EMIS

Brazil Electric Power Sector Report 2025-2026

An EMIS Insights Industry Report

Executive Summary

Sector Overview

In 2023, Brazil's electric energy sector recorded an installed capacity of 225.2 GW, reflecting a 9.6% y/y increase from 205.5 GW in 2022, marking the largest single-year expansion since the EPE's inception in 2004. Renewable energy sources strengthened their dominant position, accounting for 89.2% of total capacity, up from 79.6% in 2022. The wind and solar segments were the primary drivers, adding 4.9 GW and 13.4 GW, respectively, compared to a combined 13.5 GW added in 2022. In 2023, solar capacity continued its rapid expansion, surging by 57.3% y/y, reinforcing its position as the second-largest energy source in Brazil’s installed capacity mix. Meanwhile, hydropower capacity, while still the largest contributor, saw its share decline to 49% in 2023, from 53.4% in 2022, reflecting Brazil's ongoing diversification strategy. Electricity tariffs continued to rise, driven by inflationary pressures, fuel price volatility and increased reliance on thermal plants during dry periods. In 2023, the average tariff of residential electricity rose by an average of 0.5% y/y, following a 4.2% increase in 2022. These cost increases impacted household energy expenditures and contributed to the migration towards distributed generation, particularly solar, as consumers sought energy cost reductions. Additionally, free market participation continued to expand, with an increasing number of large commercial and industrial consumers opting for ACL contracts, benefiting from more competitive pricing and long-term contract flexibility. The policy environment remained supportive, with initiatives such as the New Growth Acceleration Programme (Novo PAC) and Ten-Year Energy Expansion Plan (PDE 2034) providing a roadmap for future investments. While tariff increases and hydrological risks posed challenges, the sector's resilience was evident in its continued diversification and expansion, reinforcing Brazil’s position as one of the world’s largest renewable energy markets.

Entry Modes

Brazil’s electric power sector remained highly attractive to foreign and private investment, with large-scale acquisitions and new market entrants contributing to its expansion during 2023 and 2024. As of 2023, 2,649 companies operated in the sector, the majority being independent power producers (72.2%). Key market entries included TotalEnergies’ USD 4.2bn acquisition of TotalEren (France) and the USD 1.96bn purchase of Enerfin SA (Norway) by Statkraft AS, marking significant foreign direct investment in Brazil’s renewable sector. Additionally, BP PLC (UK) invested USD 1.4bn in BP Bunge Bioenergia, reinforcing the bioenergy segment as a key growth area.

Foreign players primarily entered through joint ventures or direct investments in renewable energy auctions, leveraging competitive pricing in wind and solar. The free market (ACL) attracted large industries and commercial consumers that increasingly migrated away from the regulated segment (ACR) to secure lower-cost, flexible energy contracts. Meanwhile, government-led auctions remained a key market entry mechanism, particularly in hydropower, wind and solar, with contracts structured to guarantee long-term revenue stability.

Segment Opportunities

The Brazilian electric energy sector presents substantial investment opportunities, particularly in renewable energy and infrastructure modernisation. The PDE 2034 forecasts show that Brazil’s power generation capacity could reach 331 GW by 2034, with wind, solar and biomass driving the expansion. The renewable energy market continues to benefit from favourable regulatory incentives, such as tax-exempt debentures, competitive auctions and grid connection priority for clean energy projects. The government's

emphasis on decentralisation and energy storage has created new opportunities for distributed generation and grid battery solutions, which will be crucial for stabilising intermittent renewable sources. With Brazil set to add 76.5 TWh from distributed generation by 2034, solar energy in particular is expected to maintain rapid growth, supported by technological advancements and declining costs. Meanwhile, the bioelectricity segment, including biomass and biogas projects, have seen increased investment due to rising ethanol demand and government programmes such as RenovaBio.

Government Policy

The Brazilian electric energy sector operates within a structured regulatory framework, ensuring investment security and long-term policy alignment. Key institutions, including the Ministry of Mines and Energy (MME), the Energy Research Company (EPE) and the National Electric Energy Agency (ANEEL), regulate market operations and oversee strategic planning. The National Electric System Operator (ONS) manages real-time grid operations, while the Chamber of Electric Energy Commerce (CCEE) facilitates energy trading.

The 2023 policy landscape was shaped by the Novo PAC, which prioritised public-private partnerships (PPPs) to expand energy generation, transmission and storage infrastructure. Meanwhile, the PDE 2034 outlined Brazil's long-term energy expansion plans, reinforcing the country's commitment to decarbonisation and energy security. Market liberalisation efforts also continued, particularly in the ACL segment, which saw a wave of new industrial and commercial consumers migrating to competitive energy contracts. In the transmission segment, government-led auctions ensured cost-effective infrastructure expansion, with auctions awarding projects at significant discounts. Brazil also advanced its energy security strategy by reducing its reliance on hydropower, as the country remains vulnerable to droughts, and diversifying its mix with wind, solar and bioenergy projects.

Sector Snapshot

The year 2023 marked another milestone in Brazil's electric power sector, with a continued expansion of renewable energy sources, record energy auctions and substantial investments in infrastructure modernisation. By the end of the year, Brazil's total installed capacity reached 226 GW, representing a 70% increase since 2014, according to the Energy Research Company (EPE). Renewable energy sources accounted for 89% of the total energy mix in 2023, with wind and solar power contributing 30% combined. Wind generation expanded to 28.7 GW, supported by 27 competitive energy auctions held since 2009, which contracted 17.7 GW of wind capacity at progressively lower prices—falling from BRL 322.8/MWh in 2009 to BRL 196.8/MWh in 2022 (or by 39%). Solar energy experienced the strongest growth, reaching 37.8 GW of installed capacity, and becoming the second-largest energy source in Brazil. Between 2014 and 2022, 12 solar auctions awarded 5.3 GW, with contract prices plummeting from BRL 360.10/MWh to BRL 191.4/MWh (a fall of 46.8%). There were no solar auctions held in 2023 and 2024. However, new ones are planned for mid-August 2025. In 2024, the Ministry of Mines and Energy (MME) opened the period for submitting forecasts of the need to purchase electricity for the new energy auctions A-4 and A-6, scheduled for 2025. The objective is to receive forecasts from distribution agents for the preparation of guidelines for these auctions, with the start of supply on January 1, 2029, for the A-4 auction, and January 1, 2031, for the A-6 auction. The realisation of these auctions is fundamental to ensuring the country's energy security, attracting investments and boosting economic growth. The new energy auctions (A-4 and A-6) will be held in August 2025.

Additionally, distributed solar generation has continued its rapid expansion due to lower equipment costs, regulatory incentives and shorter payback periods, falling from 18.8 years in 2013 to just 3.4 years in 2023. Hydropower has remained Brazil's dominant electricity source, representing 49% of total installed capacity,

despite climate-related constraints and increasing generation volatility. Although no major new hydropower plants (UHEs) entered operation in 2023, modernisation efforts in existing plants added 6.3 GW of refurbished capacity.

In electricity transmission, the grid has expanded by over 140% in the past two decades, reaching 185,224 km in December 2023, ensuring greater system reliability and integration of new renewables. The Novo PAC infrastructure programme, launched in 2023, allocated BRL 92bn for transmission projects, supporting a 17% network expansion to 200,000 km by 2026. Transmission auctions remained highly competitive, with three major tenders held between December 2023 and September 2024, attracting BRL 43.25bn in investment. These projects covered over 11,700 km of new transmission lines, integrating key renewable hubs in the Northeast and North regions into the National Interconnected System (SIN). Additionally, efforts to reduce the number of isolated systems progressed, with Boa Vista (Roraima), the last state capital disconnected from the SIN, due to be integrated by 2026.

Electricity consumption surged in 2023, driven by economic recovery, extreme temperatures and rising industrial demand. The commercial sector saw the most significant increase, representing 18% of total consumption, fuelled by higher demand from shopping malls, hotels and data centres—with data centres alone tripling consumption from 0.51 TWh in 2021 to 1.62 TWh in 2023. The residential sector (31% of total demand) recorded higher electricity use, primarily due to above-average temperatures and increased air conditioning usage. Industrial consumption accounted for 35%, with electro-intensive industries representing 84% of total industrial demand. The free market (ACL) continued its expansion, with over 90% of industrial electricity consumption now contracted through direct bilateral agreements. The regulated market (ACR) continued to lose ground as shopping centres, hospitals and schools migrated to the ACL, reshaping Brazil's energy commercialisation landscape. In 2024, the consumption of electricity in Brazil continued its upwards trend, rising by 5.3% y/y to 560,219 GWh, with the main growth driver being residential consumers, where demand went up by 7.1% y/y. In 2024, the Southeast region accounted for the largest share of consumption, representing 47.8%, followed by the South region with 18.4%. The industrial sector contributed the largest share, representing 35.3% of total demand, followed by the residential sector (31.5%).

Investment in the electric power sector continued at a strong pace, with the PDE 2034 outlining BRL 597bn of total energy sector investments by 2034. This includes BRL 352bn for centralised generation, BRL 117bn for distributed generation, and BRL 129bn for transmission infrastructure modernisation. The Novo PAC allocated BRL 97.9bn to power generation, supporting 372 projects, of which 175 were completed (47%) as of July 2024, adding 6.6 GW to the SIN, while another 197 projects under construction are expected to contribute 10.6 GW by 2026.

