

APRIL
2014

India Carbon Fiber and Composites Market Outlook to 2018

- Surging Demand from Aerospace,
Defence and Industrial Sectors
-

TABLE OF CONTENTS

1. India Carbon Fiber Market Introduction
2. India Carbon Fiber Market Value Chain
3. Pricing Mechanism in India Carbon Fiber Market
 - 3.1. Why Is Carbon Fiber So Expensive?
4. India Carbon Fiber Market Size
 - 4.1. By Consumption Volume, 2008-2013
 - 4.2. By Value, 2008-2013
5. India Carbon Fiber Market Segmentation
 - 5.1. By Type of Raw Material Used, 2013
 - 5.2. By Grade, 2013
 - 5.3. By Semi-Finished Fiber Products and Manufacturing Processes, 2008-2013
 - 5.4. By Application, 2013
 - 5.5. By End-Users, 2008-2013
6. India Carbon Fiber Composites Market Introduction and Market Size, 2008-2013
 - 6.1. India Carbon Fiber Composites Market Segmentation By Type of Composites
 - 6.1.1. India Carbon Fiber Reinforced Polymer Market Introduction and Market Size, 2008-2013
 - 6.1.2. India Carbon-Carbon Composites Market Introduction and Market Size, 2008-2013
 - 6.1.3. India Metal Matrix Composites Market Introduction and Market Size, 2008-2013
 - 6.1.4. India Ceramic Matrix Composites Market Introduction and Market Size, 2008-2013
 - 6.2. India Carbon Fiber Composites Market Segmentation by Type of Polymer Material, 2008 & 2013
7. India Carbon Fiber Market Trends and Developments
 - Emerging Applications of Carbon Fiber Composites
 - Capacity Expansion Gaining Momentum

Surge In Research and Development Activities
Improved Penetration of Foreign Players
Aggressive Expansion of Aircraft and Space Applications

8. India Carbon Fiber Market Major Challenges

Increasing Raw Material Prices
Lack of Skilled Labor
Lack of Technological Expertise
Harmful Emissions from Carbon Fiber

9. Government Legislations in India Carbon Fiber Market

Regulations on Import of Carbon Fiber
Environment Regulations on Carbon Fiber Manufacturing

10. Market Share of Major Players in India Carbon Fiber Market

11. Company Profiles of Major Players in India Carbon Fiber Market

12. Company Profiles of Major Consumers in India Carbon Fiber Market

13. India Carbon Fiber Market Future Outlook and Projections, 2014-2018

13.1. Carbon Fiber Market, 2014-2018

13.2. Carbon Fiber Composites Market, 2014-2018

14. Cause and Effect Relationship between Industry Factors and India Carbon Fiber Market

15. Macro Economic Factors of the India Carbon Fiber Market

15.1. Crude Oil Prices, 2008-2018

15.2. Automobile Industry in India, 2008-2018

15.3. Real-Estate Market in India, 2008-2018

15.4. Wind Energy Installed Capacity in India, 2008-2018

15.5. Urban Population in India, 2008-2018

15.6. GDP Per Capita, 2008-2018

16. Analyst Recommendation

17. Appendix

- 17.1. Market Definitions
- 17.2. Abbreviations
- 17.3. Research Methodology
 - Data Collection Methods
 - Approach
 - Variables (Dependent and Independent)
 - Multi Factor Based Sensitivity Model
 - Final Conclusion
- 17.4. Disclaimer

SAMPLE

LIST OF FIGURES

Figure 1: Value-Chain of the Carbon Fiber Market in India

Figure 2: India Carbon Fiber Market Size on the Basis of Domestic Consumption in Tonnes, 2008–2013

Figure 3: India Carbon Fiber Market Size on the Basis of Revenue in INR Million, 2008-2013

Figure 4: India Carbon Fiber Market Segmentation by Type of Raw Material Used on the Basis of Volume in Percentage (%), 2013

Figure 5: India Carbon Fiber Market Segmentation by Type of Grades on the Basis of Revenue Contribution in Percentage (%), 2013

Figure 6: India Carbon Fiber Market Segmentation by Semi-Finished Products and Type of Manufacturing Processes on the Basis of Consumption Volume in Percentage (%), 2008-2013

Figure 7: India Carbon Fiber Market Segmentation by Major End-Users on the Basis of Consumption Volume in Percentage (%), 2008-2013

Figure 8: India Industrial Carbon Fiber Market Segmentation by End-User Sectors on the Basis of Consumption Volume in Percentage (%), 2013

Figure 9: India Carbon Fiber Market Segmentation by Major End-Users on the Basis of Revenue Contribution in Percentage (%), 2008-2013

Figure 10: India Industrial Carbon Fiber Market Segmentation by End-User Sectors on the Basis of Revenue Contribution in Percentage (%), 2013

Figure 11: India Carbon Fiber Composites Market Size by Revenue in INR Million, 2008-2013

Figure 12: India Carbon Fiber Composites Market Segmentation by Type of Composites on the Basis of Revenue Contribution in Percentage (%), 2008-2013

Figure 13: India Carbon Fiber Reinforced Polymer Market by Revenue in INR Million, 2008-2013

Figure 14: India Carbon-Carbon Composites Market by Revenue in INR Million, 2008-2013

Figure 15: India Metal Matrix Composites Market by Revenue in INR Million, 2008-2013

Figure 16: India Ceramic Matrix Composites Market by Revenue in INR Million, 2008-2013

Figure 17: India Carbon Fiber Composites Market Segmentation by Type of Polymer Material Used, 2008 & 2013

Figure 18: Market Share of Major Players in India Aerospace & Defense Carbon Fiber Market by Revenue in Percentage (%) in, 2013

Figure 19: Market Share of Major Players in India Industrial Carbon Fiber Market by Revenue in Percentage (%) in, 2013

Figure 20: Market Share of Major Players in India Consumer & Sports Equipment Carbon Fiber Market by Revenue in Percentage (%) in, 2013

Figure 21: India Carbon Fiber Market Future Projections on the Basis of Domestic Consumption in Tonnes, 2014-2018

Figure 22: India Carbon Fiber Market Future Projections on the Basis of Revenue in INR Million, 2014-2018

Figure 23: India Carbon Fiber Market Segmentation by Major End-Users Future Projections on the Basis of Consumption Volume in Percentage (%), 2014-2018

Figure 24: India Industrial Carbon Fiber Market Segmentation by End-User Sectors Future Projections on the Basis of Consumption Volume in Percentage (%), 2014-2018

Figure 25: India Carbon Fiber Market Segmentation by Major End-Users Future Projections on the Basis of Revenue Contribution in Percentage (%), 2014-2018

Figure 26: India Industrial Carbon Fiber Market Segmentation by End-User Sectors Future Projections on the Basis of Revenue Contribution in Percentage (%), 2014-2018

Figure 27: India Carbon Fiber Composites Market Future Projections by Revenue in INR Million, 2014-2018

Figure 28: India Carbon Fiber Composites Market Segmentation by type of Composites Future Projections on the Basis of Revenue Contribution in Percentage (%), 2014-2018

