers
- Injection moulded containers
- Roto moulded containers
- Bulk containers
- Thin-wall glass containers
- Thin-wall metal containers

Current

Trends

- Growth in consumer packaged goods
- Growth of organized retail
- Increasing use of Flexible Packaging
- Coding and marking
- Aseptic Packaging
- Usage of recyclable packaging material
- Vacuum Packaging
- Modified Atmosphere Packaging
- Aerosol packaging
- Skin Packaging
- Shrink and Stretch Packaging
- Tamper evident Packaging

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 like Geo grids, Gabions, Pond liner, reinforcement, soil erosion control products, 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 moulded water & chemical tanks, buried roto molded /FRP septic tank, ducts wire & cable etc.,

MAJOR GROWTH DRIVERS/ ADVANTAGES

- Govt. Projects like Bharat Mala Pariyojana (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

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

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, etc.
Industrial/ hospital floorings	Epoxy, PVC etc.
Geosynthetics in Roads / Railways	PE, PP, PET etc.
Others	FRP, Engineering plastics like PPO, POM, PC, Polyester, Styrenics including all Commodity Plastics



AGRICULTUR E



AGRICULTURE - HIGHLIGHTS

- The largest producer of spices, pulses, milk, tea, cashew and jute
- Largest Producer of Ginger, Okra and ranks second In production of Potatoes, Onions, Cauliflowers, Brinjal, Cabbages.
- First In Production Of Bananas (26%), Papayas (44%), Mangoes and Guavas (46%)
- The largest livestock population of around 535.8 million, which translated to around 31% of the world's livestock population.
- Second-largest producer of wheat, rice, fruits and vegetables, sugarcane, cotton and oilseeds.
- In the 2020-21 crop year, food grain production reached a record of 305.4 million tonnes. For FY2021-22, the government targeted to increase production by 3.9%.
- The total agricultural and allied products exports stood at US\$41.25 billion in FY21.
- Government aims to raise fishery export from India to Rs.1 lakh crore (US\$13.31billion) by 2024-25.



India produced 205 MMT Vegetables & 107 MMT Fruits in 2021-22

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 moulding , Thermoforming etc.,

TYPES	MAJOR PRODUCTS
Green house	PE film, PC sheets, PP trays, PE drip lateral, Plastics pipes etc.
Drip lateral	PE drip lateral pipes, 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, Thermoformed trays etc.

AGRICULTURE CONTD...

Major Benefits of Plasticulture

- Water Conservation up to 60-70%
- Yield Improvements 50-60%
- Improvement of Quality of Produce
- Fertilizer Saving up to 40%
- Govt. subsidy/Initiatives
- Appreciable reduction in post harvest losses
- Cold Desert/Wasteland can be made productive



**Ensuring Food Security for the
Country**

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)	165	74	50	25	15	90	25	75	5
Usage level India (Penetration)	20%	15%	5%	10%	10%	15%	8%	55%	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

NEW TRENDS

- Largest manufacturers of farm equipment like tractors, harvesters and tillers.
- Government initiative for farm mechanization & Contract Farming
- Surge in demand for Fruits and Vegetables as a result of shift in consumption.
- Food processing companies serving health and wellness as a new product.
- Global footprint through e-tailers.
- Use of drones in agriculture
- Product innovation on ready to eat categories.
- small farmers brought under digitalisation for input sourcing and agricultural produce marketing



APPLIANCES & CONSUMER ELECTRONICS (ACE)

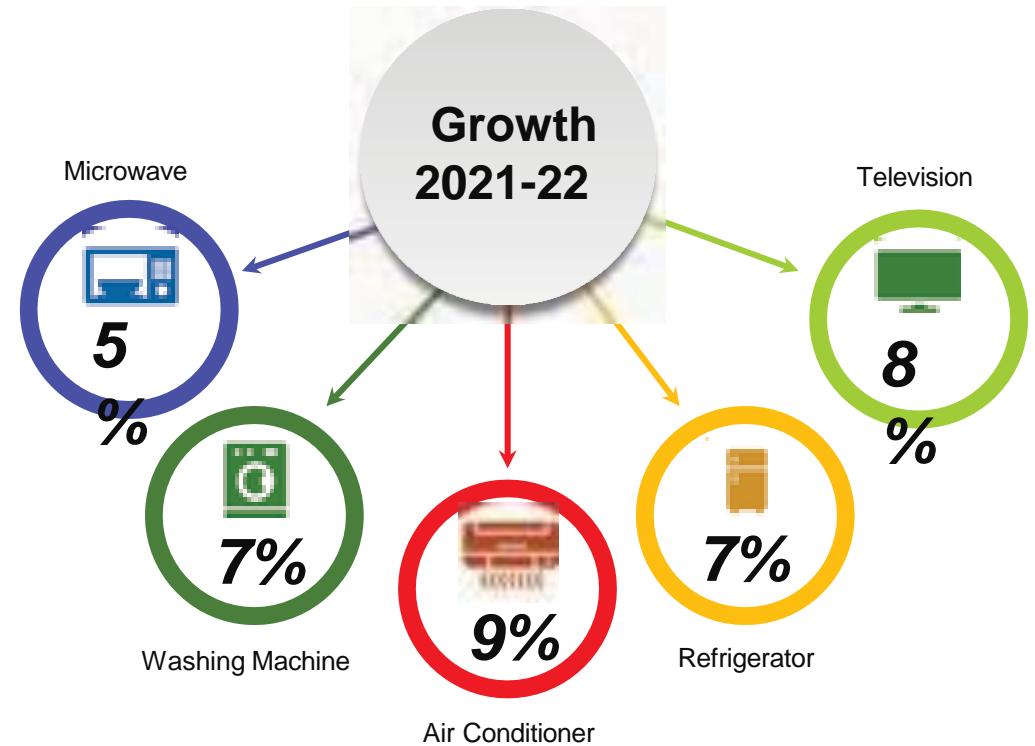


APPLIANCES & CONSUMER ELECTRONICS (ACE)

Major Products

- TV/Washing Machine/Refrigerator/AC/Microwave
- Smart phones/other brown goods -
Fan/Iron box/Mixer/Dryer etc.,

Appliances Industry Size in 2021 FY ~13.66 bn USD*



*Mobiles and Brown Goods not included

2021-22 Avg. Growth 7.5% 2022-23 (E) Avg. Growth 11%

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.

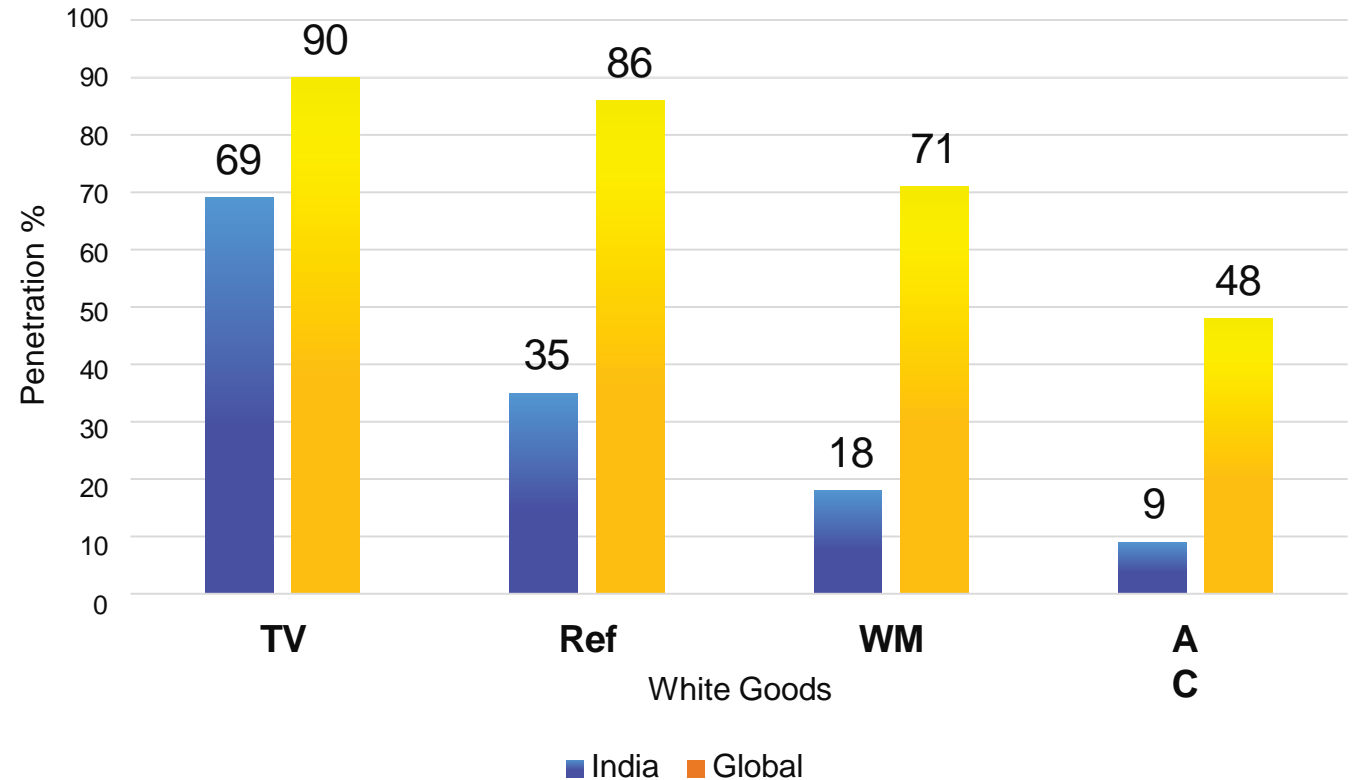
TYPES	NAJOR PRODUCTS
WM	Outer body/Tub/ Pulsator/Top lid/Drainage pipe/ Inner drum/dryer cap/PCB etc.,
Refrigerator	Liner/vegetable Trays/ Handle/ ice cube holder/Table top/ Lamp holder etc.,
AC	Indoor unit cover/ Louver/ Remote control unit/ separator etc.,
TV	Outer cabinet/ Back cabinet/ PCB/Remote 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
- Rapid technology upgradation
- Low life cycle
- Economic growth



Source: PWC report on –Future of Electronics & Consumer durable in India – Changing landscape/ Industry estimate

APPLIANCES & CONSUMER ELECTRONICS (ACE) CONTD...

