

INDUSTRIAL COST INDICATOR

ECONOMIC INDICATORS **CNI**

Revised edition

CNI
Brazilian National Confederation of Industry
THE FUTURE OF INDUSTRY

Industrial Costs Increased When Comparing 2022 to 2021

The Industrial Cost Indicator (ICI) revealed a 10.7% increase when comparing 2022 with 2021. Among the components of the ICI, the increases in production costs (+14.4%) and the cost of capital (+35.8%) contributed to this outcome. Conversely, there was a decrease in the tax cost during the period (-13.0%).

International events, such as the conflict between Russia and Ukraine, impacted production costs leading to an upsurge in input and energy commodity prices, particularly in the first two quarters of 2022. The influence of internal factors on production costs, such as the rise in personnel expenses, became more prominent in the third and fourth quarters, exhibiting less impact from external factors.








The substantial increase in the cost of capital in 2022 reflects the rise in the Selic rate from 9.25% per year in January to 13.75% per year as of August 2022.

In contrast, the tax cost experienced a decline due to tax breaks implemented in 2022, resulting in reduced federal and state tax payments relative to industrial GDP.

Note that the ICI and most of its components experienced a retreat in the last quarter of 2022; however, this decline only partially offset the accumulated increase over the past two years.

Variation of the Industrial Cost Indicator and its Components

In (%)

	Q4 2022/ Q3 2022	Q4 2022/ Q4 2021	Four-quarter cumulative rate 2022/2021
 Industrial Cost Indicator	-3.1%	-2.3%	10.7%
 Production Cost	-2.9%	3.7%	14.4%
 Energy Cost	-3.7%	0.7%	23.0%
 Personnel Cost	12.5%	11.9%	11.8%
 Intermediate Goods Cost	-5.9%	2.1%	14.5%
 Capital Cost	0.0%	9.8%	35.8%
 Tax cost	-5.4%	-32.7%	-13.0%

PRODUCTION COST

Production Costs Increased in 2022

The cost of production exhibited a growth of 14.4% in the comparison between 2022 and 2021. This outcome is due to the rise in global inflation, which had implications for all variables comprising the cost of production.

Regarding the components of production cost, personnel costs were impacted by the overall strengthening of the labor market in 2022 and the persistent increase in prices, exerting pressure on workers' salaries and resulting in an 11.8% increase in this period.

The cost of intermediate goods was influenced by escalating commodity prices and disruptions in global supply chains, which were still recovering from

the effects of the pandemic. This led to a 14.5% increase in the comparison between 2022 and 2021.

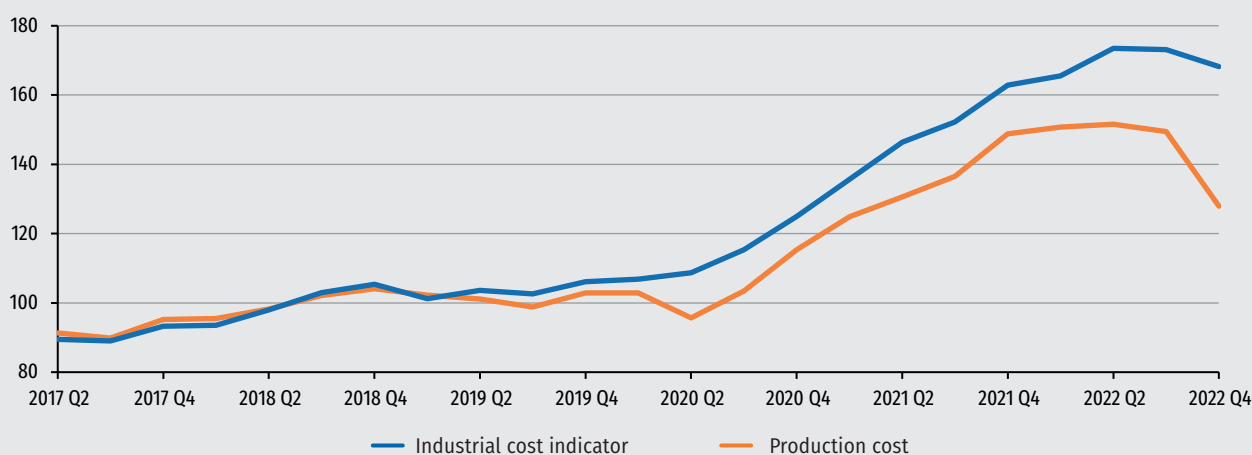
The energy cost experienced a significant surge of 23.0% due to the war between Russia and Ukraine, resulting in a constrained supply of refined petroleum products and natural gas, causing price hikes. These factors played a crucial role in explaining the elevated prices of fuel oil and natural gas.

