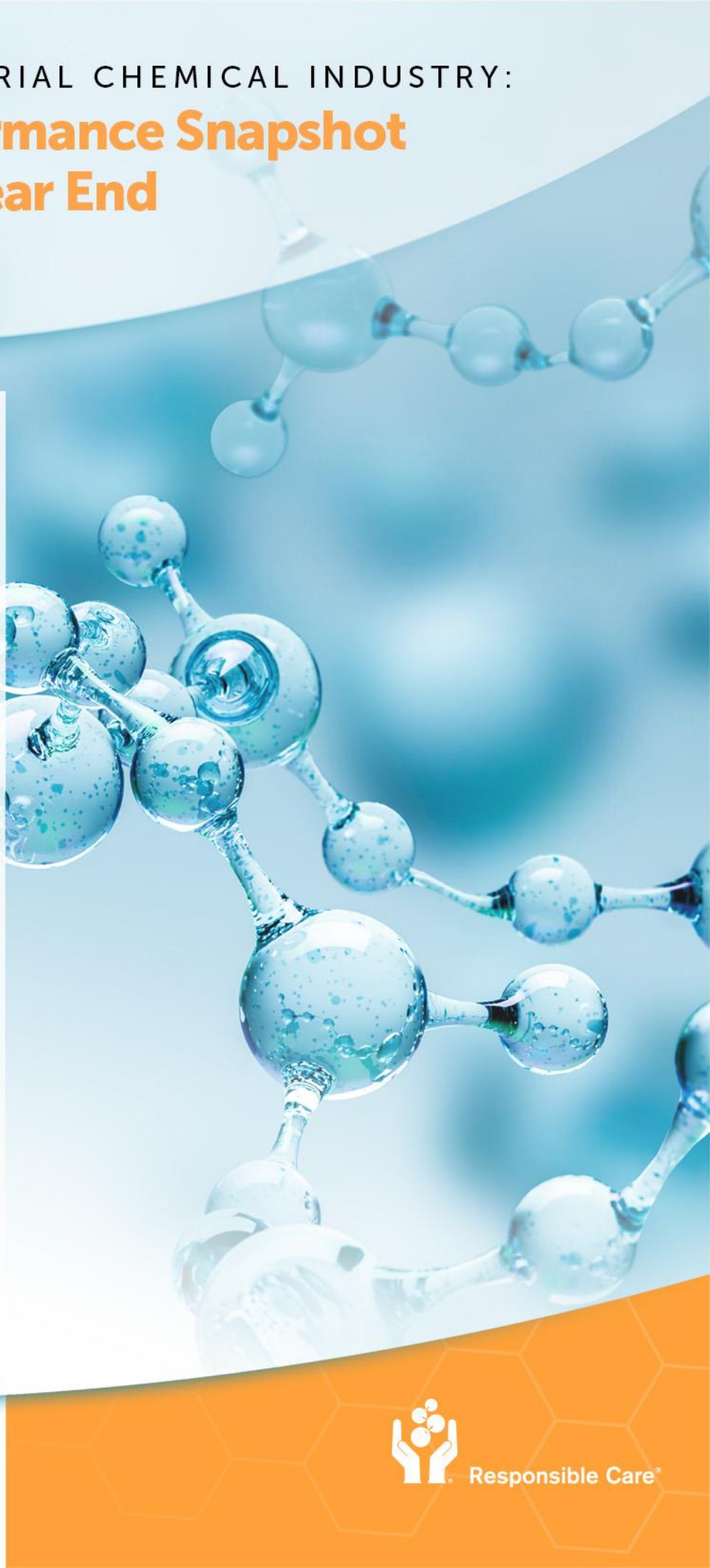
2019

# INDUSTRIAL CHEMICAL INDUSTRY: Performance Snapshot Q4/Year End



## HIGHLIGHTS

- Railway disruptions in November 2019 are felt across the Q4 2019 data CIAC tracks.
- Shipments of industrial chemicals declined 6.8% in the full year 2019 compared to 2018. Other Organic chemicals and Industrial Gases were the only sub-sectors to grow in 2019.
- Exports for industrial chemicals were down 7.5% in 2019 compared to 2018. Inorganic chemicals were the only sub-sector to grow exports in 2019.
- Industrial chemical GDP declined 2.8% in the 4th Quarter of 2019.
- Railcar shipments of Industrial Chemicals declined 5.1% in the 4th Quarter, predominately a result of labour disruptions to CN's network in November.

