

MINISTRY OF
MINES AND ENERGY



MONTHLY ENERGY BULLETIN BRAZIL

July 2023 Edition

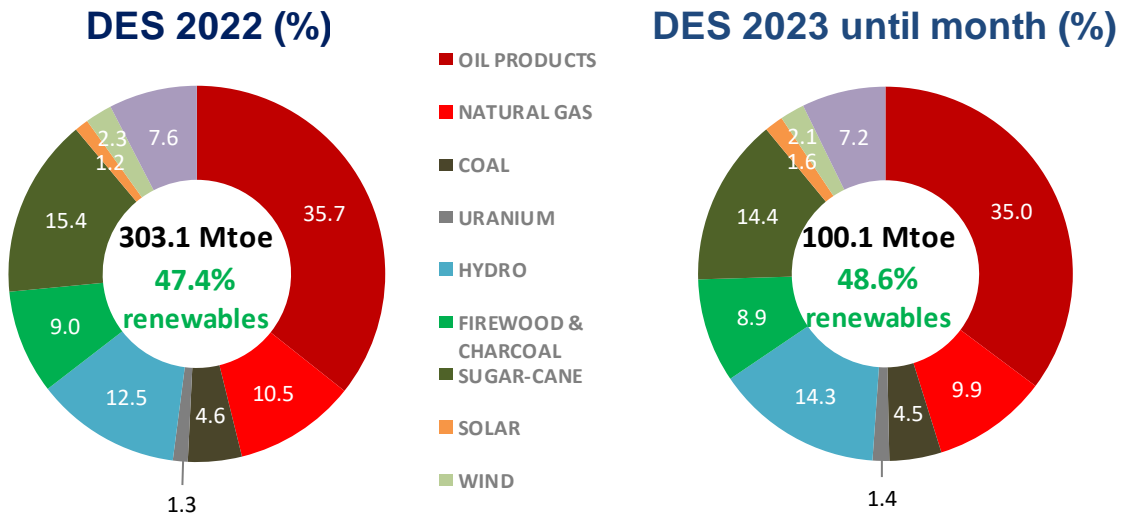
APRIL 23

DOMESTIC ENERGY SUPPLY

Based on data up to April of this year, the share of renewables in the Domestic Energy Supply – DES* increased to around 48.6%, therefore, higher than that calculated last year (47.4%), mainly due to the greater generation of hydraulic energy.

According to the most current survey by the National Supply Company (Conab), sugarcane production has shown a recovery at the end of the last year and it is estimated that there will be a 4.7% increase in its production for the 2022/2023 harvest. For ethanol, produced from sugar cane and corn, the estimated increase is 5.9%.

DOMESTIC ENERGY SUPPLY MORE RENEWABLE IN 2023

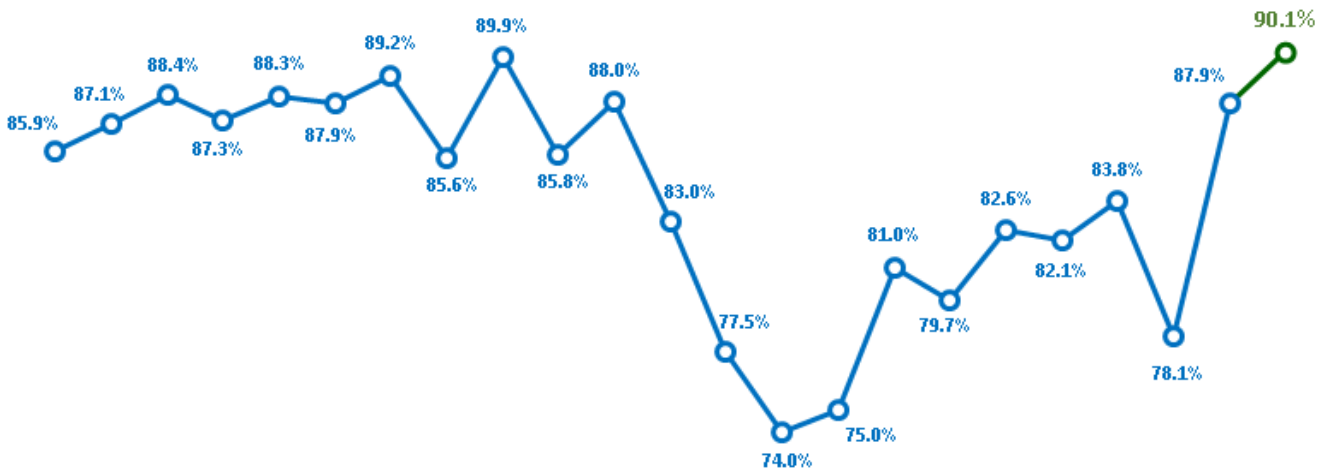


*OTHER: includes other renewable and non-renewable

This year, regarding the proportion of renewables in the Domestic Electricity Supply (DELS)², it was verified that 90.1% were obtained through renewable sources, until April, reaching the accumulated value of 238.4 TWh.