Figure 29: India Carbon Fiber Reinforced Polymers Market Future Projections by Revenue in INR Million, 2014-2018

Figure 30: India Carbon-Carbon Composites Market Future Projections by Revenue in INR Million, 2014-2018

Figure 31: India Metal Matrix Composites Market Future Projections by Revenue in INR Million, 2008-2013

Figure 32: India Ceramic Matrix Composites Market Future Projections by Revenue in INR Million, 2014-2018

Figure 33: Crude Oil Average Spot Prices in USD per Barrel, 2008-2018

Figure 34: India Automobile Sales in Million, 2008-2018

Figure 35: India Real Estate Market Size on the Basis of Revenue in USD Million, 2008-2018

Figure 36: Wind Energy Installed Capacity in India in Megawatt (MW), 2008-2018

Figure 37: Urban Population in India in Million, 2008-2018

Figure 38: Gross Domestic Product of India in USD Million, 2008-2018

SAMPLE

LIST OF TABLES

Table 1: Cost Components of Carbon Fiber with Contribution in Percentage (%)

Table 2: Cost Components of Manufacturing Cost of Carbon Fiber with Contribution in Percentage (%)

Table 3: Cost Components of High, Intermediate and Standard Modulus Carbon Fiber in INR, 2013

Table 4: Cost Components of Manufacturing Cost of High, Intermediate and Standard Modulus Carbon Fiber in INR, 2013

Table 5: India Carbon Fiber Market Segmentation by Type of Grades on the Basis of Revenue Contribution in INR Million, 2013

Table 6: India Carbon Fiber Market Segmentation by Semi-Finished Products and Type of Manufacturing Processes on the Basis of Consumption Volume in Tonnes, 2008-2013

Table 7: India Carbon Fiber Market Segmentation by Different Types of Applications on the Basis of Consumption Volume and Revenue Contribution in Percentage (%), 2013

Table 8: India Carbon Fiber Market Segmentation by Different Types of Applications on the Basis of Consumption Volume in Tonnes and Revenue Contribution in INR Million, 2013

Table 9: India Carbon Fiber Market Segmentation by Major End-Users on the Basis of Consumption Volume in Tonnes, 2008-2013

Table 10: India Industrial Carbon Fiber Market Segmentation by End-User Sectors on the Basis of Consumption Volume in Tonnes, 2013

Table 11: India Carbon Fiber Market Segmentation by Major End-Users on the Basis of Revenue Contribution in INR Million, 2008-2013

Table 12: India Industrial Carbon Fiber Market Segmentation by End-User Sectors on the Basis of Revenue Contribution in INR Million, 2013

Table 13: Market Share of Major Players in India Aerospace & Defense Carbon Fiber Market by Revenue in INR Million, 2013

Table 14: Market Share of Major Players in India Industrial Carbon Fiber Market by Revenue in INR Million, 2013

Table 15: Market Share of Major Players in India Consumer & Sports Equipment Carbon Fiber Market by Revenue in INR Million, 2013

Table 16: Company Profiles of Major Players in India Carbon Fiber Market, 2013

Table 17: Company Profiles of Major Consumers in India Carbon Fiber Market, 2013

Table 18: India Carbon Fiber Market Segmentation by Major End-Users Future Projections on the Basis of Consumption Volume in Tonnes, 2014-2018

Table 19: India Industrial Carbon Fiber Market Segmentation by End-User Sectors Future Projections on the Basis of Consumption Volume in Tonnes, 2014-2018

Table 20: India Carbon Fiber Market Segmentation by Major End-Users Future Projections on the Basis of Revenue Contribution in INR Million, 2014-2018

Table 21: Cause and Effect Relationship Analysis between Industry Factors and the Expected India Carbon Fiber Market Prospects

Table 22: Correlation Matrix of India Carbon fiber Market

Table 23: Regression Coefficients Output of India Carbon fiber Market

PRICING MECHANISM IN INDIA CARBON FIBER MARKET

...The total cost of carbon fiber is composed of manufacturing cost, marketing, distribution, dealer discount and support cost, corporate overhead expenses, research and development cost, profit, and warranty...

...Furthermore, since the carbon fiber market in India is an import oriented market, an additional import duty of about 27.0% is payable, which is inclusive of custom duty, Capital Value Tax (CVT), and education cess...

...In 2013, the cost of high modulus carbon fiber was around INR ~, followed by intermediate modulus at INR ~ and standard modulus at INR ~.

Table: Cost Components of High, Intermediate and Standard Modulus Carbon Fiber in INR, 2013

Cost Components	High Modulus	Intermediate Modulus	Standard Modulus
Manufacturing Cost			
Marketing, Distribution, Dealer Discount and Support			
Corporate Overhead Expenses			
Research and Development			
Profit			
Warranty			
Total			

Table: Cost Components of Manufacturing Cost of High, Intermediate and Standard Modulus Carbon Fiber in INR, 2013

Cost Components of Manufacturing Cost	High Modulus	Intermediate Modulus	Standard Modulus
Precursor (PAN)			
Stabilization & Oxidation			
Carbonization/Graphitization			
Surface Treatment			
Spooling & Packaging			
Total			

INDIA CARBON FIBER MARKET SIZE

BY CONSUMPTION VOLUME, 2008-2013

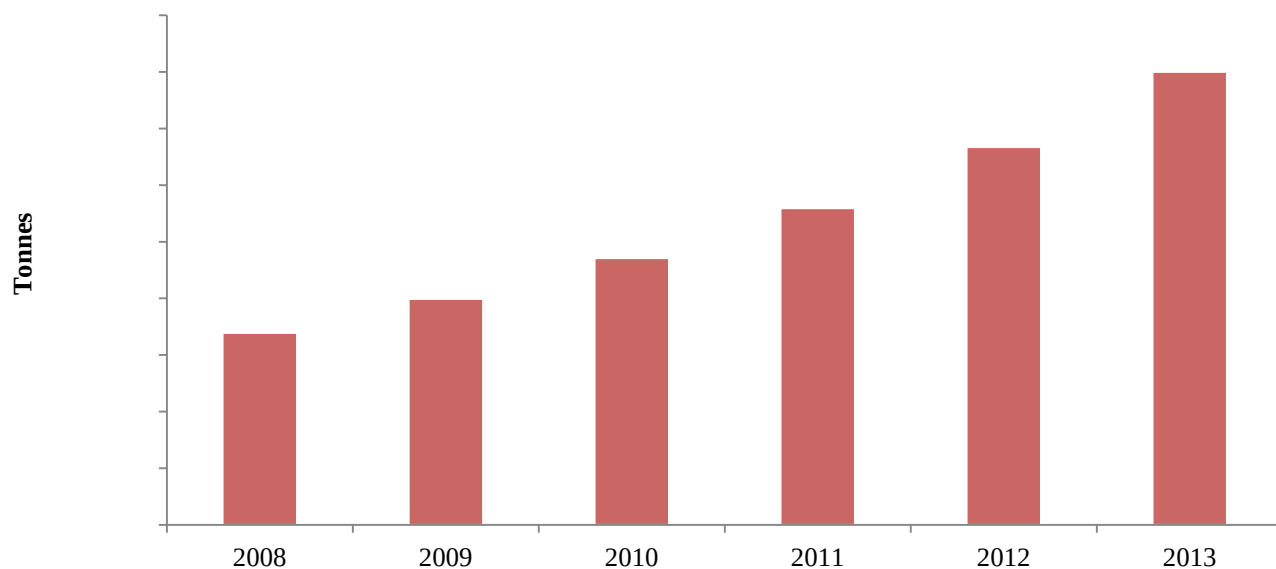
...The carbon fiber market in India has grown moderately from 2008 to 2013 in terms of the consumption volume. In 2008, the consumption of carbon fiber in India was ~ tonnes owing to an increased demand for carbon fiber reinforced polymers in the country.

