



ONE INDUSTRY
THAT MAKES A
POSITIVE IMPACT

2022

SIZE AND IMPACT

EXECUTIVE
SUMMARY

PLASTICSINDUSTRY.ORG

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The U.S. plastics industry is growing, and demand for plastics is expected to continue for the foreseeable future.

GROWTH IN PLASTICS

PRODUCTIVITY IN PLASTICS MANUFACTURING 1997–2021



Employee Growth

1.2% ↑



Manufacturing
As a Whole

1.1% ↑

PLASTICS WORKERS IN OHIO IN 2021



75K

The Most Plastics
Industry Employees

PLASTICS WORKERS IN INDIANA IN 2021



16.3

The Most Plastics
Industry Employees
(per 1,000 non-farm jobs)

TOTAL PLASTICS INDUSTRY SHIPMENTS IN 2021



\$468 BILLION

Plastics industry shipments

\$600 BILLION

Including suppliers' shipments
to the plastics industry



**6th LARGEST
INDUSTRY
in 2020**

Plastic Products in Personal Consumption



89.0%
in 2021

One industry that makes a positive impact

The 2022 Size and Impact Report indicates that the U.S. plastics industry remains one of the economy's largest sectors and continued to grow in 2021. Most plastics are used in manufacturing, although the use of plastics in services is becoming increasingly important. As can be seen from another Plastics Industry Association (PLASTICS) study, **2022 Global Trends Report**, abundant petrochemical feedstocks have helped U.S. exports and, therefore, U.S. plastics companies and the industry as a whole.



EXECUTIVE SUMMARY

This report is the story of the U.S. plastics industry in numbers. It answers several important questions, including:

- How big is the plastics industry?
- How does it compare with other industries?
- How fast is it growing?
- Where is it located in the U.S.?
- How does it affect the rest of the economy?
- What is the outlook for the industry?

The Numbers

- The U.S. plastics industry is large, accounting for nearly a million jobs (999,100) and \$468.0 billion in shipments in 2021.
- Ohio has the most plastics industry employment (75,100).
- As a percentage of total non-farm employment, the plastics industry is most important to Indiana, where it accounted for 16.3 of every 1,000 non-farm jobs in 2021.
 - Wisconsin was second (15.4).
- When suppliers to the plastics industry are

considered, plastics-related U.S. jobs grow to 1.50 million, and total shipments grow to \$600.4 billion.

- As measured by gross output, the plastic products portion of the plastics industry was the sixth largest U.S. industry in 2020 (the latest year for which data are available).
- The plastic materials and synthetics portion of the plastics industry (including rubber and fiber) was the 18th largest industry in 2020.
- A success story for the U.S. economy, plastics manufacturing employment grew 1.8% per year from 2011 to 2021, and 3.2% from 2020 to 2021.
 - This outpaced manufacturing as a whole, which saw employment grow only 0.5% per year between 2011 to 2021 and only 1.5% from 2020 to 2021.
- Real (inflation-adjusted) plastics manufacturing shipments grew at a 0.7% per year between 2011 and 2021, and 2.3% from 2020 to 2021.
 - Real shipments by manufacturing as a whole shrunk 0.5% per year between 2011 and 2021, and grew only 2.0% between 2020 and 2021.

“When suppliers to the plastics industry are included, jobs grew to 1.50 million, and total shipments grew to \$600.4 billion.”

Industry Size

Table S-1 summarizes the plastics industry by dividing it into categories named: Plastics Manufacturing, Plastics Wholesale Trade, Captive Plastic Products Manufacturing, and Upstream Impacts. Captives are plastic processing activities located in establishments, such as automobile assembly and milk bottling plants, which are not classified by the government, or by most economists, as being part of the plastics industry. The first three categories comprise what the authors call the plastics industry. The following conclusions can be drawn from Table S-1:

- The U.S. plastics industry, as it is documented by U.S. Government data, operated 15,431 manufacturing establishments, employed 808,500 people and made shipments worth \$401 billion in 2021. This excludes establishments producing captive plastic products or supplying goods and services to the plastics industry.
- When captives are included in the definition of the plastics industry, the number employed rose to 999,100 people in 2021. Another 497,000 people were employed by the upstream industries that supplied the industry, which brought the total year 2021 employment total to 1.50 million—1.0% of the U.S. non-farm workforce.