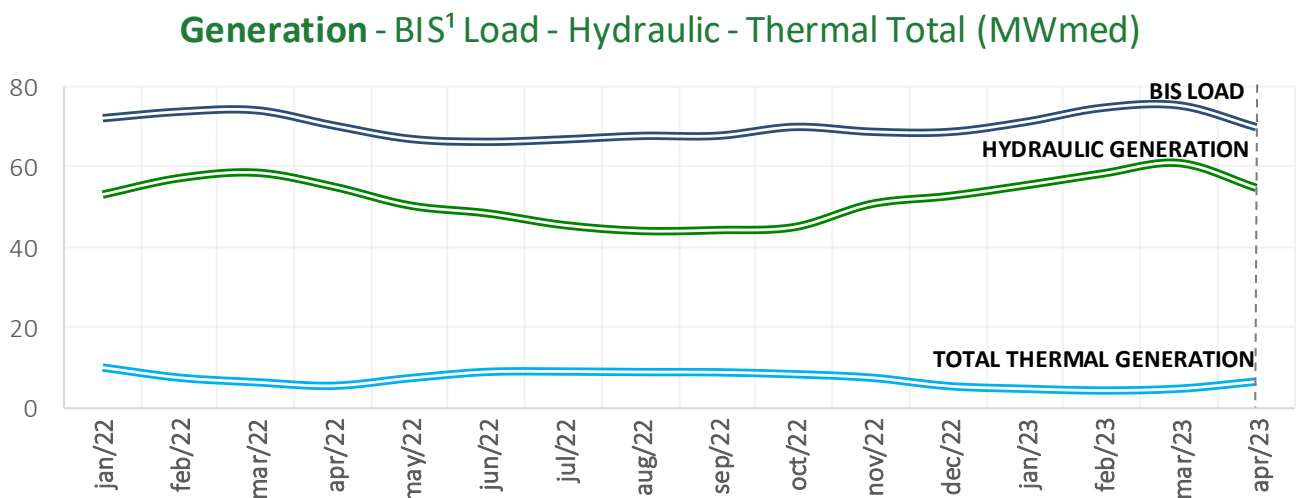
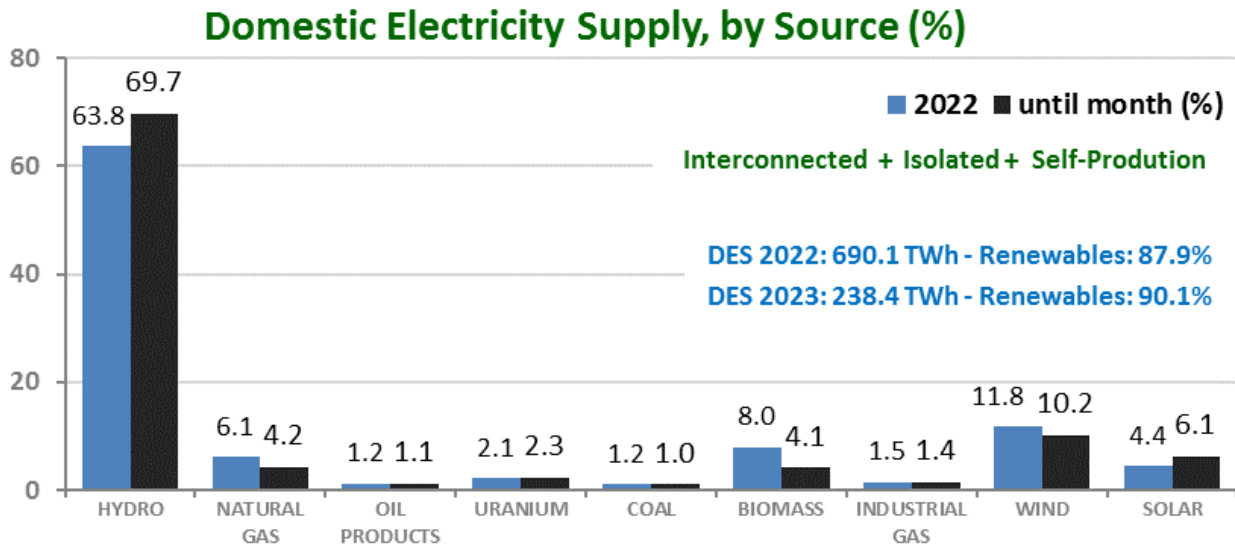
It can be seen, in the figure below, that in the first months of this year, the proportion of renewables in the OIEE is surpassing the annual results achieved throughout this century, providing cleaner energy generation, a consequence both of a favorable water regime, as well as investments in solar and wind energy.

Percentage of Renewables at DELS



It should be noted that the DELS accounts for the generation portions based on Centralized Generation, Distributed Generation (GD), Autoproducer, Isolated Systems and Electricity Interchange.

For the first three months of the year, compared to the same period of the previous year (accumulated in the year) there was a 67% increase in generation for centralized solar and 24% for wind. Brazilian hydro energy also grew, by around 2%. The increase in renewable electricity generation in 2022 and early 2023 has contributed to the reduction in the participation of coal and gas thermoelectric plants in the DELS.



¹BIS: Brazilian Interconnected System.

Source: National Electric System Operator (ONS)

HIGHLIGHTS IN APRIL 2023

Ethanol in high

Anhydrous ethanol production grew 73.5% in the accumulated result for the year.

This was due to the improvement in national productivity, according to data from the 4th survey on the 2022/23 harvest, released in April by the National Supply Company (Conab), which also points to an increase in total biofuel exports, which is due, among other factors, to the reduction in the international supply of oil and other causes related to the world demand for fuels, mainly in Europe, according to the justification presented by Conab.

