

2024

**ECONOMIC
REVIEW
OF CHEMISTRY**



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**CHEMISTRY INDUSTRY
ASSOCIATION OF CANADA**



CHEMISTRY INDUSTRY ASSOCIATION OF CANADA

The Chemistry Industry Association of Canada (CIAC) is the voice of Canada's \$75 billion chemistry industry and represents more than 50 members and partners across the country. The industry employs 93,300 Canadians and supports an additional 559,900 jobs in Canada.

Members of CIAC are signatories to Responsible Care[®]— the association's U.N.— recognized sustainability initiative. Responsible Care[®] inspires its members to take actions that improve the sustainability of their operations and reduce harm throughout the entire life cycle of their products.



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► President's Message



I am pleased to present to you the *Chemistry Industry Association of Canada's (CIAC) 2024 Economic Review of Chemistry*.

Canada's \$74.8 billion chemical manufacturing industry is a significant contributor to our country's economy. The sector is directly responsible for 93,300 jobs and pays approximately \$8.26 billion in salary and wages. Primarily concentrated in Alberta, Ontario and Quebec, the industry supports an additional 559,900 jobs across the country.

2023 saw the continued recovery of the chemistry sector from the impacts of COVID-19 and the twin shocks of the energy crisis in Europe and the rise of global interest rates. Overall, demand for chemistry was good in 2023 but lower than the last few years. 2023 saw a plunge in energy prices as the world economy reacted to multi decade high interest rates and the war in Europe. Canadian metrics for shipments and exports saw a fall from the highs of recent years as global commodity prices declined. The volume of production and exports indicated ok demand from downstream customers. Wages and employment trended near record highs as new investments have come online. 2022 saw several major chemistry investment proposals, largely centered in Alberta and Quebec get nearer to final investment decision. At the end of the year Dow Chemical announced its Net Zero cracker project in Alberta, a major investment worth nearly \$10 billion and a demonstration of the attractiveness of Canada as an investment destination. Taken together, publicly announced chemistry investment proposals exceed \$25 billion and we expect more to begin construction in the years to come. These projects are envisioned as making significant contributions towards a net zero carbon and circular economic future for Canada's chemistry sector. At CIAC, we will be highly focused on working with all levels of government to ensure supporting investment conditions to turn these proposals to final investment decisions and ultimately built infrastructure.

This annual review and the accompanying executive summary provide readers with an economic profile of the industry as well as quantitative insight into the industry's importance to our country's economy, and to all Canadians.

Yours sincerely,



Bob Masterson
President and CEO
Chemistry Industry Association of Canada

➤ Introduction¹

Using data from Statistics Canada (unless otherwise stated), CIAC's 2024 Economic Review of Chemistry provides a statistical review of various key industry indicators including shipments, imports, exports, and employment from the year 2023. The report also includes a section on specialty chemicals, statistics for the key provinces of Quebec, Ontario and Alberta, and for the segments of the industry of primary interest to CIAC members.

This report is prepared by the Association's Business and Economics (B&E) team. The B&E team provides ongoing economic analysis of government policy initiatives, business trends and changing industry dynamics.

Industrial Classification

Industries in Canada are classified according to the 2012 North American Industrial Classification System (NAICS). This classification is maintained by Statistics Canada and its counterpart organizations in the United States and Mexico. The chemical manufacturing subsector is captured in NAICS 325 which comprises establishments primarily engaged in manufacturing chemicals and chemical products, from organic and inorganic raw materials.

NAICS 325 includes the following sub-industry groups:

- Basic chemicals (NAICS 3251)
- Synthetic resins, rubbers, and synthetic fibres (NAICS 3252)
- Pesticides and fertilizers (NAICS 3253)
- Pharmaceuticals (NAICS 3254)
- Paints, coatings and adhesives (NAICS 3255)
- Soaps, cleaning compounds and toilet preparations (NAICS 3256)
- Other chemical products (NAICS 3259)

This report focuses on statistics for the overall chemical industry (NAICS 325), and for the combination of NAICS 3251 and 3252 which are collectively referred to as industrial chemicals.

- NAICS 3251 Basic chemicals - comprises establishments primarily engaged in manufacturing organic and inorganic chemicals, using basic processes such as thermal cracking, distillation, and chemical reaction.
- NAICS 3252 Synthetic resins, rubbers, and fibres— comprises establishments primarily engaged in manufacturing polymers such as polyethylene, polypropylene, butyl rubbers, polyamides, and fibres made from these resins. Polymerization of monomers into polymers, for example, ethylene into polyethylene, is the basic process.

¹ This publication intends to provide the best information available. However, neither CIAC nor its employees make any warranty, expressed or implied, or assumes any liability or responsibility for any use, or the results of such use, of any information or data disclosed in this report.

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► Chemistry Industry at a Glance

Chemical industry² shipments in Canada in 2023 were \$74.8 billion, exports were \$48 billion, and imports totaled \$83.8 billion.

The industry employed 93,300 workers in 2023 which constituted six per cent of all manufacturing jobs in Canada. In addition to the direct jobs, other jobs are supported by the purchasing activity of the chemistry industry and by the subsequent expenditure-induced activity. CIAC has estimated that for every job in the chemistry industry, another five indirect jobs are created in other parts of the economy, so in total the chemistry industry supports 559,900 jobs in Canada.

Industrial chemicals are a keystone industry within the Canadian economy. It converts and adds value to raw resources such as natural gas, crude oil, minerals, metals and biomass, creating intermediate products that are used as inputs by other parts of the chemistry industry, and by almost all other manufacturing segments. Major consumer industries include: plastic and rubber products (NAICS 326), forest products (NAICS 321 and 322), transportation equipment (NAICS 336), oil and gas extraction (NAICS 211), clothing (NAICS 315), construction (NAICS 23), and pharmaceuticals (NAICS 3254). For Industrial Chemicals, shipments in 2023 were \$31.9 billion, exports were \$24.6 billion, imports were \$28.8 billion, and employment was 17,450 indirectly supporting 104,700 jobs in the broader Canadian economy.

Table 1: Principal Statistics for the Chemical Industry

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Shipments, \$ billion	49.7	52.2	51.6	51.3	52.9	56.0	53.3	68.1	78.2	74.9
Employment, 000	84.3	86.4	84.3	86.6	85.8	86.4	81.8	78.5	90.8	93.3
Imports, \$ billion	50.3	53.7	53.3	55.8	59.8	61.8	62.3	72.9	89.6	83.8
Exports, \$ billion	35.5	36.2	35.9	33.7	38.0	37.4	36.0	41.6	52.8	48.0



Table 2: Principal Statistics for the Industrial Chemical Sector

	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Shipments, \$ billion	26.1	25.4	24.1	26.2	28.9	26.0	22.4	29.3	34.2	31.9
Employment, 000	17.5	17.7	15.7	16.4	16.4	15.8	14.9	15.8	17.1	17.45
Imports, \$ billion	19.3	19.7	18.8	19.8	21.3	20.8	20.0	22.1	31.3	28.8
Exports, \$ billion	19.8	19.2	18.7	18.7	20.6	18.4	16.5	22.3	24.8	24.6

² Chemical industry and industrial chemicals are defined on page 1.

➤ Manufacturing Shipments (Revenue)

In 2023, Canada’s chemical industry manufactured \$74.9 billion worth of products a decrease of 4.3 per cent compared to 2022.

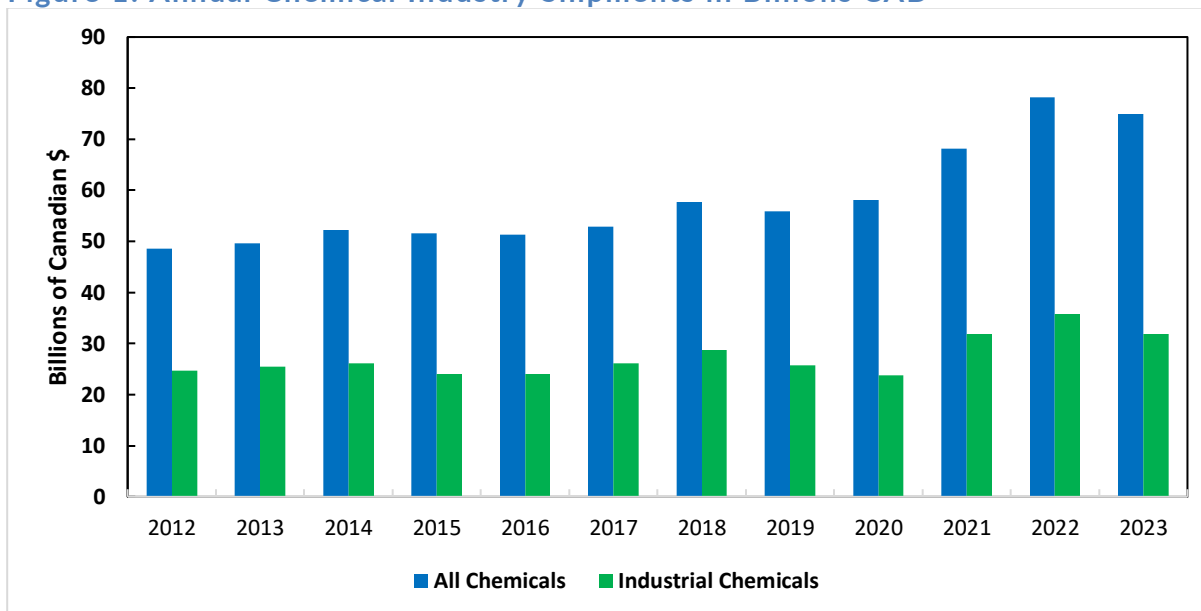
Shipments of industrial chemicals were \$31.9 billion in 2023, representing a decline of 10.8 per cent compared to 2022 (Table 3, Figure 1). The value of shipments for industrial chemicals decreased due to significant price declines following the normalization of supply chains and the rapid rise in interest rates.

Table 3: Manufacturing Shipments



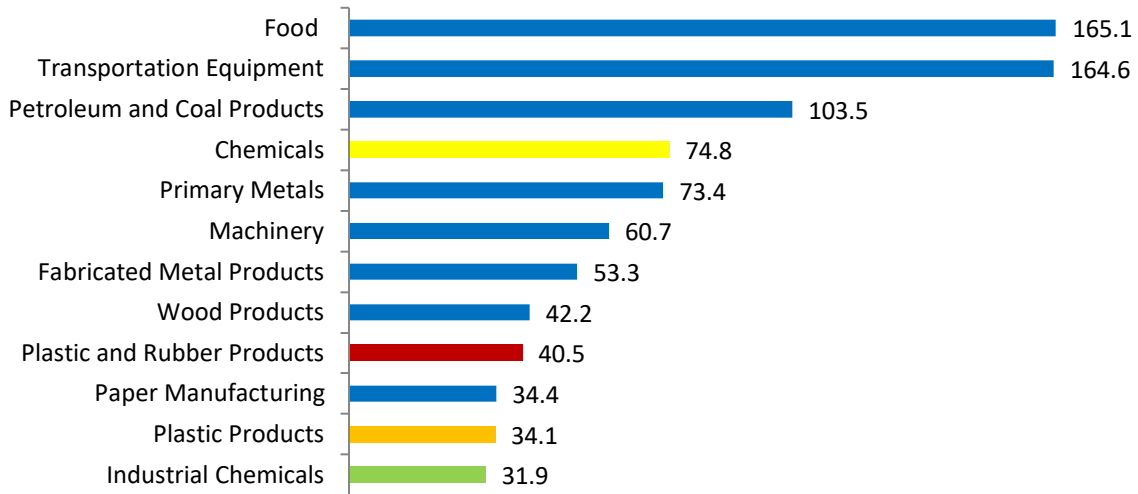
Manufacturing Shipments, \$ Billion	2022	2023	Change 2022-23
All chemicals	78.2	74.9	-4.3%
Industrial chemicals	30.5	34.2	-10.8%

Figure 1: Annual Chemical Industry Shipments in Billions CAD



Within the NAICS system, there are 21 manufacturing industries at the 3-digit level. Among these industries, chemicals (NAICS 325) ranks as the 4th largest based on value of shipments (Figure 2).

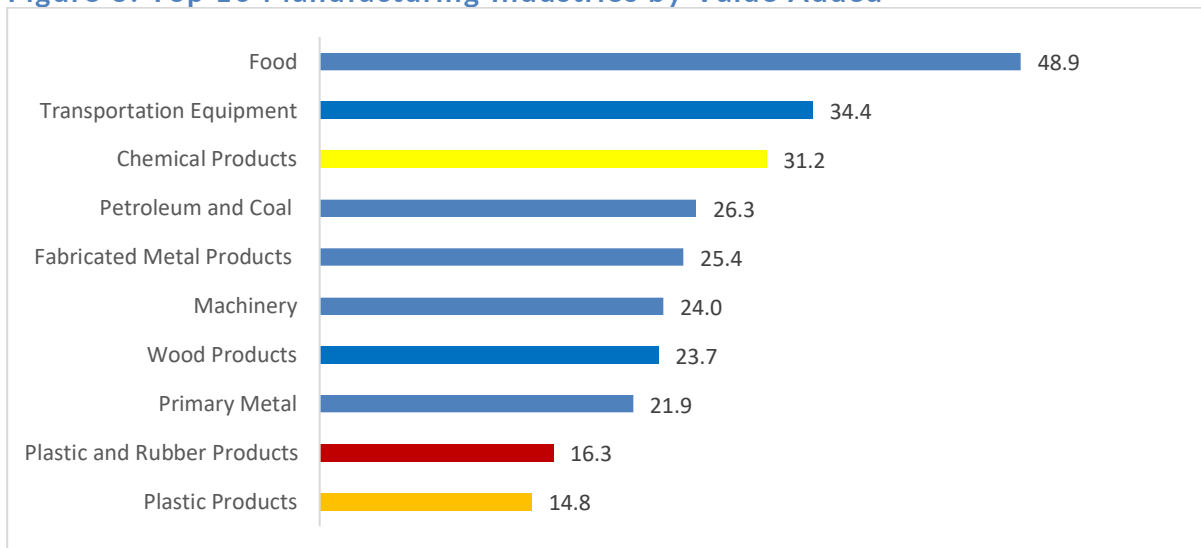
Figure 2: Top 10 Manufacturing Industries by Value of Shipments, \$ Billions



Value Added

Value added measures the value of output of an industry less the value of intermediate inputs required in the production process. Compared to all manufacturing industries, chemicals ranked 3rd based on value added in 2022 (latest available, Figure 3).