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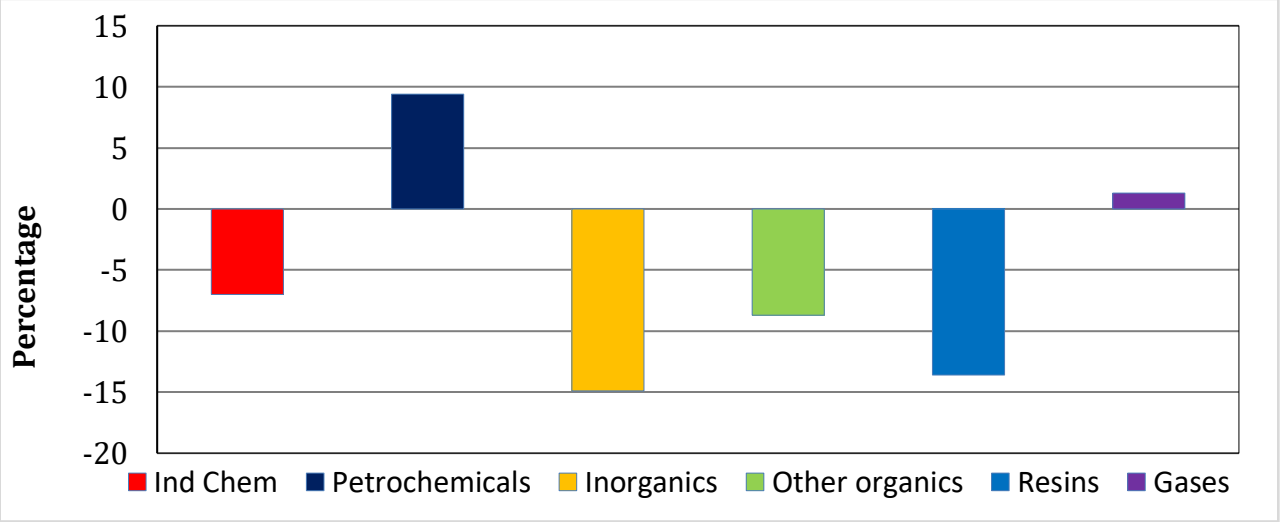
## > Shipments

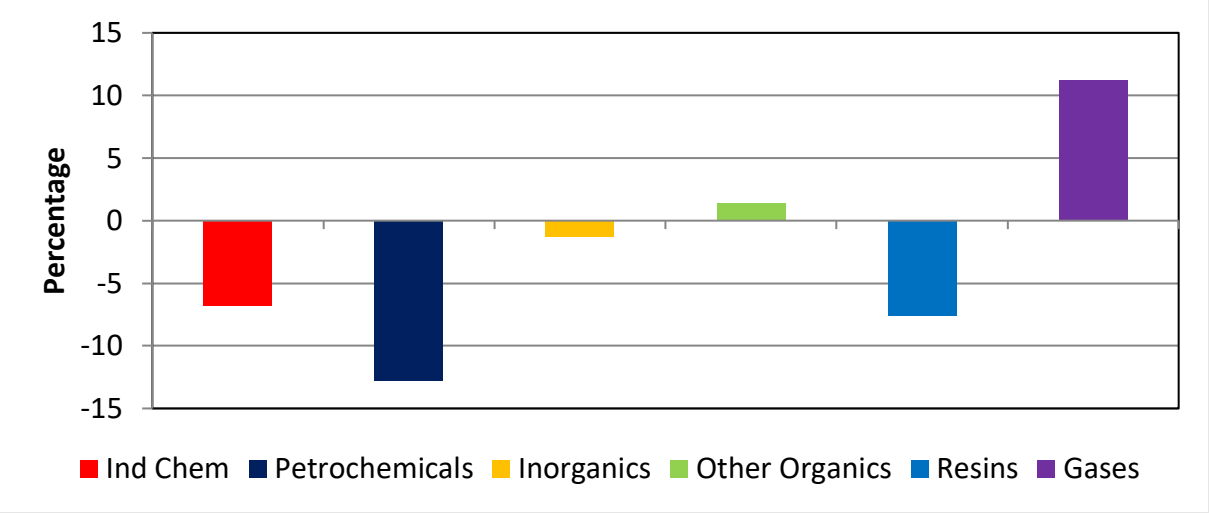
On a quarter-over-quarter basis, Industrial Chemical shipments fell by 7% from Q3 through Q4 2019. Shipments of inorganic chemicals led the decline with a 14.9% drop in Q4, followed closely by Resin's which declined 13.6% and Other Organic chemicals with a decline of 8.7%. Petrochemicals ended the year on a strong note where the completion of maintenance turnarounds led to a 9.4% increase in shipments in Q4. Industrial Gas shipments also increased in Q4, up 1.3% from Q3 2019. In Q4 the combined factors of early and severe winter weather and labor disruptions to Canadian National Railway's (CN Railway) network impacted Industrial Chemical manufacturers' ability to move their products to market. These factors were largely acute and transitory impacting the flow of goods in November 2019 and their influence will be seen throughout this report. By December and into January 2020 railway operations had returned to normal.

