

MINISTRY OF
MINES AND ENERGY



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November 2023 Edition

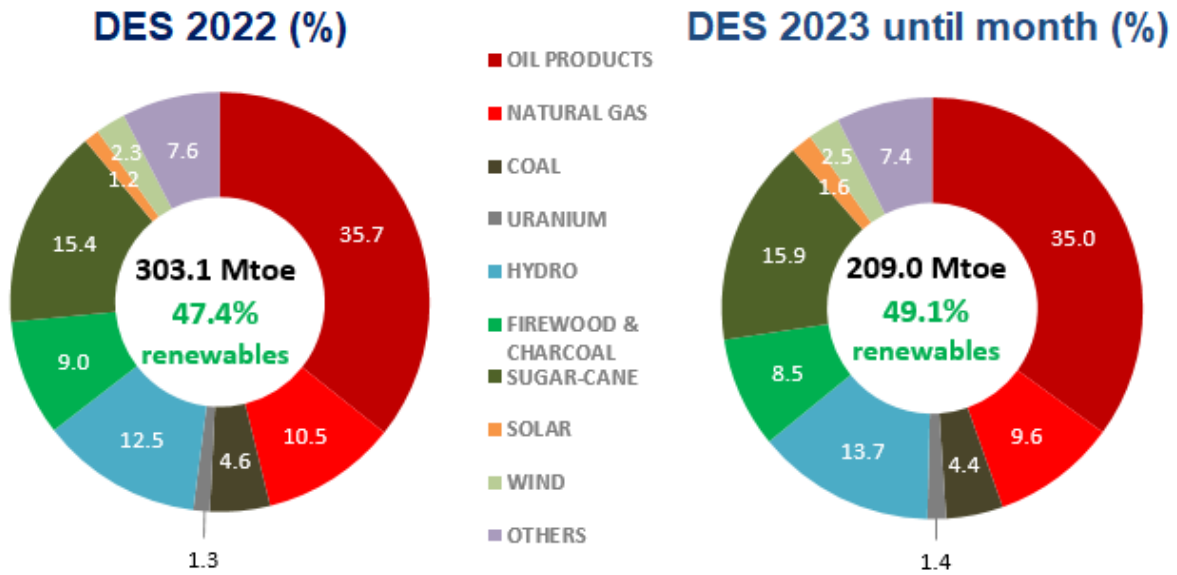
August 23

DOMESTIC ENERGY SUPPLY

Based on data until August this year, the proportion of renewable sources in the Domestic Energy Supply (DES)* increased to about 49.1%, higher than that calculated last year, 47.4%, mainly due to the greater generation of hydraulic energy.

Regarding sugarcane production, according to the most recent survey by the National Supply Company (Conab), there is an estimated increase of 11.1% compared to the 2022/2023 harvest. For ethanol produced from sugarcane and corn, the forecast is a 9.2% increase in production.

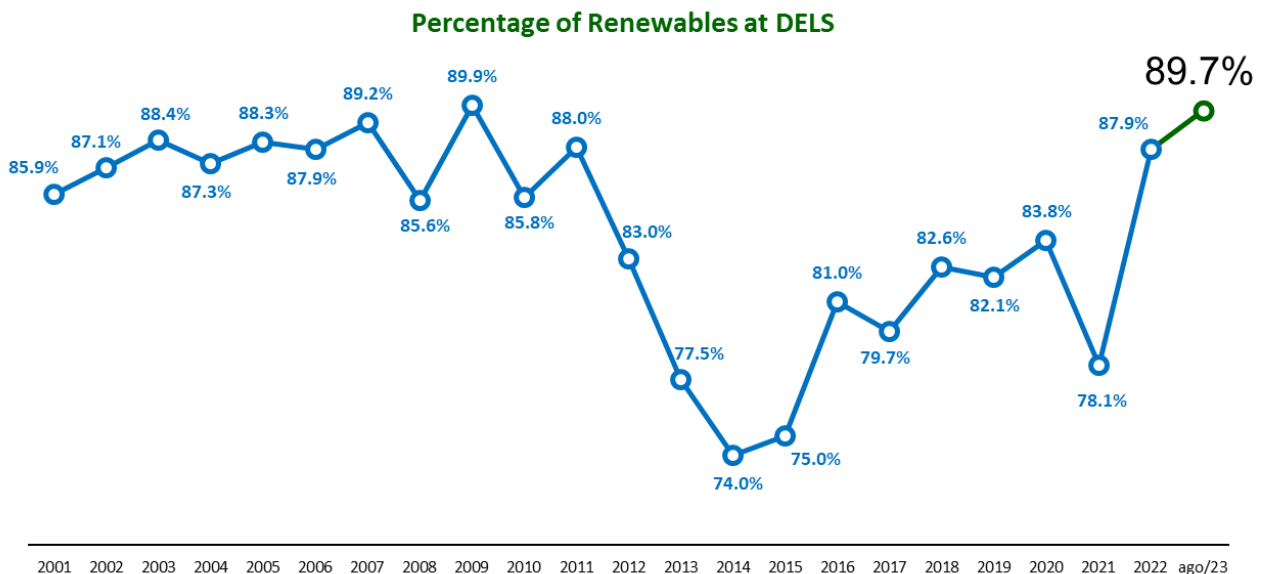
MORE RENEWABLE DOMESTIC ENERGY SUPPLY IN 2023



