

MINISTRY OF
MINES AND ENERGY



MONTHLY ENERGY BULLETIN BRAZIL

September Edition

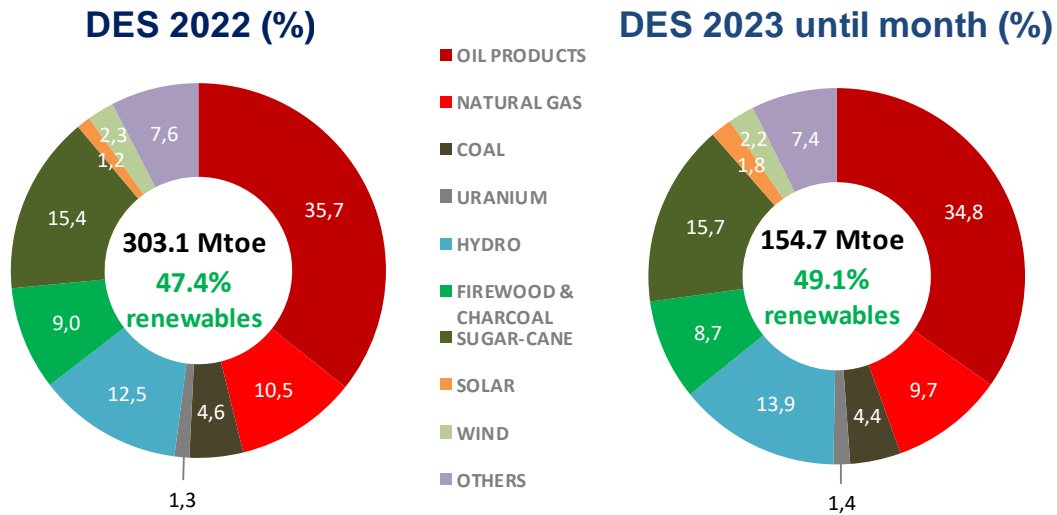
JUNE 23

DOMESTIC ENERGY SUPPLY

Based on data up to June of this year, the share of renewables in the Domestic Energy Supply – DES* increased to around 49.1%, 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), is estimated that sugarcane production will have a 11.1% increase in its production for the 2022/2023 harvest. For ethanol, produced from sugar cane and corn, the estimated increase is 9.2%.

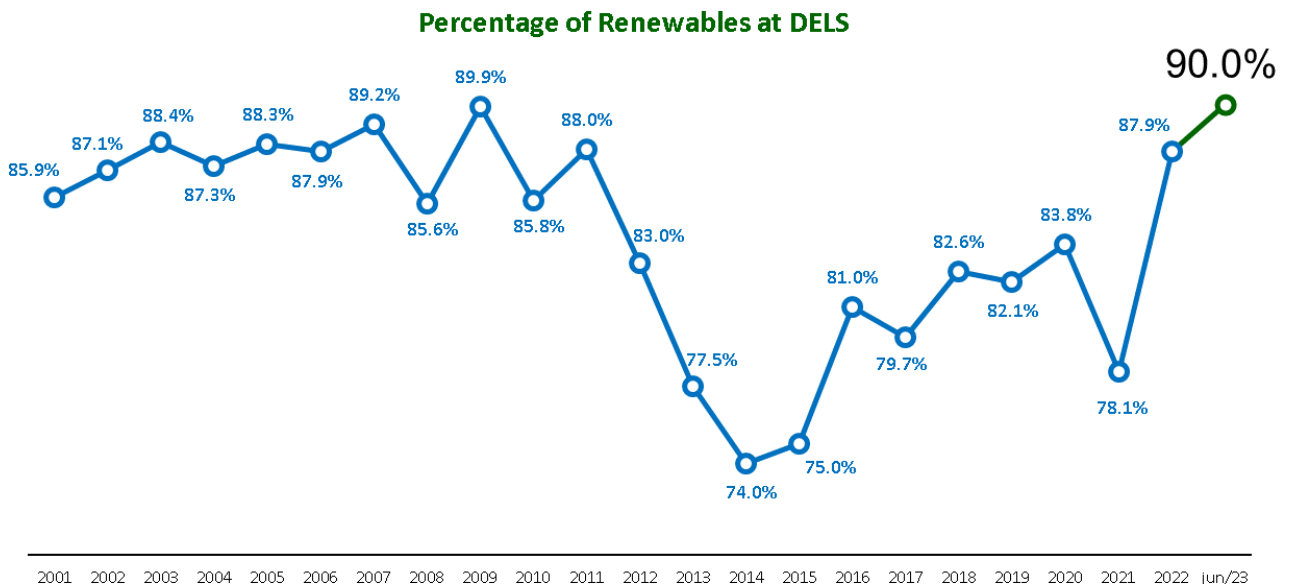
DOMESTIC ENERGY SUPPLY MORE RENEWABLE IN 2023



*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 90.0% were obtained through renewable sources, until June, reaching the accumulated value of 376.4 TWh.