Figure 3: Top 10 Manufacturing Industries by Value Added



➤ Employment

The chemical industry employed 93,300 workers in 2023. For industrial chemicals, the figure was 17,450. For both groupings, employment peaked in 2003 and has tended to decline since, although levels have been mostly flat since 2017 with slight growth as new facilities and expansions come online (Table 4 and Figure 4).

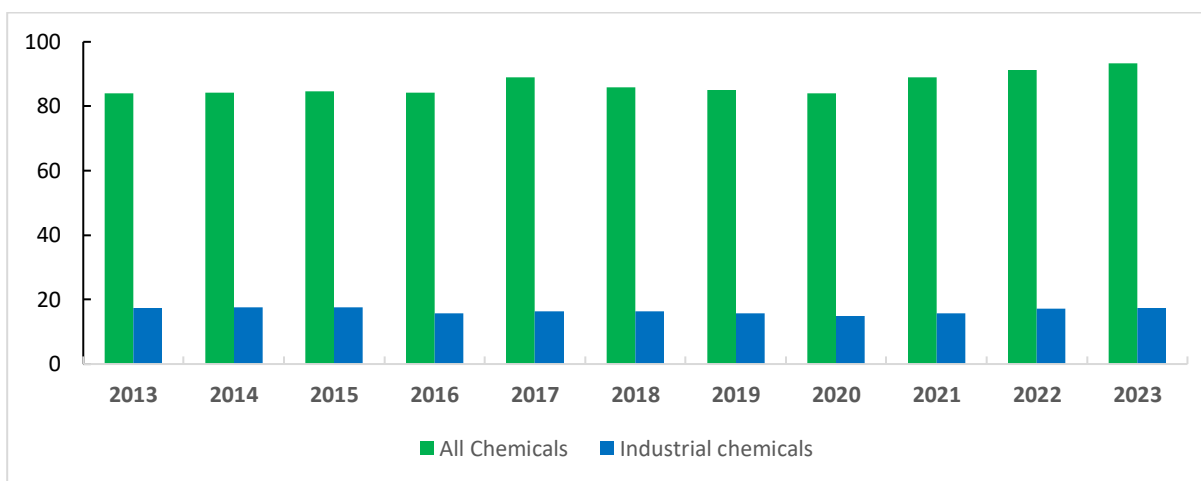
In addition to the direct jobs, additional jobs are supported by the purchasing activity of the chemical industry and by the subsequent expenditure-induced activity. For every job in the chemical industry, it is estimated that another six jobs in other sectors are indirectly linked to the industry. On this basis, the chemical industry supports about 559,900 jobs— industrial chemicals about 104,700 - in the overall Canadian economy.

Table 4: Employment in the Canadian Chemical Industry



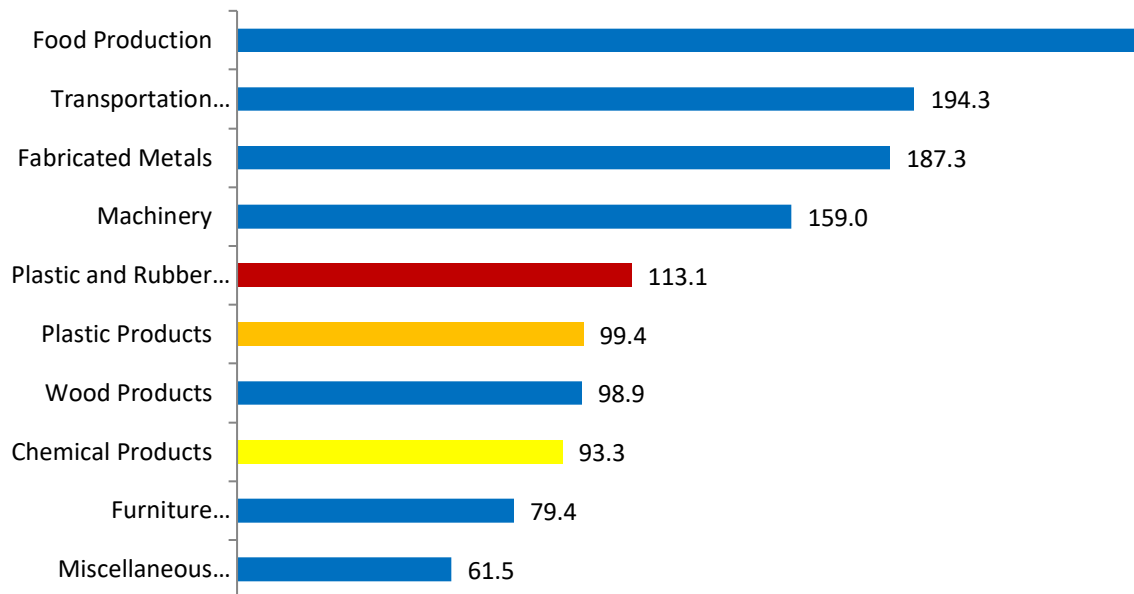
Total Employment, Thousands	2022	2023	Change 2022-2023
All Chemicals	91.2	93.3	2.3%
Industrial Chemicals	17.1	17.45	1.9%

Figure 4: Chemical Industry Employment



On the basis of employment, chemicals rank 8th among all manufacturing industries (Figure 5). Plastic Product manufacturing employed 99,400 Canadians and ranked 6th among manufacturing industries.

Figure 5: Top 10 Manufacturing Industries by Employment (in Thousands of People)



Salaries and Wages

Total salaries and wages paid to employees in the chemical industry in 2023 were \$8.26 billion, with \$2.0 billion paid in the industrial chemical segment (Table 5). 2023 saw gains in wages and salaries paid in both the overall chemical sector and the Industrial Chemicals sub-sector.

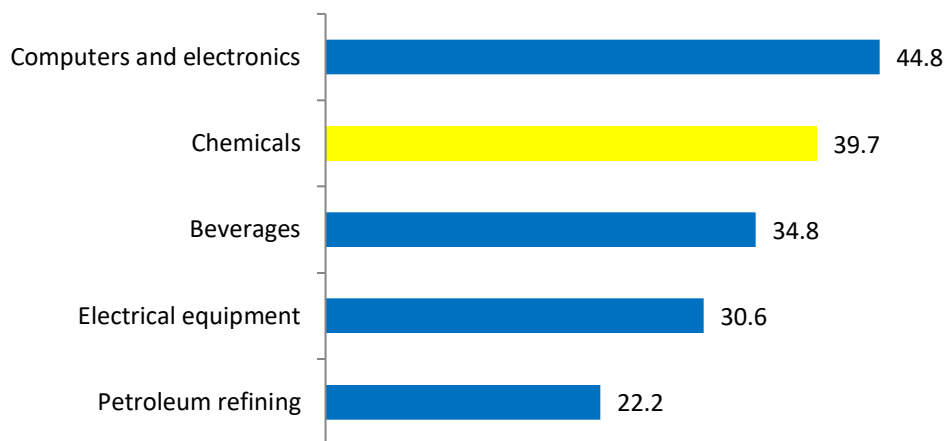
Table 5: Total Salary and Wages Paid by the Chemical Industry



Total Salaries and Wages, \$ Billion	2022	2023	Change 2022-23
All Chemicals	7.44	8.26	11%
Industrial Chemicals	1.82	2.01	11%

Chemical companies operate a variety of types of complex equipment and processes using sophisticated computer control technologies. Employees require specialized education and training to operate these processes safely and efficiently. As a result, the chemical industry's proportion of employees with a university degree (39 per cent) is second only to the computer and electronic products industry (Figure 6), and chemicals has the highest proportion of employees with post-graduate degrees.

Figure 6: Top 5 Manufacturing Industry by Proportion of Employees with a University Degree



Chemicals ranked 5th among all manufacturing industries with an average salary of \$76,600 (Figure 7). For Industrial Chemicals the average salary was higher at \$98,760. For overall manufacturing, the average salary in 2022 was \$60,460.

Figure 7: Top 10 Manufacturing Industries Based on Average Earnings Per Employee in Thousands of CAD

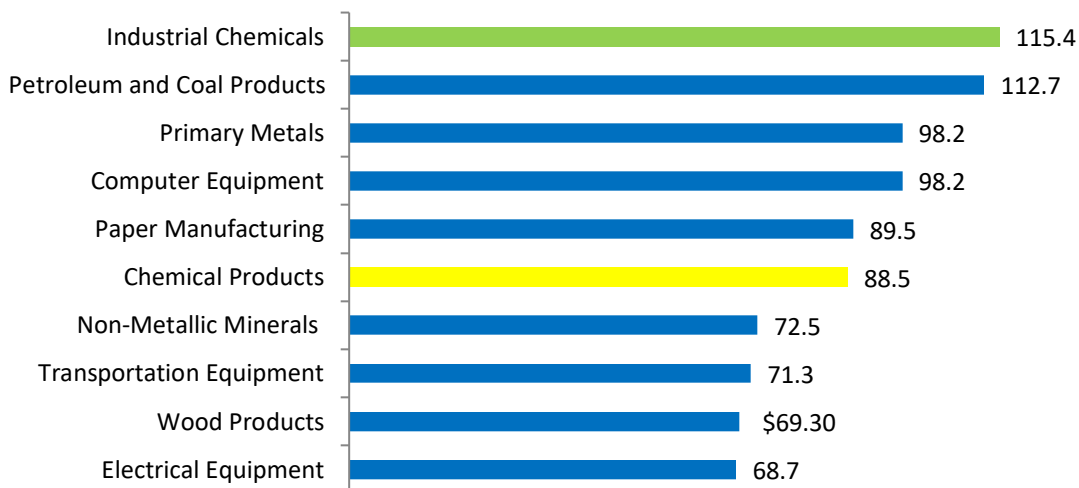



Table 6: Average Salaries in the Chemical Industry



Average Salaries and Wages, \$ Thousand	2022	2023	Change 2022-23
All Chemicals	81.6	88.5	11.0%
Industrial Chemicals	106	115.4	11.0%

International Trade

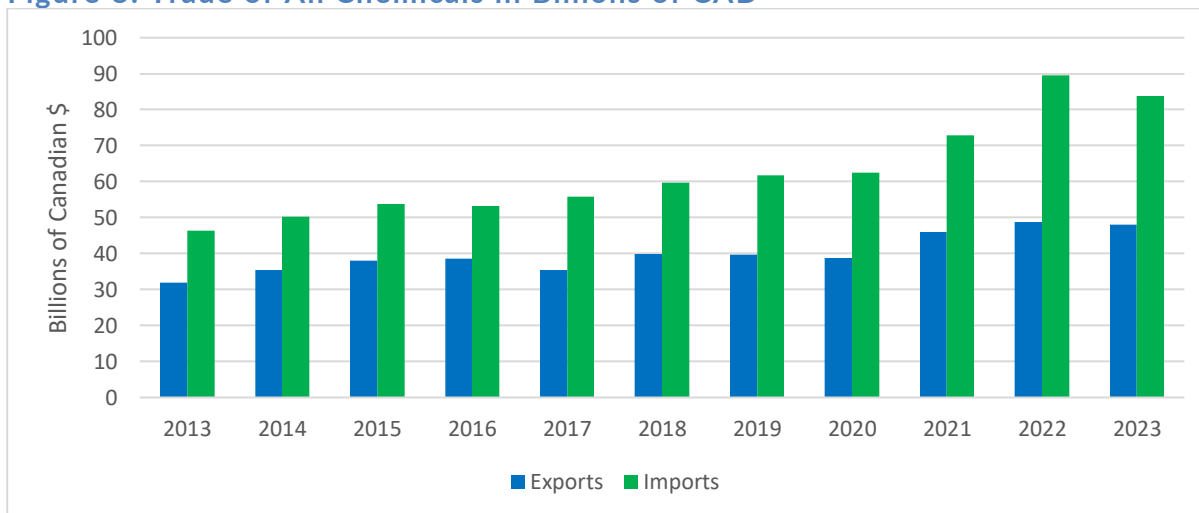
Canada exported \$48 billion worth of chemicals and chemical products to the world in 2023, a 1.5 per cent decrease compared to 2022. Imports decreased by 6.4 per cent to \$83.8 billion (Table 7 and Figure 8) driven by a recovery in demand for all sub-sectors. The United States represents the dominant export market and the dominant source of imports. In 2023, 77 per cent of exports, worth \$36.8 billion went to the United States and 54 per cent of imports worth \$45.6 billion originated there. The next largest export markets are China (3.6 per cent), followed by Japan (2.4 per cent). The next largest sources of imports were Germany (5.3 per cent), China (4.7 per cent), followed by France (2.2 per cent) and Italy (1.7 per cent each).