Although the year-on-year comparison indicated a rise in costs, when comparing the fourth quarter with the third quarter of 2022, the cost of production decreased by 2.9%. The main contributors to this reduction in production costs in the industry during the fourth quarter were the cost of intermediate goods, which fell by 5.9% during that period, and the cost of energy, which saw a decline of 3.7% in the same comparison. These costs decreased due to the normalization process of input chains towards the end of 2022 and the decrease in energy prices observed towards the end of the year.

Industrial cost indicator and production cost index

Fixed base index (Base: 2018=100)

Production cost
2022/2021: **↑ 14.4%**



Source: CNI

Note: The historical series of the ICI exhibits structural breaks in 2016 and 2020. When comparing figures before these periods, it is crucial to consider these breaks. For more detailed information, please refer to the reformulated ICI methodology.

Energy costs rise due to the war between Russia and Ukraine

The energy cost witnessed a rise of 23.0% in the comparison between 2022 and 2021. This increase is due to the growth across all components of the energy cost: +35.1% for fuel oil, +58.4% for natural gas, and +1.2% for electric power during the period.

The escalation in energy costs can be explained by the war between Russia and Ukraine that started in late February 2022 and is still ongoing. The conflict caused a reduction in oil and natural gas supplies, increasing the energy commodity prices in the foreign market in 2022, thereby impacting the industrial energy cost.

This situation was particularly intense in the first two quarters of 2022, with notable increases in the costs of oil derivatives such as fuel oil and natural gas. The cost of a barrel of BRENT oil

reached over USD120/Bbl¹ and the price of natural gas was even above USD9/MMBtu² in the worst moments of the war. However, in the subsequent quarters, these costs saw a decline.

The year 2021 experienced the most severe water resource shortage in Brazil in 91 years, resulting in reduced production at hydroelectric plants and a surge in electricity prices, with its effects persisting until the beginning of 2022. Because of the water crisis, the red flag tariff period was activated from September 1, 2021, until April 16, 2022. At the end of the red flag tariff period, the energy cost fell starting in April 2022.

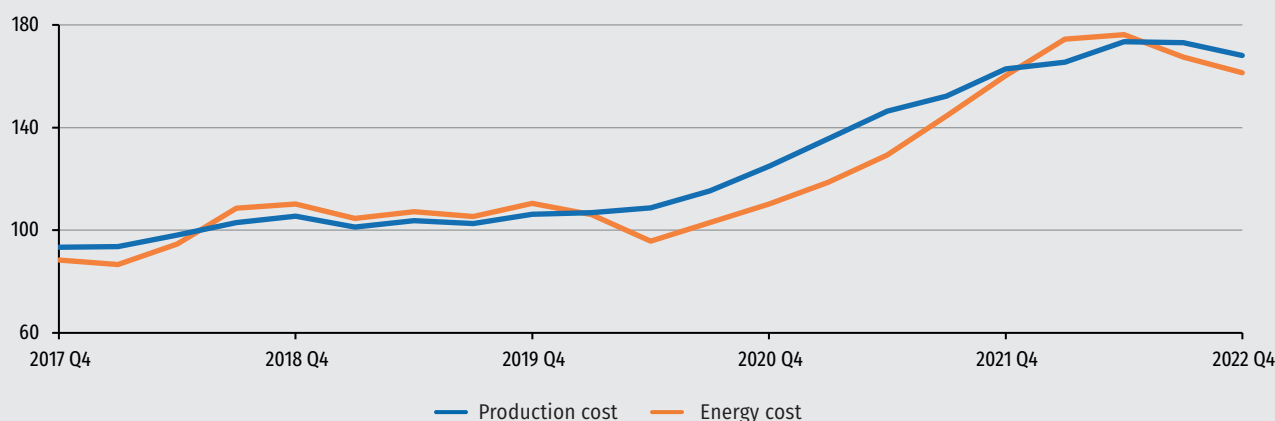
Additionally, in June 2022, the sanction of Complementary Law 194/2022, which limits the ICMS tax on energy as an essential good by law, caused a reduction in electricity costs for companies.