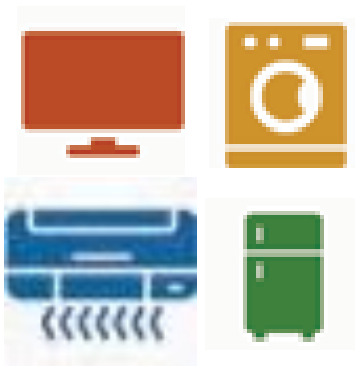


100%
FDI PERMITTED



\$13.660
Bn

INDUSTRY SIZE



\$21.18 Bn

INDIAN APPLIANCE AND
CONSUMER
ELECTRONICS
INDUSTRY IN FY25 (Est.)

MAJOR APPLIANCES	PRODUCTION MILLION 2021-22
TV	17.5
WM	8.5
Refrigerator	15
AC	7.5

TOYS

- Indian Toys Industry is estimated to be \$1.5 bn making up 0.5% of global market share.
- Mostly located in NCR, Maharashtra, Karnataka, Tamil Nadu + clusters across central Indian states.
- It is fragmented with 90% of the market being unorganized and 4,000 toy industry units from the MSME sector.
- The domestic toy demand is forecasted to grow at 10-15% against the global average of 5%.
- Exports in 2019-20 was 130 Mn USD



**100% FDI
Permitted**

AUTOMOTIV E



AUTOMOTIVE

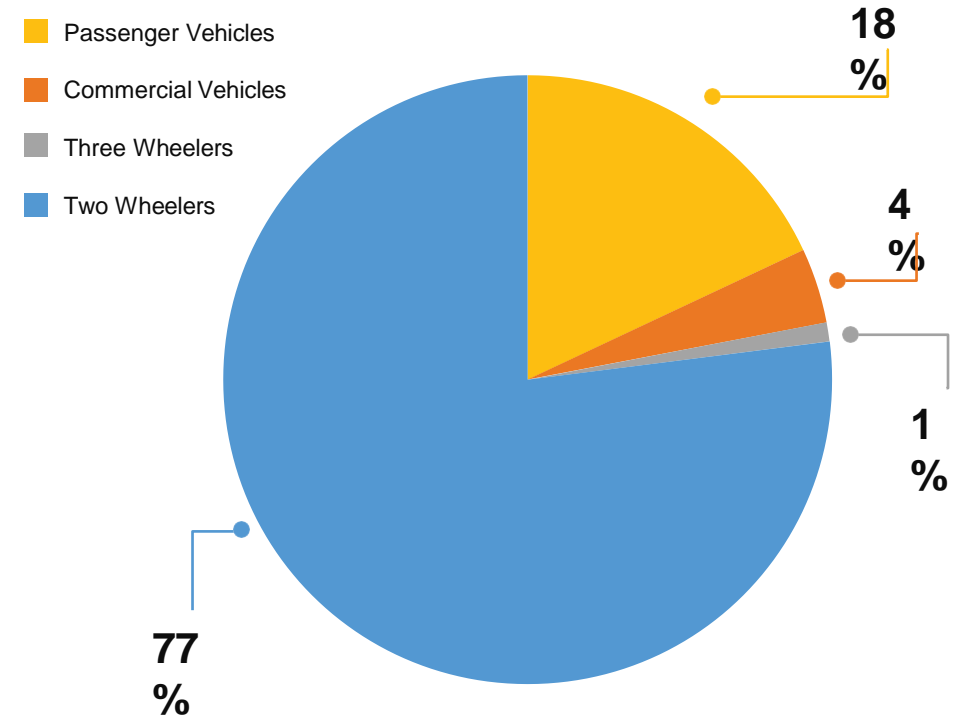
Major

Products

- Passenger vehicles(PV), Commercial vehicles(CV), Three wheelers (3W), Two wheelers (2W) and
- Quadricycle Production 2021-22 - 22933230 vehicles (22.93 million)
- Overall Growth in 2021-22 + 1.22% Over 2020-21

Break up of Growth - PV +19.2%, CV+28.9%, 3W+ 23.3%, 2W -3.5% Quadricycle + 5.9 Export +35.88%

DOMESTIC MARKET SHARE FOR 2021-22



Fourth Largest in Passenger Vehicle Production...

Major Plastics Types

PP/PE/ABS/POM/PA/PVC/PC/PU/FRP/PBT/PPS/ASA/PPO etc
virgin/filled and reinforced grades 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/compression molding etc.

TYPES	MAJOR 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, glove box, Lever, trim clips, filter cases, valves 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

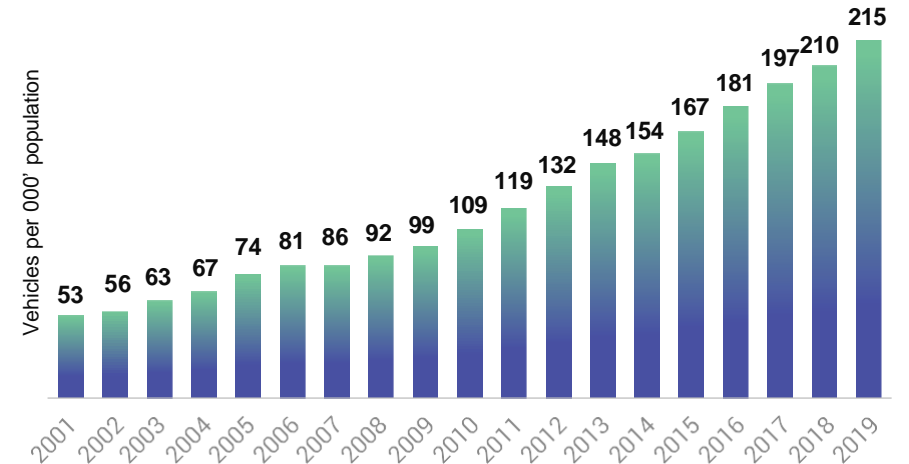
Drivers

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

Automobile Production Trends

Category	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22
Passenger Vehicles	3,801,670	4,020,267	4,028,471	3,424,564	3,062,280	3,650,698
Commercial Vehicles	810,253	895,448	1,112,405	756,725	624,939	805,527
Three-wheelers	783,721	1,022,181	1,268,833	1,132,982	614,613	758,088
Two-Wheelers	19,933,739	23,154,838	24,499,777	21,032,927	18,349,941	17,714,856
Quadricycle	1,584	1,713	5,388	6,095	3,836	4,061
Grand Total	25,330,967	29,094,447	30,914,874	26,353,293	22,655,609	22,933,230

The number of registered Motor Vehicles per 1000 Persons



Sources:

1. Offices of State Transport Commissioners/UT Administrations
2. Population – Report of the Technical Group on Populations Projections constituted by National Commission on Populations, Office of Registrar General & Census Commissioner, India

AUTOMOTIVE CONTD...

Penetration level in Top 10

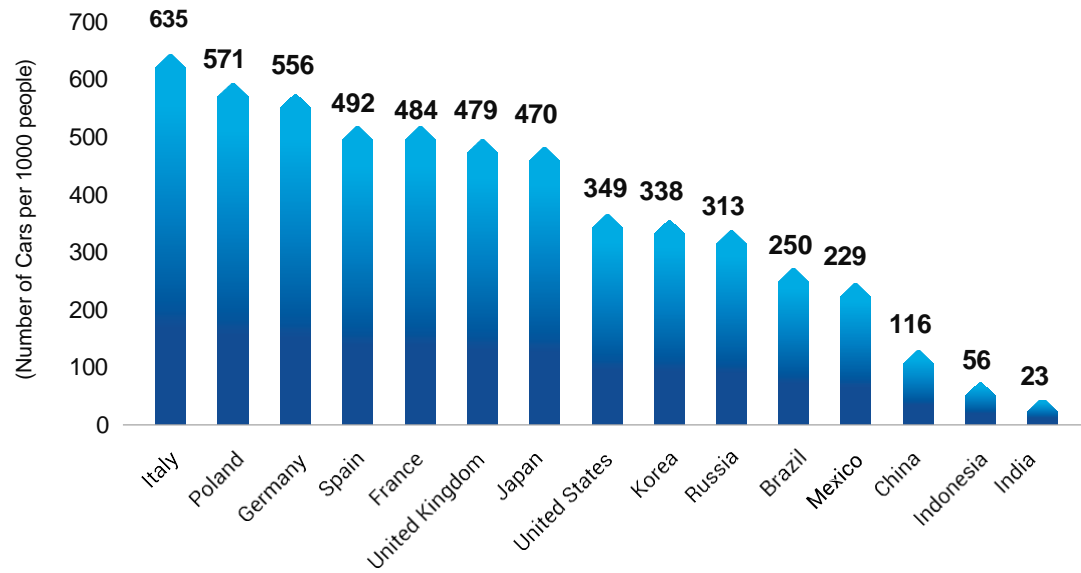
Countries Country	Total Vehicles in use	World Rank	Total Vehicle penetration per '000 people	Passenger cars			Buses and Motor coaches			Motorcycles & Mopeds		
				Total	Rank	Penetration per '000 people	Total	Rank	Penetration per '000 people	Total	Rank	Penetration per '000 people
United States	26,01,19,703	1	804	11,29,61,266	2	349	9,76,161	5	3	86,79,380	7	27
China	18,45,01,356	2	134	16,04,83,935	1	116	22,98,484	2	2	6,82,61,220	3	50
Japan	7,73,01,798	3	609	6,08,31,892	3	479	2,30,603	9	2	1,12,15,300	5	88
Brazil	6,85,11,508	4	330	5,20,04,134	4	250	9,84,847	4	5	2,53,11,251	4	122
Russia	5,23,37,486	5	363	4,51,63,201	6	313	8,74,382	7	6	22,66,183	12	16
Germany	5,09,64,751	6	619	4,58,03,560	5	556	78,949	14	1	43,14,493	8	52
Italy	4,33,23,517	7	715	3,85,15,701	7	635	98,623	12	2	97,40,471	6	161
India	4,25,15,000	8	32	3,02,42,000	10	23	17,57,000	3	1	16,89,75,000	1	128
Mexico	3,99,45,510	9	313	2,91,64,157	11	229	3,65,419	8	3	29,87,057	10	23
France	3,91,18,000	10	585	3,23,90,000	8	484	91,000	13	1	NA		NA