Market entries and foreign direct investment (FDI) have also played a key role in shaping the sector. TotalEnergies' USD 4.2bn acquisition of TotalEren (France) and the USD 1.96bn acquisition of Enerfin SA (Norway) by Statkraft AS were among the largest foreign investments in the Brazilian energy market in 2023. Additionally, BP PLC's USD 1.4bn acquisition of BP Bunge Bioenergia's 50% stake reinforced the growing role of bioenergy in Brazil's energy mix. These deals highlighted strong international interest in Brazil's expanding renewable energy sector, particularly in wind, solar and bioelectricity generation.

Sector Outlook

The Novo PAC, launched by Brazil's government in August 2023, includes 372 energy generation projects, of which 175 (47%) had been completed by July 2024, according to the Chief of Staff's Office, adding 6,597 MW to the National Interconnected System (SIN). The programme is predominantly private-led, with the exception of the state-run Angra III thermal plant (BRL 1.9bn). The remaining 197 projects (53%) are under

construction and they are expected to contribute an additional 10.6 GW by 2026. While the programme's timeline extends through 2026, investments are planned beyond this period. Total planned investments in energy generation amount to BRL 97.9bn, with BRL 32.8bn allocated to ongoing projects through 2026 and BRL 59.6bn designated for post-2026 initiatives. In the transmission sector, the Novo PAC comprises 83 ongoing projects, representing BRL 32.8bn in private investments for 2023–2026, alongside 45 new projects, which will bring total investments to BRL 59.6bn in later phases. As of July 2024, 11 transmission projects have been completed, adding 1,433 km of transmission lines and 1,545 MVA of new transformation capacity at substations. Additionally, 56 projects are under construction that are expected to expand the network by more than 9,600 km by 2026.

According to the Ten-Year Energy Expansion Plan (PDE) 2034 by the Energy Research Company (EPE) and the Ministry of Mines and Energy (MME), Brazil's power generation installed capacity is expected to reach 331 GW by the end of 2034, 254 GW of which will be centralised in the SIN, 19 GW from self-production and 59 GW from distributed generation. In terms of electricity generation, Brazil is expected to produce 1,045.3 TWh by 2034, with renewables contributing 83.4%. Biomass, wind and solar are projected to drive this growth, with biomass increasing to 44.1 TWh, wind reaching 180.3 TWh and solar rising to 60.5 TWh. Distributed generation will supply 76.5 TWh, showcasing the impact of policy incentives and technological advancements in small-scale energy systems. Additionally, energy storage is projected to grow to 800 MW, marking Brazil's efforts to improve grid reliability and integration of intermittent renewable sources. As for nuclear power, 1,405 MW of installed capacity will be added with the Angra III project that is scheduled to start operations in 2028, according to Eletronuclear, if the National Energy Policy Council (CNPE) gives it the green light. Although construction resumed at the end of 2024, following a decision by the Ministry of Mines and Energy (MME), an agreement between the government and Eletrobras about the future of the project had yet to be signed as of the end of February 2025. The federal government and Eletrobras must decide on the governance structure of Eleronuclear, with a 35% share of the company in the hands of Eletrobras but the company not interested in keeping its stake, as reported by Brazilian media outlet Valor International in February 2025.

Regarding electricity transmission, Brazil's power lines are projected to expand from 187,400 km in 2024 to 217,600 km by 2034, reflecting a 16.1% increase over the decade. Similarly, substation capacity will grow from 481,700 MVA to 563,900 MVA in the same period, a 17.1% rise. These developments will support the integration of renewable energy sources, modernisation of the national grid and improvements to energy reliability and efficiency, ensuring the infrastructure keeps pace with projected demand and decentralised energy generation growth.

In terms of investments in the electric power sector for electricity supply, as outlined in the PDE 2034, a total of BRL 597bn is projected over the 2024–2034 period, representing 18.7% of the plan's total investments. This allocation comprises BRL 352bn for centralised generation, BRL 117bn for distributed generation and BRL 129bn for transmission infrastructure, aimed at supporting grid modernisation and expansion. Meanwhile, investments in liquid biofuels are projected at BRL 102bn (3.2% of total investments), with BRL 67bn directed to ethanol production and infrastructure and BRL 35bn dedicated to biodiesel and bio-aviation fuel plants, reflecting Brazil's focus on advancing renewable energy and sustainable fuel production.

Installed Capacity by Type, 2034 Forecast

-	2024	2029	2034
Origin/Source	GW	GW	GW

Centralised	**199**	**218**	**254**
Renewables	175	189	215
Non-Renewables	24	30	39
Storage	0	0	0.8
Self-Production	**15**	**18**	**19**
Renewables	7	8	9
Non-Renewables	8	10	10
Distributed Generation	**32**	**46**	**59**
Renewables	31	46	58
Non-Renewables	0.2	0.3	0.5
Total	**245**	**283**	**331**
Renewables	213	243	282
Non-Renewables	32.2	40.2	49.4
Storage	0	0	0.8

Sources: EPE-PDE 2034

Installed Capacity by Source, 2034 Forecast

-	2024	2029	2034
Origin/Source	GW	GW	GW
Centralised	**199**	**218**	**255**
Hydropower	110	115	120
Thermal	39	44	54
Renewables	17	17	18
Non-Renewables	22	26	36
Wind	32	36	48
Solar	16	20	29
Nuclear	2	3	3
Self-Production & Distributed Generation	**46**	**65**	**78**
Renewables	38	54	67
Non-Renewables	8	11	10

Sources: EPE-PDE 2034

Total Generation by Source, 2034 Forecast

-	2024	2024	2029	2029	2034	2034
Centralised Generation	**TWh**	**%**	**TWh**	**%**	**TWh**	**%**
Hydropower	423.8	55.8	454.1	50.2	488.5	46.7
Natural Gas	15.4	2.0	53.9	6.0	62.4	6.0
Coal	6.5	0.9	4.6	0.5	4.7	0.5
Nuclear	14.0	1.8	23.3	2.6	25.5	2.4
Biomass	36.5	4.8	39.4	4.4	44.1	4.2
Wind	114.1	15.0	132.1	14.6	180.3	17.2
Solar	26.1	3.4	39.0	4.3	60.5	5.8
Others	7.3	1.0	4.3	0.5	6.0	0.6
Subtotal	*643.7*	*84.8*	*750.7*	*83.0*	*872.1*	*83.4*
Self-Production & Distributed Generation	**TWh**	**%**	**TWh**	**%**	**TWh**	**%**
Biomass	32.6	4.3	38.2	4.2	43.1	4.1
Solar	40.9	5.4	60.8	6.7	76.5	7.3
Wind	0.1	0.0	0.6	0.1	1.3	0.1
Hydropower	4.2	0.6	5.1	0.6	5.8	0.6
Non-renewables	37.4	4.9	49.3	5.4	46.4	4.4
Subtotal	*115.2*	*15.2*	*154.0*	*17.0*	*173.2*	*16.6*
Total	**758.9**	**100**	**904.7**	**100**	**1,045.3**	**100**

Sources: EPE-PDE 2034

Driving Forces

The growth of Brazil's electricity sector in 2023 was driven by a combination of regulatory reforms, infrastructure investments, government-backed energy planning, and private sector participation. The expansion resulted from long-term policies, including the Decennial Energy Expansion Plan (PDE 2034) and the New Growth Acceleration Programme (Novo PAC), alongside the evolution of energy auctions and increased private investment in concessions. These initiatives shaped the country's generation capacity, market structure and investment flows, ensuring a more diversified and resilient energy mix. The PDE 2034 projected that Brazil's power generation installed capacity will reach 331 GW by 2034, with 254 GW connected to the National Interconnected System (SIN), 19 GW from self-production and 59 GW from distributed generation. Renewables will continue leading the expansion, reaching 85% of the energy mix, with biomass, wind and solar expected to see significant growth. The Novo PAC complemented these efforts, facilitating BRL 97.9bn in power generation investments, with 24 GW in new capacity. Additionally, BRL 92.4bn was allocated to transmission expansion, which will add 200,000 km of new transmission lines by 2026, ensuring that the grid can support the growing share of renewables.

The expansion of Brazil's energy market was also supported by energy auctions, particularly in the Regulated Contracting Environment (ACR), where five auctions were held between July 2023 and December 2024, securing 37.3 TWh for BRL 6.1bn, significantly higher than the 13.1 TWh contracted in 2022. Meanwhile, the Free Contracting Environment (ACL) continued its liberalisation, attracting an increasing number of large consumers. By 2023, the number of free market commercial consumers had surged to 25,000, compared to just 39 in 2004, reflecting the growing demand for competitive and renewable energy contracts among businesses. This shift was particularly evident in commercial sectors such as data centres, shopping malls and hotels, which actively sought lower-cost and cleaner energy sources. Concession renewals further strengthened market dynamics, with several long-term contracts renegotiated to improve regulatory stability. The privatisation of Eletrobras, which had diluted the federal government's stake from 61.69% to 36.99% in 2022, continued to reshape the industry, enabling the company to focus on hydroelectric, wind and transmission projects, while divesting non-core assets.