...In 2010, the consumption of carbon fiber in India reached ~ tonnes, thereby registering a growth rate of ~%. In 2011, the market clocked consumption of ~ tonnes at a year on year growth of ~%. The year 2011 was marked by a greater number of bulk orders. These mostly included the orders of the aerospace and defense sectors.

In the subsequent year 2012, the carbon fiber consumption in India further increased at a healthy rate of ~% and reached a consumption volume of ~ tonnes...

...The country's carbon fiber market has commanded a rational growth in terms of consumption since 2008, augmenting at a CAGR of 18.8%, thereby reaching ~ tonnes in 2013.

Figure: India Carbon Fiber Market Size on the Basis of Domestic Consumption in Tonnes, 2008–2013



BY VALUE, 2008-2013

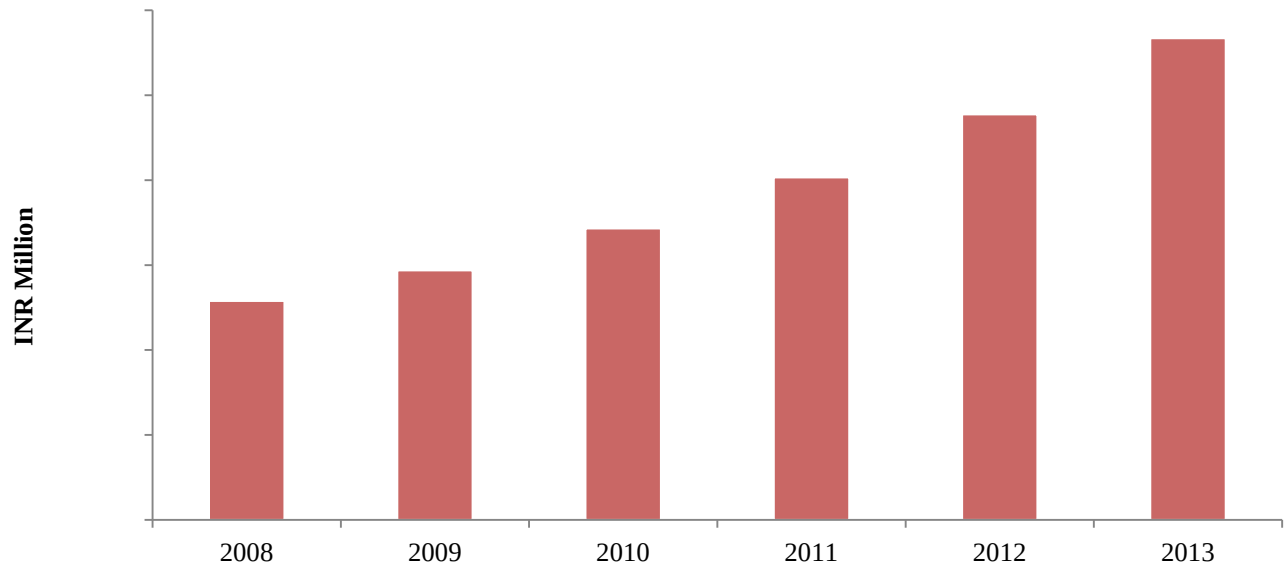
...The revenue of the country's carbon fiber market has augmented moderately from INR ~ million in 2008 to INR ~ million as recorded in 2013,

...In the year 2009, the total value of carbon fiber reached INR ~ million, growing at a slow rate of ~%...

In 2011, the carbon fiber market in India recorded growth of ~% over the previous year, thus reaching revenue worth INR ~ million...

...The industry further grew in terms of revenue, with the expansion of foreign players including Zoltek and Hexcel in the country. The market showcased a tremendous growth of nearly ~% in 2012.

Figure: India Carbon Fiber Market Size on the Basis of Revenue in INR Million, 2008-2013



INDIA CARBON FIBER MARKET SEGMENTATION

BY SEMI-FINISHED FIBER PRODUCTS AND MANUFACTURING PROCESSES, 2008-2013

...Prepregs serve an important position in the India carbon fiber and have been the largest consumers of carbon fiber for the production of carbon reinforced polymer (CFRP). In 2013, around, ~% of the total carbon fiber was used for manufacturing prepreg composite materials as against a share of ~% in 2008 in India, registering a CAGR of 20.2%...

...The consumption of carbon fiber by pultrusion process was observed to be the second highest at ~% in 2013, and has grown at a CAGR of ~% during 2008-2013.

...In 2013, the consumption of carbon fiber in this process stood at ~%, and has grown at a CAGR of 18.1% over the period from 2008 to 2013.

In terms of carbon fiber consumption, semi-finished products held a relatively minor share of ~% as witnessed in 2013...

Figure: India Carbon Fiber Market Segmentation by Semi-Finished Products and Type of Manufacturing Processes on the Basis of Consumption Volume in Percentage (%), 2008-2013