**Figure 1: Change in Shipment Value, Q4 2019 vs. Q3 2019, in percentage**




Preliminary data (Figure 2) shows Industrial Chemical shipments down 6.8% in 2019 compared to 2018. The impacts of CN Railway's November disruption can be seen in the year-over-year data. Throughout 2019, the Petrochemical sub-sector leads the downward trend, with shipments decreasing by 12.8% year-over-year. Recent maintenance and repair completions to integrated refinery operations should provide support for the sub-sector heading into 2020. Synthetic Resin shipments declined by 7.6% in 2019 largely due to a very competitive global market. Organic chemical shipments declined because of the transport disruptions and due to margin compression for Ethylene Glycol. Inorganic chemical shipments were down by 1.3% but much of this decline was largely due to transitory railway disruptions. The Industrial Gases sub-sector posted the strongest 2019, growing shipments by 11.2%.

**Figure 2: Change in Shipment Value, Full Year 2019 vs. Full Year 2018, in percentage**




## > Exports

On a quarter-over-quarter basis (see Figure 3), Industrial Chemical exports fell by 4.9%. Year-over-year (Figure 4), Industrial Chemical exports fell by 7.9%. The drop in export values was widespread across the Industrial Chemical sub-sectors. Only Inorganic chemicals and Industrial Gas exports rose in Q4, every other sub-sector experienced decline, with Petrochemicals (-11.3%) and Synthetic Resins (-10.9%) particularly hard hit. It may seem contradictory that Inorganic chemical exports should be significantly higher than shipment figures seen above. An explanation is that export transportation networks differ from domestic networks, offering an outlet for goods that could not move within Canada at that time.

