
INDUSTRY OVERVIEW

Unless otherwise indicated, the information contained in this section is derived from various governmental and official publications, other publications and the market research report prepared by Frost & Sullivan, which was commissioned by us. The information and statistics from official government sources has not been independently verified by us, the Sole Sponsor, the [REDACTED], the [REDACTED], the [REDACTED], the [REDACTED], the [REDACTED], or any of our or their respective directors and advisers or any other persons or parties involved in the [REDACTED], and no representation is given as to its accuracy. For a discussion of risks relating to our industry, please refer to the sub-section headed “Risk Factors — Risks Relating to Our Business and Industry” in this document.

SOURCES OF INFORMATION

We have commissioned Frost & Sullivan, an independent market researcher and consultant, to analyse and report on the PRC’s disposable biodegradable plastic products market. Frost & Sullivan is an independent global consulting firm founded in 1961 in New York. Frost & Sullivan provides market research on a variety of industries, among other things. The information from Frost & Sullivan disclosed in this document is extracted from a report commissioned by us for a fee of RMB780,000, and is disclosed with the consent of Frost & Sullivan (the “**Frost & Sullivan Report**”).

We have included certain information from the Frost & Sullivan Report in this document because our Directors believe that such information facilitates an understanding of the relevant market for potential investors. The market research process for the Frost & Sullivan Report has been undertaken through detailed primary research which involves discussing the status of the PRC’s disposable biodegradable plastic products market with leading industry participants and industry experts. Secondary research involved reviewing company reports, independent research reports and data based on Frost & Sullivan’s own research database.

Analysis and forecasts contained in the Frost & Sullivan Report are based on the following major assumptions at the time of compiling such reports: (i) the PRC’s economy is likely to maintain steady growth in the next decade; (ii) the PRC’s social, economic, and political environment is likely to remain stable in the forecast period; (iii) market drivers such as government supports, advanced technologies, increasing demand of disposable biodegradable plastic products and others will drive the development of the disposable biodegradable plastic products market; and (iv) COVID-19 will affect the market stability in the short term. Our Directors confirm that after taking reasonable care, there is no material adverse change in the overall market information since the date of the Frost & Sullivan Report that would materially qualify, contradict or have an impact on such information.

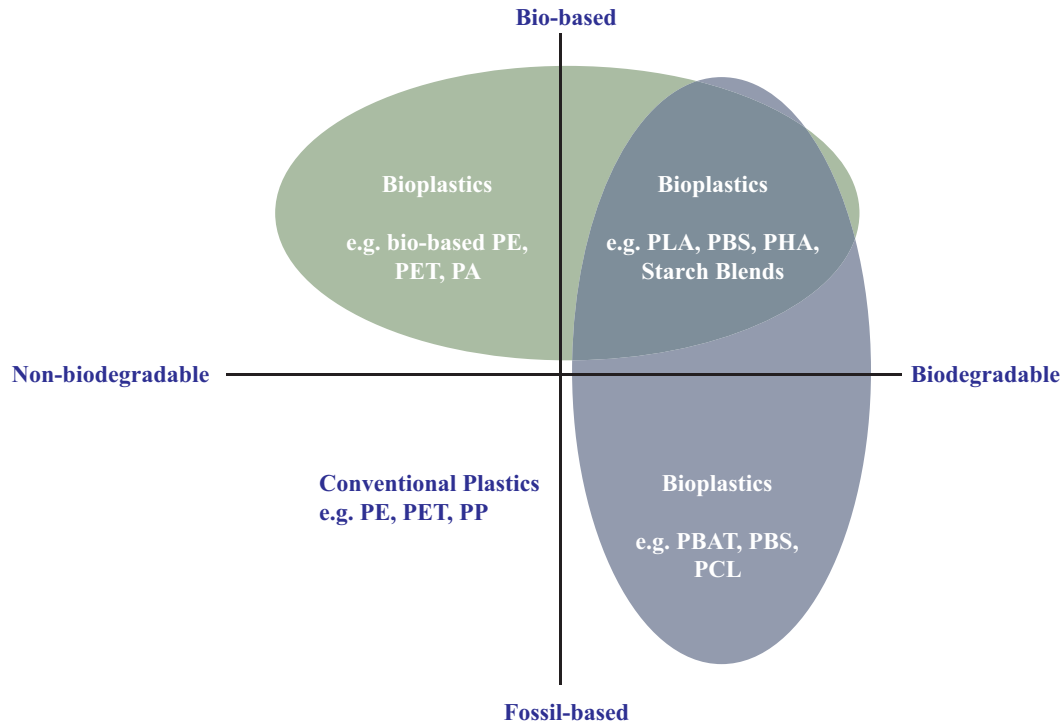
ANALYSIS OF DISPOSABLE BIODEGRADABLE PLASTIC PRODUCTS MARKET IN CHINA

Definition and Overview

Degradable plastic is recognised as plastic designed to undergo a significant change in its chemical structure under specific environmental conditions, resulting in loss of some properties that may vary as measured by standard test methods appropriate to the plastic and the application in a period of time that determines its classification. Degradable plastics are plastics that are capable of degrading in natural or compost environments in accordance with international standards, such as biodegradable plastics, photodegradable plastics, water degradable plastics and others. Biodegradable plastics are plastics that will decompose in natural aerobic (composting) and anaerobic (landfill) environments. Biodegradation of plastics occurs when microorganisms metabolise the plastics to either assimilable compounds or to humus-like materials that are less harmful to the environment.

Based on their composition, biodegradable plastics can be further segmented into bio-based biodegradable plastics and fossil based biodegradable plastics. Bio-based biodegradable plastics include starch based, PLA, PHA, cellulose based and others, while fossil based biodegradable plastics include PBAT, PBS, PCL and others.

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Notes: PBS can be produced either from bio-based feedstock such as glucose and sucrose via fermentation or from fossil-based feedstock.

Comparing with biodegradable plastics, the conventional plastics have relatively lower cost, and have higher performance of water resistance and strength. While the conventional plastic products are not degradable and harmful to the environment, the biodegradable plastic can save fossil resources by using biomass which can be regenerated and easily decomposed. For environmental protection concern and the advancement of technologies in biodegradable plastics market, the conventional plastics market share might be greatly substituted by biodegradable plastic in the future.