Oil and gas growing

Oil and gas production grew this year, showing an increase of 6.4% and 5.0% respectively in the year accumulated.

Regular gasoline and hydrated ethanol prices continue to fall

Regular gasoline and hydrous ethanol prices dropped by 23.9% and 25.5%, respectively, in relation to the same month of the previous year. This is the ninth consecutive month of decline in this indicator for both fuels.

The price drops are a direct effect of Complementary Law No. 194, of June 23, 2022, which defined that, for the purposes of levying the tax dealt with in item II of the caput of art. 155 of the Federal Constitution, fuels, natural gas, electricity, communications and public transport are considered essential and indispensable goods and services, which cannot be treated as superfluous.

Steel and Mining

Compared to April 2022, steel production decreased by 5.5%, and iron ore exports increased by 1.2%. Pig iron exports increased by 2.1% in the year accumulated.

Hydraulic supply on the rise

Hydraulic energy supply in 2023 increased by 2.5% in accumulated in the year. This corresponds to a monthly average of 57,218.1 MWavg. Itaipu's supply for the same period increased by 51.4%.

Wind supply on the rise

The wind energy supply, until April 2023, increased by 24% in accumulated 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 at the beginning of the year. For the first three months of the year, 1,632.3 MW of power from wind farms came into operation, 96% higher than last year for the same period.

International energy exchange on the rise

Up to April 2022 Brazil was as an energy importer for 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 March 2023, 1,313 MWavg were exported and in April, 1,249 MWavg were exported, despite being about 5% lower than what was exported in the previous month, it still represents a much higher value than the average considered for last year.

In February, Brazil also becomes an energy exporter to Uruguay, in a more significant way. While last year Brazil exported, on average, 0.6 MWavg to Uruguay, in April this year it exported 345 MWavg.

Natural gas availability in fall

The availability of natural gas for consumption fell by 13.3% in the year, mainly due to a reduction in imports.

Coal for electricity generation in decline

There was a decrease of 3.4% for public electricity generation in accumulated in the year.

Apparent consumption of petroleum products on the rise

The apparent consumption of petroleum derivatives increased by 3.2% in the year, with diesel decreasing by 0.8% and with regular gasoline consumption increasing by 15.1%. Automotive ethanol consumption increased by 0.2%.

The energy consumption of light Otto-cycle vehicles (gasoline, ethanol, and natural gas) has shown an increase of 7.7% in accumulated in the year.

Electricity consumption growing

Residential sector electricity consumption grew by 5.4% compared to April 2022. Industrial consumption increased by 1.1% while commercial consumption grew by 3.2%.

Biodiesel production rising

Biodiesel production increased 5.6 % in accumulated in the year.

Starting this month, a mandatory blend of 12% biodiesel in diesel oil has been established, as well as the progressive evolution of this percentage which is set to reach 15% by the year 2026.

Electricity tariffs continue to fall

All three tariffs (residential, commercial and industrial) fell in relation to the same month of the previous year, for the tenth consecutive month. The declines were 14.3% for the residential sector, 14.4% for the commercial sector and 13.8% 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.

Distributed generation installed capacity (DG) solar grows strongly

The growth of solar DG installed capacity in Brazil is still a highlight and has increased 97.3% compared to April 2022. The centralized solar installed capacity (non-GD) also increases, with a 71.3% growth compared to April 2022.

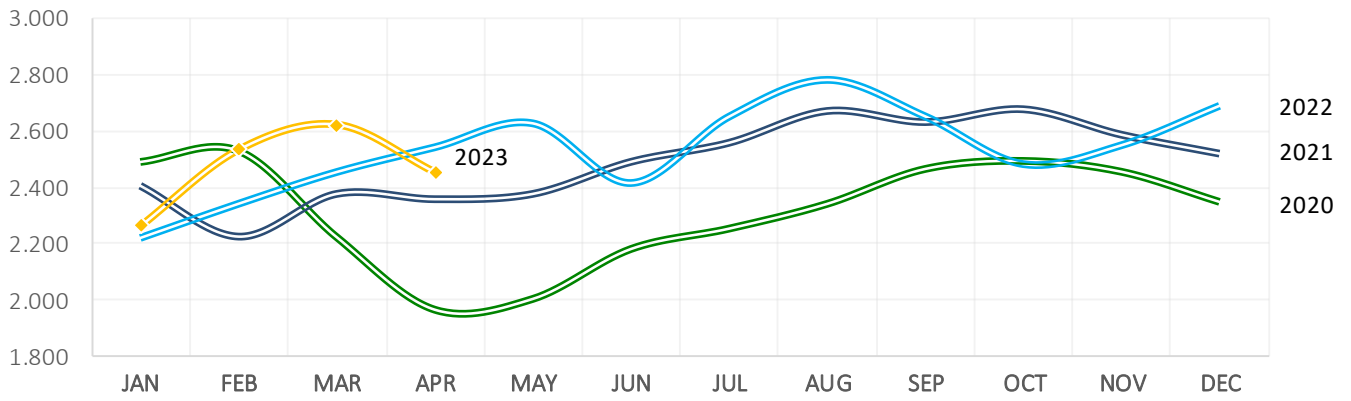
The growth of DG is a reflection of public policies to encourage renewable energy sources and distributed micro and mini-generation, such as Law No. 13,203/2015 and Law No. 14,300/2022. Considered a GD legal framework, this last law generated a “race” in the sector, by ensuring an exemption from a portion of the Tariff for the Use of the Distribution System (TUSD) until 2045.