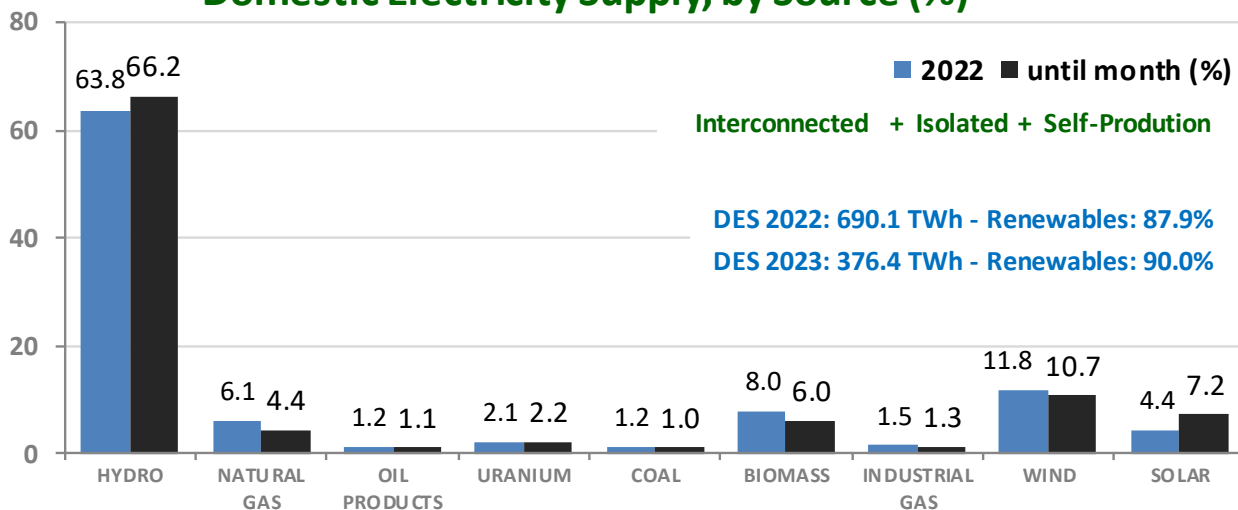
It can be seen, in the figure below, that in the first months of this year, the proportion of renewables in the OIEE is surpassing the annual results achieved throughout this century, providing cleaner energy generation, a consequence both of a favorable water regime, as well as investments in solar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



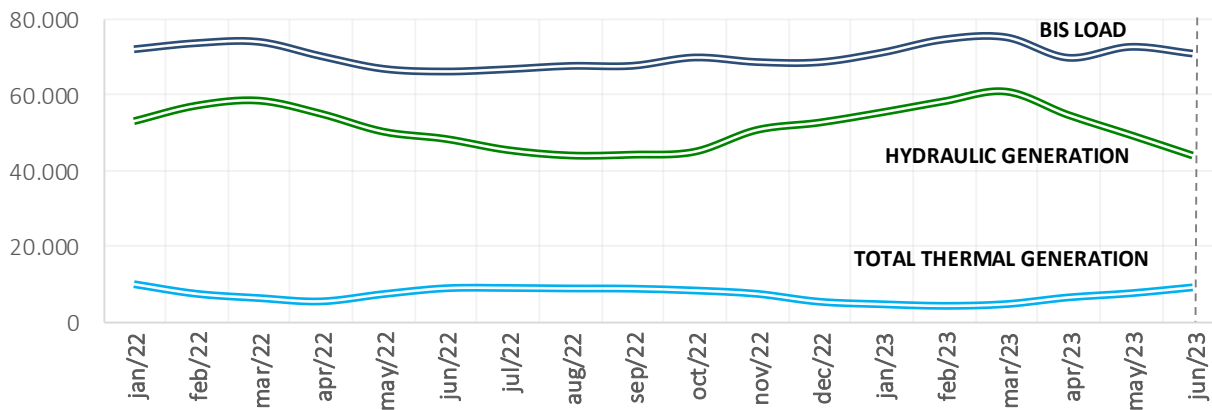
It should be noted that the DELS accounts for the generation portions based on Centralized Generation, Distributed Generation (GD), Autoproducer, Isolated Systems and Electricity Interchange between interconnected Brazilian regions.

For the first six months of the year, compared to the same period of the previous year (accumulated in the year) there was a 68% increase in generation for centralized solar and 27% for wind. Brazilian hydro energy was stable. 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.

Domestic Electricity Supply, by Source (%)



Generation - BIS¹ Load - Hydraulic - Thermal Total (MWavg)



¹BIS: Brazilian Interconnected System.

Source: National Electric System Operator (ONS) - from 04/29/23, the estimated value of MMGD was incorporated

HIGHLIGHTS IN JUNE 2023

The first power transmission auction of this year is held

This month, the first auction of power energy transmission facilities of the year was held, with all the lots offered being sold, reaching investment values of over R\$ 15 billion, which in absolute numbers was considered the largest auction ever held for the transmission area.

It is estimated that around 60 thousand direct and indirect jobs will be created. The construction, operation and maintenance of more than 6,000 km of transmission lines and 400 MVA of transformation capacity in substations were transferred to the private sector. The projects will cover the states of Bahia, Espírito Santo, Minas Gerais, Pernambuco, Rio de Janeiro, São Paulo and Sergipe.

In addition to providing increased reliability in Recife and expanding the flow of surplus photovoltaic generation and biomass from the northwest region of the state of São Paulo, the projects will expand the transmission system in the southern area of the Northeast Region and the north of the states of Minas Gerais and Espírito Santo, in order to meet the expectation of contracting high amounts of energy from renewable generation projects in the region, with emphasis on wind and solar plants.

On that occasion, the Minister of Mines and Energy highlighted that the auctions have the potential to attract more than R\$200 billion in investments in clean and renewable generation, which could make Brazil a storehouse of sustainable energy for the planet.