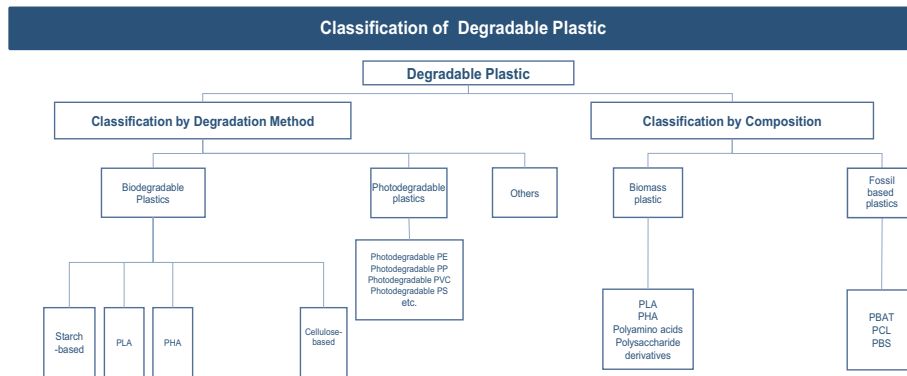
The biodegradable plastic market in China has reached a critical juncture in its growth phase. The public concern over the mounting plastic pollution, the desire of manufacturing companies to develop more sustainable plastic resins, and the support from the government for green and sustainable measures are fuelling the growth of the market.

The biodegradable plastic products in China are normally required to adhere to one or more of the following standards:

Standard Name	Type	Key content
GB/T 41010-2021 Biodegradability and identification requirements of biodegradable plastics and products (生物降解塑料與製品降解性能及標識要求).....	General	This standard specifies the general biodegradation performance and general labelling requirements of biodegradable plastics and products (not product specific).

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Standard Name	Type	Key content
GB/T 19277.1-2011 Determination of the ultimate aerobic biodegradability of plastic materials under controlled composting conditions. Method by analysis of evolved carbon dioxide. Part 1: General method (受控堆肥條件下材料最終需氧生物分解能力的測定。採用測定釋放的二氧化碳的方法。第1部分：通用方法).....	Testing	This standard specifies a testing method to measure the biodegradability of material used as the organic compound under controlled composting conditions. Biodegradability is measured by carbon dioxide emissions and its relevant conversion percentage. The simulation of composting conditions is achieved by mixing organic municipal solid waste in a typical aerobic composting condition. Testing samples is placed in compost inoculum, with preset temperature, oxygen concentration and humidity.
GB/T 38082-2019 Biodegradable plastic shopping bags (生物降解塑料購物袋)	Specific product	This standard specifies the product requirements, testing methods, inspection rules and marking, packaging, transportation, and storage biodegradable shopping bags. This standard applies to films produced with biodegradable plastic resin as the main raw material, and those made by heat sealing or bonding and other bag making processes.
GB/T 33798-2017 Bio-polyester drum-linkage bags (生物聚酯連卷袋) ...	Specific product	This standard specifies the product requirements, testing methods, inspection rules and marking, packaging, transportation, and storage of bio-polyester roll bags (i.e. equivalent to produce bag roll). This standard applies to the production of bio-polyester as the main raw material. The standard bio-polyester mainly refers to the chemical structure containing ester bonds, biodegradable polymers.

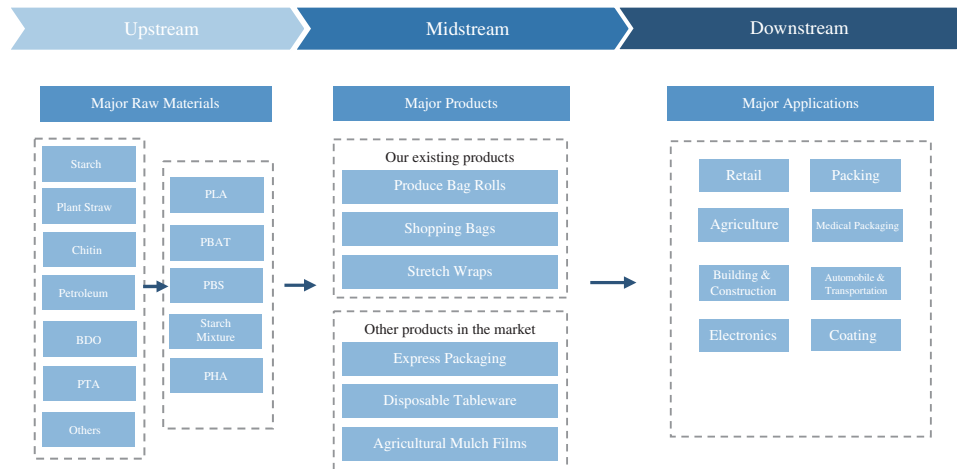


Source: Frost & Sullivan Analysis

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Analysis of Value Chain

Among them, the upstream raw material is mainly composed of the starch mixture, PLA, PBAT, PBS, and others, and for these materials, they are mainly made by starch, plant straw, chitin, and other polymers. For example, PBAT is a copolymer made by BDO (Butanediol), PTA (P-phthalic Acid), and others. The main products of biodegradable plastic products in China are produce bag rolls, shopping bags, express packaging, and disposable tableware, which are widely used in retail, packing, agriculture, medical packaging and other industries.



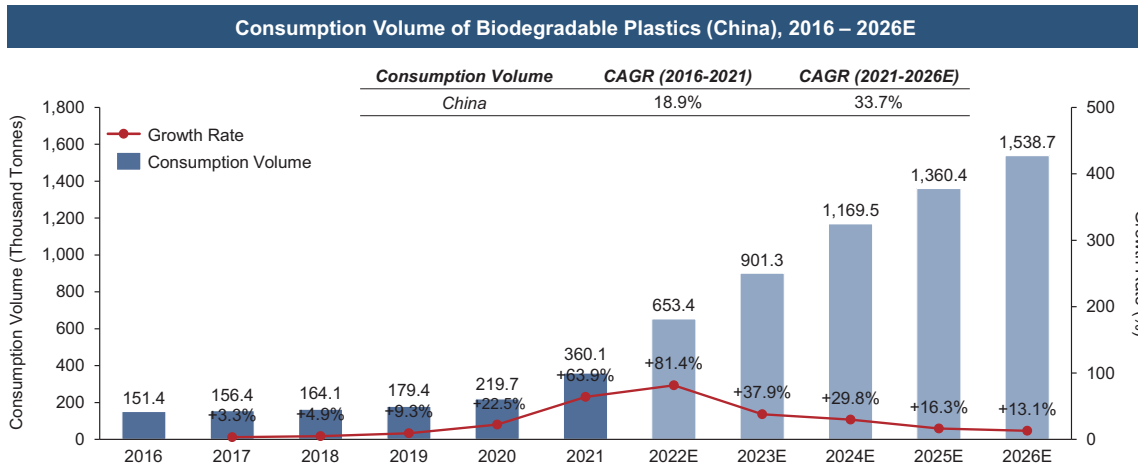
Source: Frost & Sullivan Analysis

Market Size of Disposable Biodegradable Plastic Products in China

In 2021, the sales revenue of disposable plastics products in China increased from RMB56.0 billion in 2016 to RMB111.6 billion, with a CAGR of 14.8%. In 2026, the sales revenue of disposable plastics products in China is expected to reach RMB192.1 billion, with a CAGR of 11.5%. In 2026, the percentage of disposable biodegradable plastics products in disposable plastics products in China is expected to increase from 8.2% in 2021 to 22.6%.

