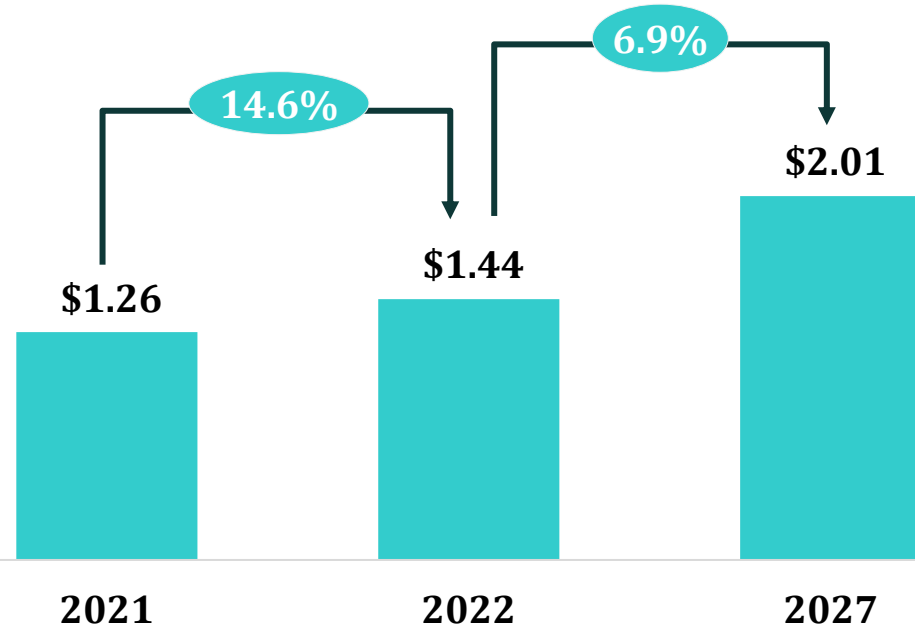


Indian Composite Materials Market

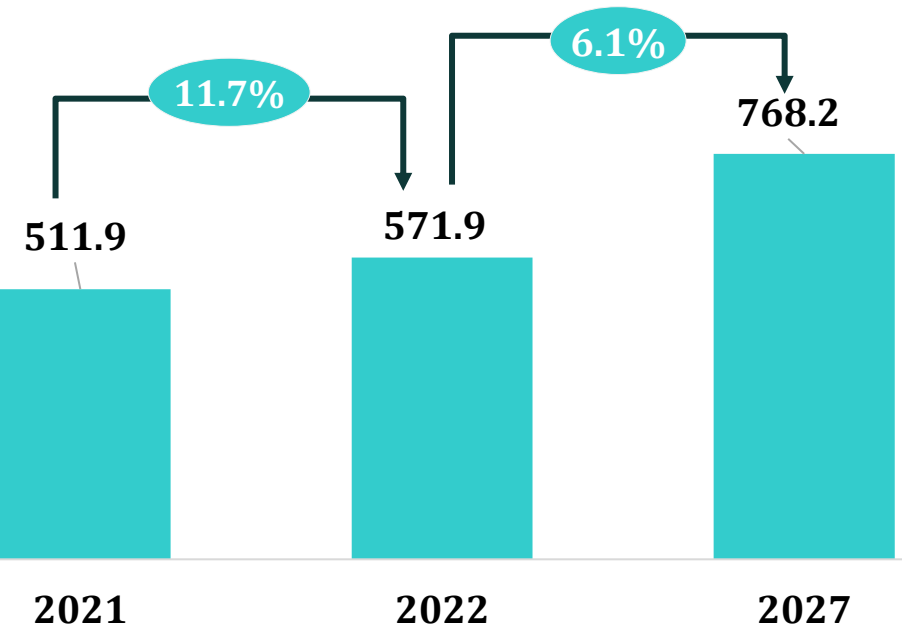
Current Status and Forecast

Indian Composite Materials Market Is Estimated to Grow Above the Global Average in the Coming Five Years (6.1% India vs 4.7% Global, in terms of Volume, 2022-2027).