For industrial chemicals, Canadian exports increased by 25.4 per cent to \$18.5 billion in 2023. Imports also increased, by 10.3 per cent to \$22.1 billion (Table 7 and Figure 9). Both imports and exports of industrial chemicals are dominated by bulk commodities like polyethylene, ethylene glycol and styrene.³ Again the United States is the primary trading partner with 78 per cent of exports worth \$18.5 billion and 61 per cent of imports worth \$17.5 billion. The next largest export markets were: China \$1.3 billion (5 per cent) and Germany \$621 million (2.6 per cent). The next largest import source partners were: China \$2.7 billion (9.5 per cent) and Switzerland \$2.5 billion (8.7 per cent).

Table 7: Trade in the Chemistry Industry

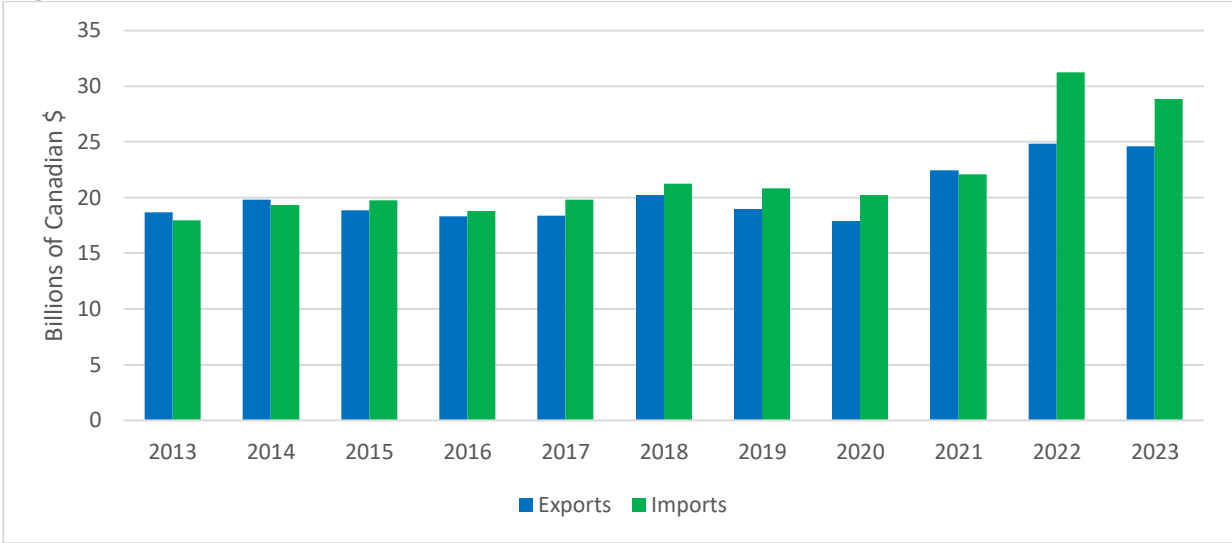
Value of Trade, \$ Billion		2022	2023	Change 2022-23
All Chemicals	Imports	89.6	83.8	-6.4%
	Exports	48.8	48.0	-1.5%
Industrial Chemicals	Imports	31.3	28.8	-7.7%
	Exports	24.8	24.6	-0.8%

Figure 8: Trade of All Chemicals in Billions of CAD



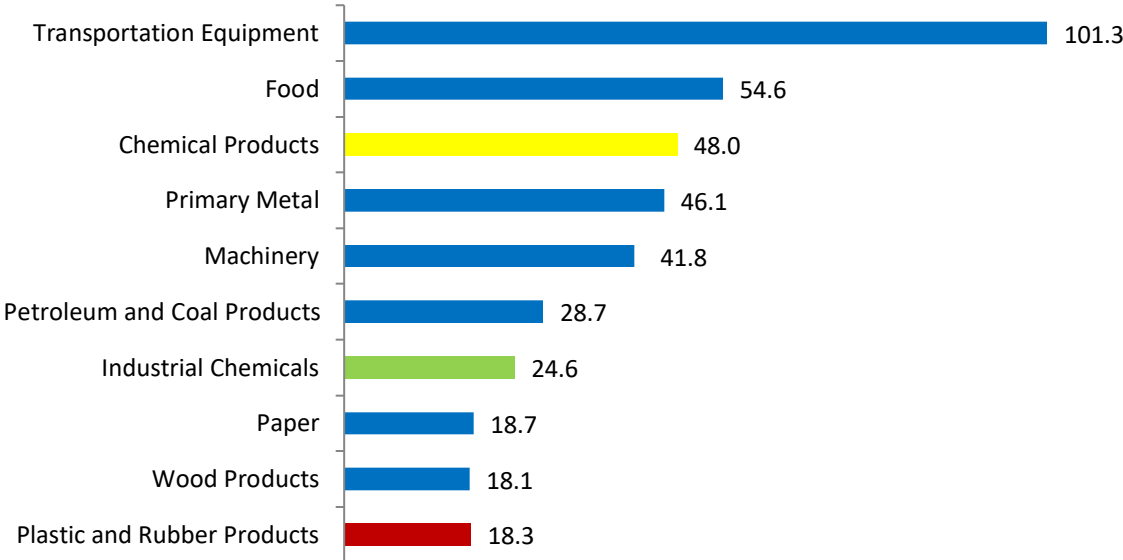
³ For further analysis of the trade of specific industrial chemicals see the Industry Profiles section beginning on page 37 of this report.

Figure 9: Trade of Industrial Chemicals in Billions of CAD



The chemistry industry was the 4th largest exporter among all manufacturing industries in 2023. (Figure 10)

Figure 10: Top 10 Manufacturing Industries by Exports in Billions of CAD



➤ Profits

Profits for the chemical sector depend on factors such as capacity utilization, energy and raw material costs, supply-demand balance and competition with foreign producers. Operating profits in 2023 for the chemical industry were \$7 billion and were \$3.19 billion for industrial chemicals (Table 8).

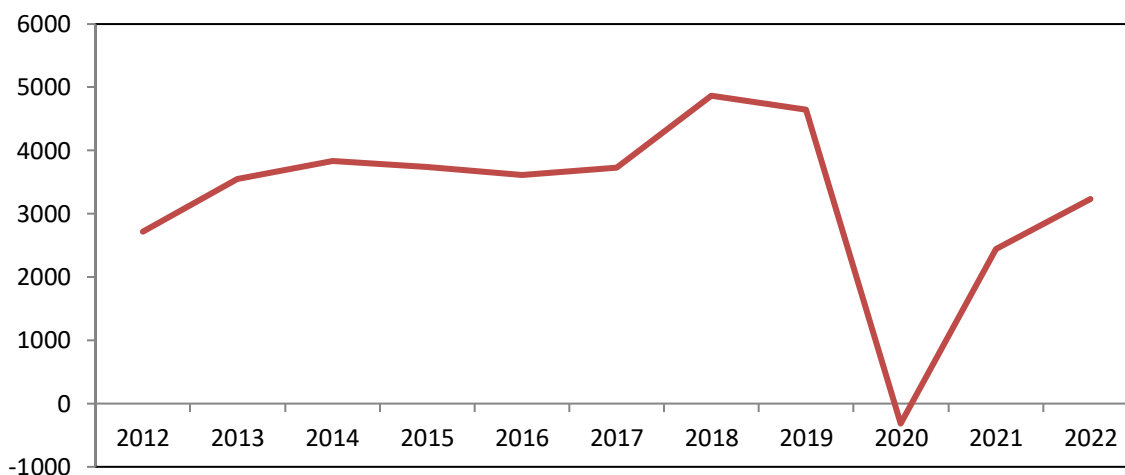
Table 8: Operating Profits in the Chemical Industry



Operating profit, \$ billion	2022	2023	Change 2022-23
Total chemicals	8.09	7.0	-13.3%
Industrial chemicals	3.23	3.19	-1.4%

Operating profits for industrial chemicals have shown a resilience following the Great Financial Crisis however, the multi-year impacts of the COVID-19 pandemic have hit profitability in the sector.

Figure 11: Operating Profits for Industrial Chemicals, in Millions of CAD



Productivity

One measure of manufacturing productivity is the value of revenue per employee. For all chemicals, output per employee in 2023 was \$802,000. For industrial chemicals, it rises to \$1.83 million. Output per employee is much higher for industrial chemicals reflecting the capital-intensive nature of the industry compared to chemicals overall. Both numbers have remained largely flat over the past decade but have increased during COVID-19 as shipment have been volatile.



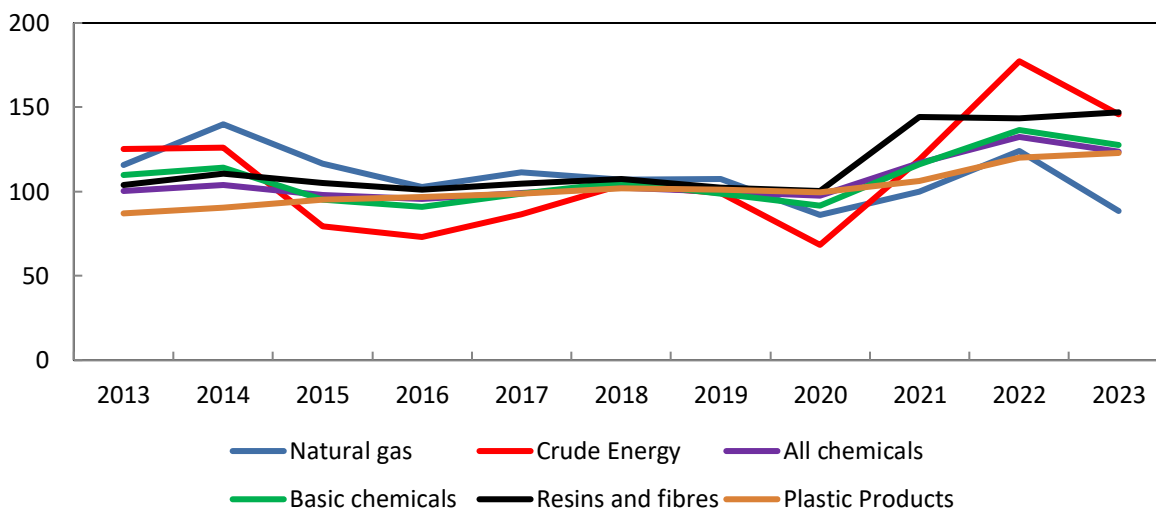
Table 9: Productivity

Output per employee, \$ thousand	2022	2023
All chemicals	801	802
Industrial chemicals	2,000	1,830

Price Index

The Industrial Product Price Index (IPPI) reflects the prices that producers in Canada receive as the goods leave the plant. Natural gas and crude oil are two important sources of feedstocks for the chemical industry (see Figure 12). Natural gas is the dominant feedstock in North America and prices have trended mostly downward since 2008 as supply from domestic and U.S. shale production overwhelmed demand. Recent additions of LNG export capacity in the U.S. have increased North American exposure to world prices, similar to crude oil. Crude oil prices fell in 2014 and have remained largely rangebound since. The COVID-19 pandemic saw crude oil and natural gas prices decline significantly in 2020. Energy prices increased dramatically in 2022 as the war in Ukraine began and major consuming countries scrambled for energy resources. 2023 saw a significant decline in global natural gas prices owing to full storage levels and in particular Canadian natural gas prices hit the lowest levels outside of the early stages of COVID in decades.

Figure 12: Price Index, 2020=100

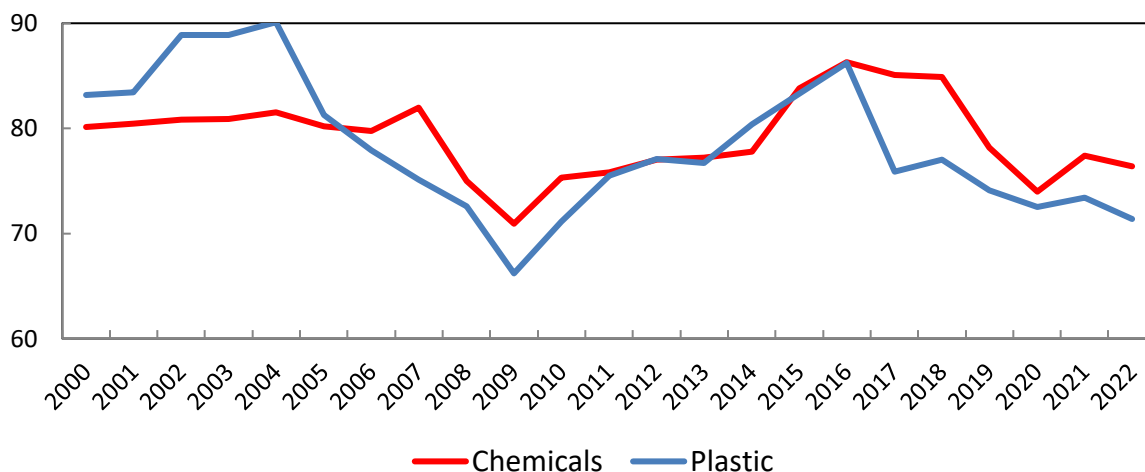


► Capacity Utilization

Capacity utilization refers to the extent to which an industry uses its installed productive capacity (Figure 13). Thus, it compares actual output with the maximum potential output that could be achieved if all capacity was fully used.

Capacity utilization for the overall chemical industry hit an all-time low of 68 per cent in the 1st quarter of 2009. Since 2009 capacity utilization has trended upward and averaged 85 per cent in 2017-2019. The COVID-19 pandemic caused a sharp drop in utilization that has been seen output recover only to 2010-2015 averages. While separate data is not available for industrial chemicals, it would be expected to have utilization rates higher than the industry average since continuous production processes are employed, whereas the segment of the industry producing formulated products relies on batch processes.