Regulatory advancements provided additional momentum for the sector's expansion. New net metering rules for distributed generation maintained investment incentives for small-scale solar photovoltaic (PV) projects, particularly among residential and commercial electricity consumers. The taxation of distributed energy resources was revised to preserve the economic viability of solar systems, contributing to continued adoption in 2023. Additionally, new policies supporting hybrid energy projects—where solar and wind farms operate together—helped reduce intermittency issues and improve grid reliability. Auctions for new transmission lines ensured that renewable generation hubs, particularly in the Northeast, could be integrated into the SIN, reinforcing Brazil's commitment to expanding its clean energy infrastructure.

Another critical factor was the rising energy demand in 2023 and 2024, influenced by climatic conditions and post-pandemic economic recovery. In 2023, Brazil experienced higher-than-average temperatures, leading to increased electricity consumption, particularly in the residential and commercial sectors. The commercial sector, which accounted for 18% of total electricity consumption in 2023, recorded one of the fastest growth rates, driven by the expansion of businesses, higher consumer spending, and reclassification of commercial users. Additionally, the rapid expansion of data centres, which tripled electricity consumption between 2021 and 2023, further contributed to demand growth. The Luz para Todos (Light for All) programme, which expands electricity access to remote areas, contributed to increased energy consumption, particularly in the Northeast and Amazon regions, where thousands of new connections were established in 2023.

Restraining Forces

Despite impressive growth in renewable energy generation, the dominance of hydropower continues to be a critical vulnerability. In 2023, hydroelectric plants accounted for nearly 50% of installed capacity, making the sector highly dependent on rainfall patterns. However, droughts and low reservoir levels in key regions, particularly in the Southeast and Northeast, limited hydropower output, increasing reliance on thermoelectric and imported energy during periods of water scarcity. Hydropower's dominance not only presents operational challenges, but also exacerbates socio-environmental tensions. Large-scale hydro projects require significant land use, frequently leading to deforestation, biodiversity loss and community displacement. Social resistance to new hydropower projects, particularly in the Amazon region, has grown as concerns over indigenous rights, deforestation and local ecosystems gain prominence. These environmental and social pressures make it increasingly difficult to develop new large-scale hydroelectric projects, limiting future expansion potential.

Another major constraint is the increasing frequency of transmission network disruptions, including wildfires and extreme weather events that compromise infrastructure. In August 2023, one of the most severe incidents occurred when a nationwide blackout affected 23,000 MW of power supply across 25

states and the Federal District, leading to a complete outage in the North subsystem. The Analysis Report on Disturbances (RAP) identified voltage control failures at multiple solar and wind plants near the 500 kV Quixadá–Fortaleza II transmission line in Ceará as a key trigger. This event highlighted systemic vulnerabilities in grid stability, transmission planning and operational security as Brazil transitions towards an increasingly decentralised and intermittent renewable energy mix.

The regulatory framework and permitting processes also pose significant barriers to the sector's expansion. While the government has promoted auctions and concessions, bureaucratic delays in environmental licensing for new generation and transmission projects remain a key bottleneck. Large-scale hydroelectric, wind and solar projects continue to face complex and time-consuming permitting procedures, particularly in areas with socio-environmental concerns. Public opposition and legal challenges related to the displacement of indigenous and rural communities, as well as ecological impacts, have delayed several major infrastructure projects. The licensing and approval timelines for new energy projects remain lengthy, often increasing investment risks and discouraging private sector participation in large-scale initiatives.

Sources

ABEEolica, ABSOLAR, Agencia Brasil, ANEEL, BCB, Chief of Staff's Office, CCEE, CMSE, CNPE, EPE, Government of Brazil, IHA, IRENA, MME, ONS, UN Comtrade

Sector in Focus

Main Economic Indicators

Name	2018	2019	2020	2021	2022	2023	2024
GDP, current prices, BRL bn	7,004.1	7,389.1	7,609.6	9,012.1	10,079.7	10,943.3	11,744.7
GDP, constant prices, y/y change, %	1.8	1.2	-3.3	4.8	3.0	3.2	3.4
GDP Per Capita, current prices, USD	9,278.2	9,008.2	7,054.4	7,950.8	9,255.2	10,349.8	10,247.3
Electricity, Gas and Water GVA, current prices, B...	171.4	190.9	209.1	221.0	211.6	242.6	264.0
Electricity, Gas and Water GVA, constant prices, ...	3.7	2.6	-1.0	1.5	10.5	5.8	3.6
Electricity, Gas and Water GVA, current prices, ...	2.4	2.6	2.7	2.5	2.1	2.2	2.2
Extended National Consumer Price Index (IPCA)...	3.7	4.3	4.5	10.1	5.8	4.6	4.8
IPCA: Ytd: Brazil: Housing: Fuel and Energy: Resi...			9.1	21.2	-19.0	9.5	-0.4
Unemployment Rate, period-end, %	11.7	11.1	14.2	11.1	7.9	7.4	6.2
SELIC Monetary Policy Rate, period-end, %	6.5	4.5	2.0	9.3	13.8	11.8	12.3
Exchange Rate USD/BRL, period-end	3.9	4.0	5.2	5.6	5.2	4.8	6.2
Electric Energy Trade Balance, USD mn	-1,784.0	-1,533.7	-1,507.7	-2,853.3	-1,109.9	-504.3	-848.4
Electric Energy Exports, USD mn	0.0	0.0	2.0	21.6	343.9	554.4	192.7
Electric Energy Imports, USD mn	1,784.0	1,533.7	1,509.6	2,875.0	1,453.7	1,058.7	1,041.1
Total FDI Equity Capital Inflow, USD mn	46,185.9	48,951.2	32,869.2	39,386.2	43,590.5	39,147.1	34,772.4
FDI Equity Capital Inflow in Electricity, Gas and ...	2,494.6	4,984.5	1,873.4	2,215.3	3,519.1	3,669.4	3,800.1
FDI Equity Capital Inflow in Electricity, Gas and ...	5.4	10.2	5.7	5.6	8.1	9.4	10.9

Sources: CEIC, IBGE, BCB, SECINT,COMEXSTAT

Main Sector Indicators

Name	2019	2020	2021	2022	2023	2024
Installed Power Generation Capacity, GW	172.28	179.50	190.57	206.45	225.95	
Power Generation, thou GWh	626.32	621.22	656.11	677.16	708.12	
Hydropower Generation, thou GWh	397.88	396.38	362.82	427.11	426.00	
Hydropower Generation, % of total	63.53	63.81	55.30	63.07	60.16	
Wind Power Generation, thou GWh	55.99	57.05	72.29	81.63	95.80	
Wind Power Generation, % of total	8.94	9.18	11.02	12.05	13.53	
Thermal Power Generation, thou GWh	83.36	74.02	122.69	57.38	53.40	
Thermal Power Generation, % of total	13.31	11.91	18.70	8.47	7.54	
Biomass Power Generation, thou GWh	52.11	55.61	51.71	51.78	53.85	
Biomass Power Generation, % of total	8.32	8.95	7.88	7.65	7.61	
Solar Power Generation, thou GWh	6.65	10.72	16.75	30.13	50.63	
Solar Power Generation, % of total	1.06	1.73	2.55	4.45	7.15	
Nuclear Power Generation, thou GWh	16.13	14.05	14.70	14.56	14.50	
Nuclear Power Generation, % of total	2.58	2.26	2.24	2.15	2.05	
Power Consumption, thou GWh	484.63	476.58	502.47	509.41	531.88	560.23
Industrial Power Consumption, thou GWh	168.12	166.44	182.14	184.48	188.53	197.56
Residential Power Consumption, thou GWh	142.41	148.17	151.25	152.77	164.73	176.43
Commercial Sector Power Consumption, thou GWh	92.08	82.52	87.79	92.50	97.91	103.01
Other Sectors Power Consumption, thou GWh	82.03	79.45	81.29	79.66	80.70	83.23
Number of Employees in Electric Power Sector, thou, period-end		125.25	127.04	126.98	129.28	132.18
Number of Employees in Electric Power Sector, % of total		0.32	0.30	0.29	0.28	0.28

Sources: CEIC, EPE, CAGED

Installed Capacity

The year 2023 marked a significant milestone in Brazil's installed electricity capacity expansion, with a record 19,501 MW increase—the largest annual growth recorded by the Energy Research Company (EPE) since its inception in 2004. By the end of the year, Brazil's total installed capacity reached 225,952 MW, with 87.3% derived from renewable sources. According to the National Electrical System Operator (ONS), the National Interconnected System (SIN) accounted for 215,991 MW, with an expansion of 16,173 MW in 2023, reinforcing the dominance of centralised generation assets. Meanwhile, distributed generation grew by 3,328 MW, reaching a total of 26,627 MW, driven by solar photovoltaic (PV) systems.

The expansion was primarily led by wind and solar power, which added 4.9 GW and 13.4 GW, respectively, while biomass thermoelectric plants contributed 196.7 MW. Fossil fuel-based thermoelectric plants and hydroelectric plants saw more modest additions of 788.7 MW and 2.4 MW, respectively. Regionally, the Northeast recorded the highest increase, with 8,912 MW added (+16.9% y/y), particularly in Bahia (3,072 MW; a 20.1% y/y increase) and Rio Grande do Norte (2,473 MW; 30.6% y/y increase), reflecting strong investment in wind and solar capacity. In the Southeast, Minas Gerais recorded the largest absolute growth, with an increase of 3,165 MW (or by 16.2% y/y), mainly from utility-scale solar plants. The distributed generation segment saw exponential growth in states such as Espírito Santo (102.5% y/y), Alagoas (101.3% y/y) and Amapá (100% y/y), driven by regulatory incentives, particularly the Net Metering framework, which has encouraged the residential and commercial adoption of small-scale solar PV systems.