**Figure 3: Change in Exports, Q4 2019 vs. Q3 2019, in percentage**

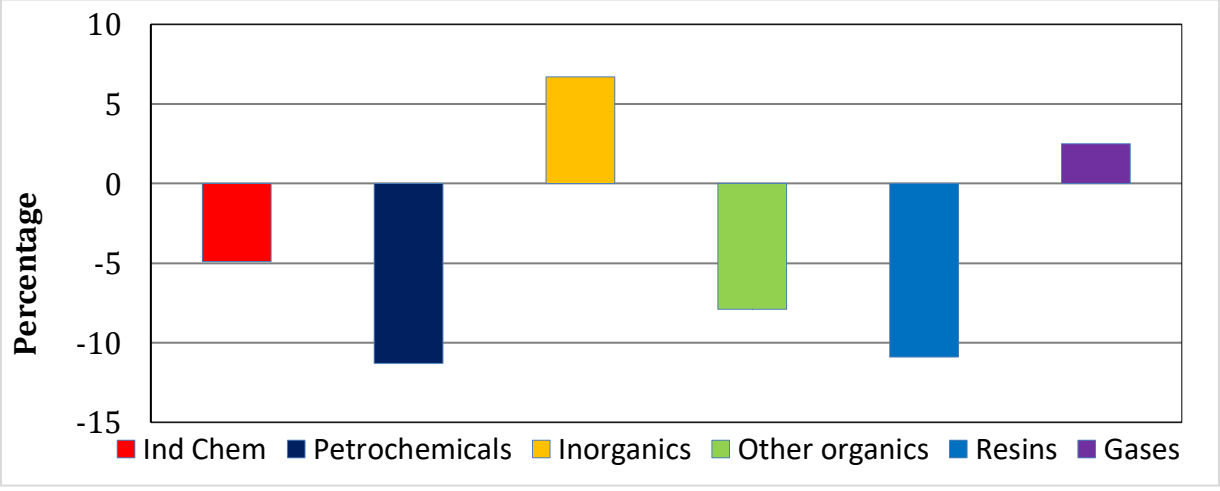
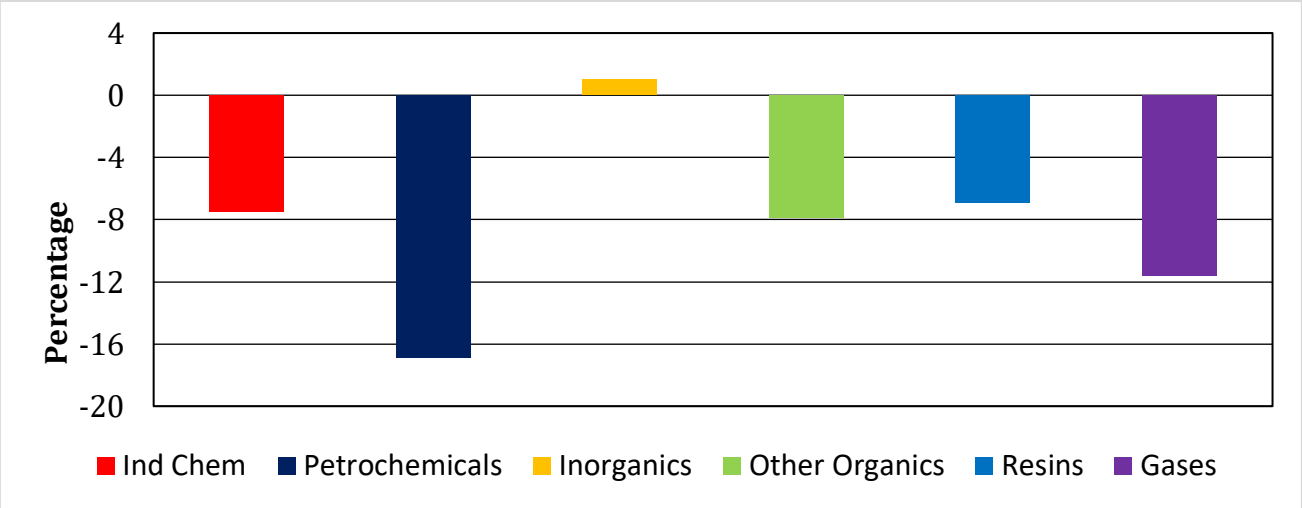


**Figure 4: Change in Exports, Full Year 2019 vs. Full Year 2018, in percentage**




Comparing year-over-year results in Figure 4, we see a similar pattern to the quarterly figures with only Inorganic chemicals showing growth (1%). Every other sub-sector saw declines in export value year-over-year, a trend seen in previous Statistical Reviews and one exacerbated by November's transportation disruptions. The critical theme to interpreting the 2019 data is the erosion of the macroeconomic backdrop over the course of the year. Declining business investment and cautious consumer spending led to flat or in some cases falling demand for intermediate chemical products as they year progressed. Resource extraction sectors were particularly hard hit as was durable goods manufacturing in the key markets of China, the E.U. and North America. These trends accelerated from the summer through the fall, moderating slightly as the year finished. Secondly, pricing pressure and margin compression among high volume industrial chemical products accelerated in the latter half of the year as recent increases to capacity (mainly in the U.S. and China), introduced a wave of new production onto the market. Figure 4 above shows the overall impacts that some products are facing on a value basis in export markets. A more granular view of these pricing pressures can be found in Tables 1 and 2 below that examine exports of specific commodities. In these tables the pressures facing some high-volume products and the impacts of the Q4 rail disruptions can be seen in detail.

**Table 1: Change in Exports of Selected Commodities, Q4 2019 vs. Q3 2019, in percentage%**

| Commodity | change, tonnage basis, % | change, $ basis, % |
|---|---|---|
| ***Petrochemicals*** | | |
| Propylene | -3.3 | -1.8 |
| Butadiene | 16.5 | 16.2 |
| Higher olefins | -3.2 | 16.8 |
| Benzene | -65.8 | -67.1 |
| Styrene | -3.0 | -9.3 |