All 2018 data

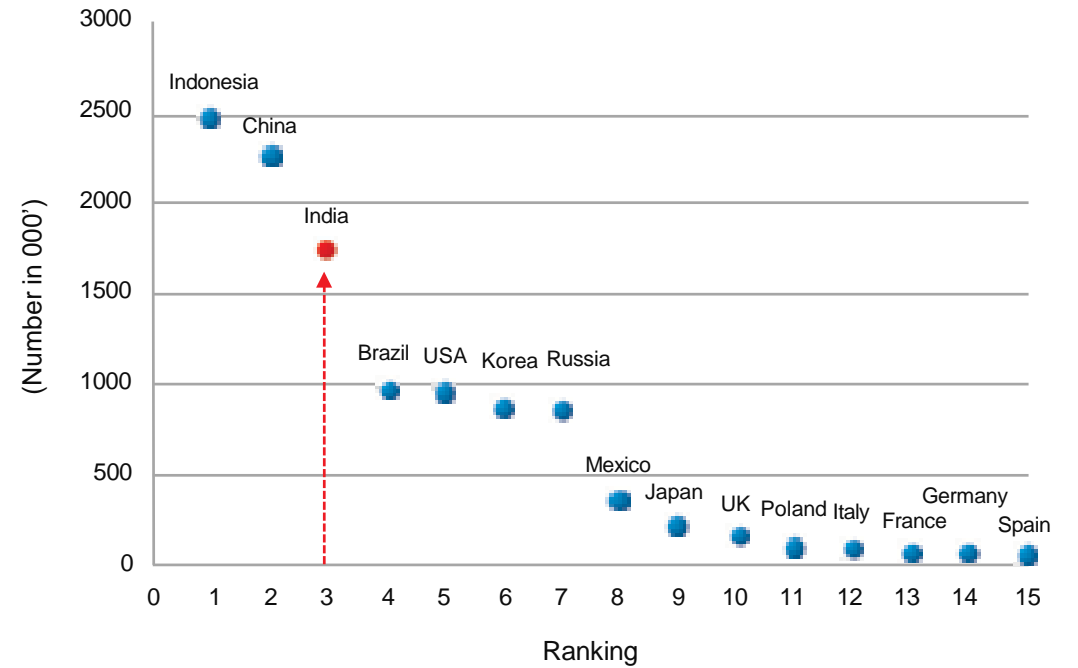
Source <https://morth.nic.in/sites/default/files/RTYB-2017-18-2018-19.pdf>

AUTOMOTIVE CONTD...

Country-wise total number of passenger cars penetration per 1000' people



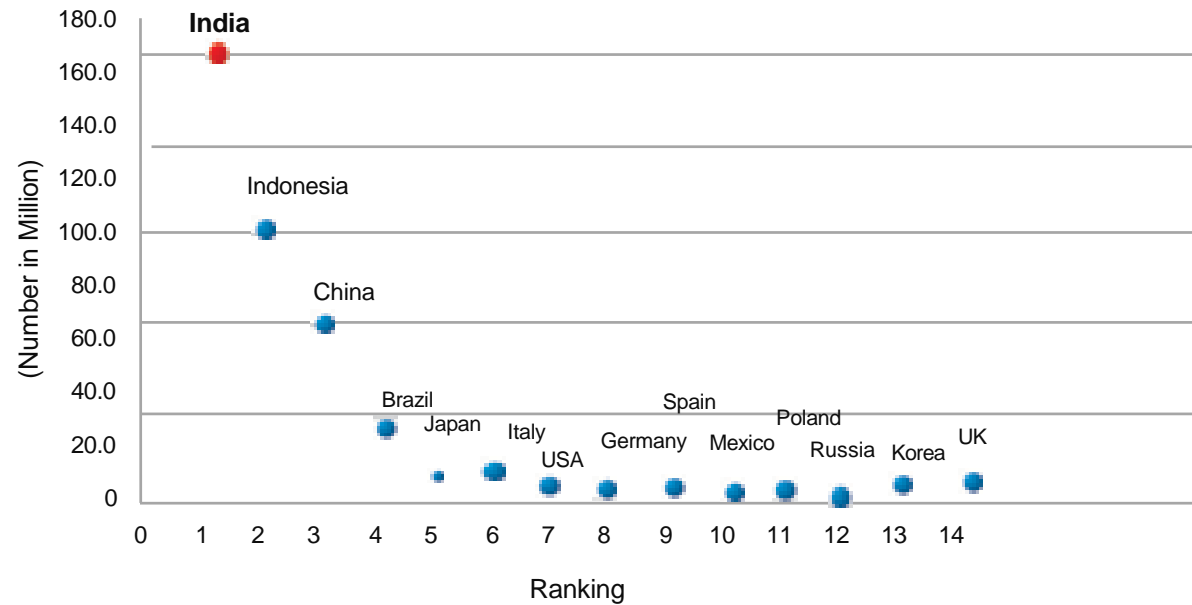
Country wise distribution of Number of Buses and Motor Coaches



All 2018 data

AUTOMOTIVE CONTD...

Chart 5.6: Country wise distribution of
Number of Motor Cycles and
Mopeds



All 2018 data

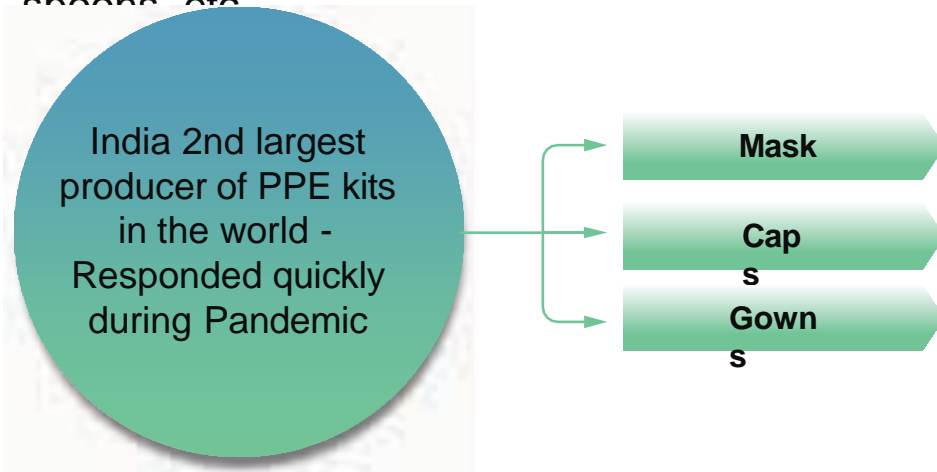
<https://morth.nic.in/sites/default/files/RTYB-2017-18-2018-19.pdf>

HEALTHCAR E

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, orthopedic pads, prosthetics, spectacle frames and lenses, endoscope mouthpiece, blood collection tubes, ECG electrodes, plastics tweezers, beakers, funnels, scoops and spoons etc.



HEALTH CARE CONTD...

Major Plastics Types

PP/PE/ABS/POM/PA/PVC/PS/PET/PC/PU/PTFE/PPO/PEEK etc.

Why plastics?

- Sterilizable
- 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 pack etc.	PVC
Parts in heart valve/knee joints etc.	High Performance Plastics

HEALTH CARE CONTD... GROWTH DRIVERS

Growing

Population

- Set to touch 1.45 billion by 2028, making it the world's most populous nation

Life Expectancy

- From the current 67.5 years, life expectancy in India is expected to increase to 70 years by 2025

Growing Middle Class

- ~73 Million households will be moving into the middle-class over the next 10 years, - Enhanced purchasing power, including Medical Devices

Health Insurance

- Approx. 20% of Indians have health insurance cover. This number is expected to increase

Ranked 7th in the top 20 wellness tourism markets globally and 3rd in Asia-Pacific

Rise in Medical

Tourism

- Due to the relatively low cost of medical care in India, it is experiencing a 22-25% growth.
- It contributes over \$2Bn to the healthcare market in India.
- Increased demand for healthcare and medical devices from rise in medical tourism.

Infrastructural Development

- 4 medical devices parks in India are in pipeline

Policy Support & Incentives

- 100% FDI allowed in Greenfield & Brownfield projects

HEALTH CARE CONTD... GROWTH DRIVERS

- Around 60 Million diabetics and may swell to 90 Million by 2025.
- Estimated that every fourth individual aged above 18 years has hypertension.
- Nearly 5.8 Million die from NCDs (heart and lung diseases, stroke, cancer and diabetes) every year.

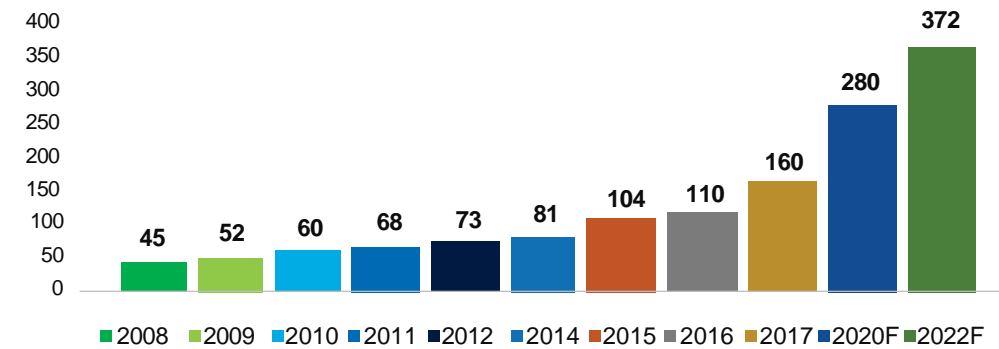
The rising NCD estimated to cost USD 4.58 Trillion before 2030.