An important structural shift observed in 2023 was the divergence in installed capacity growth across regions, highlighting the changing role of hydroelectricity and the growing reliance on wind and solar energy. Historically, Brazil's electric energy sector was heavily reliant on hydro plants, which still accounted for approximately half of installed capacity in 2023. However, the recent slowdown in hydro expansions (only 2.4 MW added in 2023) and the shift towards wind and solar reflect growing concerns over hydrological risks, climate variability and seasonal droughts, which have affected reservoir levels in previous years. The states with the largest hydroelectric shares in Brazil—Pará (22.4 GW, 20.3% of total hydro capacity), Paraná (15.7 GW, 14.2%), and São Paulo (14.9 GW, 13.5%)—recorded the lowest annual growth rates of total installed capacity in 2023, at 1.5% y/y, 3.9% y/y, and 5.8% y/y, respectively.

Installed Capacity by Source,* December 2023

Energy Source		Number of Plants**	Installed Capacity, MW	Share of Total	y/y change
Hydropower		1,321	109,922	48.6%	0.1%
Solar		18,499	37,843	16.7%	54.8%
Fossil	Natural Gas	180	18,260	8.1%	4.7%
	Petroleum	2,183	7,271	3.2%	1.2%
	Coal	21	3,086	1.4%	-3.7%
	Others (including thermal GD)	4	2,419	1.1%	3.8%
Wind		1,101	28,682	12.7%	20.7%
Biomass		643	16,479	7.3%	1.2%

Nuclear	2	1,990	0.9%	0.0%
Total	**23,954**	**225,952**	**100%**	**10.9%**

* Includes distributed generation (GD) that is independent of the National Interlinked System (SIN).

** In operation by December 2024

Sources: CEIC, EPE

Electricity Price

The electricity tariff, as defined by the Ministry of Mines and Energy (MME), encompasses various calculated components representing investments, technical operations and necessary infrastructure within the energy production chain, enabling consumer access. It embodies all the generation, transmission, distribution and commercialisation stages, including charges related to public policies. Taxes and additional fees are itemised in the electricity bill, which displays the final rate defined by ANEEL, alongside non-inclusive taxes.

In 2023, Brazil recorded an average electricity tariff of BRL 643.3 per MWh. Residential consumers experienced a 0.5% y/y average increase in their electricity tariff, while the overall average rose by 1.1% y/y, as consumer price inflation (according to the IPCA) stood at 4.3% in 2023. According to ABRACEEL, in 2023, electricity tariff adjustments varied significantly across different distribution companies, reflecting regional cost structures, regulatory revisions and market conditions. Among the distributors with the highest residential tariff increases, Equatorial Alagoas (Equatorial AL) led with a 15.4% y/y rise, followed by Equatorial Piauí (Equatorial PI) with a 14.9% y/y increase and CEMIG with a 14.7% y/y increase. These adjustments were primarily driven by higher transmission costs, inflation adjustments and the pass-through of power purchase agreements. Conversely, some distributors experienced tariff reductions, notably CEEE Equatorial (by 1.9% y/y), Enel São Paulo (1.1% y/y) and Energisa Tocantins (0.8% y/y), reflecting cost efficiency measures, regulatory decisions or reduced energy procurement costs.

Brazil's electricity sector in 2024 faces a challenging outlook, driven by deteriorating hydrological conditions, increased reliance on thermoelectric generation and rising electricity costs. After 26 consecutive months of the green tariff flag, the yellow flag was activated in July 2024, signalling a shift towards higher energy costs due to below-average rainfall projections (50% below historical levels) and above-average winter temperatures, which increased electricity demand. The situation worsened in September 2024, when Red Flag Level 2 was implemented for the first time since August 2021, further elevating electricity costs with a surcharge of BRL 7.877 per 100 kWh consumed. This escalation was driven by reduced hydroelectric reservoir inflows and rising short-term electricity market prices (PLD), leading to greater thermoelectric output, which is costlier and has a higher environmental impact.

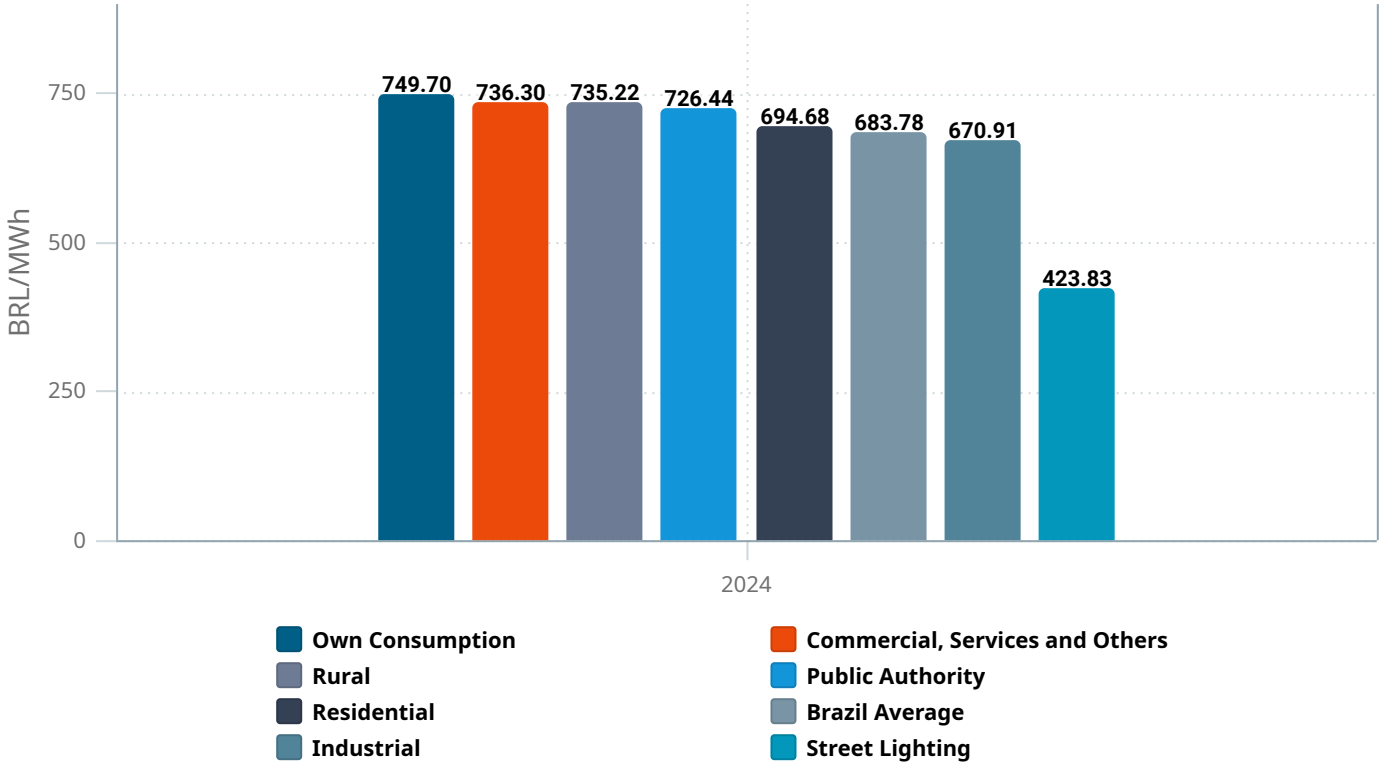
Average Electricity Price,* BRL/MWh

* Annual average excluding taxes

Name	2019	2020	2021	2022	2023	2024	2025
North	585.97	566.33	641.99	680.16	728.15	779.62	770.65
Central-West	526.66	517.21	618.81	671.59	697.02	753.77	764.08
Southeast	522.09	527.01	618.73	646.49	652.94	693.47	687.74
Brazil	511.77	510.57	603.56	633.57	643.30	683.78	677.13
Northeast	477.98	478.30	568.59	611.10	617.46	650.62	640.47
South	488.91	480.97	583.49	588.20	586.70	622.73	616.58

Sources: CEIC, ANEEL

Average Annual Electricity Price by End User,* BRL/MWh, 2024



Sources: CEIC, ANEEL

Global Positioning

In 2023, Brazil reinforced its position as South America's renewable energy leader, achieving an installed capacity of 194,085 MW from renewable sources. This placed Brazil third globally, with a 5% share of global capacity, trailing only China (1,453,701 MW) and the US (385,205 MW), according to the International Renewable Energy Agency (IRENA). This achievement reflects Brazil's diverse energy portfolio, led by hydropower and supported by the rapid expansion of wind and solar installations. Brazil retained its position as the world's second-largest hydropower market and climbed to seventh place for wind capacity, with 29.1 GW, just behind the UK (30.2 GW). Additionally, it ranked sixth for solar capacity, with 37.4 GW, following India (73.1 GW).