SPECIFICATION	APRIL					
	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)	3,220	3,094	4.1	3,276	3,080	6.4
IMPORTS AVERAGE PRICE (US\$/bbl FOB)	82.32	118.14	-30.3	84.61	93.12	-9.1
OIL PRODUCTS						
TOTAL CONSUMPTION (10 ³ b/day)	2,454	2,541	-3.4	2,467	2,389	3.2
hereof: DIESEL with biodiesel - (10 ³ b/day)	1,061	1,073	-1.1	1,066	1,075	-0.8
hereof: GASOLINE C (10 ³ b/day)	771	682.5	12.9	791	688	15.1
CONSUMER PRICE - DIESEL (R\$/l)	5.76	6.60	-12.8	6.01	5.99	0.2
CONSUMER PRICE - GASOLINE C (R\$/l)	5.51	7.25	-23.9	5.29	6.87	-23.0
CONSUMER PRICE - LPG (R\$/13 kg)	107.58	113.51	-5.2	107.83	106.95	0.8
NATURAL GAS (d)						
PRODUCTION (10 ⁶ m ³ /day)	142	137	3.4	142	136	5.0
IMPORTS (10 ⁶ m ³ /day)	19.7	17.8	11.0	18.9	31.6	-40.3
NON-UTILIZED AND REINJECTION (10 ⁶ m ³ /day)	73.2	64.0	14.3	71.9	64.2	11.9
AVAILABILITY FOR CONSUMPTION (10 ⁶ m ³ /day)	85.9	84.3	1.9	84.3	97.2	-13.3
INDUSTRIAL CONSUMPTION (10 ⁶ m ³ /day) (e)	40.7	41.6	-2.1	41.0	41.0	0.2
POWER GENERATION CONS. (10 ⁶ m ³ /day) (e)	9.7	9.6	0.7	10.2	21.2	-51.9
INDUSTRIAL PRICE SE (b) (US\$/MMBtu) - consumption range of 20,000 m ³ /day	21.93	21.49	2.1	21.36	19.42	10.0
MOTOR PRICE SE (US\$/MMBtu) (c)	27.68	22.05	25.5	27.58	20.02	37.8
RESIDENTIAL PRICE SE (US\$/MMBtu) (c)	52.67	50.21	4.9	51.28	45.10	13.7
ELECTRICITY						
NATIONAL INTERCONNECTED SYSTEM	69,997	70,420	-0.6	72,799	72,616	0.3
SOUTHEAST/MIDWEST POWER LOAD (MWavg)	40,054	41,597	-3.7	41,698	42,463	-1.8
SOUTH POWER LOAD (MWavg)	11,588	11,543	0.4	12,857	12,963	-0.8
NORTHEAST POWER LOAD (MWavg)	11,543	11,455	0.8	11,670	11,446	2.0
NORTH POWER LOAD (MWavg)	6,812	5,825	16.9	6,574	5,743	14.5
TOTAL CONSUMPTION (TWh) (d)	44.4	43.1	2.9	43.6	42.9	1.7
RESIDENTIAL	13.6	12.9	5.4	13.7	13.2	3.9
INDUSTRIAL	15.4	15.3	1.1	14.9	14.9	0.1
COMMERCIAL	8.5	8.2	3.2	8.3	8.2	2.2
OTHER SECTORS	6.8	6.8	0.5	6.6	6.6	0.1
PLANTS ENTRY INTO OPERATING (MW)	596	223	167.6	3,331	1,568	112.4
RESIDENTIAL PRICE (R\$/MWh)	824	962	-14.3	807	967	-16.6
COMMERCIAL PRICE (R\$/MWh)	784	916	-14.4	772	925	-16.5
INDUSTRIAL PRICE (R\$/MWh)	750	871	-13.8	744	886	-16.0
ETHANOL AND BIODIESEL						
BIODIESEL PRODUCTION (10 ³ b/d)	121	101	20.5	106	100	5.6
MOTOR ETHANOL CONSUMPTION (10 ³ b/d)	453	479	-5.4	454	454	0.2
ETHANOL EXPORTS (10 ³ b/d)	42	25	69.3	41	25	65.6
HYDRATED ETHANOL PRICE (R\$/l)	3.97	5.33	-25.5	3.88	5.04	-23.0
COAL						
ELECTRICITY GENERATION (MWavg)	808	358	125.7	700	724	-3.4
IMPORT PRICE (US\$ FOB/t)	264.52	300.88	-12.1	255.96	259.22	-1.3
NUCLEAR ENERGY						
ELECTRICITY GENERATION - (GWh)	1929	1997	-3.4	1,849	1,968	-6.1
INDUSTRIAL SECTORS						
STEEL PRODUCTION (10 ³ t/day)	92	98	-5.5	88	96	-8.5
ALUMINIUM PRODUCTION (10 ³ t/day) (c)	2.8	2.1	33.0	2.7	1.9	40.5
IRON ORE EXPORTS (10 ³ t/day)	774	765	1.2	771	762	1.3
PELLETS EXPORTS (10 ³ t/day)	59	62	-4.5	64	48	33.4
BIG IRON EXPORTS (10 ³ t/day)	7.1	8.3	-14.8	9.1	8.9	2.1
PAPER PRODUCTION (10 ³ t/day)	28.9	28.9	-0.1	29.4	29.8	-1.5
PULP PRODUCTION (10 ³ t/day) (c)	77.3	67.5	14.5	73.6	66.2	11.2
SUGAR PRODUCTION (10 ³ t/day)	4.5	35.8	-87.4	12.3	16.4	-24.6
SUGAR EXPORTS (10 ³ t/day)	32	44	-26.2	50	48	2.5

(a) February data.
(c) March data.