Oil and gas growing

Oil and gas production grew this year, showing an increase of 9.0% and 7.4% respectively in the year accumulated.

Regular gasoline and hydrated ethanol prices continue to fall

Regular gasoline and hydrous ethanol prices dropped by 25.8% and 23.3%, respectively, in relation to the same month of the previous year. This is the eleventh consecutive month of decline in this indicator for both fuels.

Steel and Mining

Compared to June 2022, steel production decreased by 12.5%, and iron ore exports increased by 5.4%. Pig iron exports increased by 2.2% in the year accumulated.

Hydraulic supply stable

The supply of hydraulic energy in 2023 remained stable in this month's survey. The monthly average was 53,708.7 MWavg. Itaipu's supply, for the period, increased 45.3%.

Wind supply on the rise

The supply of wind energy, until June 2023, increased by 27% in the year, as a reflection of successive monthly increases in installed capacity and the improvement in the average capacity factor. For the first six months of the year, 2,294.5 MW of wind power plants came into operation, a value 116% 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 June 2023, Brazil exported 1,079 MWavg.

Since February, Brazil also began to export energy to Uruguay, in a more significant way. While last year Brazil exported, on average, 0.6 MWavg to Uruguay, in June this year it exported 360 MWavg.

Natural gas availability in fall

The availability of natural gas for consumption fell by 8.9% in the year, mainly due to a reduction in imports.

Coal for electricity generation declining

There was a decrease of 1.2% for public electricity generation in accumulated in the year.

Apparent consumption of petroleum products on the rise

Apparent consumption of oil derivatives increased by 3.7% year-to-date, diesel consumption increased by 1.4% and gasoline consumption increased by 17.3%. 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 9.1% year-to-date.

Electricity consumption growing

Electricity consumption in the residential sector grew by 7.3% compared to June 2022. Industrial consumption increased by 3.1% while commercial consumption grew by 6.5%.

Biodiesel production rising

Biodiesel production increased by 12.6% year to date. 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 resolution established in March 2023 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) fell in relation to the same month of the previous year, for the eleventh consecutive month. The declines were 12.1% for the residential sector, 11.4% for the commercial sector and 26.1% for the industrial sector.

The price drops are a direct effect of Complementary Law in June 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 rising

The growth of solar DG installed capacity in Brazil is still a highlight and has increased 96.3% compared to June 2022. The centralized solar installed capacity (non-GD) also increases, with a 89.0% growth compared to June 2022.

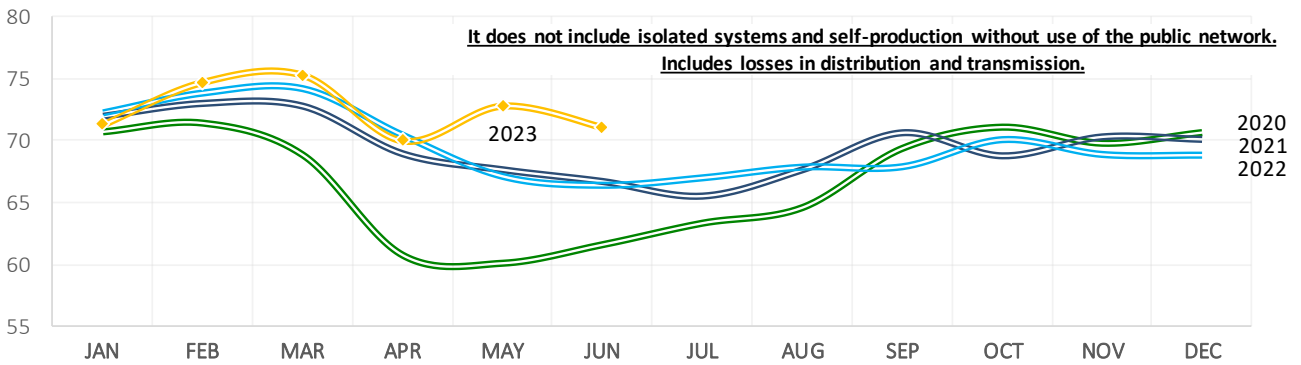
For the first six months of the year, 2,207.9 MW of centralized solar installed capacity came into operation, a value approximately five times higher compared to the same period last year.

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 ensured exemption from the Distribution System Use fee (TUSD) until the year 2045 for systems implemented or with access requests filed until January 07, 2023, allowing also, partial exemption for systems implemented until December 31, 2028, according to the transition rule.