According to IRENA, Brazil's total electricity generation in 2023 reached 710.0 TWh, a 4.8% y/y increase, with renewable sources contributing 640.2 TWh, representing an impressive 90% share of total generation. Notably, Brazil moved up to sixth place globally in power generation, surpassing Canada, driven by a

robust compound annual growth rate (CAGR) of 2.5% between 2012 and 2023. These milestones highlight Brazil's continued progress in leveraging its renewable energy potential and solidifying its leadership in the global energy transition.

Leading Countries by Power Generation, 2023

Ranking	Country	Electricity Generation, TWh	y/y change	Share of Global Total Production
1	China	9,456.4	6.9%	31.6%
2	United States	4,494.0	-1.0%	15.0%
3	India	1,958.2	7.0%	6.5%
4	Russia	1,178.2	1.0%	3.9%
5	Japan	1,013.3	-2.6%	3.4%
6	**Brazil**	**710.0**	**4.8%**	**2.4%**
7	Canada	633.2	-3.9%	2.1%
8	South Korea	617.9	-1.1%	2.1%
9	France	519.7	11.4%	1.7%
10	Germany	513.7	-11.1%	1.7%
-	Others	8,830.1	1.4%	29.6%
-	**Total**	**29,924.8**	**2.5%**	**100.0%**

Sources: CEIC, Energy Institute

Power Generation in South and Central America, 2023

Ranking	Country	Electricity Generation, TWh	y/y change	Share of Global Total Production
1	**Brazil**	**710.0**	**4.8%**	**4.9%**
2	Argentina	146.4	0.6%	2.4%
3	Colombia	93.8	4.9%	0.5%
4	Chile	88.2	0.2%	0.3%
5	Venezuela	85.7	-2.2%	0.3%
6	Other Caribbean	84.5	6.7%	0.3%

7	Other South America	83.3	11.1%	0.3%
8	Central America	65.2	3.5%	0.3%
9	Peru	62.0	3.9%	0.2%
10	Ecuador	35.3	7.1%	0.2%
11	Trinidad & Tobago	9.7	-0.7%	0.1%
-	**Total**	**1464.5**	**4.0%**	**4.9%**

Sources: CEIC, Energy Institute

Top Ten Countries by Installed Renewable Energy Capacity, 2023

Ranking	Country	Installed Capacity, MW	Share of total
1	China	1,453,701	37.6%
2	United States	385,205	10.0%
3	**Brazil**	**194,085**	**5.0%**
4	India	175,934	4.6%
5	Germany	166,939	4.3%
6	Japan	128,782	3.3%
7	Canada	108,718	2.8%
8	Spain	80,136	2.1%
9	France	67,916	1.8%
10	Italy	65,157	1.7%
-	**World**	**3,864,522**	**100%**

Sources: CEIC, IRENA

External Trade

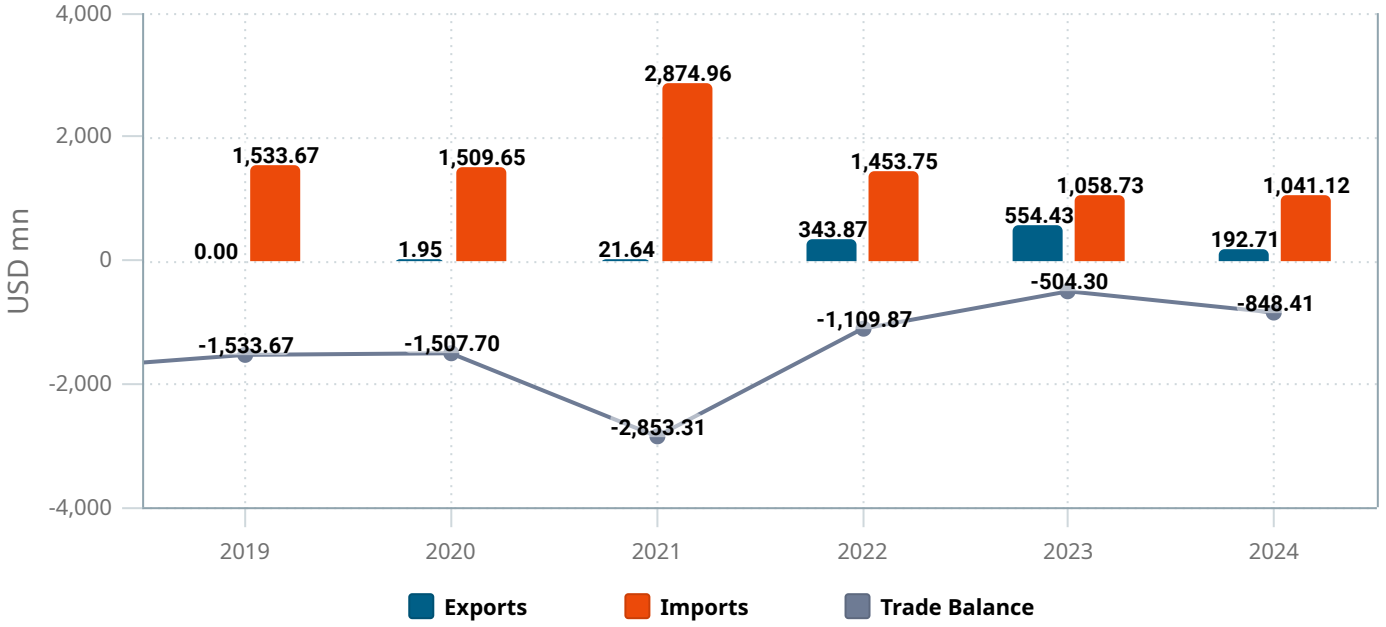
Between 2017 and 2021, Brazil relied on energy imports from neighbouring countries to meet domestic demand due to unfavourable hydrological and generation conditions. However, in 2023, improved hydrology and the growth of alternative generation sources enabled Brazil to transition into a net energy exporter. This shift was facilitated by the implementation of the Export of Turbinable Spill Programme (Exportação de Vertimento Turbinável, EVT) that was launched in October 2022 by the MME through Decree 49/2022. This programme aims to commercialise surplus hydropower generation with Argentina and Uruguay, optimising the use of excess water from hydroelectric plants. The first competitive procedure took place in January 2023, and these procedures are operationalised daily based on analyses and price calculations by the National Electric System Operator (ONS) and the Electric Energy Commercialization Chamber (CCEE). In 2023, the programme successfully exported a total of 4,279.80 GWh, with 3,282.15 GWh going to Argentina and 997.64 GWh to Uruguay. In 2023, Brazil exported 8,225 GWh of total electricity (a rise of 141.1% y/y), more than doubling the exports reported in 2022, while imports totalled 5,679 GWh (up by 12.1% y/y). However, the trade balance remained negative in monetary terms, as exports were valued at USD 554mn, whereas imports amounted to USD 1,058mn. Argentina was the main

electricity buyer, increasing its purchases from 3,411 GWh in 2022 (USD 343mn) to 6,841 GWh in 2023 (USD 457mn), reflecting a +100.6% y/y increase in demand. Paraguay remained Brazil's primary electricity supplier, mainly through the Itaipu Dam, with imports from Paraguay increasing from 5,062 GWh in 2022 to 5,674 GWh in 2023 (+12.1% y/y).

In 2024, Brazil experienced a decline in electricity exports compared to 2023, which was mainly caused by lower-than-average rainfall. Since hydropower accounts for a significant share of Brazil's electricity supply, the decrease in water availability limited the surplus energy available for export. Additionally, domestic electricity consumption increased by 5.3% y/y in 2024. This surge in demand, driven by economic growth and higher usage of cooling systems during warmer periods, further reduced the amount of electricity that could be exported.