*OTHER: includes other renewable and non-renewable

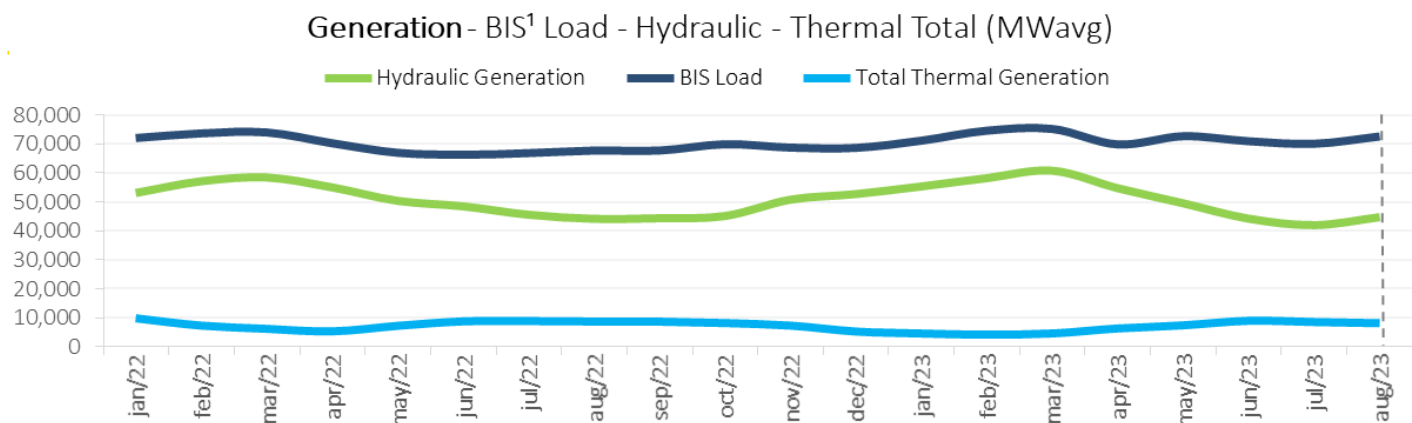
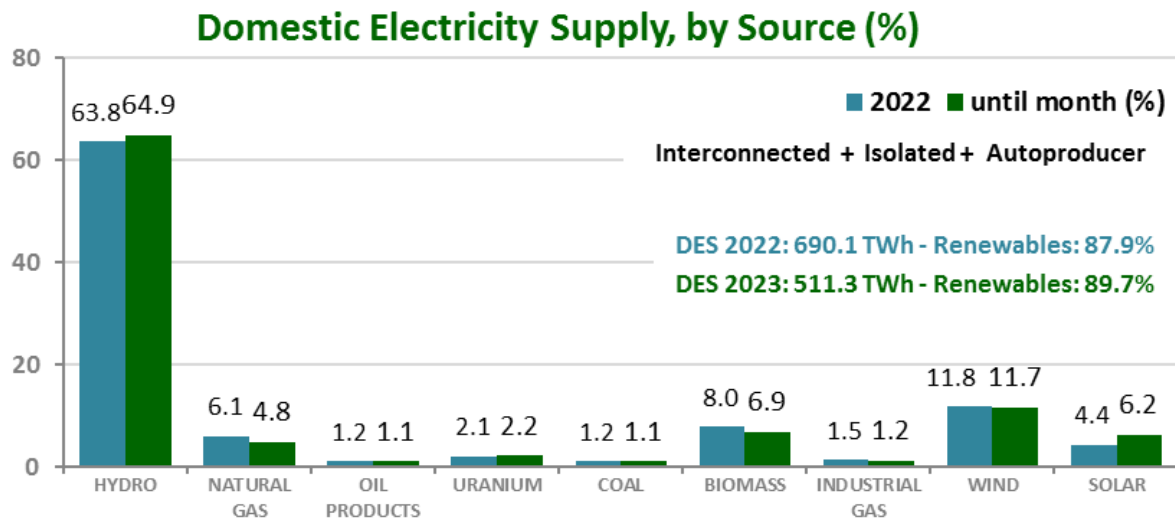
Regarding the proportion of renewables in the Domestic Electricity Supply (DELS)² this year, it was observed that 89.7% was derived from renewable sources up to August, reaching an accumulated value of 511.3 TWh.

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



It is worth mentioning that DELS accounts for the generation portions from Centralized Generation, Distributed Generation (DG), Autoproducer, Isolated Systems and Electric Energy Exchange.

For the first eight months of the year, in comparison to the same period of the previous year (year-to-date), there was a power generation of 65% in centralized solar photovoltaic and 20% 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.



¹BIS: Brazilian Interconnected System.

Source: National Electric System Operator (ONS)

HIGHLIGHTS IN AUGUST 2023

Electricity from clean sources.

This month, the Brazilian government took several measures that, in addition to benefiting thousands of families, will also positively contribute to the decarbonization of the planet.

Through Decree 11,628, which re-launches the 'Light for All' program, the aim is not only to reduce inequalities but also to incentivize energy decarbonization by promoting the use of clean and renewable sources.

And Decree 11,648, which establishes the 'Energies of the Amazon' program, with the aim of promoting investments in actions and projects in isolated systems located in the Legal Amazon region aimed at:

I - reduce the fossil power generation and consequently greenhouse gas emissions;

II - contribute to the quality and safety of the power supply;

III - structurally reduce expenditure on the Fuel Consumption Account – CCC.

Oil and gas growing

Oil and gas production increased, rising 10.4% and 7.9%, respectively, in the year-to-date.

Hydrated ethanol prices continue to fall

Gasoline C price increased by 5.9%, while the price of hydrated ethanol decreased by -8.1% compared to the same month of the previous year.