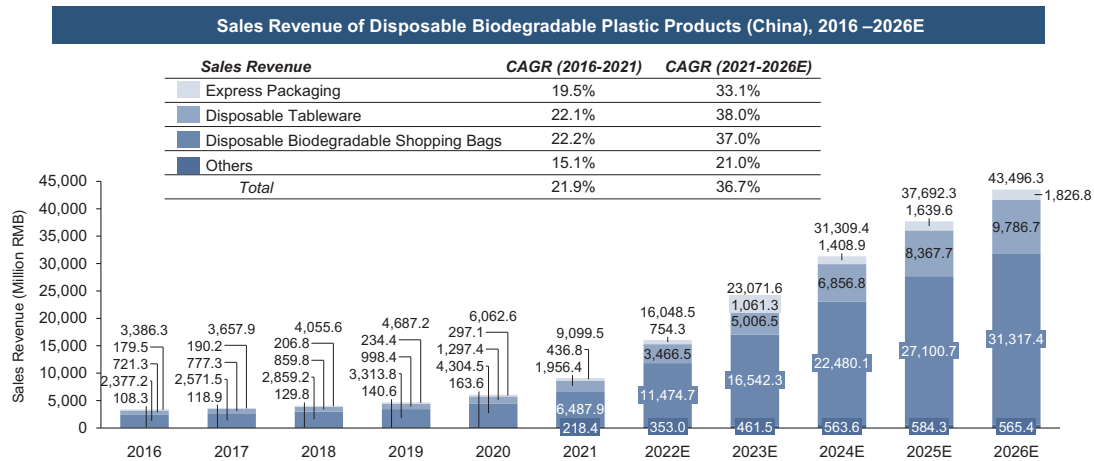
The development of disposable biodegradable plastic products market in the PRC is a policy-driven market. In 2020, the “Opinions on Further Strengthening the Control of Plastic Pollution” (《關於進一步加強塑料污染治理的意見》) was issued by National Development and Reform Commission and Ministry of Ecology and Environment, which aims to limit the usage of the conventional (non-recyclable, non-degradable) plastic products nationwide. By 2022, the consumption of conventional disposable non-degradable plastic products will be significantly reduced, and alternative products will be promoted. By 2025, the government will gradually prohibit or restrict the usage of the non-degradable plastic products. From 2016 to 2021, the total production volume of biodegradable plastics in China increased from approximately 166.4 thousand tonnes to 449.7 thousand tonnes, with a CAGR of approximately 22.0%. During the same period, the production volume of starch-based biodegradable plastic, PLA, PBAT and others experienced a growth with a CAGR of approximately 5.2%, 27.1%, 38.1% and 22.1%, respectively. In 2021, the total production volume of biodegradable plastic reached 449.7 thousand tonnes, with a growth rate of 86.6% from 2020. Such growth was mainly due to the favourable policies and the rising demand from the downstream industries. As the key raw material for biodegradable plastic products, the production capacity of PLA and PBAT has been greatly expanded, and the production volume of PLA and PBAT has increased from 62.8 thousand tonnes and 63.6 thousand tonnes in 2020 to 119.6 thousand tonnes and 182.7 thousand tonnes in 2021, respectively.

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Source: China Plastic Processing Industry Association; Frost & Sullivan Analysis

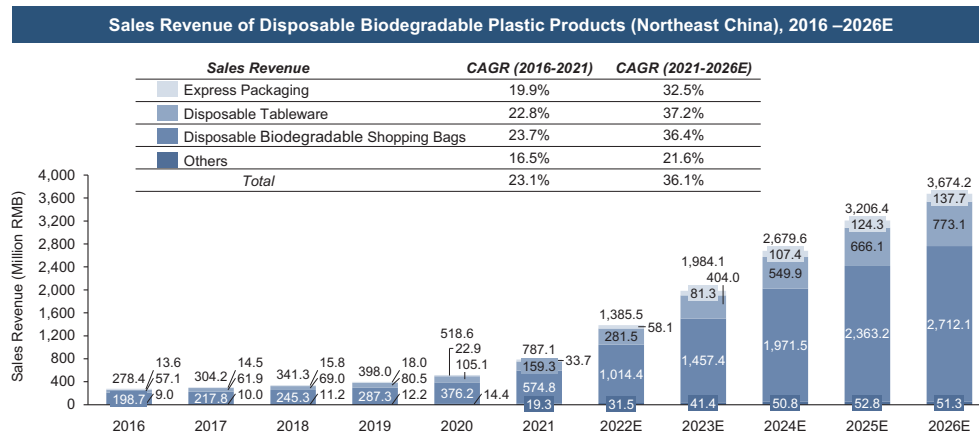
Due to the extended applications of biodegradable plastics and stable development of downstream disposable biodegradable plastic products such as Disposable Biodegradable Shopping Bags and biodegradable disposable tableware, the consumption volume of biodegradable plastics in China experienced a continuous growth from 151.4 thousand tonnes in 2016 to 360.1 thousand tonnes in 2021, with a CAGR of 18.9%. Looking forward, along with the growing demand from downstream biodegradable plastic products market, the consumption volume of biodegradable plastics in China is anticipated to enjoy a significant increase and reach 1,538.7 thousand tonnes in 2026, representing a CAGR of 33.7% from 2021 to 2026.