- The plastics industry generated \$468 billion in shipments in 2021. Another \$132 billion was generated upstream by supplying industries, bringing the total shipments of the plastics industry to \$600.4 billion.
- Table S-1 does not include downstream impacts on the industries that use plastics, or on the consumers who buy the products containing plastics.

Comparisons with Other Industries

In order to rank plastics among other industries, the authors considered 82 manufacturing industries defined by the 4-digit North American Industry Classification (NAICS) system. Data were available through 2020.

- Plastic Products (NAICS 3261), which accounted for most of the plastic processing industry, was the sixth largest U.S. manufacturing industry in terms of shipments in 2020.
- Resin, Synthetic Rubber and Artificial & Synthetic Fibers & Filament (NAICS 3252), which primarily includes the Plastic Materials and Resins Industry, was the 18th-ranked manufacturing industry in 2020.

TABLE S-1

PLASTICS INDUSTRY IMPACTS, 2021

	Number of Establishments	Employees (Thousands)	Value of Industry Shipments (\$Millions)
Plastics Manufacturing			
NAICS 325211 Plastics Materials and Resins	1,132	71.5	103,243.8
NAICS 325991 & 3261 Plastics Products	10,487	676.1	239,274.7
NAICS 3332491 Plastics Working Machinery	414	11.9	4,401.8
NAICS 33351105 Molds for Plastics	629	16.1	3,195.4
Plastics Manufacturing Totals	12,662	775.6	350,115.7
Plastics Wholesale Trade			
NAICS 424610 Wholesale Trade for Plastics Materials, Forms and Shapes	2,769	33.0	50,401.1
Government-Documented Plastics Industry	15,431	808.5	400,516.8
Captive Plastic Products	N/A	190.6	67,447.0
Plastics Industry	N/A	999.1	467,963.8
Upstream Impacts	N/A	497.0	132,464.4
Full Impact *	N/A	1,496.1	600,428.1

*Excluding downstream impacts

Rate of Growth

- Over the last 24 years, plastics industry employment, real shipments and real value added fared better than manufacturing as a whole. This is because plastics are still relatively new compared to other materials and methods of manufacture.
- Employment in the plastics manufacturing industry fell 0.9% per year between 1997 and 2021. This is better than employment in all of U.S. manufacturing, which fell 1.4% per year during the same period.
- Real value added in the plastics manufacturing industry grew 0.2% per year from 1997 to 2021. The real value of shipments by this industry was flat, pulled down by the recent COVID-19 recession.
- Productivity in plastics manufacturing, defined as real shipments per employee, grew 0.9% per year from 1997 to 2021. Productivity in manufacturing as a whole grew at a slightly higher 1.0% per year rate.
- The number of plastics industry establishments continued to drift downward slowly as the industry consolidated and became more efficient.
- Employment fell from 2000 through 2010 and then began rising. The decline mirrored what happened to the rest of manufacturing, except that plastics manufacturing was more volatile, falling faster during the recession and recovering faster after it ended.
- The U.S. plastics industry thrives in a free-trade environment. The COVID-19 pandemic hurt trade for most industries and countries in 2021 and is still having an effect.

TABLE S-2

COMPARATIVE GROWTH RATES, 1997-2021

	Plastics Manufacturing	All Manufacturing
Employment	-0.9%	-1.4%
Real Shipments	0.0%	-0.5%
Real Value Added	0.2%	-0.5%
Productivity Growth	0.9%	1.0%

Location

- The plastics industry is found in all 50 states. As can be seen from Table S-3, Ohio had the most plastics industry employees in 2021, followed by Texas, California, Michigan, Illinois, Pennsylvania, Indiana, Wisconsin, North Carolina and Georgia.

TABLE S-3

TOP STATES FOR PLASTICS EMPLOYMENT (PLASTICS INDUSTRY, 2021)

Rank	State	Plastics Employment Thousands
1	Ohio	75.1
2	Texas	73.1
3	California	73.1
4	Michigan	64.3
5	Illinois	52.7
6	Pennsylvania	52.3
7	Indiana	50.2
8	Wisconsin	44.4
9	North Carolina	39.0
10	Georgia	32.9
	U.S. Total	999.1

“Over the last 24 years, plastics industry employment, real shipments and real value added fared better than manufacturing as a whole.”

- An alternative measure, plastics industry employees per thousand non-farm employees, indicates how concentrated the plastics industry is in each state—or how much that state specializes in plastics. Using this alternative measure, Table S-4 shows that Indiana has the largest number of plastics industry employees per thousand non-farm employees, followed by Wisconsin, Michigan, Ohio, Kentucky, South Carolina, Rhode Island, Alabama, Tennessee and Iowa.