Potential for Syringes, Blood and Urine bags, Masks, Caps etc.,

2021 India has 1.3 hospital beds per 1,000 – Target 3 Million beds (3 beds per 1,000 by 2025) - Potential for Medical Beds

Growth Trend of India's Healthcare Sector (USD Billion)



Note: Compound Annual Growth Rate (2008-2022): 16.28%

HEALTH CARE CONTD... MEDICAL DEVICES

Medical devices are segregated into five major segments

- Consumables & Disposables - Needles and syringes
- etc., Diagnostic Imaging - MRI, X-Ray, Ultrasounds,
- etc., Dental Products includes - Dentures, braces etc.,
- Orthopaedics & Prosthetics - Knee implants, artificial joints
- Patient Aids include hearing aids and pacemakers etc.,



HEALTH CARE CONTD... MEDICAL DEVICES

- Medical devices represent a sunrise sector
- Market size is est. USD 11 Billion, expect to grow to USD 50 Billion by 2025
- CAGR of 15% over the last 3 years
- India is the 4th largest medical devices market in Asia - top 20 markets globally of 6,000 types of medical devices - India imports nearly 86%



Category		2015-16	2016-17	2017-18	2018-19	2019-20
Medical Devices (USD Million)	Exports	606	621	683	823	986
	Imports	1,326	1,351	1,525	1,765	1,766

Imports and Exports in India's Medical Devices Sector

TRENDS



3D PRINTING

- 3D printing is one type of manufacturing process for making a three-dimensional solid product.
- This utilizes a digital file containing 3D model of the intended product, polymer and a typical 3D digital printer connected thru a software.
- It is also called additive manufacturing (AM) in which the intended product is first digitally sliced into number of layers and the object is printed layer by layer successively using a polymeric material.
- It is typically like any other digital printer except that the sliced layers are built one over another sequentially to the required 3D shape.
- The addition of material can happen in multiple ways like powder deposition/ resin curing/filament fusing.



3D printing produces complex shapes using less material than traditional manufacturing methods.

3D printing is the opposite of subtractive Manufacturing...

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/Website

3D PRINTING CONTD...

Major types

There are seven types of additive manufacturing processes.

These are

- Fused deposition modeling (FDM)/Fusion Filament Fabrication (FFF)
- Stereolithography (SLA)
- Digital Light Processing (DLP)
- Selective Laser Sintering
- ~~SLM~~ Selective laser melting (SLM)
- Laminated object manufacturing (LOM)
- Digital Beam Melting (EBM)



The major Polymer materials in use are:
PLA,ABS, PA,PET-G,PC,TPU/TPE,
HIPS,

Other specialty materials are : ASA/ PC-ABS blend
/PPSF/PPSU/PEI /PVA.

Resins/photocurable /Photosensitive liquid materials
Forms available: Filament/Powder/Liquid resins

**The most common types of 3D Printing techniques-FDM/FFF, SLA,
SLS.**

3D PRINTING CONTD...

Applications

Automotive

- Account for the largest share in this market due to its ease of applications in the production of end-products (spare parts, engines, other interior, and exterior parts).

Health care

- For Production of customized implants, devices, dental crowns etc.,

Consumer

- For electronic gadgets, jewelry, shoes, cosmetics products, toys, furniture, office accessories, musical instruments, bicycles, and food products etc.,
- This technique is primarily aimed for low volume production of high value products with complex geometries, functional & rapid prototypes, tooling, lightweight components, on demand production, fast product development etc.,



Witness growth of around 30% in India currently.

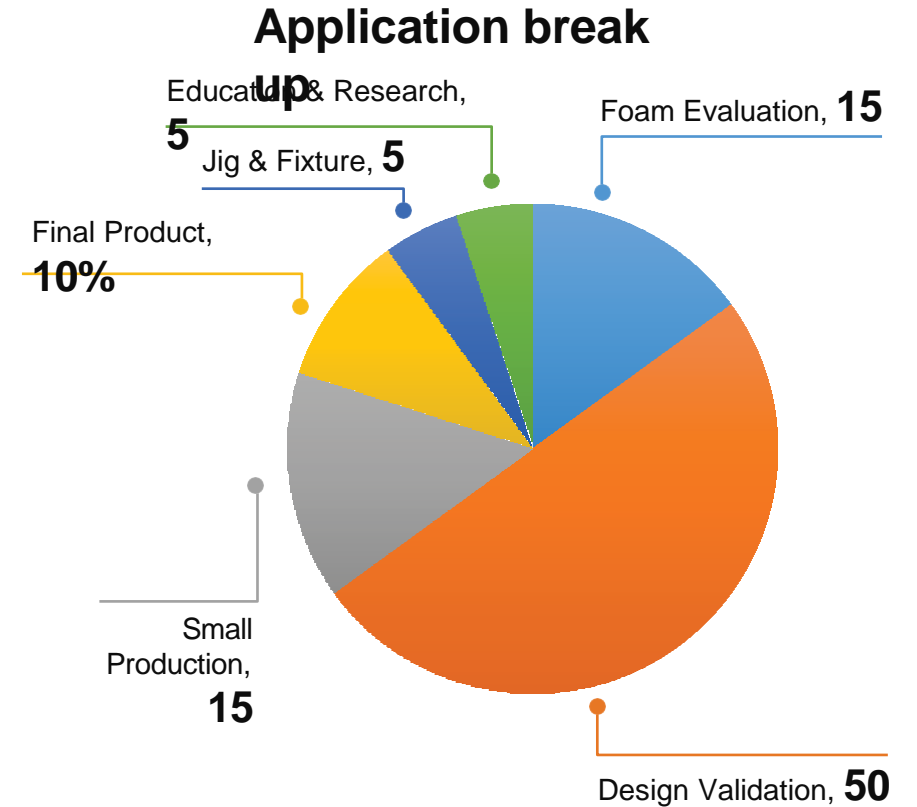
3D PRINTING CONTD...

Est. Global AM market size USD 2020 : ~ US\$14 Billion
 Est. to reach in 2027 : ~ US 41 Billion
 India Market share ~4%
 India Growth - 30%
 No. of major manufacturers in India 40 +

National strategy for additive manufacturing” published by Ministry of Electronics and Information Technology in Dec 2020.

The Genesis of the National Strategy

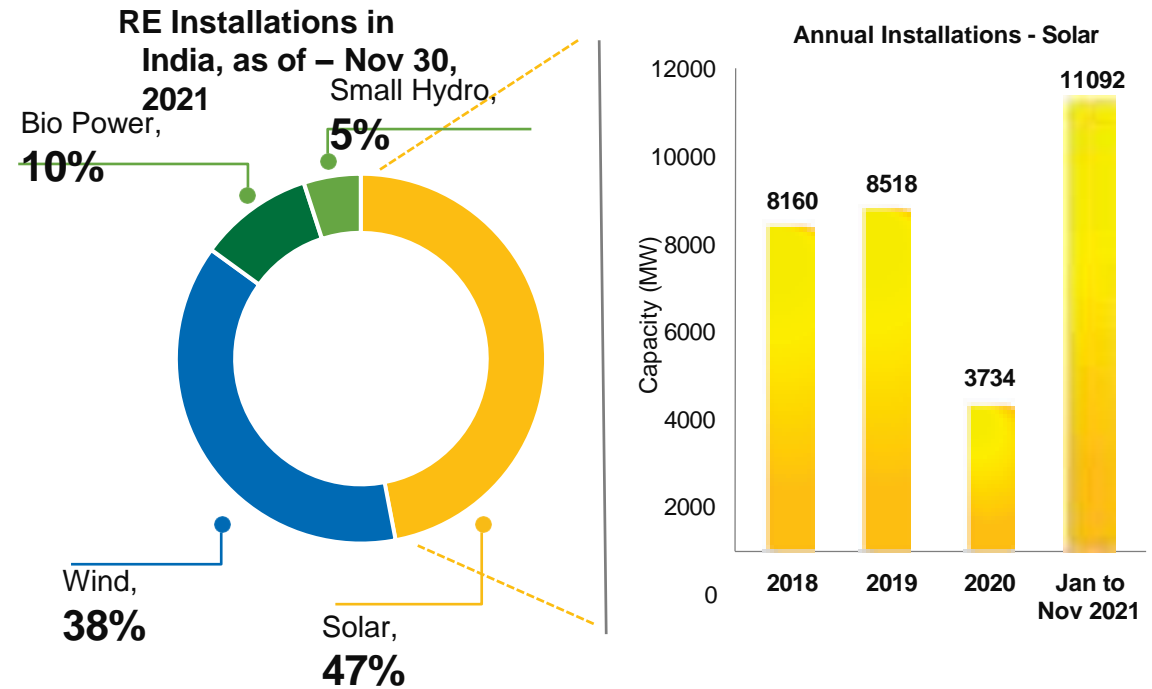
- are: Aim to create a conducive ecosystem.
- To overcome technical and economic barriers Facilitating development of the domestic market and enhancement of global market share.
- Seek to encourage and promote local manufacturers support base for foreign companies.



Photopolymers, Powders and >80% of Filaments are currently being imported...

RENEWABLE ENERGY HIGH GROWTH OPPORTUNITY

- India's Total renewable capacity reached to 104GW & solar contributes to 47% share
- India takes 4th position in World's Total Renewable Energy (RE) Capacity in Aug'2021
- Ranked fourth in wind power, fifth in solar power
- 50GW is under installation in 2022 & 27 GW in tendering



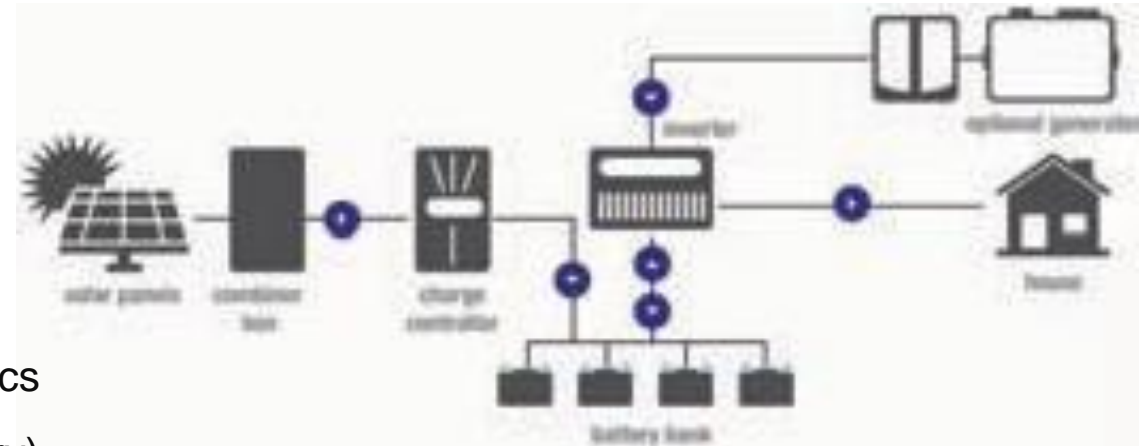
As of January 2022, India's installed renewable energy capacity stood at 152.36 GW, representing 38.56% of the overall installed power capacity

India has ambitious plans to reach RE 450GW target by 2030.