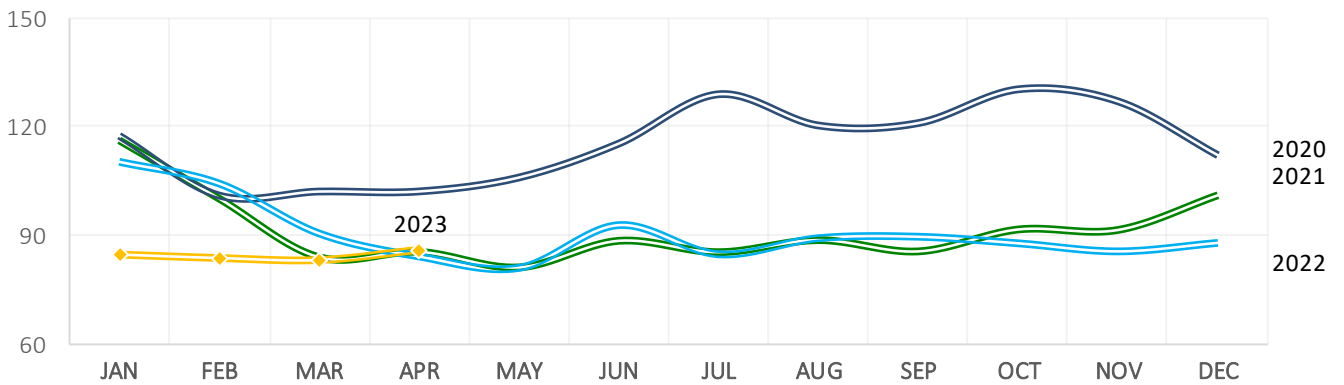
(b) SE is the acronym of Southeast
(d) The traditional self-producers (consumers that do not use public grid) is not included.

Oil Products Total Consumption (10³ bbl/d)



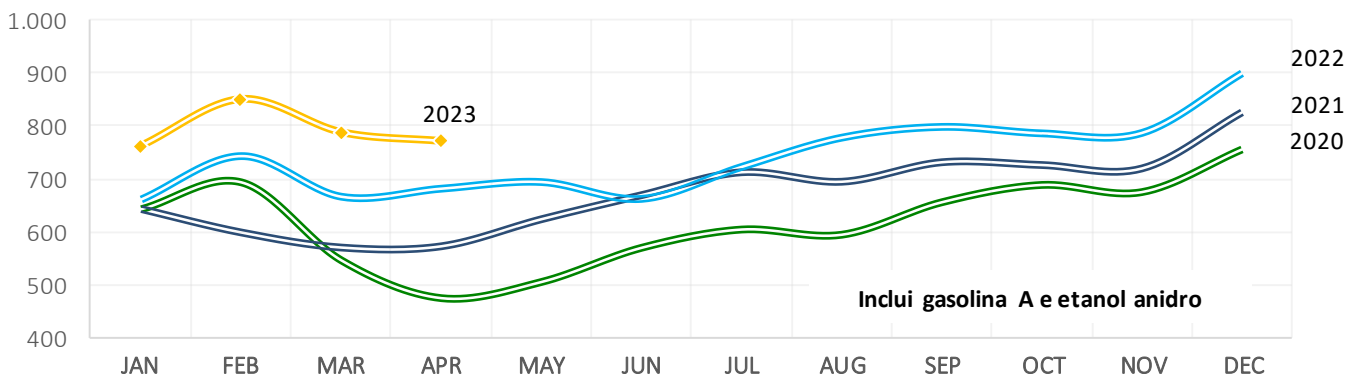
Source: National Petroleum Agency (ANP)

Natural Gas Total Demand (million m³/d)



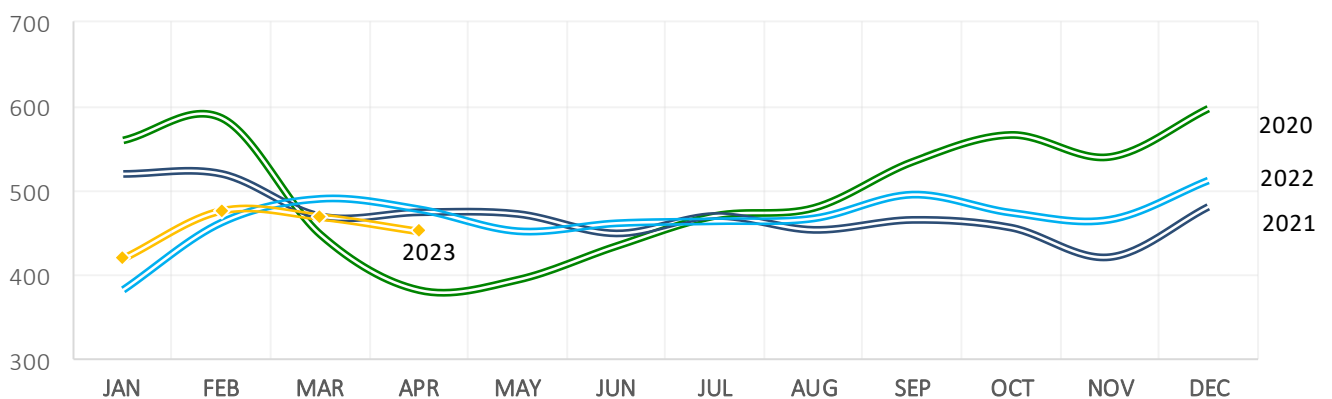
Sources: National Petroleum Agency (ANP) and National Electric System Operator (ONS)