Indian Composite Materials Market Size and Forecast (US\$ Billion)

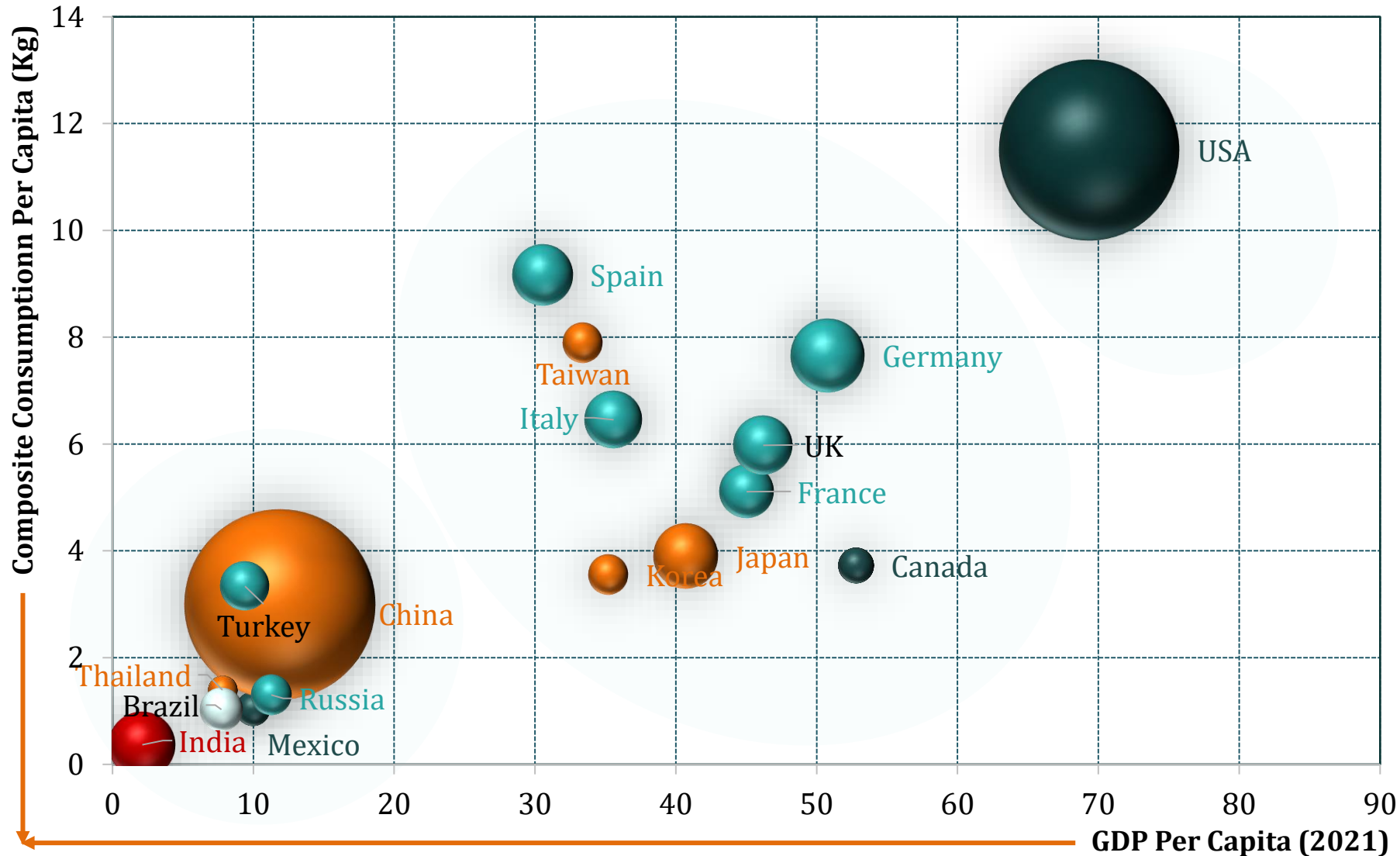


Indian Composite Materials Market Size and Forecast (Kilotons)



- The Indian composite materials market was estimated at US\$ 1.26 Billion in 2021 and is likely to grow at a healthy CAGR of 6.9% over the next five years to reach US\$ 2.01 billion in 2027. This equates to the consumption of 511.9 kilotons of composite materials in 2021 and 768.2 kilotons in 2027.
- Both glass fiber suppliers, Owens Corning and Goa Glass Fibre Limited, grew at a low-end single-digit rate in the year 2020.
- The composite consumption per capita was merely 0.37 kg in India in 2021, which is quite lower before the matured markets, such as the USA with 11.5 kg and Germany with 7.7 kg.