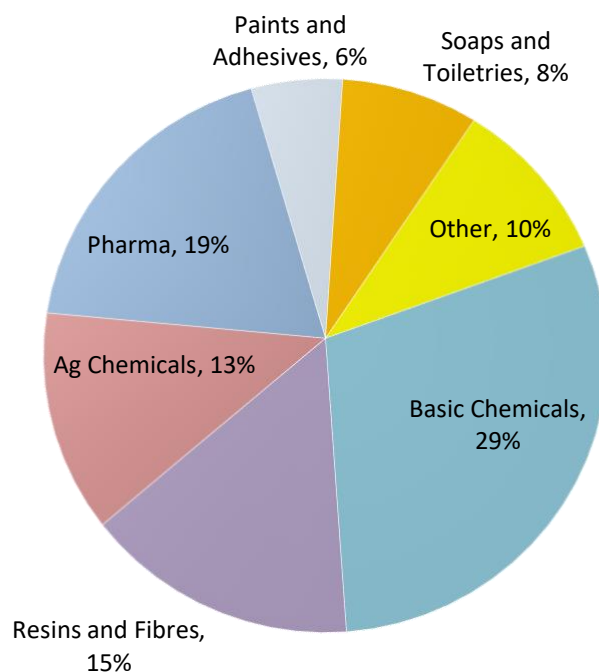
Figure 13: Capacity Utilization in the Chemical and Plastic Product Sectors, %



Other Chemical Manufacturing Subsectors

As mentioned previously, the Canadian chemical industry is comprised of seven sub-industries. Figure 14 shows the relative size of these industries by shipment value in 2023. Industrial chemicals accounted for 46 per cent of the total industry.

Figure 14: Distribution by Chemical Sub-Industries Based on Shipments



While NAICS 3251 and 3252 are the focus of this report, the following tables provide some data on the other sub-industries.

Table 10: Principal Statistics for Pesticides, Fertilizers and Other Agricultural Chemicals (NAICS 3253)

	Shipments, \$ million	Employment	Imports, \$ million	Exports, \$ million
2015	5,413	5,722	3,398	1,891
2016	6,181	5,722	3,991	1,485
2017	5,536	5,914	3,969	1,327
2018	6,099	5,598	4,034	1,393
2019	6,272	4,882	4,033	1,424
2020	7,750	5,090	4,014	1,997
2021	9,958	6,089	5,077	3,020
2022	9,958	6,089	7,205	3,020
2023	9,162	5,706	6,224	2,387

Table 11: Principal Statistics for Pharmaceuticals (NAICS 3254)

	Shipments, \$ million	Employment	Imports, \$ million	Exports, \$ million
2015	11,670	29,917	17,228	11,759
2016	12,068	31,788	17,630	8,890
2017	12,255	31,124	19,502	10,995
2018	12,911	31,310	19,502	12,166
2019	13,796	31,748	21,546	12,319
2020	13,770	33,391	22,574	13,248
2021	13,065	34,023	26,621	10,712
2022	14,543	34,022	30,205	15,172
2023	13,686	34,862	28,135	12,138

**Table 12:
Principal Statistics for Paints, Coatings and Adhesives (NAICS
3255)**

	Shipments, \$ million	Employment	Imports, \$ million	Exports, \$ million
2015	2,619	8,593	2,322	694
2016	3,342	8,216	2,434	763
2017	3,203	7,773	2,373	769
2018	3,122	6,725	2,459	871
2019	3,185	7,502	2,563	902
2020	3,057	7,296	2,442	817
2021	2,982	7,437	2,599	903
2022	4,068	7,237	3,090	1,092
2023	4,068	7,478	3,193	1,029

**Table 13: Principal Statistics for Soaps, Cleaning Compounds and Toilet
Preparations (NAICS 3256)**

	Shipments, \$ million	Employment	Imports, \$ million	Exports, \$ million
2015	4,433	11,769	6,072	3,334
2016	4,911	13,946	6,400	3,063
2017	4,821	14,018	6,581	3,065
2018	5,149	15,384	6,818	3,848
2019	4,911	14,437	7,025	3,829
2020	4,673	13,113	7,815	3,721
2021	4,706	12,536	7,069	3,943
2022	6,122	13,665	8,364	4,370
2022	6,122	13,798	9,091	4,037

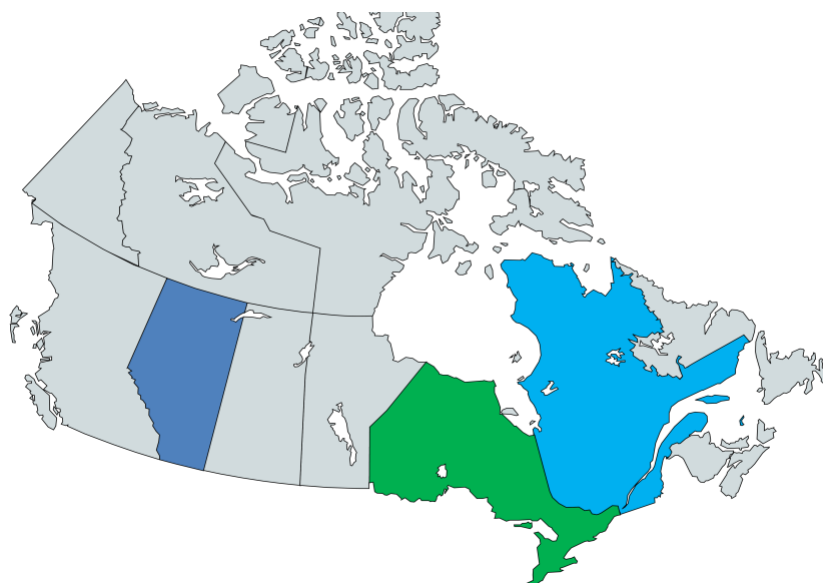
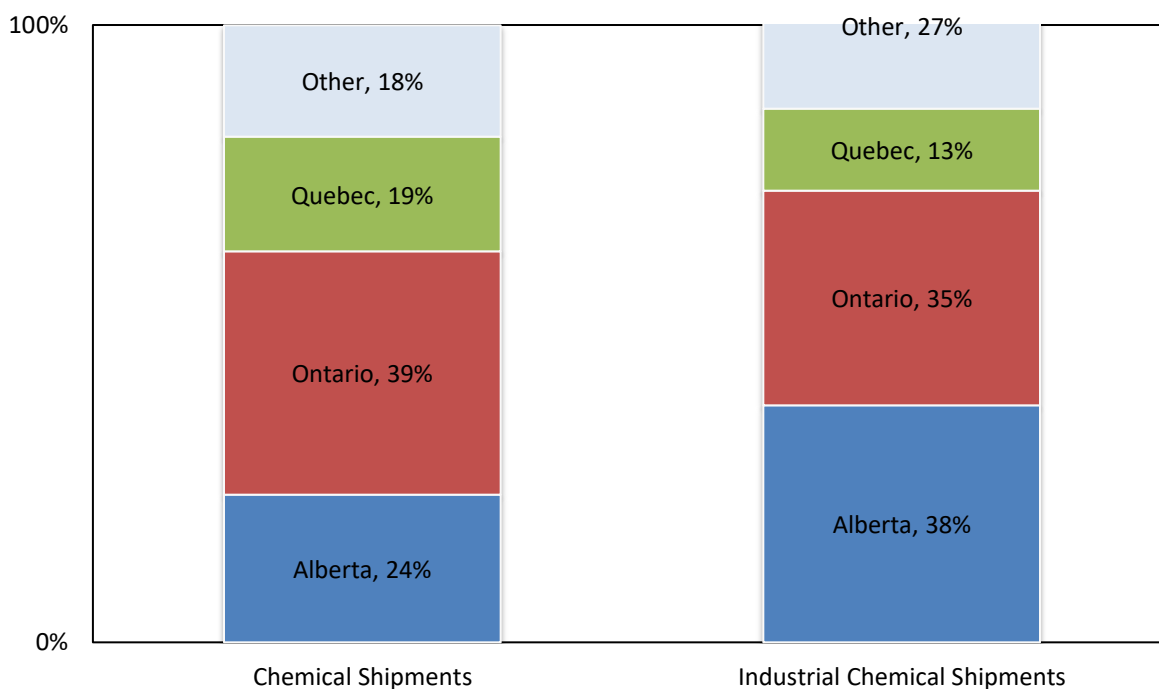
Table 14: Principal Statistics for Other Chemical Products (NAICS 3259)

	Shipments, \$ million	Employment	Imports, \$ million	Exports, \$ million
2015	5,622	10,837	5,016	1,983
2016	5,284	10,660	5,410	1,965
2017	5,922	10,587	5,710	2,198
2018	6,140	11,355	5,894	2,267
2019	5,543	10,710	5,927	2,457
2020	5,488	12,267	5,468	3,285
2021	7,495	14,083	6,120	4,285
2022	7,495	13,665	8,176	4,285
2023	7,495	13,798	8,300	4,285

► Provincial Statistics

Both the overall chemical industry and the industrial chemicals segment are concentrated in the provinces of Ontario, Alberta and Quebec (Figure 15). Further information about these three main provinces is contained in the following portions of the analysis.

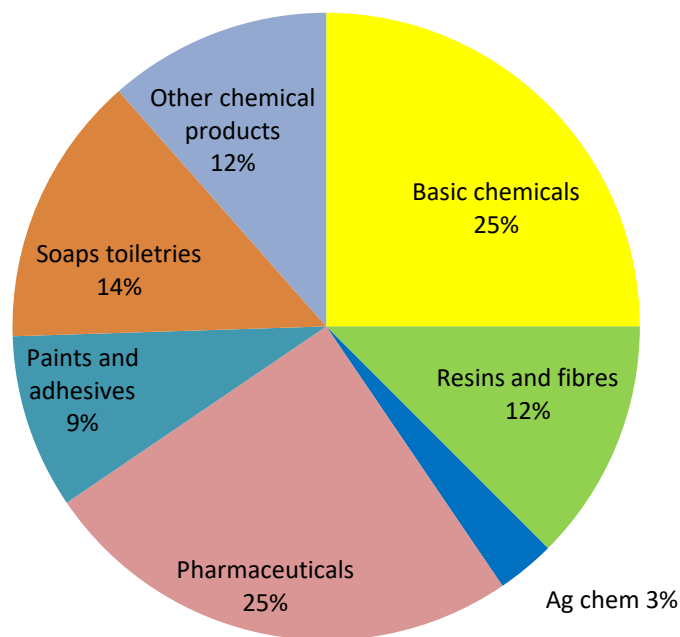
Figure 15: Provincial Distribution of the Chemical Industry, by Value of Shipments



a. Ontario

In 2023, Ontario's chemical industry had shipments of \$29.2 billion an increase of 18.3 per cent from 2022. Industrial chemical shipments totaled 11.6 billion in 2023 an increase of 39.3 per cent from 2022 (Figure 16).

Figure 16: Composition of the Ontario Chemical Industry



The largest cluster for the industrial chemical industry is in the Sarnia region, with the next largest concentrations in the Golden Horseshoe and along the St. Lawrence Seaway.

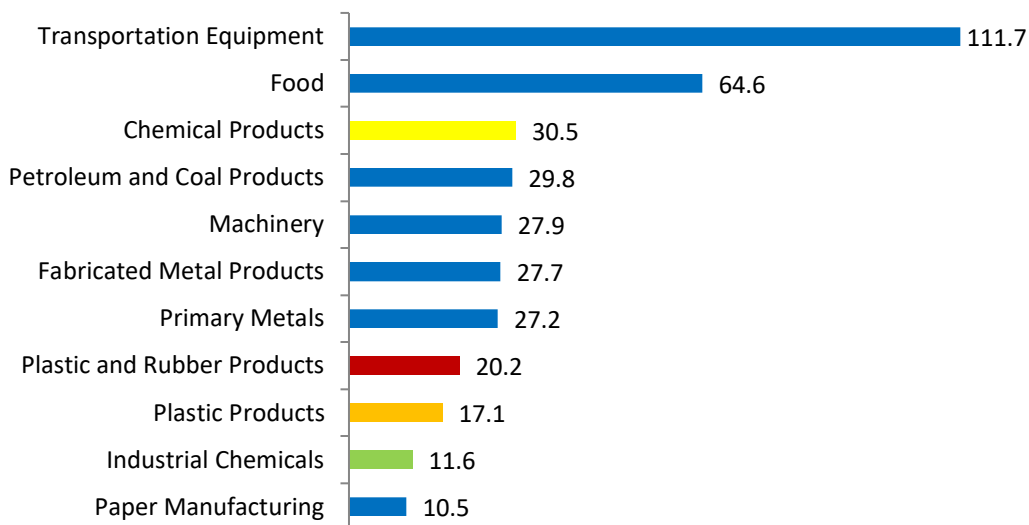
Table 15: Ontario Chemical Industry Shipments



Shipments, \$ billion	2022	2023	Change 2022-23
All chemicals	33.1	30.5	-7.8%
Industrial chemicals	13.5	11.6	-14.4%

On the basis of shipments, Chemicals was the 3rd largest of all manufacturing industries in the province in 2023 (Figure 17).