TABLE S-4

**TOP STATES FOR PLASTICS CONCENTRATION
(PLASTICS INDUSTRY, 2021)**

Rank	State	Plastics Employees per 1,000 Non-Farm Employees
1	Indiana	16.3
2	Wisconsin	15.4
3	Michigan	15.3
4	Ohio	14.0
5	Kentucky	13.6
6	South Carolina	12.5
7	Rhode Island	10.7
8	Alabama	10.5
9	Tennessee	10.4
10	Iowa	9.2
	U.S. Average	6.8

- The states with the highest concentrations of plastics industry employees tend to have the highest concentrations of manufacturing activity, which is consistent with the fact that most plastic products go into manufactured goods.

Upstream (Supplier) Impacts

Jobs are created in the plastics industry, but they are also created in the industries that, directly or indirectly, supply goods and services to the plastics industry. These industries supply fuel, spare parts, office supplies, accounting services, transportation services, etc. As was discussed in connection with Table S-1, the employment and shipments of these upstream industries contribute significantly to the impact of plastics on the economy.

- During 2021, upstream industries accounted for 497,000 jobs in order to supply goods and services to the plastics industry—every two plastics jobs support another job elsewhere in the economy.
- During 2021, upstream industries generated \$132.5 billion in shipments in order to supply goods and services to the plastics industry.

Downstream (User) Impacts

Some plastic products, such as toys and wastebaskets, are final goods ready for use. Most are intermediate goods, which are associated with services or are sent on for subsequent manufacturing processes before becoming a final good. Virtually all plastic products wind up as part of some kind of final good or service.

- In 2021, an impressive 25.8% of the final consumption of plastic products, on a value basis, wound up in some form of service, including healthcare, food services and drinking places, retail and wholesale trade, and other services.
- Construction accounted for 8.4% of final plastic products.
- A large share (29.9%) went into non-durable goods: food, tobacco and spirits (8.1%); plastic products (15.5%); and other non-durables (6.3%).
- Durable goods accounted for the remaining 22.7% share: transportation equipment (11.4%); furniture and related (2.8%); and other durables (8.5%).
- In terms of who was ultimately buying these plastics-containing goods and services in 2021, 89.0% went to personal consumption by households, 28.9% went into private fixed investment, and 13.1% was used by state, local and federal government agencies.¹
- The most intense final user of plastic products in 2021, in terms of the value of plastic products per dollar of final product or service, was the plastic products industry itself, followed by: mattresses, blinds and shades; soft drinks and ice; sign manufacturing; and seasonings and dressings.

Forecasts

In the final section of this report, Perc Pineda, Ph.D., Chief Economist with the Plastics Industry Association (PLASTICS), offers his outlook for the plastics industry, and numerical forecasts for employment and shipments.

- Growth in the plastics industry is expected in 2022 and 2023 but at a lower rate, compared to an earlier forecast, due to slowing domestic and global economic growth. Thus far, demand for plastics has been increasing, but supply chain challenges in plastics end-markets continue to weigh on the industry's growth momentum.
- Tight skilled labor supply is one of the headwinds that will slow plastics industry growth this year and the next.
- The plastics industry primarily supports the manufacturing sector and therefore will continue to shift toward states with new manufacturing facilities. COVID-19's disruption of the supply chain has increased interest in reshoring manufacturing. Despite projected slower economic growth, the U.S. economy is performing better than other countries making it an attractive market for expansion.
- U.S. plastics industry employment growth will slow this year and is projected to contract marginally in the next two years. However, job totals are still expected to exceed pre-pandemic (2019) levels. The plastics manufacturing sector could see 0.2% employment increase this year—after the 3.2% increase last year. A 0.1% decrease is projected in 2023.
- Real plastics industry shipments are expected to increase by 1.8% this year following a 2.3% increase last year. Given anemic economic growth projections, a 1.2% increase is expected in real shipments next year.

In the sections that follow, the authors provide data, discuss definitions and methodology, and develop the conclusions just discussed.

¹ These percentages add up to more than 100%, because the 30.9% that was provided by imports (net of exports)—not supplied by domestic producers—was not deducted. Imports rose sharply in 2021 because of the pandemic and government stimulus. The deduction would be required if National Income and Product Account (NIPA) accounting was used.