| | | |
|---|---|---|
| ***Inorganic chemicals*** | | |
| Chlorine | -30.1 | -35 |
| Hydrochloric acid | -30.8 | -33.3 |
| Sulphuric acid | -10.4 | -5.2 |
| Sodium hydroxide | -42.3 | -50.8 |
| Titanium dioxide | -22.4 | -21.6 |
| Sodium chlorate | -9.3 | -10.7 |
| Aluminum sulphate | -4.4 | -7.4 |
| Sodium silicates | -46.2 | -52.1 |
| Hydrogen peroxide | -13.6 | -20.6 |
| ***Other organic chemicals*** | | |
| Methanol | -26.0 | -30.1 |
| Isopropyl alcohol | 3.8 | -20.7 |
| Ethylene glycol | 16.2 | 15.5 |
| ***Synthetic Resins*** | | |
| Polyethylenes | -6.9 | -13.9 |
| Butyl rubbers | -2.6 | -6.2 |
| ***Specialty Chemicals*** | | |
| Palmitates and stearates | -7.2 | -13.7 |
| Orthophthalates | -71.7 | -75.1 |
| Azo compounds | -61.9 | 73.7 |
| Cyanine dyes | -7.9 | -9.1 |
| Azo dyes | -48.6 | -10.3 |
| Other fatty acids | -8.9 | -14.9 |

Table 1 shows quarter-over-quarter changes in industrial chemical exports, where weather-related and labour rail traffic disruptions come into focus. We can see the volume and pricing decline almost in lockstep across all our tracked Inorganic chemicals and severe declines for Methanol and Benzene shipments. Given the relatively high demand for these chemicals throughout the rest of the year (see Table 2 below) it is believed that transportation disruptions played a role in the steep decline in quarter-over-quarter figures. Similarly, early and severe winter conditions in much of Canada and the northern United States in the fall may have increased demand for Ethylene Glycol leading to the dramatic increase seen in Table 1. Additionally, maintenance activity in Sarnia and Ft. Saskatchewan may have temporarily decreased the production of some products. However, not all pricing and volume variations reflect short-term conditions.

**Table 2: Change in Exports of Selected Commodities, Full Year 2019 vs. Full Year 2018, in percentage**

| Commodity | change, tonnage basis, % | change, $ basis, % |
|---|---|---|
| ***Petrochemicals*** | | |
| Propylene | -7.0 | -7.4 |
| Butadiene | -7.2 | -4.9 |
| Higher olefins | 11.7 | 7.2 |
| Benzene | 2.5 | -12.3 |
| Styrene | -12.9 | -30.2 |
| ***Inorganic chemicals*** | | |
| Chlorine | 11.6 | 23.8 |
| Hydrochloric acid | -12.3 | -20 |
| Sulphuric acid | 3.0 | 56.4 |
| Sodium hydroxide | -17.3 | -42.9 |
| Titanium dioxide | 181 | 138 |
| Sodium chlorate | -8.3 | -4.4 |
| Aluminum sulphate | -21.2 | -2.9 |
| Sodium silicates | 52.5 | 44.3 |
| Hydrogen peroxide | 14.1 | 9.2 |
| ***Other organic chemicals*** | | |
| Methanol | 2.2 | -13.9 |
| Isopropyl alcohol | No change | -16 |
| Ethylene glycol | 1.4 | -29 |
| ***Synthetic resins*** | | |
| Polyethylenes | -4.0 | -13.3 |
| Butyl rubbers | -15.1 | -11.4 |
| ***Specialty chemicals*** | | |
| Palmitates and stearates | -5.9 | -5.3 |
| Orthophthalates | 20.5 | 29.1 |
| Azo compounds | -23.6 | 4.4 |
| Cyanine dyes | -9.0 | -8.8 |
| Azo dyes | 6.7 | 19.7 |
| Other fatty acids | -49.6 | -77.2 |

Table 2 shows year-over-year changes in industrial chemical exports and here the changing macroeconomic backdrop becomes clear. Many of the highest volume industrial chemicals saw pricing declines that are in excess of associated volume declines. In 2019 margins were particularly pressured for styrene, ethylene glycol and polyethylene.[1] Indeed, when many multi-national