SPECIFICATION	JUNE					
	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)	3,443	2,915	18.1	3,305	3,032	9.0
IMPORTS AVERAGE PRICE (US\$/bbl FOB)	58.46	107.62	-45.7	79.72	98.70	-19.2
OIL PRODUCTS						
TOTAL CONSUMPTION (10 ³ b/day)	2,594	2,415	7.4	2,523	2,434	3.7
hereof: DIESEL with biodiesel - (10 ³ b/day)	1,177	1,109	6.1	1,103	1,088	1.4
hereof: GASOLINE C (10 ³ b/day)	805	663.3	21.4	803	685	17.3
CONSUMER PRICE - DIESEL (R\$/l)	5.02	7.20	-30.3	5.74	6.34	-9.6
CONSUMER PRICE - GASOLINE C (R\$/l)	5.38	7.25	-25.8	5.32	7.00	-23.9
CONSUMER PRICE - LPG (R\$/13 kg)	103.46	112.55	-8.1	107.01	108.82	-1.7
NATURAL GAS (d)						
PRODUCTION (10 ⁶ m ³ /day)	152	133	14.6	144	134	7.4
IMPORTS (10 ⁶ m ³ /day)	20.6	26.7	-22.8	18.6	29.1	-35.9
NON-UTILIZED AND REINJECTION (10 ⁶ m ³ /day)	80.7	66.8	20.9	77.6	69.8	11.2
AVAILABILITY FOR CONSUMPTION (10 ⁶ m ³ /day)	92.2	92.8	-0.7	85.4	93.8	-8.9
INDUSTRIAL CONSUMPTION (10 ⁶ m ³ /day)	38.5	42.4	-9.1	40.0	41.3	-3.2
POWER GENERATION CONS. (10 ⁶ m ³ /day)	16.2	14.7	10.1	11.4	18.0	-36.9
INDUSTRIAL PRICE SE (b) (US\$/MMBtu) - consumption range of 20,000 m ³ /day	22.02	21.92	0.4	21.48	20.28	5.9
MOTOR PRICE SE (US\$/MMBtu)	27.23	22.62	20.3	27.40	20.86	31.4
RESIDENTIAL PRICE SE (US\$/MMBtu)	55.27	50.39	9.7	52.37	46.94	11.6
ELECTRICITY						
NATIONAL INTERCONNECTED SYSTEM	71,077	66,448	7.0	72,515	70,658	2.6
SOUTHEAST/MIDWEST POWER LOAD (MWavg)	39,918	37,876	5.4	41,297	41,083	0.5
SOUTH POWER LOAD (MWavg)	12,181	11,874	2.6	12,641	12,513	1.0
NORTHEAST POWER LOAD (MWavg)	11,921	10,606	12.4	11,815	11,216	5.3
NORTH POWER LOAD (MWavg)	7,057	6,092	15.8	6,762	5,847	15.7
TOTAL CONSUMPTION (TWh) (a)	42.6	40.7	4.5	43.6	42.4	2.8
RESIDENTIAL	12.8	11.9	7.3	13.5	12.9	4.8
INDUSTRIAL	15.6	15.1	3.1	15.4	15.0	2.4
COMMERCIAL	7.6	7.1	6.5	8.1	7.9	3.0
OTHER SECTORS	6.6	6.5	0.6	6.6	6.6	-0.3
PLANTS ENTRY INTO OPERATING (MW)	543	158	243.9	5,160	2,333	121.2
RESIDENTIAL PRICE (R\$/MWh)	831	844	-1.5	816	928	-12.1
COMMERCIAL PRICE (R\$/MWh)	810	786	3.1	783	884	-11.4
INDUSTRIAL PRICE (R\$/MWh)	772	737	4.8	625	846	-26.1
ETHANOL AND BIODIESEL						
BIODIESEL PRODUCTION (10 ³ b/d)	137	106	28.9	115	103	12.6
MOTOR ETHANOL CONSUMPTION (10 ³ b/d)	462	462	0.1	459	455	1.0
ETHANOL EXPORTS (10 ³ b/d)	14	44	-67.3	33	26	24.4
HYDRATED ETHANOL PRICE (R\$/l)	3.76	4.90	-23.3	3.89	4.97	-21.8
COAL						
ELECTRICITY GENERATION (MWavg)	1002	959	4.5	747	756	-1.2
IMPORT PRICE (US\$ FOB/t)	219.92	412.89	-46.7	247.53	310.81	-20.4
NUCLEAR ENERGY						
ELECTRICITY GENERATION - (GWh)	2011	1032	94.9	1,903	1,808	5.3
INDUSTRIAL SECTORS						
STEEL PRODUCTION (10 ³ t/day)	85	97	-12.5	88	96	-8.9
ALUMINIUM PRODUCTION (10 ³ t/day) (c)	2.8	2.1	29.5	2.7	2.0	39.4
IRON ORE EXPORTS (10 ³ t/day)	1,080	1,025	5.4	872	804	8.6
PELLETS EXPORTS (10 ³ t/day)	61	42	45.1	64	50	27.8
BIG IRON EXPORTS (10 ³ t/day)	8.3	13.6	-39.4	9.7	9.9	-2.2
PAPER PRODUCTION (10 ³ t/day)	29.7	30.7	-3.3	29.4	30.0	-1.9
PULP PRODUCTION (10 ³ t/day)	68.6	68.5	0.2	66.1	66.3	-0.3
SUGAR PRODUCTION (10 ³ t/day)	173.8	157.8	10.1	75.4	58.4	29.0
SUGAR EXPORTS (10 ³ t/day)	102	78	31.2	64	54	20.0