Comparing energy costs between Q4 and Q3 2022, there was a 3.7% decrease after a prolonged period of cost increases. This result was due to the 8.5% decrease in fuel oil costs and 4.1% decrease in natural gas costs, despite the slight 0.5% increase in electricity costs.

Production cost indicator and energy cost index

Fixed base index (Base: 2018=100)

Energy costs
2022/2021: **↑ 23.0%**



Source: CNI, based on ANP and ANEEL data.

¹ Before the war, the closing futures price for a barrel of Brent oil stood at approximately USD80 per barrel (Bbl).

² Before the war, the closing futures price for natural gas was approximately USD3.5 per million British thermal units (MMBtu).

Personnel costs have been driven up by the rise in average income levels

Personnel costs, as measured by the average income of industry workers, experienced an 11.8% increase in the comparison between 2021 and 2022. This outcome is due to the growth in the number of employed individuals and the recovery of average income, which characterized the 2022 labor market.

The continuous growth in average income throughout 2022 resulted in a 13.4%

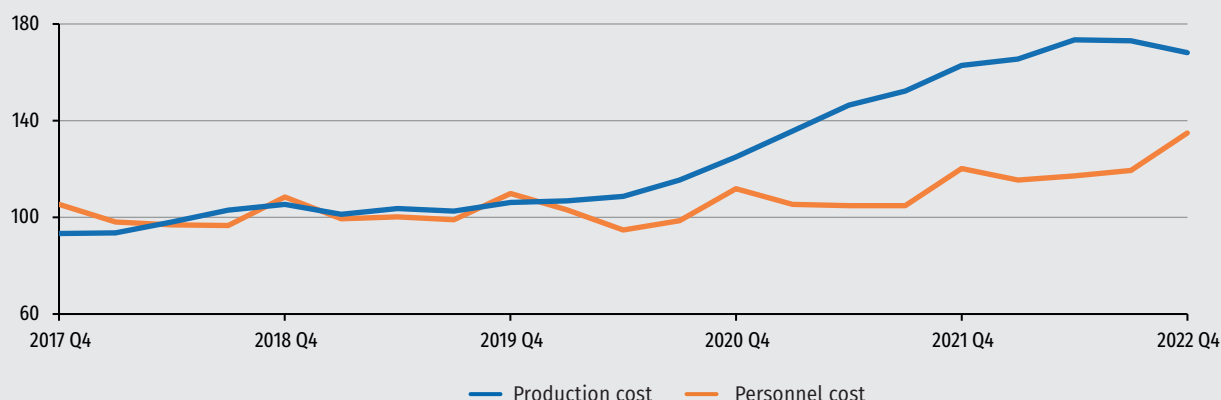
increase in the wage bill, while employment only saw a modest 1.4% growth when comparing 2022 with 2021.

Unlike other components of production cost, personnel cost continued to rise when comparing the fourth quarter to the third quarter of 2022. Personnel costs increased by 12.5%, although it is worth noting that such an upward trend is typically observed in the fourth quarter of each year. In 2022, this increase was primarily driven by the growth in the wage bill, which saw a variation of 12.2% in the fourth quarter. Conversely, employment experienced a slight decline of 0.3%, indicating relative stability in the number of employed individuals when comparing the fourth and third quarters of 2022.

Production cost indicator and personnel cost index

Fixed base index (Base: 2018=100)

Personnel Cost
2022/2021: **↑ 11.8%**



Source: CNI.

Note: The historical series of the ICI exhibits structural breaks in 2016 and 2020. When comparing figures before these periods, it is crucial to consider these breaks. For more detailed information, please refer to the reformulated ICI methodology.

The cost of intermediate goods has risen due to the ongoing war between Russia and Ukraine

In the comparison between 2022 and 2021, the cost of intermediate goods experienced a 14.5% increase, driven by the higher costs of imported inputs (+15.2%) and domestic intermediate goods (+14.4%). These increases stem from various factors.

The Brazilian industry has been significantly affected by the high cost of intermediate goods since the onset of the pandemic. The war between Russia and

Ukraine, along with extensive city closures in China throughout 2022, further contributed to the delay in the normalization of global supply chains, which had not fully recovered from the pandemic's impact. Consequently, global imbalances in input chains resulted in price hikes and increased costs of intermediate goods.