India Offers the Highest Whitespace Opportunities in terms of Composite Consumption Per Capita.

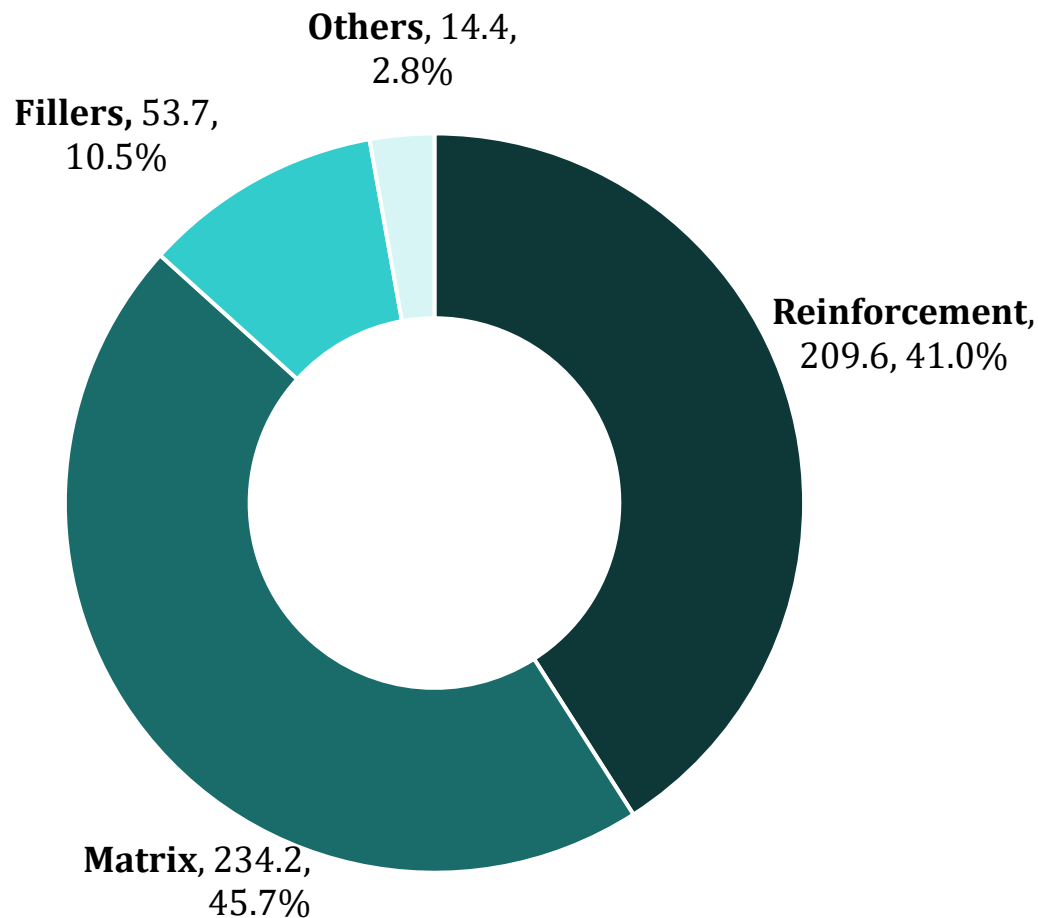


- There are three clusters in terms of composite consumption per capita.
- **First Cluster:** The USA with the highest composite consumption (11.5 kg) per capita.
- **Second Cluster:** Other matured markets, such as Germany, with good composite consumption per capita (4-9 kg).
- **Third Cluster:** Developing markets with very low composite consumption per capita (<3 kg).

Note: Bubble size represents the country's composite materials market size in 2021 (Tons).

Out of the Total Composite Materials Market in India, Matrices and Reinforcements Collectively Represent 86.7% Share in 2021.