C Gasoline Consumption (10³ bbl/d)



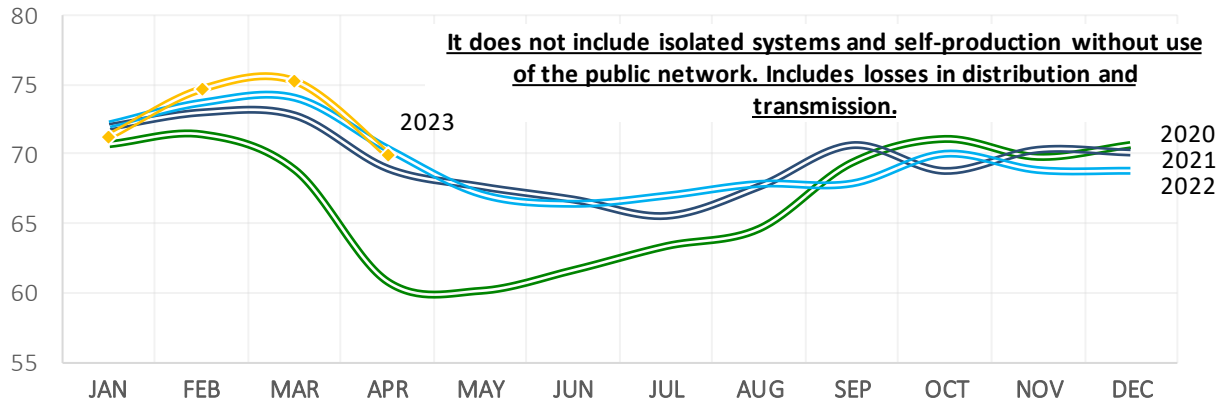
Source: National Petroleum Agency (ANP)

Motor Ethanol Total Consumption (10³ bbl/d)



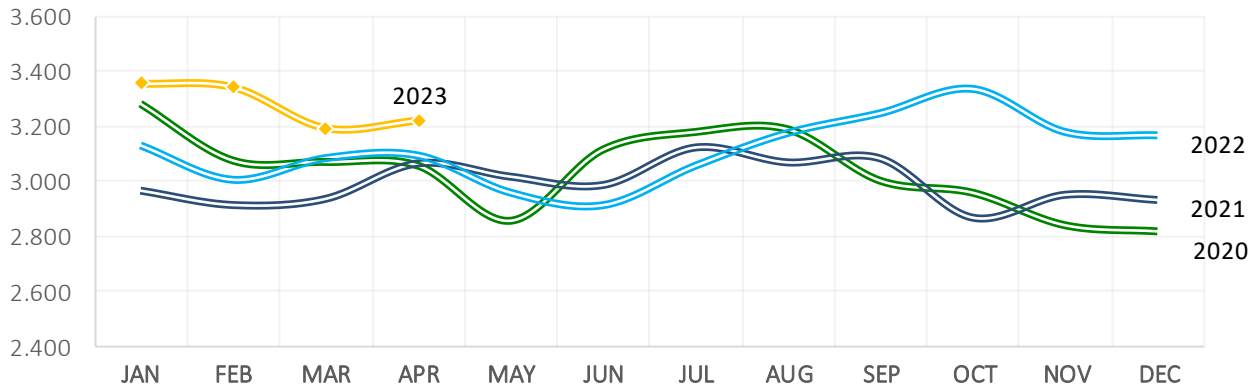
Source: National Petroleum Agency (ANP)

National Interconnected System Power Load (GWavg)



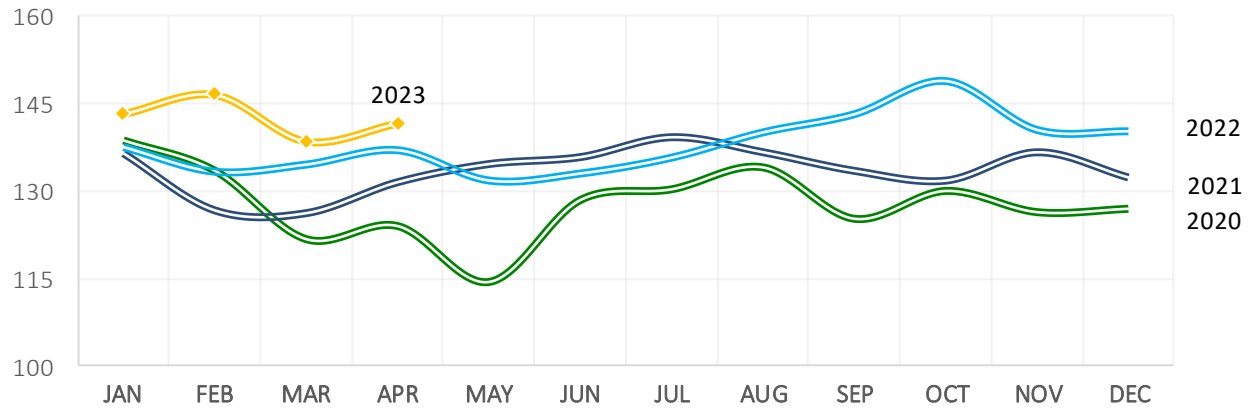
Source: National Electric System Operator (ONS)