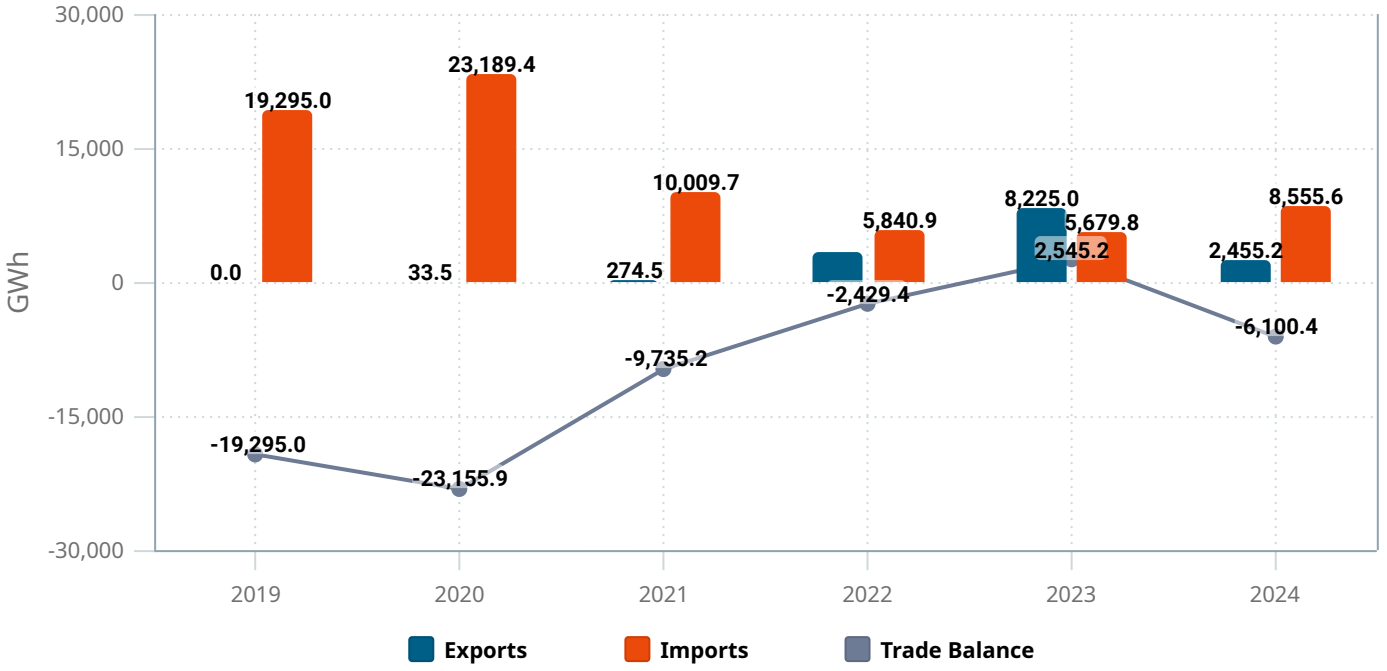
External Trade in Electricity,* USD mn

* HS code: 271600



Sources: CEIC, SECINT,COMEXSTAT

External Trade in Electricity, GWh



Sources: CEIC, UN Comtrade

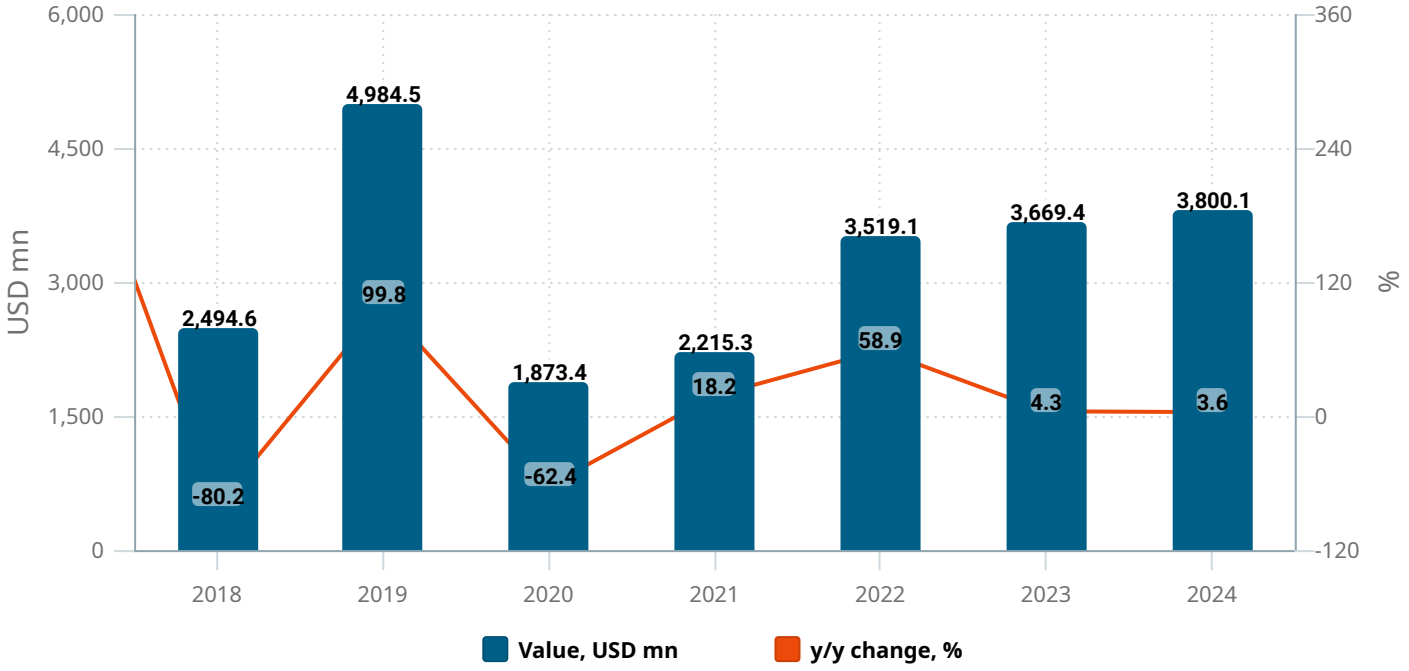
Foreign Direct Investment

In 2023, foreign direct investment (FDI) equity capital inflows into the electricity, gas and utilities sector increased by 4.3% y/y to reach USD 3.7bn, although this remained below historically higher figures. Geopolitical factors continue to influence FDI flows, given the sector's regulatory intricacies. The established presence of influential incumbents in Brazil's electric power industry, both domestic and foreign, limits opportunities for new entrants. Brazil's electricity sector attracted significant FDI, particularly in renewable energy and infrastructure projects. One of the largest deals was TotalEnergies' acquisition of Total Eren SA in July 2023, valued at USD 4.2bn. This French investment reinforced TotalEnergies' presence in Brazil's wind and solar segments, supporting the country's renewable energy expansion. Another major transaction was Statkraft AS (Norway) acquiring Enerfin SA in November 2023, for USD 1.96bn, strengthening Norway's role in Brazil's wind power market. Additionally, BP PLC (UK) expanded its stake in BP Bunge Bioenergia SA, acquiring 50% of the company for USD 1.4bn in June 2024, reinforcing its position in biofuels and ethanol production.

In 2024, FDI into the sector rose for a third consecutive year, reaching USD 3.8bn, an increase of 3.6% and reaching a share of almost 11% of the total FDI inflow.

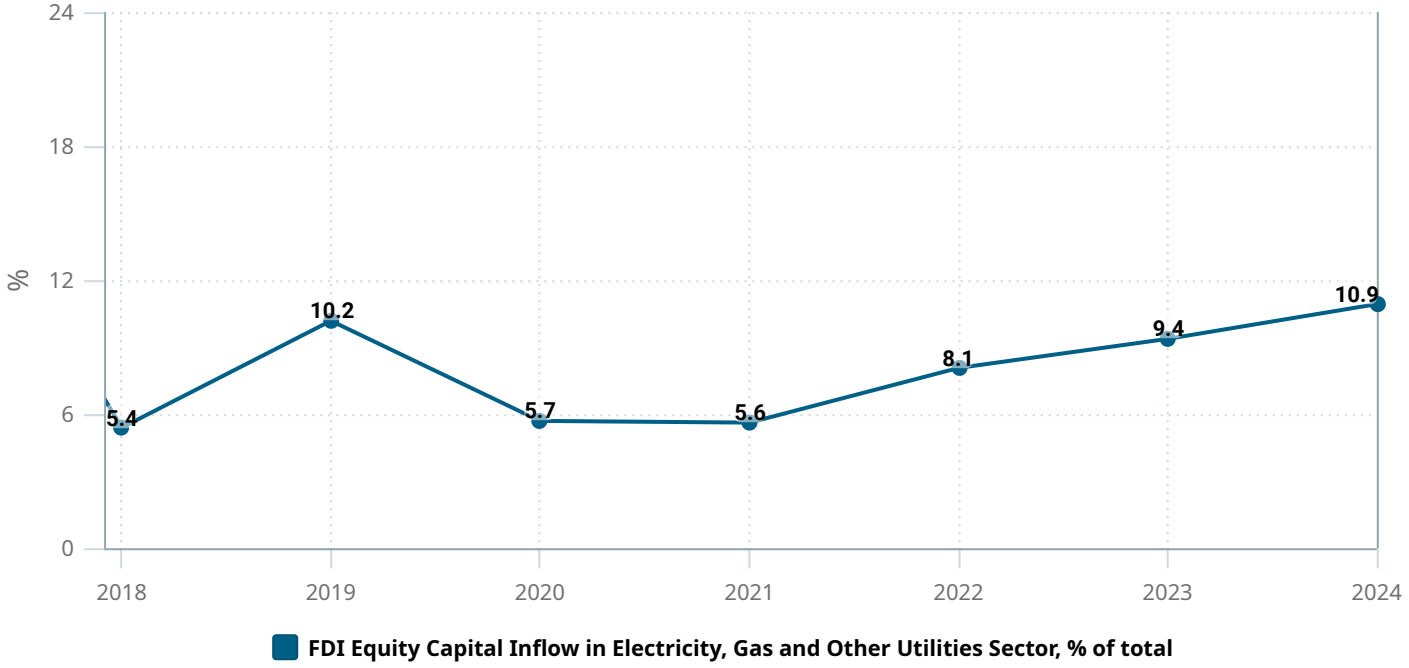
As reported by the Electric Energy Commercialisation Chamber (CCEE), between July 2023 and December 2024, Brazil conducted five existing energy generation auctions, securing 37.3 TWh for BRL 6.1bn, a sharp increase from 13.1 TWh contracted in 2022. The December 2023 auctions (30th and 31st, A-1 & A-2) secured 751 MW on average, generating BRL 234.5mn in savings, while the December 2024 auctions (32nd and 33rd, A-1 & A-2) contracted a 2,130.3 MW average, delivering BRL 1.15bn in savings. However, the 34th auction (A-3) failed to attract bidders, reflecting limited market interest in long-term procurement contracts. Meanwhile, Brazil's transmission auctions continued their strong performance, with three auctions held between December 2023 and September 2024, attracting BRL 43.25bn in investments. These projects covered over 11,700 km of transmission lines and 20,000 MVA of substation capacity, securing cost reductions of up to 48.9% below ceiling prices.