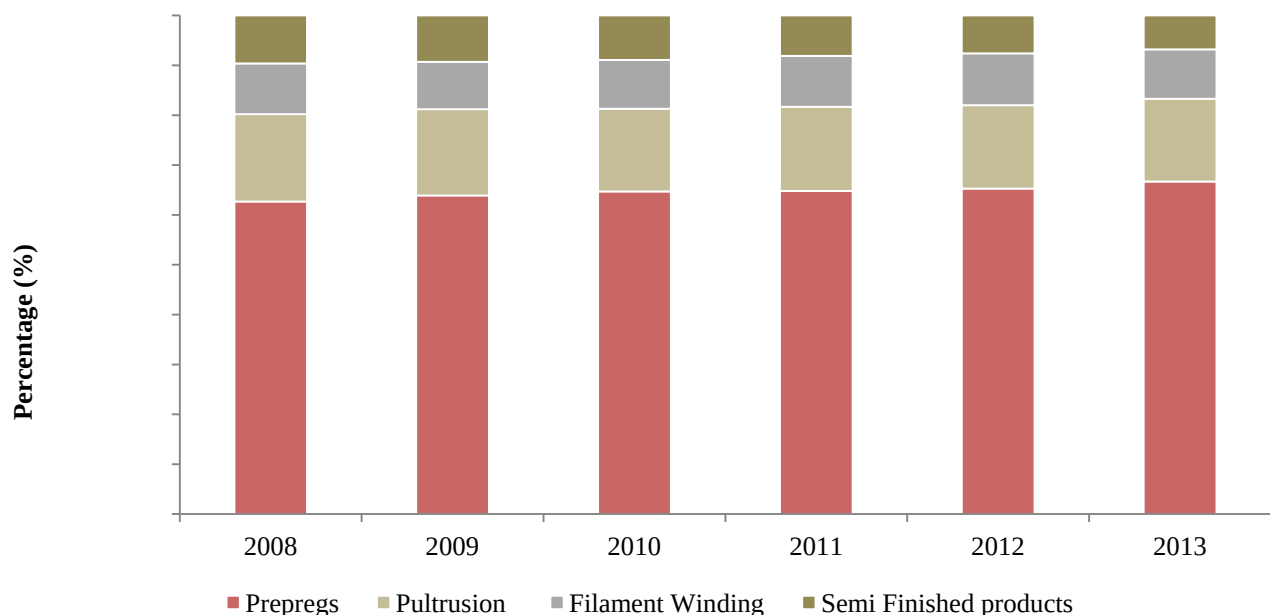


Table: India Carbon Fiber Market Segmentation by Semi-Finished Products and Type of Manufacturing Processes on the Basis of Consumption Volume in Tonnes, 2008-2013

Category	2008	2009	2010	2011	2012	2013
Prepregs						
Pultrusion						
Filament Winding						
Semi Finished Products						
Total						

BY APPLICATION, 2013

...The carbon fiber composite segment consumed around ~% of the total carbon fiber capacity and contributed ~% of the total carbon fiber market revenue in the year 2013. The textile segment is the second largest carbon fiber market segment in India, which accounted for ~% of the total market revenue in 2013, while consuming only ~% of the total carbon fiber quantity consumed in India...

...In 2013, microelectrodes accounted for a share of ~% in the overall revenue of India carbon fiber market and consumed approximately ~% of the total carbon fiber capacity.

On the other hand, syngas registered a diminutive contribution of ~% to the total market revenue, while consuming approximately ~% of the total carbon fiber capacity in India as recorded in 2013.

Table: India Carbon Fiber Market Segmentation by Different Types of Applications on the Basis of Consumption Volume and Revenue Contribution in Percentage (%), 2013

Applications	Consumption Volume (%)	Revenue Contribution (%)
Composites		
Textiles		
Microelectrodes		
Catalysis (Production of Syn Gas)		
Total		

Table: India Carbon Fiber Market Segmentation by Different Types of Applications on the Basis of Consumption Volume in Tonnes and Revenue Contribution in INR Million, 2013

Applications	Consumption Volume (Tonnes)	Revenue Contribution (INR Million)
Composites		
Textiles		
Microelectrodes		
Catalysis (Production of Syn Gas)		
Total		

BY END-USERS, 2008-2013

...In 2013, the aerospace and defense sector registered massive revenue contribution of ~% worth INR 941.4 million as against a contribution of ~%, worth INR ~ million in 2008. The revenue contribution from this sector has grown at a CAGR of 17.6% over the period of 2008-2013.

The contribution by the aerospace and defense sector in terms of volume consumption of the total carbon fiber capacity in India was about ~% in 2013, as compared to ~% in 2008, registering a CAGR of ~% over the period.

In 2013, contribution from this sector was approximately ~% as against a contribution of ~% in the total revenue of the India carbon fiber market in 2008...

...In contrast, industrial sector accounted for a share of ~% of the total carbon fiber volume consumption in the country, as recorded in 2008 and has grown at a CAGR of 18.2% over the period of 2008-2013, registering a consumption volume of ~ tonnes in 2013.

...The wind energy sector was the second largest contributor to the revenue of the industrial carbon fiber market in India, registering revenue worth INR ~ million, as recorded in 2013. On the other hand, the contribution in terms of volume was approximately ~ tonnes in 2013...

...The consumer and sports equipment sector has registered a decline in contribution in the total revenue of the India carbon fiber market over the years, registering a share of ~% in 2013 as compared to a contribution of ~% in 2008, growing at a CAGR of 13.4% over the period...

Figure: India Carbon Fiber Market Segmentation by Major End-Users on the Basis of Consumption Volume in Percentage (%), 2008-2013

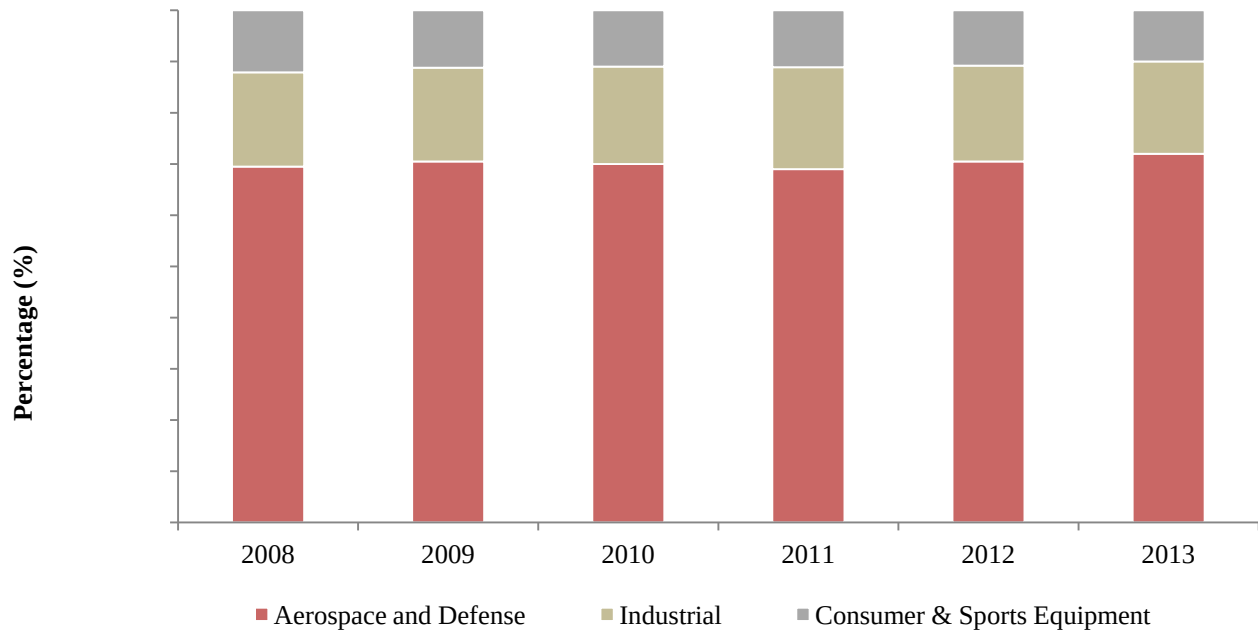


Table: India Carbon Fiber Market Segmentation by Major End-Users on the Basis of Consumption Volume in Tonnes, 2008-2013

End-Users	2008	2009	2010	2011	2012	2013
Aerospace and Defense						
Industrial						
Consumer & Sports Equipment						
Total						

Table: India Industrial Carbon Fiber Market Segmentation by End-User Sectors on the Basis of Consumption Volume in Tonnes, 2013