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 here : 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 49GW+ so far .
 - Plastic consumption: >20KT required for 100GW, however mostly Imported.



Targeting ~ 450 Gigawatt (GW) of installed renewable energy capacity by 2030 – about 280 GW (over 60%) is expected from solar

WIND ENERGY

HIGH GROWTH OPPORTUNITY CONTD...

- India Ranks 4th in Wind Energy Installation Globally
- (2021) Wind Power Potential is over 695 GW at 120 m
- Hub Height
 - Over 34000 Turbines (Windmill) installed with 39.24 GW Vs China 343.8 GW
- as of 2021.
 - As of 2021, the wind energy constitute 10% of total Power produced which
- thermal energy being the largest at 59% in India.
- Growth in 2021 over 2020 was 3.8%
 - Turbine capacity ranges from 250 KW to 3.5 MW. Future range estimated to be
- 4.5 KW with 160-meter rotor diameter.
 - About 45 manufacturing units with 60 Turbines models and 16 R&D center
- operating in India
- Only country to have a dedicated Ministry
 - Clean and non-polluting fuel source without water requirement



Major FRP Usages in Blades and Cones of Wind Mill

LEDs

- Launched in 2015, the Unnat Jyoti by Affordable LEDs for All (UJALA) & Street Lighting National Programme (SLNP).
- In a short span of three years, has emerged as the world's largest lighting replacement programme.
- Government aggressively driving projects/specifications & Implementing standards.
- By product, India LED lighting market is segregated into; LED Street Lights, LED Tube Lights, LED Bulbs & Lamps, LED Luminaries, LED Down-lights.
- As of 16th May 2022 , total LED distributed stands at 367.9 millions under UJALA.
- The Indian LED lighting market reached a value of US\$ 2,754 Million in 2021.
- Bulk requirements for Railways, Airport authority, Highways & other large usage projects

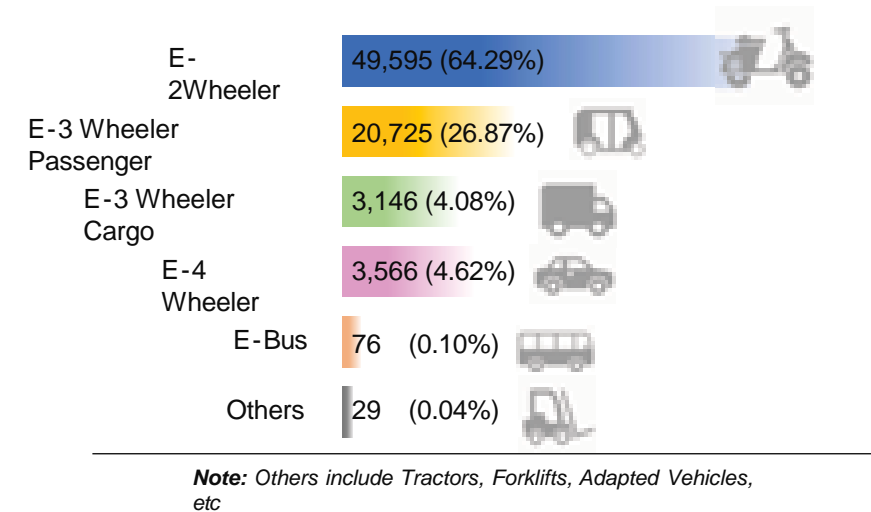


Growth Drivers

- LED Bulbs (Retrofits) Tube lights Lamps for Engineering Plastics

EV

- Overall Growth of EV 211% over 20-21. 2W witnessed 461% growth , 3W : 98% & Cars posted
- 251% New Investments coming in India for batteries , Charging stations etc.
- Almost all major Engineering plastics viz PA, PC, PC-ABS, ABS PBT, PPO, PPS, Compounds & blends of other
- Plastics. FRP have different products & likely to witness a robust growth in Auto segment.



The number of EV as of 25th March 2022, is 10,76,420 & 1,742 Public Charging Stations (PCS)

India Focuses on EV's : Target to reach 30~40% of the car build by 2030

Source : Industry Estimate /<https://www.makeinindia.com/sector/automobiles/Evreporter.com>

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
- FRP Toilet modules /Waste bins



Over 100 million toilets in rural India targeted.

SKILL INDIA

- Skill India was launched on 15 July 2015 which aims to train over 40 crore people in different skills by 2022
- Plastics comes under Rubber Chemical & Petrochemical skill development council(RCPSCDC)
- 37 courses are being offered under Plastics
- 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



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)
 - Rotomoulded 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 /FRP)
- Envisaged usage of 8-10% waste plastic in roads will lead to improved Plastic Waste Management
- Light poles/Multiutility poles /Manhole cove, decorative cladding/ water proofing for Green Building in FRP



Status as of May 2022
100 cities, 5151 projects, 2.05
lakh crore amounts

Status as of May 2022 - 100 cities, 5151 projects, 2.05 lakh crore amounts

NATIONAL MISSION FOR CLEAN GANGA (NMCG)

- Clean Ganga Mission aims at making Ganga pollutants free and to re-develop its ecological system. It involves, sewage infrastructure, solid waste management, river front development, afforestation
 - 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
 - Piping /Tanks/Filter system with FRP
- River Clean up System (RCS) will generate Waste Plastics stream for recycling.



NATIONAL 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 /Advance composite estimated Potential ~ 250 KTA
 - India ranks among the top 10 countries in the world
 - It allocates 1.8% of its GDP to defense spending
- Only 35% of defense equipment manufacturers in India with large import component.



Source : Industry Estimate

<https://idstch.com/geopolitics/indian-offset-policy-still-overcome-challenges-achieve-target-worth-usd15-billion-defence-offset-work-next-decade/>

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 -
FRP poles / Radomes



To transform India into a digitally empowered society and knowledge economy.

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 (Thermoplastics & Thermosets)
- 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



21 sectors have been identified under this scheme...

Source : Industry Estimate <https://www.makeinindia.com/sectors/>

PRADHAN MANTRI AWAAS YOJANA (PMAY URBAN & RURAL)

- Introduced in 2016, PMAY-U aimed to provide 'Housing for All by 2022' by establishing 1.14 crore houses for urban poor across the country over the next seven years (between 2015 and 2022).
- Launched in November 2016, PMAY-G was designed to support 'Housing for All by 2022 by building 2.95 crore houses for rural poor across the country by 2022.
- PMAY will increase the consumption of:
 - Plastic article such as UPVC Pipe & Fitting, wires & Cables, White goods, Plastic doors etc., ~ 150 KTA
 - Low cost housing using FRP panels/ shelters



52.55 lakh house completed under PMAY-U as of Nov 2021
1.71 crore houses completed under PMAY-G as of 2nd Feb
2022...

ATAL MISSION FOR REJUVENATION AND URBAN TRANSFORMATION (AMRUT 2.0)

- (AMRUT) launched in June 2015 with the focus to establish infrastructure that could ensure adequate robust sewage networks and water supply for urban transformation by implementing urban revival projects.
- The flagship program has already invited a huge fund and participation of big companies. In AMRUT 2.0 the rest of the cities out of 500 will be finalized and implemented for the next phase.
- AMRUT 2.0 aims to provide 100% coverage of water supply to all households in around 4,700 ULBs (Urban Local Bodies).
- Potential Plastic Usage in Mission
 - HDPE/PVC Pipes, septic Tanks in FRP& rotomolded PE etc for sewage network and water Supply
 - Estimated potential would be 300 KT



PLASTICS PIPES IN NATION BUILDING

- PE/PVC/OPVC pipes for water supply networks for smart cities and AMRUT cities, Jal Jeevan Mission of Govt of India to conserve water by minimizing leakage and 24 X 7 supply.
- Large diameter HDPE/FRP pipes for Desalination plants, Sea water intake and outfall pipelines for Chemical and industrial treated effluent, raw water supply to industry & power plants, Transportation of treated sewage water for Industrial use.
- MDPE and HDPE pipes for City gas distribution network for household piped natural gas (PNG) as per Gol target to increase participation gas from 6.2% to 15% in India's energy basket.
- PVC Pipes - agriculture, water supply, plumbing, rainwater harvesting, SWR, Sewerage, electric conduits, telephone ducts
- PVC, PPr and CPVC pipes for building water supply and SWR pipes.
- PE drip and sprinkler irrigation pipes to reduce water demand per ton of agricultural produce and thereby increasing the irrigated land area for same water availability.
- PE double wall Corrugated Pipes for sewage transport network.



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



FRP pipes/Reverse osmosis membrane housing / Filters/ FRP tanks for sewage water treatment

Rural household tap connections completed as of May 2022 was 9.6 crore (50.22 %)

Source : Industry Estimate/<https://jaljeevanmission.gov.in/>

CITY GAS DISTRIBUTION NETWORK

- The push for city gas expansion is part of the government's plan for raising the share of natural gas in the country's energy basket to 15 per cent by 2030 from the current 6.2 per cent.
- As of March 2021, India had a total of 78.65 lakh piped natural gas connections and 3,094 compressed natural gas stations.
- Presently, there are 228 geographical areas authorised by PNGRB in 27 states and UTs covering approximately 53 per cent of the country's geographical area and 70 per cent of its population.
- After 11th and 11A CGD bidding rounds covering 66 geographical areas, 98% population and 88% area of the country will be covered. PNG connections to increase over 5 Crore & CNG stations to increase over 10000
- Estimated Pipe consumption for CGD Network over 500 KT by 2030
- Potential for LPG Composite Cylinders



PE RESIN REQUIREMENT FOR CGD PROJECTS UNDER 9th & 10th BIDDING ROUND

ZONE	STATES	No. of DOMESTIC CONNECTIONS			KT
		9th Round (Lacs)	10th Round (Lacs)	TOTAL	
North	Punjab, Haryana, UP, Rajasthan, Uttarakhand	59.4	41.8	101.2	133
West	Maharashtra, Gujarat, Daman & Diu	26.5	0	26.5	35
East	Bihar, Jharkhand, West Bengal, Assam, Tripura, Odisha	14.0	37.5	51.5	68
South	AP, Tamilnadu, Karnataka, Kerela, Puducherry, Telangana	115.3	102.9	218.2	287
Central	MP, Chattishgarh	5.8	16.5	22.3	29
Total		221.0	198.8	419.8	553

Additional requirement for Geographical Areas under 11th CGD bidding round.