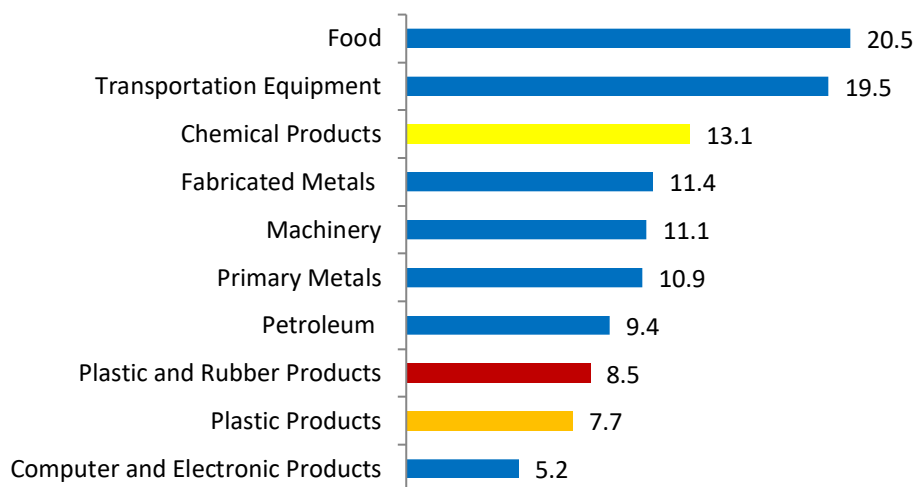
Figure 17: Top 10 Manufacturing Industries in Ontario by Value of Shipments, \$ Billion



• Value Added

On the basis of value added, chemicals also ranked 3rd among all manufacturing industries in 2022 (latest data available) (Figure 18).

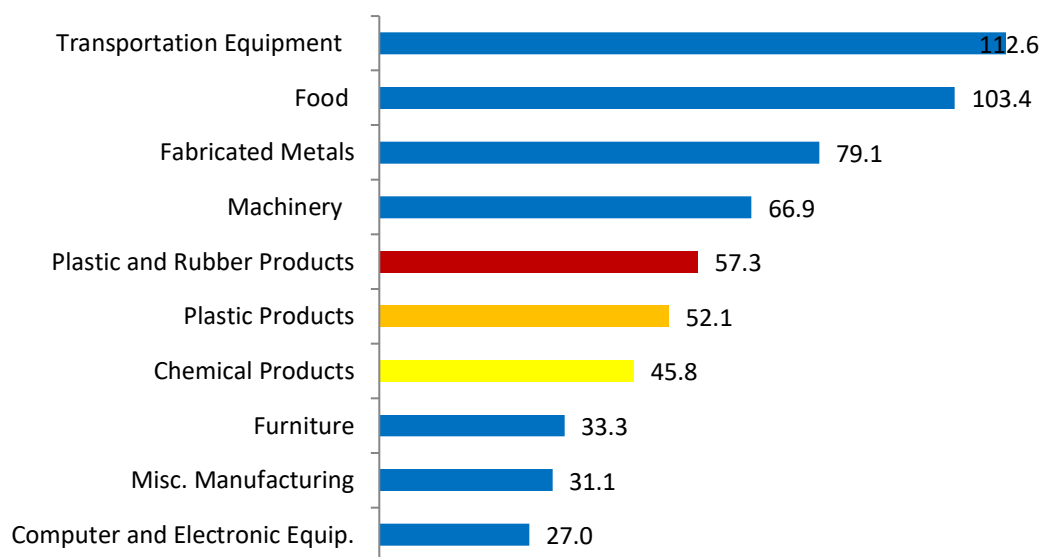
Figure 18: Top 10 Industries by Value Added in Ontario, \$ Billions.



• Employment Ranking

The chemical industry directly employed 45,790 people in Ontario in 2023, an increase of 11.8 per cent from 2022. When indirect employment is included, it is estimated that the chemical industry supports almost 275,000 jobs in the province. The number of employees working in industrial chemicals was 10,610 a 11.8 per cent increase from 2022. The industrial chemical sector supports over 63,650 jobs in the province. When compared to other manufacturing industries, chemicals ranked 7th on the basis of employment (Figure 19).

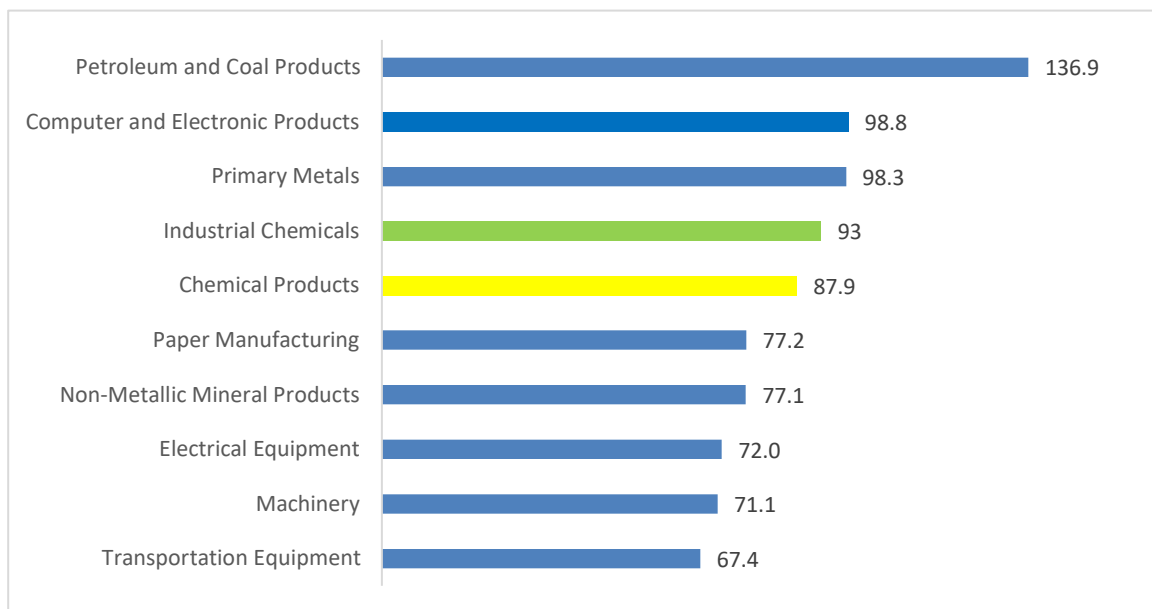
Figure 19: Top 10 Manufacturing Industries by Number of Employees in Ontario in Thousands



• Salaries and Wages

The chemical industry paid a total of \$4.02 billion in salaries and wages in the province in 2023. With an average annual salary of \$87,900, the industry ranked 5th among all manufacturing industries in Ontario (Figure 20). The Industrial Chemical sub-sector paid \$941 million in wages and had an average salary of \$96,990. The average salary across all manufacturing industries in Ontario was \$71,000.

Figure 20: Top 10 Manufacturing Industries by Average Salary in Ontario in \$ Thousands



• Trade

The value of exports by the chemical industry from Ontario in 2023 was \$22.7 billion, while imports were \$56.3 billion (Table 16). The United States was the destination for 75 per cent of exports, followed by Japan (4.6 per cent), United Kingdom (3.1 per cent) and China (2 per cent). The United States was also the source for most imports (53 per cent), followed by Switzerland (4.4 per cent); Germany (3.1 per cent) and China (2 per cent.)

For industrial chemicals, exports from Ontario were \$8.3 billion, while imports were \$18 billion (Table 16) in 2022. The United States was the destination for 75 per cent of exports, followed by United Kingdom (5.8 per cent), Netherlands (5.7 per cent) and Germany (2.7 per cent). The United States was also the source of most imports (78 per cent), followed by China (5.5 per cent).

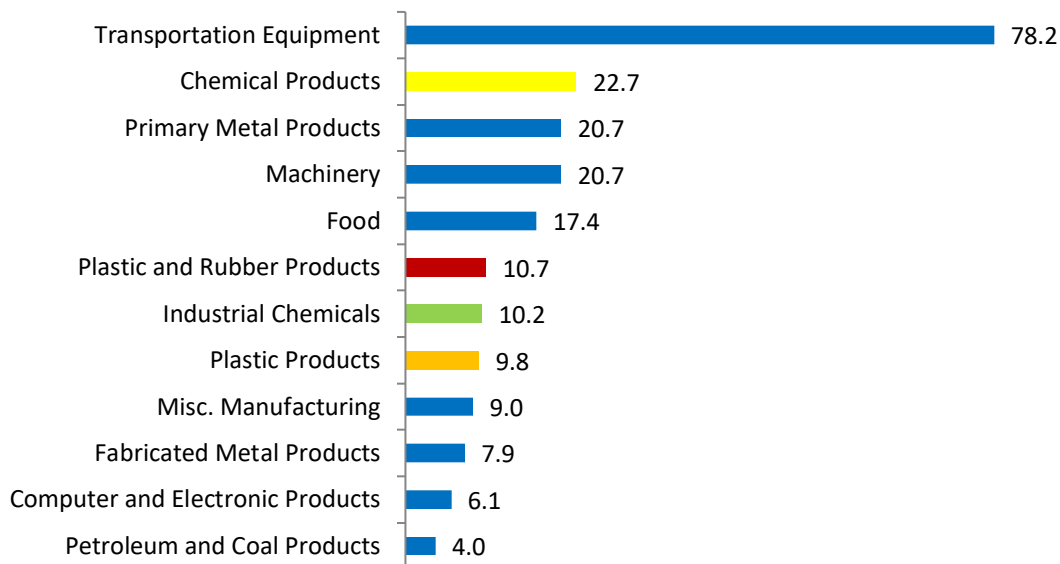
Table 16: Trade by the Chemical Industry in Ontario



Value of trade, \$ billion		2022	2023	Change 2022-23
All chemicals	Imports	60.5	56.3	-7.0%
	Exports	23.7	22.7	-4.3%
Industrial chemicals	Imports	20.5	18.0	-13.5%
	Exports	9.3	8.3	-11.9%

Chemicals is the 2nd largest exporter among all manufacturing industries (Figure 21).

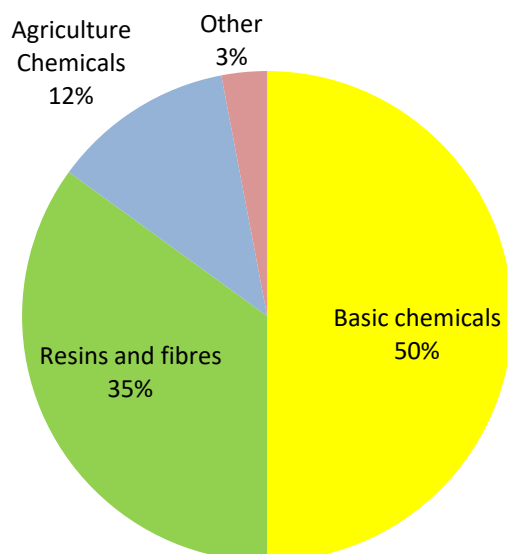
Figure 21: Top 10 Manufacturing Industries by Value of Exports from Ontario, \$Billions



b. Alberta


In 2023, Alberta's chemical industry had shipments of \$16.8 billion (Table 17). Industrial Chemicals represent 84 per cent of the total (Figure 22), with \$14.4 billion in shipments in 2023.

Figure 22: Composition of the Alberta Chemical Industry



The industrial chemical industry in Alberta is located in the Industrial Heartland region northeast of Edmonton, in central Alberta, near Red Deer, in Medicine Hat, and growing in size and scope near Grande Prairie.

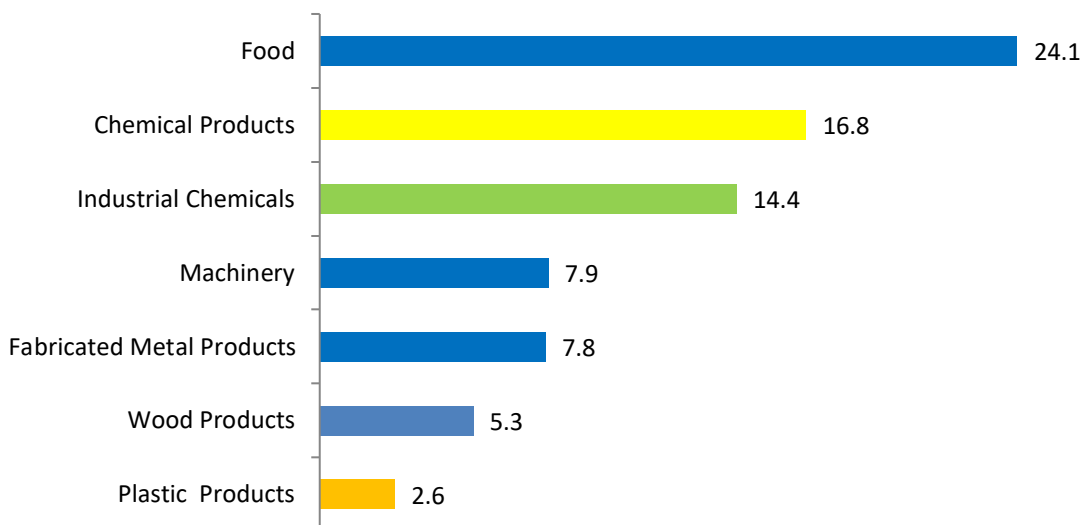
Table 17: Alberta Chemical Industry Shipments



Shipments, \$billion	2022	2023	Change 2022-23
All chemicals	19.7	16.8	-14.4%
Industrial chemicals	14.1	14.4	2.0%

Based on value of shipments Chemicals ranked 2nd among all manufacturing industries in the province in 2022 (Figure 23).

