MINISTRY OF
**MINES AND ENERGY**

BRAZILIAN GOVERNMENT
BRASIL
UNITING AND REBUILDING

# MONTHLY ENERGY BULLETIN BRAZIL

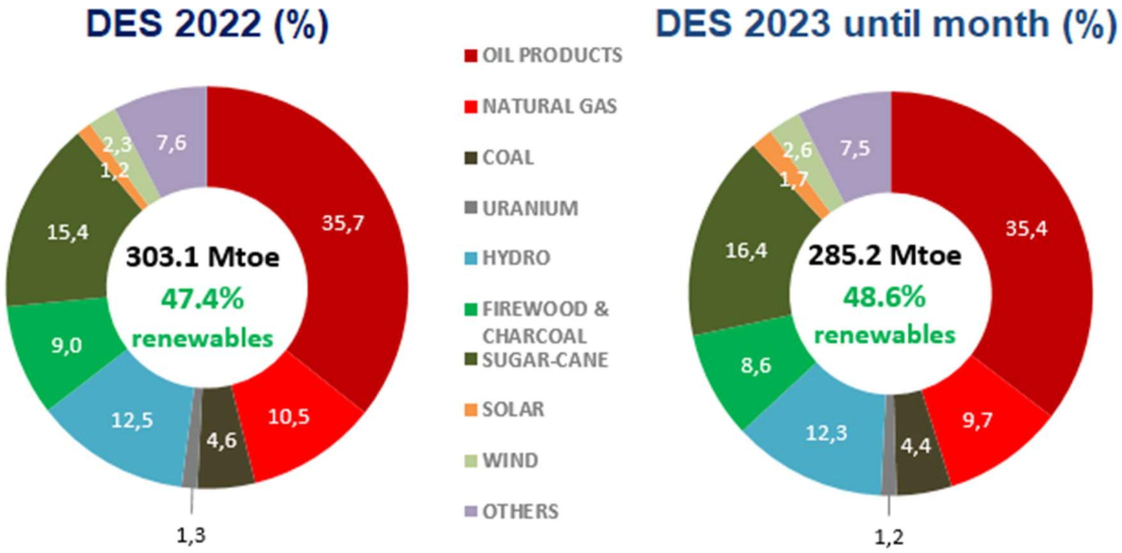
March 2024 Edition
November 23

## DOMESTIC ENERGY SUPPLY

Based on data until November 2023, the proportion of renewable sources in the Domestic Energy Supply (DES)[1] increased to about 48.6%, higher than that calculated last year, 47.4%, mainly due to a greater generation of renewable power energy and a greater demand for sugarcane products and biodiesel.

Regarding sugarcane production, according to the most recent survey by the National Supply Company (Conab), there is an estimated increase of 27.4% compared to the 2022/2023 harvest. For ethanol produced from sugarcane and corn, the forecast is a 9.9% increase in production.

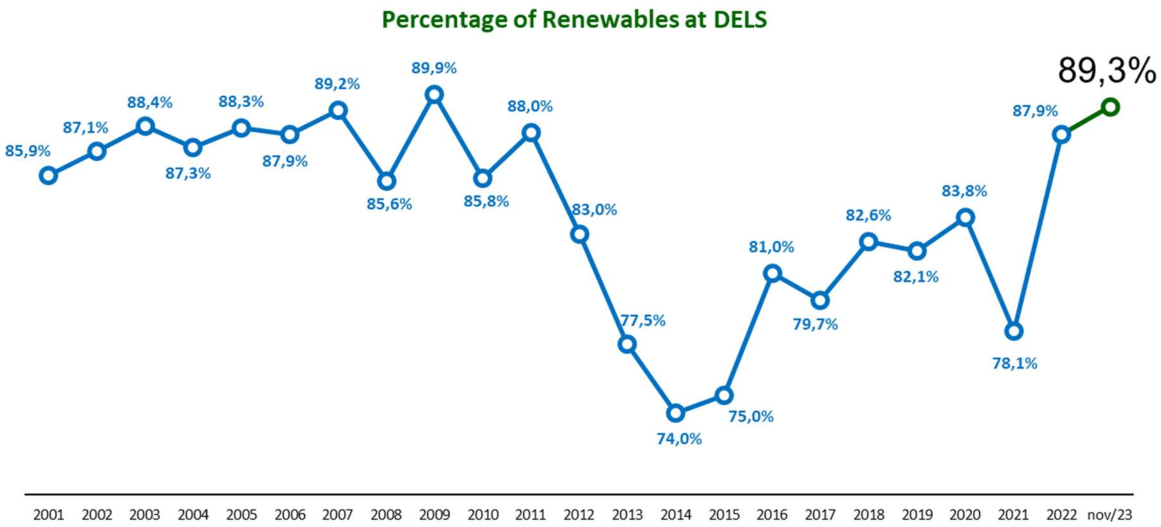
### MORE RENEWABLE DOMESTIC ENERGY SUPPLY IN 2023