Steel and Mining

Compared to August 2022, steel production decreased by 4.5% and iron ore exports increased by 9.9%. Pig iron exports rose 5.0% in the year accumulated.

Hydraulic supply stable

The hydraulic energy supply in 2023 showed a small drop of 0.7% in the year to date. The monthly average was 51,057.7 MWavg. Itaipu's supply, for the same period, increased 38.0%.

Wind Supply in high

Wind energy supply, until August 2023, increased by 20% in the year, as a reflection of the successive increases in installed capacity that can be observed month by month and the improvement in the average capacity factor. For the first eight months of the year, 3,172.3 MW of wind power plants came into operation, 113% higher than last year for the same period.

International energy exchange on the rise

Up to April 2022 Brazil was as an energy importer from Argentina, however this has changed. Since May 2022, Brazil has exported more than it imported, with a monthly average of 829.5 MWavg from May to December 2022. In August this year, Brazil exported 239 MWavg.

In relation to Uruguay, Brazil imported 1 MWavg in August this year.

Natural gas availability in fall

Gas consumption availability fell by 7.4% in the year accumulated.

Coal for electricity generation on the rise

There was an increase of 2.0% for public electricity generation in the year accumulated.

Apparent consumption of petroleum products on the rise

The apparent consumption of oil derivatives increased by 2.7% in the year, with diesel decreasing by 2.4% and regular gasoline consumption increasing by 13.6%. Automotive ethanol consumption increased by 1.0%.

The energy consumption of light Otto-cycle vehicles (gasoline, ethanol, and natural gas) has shown an increase of 7.2%.

Electricity consumption in high

Residential sector electricity consumption grew by 7.3% compared to August 2022. Industrial consumption increased by 1.5% while commercial consumption grew by 5.1%.

Biodiesel production rising

Biodiesel production increased 15.4 % in the year accumulated.

As of April this year, 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 the year 2026. A March 2023 law established new guidelines for the evolution of the mandatory addition of biodiesel to diesel oil sold to the end consumer.

Electricity tariffs continue to fall

All three tariffs (residential, commercial, and industrial) continue to show a decline compared to the previous year's cumulative. The residential tariff dropped by 7.7%, while there was a decrease of 6.6% for the commercial sector and 6.2% for the industrial sector.

The price drops are a direct effect of Complementary Law No. 194, of June 23, 2022, which defined that, for the purpose of levying the tax dealt with in the Brazilian Constitution, fuels, natural gas, electricity, communications and public transport are considered essential and indispensable goods and services, which cannot be treated as superfluous.

Solar distributed generation installed capacity (DG) rising

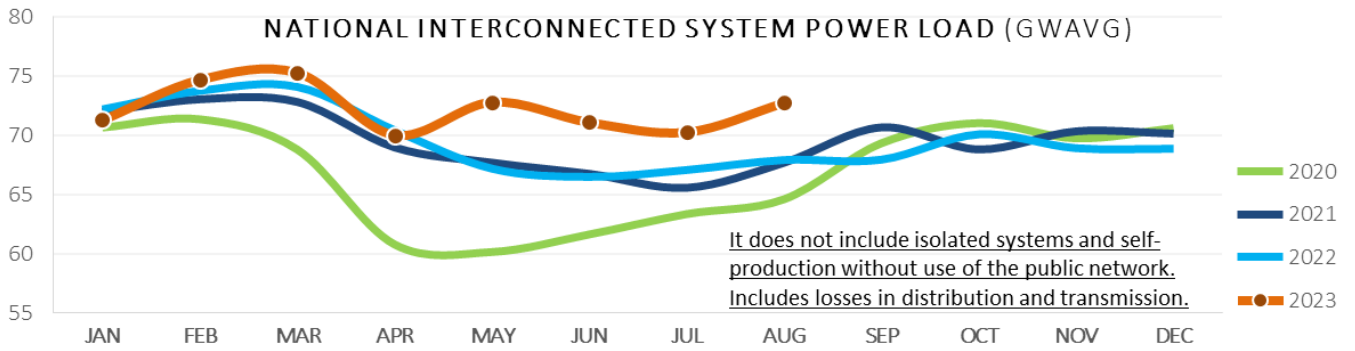
The growing in solar DG installed capacity in Brazil is still a highlight and has increased 82.0% compared to august 2022. The centralized solar installed capacity (non-GD) also increases, with a 78.9% growth compared to august 2022.

For the first seven months of the year, 3,073.4 MW of installed centralized solar capacity came into operation.

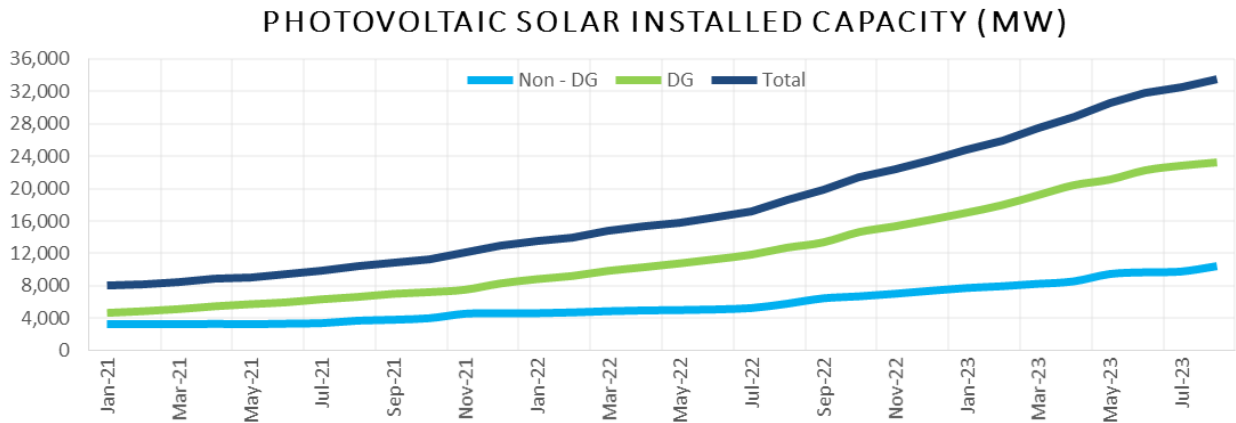
The DG's growth is a reflection of public policies to encourage renewable energy sources and distributed micro and mini-generation, such as Law No. 13,203/2015 and Law No. 14,300/2022, which is considered a legal framework for distributed generation in Brazil.