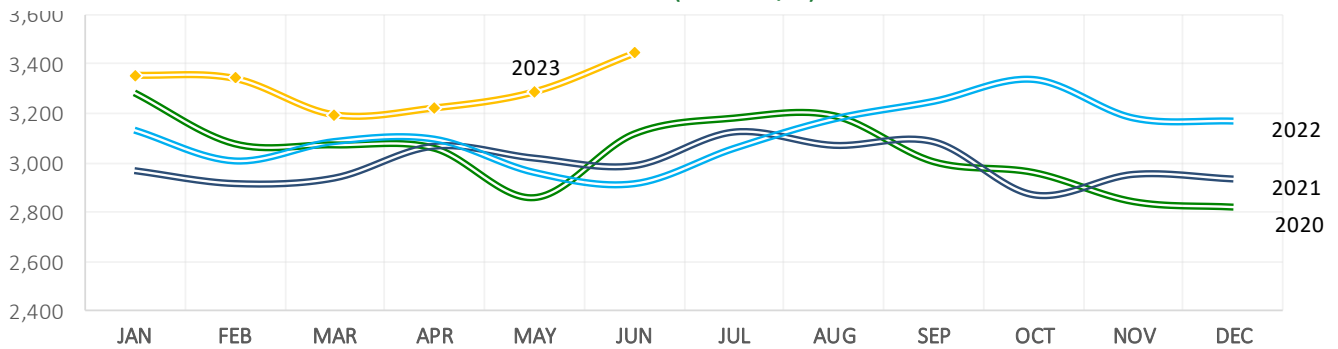
(a) The traditional self-producers (consumers that do not use public grid) is not included. (b) SE is the acronym of Southeast
(c) April Data

National Interconnected System Power Load (GWavg)



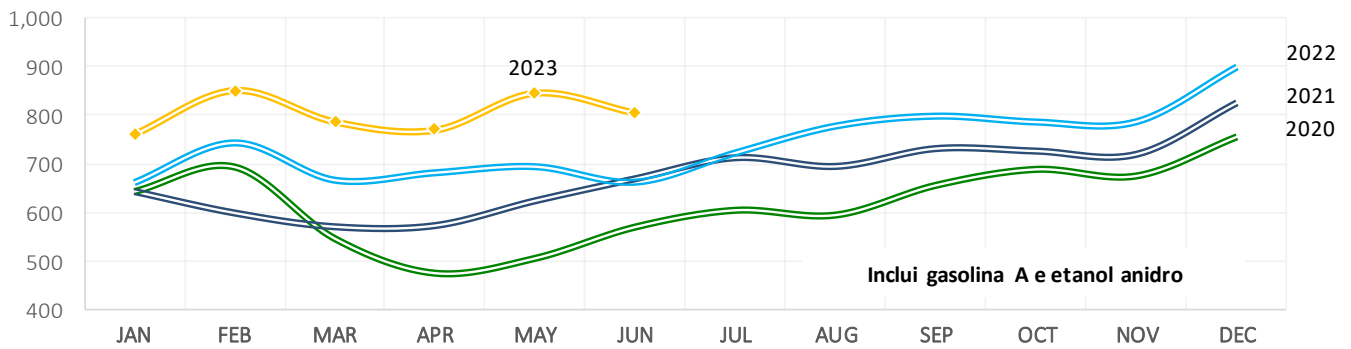
Source: National Electric System Operator (ONS) - from 04/29/23, the estimated value of MMGD was incorporated

Oil Production (10³ bbl/d)



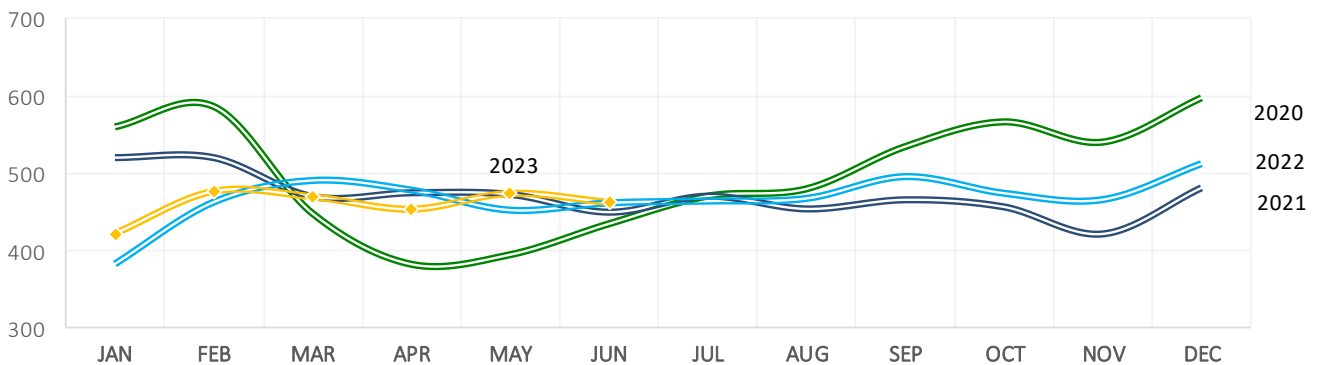
Source: National Petroleum Agency(ANP)

C Gasoline Consumption (10³ bbl/d)