*OTHER: includes other renewable and non-renewable

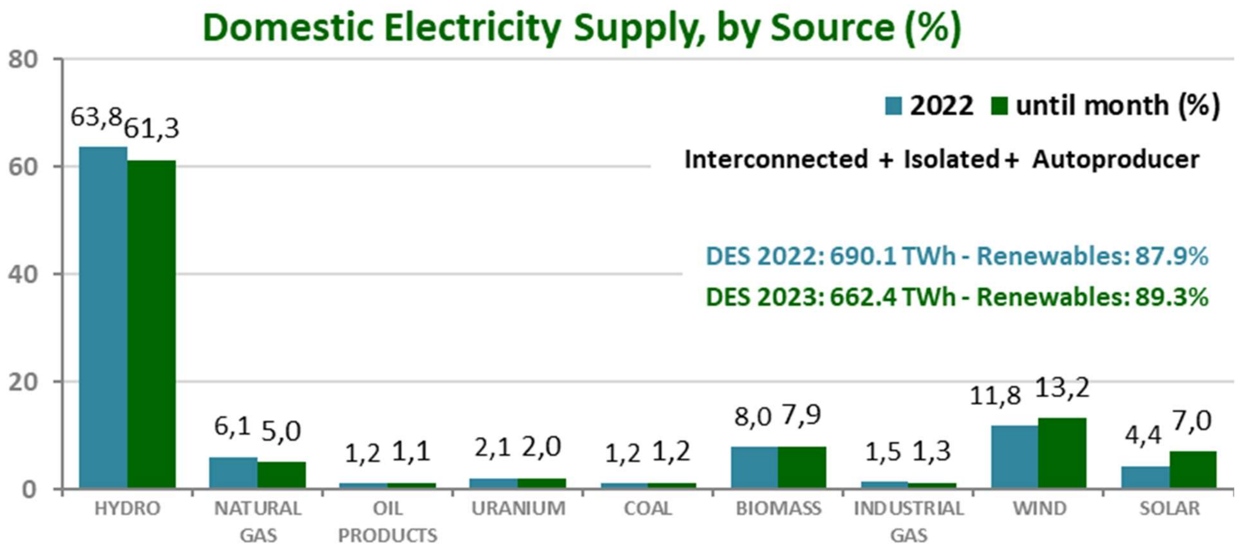
Regarding the proportion of renewables in the Domestic Electricity Supply (DELS)[2] this year, it was observed that 89.3% was derived from renewable sources up to November, reaching an accumulated value of 662.4 TWh.

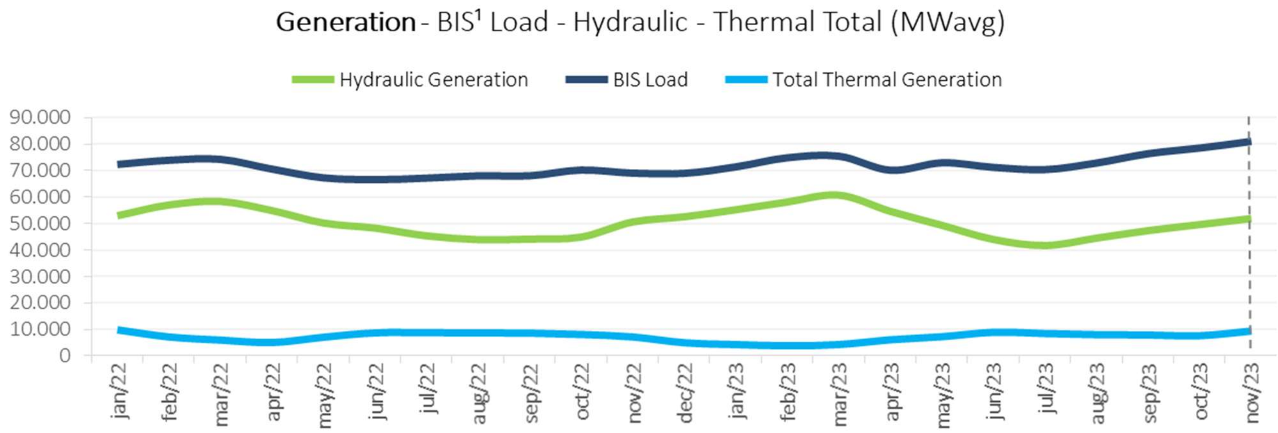
The figure below highlights the significant proportion of renewables in our DELS, contributing to a cleaner energy generation. This is a result of both favorable hydrological conditions and investments in solar and wind energy.



It is important to mention that DELS accounts for the generation portions from Centralized Generation, Distributed Generation (DG), Auto production, Isolated Systems and Electric Energy Exchange.

For the first eleven months of the year, in comparison to the same period of the previous year (year to date, YTD, comparing current year and previous year), there was a power generation of 62% in centralized solar photovoltaic and 16% in wind. National hydropower remained steady, with a minor decrease of about 1%. The increase in renewable electricity generation in 2022 and 2023 led to a significant reduction in the share of coal and natural gas-fired power plants in the DELS.




[1]BIS: Brazilian Interconnected System.

Source: National Electric System Operator (ONS)

# HIGHLIGHTS IN NOVEMBER 2023

## Biodiesel production rising

In November, biodiesel production reached its highest percentage increase this year. As already presented in previous bulletins, as a direct consequence of CNPE resolution nº 3, of March 20, 2023, which established new guidelines for the evolution of the mandatory addition of biodiesel to diesel oil sold to the final consumer. Thus, we have seen successive increases in the biodiesel production. In this month there was an increase of 35% in relation to the same month last year, the highest percentage of growth recorded this year.

Year-to-date, biodiesel production increased by 18.4%.

From April 2023, the mandatory blending content of biodiesel in diesel oil was increased to 12%, as well as the progressive evolution of this percentage, which should reach 15% by 2026.

In December 2023, CNPE approved the anticipation of the mandate of 14% in the mixture of biodiesel and diesel to March 2024 and 15% to March 2025.

Biodiesel replacing fossil diesel contributes to reducing greenhouse gas emissions, in addition to reducing the need to import fossil fuel.

## Oil and gas growing

Oil and gas production increased, rising 11.4% and 8.3% respectively, YTD / YTD previous year.

## Regular gasoline and hydrated ethanol prices continue to fall

Regular gasoline and hydrated ethanol prices decreased by 11.6% and 15.2% respectively, YTD / YTD previous year.

## Steel and Mining

Steel production fell by 6.7%, however aluminum production grew by 30.4%, iron ore exports increased by 7.3% and pellet exports increased by 31.4%, YTD / YTD previous year.