ESTIMATED TOTAL POTENTIAL ON GOVT. INITIATIVES

GOVT. INITIATIVES	PLASTICS PRODUCTS	EST. POTENTIAL KT
Swachh Bharat	Plastics Pipes & Fittings, dust bins, water tanks, optical fiber cable ducts, Cables, PLV ducts, Doors & windows, Engineering plastics components, pharma & Food packaging, Auto components /FRP Pipes & Tanks etc.	1895
Smart Cities		1085
Clean Ganga River Mission		45
National Offset Policy for Defense Application		250
Digital India		250
Make In India		650
PMAY		150
Amrut 2.0		300
CGD		553
Jal Jeevan mission		200
Total		5378

The Estimated Potential is ~ 5.4 Million Tons.

Source : Industry Estimate

ESTIMATED VALUE OF INDIAN PLASTICS INDUSTRY 2021-22



EST. PLASTICS INDUSTRY MARKET SIZE (2021-22) - INDIA

EST. MARKET SIZE	
Description	Value in Rs Lakh Crore
Plastics Products Manufactured	3.52
Plastics Raw Material Exported	0.31
Plastics Finished Goods Imported	0.49
Recycled Plastics Products Manufactured	0.70
Additives, Fillers, Colour Masterbatches etc.	0.45
All Machinery (cumulative) & Moulds	1.62
Miscellaneous like Test Equipment etc.	0.01
Total Value (Rs in Lakh Crore)	7.1
Value (USD in Billion)@ conversion Rs 74/USD	96

Estimated 2021-22 Market Size ~Rs 7.1 lakh Crore (~USD 96 Bn)

Source : Industry Estimate / Mr. Jayesh Rambhia

MAN POWER

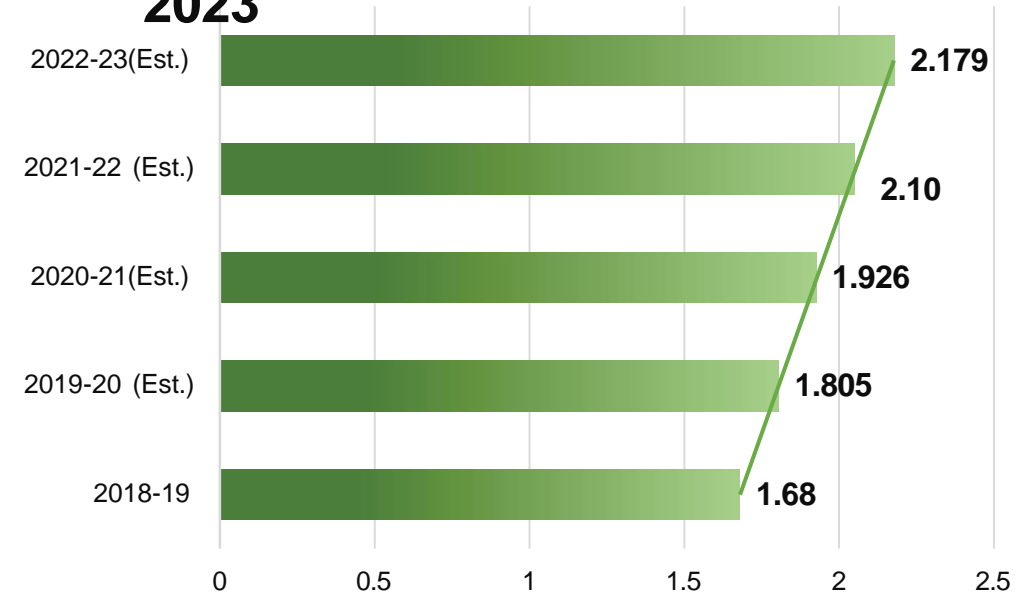


TECHNICAL MANPOWER (2021-22) - INDIA

YEAR	MANPOWER* (in Millions)	MANPOWER GROWTH %
2018-19	1.68	7.44
2019-20	1.81	6.70
2020-21	1.93	6.49
2021-22	2.1	6.24

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

Manpower millions 2018 - 2023



Estimated Man Power Break up Ratio - Machinery Wise

Moulding / Extrusion including conversion

40/60

Estimated total manpower to be 4.4 million which includes unskilled/ Contract Labour and Staff.

Source CIPET/Industry Estimate

RECYCLIN G

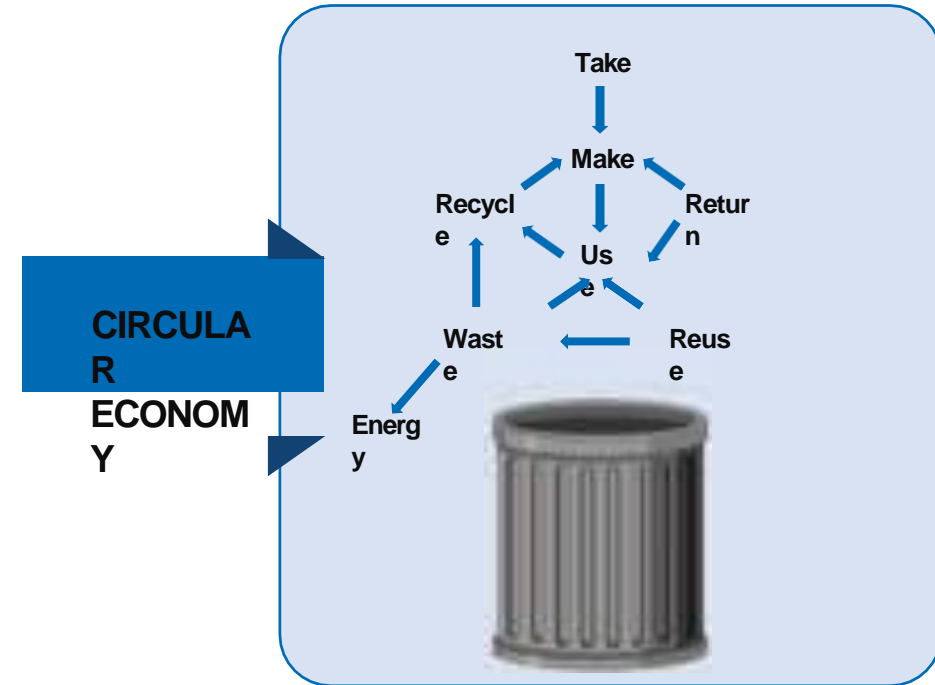
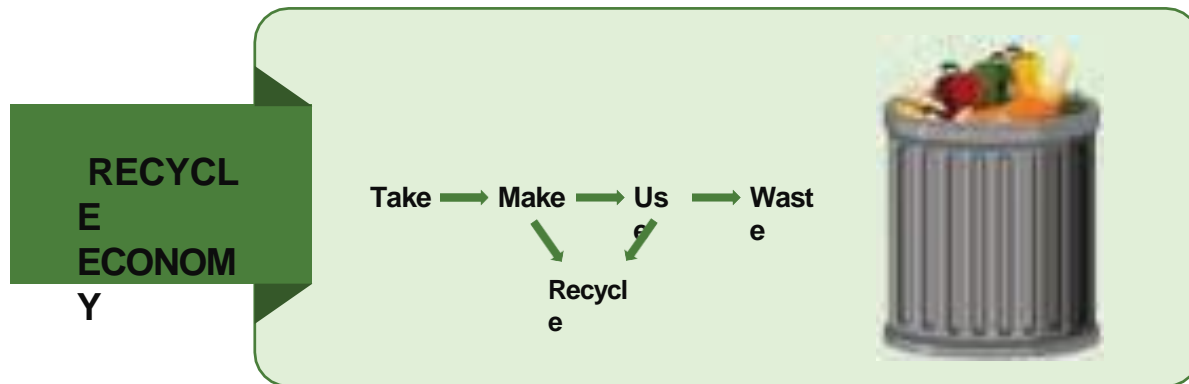
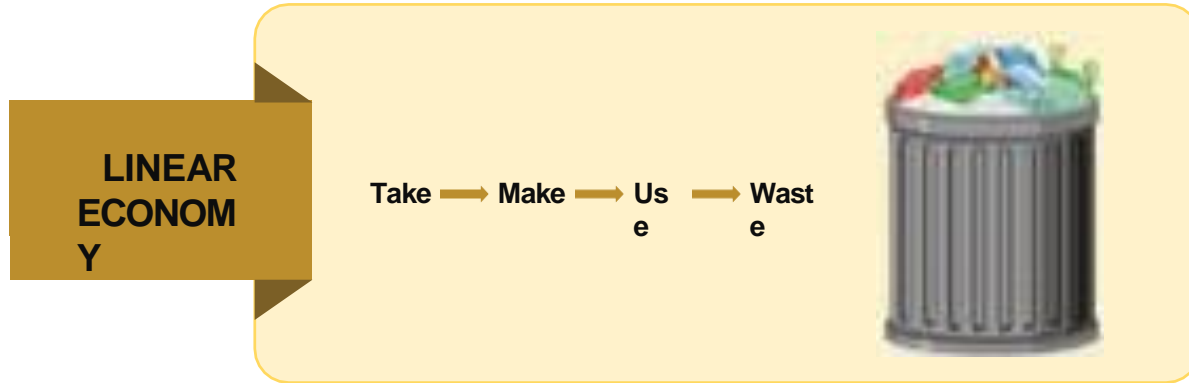