According to the CNI Industrial Surveys, industrial entrepreneurs identified the lack or high cost of raw materials as the top concern for the industry in three out of the four quarters of 2022, highlighting its importance in industrial production.

In the comparison between the third and fourth quarters of 2022, the cost of intermediate goods decreased by 5.9%, influenced by reductions in costs of both

domestic intermediate goods (-5.6%) and imported intermediate goods (-7.6%). This outcome can be attributed to the beginning of the input chain normalization process in the latter quarters of 2022, allowing a decrease in the cost of intermediate goods.

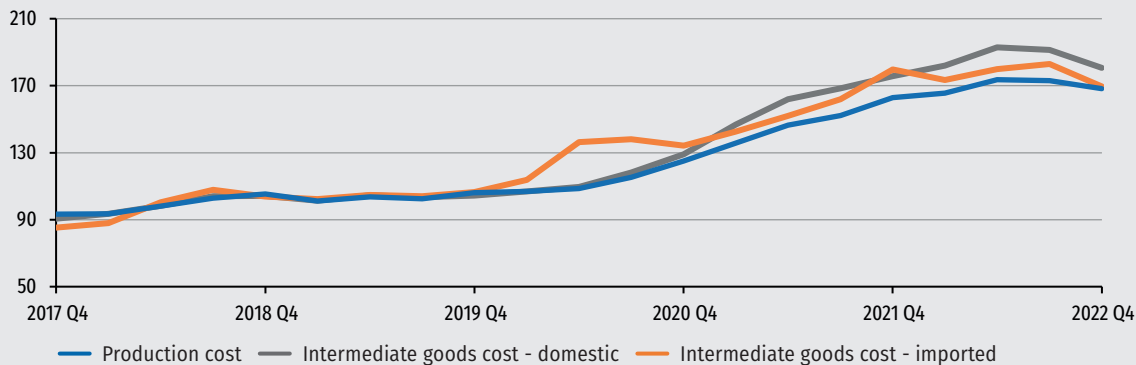
Production cost indicator and intermediate goods cost index

Fixed base index (Base: 2018=100)

Cost with intermediaries
2022/2021:

↑ 14.4%
Domestic

↑ 15.2%
Imported



Source: CNI, based on data from the Brazilian Central Bank, IBGE, and MDIC.

COST OF CAPITAL

Costs with Working Capital Show Expressive Growth

The cost of capital, as measured by the interest rate for working capital, exhibited growth in the comparison between 2022 and 2021, with an increase of 35.8%. This significant increase is due to successive rises in the base interest rate, known as the Selic, which increased from 9.25% at the end of the fourth quarter of 2021 to 13.75% at the end of the fourth quarter of 2022.

When comparing the third and fourth quarters of 2022, the cost of capital remained stable, reflecting the maintenance of the Selic rate at a high level of 13.75% per year.

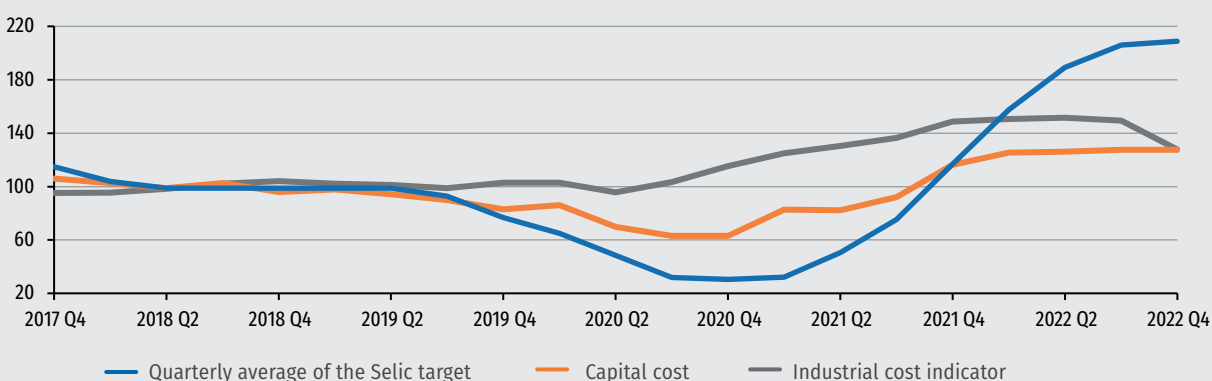
High-interest rates were also identified as a prominent issue for the Brazilian industry, with an increase in the percentage of mentions, as reported by the 2022 CNI's Industrial Surveys. The matter of interest rates contributes to the heightened cost of credit for entrepreneurs and influences decisions such as investments and machinery purchases.

