



**CCM** Data & Business  
Intelligence

# **Biomaterial Industry in China**

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## 1. Executive summary

Biomaterial industry is growing rapidly in China. Biodegradable plastics are the major biomaterials that have been put into industrial production. As for other bio-based materials, only bio-PA and bio-PTT have been put into industrial production.

### - Biodegradable plastics

As of 2015, there were mainly six types of biodegradable plastics being produced in China, namely polylactic acid (PLA), polybutylene succinate (PBS), polyhydroxyalkanoates (PHA), starch-based materials, polypropylene carbonate (PPC) and polycaprolactone (PCL). In 2015, the Chinese capacity and output of these biodegradable plastics reached about XXXX t/a and XXXX tonnes, respectively.

Currently in China, these biodegradable plastics are mainly applied in packing materials, agricultural film, and 3D printing. The increasing demand from these fields has become a main force driving the development of the Chinese biomaterial industry. For example, in 2015, due to the prohibition of disposable plastic bags in Jilin Province, there was a greater demand for biodegradable packing materials, and in response, many Chinese producers had increased their capacity of PLA. In addition, the rapid development of 3D printing industry in China also contributes to the development of PLA, a major raw material of 3D printing. What's more, stimulated by the wide use of PBS agricultural film in Xinjiang Uyghur Autonomous Region, the domestic output of PBS has increased from XXXX tonnes in 2014 to XXXX tonnes in 2015.

With the gradual promotion of biodegradable plastics in the domestic market, China's proportion of export of some biodegradable plastics decreased slightly. For example, the proportion of export of PBS has declined from over XXXX in 2014 to about XXXX in 2015.

At present, the major factor that hinders the development of biodegradable plastics in China is the high price, the average of which is XXXX times as much as general-purpose plastics. For example, although starch-based material is the cheapest amongst the six biodegradable plastics, it's more expensive than polyethylene (PE), a kind of general-purpose plastic.

### - Other bio-based materials

In 2015, the domestic capacities of bio-polyamide (bio-PA) and bio-polytrimethylene terephthalate (bio-PTT) reached XXXX t/a and XXXX t/a, respectively. These two products were mainly exported to Europe. The ex-works prices of bio-PA and bio-PTT were both over USD XXXX /t, twice higher than that of oil-based PA and oil-based PTT. Bio-PA is mainly applied in vehicles and electronic components, while bio-PTT is mainly applied in clothing.

More and more products will be consumed in the domestic market and the price will further decline. High value-added areas such as 3D printing will have a large demand for biomaterials.

## 2. Introduction and methodology

This report was drafted by diverse methods listed as follows:

### - Desk research

There are various sources of desk research, including published magazines, journals, government statistics, industrial statistics, customs statistics, association seminars as well as information from the Internet. A lot of work has been done in the compilation and analysis of the obtained information. When necessary, checks would be made with Chinese suppliers regarding market information such as key producers, key end users, production and demand.

### - Telephone interviews

CCM has carried out extensive telephone interviews in order to survey the actual market situation of biomaterial in China.

Interviewees include:

- Key producers
- Key traders
- Associations
- Experts

### - Network research

CCM contacted players in the industry through B2B websites and software.

### - Data processing and presentation

The collected data are sourced from:

- CCM's database
- Published articles from periodicals, magazines and journals, and third-party databases
- Statistics from governments and international institutes
- Third-party data providers
- Customs statistics
- Comments from industrial experts
- Professional databases from other sources
- Information from the internet
- Enterprises' annual reports

Data from various sources have been combined and cross-checked to make this report as precise and scientific as possible. Throughout the process, a series of internal discussions have been conducted in order to analyze the data and draw conclusions from them.

### 3. What's in this report?

#### Biodegradable plastic

Nowadays, the average price of biodegradable plastic is about XXXX times higher than that of general-purpose plastic. Given this, without effective promotion policy, it's hard to popularize biodegradable plastics in the domestic market. In 2015, more than XXXX of the Chinese biodegradable plastics were sold abroad.

From 2014 to 2015, the total domestic capacity of biodegradable plastics had increased from XXXX t/a to XXXX t/a, more than half of which was attributed to XXXX.