FDI Equity Capital Inflow in Electricity, Gas and Other Utilities Sector



Sources: CEIC, BCB

FDI Equity Capital Inflow in Electricity, Gas and Other Utilities Sector, share of total, %



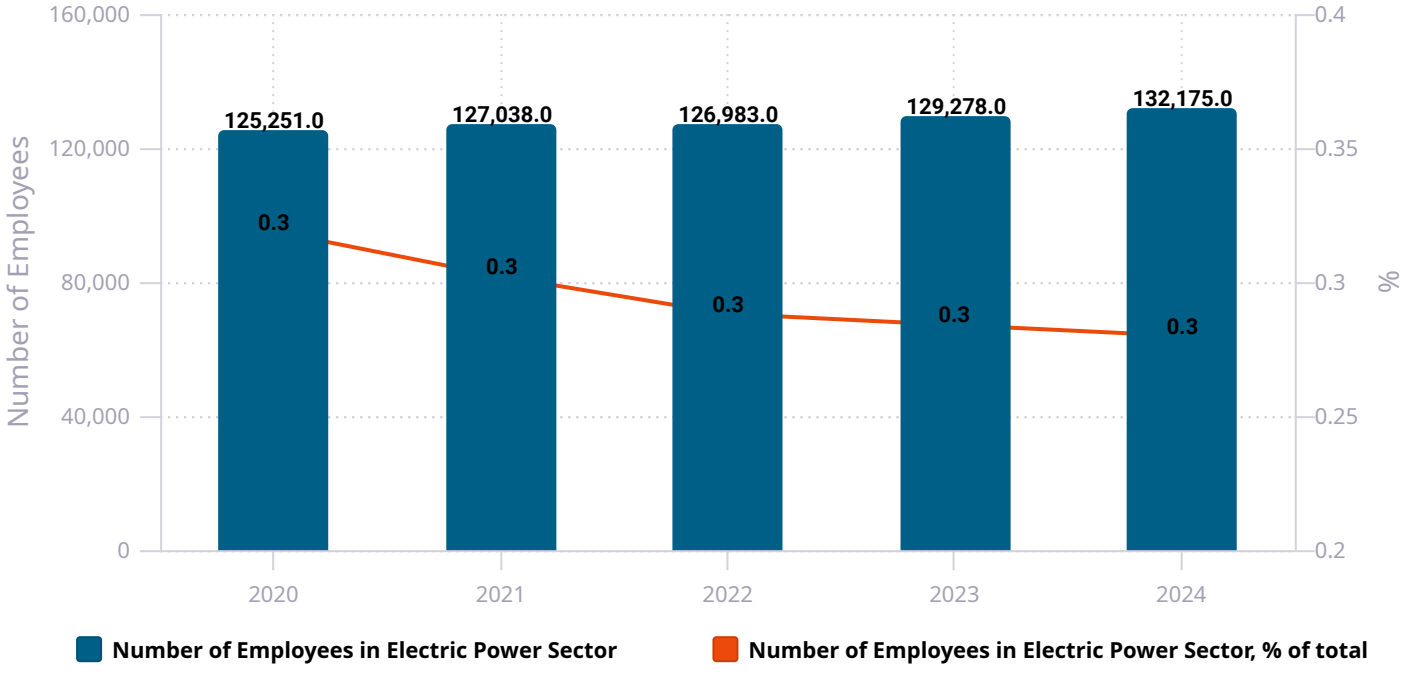
Sources: CEIC, BCB

Enterprises and Employment

As of December 2023, the Brazilian electric power sector comprised 2,649 companies, according to the Energy Research Company (EPE). The vast majority of these entities (72.2%) functioned as independent power producers (IPPs). Power distributors, despite constituting a smaller proportion (3%) of the total enterprises, employed the largest workforce, with 75,072 individuals as of the end of 2024 (57% of all employees in the sector). According to the New General Registry of Employed and Unemployed (Novo CAGED), in December 2024, total employment in the sector increased by 2.4% y/y, to 132,175 employees, compared to 129,278 in 2022.

The trend highlights an ongoing structural shift in employment, with jobs gradually transitioning away from fossil fuel-related segments towards the construction and development of renewable energy projects, particularly in solar and wind power. The expansion of renewable energy capacity, driven by government incentives and private sector investments, has led to increased demand for specialised labour in areas such as solar panel and wind turbine installation, grid integration and energy storage solutions. In 2023, Brazil's renewable energy sector employed approximately 1.57mn direct jobs, a 12.1% y/y increase from 1.4mn jobs in 2022, according to IRENA. Solar (264,000 jobs; +7% y/y) and wind (80,300 jobs; +19% y/y) drove this growth, while hydropower, traditionally the largest employer, saw a slowdown due to reduced net additions—dropping from 343 MW in 2022 to approximately 100 MW in 2023. As a result, direct jobs in hydropower decreased by 16% y/y, from 194,000 to 177,300. The country installed 13.5 GW of new solar photovoltaic and nearly 5 GW of wind capacity, but it remains a net importer of renewable energy products, particularly solar panels. Despite workforce expansion, gender disparities persist, with women holding only 20% of photovoltaic system integrator jobs and just 2% of assembly and installation roles.

Number of Employees in Electric Power Sector



Sources: CEIC, CAGED

Number of Employees in Electric Power Sector by Sub-sector, December 2024

Subsector	Employees	Share
Power Distribution	75,072	56.80%
Power Generation	35,139	26.50%
Power Transmission	17,774	13.50%
Electricity Trade	4,190	3.20%
Total	132,175	100%

Sources: CEIC, CAGED/MTE

Number of Enterprises in Electric Power Sector by Type

Type	2018	2019	2020	2021	2022	2023
Independent Power Producers	1,201	1,259	1,400	1,538	1,705	1,914
Electricity Trading Companies	270	341	397	456	491	517
Self-Producers	69	75	77	83	94	102
Power Distribution Companies	45	47	47	53	70	77
Public Service Power Generation Concessionaires	46	45	43	44	43	39
Total	**1,631**	**1,767**	**1,964**	**2,174**	**2,403**	**2,649**

Sources: CEIC, EPE

Sources

ABRACEEL, Agencia Brasil, ANEEL, BCB, CAGED/MTE, CCEE, Chief of Staff's Office, ComexStat/MDIC, Energy Institute, EPE, IBGE, IRENA, MME, ONS, SECINT, UN Comtrade

Competitive Landscape

Highlights

Overview

The Brazilian electricity sector is divided into two primary segments: the Regulated Contracting Environment (ACR) and the Free Contracting Environment (ACL). In the regulated market (ACR), electricity supply is primarily managed by distribution companies, which provide electricity to residential and small business consumers. ACR contracts are typically long-term agreements established through government-led auctions, ensuring price stability and supply reliability. For example, contracts in the Northeast region often source electricity from large hydroelectric plants like those managed by Chesf, a subsidiary of Eletrobras, ensuring consistent service to smaller urban and rural areas. The ACR primarily caters to residential customers, small businesses and small-scale industries, offering them regulated tariffs set by the National Electric Energy Agency (ANEEL). This ensures stable pricing, but it limits flexibility for individual contract negotiation.

In contrast, the free market (ACL) provides greater flexibility and appeals to large-scale industrial and commercial consumers, such as mining operations in Minas Gerais or large manufacturers in São Paulo. These consumers negotiate direct contracts with power generators or commercialisation companies, tailoring agreements to suit their specific operational needs. For instance, companies operating in the ACL often procure energy from renewable sources, such as wind farms in the Northeast or solar projects in Goiás, enabling them to meet sustainability goals while benefitting from competitive pricing. Additionally, independent power producers (IPPs) play a crucial role in the ACL, supplying energy directly to industrial clusters or high-demand commercial clients. The flexibility of the ACL allows companies to choose energy sources, optimise costs and align with environmental, social and governance (ESG) objectives, making it an attractive option for energy-intensive sectors such as metallurgy, agribusiness and logistics. Ultimately, the choice between the ACR and ACL depends on a company's energy consumption profile, its geographical location and strategic priorities, with each segment offering distinct advantages in terms of costs, sustainability and operational control.

Market Structure

The Brazilian electricity sector has undergone a significant transformation, particularly in 2023, as the market shifted towards greater decentralisation. In previous years, the National System Operator (ONS) primarily managed a small number of large agents, which controlled most of the country's energy assets. However, the market now consists of hundreds of independent providers, fostering a more decentralised and competitive landscape. This transition has been driven by regulatory changes, increased investment in distributed generation and the growing adoption of renewable energy sources. A key driver of this transformation has been the expansion of the Free Contracting Environment (ACL), which continues to gain ground over the Regulated Contracting Environment (ACR). The ACL has experienced rapid growth, with a significant increase in industrial, commercial and large-scale consumers opting for direct energy contracts with generators rather than relying on traditional distribution companies. This trend has been particularly pronounced in the renewable energy segment, where wind and solar producers are increasingly selling power through long-term private contracts, rather than participating in government-led auctions under the ACR. One of the most notable changes in 2024 was the rise of independent power producers (IPPs), particularly solar and wind generators that are not connected to the National Interconnected System (SIN). These producers operate in isolated grids or supply large consumers directly,

bypassing the central transmission network. This shift is further accelerating the growth of the ACL, reinforcing its role as a key market segment for new energy investments.