## Hydraulic supply growing

The supply of hydraulic energy increased by 1.2%, YTD / YTD previous year. The monthly average was 50,699.5 MWavg. Itaipu's supply, for the same period, increased 31.4%.

## Wind Supply in high

Wind energy supply, up to November 2023, increased by 16% YTD, as a reflection of the successive increases in installed capacity, which can be observed month by month. For the first eleven months of 2023 4,092.7 MW of wind power plants came into operation, a value 55.3% higher than the same period of the last year.

## International power energy exchange

In November 2023, Brazil exported 20 MWavg from Argentina and 2 MWavg to Uruguay.

## Natural gas availability falling

Gas consumption availability fell by 5.4%, YTD / YTD previous year.

## Coal for electricity power generation

There was an increase of 4.0% for coal public power generation, YTD / YTD previous year.

## Apparent consumption of petroleum products on the rise

Apparent consumption of oil derivatives increased by 2.4%, diesel consumption increased by 2.9% and gasoline consumption increased by 8.6%, YTD / YTD previous year. Automotive ethanol consumption increased by 3.7%.

The energy consumption of light Otto-cycle vehicles (gasoline, ethanol, and natural gas) has shown an increase of 5.7%.

## Electricity consumption in high

Electricity consumption in the residential sector grew 14.2% compared to November 2022. Industrial consumption increased by 3.9% while commercial consumption grew 11.5%.

## Electricity tariffs continue to fall

All three tariffs (residential, commercial, and industrial) continue to show a decline compared to the previous year's. The residential tariff dropped by 2.9%, while there was a decrease of 1.8% for the commercial sector and a 1.4% decrease for the industrial sector.

## Solar distributed generation installed capacity (DG) rising

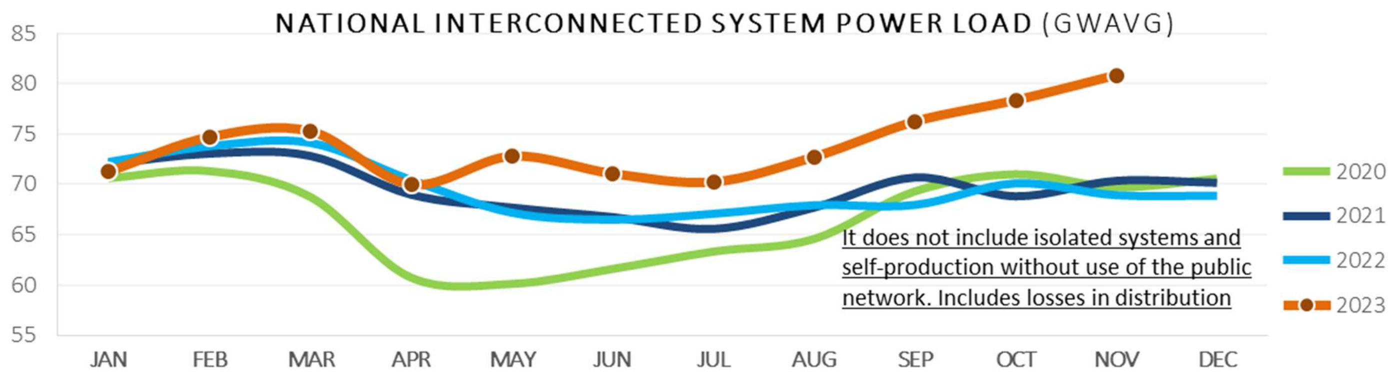
The growing in solar DG installed capacity in Brazil is still a highlight and has increased 61.2% compared to November 2022. The centralized solar installed capacity (non-GD) also increases, with a 55.0% growth compared to November 2022.

For the first eleven months of the year, 3,646.5 MW of installed centralized solar capacity came into operation.

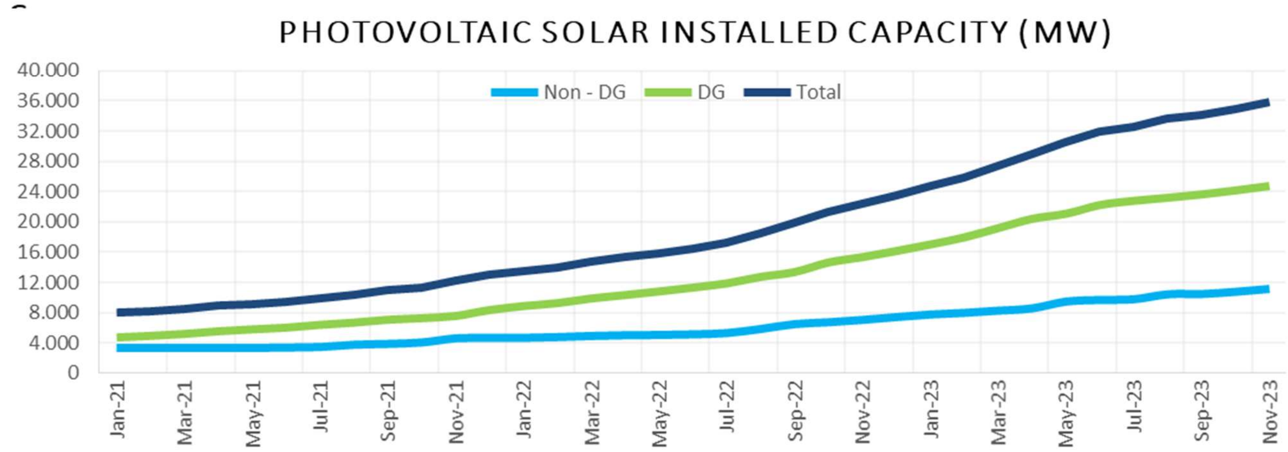
The DG’s growth is a result of public policies to encourage renewable energy sources and distributed micro and mini-generation, such as Law No. 13,203/2015 and Law No. 14,300/2022, which is considered a legal framework for distributed generation in Brazil.