Indian Composite Materials Market by Material Type (511.9 Kilotons in 2021)

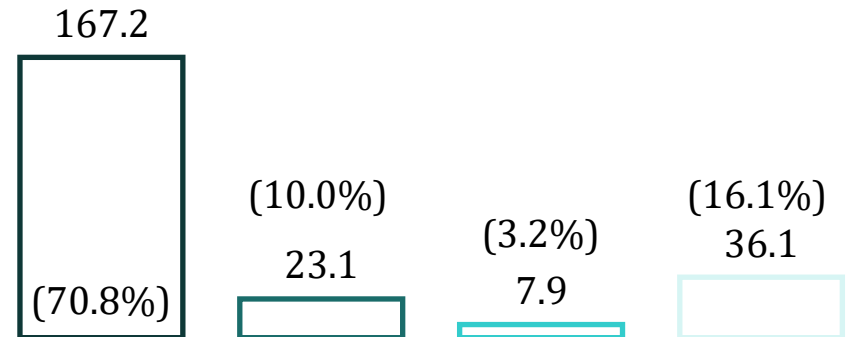
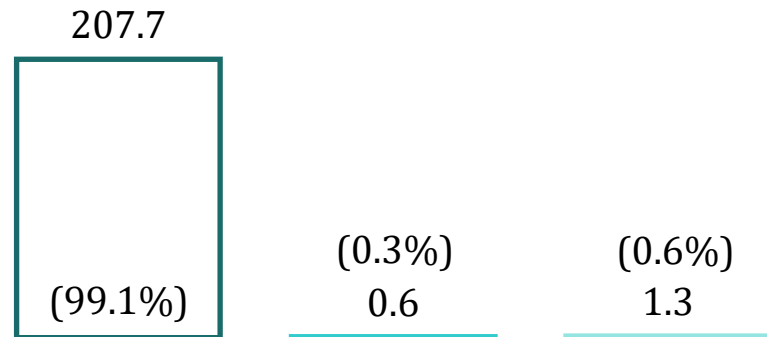


- Post pandemic economic growth, the country is likely to top the list of the most attractive markets in the world.
- The penetration of composite materials is still significantly low in most of the end-use industries in India as compared to the other matured markets, such as the USA and Germany.
- Reinforcement and matrix (resin) collectively account for 86.7% share of the total Indian composite materials market in 2021, in terms of volume.
- Much higher share (92.3%) of both materials in terms of value. The price of carbon fiber and epoxy resin drives this difference.
- In reinforcement, glass fiber is the most dominant, whereas polyester is the most dominant matrix system.
- Adhesives, core materials, and gel coats are the key materials considered under Others. Epoxy is the choice of adhesives. PVC and balsa are the major core materials.

Glass Fiber, Polyesters, and Epoxies Are the Dominant Materials, Collectively Representing 77.7% Share in 2021 (Total 511.9 Kilotons in 2021).

Indian Composite Reinforcement Market Breakdown in 2021 (209.6 Kilotons)

Indian Composite Matrix Systems Market Breakdown in 2021 (234.2 Kilotons)