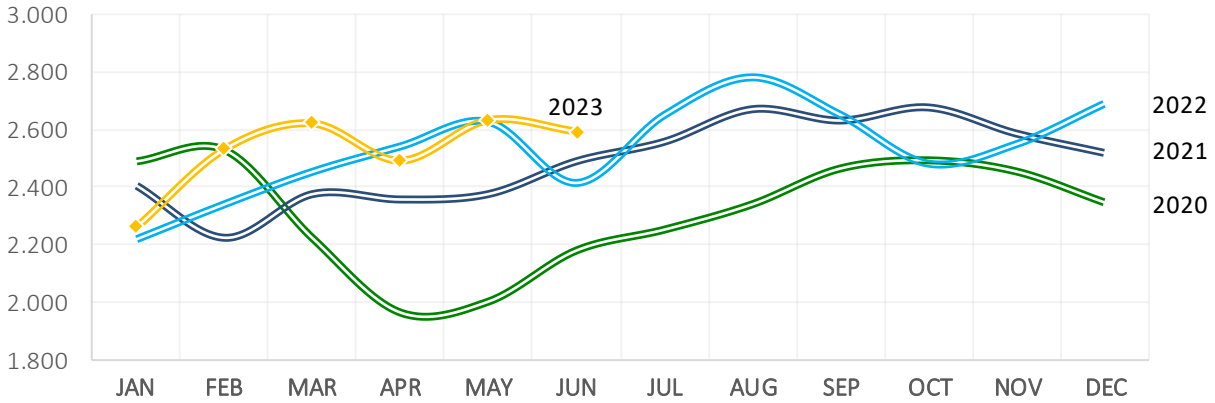
Source: National Petroleum Agency (ANP)

Motor Ethanol Total Consumption (10³ bbl/d)



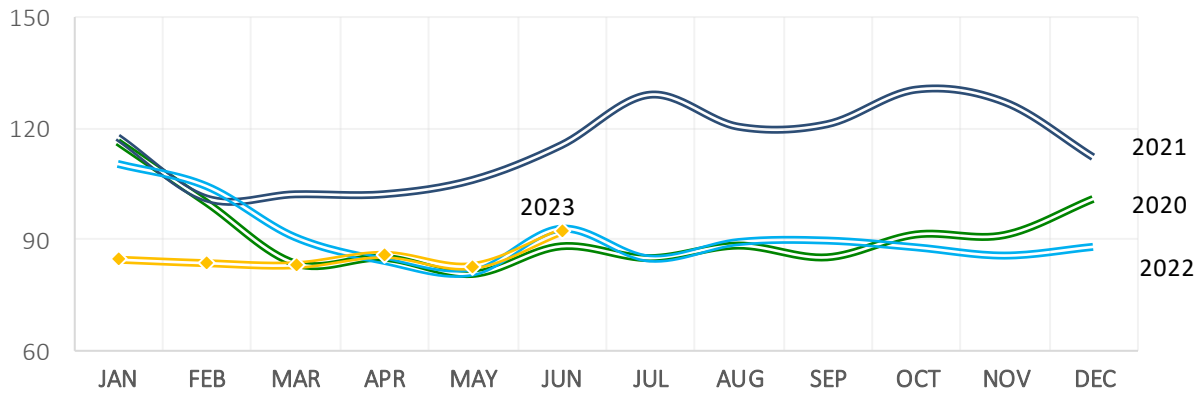
Source: National Petroleum Agency (ANP)

Oil Products Total Consumption (10³ bbl/d)



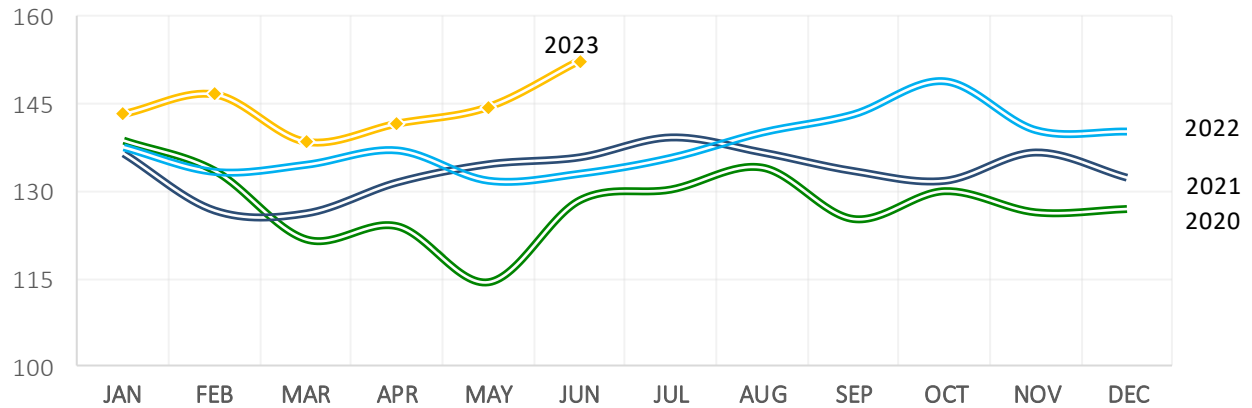
Source: National Petroleum Agency

Natural Gas Total Demand (million m³/d)