| SPECIFICATION | November IN THE MONTH 2023 | 2022 | Δ% 23/22 | YTD / YTD Previous Year 2023 | 2022 | Δ% 23/22 |
|---|---|---|---|---|---|---|
| **OIL** | | | | | | |
| PRODUCTION - with Shale Oil and NGL($10^3$ b/d) | 3,760 | *3,178* | 18.3 | 3,464 | *3,108* | 11.4 |
| IMPORTS AVERAGE PRICE (US$/bbl FOB) | 91.31 | *92.79* | -1.6 | 83.35 | *100.54* | -17.1 |
| **OIL PRODUCTS** | | | | | | |
| TOTAL CONSUMPTION ($10^3$ b/day) | 2,570 | *2,548* | 0.9 | 2,581 | *2,520* | 2.4 |
| hereof: DIESEL with biodiesel - ($10^3$ b/day) | 1,187 | *1,129* | 5.1 | 1,158 | *1,125* | 2.9 |
| hereof: GASOLINE C ($10^3$ b/day) | 767 | *787.4* | -2.6 | 788 | *726* | 8.6 |
| CONSUMER PRICE - DIESEL (R$/l) | 6.08 | *6.58* | -7.6 | 5.74 | *6.60* | -13.1 |
| CONSUMER PRICE - GASOLINE C (R$/l) | 5.63 | *5.04* | 11.7 | 5.49 | *6.21* | -11.6 |
| CONSUMER PRICE - LPG (R$/13 lg) | 101.38 | *110.17* | -8.0 | 104.51 | *109.90* | -4.9 |
| **NATURAL GAS (d)** | | | | | | |
| PRODUCTION ($10^6$ $m^3$/day) | 162 | *140* | 15.5 | 149 | *138* | 8.3 |
| IMPORTS ($10^6$ $m^3$/day) | 20.5 | *21.1* | -2.8 | 17.6 | *24.9* | -29.5 |
| NON-UTILIZED AND REINJECTION (106 $m^3$/day) | 89.3 | *75.8* | 17.8 | 80.8 | *71.8* | 12.6 |
| AVAILABILITY FOR CONSUMPTION ($10^6$ $m^3$/day) | 93.4 | *85.7* | 9.0 | 86.0 | *90.9* | -5.4 |
| INDUSTRIAL CONSUMPTION ($10^6$ $m^3$/day) **(c)** | 39.0 | *40.9* | -4.6 | 39.7 | *41.6* | -4.6 |
| POWER GENERATION CONS. ($10^6$ $m^3$/day)**(d)** | 16.5 | *11.7* | 40.9 | 11.6 | *15.4* | -24.4 |
| INDUSTRIAL PRICE SE **(b)** (US$/MMBtu) - consumption range of 20,000 $m^3$/day **(c)(g)** | 19.29 | *22.04* | -12.5 | 21.13 | *20.77* | 1.7 |
| MOTOR PRICE SE (US$/MMBtu) **(c)(g)** | 27.00 | *20.75* | 30.1 | 27.64 | *20.81* | 32.8 |
| RESIDENTIAL PRICE SE (US$/MMBtu) **(c)(g)** | 52.88 | *51.18* | 3.3 | 53.03 | *48.25* | 9.9 |
| **ELECTRICITY** | | | | | | |
| NATIONAL INTERCONNECTED SYSTEM | 80,876 | *68,894* | 17.4 | 73,955 | *69,605* | 6.2 |
| SOUTHEAST/MIDWEST POWER LOAD (MWavg) | 46,273 | *39,195* | 18.1 | 42,073 | *40,123* | 4.9 |
| SOUTH POWER LOAD (MWavg) | *13,393* | *11,720* | 14.3 | 12,628 | *12,052* | 4.8 |
| NORTHEAST POWER LOAD (MWavg) | *13,566* | *11,444* | 18.5 | 12,140 | *11,236* | 8.0 |
| NORTH POWER LOAD (MWavg) | *7,644* | *6,535* | 17.0 | 7,115 | *6,194* | 14.9 |
| TOTAL CONSUMPTION (TWh) **(a)** | 46.4 | *42.8* | 8.5 | 44.0 | *42.3* | 4.0 |
| RESIDENTIAL | 14.8 | *13.0* | 14.2 | 13.6 | *12.7* | 7.1 |
| INDUSTRIAL | 16.0 | *15.4* | 3.9 | 15.6 | *15.3* | 2.6 |
| COMMERCIAL | 8.6 | *7.7* | 11.5 | 8.1 | *7.7* | 5.1 |
| OTHER SECTORS | 7.0 | *6.7* | 4.8 | 6.7 | *6.7* | 0.4 |
| PLANTS ENTRY INTO OPERATING (MW) | 639 | *1030* | -38.0 | 8,552 | *7,078* | 20.8 |
| RESIDENTIAL PRICE (R$/MWh) **(e)** | 872 | *777* | 12.2 | 834 | *860* | -2.9 |
| COMMERCIAL PRICE (R$/MWh) **(e)(f)** | 837 | *733* | 14.1 | 802 | *817* | -1.8 |
| INDUSTRIAL PRICE (R$/MWh) **(e)** | 803 | *705* | 13.9 | 770 | *781* | -1.4 |
| **ETHANOL AND BIODIESEL** | | | | | | |
| BIODIESEL PRODUCTION ($10^3$ b/d) | 147 | *109* | 34.9 | 128 | *108* | 18.4 |
| MOTOR ETHANOL CONSUMPTION ($10^3$ b/d) | 542 | *466* | 16.3 | 480 | *463* | 3.7 |
| ETHANOL EXPORTS ($10^3$ b/d) | 41 | *53* | -23.3 | 42 | *40* | 3.9 |
| HYDRATED ETHANOL PRICE (R$/l) | 3.56 | *3.83* | -7.0 | 3.77 | *4.45* | -15.2 |
| **COAL** | | | | | | |
| ELECTRICITY GENERATION (MWavg) | 1209 | *845* | 43.1 | 880 | *846* | 4.0 |
| IMPORT PRICE (US$ FOB/t) | 197.41 | *253.64* | -22.2 | 219.45 | *294.47* | -25.5 |
| **NUCLEAR ENERGY** | | | | | | |
| ELECTRICITY GENERATION - (GWh) | 621 | *1134* | -45.2 | 1,656 | *1,633* | 1.4 |
| **INDUSTRIAL SECTORS** | | | | | | |
| STEEL PRODUCTION ($10^3$ t/day) | 91 | *87* | 4.3 | 88 | *94* | -6.7 |
| ALUMINIUM PRODUCTION ($10^3$ t/day) **(c)** | 2.8 | *2.5* | 14.0 | 2.7 | *2.1* | 30.4 |
| IRON ORE EXPORTS ($10^3$ t/day) | 979 | *952* | 2.8 | 950 | *885* | 7.3 |
| PELLETS EXPORTS ($10^3$ t/day) | 68 | *45* | 50.4 | 66 | *50* | 31.4 |
| BIG IRON EXPORTS ($10^3$ t/day) | 6.3 | 9.9 | -35.9 | 10.4 | 10.2 | 1.9 |
| PAPER PRODUCTION ($10^3$ t/day) | 31.0 | *30.4* | 1.9 | 28.8 | *30.2* | -4.6 |
| PULP PRODUCTION ($10^3$ t/day) | 67.6 | *74.6* | -9.3 | 66.0 | *68.4* | -3.6 |
| SUGAR PRODUCTION ($10^3$ t/day) | 144.1 | *107.6* | 33.9 | 132.1 | *106.0* | 24.6 |
| SUGAR EXPORTS ($10^3$ t/day) | 124 | *112* | 10.9 | 92 | *76* | 22.2 |