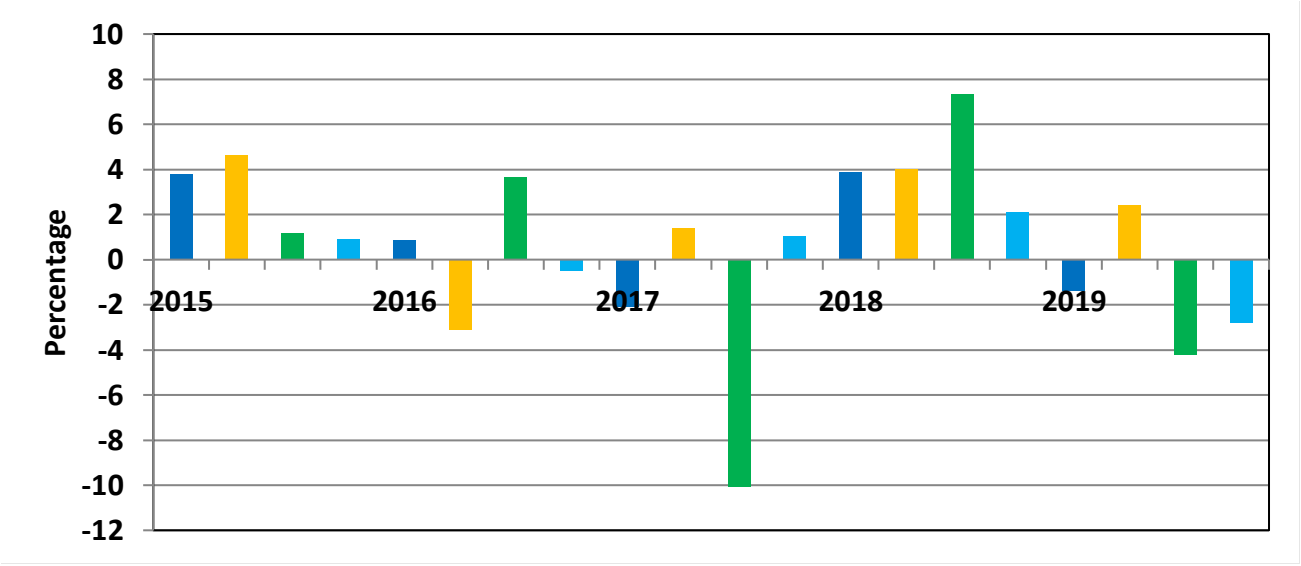
[1] Kristen Hays et al. "New capacities, weaker downstream markets to weigh on ethylene in 2020," S&P Global, November 26, 2019.
Lee, Brian., "Styrene: The Calm Before the Storm," IHS Markit: Chemicals, Dec. 6, 2019
Miranda Zhang et al. "Surging monoethylene glycol supply shifts global trade flows," S&P Global, November 25, 2019
Miguel Cambeiro et al., "US polyethylene resin export prices rise on rebalancing, margin expansion drive.' S&P Global Jan. 29, 2020

companies reported Q4 earnings in early 2020 a common theme was the extremely competitive pricing environment, particularly for chemical producers utilizing higher cost feedstocks such as naphtha.[2] For a more detailed discussion of the changing macroeconomic backdrop please see CIAC's 2019 Year End Survey of Business Conditions.

## > Gross Domestic Product (GDP)

GDP for Industrial Chemicals declined by 2.8% in Q4 of 2019 from Q3 2019 levels (see Figure 5). This means over the second half of 2019 Industrial Chemical GDP has fallen 5.5% reflecting the business and transportation conditions discussed earlier in this report. The quarterly comparisons of GDP levels seen in Figure 6 puts the recent decline into context.

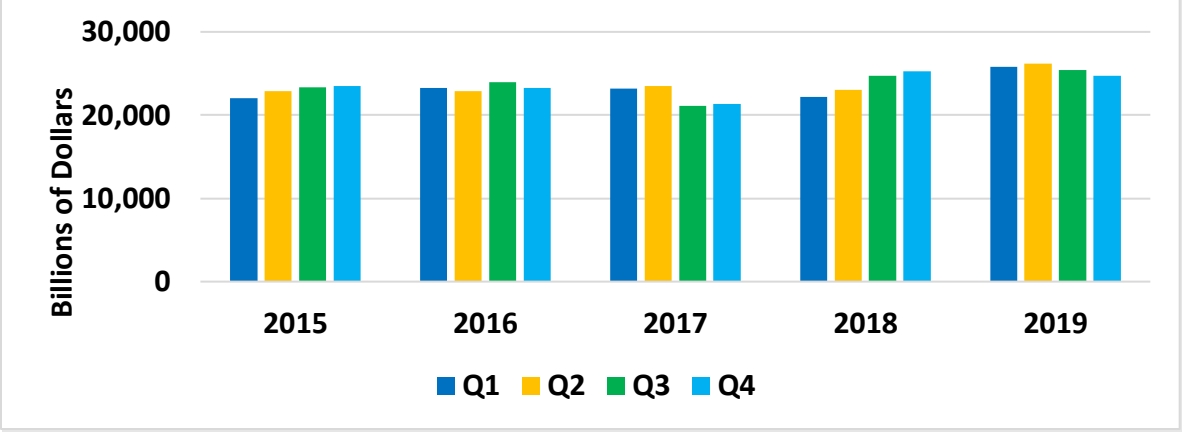
**Figure 5: Quarter-Over-Quarter Change in GDP for Industrial Chemicals, in percentage**