SPECIFICATION	August					
	IN THE MONTH			ACCUMULATED IN THE YEAR		
	2023	2022	Δ% 23/22	2023	2022	Δ% 23/22
OIL						
PRODUCTION - with Shale Oil and NGL(10 ³ b/d)	3,541	3,174	11.5	3,372	3,053	10.4
IMPORTS AVERAGE PRICE (US\$/bbl FOB)	84.69	111.48	-24.0	80.29	101.96	-21.3
OIL PRODUCTS						
TOTAL CONSUMPTION (10 ³ b/day)	2,745	2,779	-1.2	2,572	2,505	2.7
hereof: DIESEL with biodiesel - (10 ³ b/day)	1,292	1,211	6.7	1,139	1,112	2.4
hereof: GASOLINE C (10 ³ b/day)	790	778.6	1.4	797	702	13.6
CONSUMER PRICE - DIESEL (R\$/l)	5.51	7.10	-22.4	5.61	6.58	-14.7
CONSUMER PRICE - GASOLINE C (R\$/l)	5.71	5.39	5.9	5.41	6.68	-19.0
CONSUMER PRICE - LPG (R\$/13 kg)	101.09	111.62	-9.4	105.63	109.58	-3.6
NATURAL GAS (d)						
PRODUCTION (10 ⁶ m ³ /day)	148	140	5.6	146	135	7.9
IMPORTS (10 ⁶ m ³ /day)	14.1	22.2	-36.7	17.7	27.0	-34.4
NON-UTILIZED AND REINJECTION (10 ⁶ m ³ /day)	79.5	72.9	9.1	78.5	70.3	11.7
AVAILABILITY FOR CONSUMPTION (10 ⁶ m ³ /day)	82.4	89.3	-7.7	85.2	92.1	-7.4
INDUSTRIAL CONSUMPTION (10 ⁶ m ³ /day) (d)	38.5	43.0	-10.4	39.6	41.7	-4.9
POWER GENERATION CONS. (10 ⁶ m ³ /day) (d)	16.2	11.9	35.3	12.6	16.4	-23.4
INDUSTRIAL PRICE SE (b) (US\$/MMBtu) - consumption range of 20,000 m ³ /day (d)	22.02	22.11	-0.4	21.62	20.61	4.9
MOTOR PRICE SE (US\$/MMBtu) (d)	27.23	21.29	27.9	27.36	20.82	31.4
RESIDENTIAL PRICE SE (US\$/MMBtu) (d)	55.27	52.18	5.9	53.09	47.89	10.9
ELECTRICITY						
NATIONAL INTERCONNECTED SYSTEM	72,734	67,887	7.1	72,253	69,842	3.5
SOUTHEAST/MIDWEST POWER LOAD (MWavg)	41,145	38,521	6.8	41,047	40,418	1.6
SOUTH POWER LOAD (MWavg)	12,275	11,618	5.7	12,520	12,281	1.9
NORTHEAST POWER LOAD (MWavg)	11,806	11,128	6.1	11,784	11,140	5.8
NORTH POWER LOAD (MWavg)	7,508	6,620	13.4	6,902	6,004	15.0
TOTAL CONSUMPTION (TWh) (a)	43.4	42.1	3.1	43.3	42.2	2.8
RESIDENTIAL	13.0	12.1	7.3	13.3	12.6	5.1
INDUSTRIAL	16.1	15.9	1.5	15.5	15.2	2.2
COMMERCIAL	7.7	7.3	5.1	8.0	7.7	3.1
OTHER SECTORS	6.6	6.8	-2.7	6.6	6.6	-0.8
PLANTS ENTRY INTO OPERATING (MW)	1358	650	108.9	7,050	3,720	89.5
RESIDENTIAL PRICE (R\$/MWh)	847	771	9.9	822	891	-7.7
COMMERCIAL PRICE (R\$/MWh)	816	728	12.2	791	847	-6.6
INDUSTRIAL PRICE (R\$/MWh)	782	695	12.6	760	811	-6.2
ETHANOL AND BIODIESEL						
BIODIESEL PRODUCTION (10 ³ b/d)	144	118	21.5	123	107	15.4
MOTOR ETHANOL CONSUMPTION (10 ³ b/d)	497	468	6.3	462	458	1.0
ETHANOL EXPORTS (10 ³ b/d)	50	56	-11.3	39	31	22.8
HYDRATED ETHANOL PRICE (R\$/l)	3.63	3.95	-8.1	3.84	4.76	-19.4
COAL						
ELECTRICITY GENERATION (MWavg)	1042	1018	2.4	833	817	2.0
IMPORT PRICE (US\$ FOB/t)	177.90	304.88	-41.6	232.63	315.04	-26.2
NUCLEAR ENERGY						
ELECTRICITY GENERATION - (GWh)	2013	1589	26.7	1,927	1,659	16.1
INDUSTRIAL SECTORS						
STEEL PRODUCTION (10 ³ t/day)	89	93	-4.5	88	95	-7.8
ALUMINIUM PRODUCTION (10 ³ t/day) (c)	2.6	2.1	22.2	2.7	2.0	31.1
IRON ORE EXPORTS (10 ³ t/day)	1,145	1,041	9.9	917	855	7.3
PELLETS EXPORTS (10 ³ t/day)	63	35	81.0	65	49	32.4
BIG IRON EXPORTS (10 ³ t/day)	13.7	11.6	17.6	10.5	10.0	5.0
PAPER PRODUCTION (10 ³ t/day)	30.1	30.5	-1.6	28.2	30.1	-6.3
PULP PRODUCTION (10 ³ t/day) (c)	66.4	72.6	-8.5	66.1	68.0	-2.7
SUGAR PRODUCTION (10 ³ t/day)	227.1	187.7	21.0	114.0	93.5	22.0
SUGAR EXPORTS (10 ³ t/day)	138	95	44.4	77	64	20.5