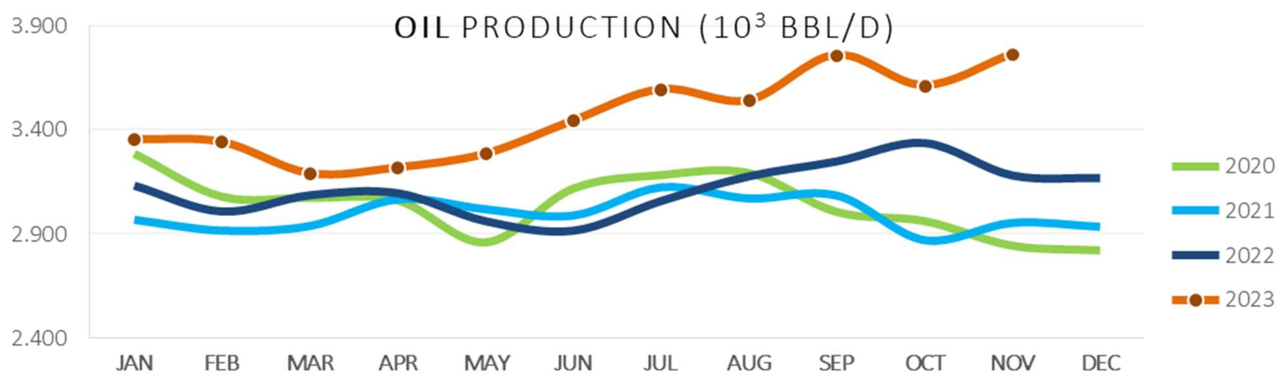
**(a) The traditional autoproducers (consumers that do not use public grid) is not included.**
**(b) SE is the acronym of Southeast**
**(c) September Data**
**(d) Estimated**
**(e) Include Taxes: PIS/Cofins and ICMS.**
**(f) Commercial Sector, Services, and Others; Public Lighting; Public Service**
**(g) Natural gas prices include taxes and refer to the Southeast region**



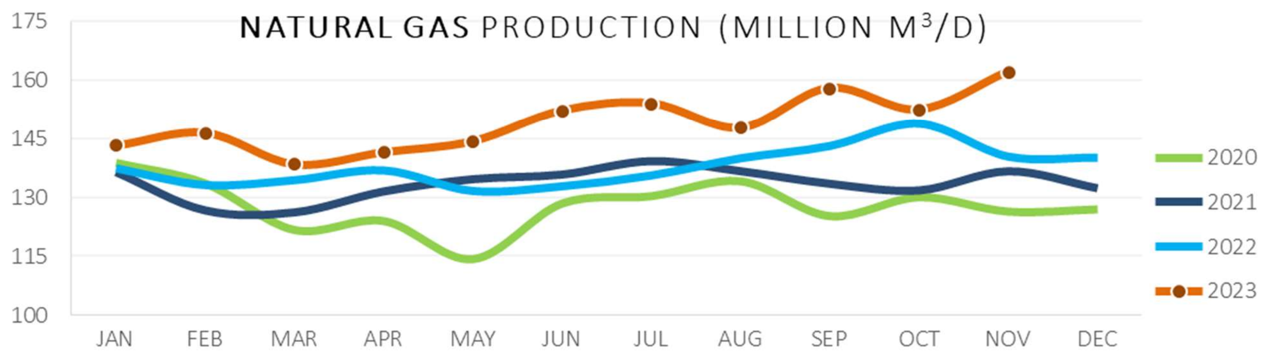

Source: National Electric System Operator (ONS)