Q4 2019 GDP levels remain among multi-year highs, signifying strong business fundamentals. Given recent tepid forecasts for 2020 chemical demand growth due to regional and global impacts of the coronavirus pandemic, Canadian Industrial Chemical GDP growth may remain range-bound for upcoming quarters with significant potential for downside movement. Recent capital investments and turnaround completions will over time push up the potential GDP gains for industrial chemicals.

[2] Boswell, Clay., " ExxonMobil chemical segment swings to loss on lower margins," Chemical Week, January 31, 2020
Clay Boswell, " LyondellBasell Earnings drop year over year on slowdown." Chemical Week, January 27, 2020
Clay Boswell " Dow earnings fall on lower prices and margin declines," Chemical Week January 29, 2020
Mark Thomas, "Shell's chemical business swings to %65 million loss on lower margins, volume." Chemical Week, January 30, 2020

**Figure 6: Quarterly GDP for Industrial Chemicals, in Billions of Dollars (chained 2012)**




## > Rail Car Shipments

The number of rail cars used to ship Industrial Chemicals (Figure 7) declined by 5.1% in Q4 2019. Two factors aided in this dramatic decline: 1) labour disruptions across CN Railway's national network and 2) early winter weather in British Columbia that decreased traffic into the Port of Vancouver. Much of this decline was concentrated in November where industrial chemical traffic declined by 18.9% from October 2019 levels. Traffic levels recovered in December and January 2020 and anecdotal reports from shippers noted backlog inventory declines over that period.

**Figure 7: Quarter-Over-Quarter Change in Number of Railcars Shipping Industrial Chemicals, in percentage**

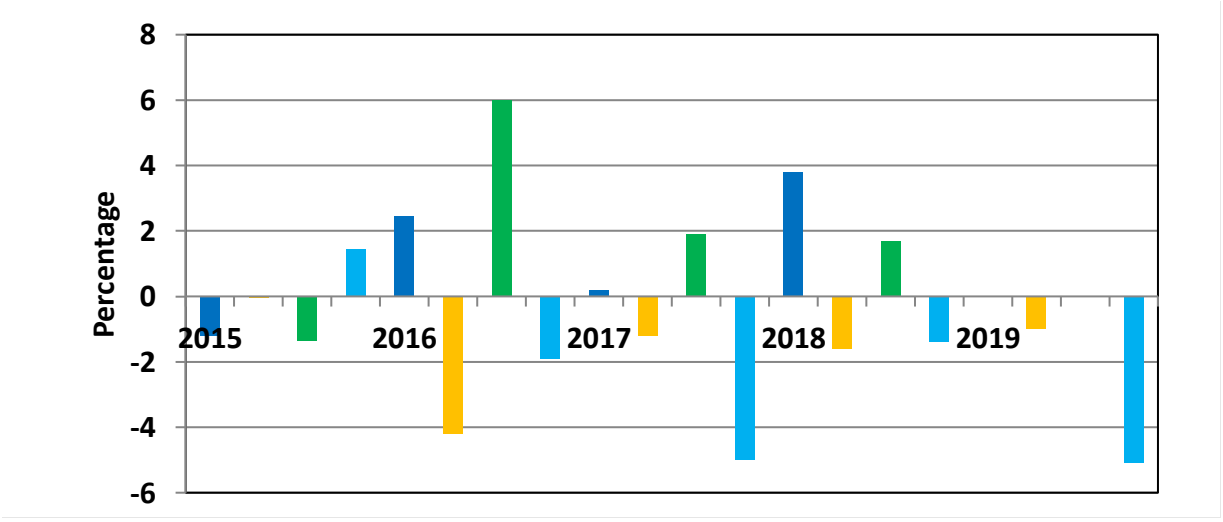
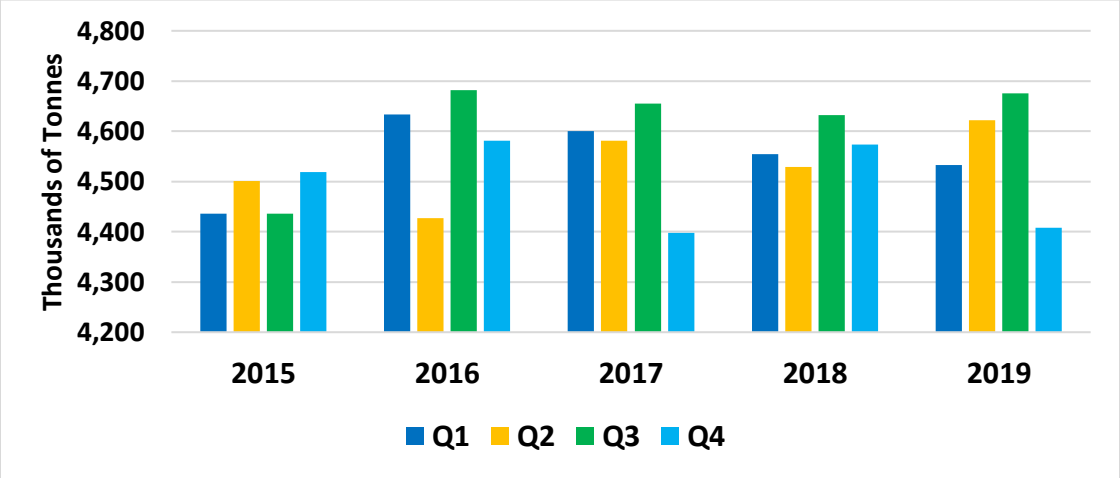