Figure 23: Top 5 Manufacturing Industries in Alberta by Value of Shipments, \$Billion⁴

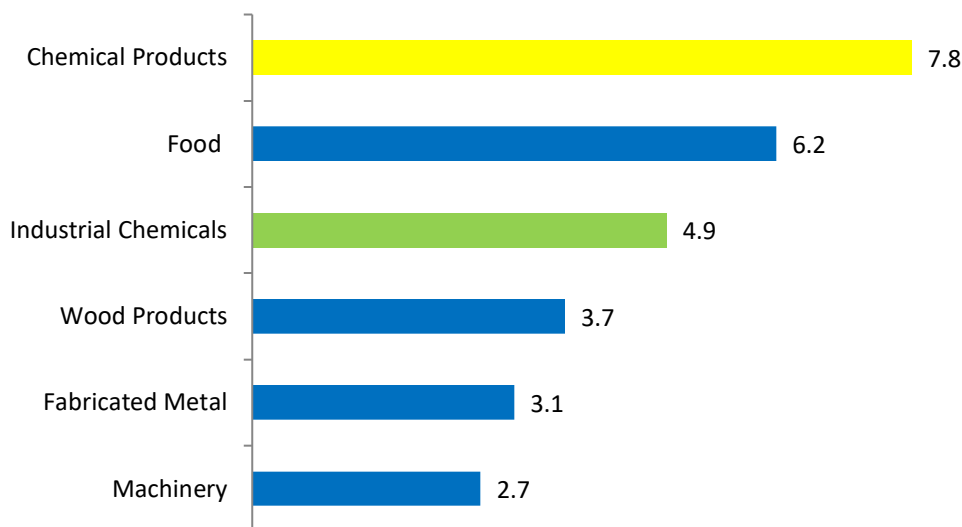


⁴ The top 10 industries cannot be ranked because data for many industries has been suppressed by Statistics Canada.

- **Value Added**

Based on value added, chemicals ranked 1st among all manufacturing industries (Figure 24) based on 2022 data (latest available).

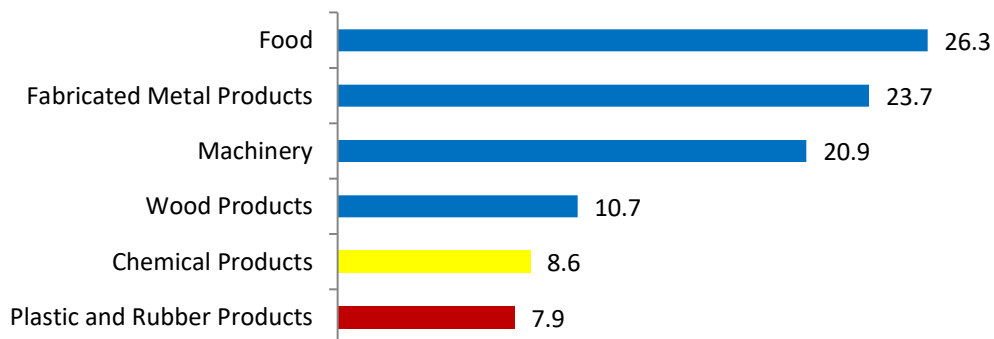
Figure 24: Top 5 Industries by Value Added in Alberta, \$ Billion



- **Employment Ranking**

The chemical industry employed 8,649 people in Alberta in 2023, an increase of 2.7 per cent compared to 2022. When indirect employment is included, it is estimated that the chemical industry supports about 51,900 jobs in the province. The number of employees working in industrial chemicals in 2022 was 4,962 indirectly supporting over 28,770 jobs in the province. When compared to other manufacturing industries in the province, chemicals ranked 5th (Figure 25).

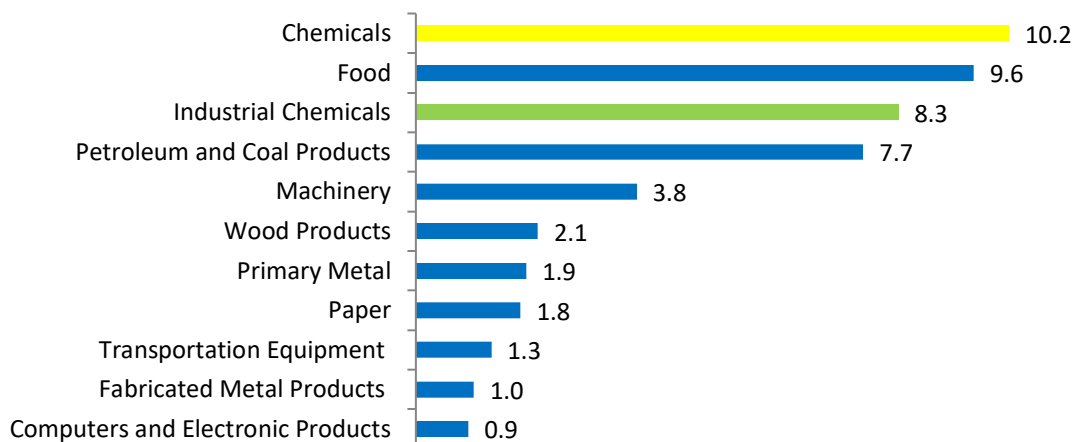
Figure 25: Top Manufacturing Industries by Employment in Alberta



• Salaries and Wages

The chemical industry paid a total of \$1.03 billion in salaries and wages in the province in 2023. The average salary paid to employees in the chemical industry was \$120,000 which ranked 1st among all manufacturing industries (Figure 26). **The average salary within industrial chemicals was \$111,300.**

Figure 26: Top Manufacturing Industries by Average Salary in Alberta, \$ Thousands



• Trade

The value of exports by the chemical industry from Alberta in 2023 was \$10.2 billion, while imports were \$4.3 billion (Table 18). The United States was the destination for 89 per cent of exports, followed by China (8 per cent) and Mexico (1 per cent). The United States was also the source of most imports (76 per cent), followed by China (8 per cent), South Korea (2 per cent) and Australia (2 per cent).

For industrial chemicals, exports from the province in 2022 were \$8.3 billion, while imports were \$2.3 billion. The United States was the destination for 85 per cent of exports, followed by China (10 per cent) and the United Kingdom (1 per cent). The United States was also the source of most imports (80 per cent), followed by China (6 per cent), Australia (4 per cent) and Finland (2 per cent).

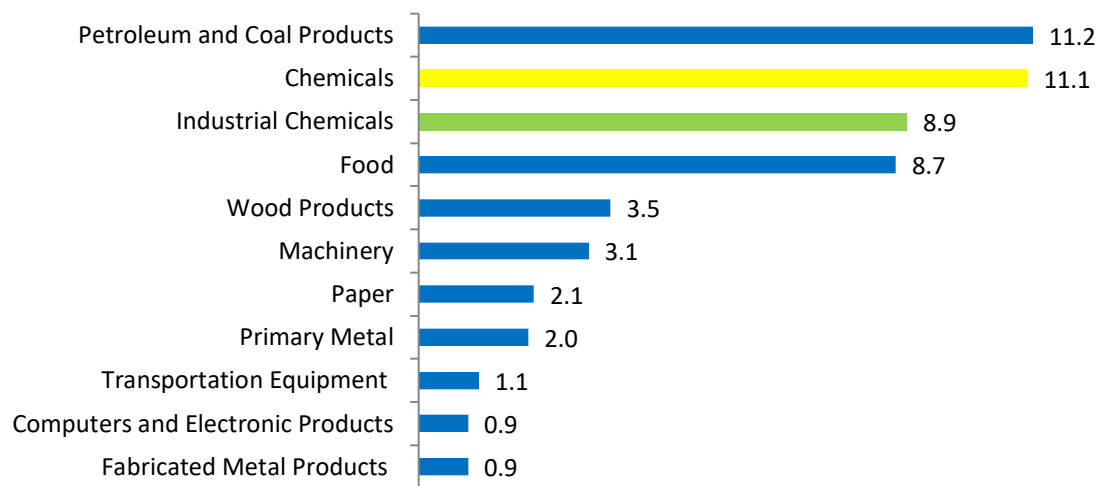
Table 18: Trade by the Chemical Industry in Alberta



Value of trade, \$ billion		2022	2023	Change 2022-23
All chemicals	Imports	4.4	4.3	-2.2%
	Exports	11.1	10.2	-7.5%
Industrial chemicals	Imports	2.5	2.3	-7.6%
	Exports	8.9	8.3	11.1%

Chemicals ranks 2nd among manufacturing industries in terms of exports from Alberta (Figure 27).

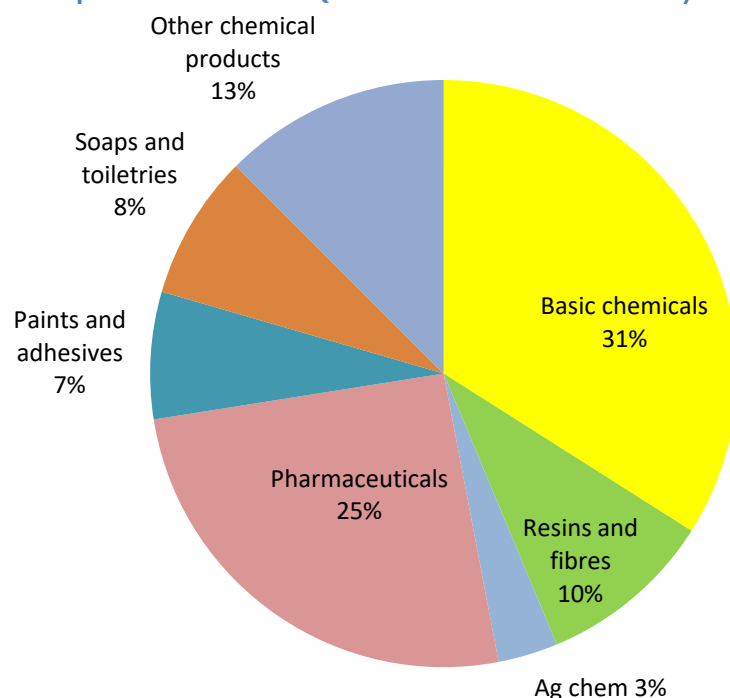
Figure 27: Top Manufacturing Industries by Value of Exports from Alberta, \$ Billion



c. Quebec

In 2023, Quebec's chemical industry had shipments of \$14.4 billion an decrease of 4.1 per cent from 2022. Industrial chemicals accounted for 41 per cent of the total (Figure 28).

Figure 28: Composition of the Quebec Chemical Industry



In 2023, shipments of industrial chemicals were \$5.8 billion a 7.1 per cent decrease from 2022 (Table 19). The industrial chemical industry in Quebec is concentrated in the eastern end of Montreal and along the south shore of the St. Lawrence River.

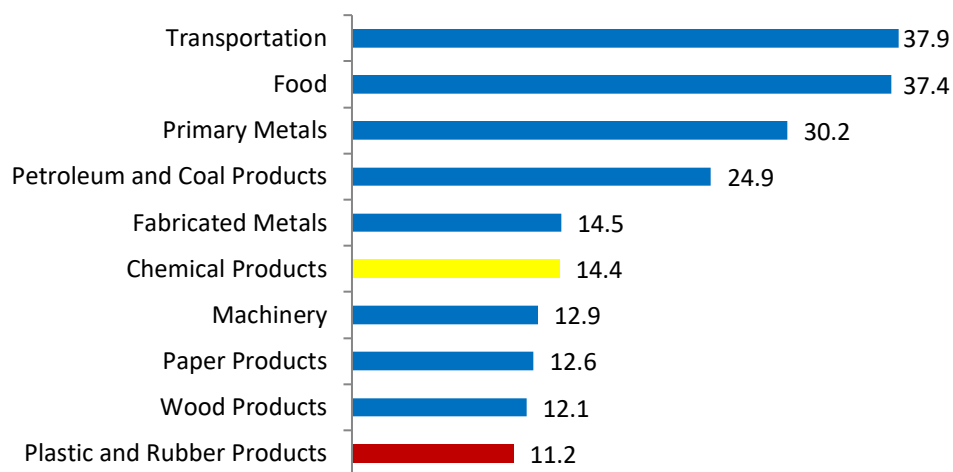
Table 19: Quebec Chemical Industry Shipments



Shipments, \$billion	2022	2023	Change 2022-23
All chemicals	14.9	14.3	-4.1%
Industrial chemicals	6.3	5.8	-7.1%

Based on shipments Chemicals was the 6th largest manufacturing industry (Figure 29).

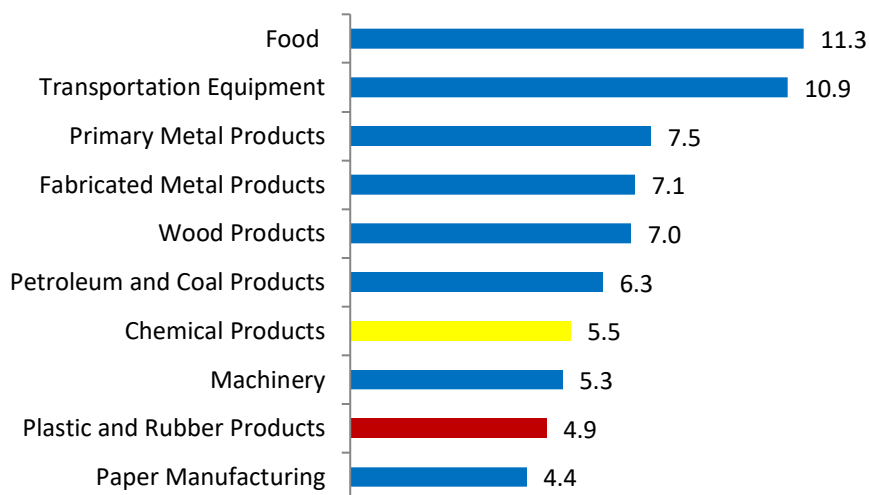
Figure 29: Top 10 Manufacturing Industries in Quebec by Value of Shipments, \$ Billion



- Value Added**

Based on value added, chemicals ranked 6th among all manufacturing industries in Quebec in 2022 (Figure 30).