PLASTICS RECYCLING/RECOVERY (2021- 22) - INDIA

- >90% rigid plastics waste is recycled
- >90% PET bottle waste is recycled
- In-house plastics scrap utilized in production process
- Feedstock recycling (Pyrolysis) increased to 70 KT and energy recovery through co-processing in cement kiln gained momentum (~500 KT)*
- ~60% of Post consumer plastics is recycled
- Government Order issued for use of plastics waste in bitumen road construction



CIRCULAR ECONOMY

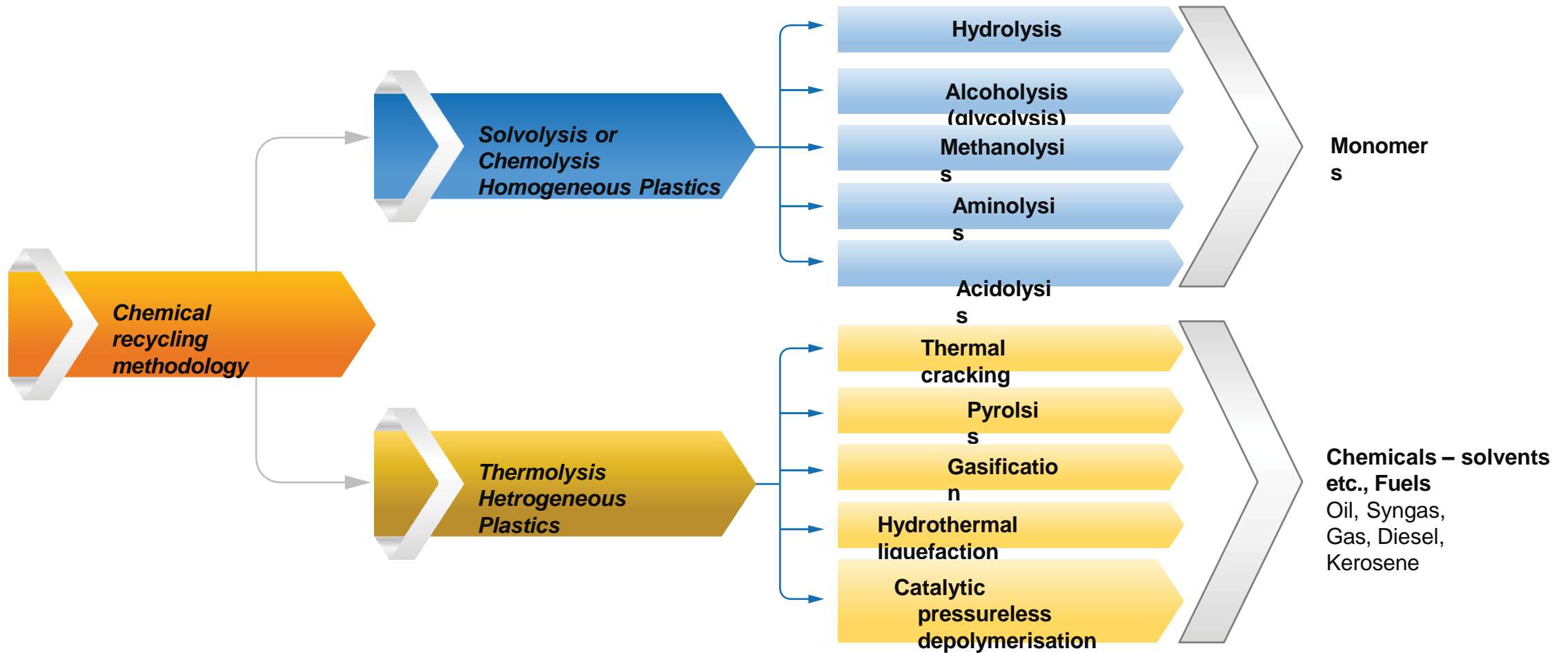


An Economic System focused at Eliminating Waste and the continual use of Resources

PLASTICS RECYCLING / RECOVERY OPTIONS



CHEMICAL RECYCLING



MAJOR PLASTICS RECYCLING CENTRES

S. No.	State	Location	S. No.	State	Location	S. No.	State	Location
1	Bihar	Patna	21	Madhya Pradesh	Indore	41	Tamil Nadu	Madurai
2	Chattisgarh	Raipur	22	Madhya Pradesh	Bhopal	42	Tamil Nadu	Tiruchirappalli
3	Chattisgarh	Bilaspur	23	Maharashtra	Dharavi	43	Tamil Nadu	Tirunelveli
4	Daman	Daman	24	Maharashtra	Malegaon	44	Tamil Nadu	Salem
5	Delhi	Tikri Kalan	25	Maharashtra	Jalgaon	45	Telangana	Hyderabad
6	Delhi	Kamruddin Nagar	26	Maharashtra	Aurangabad	46	Uttar Pradesh	Kanpur
7	Delhi	Vishwas Nagar	27	Maharashtra	Sholapur	47	Uttar Pradesh	Meerut
8	Delhi	Shahdara	28	Maharashtra	Kolhapur	48	Uttar Pradesh	Lucknow
9	Gujarat	Dhoraji	29	Odisha	Bhubneshwar	49	West Bengal	Kolkata
10	Gujarat	Ahmedabad	30	Odisha	Cuttack	50	West Bengal	Siliguri
11	Gujarat	Bhavnagar	31	Odisha	Balasore	51	West Bengal	Maldah
12	Karnataka	Belgaum	32	Punjab	Amritsar	52	West Bengal	Murshidabad
13	Karnataka	Dharwad	33	Punjab	Khanna			
14	Karnataka	Shivamogga	34	Punjab	Dhuri			
15	Karnataka	Mangaluru	35	Punjab	Ludhiana			
16	Karnataka	Davangere	36	Punjab	Moga			
17	Karnataka	Tumakuru	37	Punjab	Jalandhar			
18	Karnataka	Bengaluru	38	Rajasthan	Jaipur			
19	Karnataka	Mysuru	39	Tamil Nadu	Chennai			
20	Kerala	Kochi	40	Tamil Nadu	Coimbatore			

Source : Industry Estimate / ICPE

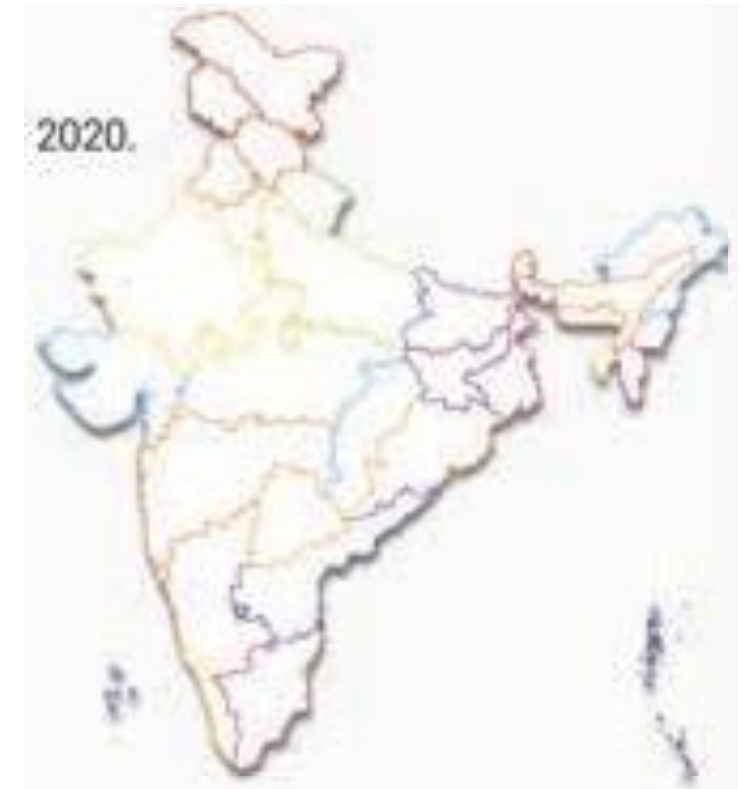
SUMMAR Y



INDIA... it's HAPPENING

Plastics Industry

- Indian Plastics Industry is one of the oldest (1945) and completed Platinum Jubilee in 2020.
- India is 4th largest producer of Polypropylene in the world.
- India is 3rd largest consumer of Plastics in the world.
- India is No. 1 in Lamitubes, BOPP films , FIBC bags manufacturing. The largest rotomolded tank market is in India.
- India is largest producer of tractor in the world. Major plastics parts for automobiles are made in India.



**Progress through
Plastics**

INDIA... it's HAPPENING

Plastics Industry Contd...

- Growth in Machinery CAGR in the last 5 years 9.3 %
- Most of Machinery are made with in India and exported too.
- 2021-22 Plastic Demand is 20.89 million tons and Projected to exceed 22 million tons by 2023
- The per capita consumption of Plastics increased to 15 kg up from 13.6 kg in 2018-19.
- Global Companies Investing in India
- Lower Import Duties on Polymer Raw Materials
- Proposed Government Policies to help Growth of Plastic Industry

INDIA... it's HAPPENING

Economy & Demography

- Established Democracy & Stable Democratic Government with favourable Economic Policies
- Young Population, median age of 28.7 years
- Large pool of scientific and technically trained Manpower
- India, the largest market in South Asia. Robust Domestic Demand
- 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