Figure 8 shows a quarterly comparison of the volume of Industrial Chemicals shipped and you can see that the decline in rail traffic is matched only a few times over the last few years. Most recently in Q4 2017 when a similar period of labour disruption and poor weather impacted the flow of chemical products.

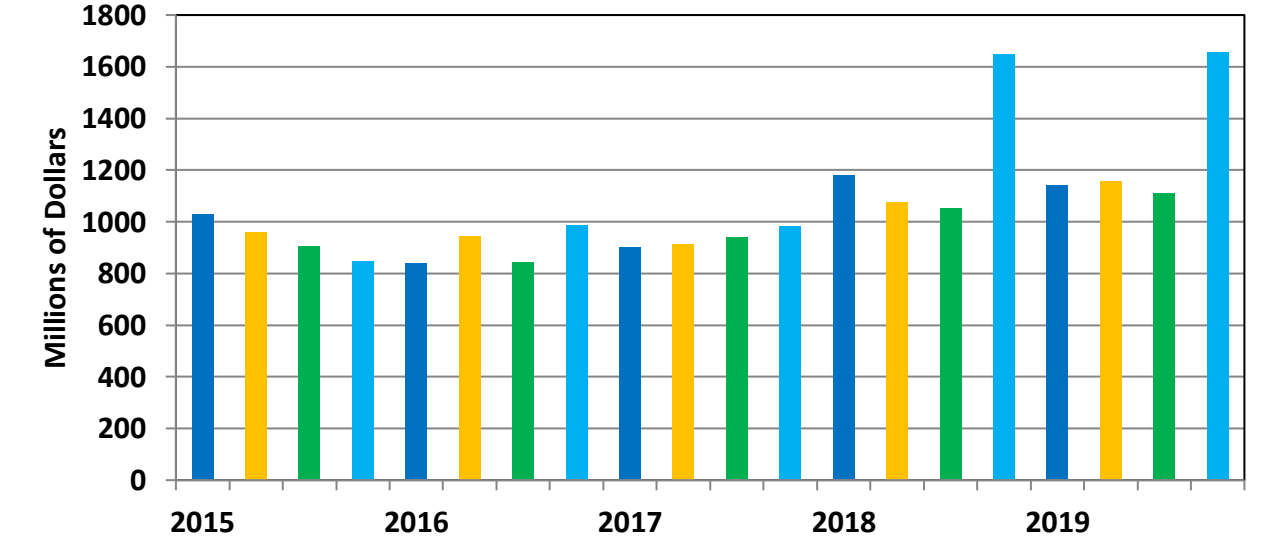
**Figure 8: Quarterly Volume of Industrial Chemicals Shipped via Train, in Thousands of Tonnes**




## > Profits

Operating profits (Figure 9) for Industrial Chemicals in the fourth quarter of 2019 were $1656 million. This figure reflects the strong underlying business conditions for chemical producers throughout 2019.

**Figure 9: Quarterly Operating Profits for Industrial Chemicals, in Millions of Dollars**



***Note: All data in this report are based on Statistics Canada sources and is elsewhere noted by citation.***

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