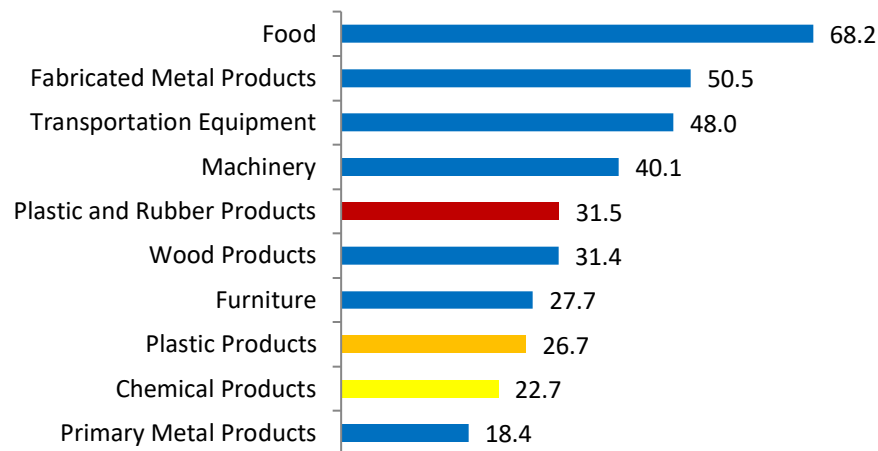
Figure 30: Top 10 Manufacturing Industries by Value Added in Quebec



• Employment Ranking

The chemical industry employed 22,700 people in Quebec in 2023. When indirect employment is included, it is estimated that the chemical industry supports 136,200 additional jobs in the province. The industrial chemical industry employs 3,181 and supports an additional 19,100 jobs in the province. When compared to all manufacturing industries in the province, chemicals ranked 9th (Figure 31).

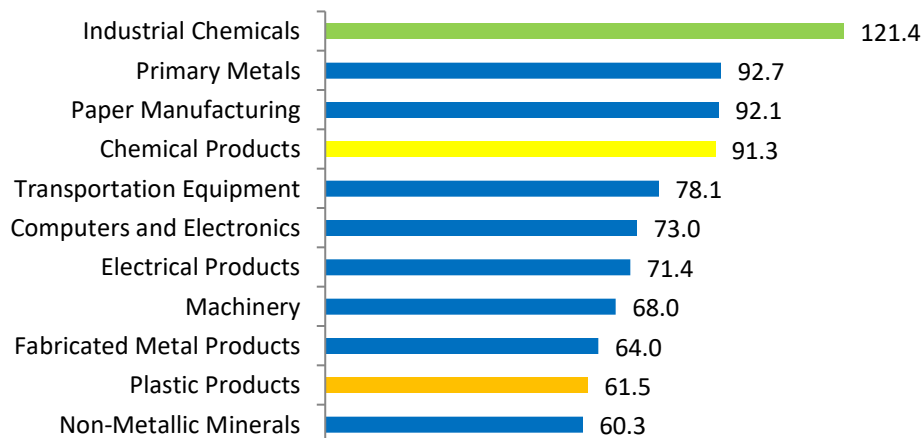
Figure 31: Top Manufacturing Industries by Employment in Quebec



• Salaries and Wages

The chemical industry paid a total of \$2.1 billion in salaries and wages in the province in 2023, corresponding to an average annual salary of \$91,300, which placed the industry 4th in Quebec (Figure 32). **For Industrial Chemicals the average salary is 121,400 and for all manufacturing, the average salary in the province was \$69,430.**

Figure 32: Top Manufacturing Industries by Average Salary in Quebec, \$ Thousands



• Trade

The value of exports by the chemical industry from Quebec in 2023 was \$7.8 billion and imports were \$11.0 billion (Table 20). The United States was the destination for 87 per cent of exports, followed by Mexico (2.5 per cent) and Belgium (2.3 per cent). Quebec is different from the other provinces in that a much lower proportion of its imports come from the United States (34 per cent), followed by Germany (9.5 per cent), France (7 per cent), Belgium (7 per cent) and China (7 per cent).

For industrial chemicals, exports from the province in 2023 were \$3.7 billion, and imports were \$4.0 billion. The United States was the destination for 85 per cent of exports, followed by Mexico (5 per cent) and the Netherlands (3 per cent). The United States was the source of 33 per cent of imports, followed by China (15 per cent), Belgium (8 per cent) and Kazakhstan (4 per cent).

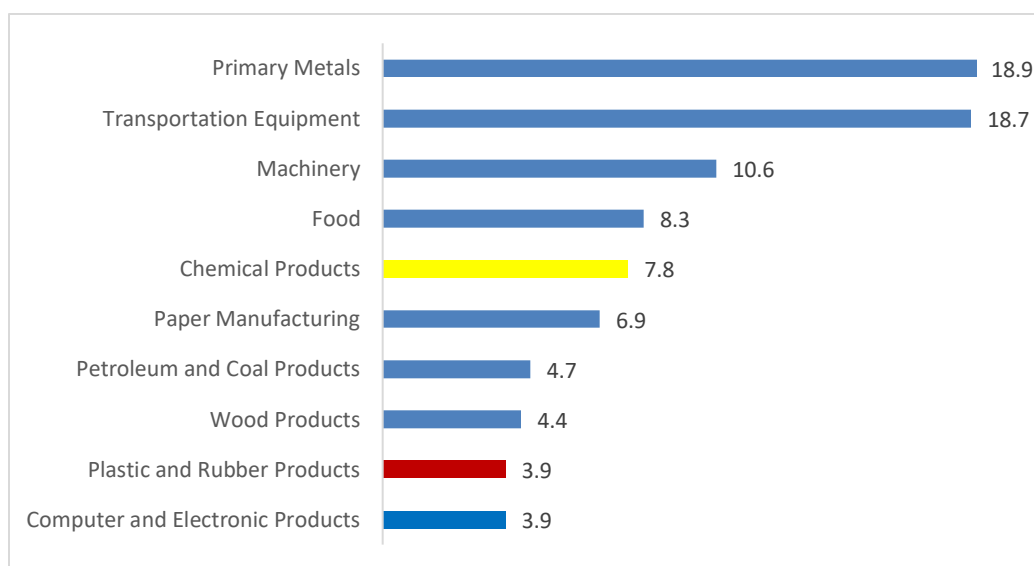
Table 20: Trade by the Chemical Industry in Quebec



Value of trade, \$ billion		2021	2022	Change 2021-22
All chemicals	Imports	11.6	11.0	-5.1%
	Exports	7.6	7.8	2.5%
Industrial chemicals	Imports	4.4	4.0	-9.1%
	Exports	3.9	3.7	-6.4%

Compared to all other manufacturing industries, chemicals were the 5th largest export industry (Figure 33).

Figure 33: Top 10 industries by Value of Exports from Quebec, \$ Billion



Industry Profiles

The segments of the chemical industry of primary interest to CIAC members are profiled according to the following categories:



- Petrochemicals and other organic chemicals
- Inorganic chemicals
- Synthetic resins, rubbers and fibres
- Specialty chemicals

a. Petrochemicals and Other Organic Chemicals

Statistics Canada reports data on organic chemicals in two industry groups:

- NAICS 32511 – Petrochemicals
- NAICS 32519 – Other organic chemicals.

The petrochemicals industry only includes hydrocarbons. The main petrochemicals produced by CIAC members in Canada are ethylene, propylene, butylenes, butadiene, higher olefins, alkanes, benzene, toluene, xylenes, and styrene. Ethylene is the largest-volume petrochemical; it is always consumed very close to the point of production so almost none is traded.

Organic chemicals that contain atoms other than hydrogen and carbon are captured in the other organic chemicals industry. CIAC members are producers of all of the largest-volume chemicals in this category in Canada: methanol, isopropyl alcohol, and ethylene glycol.

Table 21: Principal Statistics for Petrochemicals and Other Organic Chemicals

	2019	2020	2021	2022	2023
Establishments					
Petrochemicals	29	29	27	X	X
Other organic chemicals	145	134	136	X	X
Shipments \$M					
Petrochemicals	5,945	5,138	6,876	8,092	7,163
Other organic chemicals	5,601	4,716	5,635	7,881	7,479
Employment					
Petrochemicals	1,884	1,820	1,933	2,175	2,225
Other organic chemicals	3,137	2,917	2,852	3,464	3,544
Exports \$M					
Petrochemicals	2,061	1,617	2,269	2,504	2,211
Other organic chemicals	3,866	4,057	4,396	5,226	6,248
Imports \$M					
Petrochemicals	846	629	1,088	1,418	1,106
Other organic chemicals	6,537	6,497	8,152	11,806	11,968

• Commodity Data

Statistics Canada reports production data for a limited number of organic chemicals (Table 22).

Table 22: Canadian Production of Specific Organic Chemicals, Kilotonnes

	2018	2019	2020	2021	2022
Benzene	807	826	727	610	724
Toluene	477	397	395	112	157
Xylenes	646	583	584	584	654
Butadiene	235	235	228	241	220
Propylene	562	535	542	485	475
Formaldehyde	154	151	138	121	141

More data exists for imports and exports than for domestic production. Table 23 shows the exports for a select range of organic chemicals, in both tonnage and dollar value terms.

Table 23: Canadian Exports of Select Organic Chemicals, Kilotonnes

	Value, \$M	Quantity, kt	Top Markets
Benzene	122	88	USA 90% Belgium 10%
Butadiene	31	61	USA 99%
Ethylene glycol	1,239	979	China 59% USA 40%
Higher olefins	236	146	USA 97% China 1%
Isopropyl alcohol	101	68	USA 99%
Methanol	272	167	USA 99%
Propylene	109	42	USA 99%
Styrene	680	402	USA 100%

Table 24: Canadian Imports of Select Organic Chemicals, Kilotonnes

	Value, \$M	Quantity, kt	Top Markets
Benzene	47.7	15	USA 99%
Butadiene	5.8	4.9	South Korea 55% USA 42%
Ethylene glycol	15.8	13.8	USA 98%
Higher olefins	4.8	1.4	Saudi Arabia 59% USA 35%
Isopropyl alcohol	29	18	USA 68% China 7%

Methanol	198	430	Trinidad and Tobago 75% USA 15%
Propylene	6.2	0.696	USA 96%
Styrene	16	7.98	USA 99%

• CIAC Members Producing Petrochemicals and Organic Chemicals in Canada

- › ARLANXEO Canada Inc.
- › BASF Canada
- › Canada-Kuwait Petrochemical Corporation⁵
- › Dow Chemical Canada ULC
- › Evonik Oil Additives Canada Inc.
- › H.L. Blachford Ltd.
- › Imperial Oil
- › INEOS Canada Partnership
- › Inter-Pipeline Ltd.⁶
- › Lanxess Canada Co./Cie
- › Jungbunzlauer Canada Inc.
- › MEGlobal Canada ULC
- › Methanex Corporation
- › Nouryon
- › NOVA Chemicals Corporation
- › SEQENS
- › Shell Chemicals Canada Ltd.
- › Stepan Canada Inc.
- › W.R. Grace Canada Corp

b. Industrial Gases

Statistics Canada reports data on Industrial gases as part of basic chemicals within NAICS 32512. Under this category there is a single sub-category – Industrial Gas Manufacturing

Industrial Gas manufacturers produce organic and inorganic gases in compressed - liquid and solid forms. Some of the most used industrial gases include: acetylene, carbon dioxide, helium, hydrogen, nitrogen, dry ice and oxygen. Manufacturing processes also include industrial gas separation and air separation configurations.

Often Industrial Gas manufacturers will co-locate on larger manufacturing sites utilize feedstock streams produced as co-products from the larger facility. However, this is not a hard rule, with diverse customer markets and a relatively small physical footprint industrial gas manufacturers can also locate closer to demand in light industrial areas.

⁵ Currently pre-production facility is under construction

⁶ Currently pre-production facility is under construction

Table 25: Principal Statistics for Industrial Gases

	2019	2020	2021	2022	2023
Establishments	145	101	115	115	113
Shipments \$M	1,311	1,180	1,321	1,525	1,149
Employment	1,049	1,074	1,146	1,146	1,071
Exports \$M⁷	120	125	138	138	122
Imports \$M	186	176	180	262	190

• CIAC Members Producing Industrial Gases

- Praxair Canada Inc.

c. Inorganic Chemicals

Statistics Canada reports data on inorganic chemicals as part of basic chemicals within NAICS 32518. Under this category there are two sub-industry classifications:

- NAICS 325811 – Alkali and chlorine
- NAICS 325819 – Other inorganic chemicals.

Since 2010, shipment and employment data have been suppressed at the 6-digit NAICS level and only reported at the 5-digit level.

The main inorganic chemicals produced by CIAC members in Canada are: chlorine, sodium hydroxide, hydrochloric acid, hydrogen peroxide, sodium chlorate, sodium silicates, sulphuric acid, and titanium dioxide.

Table 26: Principal Statistics for Inorganic Chemicals

	2019	2020	2021	2022	2023
Establishments					
Chlor-alkali	5	5	5	5	5
Other inorganic chemicals	104	104	104	104	104
Shipments \$M	4,310	3,484	3,568	3,568	5,288
Employment	3,420	3,340	3,569	3,569	4,615
Exports \$M⁸					
Chlor-alkali	77	78	135	230	251
Other inorganic chemicals	3,703	2,730	4,108	4,996	5,929
Imports \$M					
Chlor-alkali	456	458	411	619	630
Other inorganic chemicals	2,847	3,333	3,285	4,217	3,352

⁷ Exports and Imports sometimes exceed shipments due to different databases used to collect the two sets of data.

⁸ Exports and Imports sometimes exceed shipments due to different databases used to collect the two sets of data.

● **Commodity Data**

Statistics Canada reports production data for a limited number of inorganic chemicals (Table 27).

Table 27: Canadian Production of Specific Inorganic Chemicals, Kilotonnes

	2018	2019	2020	2021	2022
Carbon black	241	243	237	188	228
Chlorine	894	269	x	367	448
Hydrogen peroxide	239	243	237	234	235
Sodium hydroxide*	453	445	450	445	460

*estimated

More data exists for imports and exports than for domestic production.