Industrial cost indicator and cost of capital index

Fixed base index (Base: 2018=100)

Cost of capital:
2022/2021

↑ 35.8%



Source: CNI, based on data from the Central Bank of Brazil.

Note: The historical series of the ICI exhibits structural breaks in 2016 and 2020. When comparing figures before these periods, it is crucial to consider these breaks. For more detailed information, please refer to the reformulated ICI methodology.

TAX COST

Industry Tax Costs Decrease

The tax cost, calculated by the total federal and state taxes paid by the industry, divided by the industrial GDP, decreased by 13.0% in the comparison between 2022 and 2021. This reduction is due to a decrease in tax collection coupled with the growth of the industrial GDP. During the period, federal taxes experienced a decline of 2.7%, while state taxes increased by 7.6%.

The main factors explaining the drop at the federal level were the PIS/Cofins exonerations on fuels³ and the reduction

of IPI rates⁴ on some industrial products. State taxes were influenced by Complementary Law 194/2022, which established maximum ICMS rates for essential goods such as fuels, electricity, transportation, and telecommunications services. These rates align with each state's modal rate, typically set to 17%.

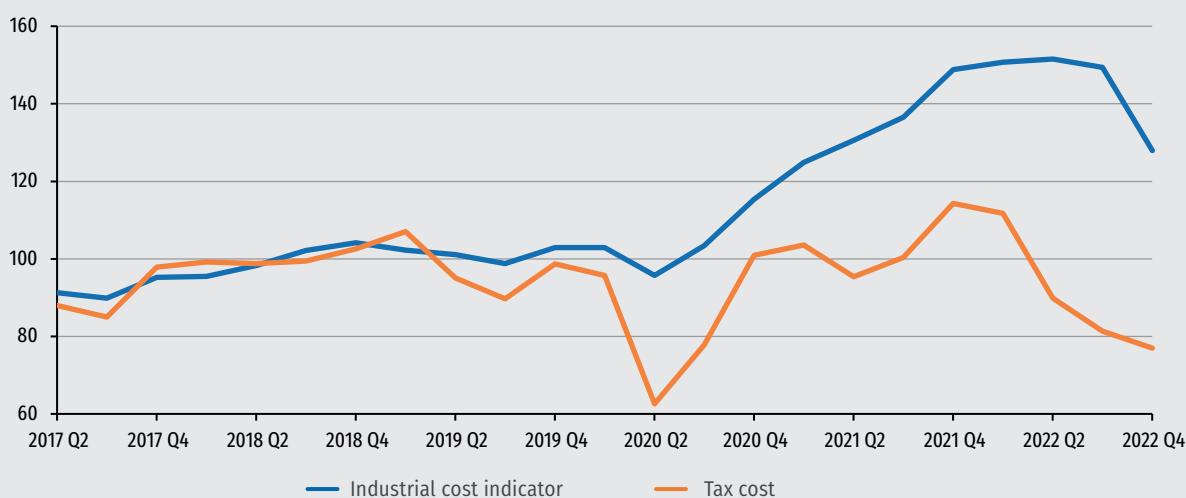
Additionally, the industrial GDP observed a significant increase, growing by 21.2% in current values.

Evaluating the tax cost when comparing the third and fourth quarters of 2022, there was a decrease of 5.4%. This outcome was primarily driven by a 1.4% decrease in federal tax costs (IPI, PIS, and Cofins) and a 6.2% decrease in state tax costs (ICMS).

Industrial cost indicator and tax cost index

Fixed base index (Base: 2018=100)

Tax cost: **↓ -13.0%**
2022/2021



Source: CNI, based on data from the Federal Revenue Service, Confaz, and IBGE.

Note: The historical series of the ICI exhibits structural breaks in 2016 and 2020. When comparing figures before these periods, it is crucial to consider these breaks. For more detailed information, please refer to the reformulated ICI methodology.