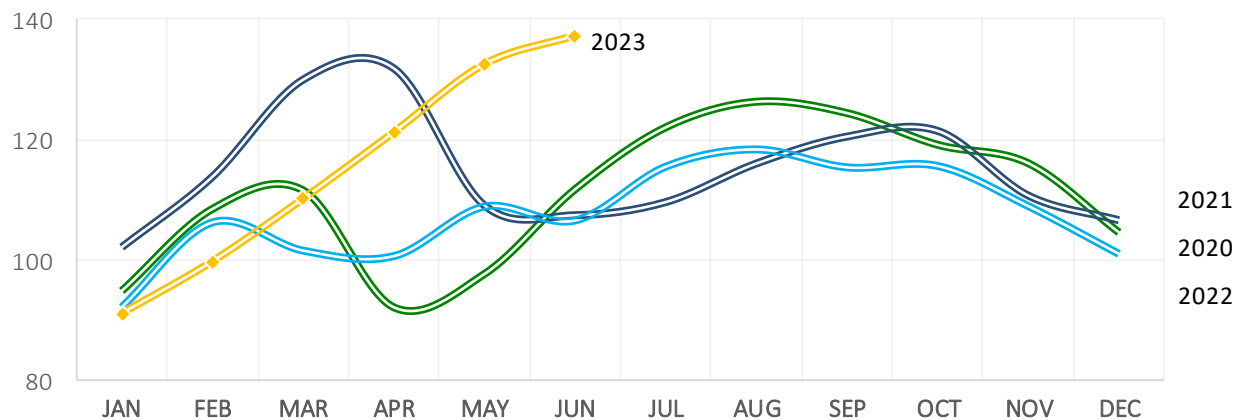
Sources: National Petroleum Agency (ANP) and National Electric System Operator (ONS)

Natural Gas Production (million m³/d)



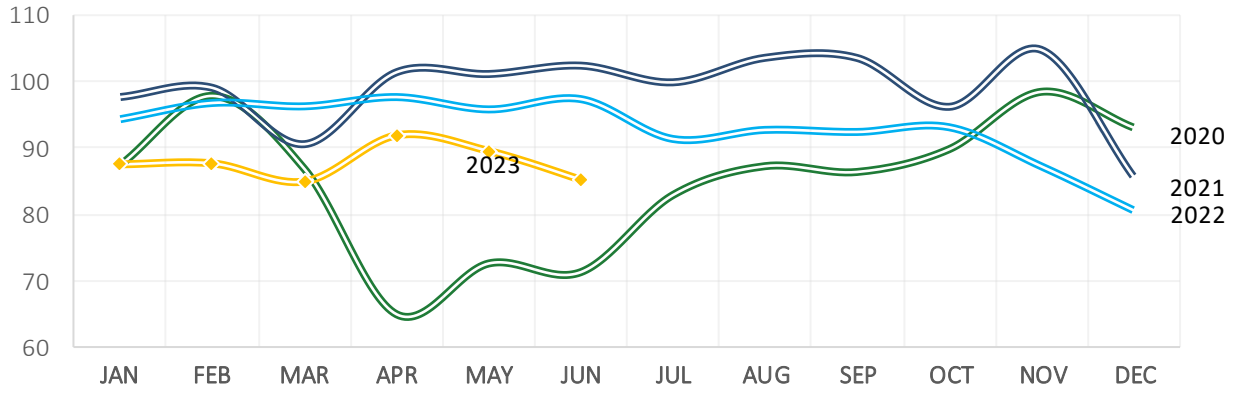
Source: National Petroleum Agency (ANP)

Biodiesel Production (10³ bbl/d)



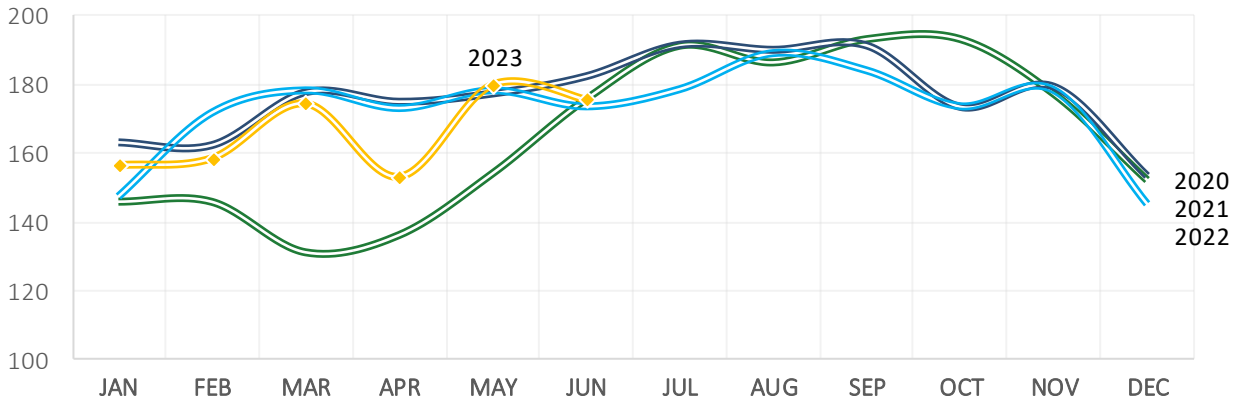
Source: National Petroleum Agency (ANP)

Steel Production (10³ t/d)