ANNEXURE S



IMAGINE LIFE WITHOUT PLASTICS

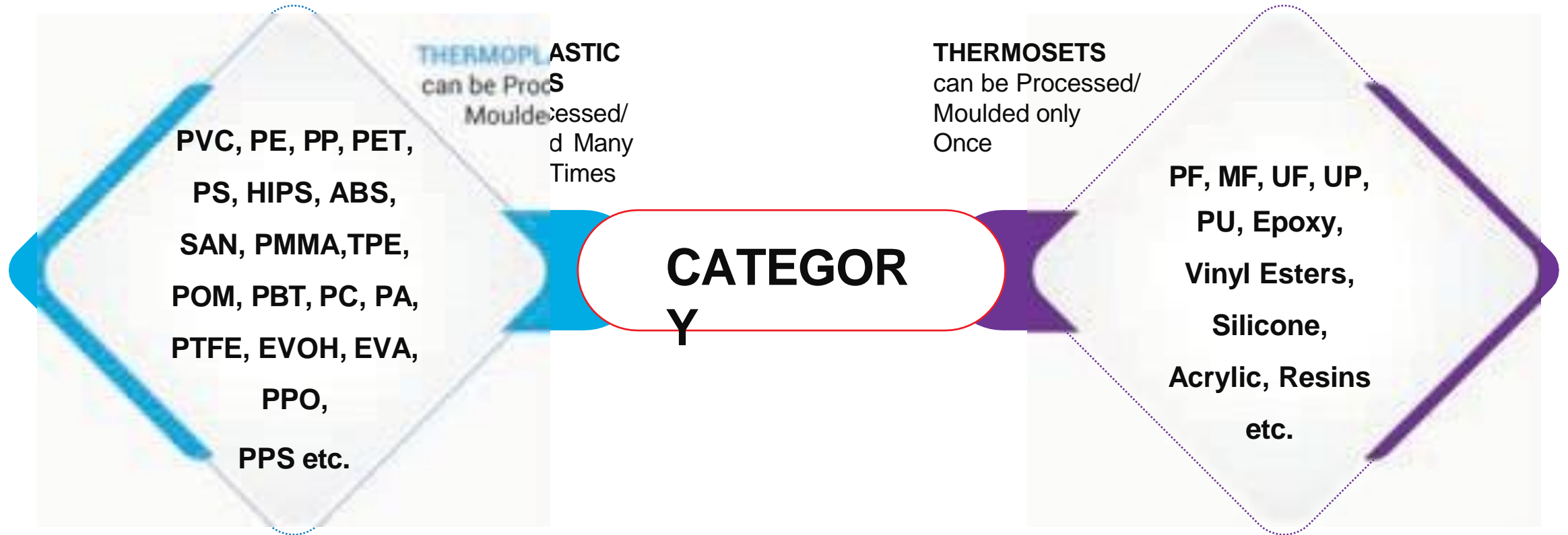


HOW PLASTICS PENETRATES OUR LIVES

- 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



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. May 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.plasticmakeitpossible.com/whats-new-cool/automotive/fuel-efficiency/improving-fuel-efficiency-made-possible-with-plastics/>

BENEFITS OF PLASTICS TO SOCIETY



PLASTIC SAVES FUEL

Over the lifetime of the average car, lightweight plastic parts save around

3,000 LITRES

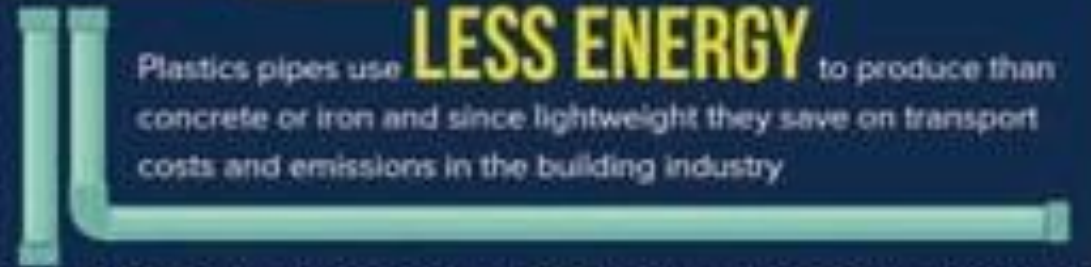
of petrol as a result – which would get you to and from New York almost five times!



For every 7 trucks needed to deliver paper bags,



only **1 TRUCK** is needed for the same number of plastic bags



Plastics pipes use **LESS ENERGY** to produce than concrete or iron and since lightweight they save on transport costs and emissions in the building industry

The Boeing 787 Dreamliner is comprised of **50%** plastic composites by weight & **80%** by volume, which contributes to a



20% FUEL SAVING

BENEFITS OF PLASTICS TO SOCIETY

Saves Food

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



Plastics plays a significant role in Food Preservation

BENEFITS OF PLASTICS TO SOCIETY



BENEFITS OF PLASTICS TO SOCIETY

Health Care

- 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.

BENEFITS OF PLASTICS TO SOCIETY

Powering & Protection

- Plastic Wire & Cables and Cords Powering Every Home, Office and all Electronics Gadgets
- Household 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.
- 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%

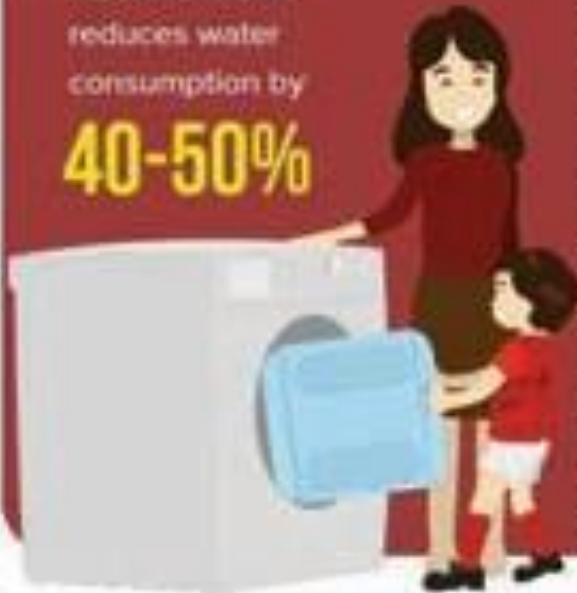
BENEFITS OF PLASTICS TO SOCIETY



PLASTIC SAVES WATER

Using plastics in modern washing machine drums reduces water consumption by

40-50%



The production of plastic bags consumes

LESS THAN 4%

of the water needed to make paper bags



Officials in Los Angeles recently released 96 million plastic balls into the 75-acre Los Angeles Reservoir in hopes of preventing

300 MILLION GALLONS

of water from evaporating each year



Plastic pipes have the lowest overall failure rate when compared to other materials and are designed to last more than




100 YEARS



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 – An Alternative				
				
SACKS	CONTAINERS	DRUMS	DOORS	Plastics Gear

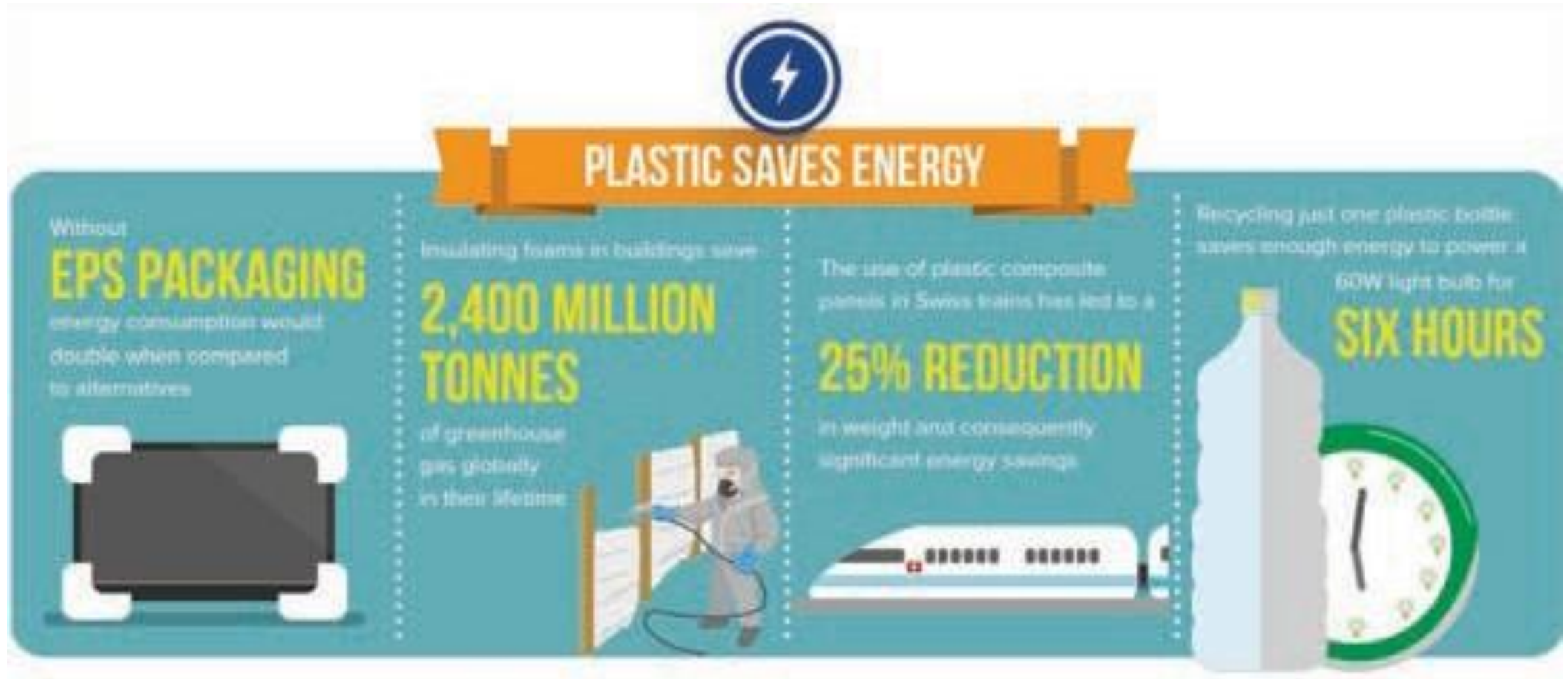
BENEFITS OF PLASTICS TO SOCIETY

Plastics have Minimum Carbon Footprint Compared to Alternatives



Source: British Plastics Federation

BENEFITS OF PLASTICS TO SOCIETY



WINDOWS

ACKNOWLEDGEMENT FOR DATA AND PHOTOGRAPHS

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- Gharda Chemicals
- GSF
- C
- ICPE
- IFIBCA
- Indian PU association
- IOCL
- Jayvee Organics & Polymers
- Kolsite
- Mechemco
- Milacron
- OK Play
- OPPI
- Plexconcil
- PMMAI
- Prasad Koch/silvin
- Rajiv Plastics
- Reliance Industries Limited
- ROMA – Rotomoulding association
- SABIC
- SIAM
- Supreme Petrochemical
- TAGMA
- TIPCO
- Uniloy India
- Windsor Machines
- Wittmann India

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 terephthalate
- 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
- FIBC – Flexible Intermediate Bulk Container

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