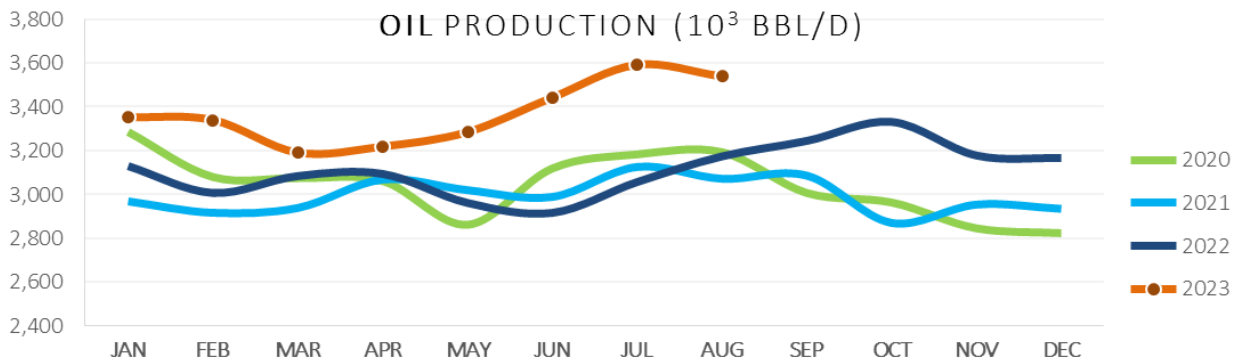
(a) The traditional autoproducers (consumers that do not use public grid) is not included. (b) SE is the acronym of Southeast
(c) Estimated Data (d) June Data



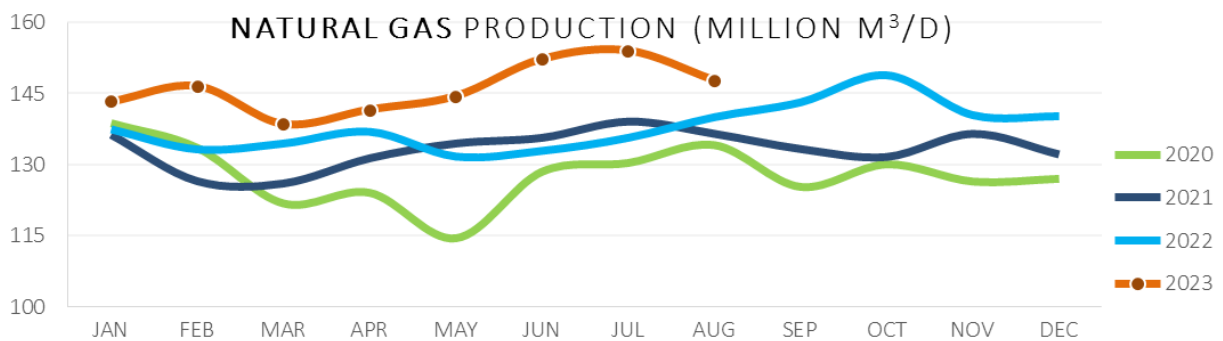
Source: National Electric System Operator (ONS)