■ Glass Fiber
 ■ Carbon Fiber
 ■ Aramid Fiber

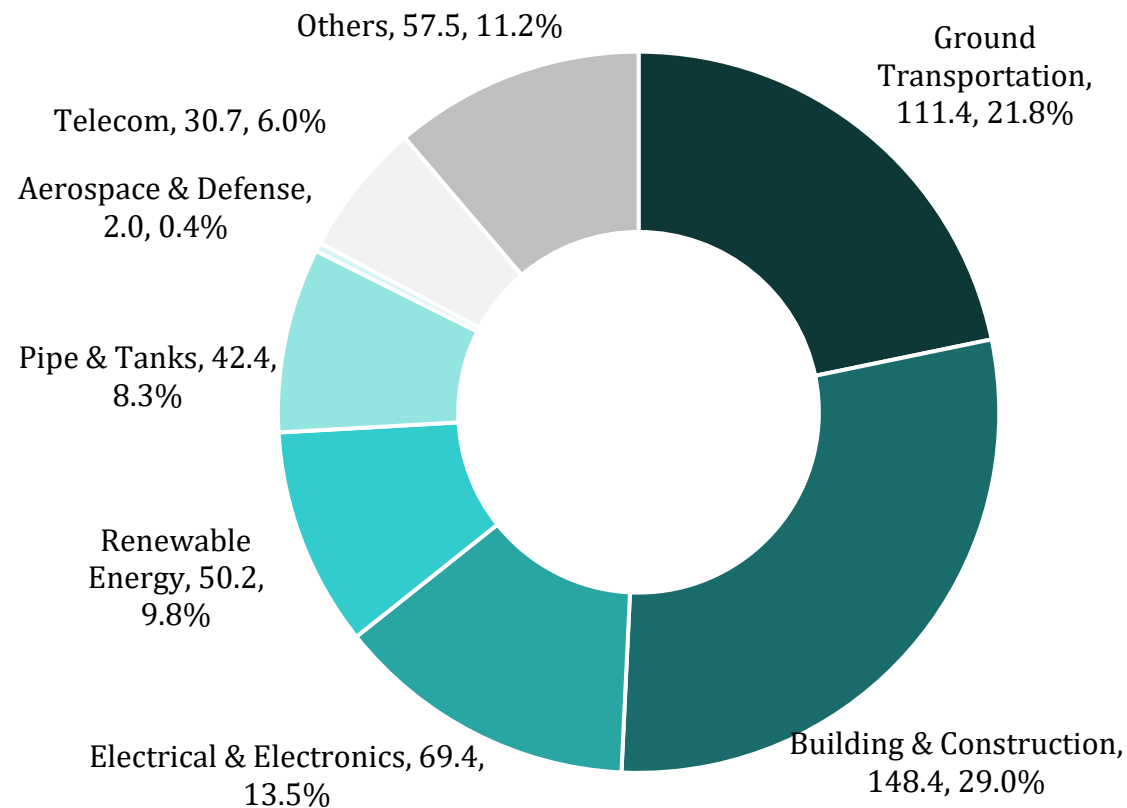
■ Polyester
 ■ Epoxy
 ■ Vinyl Ester
 ■ Others

- Glass fiber holds an unassailable lead in the market: 99.1% share in both, 2021 and 2027 (volume basis).
- High use of glass fiber in all the cost-sensitive markets including construction, wind energy, and transportation.
- Carbon fiber is preferably used in the A&D industry with low use in automotive, mainly for the export market.
- Currently, CF is entirely imported, mainly in the form of prepreg. TASL and HAL are the key users of CF prepreg.

- Polyester is the most preferred resin system, alone accounting for 70.8% share in 2021, in terms of volume.
- Polyester is the most preferred resin system with glass fiber to serve the cost-sensitive markets.
- Epoxy is the second-most dominant resin system with 10% share in 2021. Epoxy to witness the highest growth in years to come, driven by the A&D and wind energy segments.
- Low use of thermoplastics as compared to other key markets.