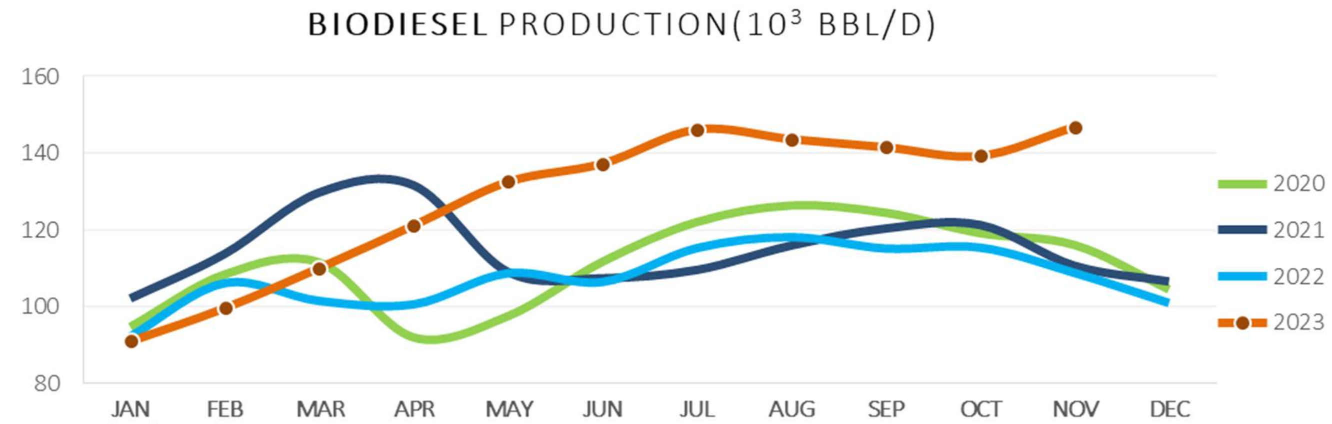

Source: Eletric Energy Secretary of Ministry of Mines and Energy



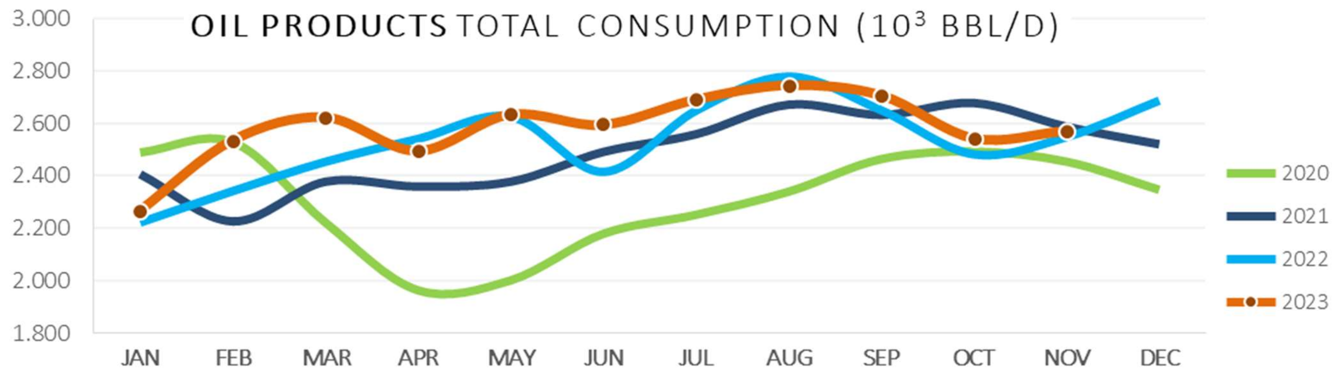

Source: National Petroleum Agency




Source: National Petroleum Agency




Fonte: National Petroleum agency

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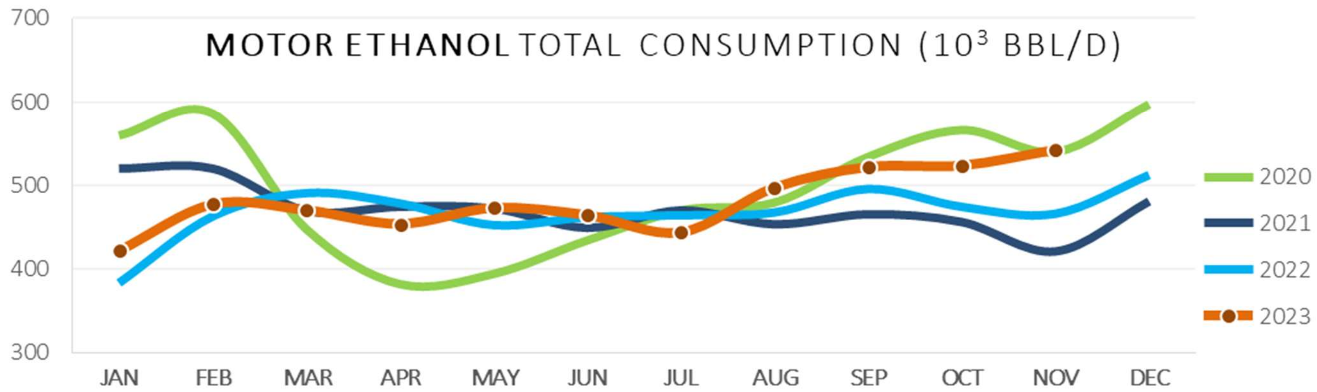