Source: Electric Energy Secretary of Ministry of Mines and Energy

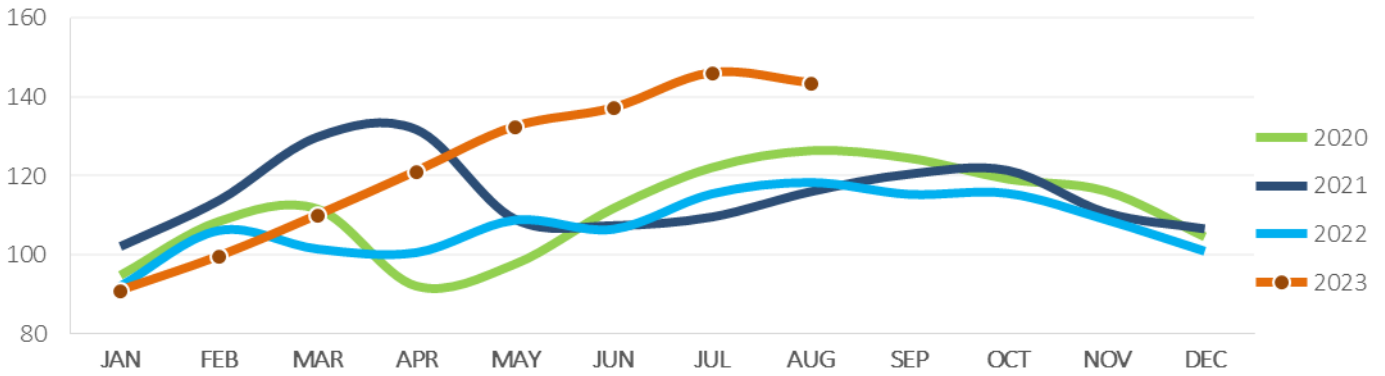


Source: National Petroleum Agency



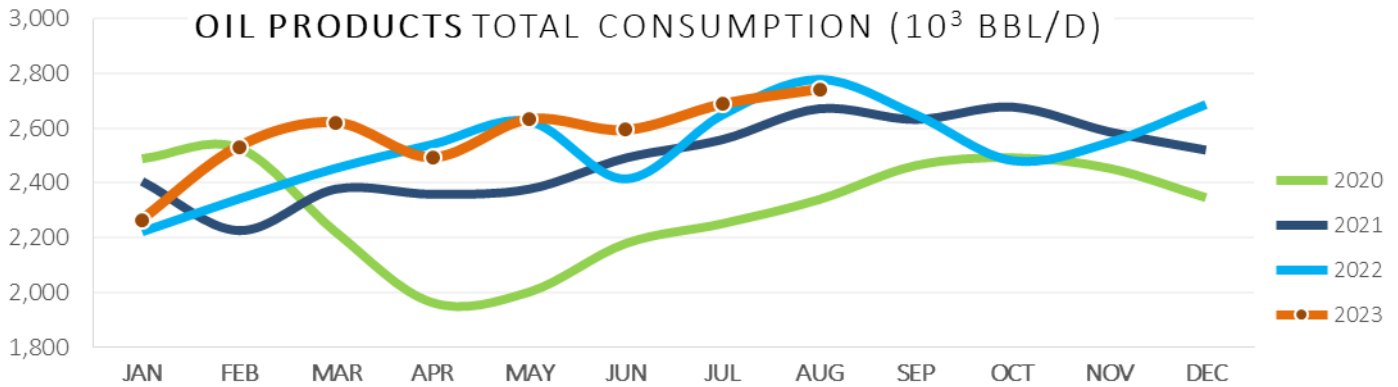
Source: National Petroleum Agency

BIODIESEL PRODUCTION (10³ BBL/D)



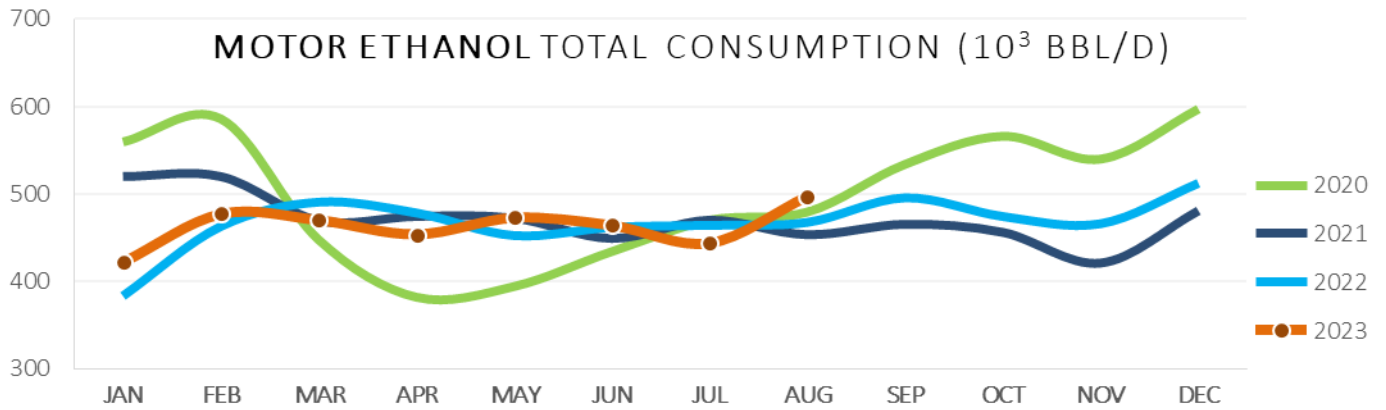
Source : National Petroleum Agency

OIL PRODUCTS TOTAL CONSUMPTION (10³ BBL/D)