Table 1.1-1 Capacities of different biodegradable plastics in China, 2014-2015, t/a

Biodegradable plastic	2015	2014
PLA	XXXX	XXXX
...	...	...
<b>Total</b>	XXXX	XXXX

Source: CCM

#### Other bio-based materials

- Bio-PA

In China, bio-PA was put into industrial production in Arkema (Suzhou) Polyamides Co., Ltd. (Arkema Suzhou). In 2011, the company's XXXX t/a bio-PA production line was in full production. Therefore, Arkema Suzhou started to expand its production capacity. The first-stage project of its bio-PA project was finished in 2013 with a capacity of XXXX t/a and the total capacity of bio-PA reached XXXX t/a. As of March 2016, The second-stage bio-PA project was under construction in Arkema Suzhou with a capacity of XXXX t/a.

During 2014-2015, over XXXX of the Chinese bio-PA products were XXXX, mainly to XXXX.

In 2015, the ex-works price of bio-PA in China was about XXXX.

## Introduction of major biodegradable plastics in China, 2014-2015

### Polylactic acid

#### Supply

Table 2.1.1-2 Capacity and output of major PLA producers in China, 2014-2015

No.	Producer	Capacity'15, t/a	Capacity'14, t/a	Output'15, tonne	Output'14, tonne
1	Zhejiang Hisun Biomaterials Co., Ltd.	15,000	XXXX	XXXX	XXXX
...	...	...	...	...	...
<b>Total</b>		XXXX	XXXX	XXXX	XXXX

Source: CCM

#### Export

Table 2.1.2-1 China's export of PLA (primary form) by month, 2015

Month	Volume, tonne	Value, USD	Price, USD/kg
Jan.	...	...	...
...	...	...	...
<b>Total</b>	XXXX	XXXX	XXXX

Source: China Customs & CCM

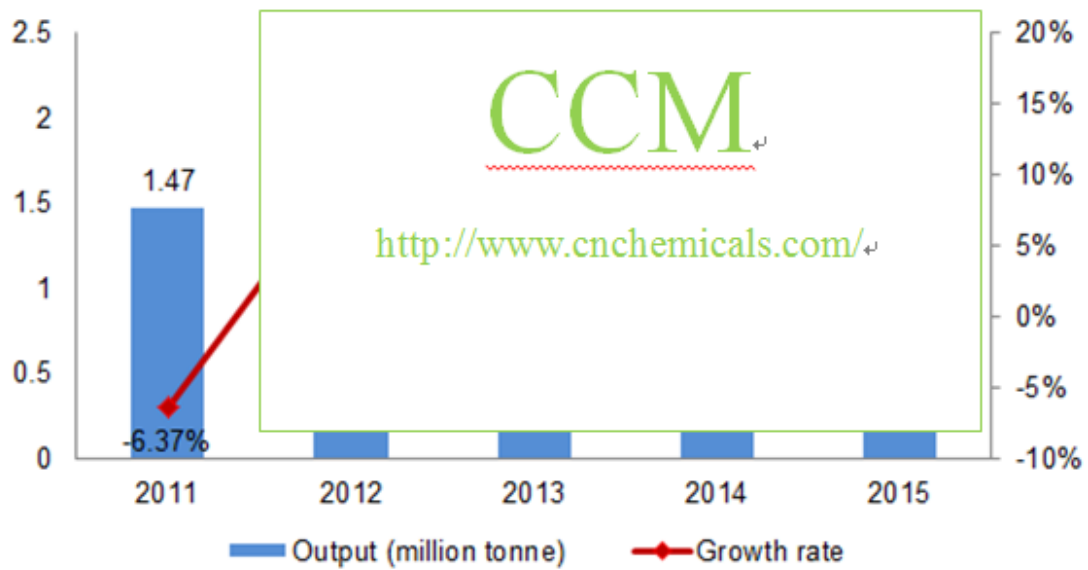
### Downstream application of biomaterials in China

#### - Agricultural film

In 2015, the total domestic output of agricultural film was XXXX million tonnes, with an average annual growth rate of about XXXX between 2011 and 2015. More than XXXX of the agricultural film in China is non-degradable agricultural film with PE as a major raw material. Supposing bio-based agricultural film will gradually replace traditional agricultural film, biomaterials will embrace a great opportunity for development.



Figure 3-1 Output of agricultural film in China, 2011-2015



Source: CCM

### Factors that influence the development of biomaterials in China

#### Driving forces

- Policy support

Table 4.1-1 Policies & regulations on biomaterials in China, 2012-2015

Issuing date	Execution date	Region	Policies & regulations	Description
29 Dec., 2012	XXXX	XXXX	XXXX	XXXX
XXXX	12 June, 2014	XXXX	XXXX	XXXX
XXXX	XXXX	China	XXXX	XXXX
XXXX	XXXX	XXXX	Made in China 2025	XXXX

Source: The State Council & National Development and Reform Commission of China