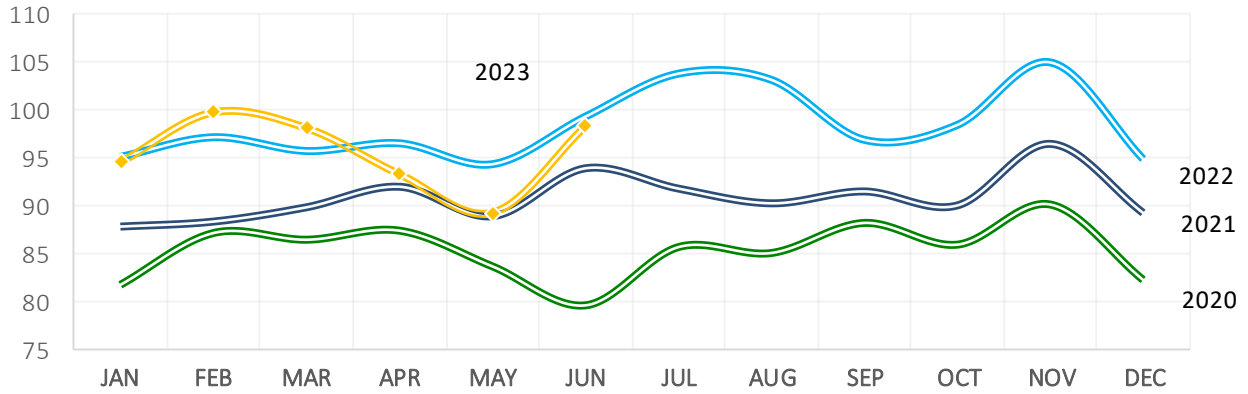
Source: Brazil Steel Institute

Cement Sales (10³ t/d)



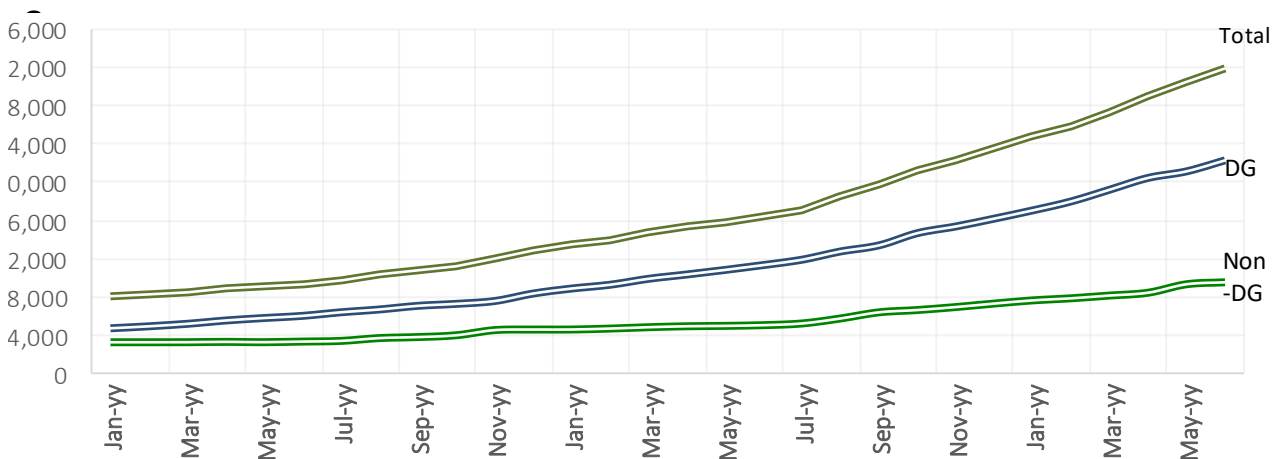
Source: National Cement Industry Union

Paper and Pulp Production (10³ t/d)

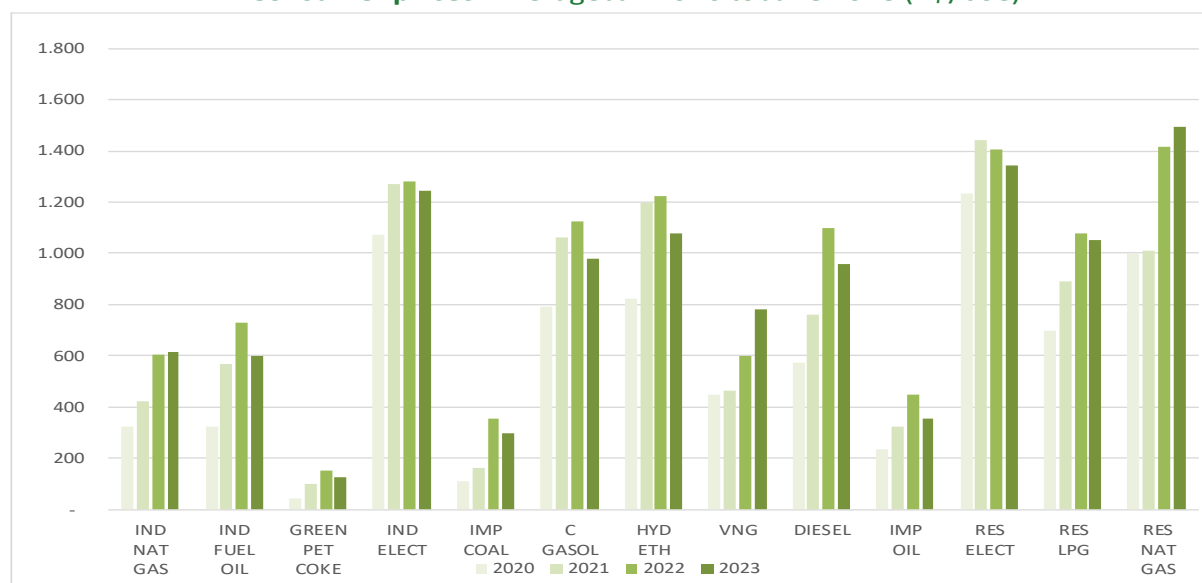


Source: Brazilian Tree Industry (IBA)

Photovoltaic Solar Installed Capacity (MW)



Consumer prices- Average Jan 2020 to June 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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