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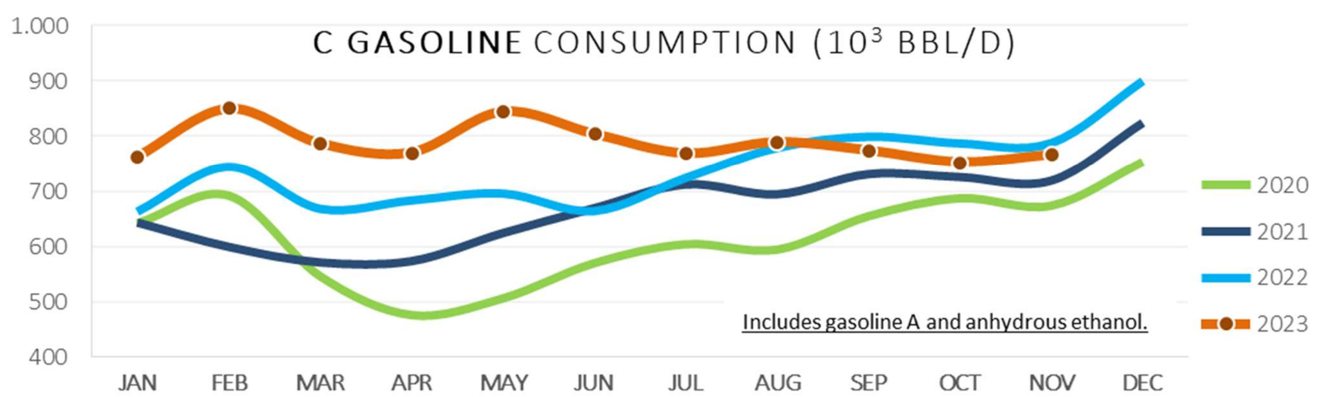
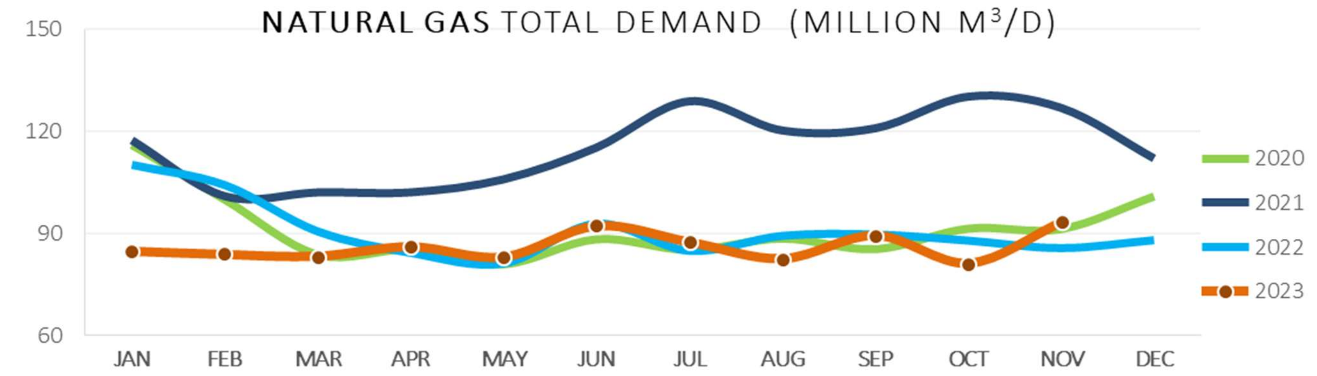
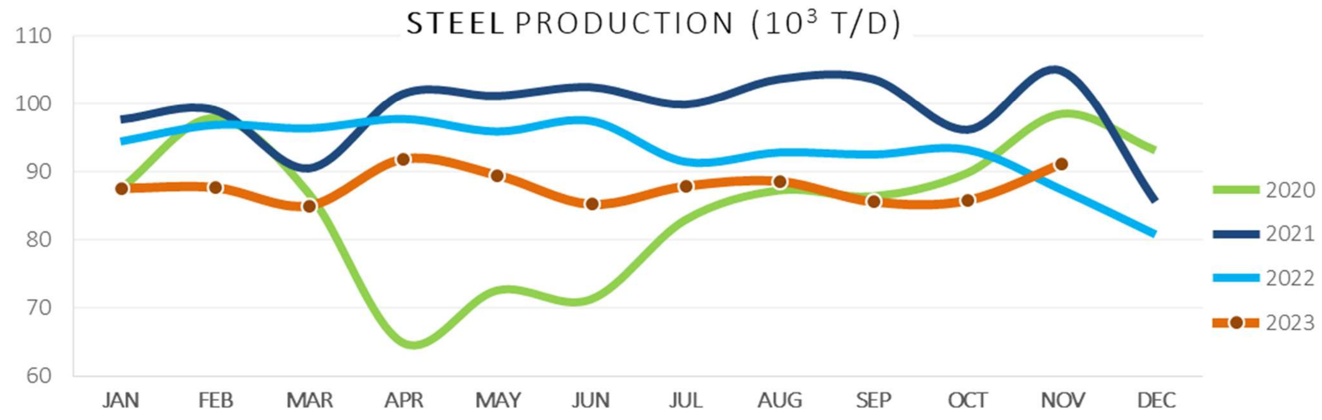