Source: China Plastic Processing Industry Association; Frost & Sullivan Analysis

From 2016 to 2021, the total sales revenue of disposable biodegradable plastic products in China increased from RMB3,386.3 million to RMB9,099.5 million, with a CAGR of 21.9%. The major disposable biodegradable plastic products include express packaging, disposable tableware, Disposable Biodegradable Shopping Bags and others such as agricultural mulch films. During the period of 2016 to 2021, the sales revenue of disposable biodegradable plastic products in express packaging, disposable tableware, Disposable Biodegradable Shopping Bags and others experienced a growth with a CAGR of 19.5%, 22.1%, 22.2%, and 15.1%, respectively. By 2026, the total sales revenue of disposable biodegradable plastic products in China is expected to reach RMB43,496.3 million, representing a CAGR of 36.7% from 2021 to 2026. From 2021 to 2026, the sales revenue of disposable biodegradable plastic products in express packaging, disposable tableware, Disposable Biodegradable Shopping Bags and others in China is anticipated to grow at a CAGR of 33.1%, 38.0%, 37.0%, and 21.0%, respectively.

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Source: China Plastic Processing Industry Association; Frost & Sullivan Analysis

As the policies related to comprehensively prohibiting the production, sales and use of some non-degradable plastic products were implemented firstly in Jilin province in 2015, the disposable biodegradable plastic products market in Northeast China experienced growth during FY2016–2021, with a CAGR higher than that of the PRC as a whole. From 2016 to 2021, the total sales revenue of disposable biodegradable plastic products in Northeast China increased from RMB278.4 million to RMB787.1 million, with a CAGR of 23.1%. During the same period, the sales revenue of disposable biodegradable plastic products in Northeast China for express packaging, disposable tableware, Disposable Biodegradable Shopping Bags and others experienced a growth with a CAGR of 19.9%, 22.8%, 23.7%, and 16.5%, respectively. By 2026, the total sales revenue of disposable biodegradable plastic products in Northeast China is expected to reach RMB3,674.2 million, representing a CAGR of 36.1% from 2021 to 2026. From 2021 to 2026, the sales revenue of disposable biodegradable plastic products in express packaging, disposable tableware, Disposable Biodegradable Shopping Bags and others in Northeast China is anticipated to grow at a CAGR of 32.5%, 37.2%, 36.4%, and 21.6%, respectively.

Market Drivers

Government Supports: As a policy-driven industry, the pace of development of disposable biodegradable plastic products market in China relies on policies and regulations introduced by the government. For example, in 2020, Opinions on Further Strengthening the Control of Plastic Pollution (《關於進一步加強塑料污染治理的意見》) was issued by the National Development and Reform Commission, Ministry of Ecology and Environment which stated that: By 2022, the consumption of disposable plastic products will be significantly reduced, alternative products will be promoted, and the proportion of plastic waste recycling and energy utilisation will be greatly reduced. Also, the local governments have successively introduced supplementary policies in terms of plastic pollution control. For example, in 2020, the relevant government departments in Jilin province proposed to prohibit the production, sale, and supply of plastic products that do not meet the regulations and will phase out non-degradable express plastic packaging by 2025. Moreover, in 2021, Administrative Measures for Use and Report of Disposable Plastic Products (Draft for comments) (《一次性塑料製品使用、報告管理辦法(徵求意見稿)》) was issued by the Ministry of Commerce, which encouraged the reduction of the use of disposable plastic products, and scientifically promoted the application of recyclable and degradable alternative products. Accordingly, favourable policies have been implemented continuously and thus increased the sales of disposable biodegradable plastic products in recent years.

Advanced Technologies: Technological innovation has greatly improved the industrial transformation and upgrading of the disposable biodegradable plastic products market. Most disposable biodegradable plastic products manufacturers, especially some of the leading ones, focus on improving the performance of disposable biodegradable plastic products, such as size,

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thickness, colour, weight holding capacity, tear resistance and light transmittance. Advanced and mature technologies play an important role in manufacturing quality disposable biodegradable plastic products and reducing the cost and waste in the production process of disposable biodegradable plastic products. Accordingly, advanced and mature technology has contributed to the healthy development of the disposable biodegradable plastic products market.

Increasing Demand of Biodegradable Plastic Products: With the increasing awareness of environmental issues, the demand for biodegradable plastic products has increased in recent years. In 2020, Chinese government announced the goals of carbon peak and carbon neutrality, and proposed to implement the goal of national independent contribution to strive to reach the peak of carbon dioxide emissions by 2030 and mounting efforts to achieve carbon neutrality by 2060. The application of biodegradable plastic products, such as Disposable Biodegradable Shopping Bags, express packaging, and disposable tableware have contributed to a great amount of carbon reduction since it can be easily recycled and decomposed without incineration. Accordingly, the increasing demand for biodegradable plastic products will promote the development of the biodegradable plastic products market.

Future Opportunities

Integration of Value Chain: The integration of the value chain is the main development trend to optimise the allocation of resources and promote the wide applications in the disposable biodegradable plastic products market. The disposable biodegradable plastic products manufacturers tend to expand their business upstream, which will control the supply of raw material and save the cost of raw material. Meanwhile, some disposable biodegradable plastic products manufacturers focus on varying disposable biodegradable plastic products in different downstream applications to develop customers' resources. Accordingly, the integration of the value chain will promote the development of the disposable biodegradable plastic products market.

Replacement of Imported Raw Materials: Compared with the renowned international biodegradable plastic resin manufacturers, the production technological level of biodegradable plastic resin manufacturers in China is comparatively backward and the performance of their products is less competitive. For example, biodegradable plastic agricultural mulch films have high requirement for PBAT, and currently the biodegradable plastic agricultural mulch film manufacturers in China are heavily relying on importing the high quality PBAT from other countries. However, in recent years, with the continuous investment in R&D in China, the technology level of some of the local raw materials manufacturers have improved continuously, and is approaching international level. Therefore, the increasing use of raw material manufactured by locals will greatly cut the cost of biodegradable plastic products, which will further improve the biodegradable plastic products manufacturers' profits and drive the sustainable development of this market.

Strong Demand from Disposable Biodegradable Shopping Bags: Ever stringent government policies and environmental regulations pushed by reducing plastic pollution are expected to drive downstream industrial sectors to search for biodegradable plastics products. As a result, disposable biodegradable plastic products with a broad line of applications are projected to benefit from the trend to speed up its development. Especially, with the rising penetration rate of biodegradable plastic products in the application of Disposable Biodegradable Shopping Bags, the sales revenue of Disposable Biodegradable Shopping Bags in the disposable biodegradable plastic products market is expected to reach RMB31.3 billion in 2026, with a CAGR of 37.0% from 2021 to 2026.