Table 28: Canadian Exports of Select Inorganic Chemicals, Kilotonnes

	Value, \$M	Quantity, kt	Top markets
Carbon black	355	202	USA 80% China 4% Belgium 4%
Chlorine	188	237	USA 100%
Ammonia	96.5	1,063	USA 100%
Hydrochloric Acid	56	293	USA 99%
Hydrogen Peroxide	41	83	USA 99%
Sodium Chlorate	311	382	USA 84% Japan 9%
Sodium Hydroxide	57	56	USA 99%
Sodium Silicate	22	33	USA 99%
Sulphuric Acid	274	1,813	USA 99%
Titanium Dioxide	19.2	6.4	Germany 67% India 10% Brazil 8% USA 6%

Table 29: Canadian Imports of Select Inorganic Chemicals

	Value, \$M	Quantity, kt	Top Markets
Carbon black	142	56	USA 82% China 12%
Chlorine	3.42	1.4	USA 98%
Hydrochloric Acid	18.1	38	USA 99%
Hydrogen Peroxide	10	3.9	USA 94%

			Switzerland 3%
Sodium Chlorate	1.1	0.41	USA 96%
Sodium Hydroxide	11.7	11.3	USA 80%
			China 15%
Sodium Silicates	20.8	25.2	USA 95%
Sulphuric Acid	30.0	122	USA 99%
			China 60%
Titanium Dioxide	54.3	11.5	France 18%
			USA 7%
			Germany 3%

● **CIAC Members Producing Inorganic Chemicals in Canada**

- › Arkema Canada Inc.
- › CCC Sulphur Products
- › Chemtrade
- › ERCO Worldwide
- › Evonik Canada Inc.
- › KRONOS Canada Inc.
- › National Silicates Limited
- › Cabot Canada Ltd.
- › NorFalco Sales Inc., GLENCORE Canada Corporation
- › Nouryon
- › Praxair Canada Inc.
- › Solvay Canada Inc.
- › W.R. Grace Canada Corp
- › United Initiators Canada Ltd

c. Synthetic Resins, Rubbers and Fibres

There are two industry sub-groups within this classification:

- NAICS 32521 – Synthetic resins and rubbers
- NAICS 32522 – Synthetic fibres.

Since 2013, shipment and employment data have been suppressed at the 5-digit NAICS level and only reported at the 4-digit level.

The main synthetic resins and rubbers produced in Canada are polyethylene, ethylene vinyl acetate, polystyrene, PVC, polyacrylamides, PET, nylons, urea and phenol formaldehydes, latex emulsions, unsaturated polyesters, silicones, and butyl and halobutyl rubbers. Synthetic fibres are produced in Canada using a variety of domestically-produced and imported resins.

Table 30: Principal Statistics for Synthetic Resins Rubbers and Fibres

	2019	2020	2021	2022	2023
Establishments					
Synthetic resins and rubbers	112	108	105	X	X
Synthetic fibres	32	30	23	X	X
Shipments \$M					
	9,597	8,333	11,268	10,898	10,709
Employment, 000					
	5,009	4,313	4,747	5,539	6,036
Exports \$M					
Synthetic resins and rubbers	7,712	7,028	10,943	10,044	9,306
Synthetic fibres	283	232	291	260	250
Imports \$M					
Synthetic resins and rubbers	8,620	7,735	10,941	12,492	10,718
Synthetic fibres	528	430	485	537	525

• Commodity Data

Within these industries, Statistics Canada reports production data only for polyethylene (Table 28).

Table 31: Canadian Production of Synthetic Resins, Kilotonnes

	2018	2019	2020	2021	2022
Polyethylene	3,854	3,599	3,871	4,052	3,820

Table 32: Canadian Exports of Select Synthetic Resins and Rubbers

	Value, \$M	Quantity, kt	Top Markets
Butyl and halobutyl rubbers	230	53	USA 35% China 27% Belgium 8%
Polyethylene	4,853	3,303	USA 86% Mexico 4%

Table 33: Canadian Imports of Select Synthetic Resins and Rubbers

	Value, \$M	Quantity, kt	Top Markets
Butyl and Halobutyl Rubbers	12.0	2.6	Belgium 40% USA 45%
Polyethylene	1,800	845	USA 96%

• CIAC Members Producing Synthetic Resins, Rubbers and Fibres in Canada

- › ARLANXEO Canada Inc.
- › BASF Canada
- › Dow Chemical Canada ULC
- › DuPont Canada Company
- › Imperial Oil
- › NOVA Chemicals Corporation

d. Specialty Chemicals

This profile is different from the others in the series. There is no Statistics Canada aggregation that provides data for an industry called specialty chemicals. Therefore, a number of assumptions have been made to derive an approximation for the size of this industry grouping.

Examples of the types of specialty chemicals produced by CIAC members include: fatty acids, maleic anhydride, plasticizers, citric acid, photochemicals, and additives for lubricants, plastics and rubber.

- Assumption #1: Specialty chemicals are a subset of NAICS 32519 – Other organic chemicals. Very little, if any, specialty chemicals fall within the petrochemical industry as it is comprised primarily of commodity products. For this analysis it is assumed that inorganic chemicals and synthetic resins and rubbers can also be excluded.
- Assumption #2: The ratio of specialty chemical to commodity chemical exports can be used to estimate the value of shipments and employment attributable to specialty chemicals. This assumption allows the use of relatively-detailed trade data to gain a measure of the level of specialty chemical production in Canada. However, deciding which products are commodity versus which are specialty remains subjective.

There are about 15 facilities in Canada producing ethanol that are captured within the other organic chemical industry. Since ethanol is primarily used for fuel, these facilities are not considered part of specialty chemicals.

Estimated statistics for the total other organic chemicals industry and the specialty component are shown in Table 30. The data for the other organic chemicals industry includes both commodity and specialty chemicals, and is repeated from the Petrochemicals profile. It is presented again to provide an indication of the relative size of the commodity versus specialty element of the industry.

Table 30: Estimated Principal Statistics for Specialty Chemicals

	2019	2020	2021	2022	2023
Establishments					
Other organic chemicals	145	145	145	X	X
Specialty chemicals	113	113	113	X	X
Shipments \$M					
Other organic chemicals	5,601	4,716	5,635	7,881	7,881
Specialty chemicals	2,660	2,660	2,660	2,600	2,600
Employment, 000					
Other organic chemicals	3,137	2,917	2,852	3,464	3,464
Specialty chemicals	1,880	1,880	1,880	2,335	2,335
Exports \$M					
Other organic chemicals	3,866	4,057	4,396	5,837	5,837
Specialty chemicals	1,620	1,620	1,620	1,620	1,620
Imports \$M					
Other organic chemicals	6,534	6,497	8,152	11,806	11,806
Specialty chemicals	2,720	2,720	2,720	4,840	4,840

● **Commodity Data**

Table 34 shows the exports for a select range of specialty chemicals, in both tonnage and dollar value terms in 2024.

Table 35: Canadian Exports of Select Specialty Chemicals, Kilotonnes

	Value, \$M	Quantity, kt	Top Markets
Palmitates and stearates	15.8	4.4	USA 83% Hong Kong 4% China 3%
Dinonyl or didecyl orthophthalates	5.1	1.52	USA 99%
Azo compounds	4.6	0.60	USA 83% Japan 10%
Cyanine dyes	41.2	2.30	USA 100%
Azo dyes	4.2	0.16	USA 92% Spain 2% China 2%
Other fatty acids	9.9	6.8	USA 85% Germany 10%

Table 36: Canadian Imports of Select Specialty Chemicals. Kilotonnes

	Value, \$M	Quantity, kt	Top Markets
Palmitates and stearates	70.1	18.9	USA 42% Malaysia 42% India 4% Indonesia 2%
Dinonyl or didecyl orthophthalates	7.0	4.96	Germany 37% Sweden 32% USA 25%
Azo compounds	0.6	0.35	Mexico 89% USA 4% Japan 3%
Cyanine dyes	4.81	0.235	USA 50% China 19% Germany 12% India 9%
Azo dyes	38	2.54	USA 42% China 24% Germany 15% India 15%
Other fatty acids	38	30.9	Malaysia 66% USA 21% India 9%

- **CIAC Members Producing Specialty Chemicals in Canada**

- › BASF Canada
- › Evonik Oil Additives Canada Inc.
- › H.L. Blachford Ltd.
- › Imperial Oil
- › Jungbunzlauer Canada Inc.
- › Lanxess Canada Co./Cie
- › Nouryon
- › Procter and Gamble, Inc.
- › SEQENS
- › Stepan Canada Inc.
- › W.R. Grace Canada Corp

Plastic Product Manufacturing Sector Summary

Canada’s Plastic Product Manufacturing Sector – **Shipments of \$34.1 billion** in 2023, supporting; **99,414 jobs** that paid **\$5,893 billion in wages**. There are more than 1,800 unique plastic product manufacturing companies in Canada and 86% of those employ less than 100 people.

Ontario Plastic Product Manufacturing – **Shipments of \$17.1 billion in 2023**, supporting **52,076 jobs that paid \$2.946 billion in wages**. There are 820 unique plastic product manufacturing companies in Ontario 75% of which employ less than 100 people.

Quebec Plastic Product Manufacturing – **Shipments of \$9.195 billion** in 2023, supporting; **26,690 jobs** that paid **\$1.614 billion in wages**. There are 520 unique plastic product manufacturing companies in QC and 86% of those employ less than 100 people. Quebec’s overall sector composition is similar to that of Ontario and the National numbers albeit at half Ontario’s size.

Alberta Plastic Product Manufacturing – Shipments of **\$2,572 billion** in 2023, supporting 7,265 jobs, that paid \$364 million in wages. There are 130 unique plastic product manufacturing companies in AB 89% of which employ less than 100 people.

Plastic Sector Economic Tables National Level

Table 1: Plastic Product Manufacturing (NAICS 3261)

	Shipments, \$ million	Employment	Imports, \$ million	Exports, \$ million	Wages, \$ million
2018	25,513	92,732	12,996	11,428	4,800
2019	27,743	93,020	13,145	11,497	5,227
2020	26,257	89,700	13,085	11,359	4,594
2021	31,304	99,501	14,547	12,999	5,170
2022	36,263	101,221	17,043	14,947	5,702
2023	34,065	99,414	16,130	14,940	5,892

Table 2: Unsupported plastic packaging materials and unlaminated film and sheet manufacturing (NAICS 32611)

	Shipments, \$ million	Employment	Imports, \$ million	Exports, \$ million	Wages, \$ million
2018	4,990	12,812	2,985	2,498	760
2019	5,426	12,852	2,906	2,604	828
2020	5,427	12,642	3,043	2,566	802
2021	6,516	12,812	3,301	3,142	906
2022	7,471	12,852	3,828	3,531	974
2023	7,706	12,642	3,464	3,261	1,006

Table 3: Plastic Pipe, Pipe Fitting and Unsupported Profile Shape Manufacturing (NAICS 32612)

	Shipments, \$ million	Employment	Imports, \$ million	Exports, \$ million	Wages, \$ million
2018	2,704	6,618	1,472	1,207	396
2019	2,479	6,639	1,437	1,170	431
2020	2,185	5,902	1,368	1,255	330
2021	2,805	6,372	1,572	1,508	377
2022	3,451	6,482	1,895	1,842	457
2023	3,495	6,366	1,772	1,864	472

Table 4: Laminated Plastic Plate, Sheet and Shape Manufacturing (NAICS 32613)

	Shipments, \$ million	Employment	Imports, \$ million	Exports, \$ million	Wages, \$ million
2018	344	980	1,152	683	63
2019	375	982	1,154	701	68.6
2020	258	844	1,092	687	46.5
2021	300	917	1,212	735	53.8
2022	334	932	1,406	853	56.4
2023	339	916	1,411	857	58.3

Table 5: Polystyrene Foam Product Manufacturing (NAICS 32614)

	Shipments, \$ million	Employment	Imports, \$ million	Exports, \$ million	Wages, \$ million
2018	1,236	3,621	148	171	193
2019	1,344	3,623	152	220	210
2020	1,292	3,552	135	199	198
2021	1,605	3,912	122	257	242
2022	1,860	3,979	150	302	271
2023	1,884	3,909	140	304	280

Table 6: Urethane and other foam product (except polystyrene) manufacturing (NAICS 32615)

	Shipments, \$ million	Employment	Imports, \$ million	Exports, \$ million	Wages, \$ million
2018	990	3,424	354	171	165
2019	1,076	3,435	380	220	180
2020	1,094	3,464	371	238	176
2021	1,444	3,823	424	328	202
2022	1,605	3,889	483	332	223
2023	1,625	3,820	492	275	230

Table 7: Plastic Bottle Manufacturing (NAICS 32616)

	Shipments, \$ million	Employment	Imports, \$ million	Exports, \$ million	Wages, \$ million
2018	651	2,599	661	413	124
2019	708	2,607	670	393	135
2020	725	2,773	658	475	134
2021	729	2,558	641	478	134
2022	874	2,602	725	498	161
2023	885	2,556	710	450	166

Table 8: Other Plastic Product Manufacturing (NAICS 32619)

	Shipments, \$ million	Employment	Imports, \$ million	Exports, \$ million	Wages, \$ million
2018	15,073	62,677	6,226	6,134	3,100
2019	16,390	62,872	6,446	6,090	3,375
2020	15,414	59,319	6,433	5,753	3,430
2021	17,904	67,624	7,274	6,551	3,255
2022	20,668	68,793	8,557	7,590	3,560
2023	18,952	67,565	8,141	7,930	3,679

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