Industrial Market End-Users of Carbon Fiber	Tonnes
Civil & Construction	
Wind Turbine	
Automotive & Transportation	
Pressure Vessels	
Oil & Gas (Drill Shafts, Pipeline)	
Total	

Table: India Carbon Fiber Market Segmentation by Major End-Users on the Basis of Revenue Contribution in INR Million, 2008-2013

End-Users	2008	2009	2010	2011	2012	2013
Aerospace and Defense						
Industrial						
Consumer & Sports Equipment						
Total						

Table: India Industrial Carbon Fiber Market Segmentation by End-User Sectors on the Basis of Revenue Contribution in INR Million, 2013

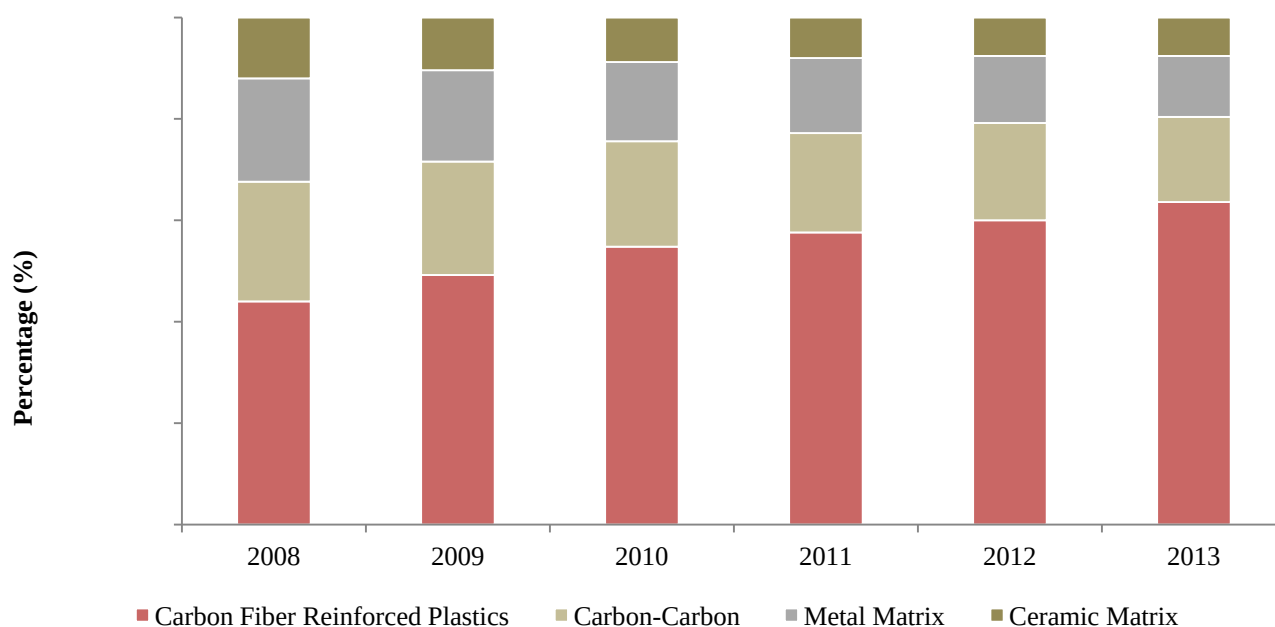
Industrial Market End-Users of Carbon Fiber	Revenue (INR Million)
Civil & Construction	
Wind Turbine	
Automotive & Transportation	
Pressure Vessels	
Oil & Gas (Drill Shafts, Pipeline)	
Total	

INDIA CARBON FIBER COMPOSITES MARKET SEGMENTATION BY TYPE OF COMPOSITES

...Carbon fiber reinforced polymers are the largest composites segment, which commanded a share of ~% in the total revenue generated by the India carbon fiber composites market in 2013 as against a contribution of ~% in 2008...

...Additionally, metal-matrix and ceramic matrix composites also registered decline in contributions and captured a share of ~% and ~%, respectively in 2013 as against a share of ~% and ~% in 2008.

Figure: India Carbon Fiber Composites Market Segmentation by Type of Composites on the Basis of Revenue Contribution in Percentage (%), 2008-2013



INDIA CARBON FIBER REINFORCED POLYMER MARKET INTRODUCTION AND MARKET SIZE, 2008-2013

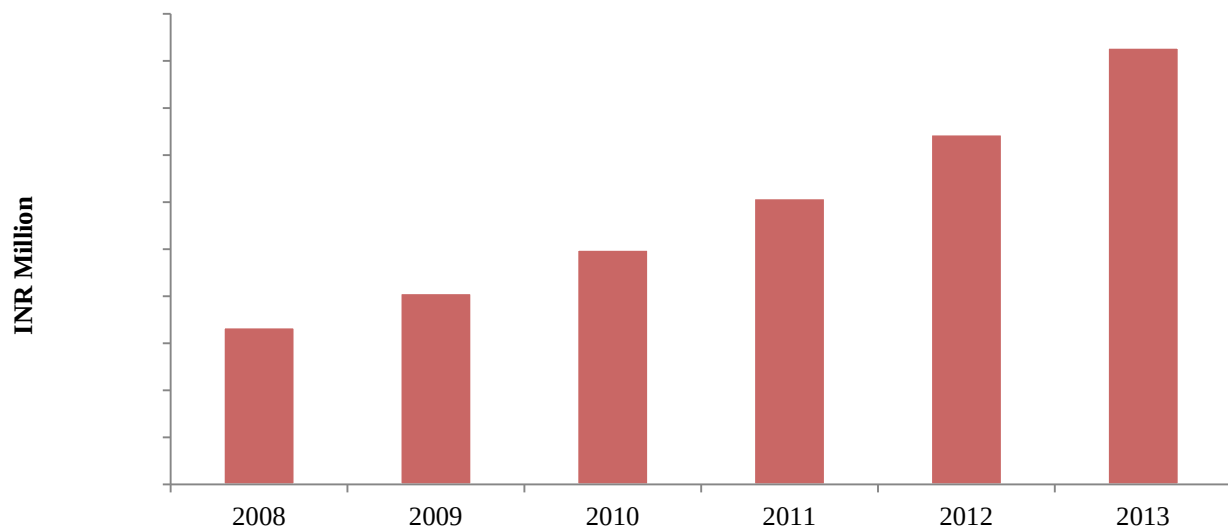
Carbon fiber reinforced polymer market has experienced unwavering growth over the last six years (2008-2013), on account of increase in infrastructural developments and shifting consumer preferences towards high-technology products...

The CFRP market has grown at a CAGR of 22.7% over the period of 2008-2013.

The revenue generated by the CFRP market stood close to INR ~ million in 2008. The market registered a growth of ~% in 2009 as compared to the successive years. This was primarily due to the economic slowdown as the market recorded a value of INR ~ million.

...The revenue of the market was recorded to be INR ~ million in 2011, which further grew at a rate of ~ in 2012, reaching INR ~ million. The CFRP market maintained a strong growth of ~% in 2013 and registered revenue worth INR ~ million.