Challenges

Shortage of Raw Materials: The cost of disposable biodegradable plastic products is affected by the price of raw materials and production capacity. For example, from 2019 to 2020, the price of PBAT and PLA is greatly affected by their unprocessed materials, BDO, PTA and corn. During

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the period, the BDO was unable to increase due to shortage of its primary material, calcium carbide, which led to the supply shortage of BDO and as a result, the price of PBAT increased. Also, the supply of PLA in China is limited by the lactide purification technology. Lactide is the key unprocessed material of PLA, and is mainly imported from other countries. As such, the unstable supply of raw material might directly affect the profitability of the disposable biodegradable plastic product manufacturers.

The Potential Threats from Alternative Products: There are other raw materials, which are mainly composed of paper, wood, bamboo and other reusable materials, that can be used to produce alternative products. These alternative materials have different application because of their own unique properties and functionalities. Wood and bamboos are generally used to produce disposable tableware with less complicated product design (e.g., chopsticks and forks) in contrast to disposable plastic tableware, while papers are generally used to produce disposable tableware (e.g., straws, plates, bowls and cups) and Disposable Biodegradable Shopping Bags with low level of water resistance. The characteristics of plastic, being light, mouldable, durable and of high water resistance allow disposable biodegradable plastic products to occupy a sustainable competitive position in the Disposable Biodegradable Shopping Bags, disposable tableware, film and other markets. The major alternative products for our Group’s biodegradable plastic products are paper shopping bags. The cost of a paper shopping bag is approximately two times higher than the cost of a biodegradable plastic shopping bag. Even though the average price of paper per tonne might be lower than the average price of biodegradable plastic per tonne, the weights of a paper shopping bag is much heavier than a biodegradable plastic shopping bag. Therefore, paper shopping bags cost more than biodegradable plastic shopping bags. The table below sets forth the comparison of alternative products produced by different types of raw materials including plastic, paper, wood and bamboo.

Comparison of Biodegradable Products Produced by Different Type of Raw Materials			
Type of Raw Material	Properties	Main Applications	Price Comparison
Plastic	light, mouldable, durable and of high water resistance	disposable shopping bags, disposable tableware, express packaging and agricultural films	Relatively Low
Paper	light, easy to print, recyclable, but of low water resistance	disposable shopping bags and disposable tableware with low level of water resistance	Relatively Low
Wood	durable, of firm structure and of high thermal insulation	disposable tableware with less complicated product design	Relatively High
Bamboo	durable, of firm structure and of high toughness	disposable tableware with less complicated product design	Relatively High

Source: Frost & Sullivan Analysis

Market Supervision. The rising demand for biodegradable plastic products will attract more new entrants to enter the market. Along with increasing number of new market players participating, it will become more difficult and challenging to maintain consistent product quality.

Further Tightening of Plastic Products Ban. Since the disposable biodegradable plastic products market is a policy-driven market in China, the market participants heavily rely on the government’s policies and regulations. Once the government decides to tighten or adopt more strict measures to ban all plastic products, including biodegradable plastic, it may adversely affect the business of the disposable biodegradable plastic products manufacturers.

Consumer Behaviours. Environmental protection consciousness positively affects consumer behaviours. For certain consumer groups, they prefer to choose reusable shopping bags, such as canvas tote bag or mesh bags, rather than disposable shopping bags, whether they are degradable or non- degradable, for environmental protection purpose. Therefore, different consumer behaviours also affect the sales of disposable biodegradable plastic products.

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Entry Barriers

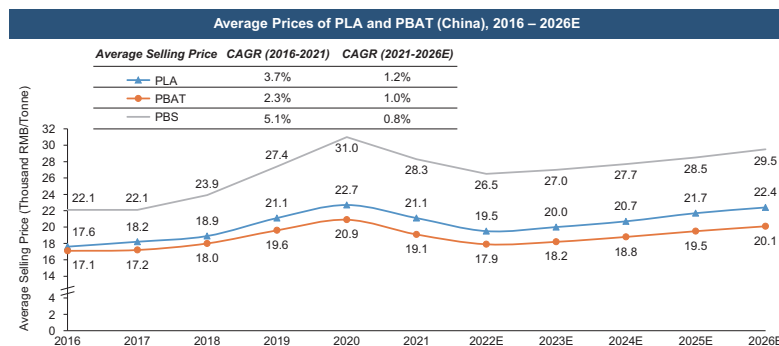
Technology Capability: The existing manufacturers in the disposable biodegradable plastic products industry have to master the key technologies of developing different formulations to maintain competitiveness, which requires a long time of repeated experiments and the accumulation of experiences. Furthermore, there are high requirements for equipment maintenance and safe operation during the production process of plastic additives to avoid potential safety hazards and meet the requirements of environmental protection. New entrants will face great challenges to break through the technical barriers, which is one of the major entry barriers.

Talent Reserve: In the disposable biodegradable plastic products market, the R&D of production process and ingredients proportion requires a group of technical, R&D and quality inspection talents with high R&D and manufacturing capabilities. Qualified talents in the disposable biodegradable plastic products industry in China are in short supply and competition for quality workers is intense. New entrants will face great challenges to establish their own talent reserve who can master the core technologies in R&D and quality inspection in a short time.

Stakeholder Relationship: Disposable biodegradable plastic products manufacturers are relatively dependent on partner organisations, the vast majority of existing manufacturers are backed by research institutes or in partnership with the government. With more time in the industry and more cooperation with the government and other partners, the existing manufacturers may be able to maintain a considerable first-mover advantage. It is also difficult for new entrants to prove their strengths and to reach partnership with relevant departments, as well as obtain support from research departments or raise sufficient capital from investors. Also, the in-time deliveries, high-quality products, and capability of massive production are other barriers for the new entrants to keep solid customer relationships.

Initial Investment: Disposable biodegradable plastic products manufacturers often require a significant upfront investment, especially the establishment of production lines and equipment. In addition, such existing large manufacturers will accelerate the transfer of industry resources to the market players already in the industry. For new entrants, it is rather difficult to obtain mature technologies and sufficient experiences to meet the product lines and equipment requirements in a short period and engage in proficient and standardised production.