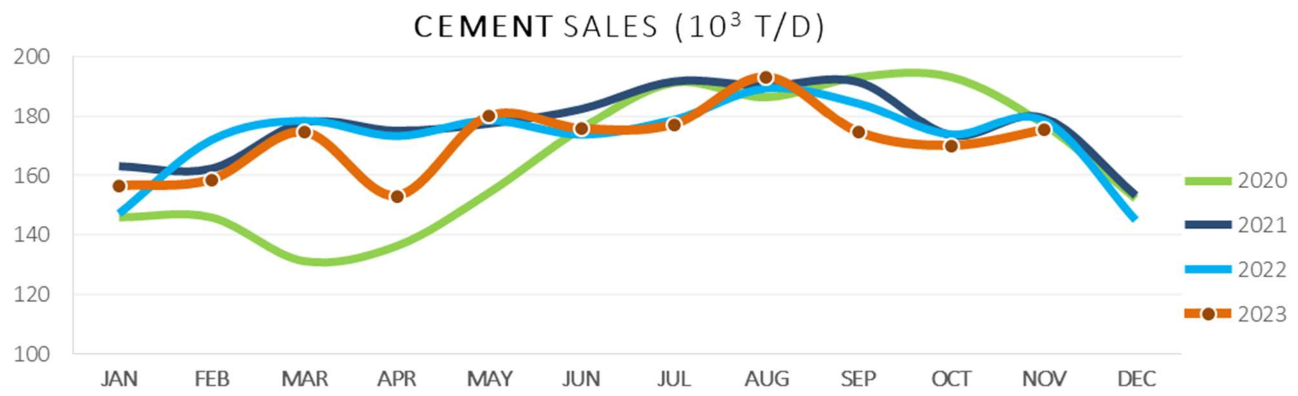

Source: National Petroleum Agency



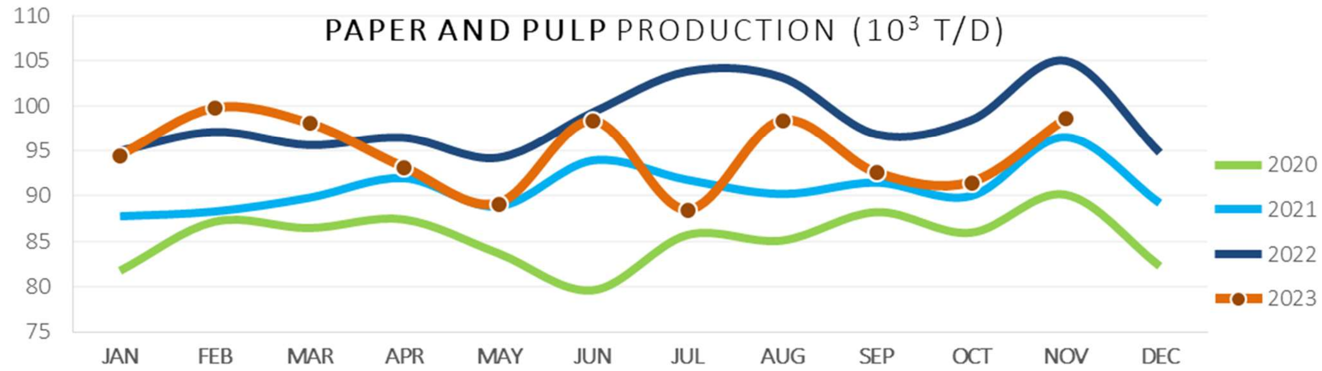

Sources: National Petroleum Agency (ANP) and National Electric System Operator (ONS)



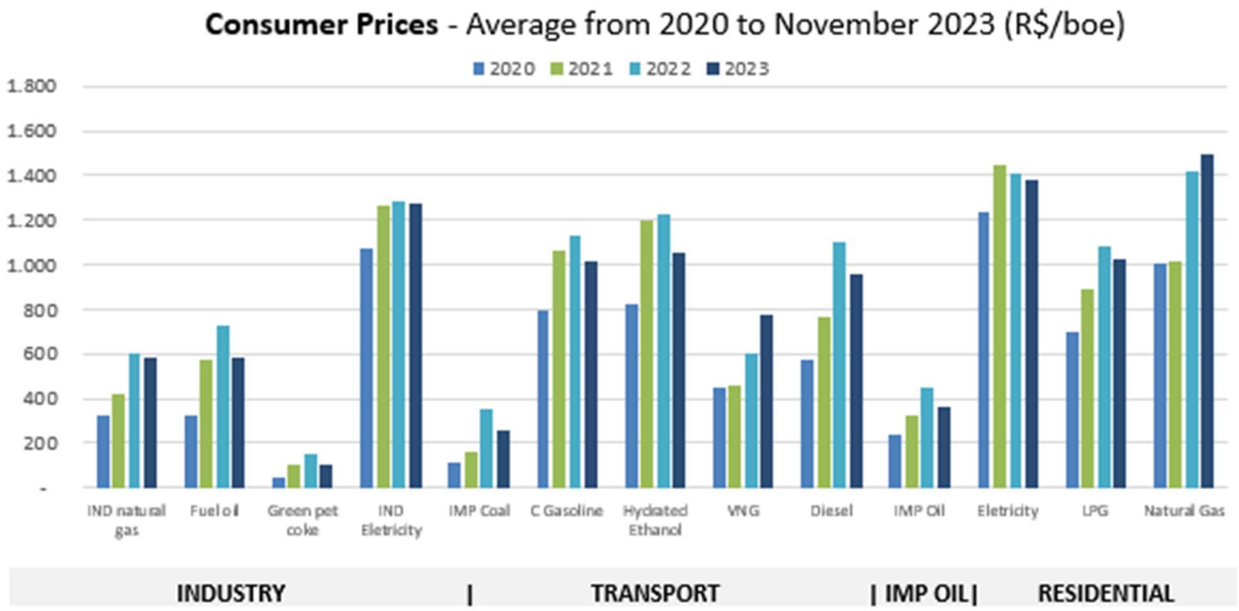

Source: Brazil Steel Institute




Source: National Cement Industry Union




Source: Brazilian Tree Industry (IBA)




# METHODOLOGICAL NOTES

The bulletin reports the monitoring of energy and non-energy variables that allow estimating the monthly and accumulated behavior of the total energy demand in Brazil.

Total gas demand = domestic production (+) import (-) unused (-) reinjection.

[1] Domestic Energy Supply (DES), represents all the energy made available to meet the national demand for energy.

[2] The 2022 data from the DES and DELS were consolidated by the 2023 National Energy Balance.

The Monthly Energy Bulletin uses information and data obtained in the Brazilian energy sector to calculate and estimate the behavior of relevant energy indicators, and its data have a lag of up to three months.

Access the interactive dashboard

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