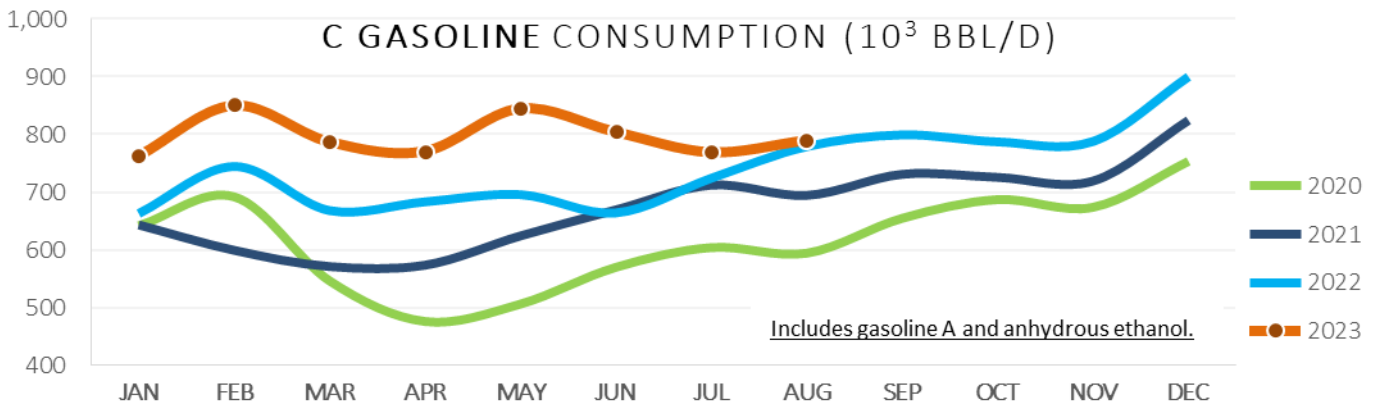
Source: National Petroleum Agency

MOTOR ETHANOL TOTAL CONSUMPTION (10³ BBL/D)

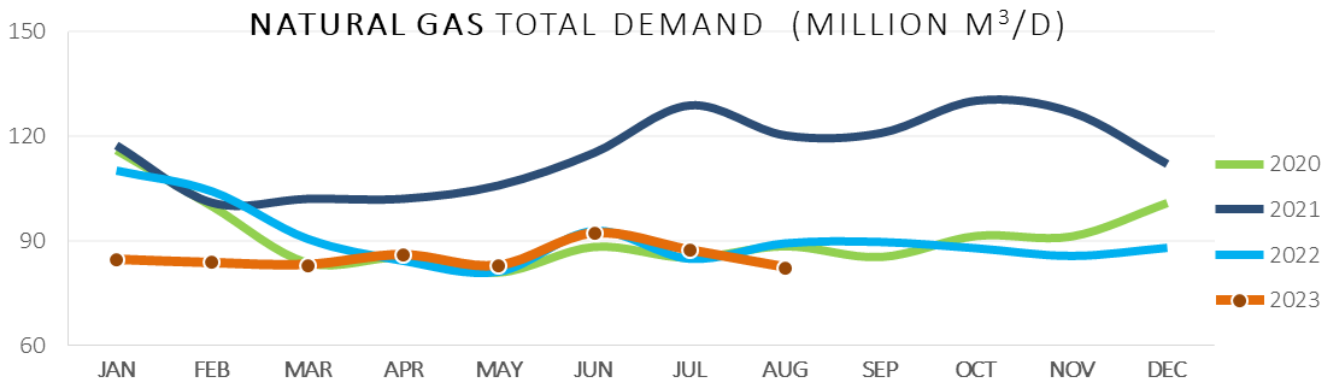


Source: National Petroleum Agency

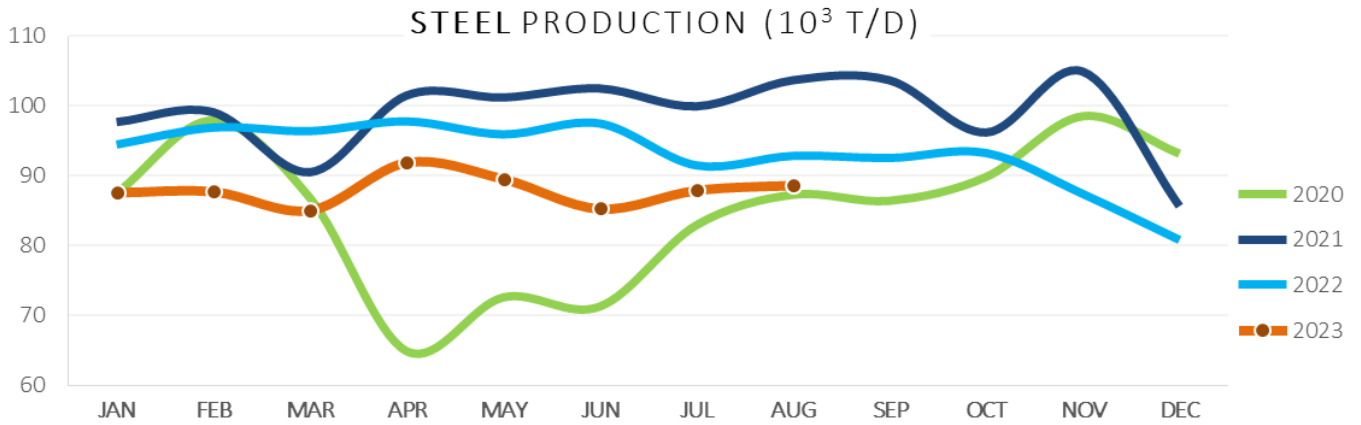
C GASOLINE CONSUMPTION (10³ BBL/D)