³ CL 192/2022 stipulated the PIS/Cofins rates reduction to zero for diesel oil, biodiesel, aviation kerosene, and liquefied petroleum gas (LPG), effective from March 2022. On the other hand, CL 194/2022 mandated the reduction of PIS/Cofins rates to zero for gasoline and ethanol, as well as the Cide-Fuels gasoline rates reduction at the federal level. It also introduced changes to the ICMS legislation at the state level.

⁴ Decrees 11,182 and 11,158 of 2022 implemented a linear reduction of 35% in the IPI rates for select industrial products.

INDUSTRIAL COSTS AND COMPETITIVENESS

The Domestic Market Has Witnessed an Upsurge in Industry Competitiveness along with Enhanced Profitability

The industry's profitability index increased by 4.6% when comparing 2022 to 2021. This increase was driven by a 15.8% rise in the prices of goods sold by the manufacturing industry, outpacing the industry's cost increase of 10.7% during the same period.

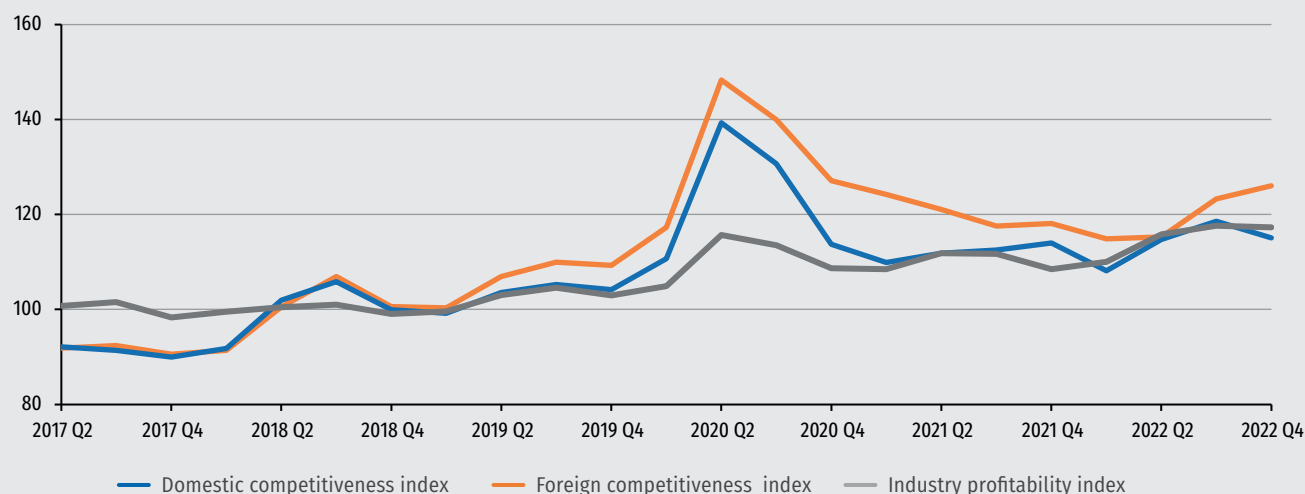
The domestic market saw an improvement in the competitiveness of the Brazilian industry. The domestic

market competitiveness index, calculated by dividing the price index of imported manufacturing products by the Brazilian industry's cost index, increased by 1.8%. This was due to the price of imported goods increasing at a higher rate than the costs of the Brazilian industry.

However, in a year-on-year comparison, the Brazilian industry experienced a slight decline in competitiveness in the foreign market. The cost of industrial products from the United States, in Reais, increased by 10.5% during the period, while the costs of the Brazilian industry grew slightly higher by 10.7%.

The industry's profitability index and price competitiveness index in both foreign and domestic markets were important metrics to evaluate industry performance

Fixed base index (Base: 2018=100)



Source: CNI.

Note: The industry profitability index is calculated by dividing the national manufacturing industry price index (IPA-IPP Manufacturing Industry) by the Industrial Cost Indicator - ICI. The price competitiveness indexes of the industry in the foreign and domestic markets, on the other hand, are the result of dividing the price index of manufactured goods in the USA, in Reais, and the price index of imported manufacturing products, in Reais, respectively, by the ICI.



Learn More

For further information on previous issues, methodology, and historical series, please visit:

www.cni.com.br/e-ici

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