Figure: India Carbon Fiber Reinforced Polymer Market by Revenue in INR Million, 2008-2013

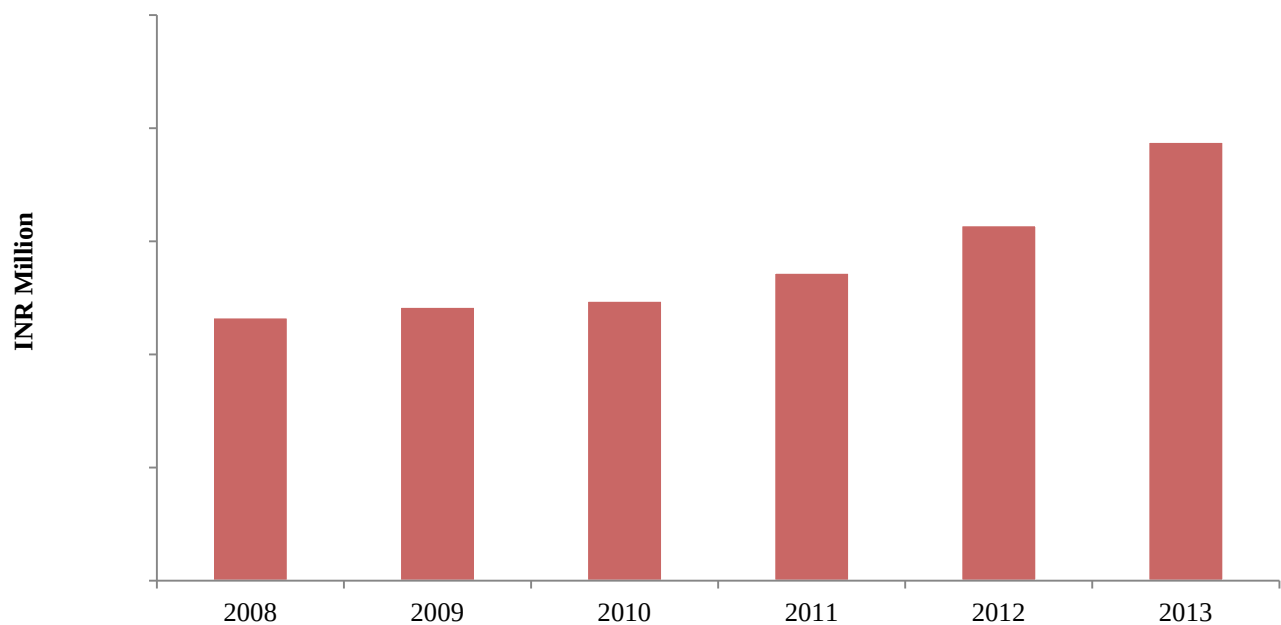


INDIA CERAMIC MATRIX COMPOSITES MARKET INTRODUCTION AND MARKET SIZE, 2008-2013

...The contribution in revenue was around ~% and amounted to revenue worth INR ~ million in 2013, as against a contribution of ~%, worth INR ~ million in 2008.

...The market has grown at a slow CAGR of ~% over the period of 2008-2013...

Figure: India Ceramic Matrix Composites Market by Revenue in INR Million, 2008-2013



MARKET SHARE OF MAJOR PLAYERS IN INDIA CARBON FIBER MARKET

...Toray was the market leader in the aerospace and defense carbon fiber market, commanding an approximate share of ~% in the overall carbon fiber market revenue, including composites in 2013. Hexcel stood as the second largest player in the Indian aerospace and defense market of carbon fibers. The company captured a market share of ~% in total carbon fiber market revenue in India as of 2013.

...Zoltek was the major player in the industrial carbon fiber market in India. Zoltek's carbon fiber segment includes woven fabrics, milled fiber, pultruded profiles, staple fiber, and the company commanded a market share of ~% in the total industrial carbon fiber market revenue in 2013. Toho Tenax accounted for a ~% share in the overall industrial carbon fiber market revenue in India in 2013...

...The market share of Formosa in the consumer and sports equipment carbon fiber market in India as of 2013 was ~%, while SGL and Mitsubishi jointly captured approximately ~% share in the market.

Table: Market Share of Major Players in India Aerospace & Defense Carbon Fiber Market by Revenue in Percentage (%), 2013

Major Players	Market Share (%)
Toray	
Hexcel	
Total	

Table: Market Share of Major Players in India Industrial Carbon Fiber Market by Revenue in Percentage (%), 2013

Major Players	Market Share (%)
Zoltek	
Toho	
Others (SGL, Formosa)	
Total	

Table: Market Share of Major Players in India Consumer & Sports Equipment Carbon Fiber Market by Revenue in Percentage (%), 2013

Major Players	Market Share (%)
Formosa	
SGL, Mitsubishi	
Total	

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INDIA CARBON FIBER MARKET FUTURE OUTLOOK AND PROJECTIONS, 2014-2018

CARBON FIBER MARKET, 2014-2018

...The carbon fiber market has showcased a CAGR of nearly 18.8% during the respective period, registering the overall consumption volume of ~ tonnes in 2013. The carbon fiber market in India is further anticipated to grow at a CAGR of 20.9% to reach consumption volume of ~ tonnes by the year 2018...

...Additionally, the India carbon fiber market is expected to generate revenue of INR ~ million in 2016 and INR ~ million in 2018, recording ~% and ~% growth rates, respectively, thereby registering a CAGR of 19.8% for the period 2013-2018.

Aerospace and Defense market is expected to remain the largest consumer of carbon fiber and its derivatives, thus growing to an average annual consumption of ~ tonnes by 2018. India is one of the largest defense equipment importers globally...

The industrial sector is anticipated to reach to a consumption volume of ~ tonnes by 2018. The key user segments in the industrial sector with relatively high penetration in the carbon fiber market will be the wind turbine and civil & construction sectors. The consumption volume from these sectors is anticipated to grow at a CAGR of ~% and ~%, respectively, during the period of 2013-2018...

Consumer and the sports equipment sector is expected to reach to a consumption volume of ~ tonnes by 2018. With changing economic conditions, increased manufacturing of sports equipment and consumer products, this sector is set to grow at a CAGR of 19.4% over the period of 2013-2018.

Whereas in value terms, the aerospace and defense in India is projected to grow at a CAGR of ~% over 2013 to 2018, reaching INR ~ million by 2018...

...On the other hand, the industrial sector of the carbon fiber market will grow at a CAGR of 22.1% from 2013 to 2018, and amount to a value of INR ~ million by 2018. For the future period of 2013-2018, the automotive sector is anticipated to be the fastest growing segments in the Indian industrial carbon fiber market, with a CAGR of ~% followed by the wind turbine sector, growing at a CAGR of ~%...

...The consumer and sports equipments segment is still in its budding stage and is estimated to pick up pace after 2015 and grow rapidly after 2018. This market is expected to generate revenue worth INR ~ million in 2015 and INR ~ million in 2018 respectively, thereby growing at a CAGR of 16.1% over the period of 2013-2018...