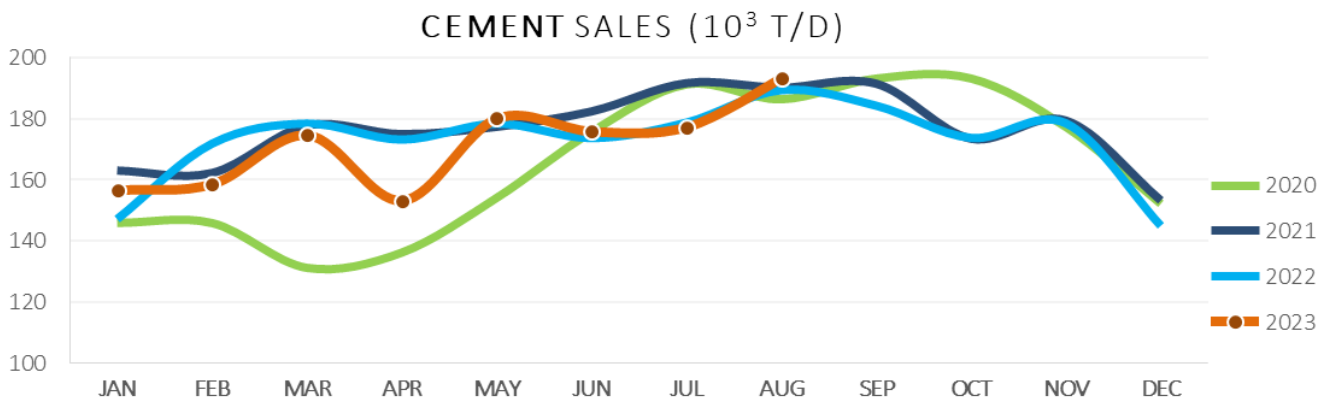
Source: National Petroleum Agency



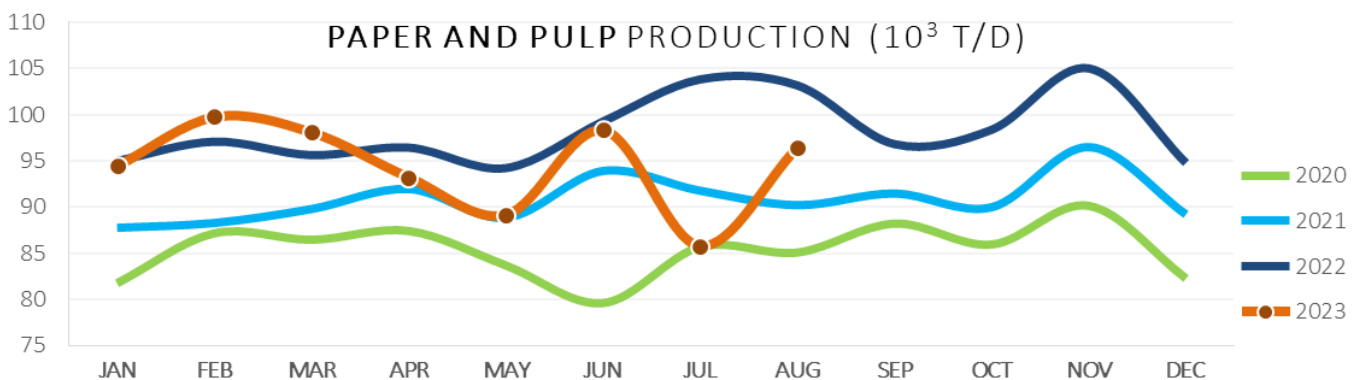
Sources: National Petroleum Agency (ANP) and National Electric System Operator (ONS)



Source: Brazil Steel Institute

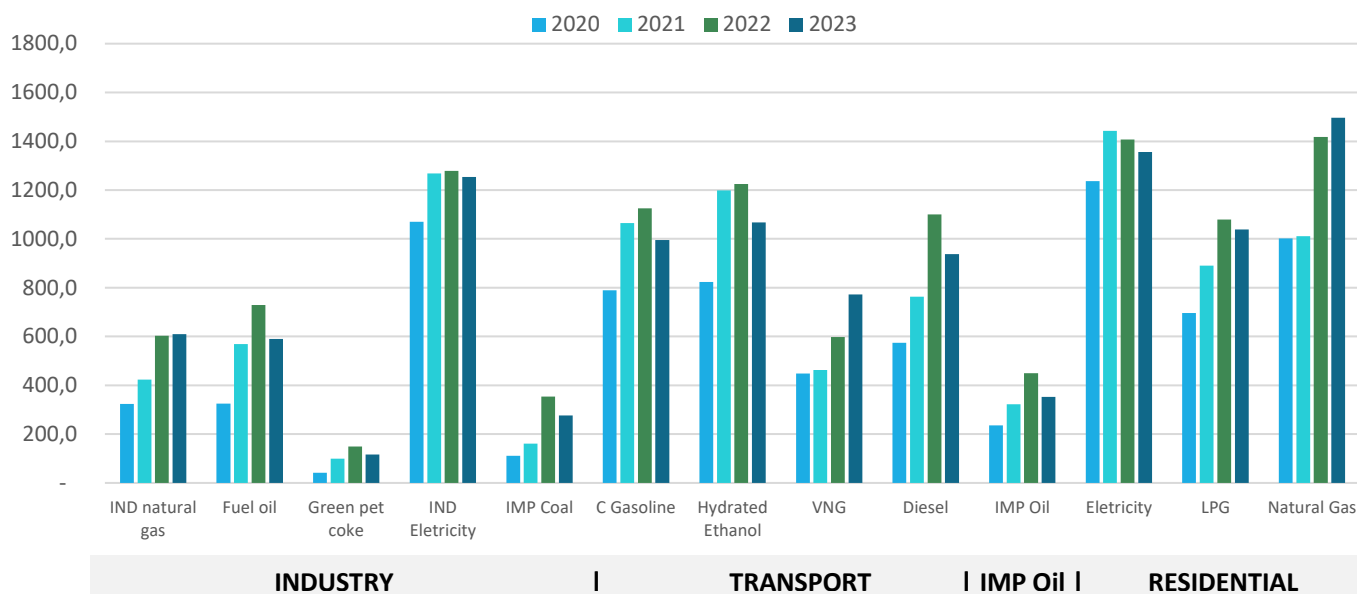


Source: National Cement Industry Union



Source: Brazilian Tree Industry (IBA)

Consumer Prices - Average from 2020 to August 2023 (R\$/boe)



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.



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