Oil Production (10³ bbl/d)



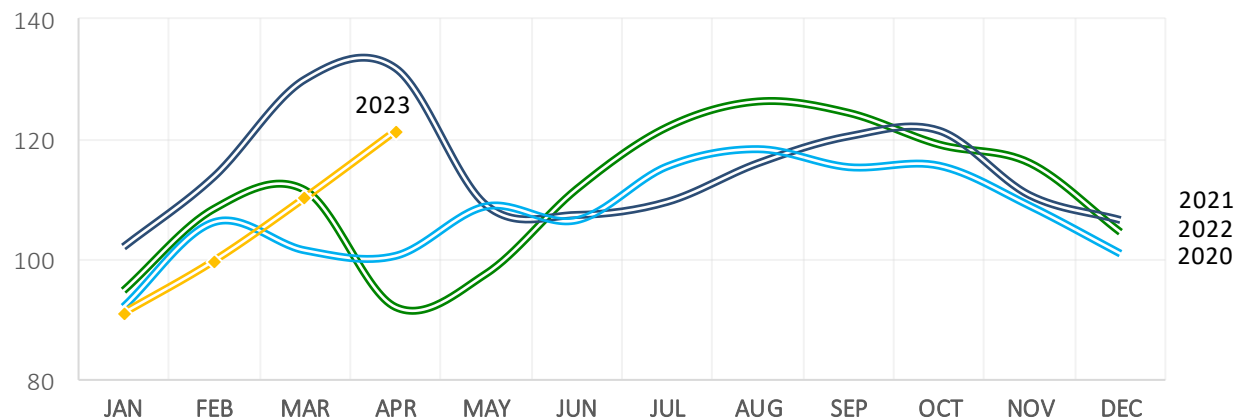
Source: National Petroleum Agency (ANP)

Natural Gas Production (million m³/d)



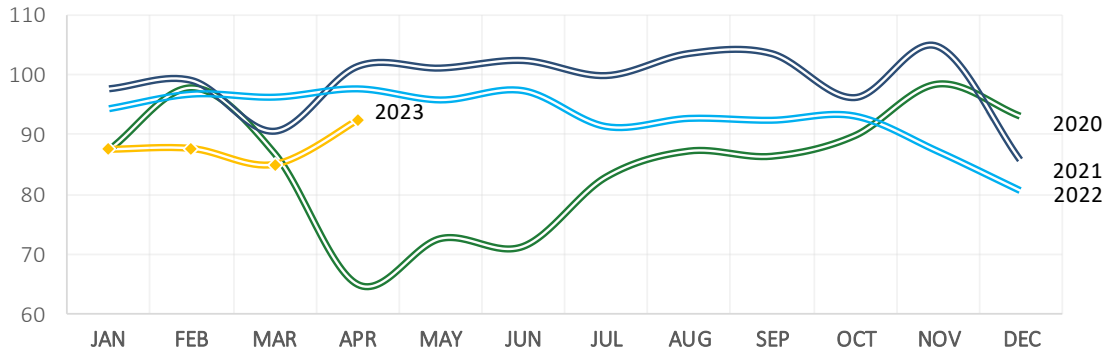
Source: National Petroleum Agency (ANP)

Biodiesel Production (10³ bbl/d)



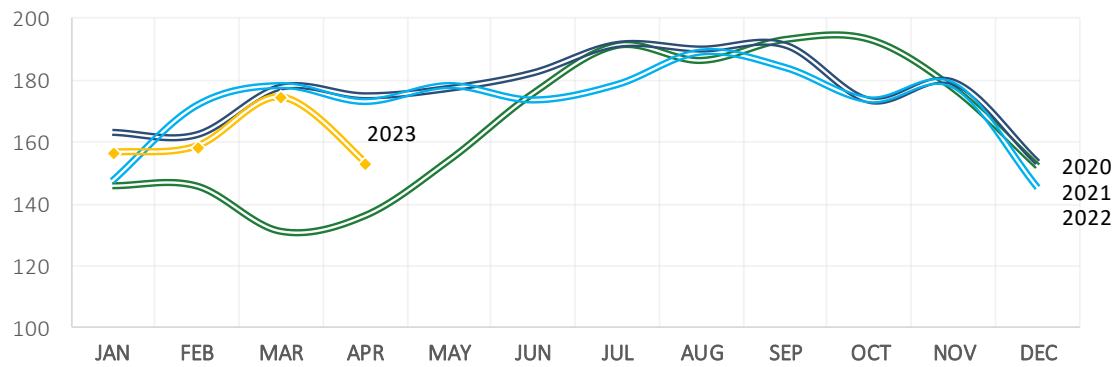
Source: National Petroleum Agency (ANP)

Steel Production (10³ t/d)