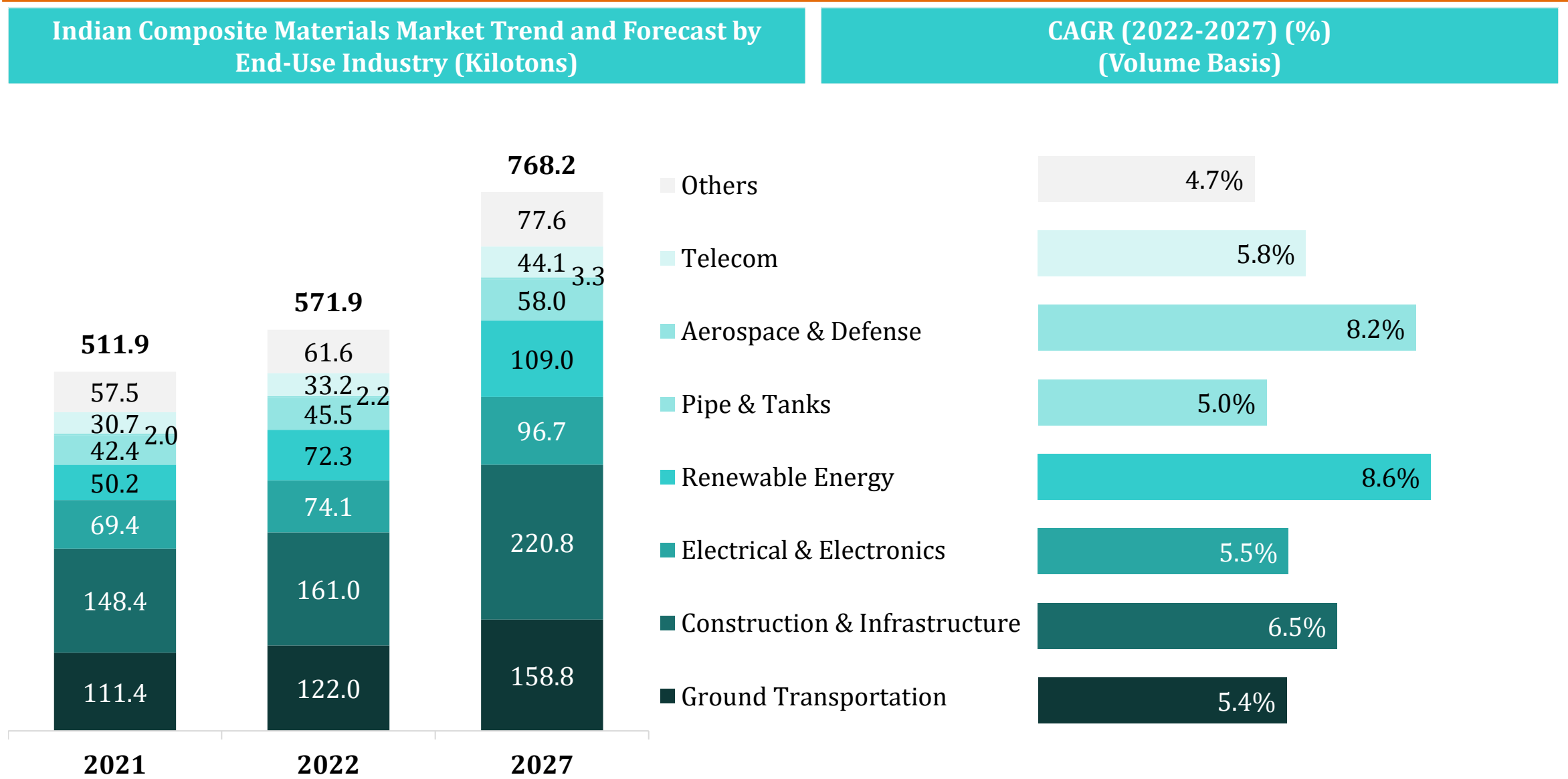
Ground Transportation and Building, Construction, & Infrastructure Are the Two Biggest Markets, Representing ~51% Share in 2021.

Indian Composite Materials Market by End-Use Industry Type in 2021 (511.9 Kilotons in 2021)



- Ground transportation and building, construction, & infrastructure collectively accounted for approximately 50.8% share of the total Indian composite materials market in 2021, in terms of volume.
- Over the years, composite stakeholders have been efficacious in marking some penetration of composite materials (especially glass fiber composites) in both end-use industries. However, the current penetration is still consequentially low and allows to further blossom with greater penetration in existing applications as well as through new applications' development.
- The breakdown of end-use industries is quite similar to that of the global market's end-use industry breakdown with building, construction, & infrastructure and ground transportation being the major segments.

Ground Transportation and Construction & Infrastructure Are Likely to Remain the Key Markets for Composite Materials by 2027.



Glass Fiber Is the Most Dominant Fiber Type in All Industries Except A&D. Similarly, Polyester Is the Most Dominant Resin Except A&D and Renewable Energy.

	Reinforcement			Matrix Systems			
	Glass Fiber	Carbon Fiber	Aramid Fiber	Polyester	Epoxy	Vinyl Ester	Other Resins
Ground Transportation	●	∴	∴	●	∴	∴	◐
Construction & Infrastructure	●	∴	∴	●	∴	◐	∴
Pipe & Tanks	●	∴	∴	●	∴	◐	∴
Electrical & Electronics	●	∴	∴	●	∴	∴	◐
Renewable Energy	●	∴	∴	∴	●	∴	∴
Aerospace & Defense	◐	◑	◑	∴	●	∴	∴
Others	●	∴	∴	●	∴	∴	∴