Average Selling Prices of Raw Materials (PLA, PBAT, and PBS)



Source: China Plastic Processing Industry Association; Frost & Sullivan Analysis

PLA, PBAT, and PBS are the major raw materials of biodegradable plastic products, and their average prices are primarily affected by the fluctuation of unprocessed material prices such as BDO, PTA and corn. Since 2020, the market acceptance for biodegradable plastic products has been increasing, given the production costs for biodegradable plastic products started to decrease comparing to conventional non-biodegradable plastic products. Moreover, the Opinions on Further Strengthening the Control of Plastic Pollution (《關於進一步加強塑料污染治理的意見》) issued by National Development and Reform Commission to prohibit the usage of conventional plastic

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products has accelerated the development of the biodegradable plastic market and the demand for PLA, PBAT, and PBS. From 2016 to 2021, the average prices of PLA and PBAT have greatly increased from RMB17.6 thousand per tonne to RMB21.1 thousand per tonne, and from RMB17.1 thousand per tonne to RMB19.1 thousand per tonne, with a CAGR of 3.7% and 2.3%, respectively. From 2016 to 2021, the price of PBS increased from RMB22.1 thousand per tonne to RMB28.3 thousand per tonne, with a CAGR of 5.1% from 2016 to 2021. The price of PBAT was affected by the supply of BDO since 60% of PBAT was made by BDO. While BDO is restricted from expansion due to shortage of its primary material calcium carbide, the shortage supply of BDO increased the price of PBAT. Also, the supply of PLA in China is limited by lactide purification technology. Lactide is the key unprocessed material of PLA and is mainly imported from other countries. The supply of raw materials is not adequate to meet the market demand, thereby increased the prices of PLA and PBAT in 2019 and 2020. The prices of PLA, PBAT and PBS experienced a slight decrease in 2021 due to more production capacity being released in China, but will maintain stable growth because of the increasing demand for PLA, PBAT and PBS in China. In 2026, the average prices of PLA and PBAT are likely to reach RMB22.4 thousand per tonne and RMB20.1 thousand per tonne, representing a CAGR of 1.2% and 1.0% from 2021 to 2026, respectively. The price of PBS is expected to reach to RMB29.5 thousand per tonne in 2026, with a CAGR of 0.8% from 2021 to 2026. The costs of biodegradable plastic products mainly include raw material, labour cost, and others, and the cost varies by company’s technologies and equipment. Normally, the raw material, such as PBAT, PLA, and calcium carbonate, takes approximately 70-80% of the total cost of biodegradable plastic products, and the additives take within 5%. The labour cost takes 6%-7% of the total cost. Other costs mainly include manufacturing cost.

COMPETITIVE LANDSCAPE OF DISPOSABLE BIODEGRADABLE PLASTIC PRODUCTS IN CHINA

Ranking and Market Share in China

The disposable biodegradable plastic products market in China was fragmented, with approximately 1,200 market participants as at 31 December 2021. In terms of sales revenue derived from disposable biodegradable plastic products in 2021, the top five disposable biodegradable plastic products manufacturers in China accounted for approximately 13.4%. Our Group ranked fourth among all disposable biodegradable plastic products manufacturers in China, with a market share of approximately 2.6% in 2021. In terms of sales revenue derived from Disposable Biodegradable Shopping Bags (including both shopping bag and produce bag roll) in 2021, our Group accounted for approximately 3.6% of total sales revenue of Disposable Biodegradable Shopping Bags in China.

Ranking	Company	Background Information	Market Share (%)
1	Company A	One of the leading disposable biodegradable plastic products manufacturers in China headquartered in Guangdong Province and engages in the production and sales of biodegradable bags, films and other biological products since 2003.	3.2
2	Company B	One of the leading disposable biodegradable plastic products manufacturers in China headquartered in Hebei Province and focusing on diversified types of packing products including biodegradable plastic products.	2.9
3	Company C	A high-tech enterprise headquartered in Anhui Province and specialising in degradable and environmental-friendly plastic and paper packing products, including biodegradable plastic bags, biodegradable agricultural films and plastic containers.	2.7
4	Our Group	One of the leading manufacturers of disposable biodegradable plastic products in Northeast China, committed to becoming one of the leading environmental-friendly manufacturers in the PRC.	2.6
5	Company D	One of the leading manufacturers of disposable biodegradable plastic products in China headquartered in Anhui Province, focusing on the R&D, production and sales of paper and plastic tableware, and independently developing the modification technology of biodegradable plastic materials such as PLA. Company D, with the total revenue of approximately RMB0.7 billion in 2021, was in the status of listing application on Shenzhen Stock Exchange.	2.0
Top 5			13.4

Source: Frost & Sullivan Analysis

Note:

- (1) The total sales revenue of disposable biodegradable plastic products in China reached approximately RMB9.1 billion in 2021.

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Ranking and Market Share in Northeast China

The disposable biodegradable plastic products market in Northeast China is relatively concentrated, with the top five disposable biodegradable plastic products manufacturers accounting for approximately 53.9% in terms of sales revenue derived from disposable biodegradable plastic products in 2021. In terms of sales revenue derived from biodegradable plastic products in 2021, our Group ranked first among all disposable biodegradable plastic products manufacturers in Northeast China, with the market share of 29.6%.

Ranking	Company	Background Information	Market Share (%)
1	Our Group	One of the leading manufacturers of disposable biodegradable plastic products in Northeast China, committed to becoming one of the leading environmental-friendly manufacturers in the PRC.	29.6
2	Company E	One of the leading disposable biodegradable plastic products producers in Northeast China that mainly focuses on nationwide customers from supermarkets, takeout platforms and express companies.	11.5
3	Company F	One of the leading disposable biodegradable plastic products manufacturers in Northeast China that mainly focuses on the research and development, production and sales of PLA.	6.0
4	Company G	One of the earliest companies engages in manufacture of agricultural mulch films in the PRC, which has explored the application of biodegradable plastics in agricultural mulch films and Disposable Biodegradable Shopping Bags.	3.5
5	Company H	One of the leading disposable biodegradable plastic products manufacturers in Northeast China that focuses on the R&D, production and sales of biodegradable plastic bags and has a wide business coverage in China and overseas countries such as the United States, Europe, Africa and Japan.	3.3
Top 5			53.9

Source: Frost & Sullivan Analysis

Note:

- (1) The total sales revenue of disposable biodegradable plastic products in Northeast China reached approximately RMB787.1 million in 2021.

The disposable biodegradable plastic products market in Northeast China is rather concentrated, with the top five disposable biodegradable plastic manufacturers producers accounted for approximately 64.9% in terms of sales revenue derived from Disposable Biodegradable Shopping Bags in 2021. Our Group ranked first among all disposable biodegradable plastic products manufacturers in Northeast China, with a market share of approximately 40.6% in 2021.