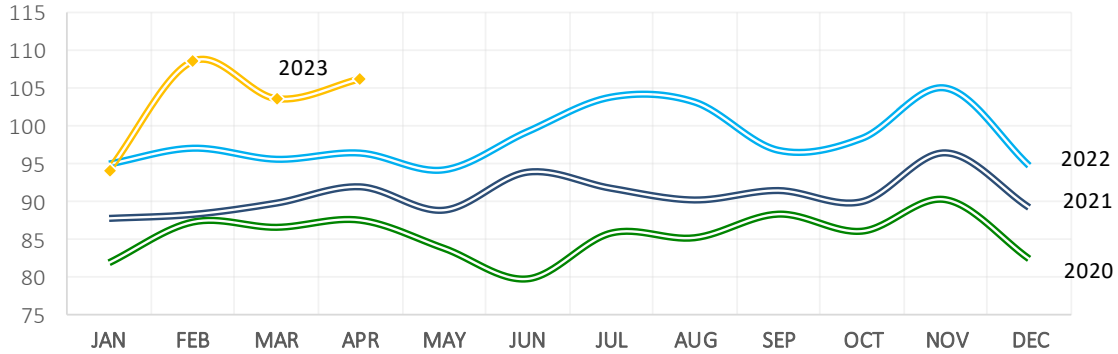
Source: Brazil Steel Institute

Cement Sales (10³ t/d)



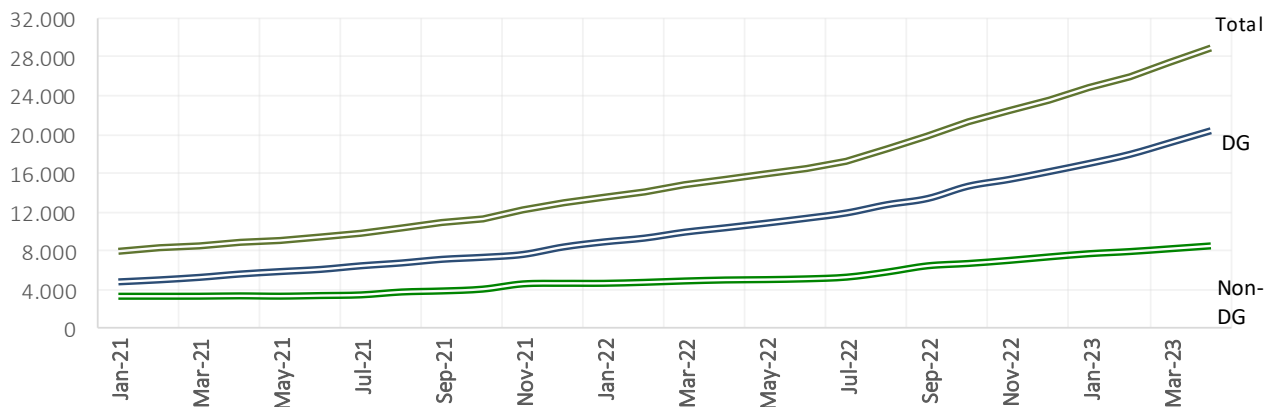
Source: National Cement Industry Union

Paper and Pulp Production (10³ t/d)



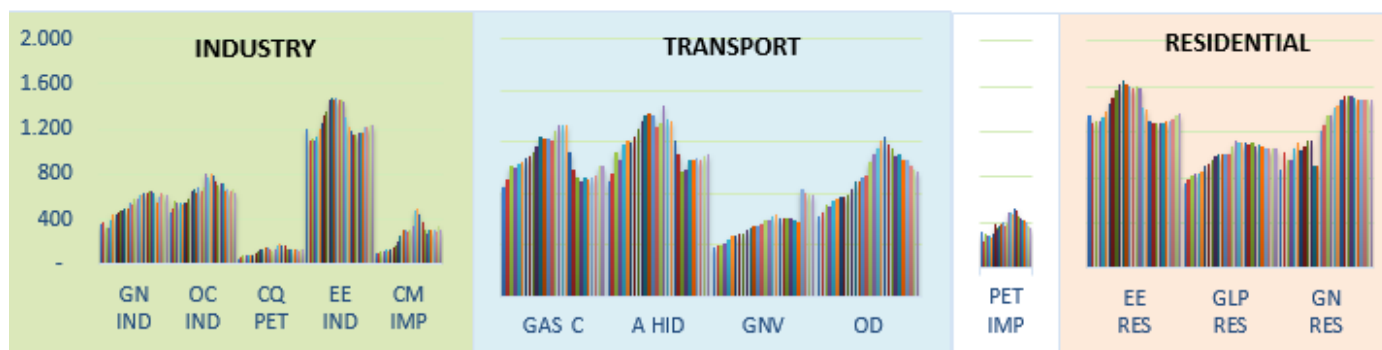
Source: Brazilian Tree Industry (IBA)

Photovoltaic Solar Installed Capacity (MW)



Source: Eletic Energy Secretary of Ministry of Mines and Energy

Consumer Prices - Jan 2021 to Apr 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), or Total Energy Demand, represents the energy necessary to move the economy of a country or region over a period. Includes final energy consumption in the residential sector and in the other economic sectors, including losses in transmission and distribution, losses on power transformation, and the own consumption of the energy sector.

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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Pedro Augusto de Menezes Filho

Sérgio Luis Nogueira

Ubyrajara Nery Graça Gomes

William de Oliveira Medeiros

Department of Information, Studies and Energy Efficiency – DIEE/SNTEP/MME

diee@mme.gov.br | +55 61 2032.5986