Figure: India Carbon Fiber Market Future Projections on the Basis of Domestic Consumption in Tonnes, 2014-2018

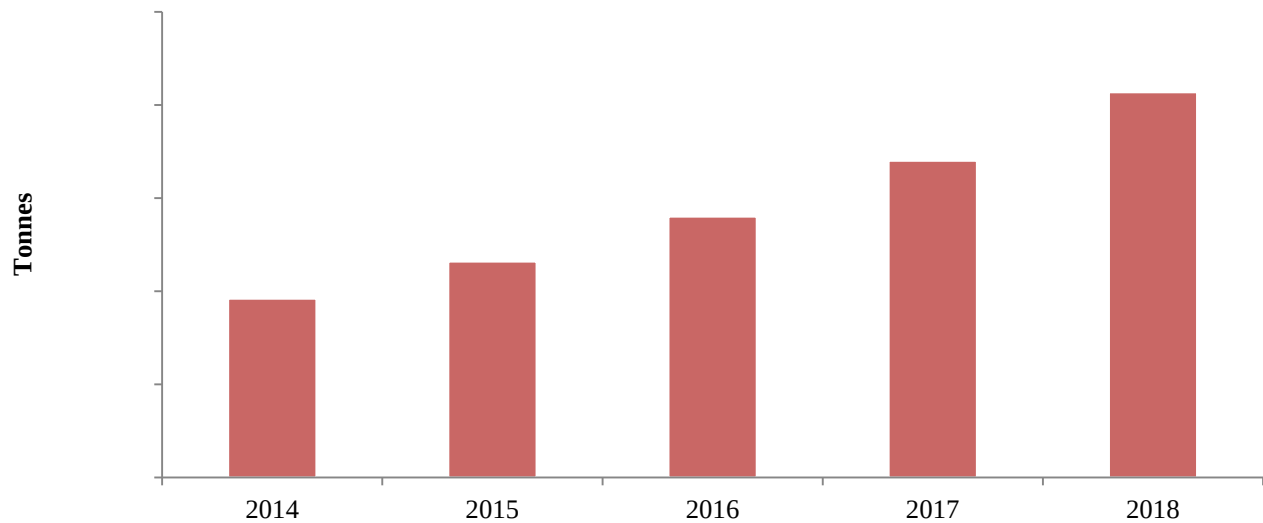


Figure: India Carbon Fiber Market Future Projections on the Basis of Revenue in INR Million, 2014-2018

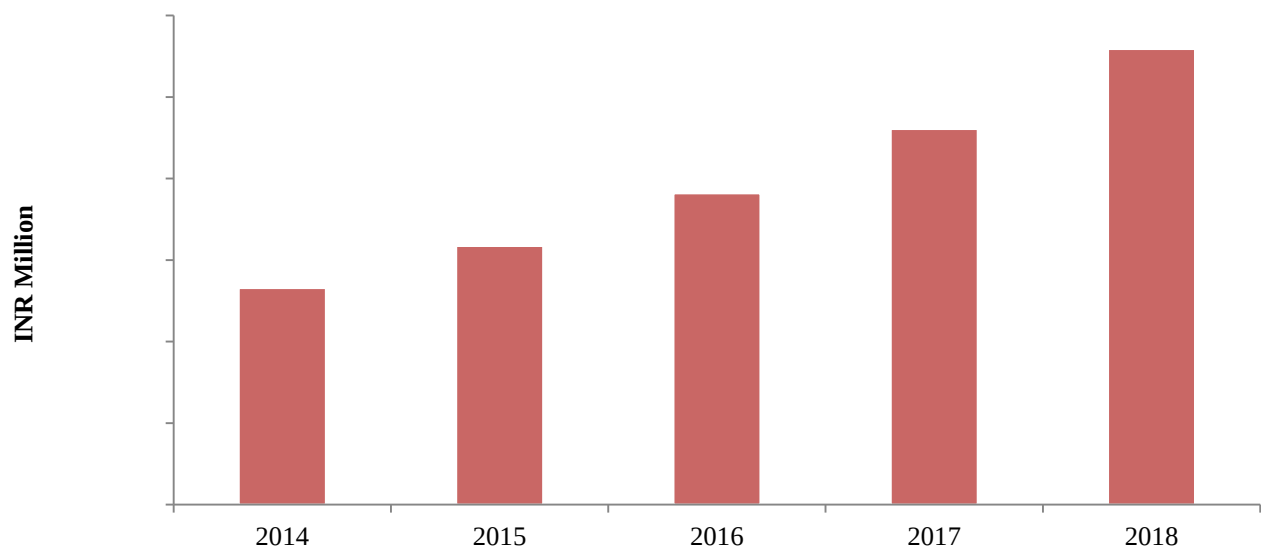


Figure: India Carbon Fiber Market Segmentation by Major End-Users Future Projections on the Basis of Revenue Contribution in Percentage (%), 2014-2018