Ranking	Company	Background Information	Market Share (%)
1	Our Group	One of the leading manufacturers of disposable biodegradable plastic products in Northeast China, committed to becoming one of the leading environmental-friendly manufacturers in the PRC.	40.6
2	Company E	One of the leading disposable biodegradable plastic products manufacturers in Northeast China that mainly focuses on nationwide customers from supermarkets, takeout platforms and express companies.	13.1
3	Company F	One of the leading disposable biodegradable plastic products manufacturers in Northeast China that mainly focuses on the research and development, production and sales of PLA.	4.8
4	Company H	One of the leading disposable biodegradable plastic products manufacturers in Northeast China that focuses on the R&D, production and sales of biodegradable plastic bags and has a wide business coverage in China and overseas countries such as the United States, Europe, Africa and Japan.	3.8
5	Company I	One of the leading disposable biodegradable plastic products manufacturers in Northeast China that mainly focuses on the manufacture of Disposable Biodegradable Shopping Bags and disposable tableware, with various customers in food and beverage industry.	2.6
Top 5			64.9

Source: Frost & Sullivan Analysis

Note:

- (1) The total sales revenue from Disposable Biodegradable Shopping Bags of disposable biodegradable plastic products manufacturers in Northeast China reached approximately RMB574.8 million in 2021.

Ranking and Market Share in Southeast China

Due to the sound economic development and the implementation of environmental protection related policies, the total sales revenue of disposable biodegradable plastic products in Southeast China increased from approximately RMB1.8 billion in 2016 to RMB4.7 billion in 2021, with a CAGR of 21.2%, and is expected to reach approximately RMB23.6 billion in 2026, representing a CAGR of 38.1% from 2021 to 2026. Among all disposable biodegradable plastic products manufacturers in China, approximately 50% are located in Southeast China with the number of market participants in Southeast China reaching approximately 600 as at 31 December 2021, and

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in terms of sales revenue derived from disposable biodegradable plastic products in 2021, the top five disposable biodegradable plastic products manufacturers in Southeast China accounted for approximately 22.0% of the total sales revenue of disposable biodegradable plastic products in Southeast China. In Southeast China, a large number of disposable biodegradable plastic products manufacturers focus on the production of disposable tableware due to high demand in these regions, thus the market of Disposable Biodegradable Shopping Bags in Southeast China was rather fragmented.

Ranking	Company	Background Information	Market Share (%)
1	Company A	One of the leading disposable biodegradable products manufacturers in China headquartered in Guangdong Province and engages in the production and sales of biodegradable bags, films and other biological products since 2003.	6.1
2	Company C	A high-tech enterprise headquartered in Anhui Province and specialising in degradable and environmental-friendly plastic and paper packing products, including biodegradable plastic bags, biodegradable agricultural films and plastic containers.	5.1
3	Company D	One of the leading manufacturers of disposable biodegradable plastic products in China headquartered in Anhui Province, focusing on the R&D, production and sales of paper and plastic tableware, and independently developing the modification technology of biodegradable plastic materials such as PLA. Company D, with the total revenue of approximately RMB0.7 billion in 2021, was in the status of listing application on Shenzhen Stock Exchange.	3.9
4	Company J	A high-tech enterprise headquartered in Zhejiang Province and specialised in the R&D, production and sales of plastic tableware and biodegradable plastic tableware with sales regions covering the United States, China, Canada, South America, etc.. Company J, with the total revenue of approximately RMB1.5 billion in 2021, was in the status of listing application on Shenzhen Stock Exchange.	3.6
5	Company K	A high-tech enterprise founded in 2011, headquartered in Guangdong Province, and dedicated to the one-stop production of biodegradable plastic masterbatches and biodegradable plastic products mainly including disposable shopping bags.	3.3
Top 5			22.0

Source: Frost & Sullivan Analysis

Note:

- (1) The total sales revenue of disposable biodegradable plastic products in Southeast China reached approximately RMB4.7 billion in 2021.

The biodegradable plastics masterbatches market in the PRC is relatively concentrated. As of 31 December 2021, there were over 30 biodegradable plastics producers that produce biodegradable plastic masterbatches in the PRC, with the top five producers accounting for approximately 48.0% in terms of production capacity of biodegradable plastic masterbatches and the annual revenue of masterbatches amounted to approximately RMB8,426 million in 2021. In terms of production capacity of biodegradable plastic masterbatches as of 31 December 2021, our Group accounted for approximately 1.4% of total production capacity in China.

ANALYSIS OF AUTOMOBILE PARTS ENGINEERING PLASTIC PRODUCTS MARKET IN CHINA

Definition of Engineering Plastics

Engineering plastics, usually refer to thermoplastic materials rather than thermosetting ones, are a group of plastic materials that have good mechanical and/or thermal properties than the plastics that are used more widely, such as PS, PVC, PP and PE.

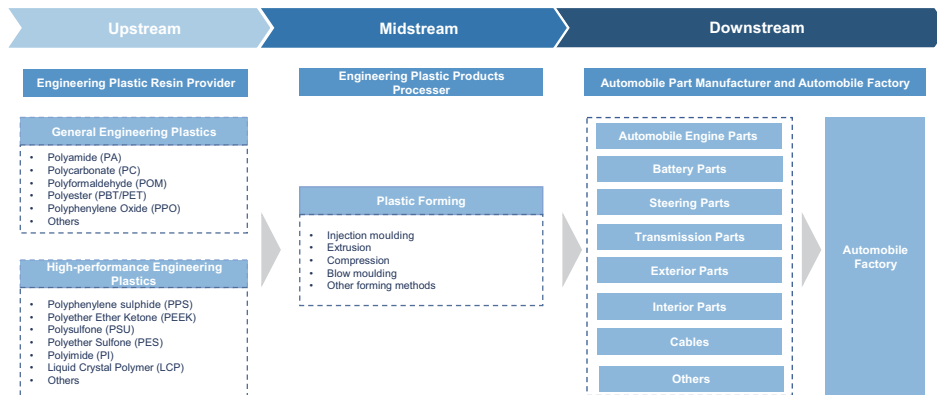
INDUSTRY OVERVIEW

Being more expensive than the more widely used plastics, engineering plastics are produced in lower quantities and tend to be used for smaller objects or low-volume applications (such as mechanical parts), rather than for bulk and high-volume ends (like containers and packaging). Engineering plastics have higher heat resistance than standard plastics and are continuously usable at temperatures up to approximately 150 °C .

Engineering plastics are gradually replacing traditional engineering materials such as metal, glass or ceramics in many applications. In addition to equalling or surpassing them in weight/strength and other properties, engineering plastics are relatively easier to be manufactured into complicated shapes. Each engineering plastic usually has a unique combination of properties that may make it good alternatives to traditional engineering materials.