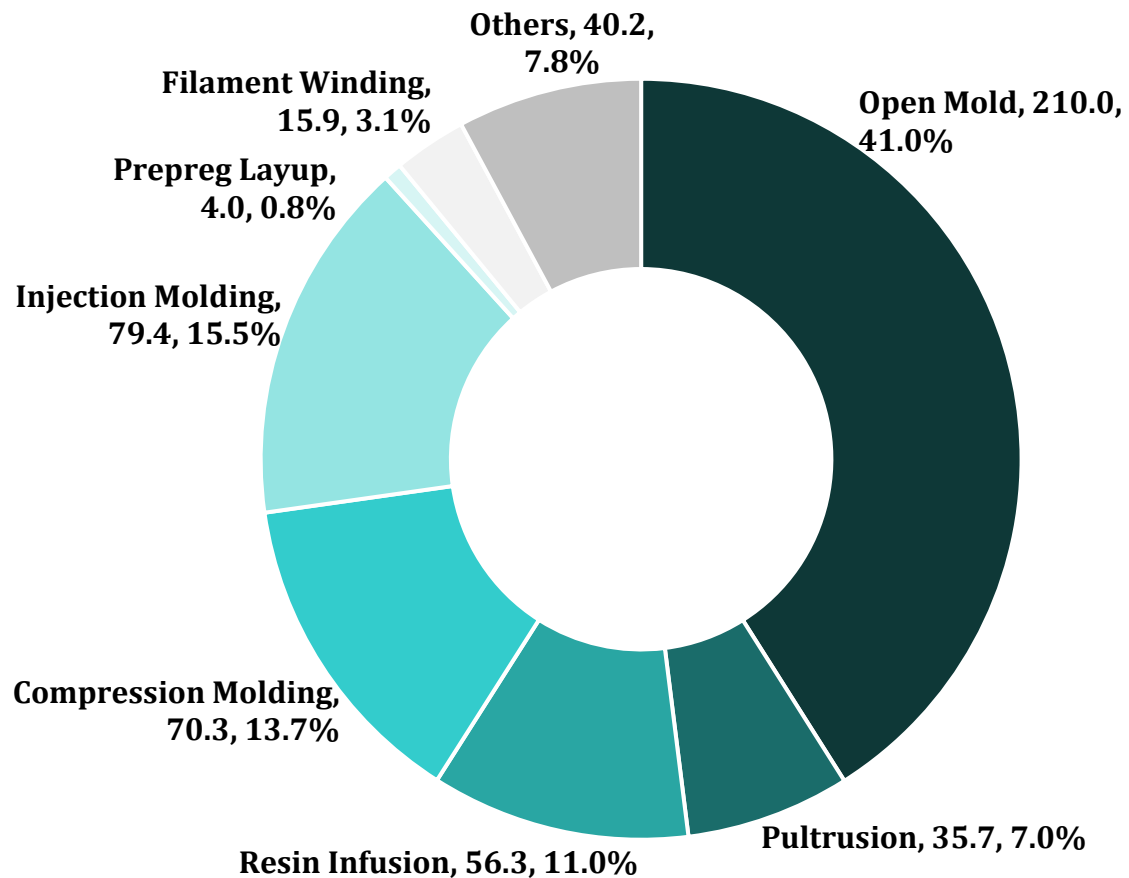
Dominance (Volume Basis)

● >75% ◐ 50%-75% ◑ 25%-50% ◒ 5%-20% ∴ <5%

- Glass fiber is the dominant material in all industries except A&D, latter is dominated by carbon and aramid fibers.
- Polyester is the preferred resin system in all the industries except A&D and wind energy, which are dominated by epoxy resins.

Open Mold Dominates the Indian Market. Resin Infusion and Prepreg Layup Are Gaining Traction.

Indian Composite Materials Market by Manufacturing Process Type (511.9 Kilotons in 2021)



- Open mold (hand and spray layup) is the most dominant process with 41.0% share in 2021.
- India is home of many small-sized composite part fabricators, fabricating parts mainly through the hand layup process.
- Compression and injection molding are gaining traction in the ground transportation (more precisely in automotive) and electrical & electronics industries.
- Pultrusion is most dominantly used in the building, construction, and infrastructure. Cooling tower, structural profiles, handrails, ladder, grating, and cable trays are some of the key applications.
- Resin infusion (RTM/VARTM/SCRIMP) is mainly preferred in wind turbine blade construction, whereas filament winding in tubular sections, such as pipe and tanks.

Thank You!