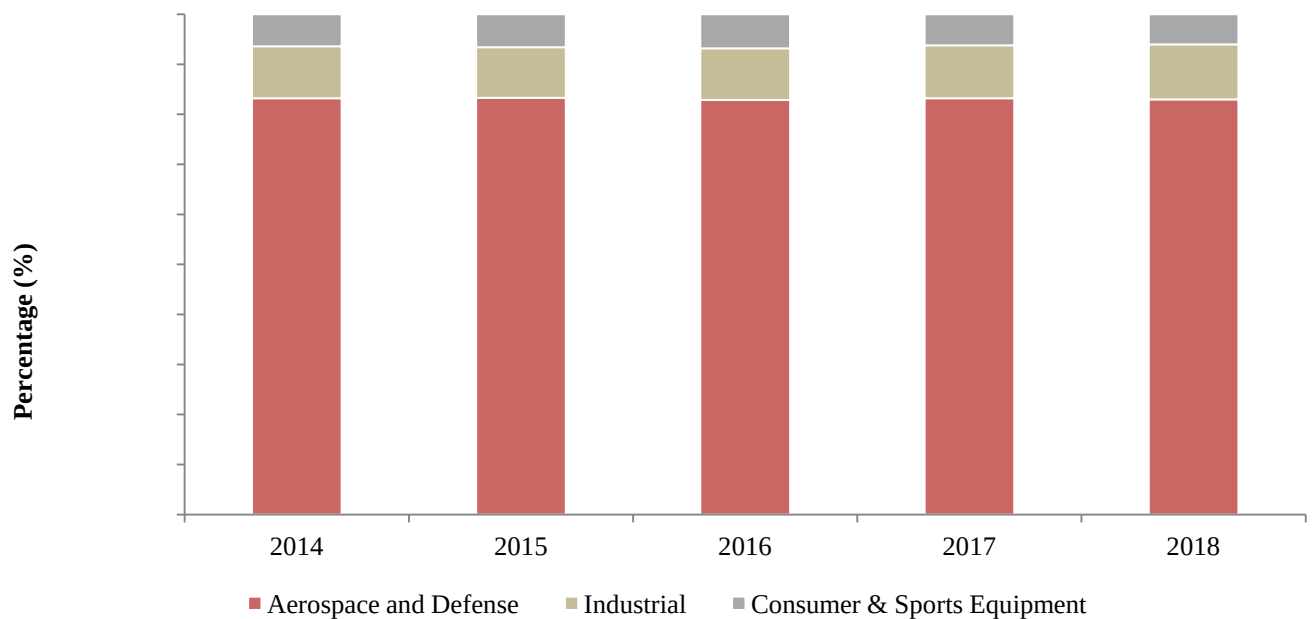
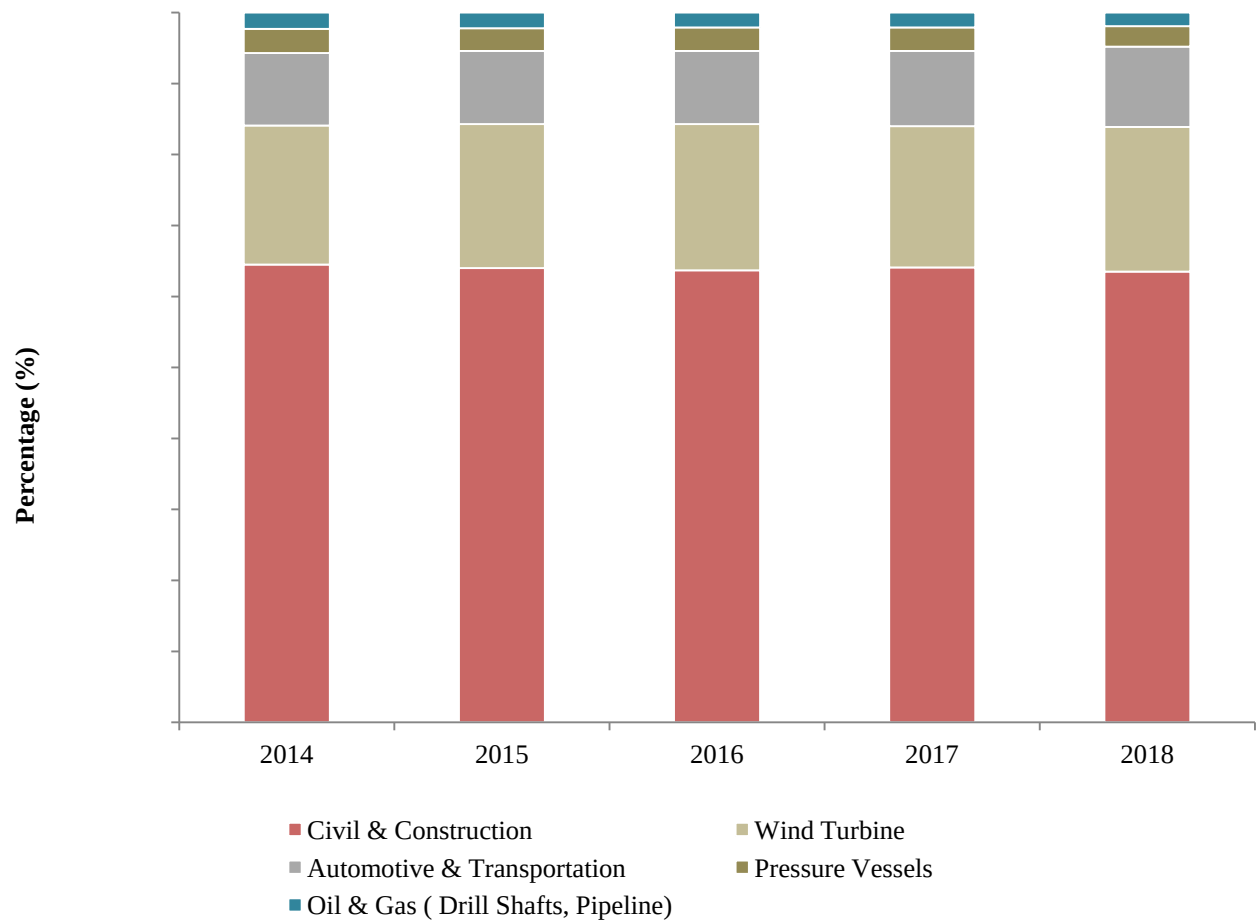


Figure: India Industrial Carbon Fiber Market Segmentation by End-User Sectors Future Projections on the Basis of Revenue Contribution in Percentage (%), 2014-2018



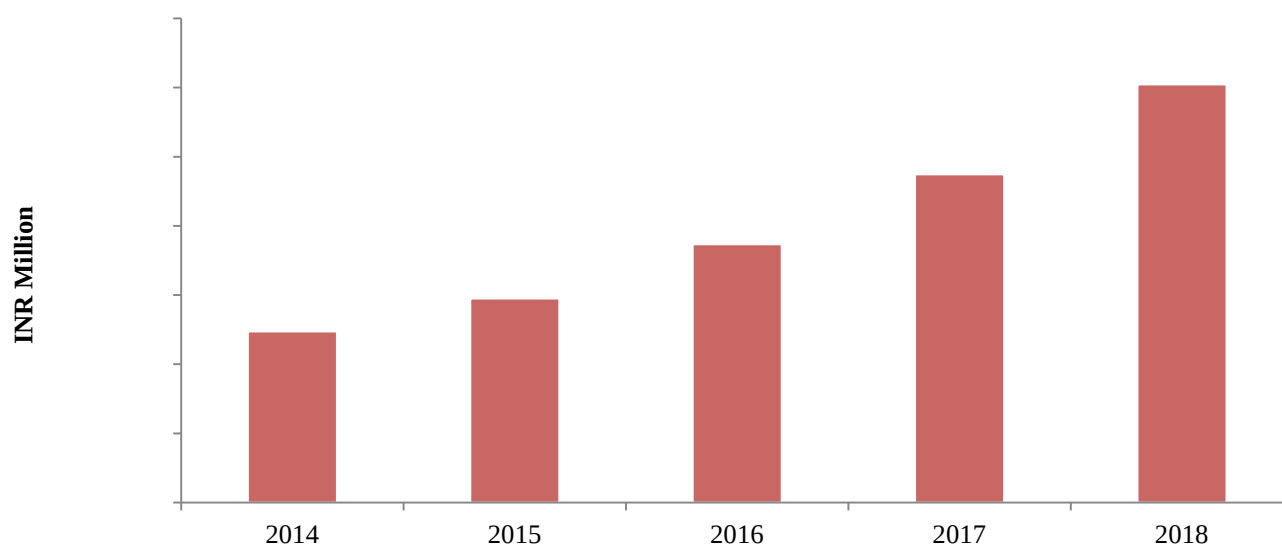
CARBON FIBER COMPOSITES MARKET, 2014-2018

...The revenue of India carbon fiber composites market is projected to increase from INR ~ million in 2013 to INR ~ million by 2018, at a CAGR of 24.2%...

The contribution from carbon-carbon composites in India is predicted to grow at a CAGR of 16.9% from 2013-2018 as compared to a CAGR of 13.4% from 2008-2013 and will reach INR ~ million in 2018.

...Additionally, the mechanical and chemical application will continue to guide the revenue for ceramic matrix composites in the country, thereby reaching revenue worth INR ~ million at a CAGR of ~% over the period of 2013-2018...

Figure: India Carbon Fiber Composites Market Future Projections by Revenue in INR Million, 2014-2018



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