Value Chain Analysis

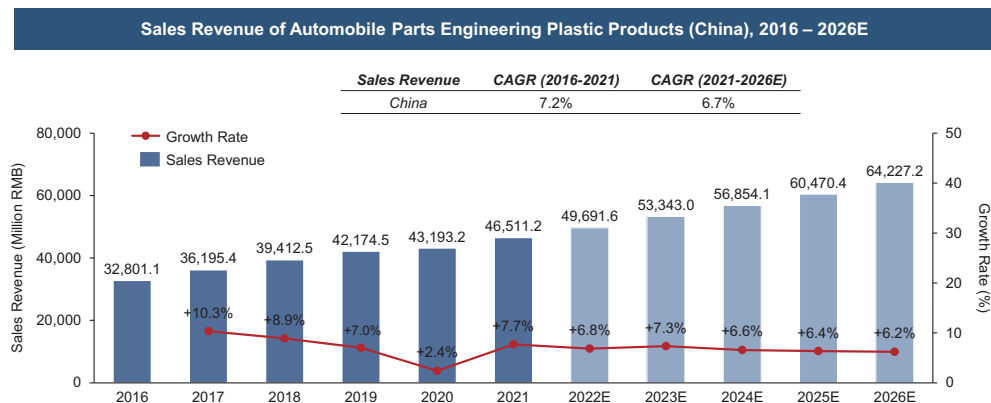
The value chain of automobile part engineering plastic products market consists of upstream engineering plastic resin provider, midstream engineering plastic processor and downstream automobile parts manufacturer and automobile factory. Among them, the upstream engineering plastic resin providers offer general engineering plastic and the high-performance engineering plastics. The midstream refers to the engineering plastic processors that produce the automobile parts engineering plastic products. The downstream is the automobile parts manufacturer that manufactures automobile parts or assemblies and provides them to the automobile factory. The overlapping customers and suppliers phenomenon is in line with the industry practice in the automobile parts engineering plastic products market.



Source: Frost & Sullivan Analysis

INDUSTRY OVERVIEW

Market Size of Automobile Parts Engineering Plastic Products Market in China



Source: Frost & Sullivan Analysis

From 2016 to 2021, the sales revenue of automobile parts engineering plastic products increased from RMB32,801.1 million to RMB46,511.2 million, with a CAGR of 7.2%. In the future, with the growing trend of automobile lightweight and the increase in the automobile production volume, especially the new energy vehicles, the sales volume of automobile parts engineering plastic products is expected to reach RMB64,227.2 million in 2026, representing a CAGR of 6.7% from 2021 to 2026.

Future Opportunities

Increase of Automobile Holding Volume: In recent years, China’s automobile industry has developed rapidly and ranked first in the world, in terms of the total sales volume in 2021. With the steady growth of China’s economy, the increase of urbanisation rate and the continuous improvement of residents’ consumption capacity, the holding capacity of the passenger automobile has increased rapidly. In 2021, automobile ownership per 1,000 people is about 214, 661, and 860 for China, Germany and United States, respectively. The accelerated urbanisation and continuous growth of per capita disposable income of urban households will enhance the consumption capability of residents and increase the sales volume of automobile, which will promote the development of automobile part engineering plastic products market in China.

Growing Demand from New Energy Vehicles: The government continues to announce favourable policies of developing new energy vehicles. For example, in 2021, the State Council issued the “Carbon Peaking Action Plan by 2030”, which proposed to raise the proportion of sales of new energy vehicles in total sales of vehicles in the current year to 40% by 2030. Such policies drove the new energy vehicle market. With the wide application of power batteries due to the rapid development of the new energy vehicle market, the requirements for lightweights and plastic application volume continue to increase. In the future, with the popularisation of new energy vehicles, the demand for automobile parts, such as battery casings, will experience rapid growth, which is expected to promote the development of the automobile part engineering plastic products market in China.

Shorter Upgrade Cycle of Automobile: Nowadays, the customers have higher requirements for the quality of automobile and an increased demand for a greater variety of vehicle types. In order to maintain the advantages in competition and meet the requirements of customers, automobile manufacturing companies continue to speed up the upgrade and replacement of automobiles, and shorten the development cycle of new automobile models. The shorter upgrade cycle of automobiles will put forward larger demands for automobile parts engineering plastic products, so as to stimulate the development of the market.

INDUSTRY OVERVIEW

Challenges

Fluctuation of Supply and Price of Raw Materials: The operations and financial results of automobile parts engineering plastic products producers are highly relying on their ability to obtain adequate and stable supply of high-quality raw materials. The prices and availability of engineering plastic raw materials depend on a variety of factors, including the oil price, technique development, local government policies and market demand which may lead to price fluctuations. The difficulties in obtaining stable supply of raw materials and the price fluctuation may affect the normal production and sales of automobile parts engineering plastic products processor and reduce their profitability.

Entry Barriers

Quality Authentication: Quality authentication certificate is an entry barrier for automobile part engineering plastic products markets. For example, ISO 9001 certification outlines the importance of high-quality goods and services. Moreover, for automobile industry specifically, the IATF 16949 certification is a merit badge for companies that are responsible for creating and supplying automobile elements or assemblies to the customers. When a company attains an IATF 16949 certification, it signifies a number of high marks about its products to a prospective buyer. Therefore, only companies with relative competitive advantages in technology R&D, enterprise management, quality control, production organisation and product supply can successfully pass the above certification and audit process and thus to obtain the quality authentication certificate is an entry barrier for the potential participants.

Customer Base and Relationship: Downstream customers often have requirements for the stable and continuous supply of engineering plastics, whilst large-scale customers that require high supply volume normally have higher requirements for the production track record of engineering plastic suppliers. Therefore, once they have established a successful cooperation with the engineering plastic products producers, the customers tend to prefer existing suppliers over new entrants. Existing suppliers with established track record are also much easier to attract new customers than the new entrants.

Capital Investment: The automobile parts engineering plastic products market has a high requirement on capital investment, as the construction of production facilities and the procurement of production equipment require a high capital investment. Therefore, capital investment is one of the main barriers for new entrants in the automobile parts engineering plastic products market.

Competitive Landscape of Automobile Parts Engineering Plastic Products Market

With more than 10,000 players in this market, China’s automobile parts engineering plastic products market is fragmented, and each participant has its own product categories focus. Our Group accounted for approximately 0.04% of the automobile part engineering plastic products market in terms of sales revenue in 2021.