Main Players

The Brazilian electricity sector is shaped by several key players, each with a strong presence in generation, transmission and distribution. Raízen, a major integrated energy company, operates across bioenergy, ethanol, fuel distribution and renewable energy. As Brazil's largest ethanol producer, it has expanded its solar energy portfolio, particularly through long-term private energy contracts in the Free Contracting Environment (ACL), while also investing in biogas and second-generation ethanol projects to reinforce its low-carbon energy strategy. Neoenergia, a subsidiary of Spain's Iberdrola, remains one of Brazil's largest integrated electricity providers, operating across 18 states in generation, transmission, distribution and commercialisation. The company has increased its wind and solar capacity, particularly in the Northeast region, where it manages some of Brazil's largest renewable energy projects, and it continues to expand its transmission infrastructure with new concessions awarded in 2024. CPFL Energia, controlled by State Grid Brazil, the local subsidiary of China's State Grid, is a major transmission and distribution operator, managing over 69,000 km of transmission lines. The company continues to expand its hydropower and wind portfolio, while investing in smart grids, digitalisation and distributed generation solutions to improve efficiency and adapt to the rising demand for decentralised energy among industrial and commercial consumers. Eletrobras, Latin America's largest electricity company by installed capacity, at 44.2 GW as of September 2024, holds a dominant position in Brazil's transmission segment, operating 37.5% of the country's high-voltage lines. Following its privatisation in 2022, Eletrobras has divested its gas-fired and coal assets, aligning with its commitment to achieve net-zero emissions by 2030, while increasing its stake in strategic hydroelectric projects to consolidate its leadership in clean energy generation. CEMIG, one of Brazil's largest electricity distribution companies, served over 9.2mn consumers across 774 municipalities by the end of 2023, primarily in Minas Gerais state. The company operates 83 generation assets, including hydropower, wind and solar plants, with an installed capacity of 5.1 GW, and is expanding its solar distributed generation investments, alongside strengthening its transmission infrastructure to enhance system resilience and accommodate growing energy demand.

Market Entries

Between July 2023 and December 2024, 109 deals took place in the Brazilian electric power sector for a disclosed combined value of USD 20.8bn. In July 2023, TotalEnergies SE acquired a 70.8% stake in Total Eren SA for USD 4.21bn, gaining renewable assets across South America (Brazil's 292 MW Pirapora Solar and Argentina's wind projects), Eastern Europe (Ukraine's solar parks and Bulgaria's wind farms), Africa (Egypt's 500 MW Benban Solar Park and Morocco's wind farms), and Asia (India's 450 MW Karnataka Solar and Vietnamese offshore wind). The deal added 3.5 GW to TotalEnergies' renewable portfolio, with a pipeline exceeding 20 GW. Similarly, Equinor ASA (Norway) strengthened its renewable energy portfolio with the acquisition of Rio Energy Projetos de Energia Ltda for USD 738.89mn in the same month. In August 2023, Copel conducted a landmark secondary public offering (SPO), raising USD 1.06bn for a 21.16% stake. This transaction marked a significant step in Copel's history, generating substantial investor interest. Other key market movements include Statkraft AS (Norway) acquiring Spanish wind energy producer Enerfin SA for USD 1.96bn in November 2023, further consolidating its presence in renewable energy generation, and Engie Brasil and Engie SA purchasing five solar power plants for USD 645.84mn in October 2023, bolstering their solar energy footprint. Additionally, Actis LLP (UK) acquired two transmission assets for USD 535.01mn in November 2023, reflecting the ongoing appeal of Brazil's transmission segment. In 2024, renewable energy continued to attract interest. In April 2024, Trustee

Distribuidora acquired a 39% stake in Emae SA for USD 197.99mn, and Ivi Energia SA and Brookfield Asset Management Inc purchased a portfolio of 41 solar energy plants for USD 119.97mn in March 2024.

Among the most significant M&A announcements in 2024, Vibra Energia SA announced on August 21, 2024, its plan to acquire a 50% stake in Comerc Energia SA for USD 1.73bn, aiming to strengthen its position in energy commercialisation. In June 2024, BP PLC (UK) disclosed its intention to acquire a 50% minority stake in BP Bunge Bioenergia SA for USD 1.4bn, highlighting its commitment to Brazil's bioenergy sector. Additionally, on June 10, 2024, J&F Investimentos SA revealed plans to acquire a portfolio of thermoelectric generation assets for USD 654.8mn, marking a strategic move into thermoelectric power generation.

Top Ten Companies by Installed Capacity, MW, Dec 2024

Ranking	Company	Installed Capacity, MW	Market Share
1	Norte Energia SA	11,233.1	5.3%
2	São Francisco Hydroelectric Company (Eletrobras CHESF)	10,456.9	5.0%
3	Northern Brazil Electric Utilities (Eletrobras Eletronorte)	9,246.6	4.4%
4	Brazilian Electric Utilities (Eletrobras)	7,561.2	3.6%
5	Itaipu Binacional	7,000.0	3.3%
6	Paraná River	4,995.2	2.4%
7	Petrobras	4,910.1	2.3%
8	Jirau	3,750.0	1.8%
9	Engie Brazil	3,619.0	1.7%
10	Santo Antonio	3,568.0	1.7%
-	Others	144,208.1	68.5%
-	Total	210,548.0	100.0%

Sources: CEIC, ANEEL

Top Ten Companies by Power Distribution Revenue, Jan-Sep 2024

Ranking	Company	Distribution Revenue, BRL mn
1	Cemig	19,055.54
2	Eletropaulo	14,977.99
3	Copel	12,583.51
4	Coelba	11,664.00
5	CPFL	11,358.42
6	Light	10,022.01
7	Equatorial PA	7,876.36

8	Elektro	6,881.00
9	ENEL CE	6,197.68
10	CELPE	6,012.00

Sources: CEIC, EMIS Company Database, Companies' Financial Statements

Top Ten Power Distribution Companies by Consumer Units, Sep 2024

Ranking	Company	Consumer Units	Market Share
1	Cemig	9,835,494	10.93%
2	Eletropaulo	8,234,376	9.15%
3	Coelba	6,359,992	7.07%
4	Copel	5,224,635	5.81%
5	CPFL	4,669,674	5.19%
6	Light	4,490,356	4.99%
7	Celpe	4,037,670	4.49%
8	Enel	3,669,240	4.08%
9	Celg	3,130,138	3.48%
10	Celesc	3,041,851	3.38%
-	Others	37,258,453	41.42%
-	Total	89,951,879	100.0%

Sources: CEIC, ANEEL

Top Companies by Total Operating Revenue,* 2023

Ranking	Company	Main Activities	Total Revenue, 2023, BRL mn	Total Revenue, 2023, y/y change	Total Assets, 2023, BRL mn
1	Raizen Energia**	Sugarcane Manufacturing; Biomass Electric Power Generation; Basic Chemical Manufacturing	67,112.96	-14.45%	95,357.89
2	Neoenergia	Fossil Fuel Electric Power Generation; Hydroelectric Power Generation; Management of Companies and Enterprises; Electric Power Transmission, Control and Distribution	44,342.00	3.6%	99,112.00

3	Equatorial Energia	Management of Companies and Enterprises; Electric Power Transmission, Control and Distribution	40,985.08	51.1%	103,643.45
4	Centrais Eletricas Brasileiras (Eletrobras)	Management of Companies and Enterprises; Electric Power Transmission, Control and Distribution	40,351.92	9.1%	267,057.65
5	CPFL Energia	Management of Companies and Enterprises; Electric Power Generation, Transmission and Distribution	40,061.90	0.5%	74,971.23
6	Companhia Energetica de Minas Gerais (Cemig)	Wind Electric Power Generation; Fossil Fuel Electric Power Generation; Hydroelectric Power Generation; Electric Power Transmission, Control and Distribution	37,282.26	5.4%	55,000.08
7	Cemig Distribuicao	Electric Power Distribution; Power and Communication Line and Related Structures Construction	23,348.44	11.6%	27,582.57
8	Companhia Paranaense de Energia Eletrica (Copel)	Wind Electric Power Generation; Fossil Fuel Electric Power Generation; Hydroelectric Power Generation; Management of Companies and Enterprises; Power and Communication Line and Related Structures Construction; Electric Power Transmission, Control and Distribution	21,881.46	-2.7%	21,831.13
9	Metropolitana Eletricidade de Sao Paulo (Eletropaulo)	Electric Power Distribution; Management of Companies and Enterprises; Office Administrative Services	19,256.70	1.3%	28,630.90
10	Rede Energia Participacoes	Electric Power Transmission, Control and Distribution; Electric Power Distribution	16,145.75	6.6%	27,652.72

* NAICS code: 2211; ** The financial year for Raizen Energia runs from April to March. The presented results refer to FY 2024, which ended in March 2024.

Sources: CEIC, EMIS Company Database, Companies' Financial Statements

Main Players

Raizen Energia

Raízen, a Brazilian integrated energy company, operates in multiple sectors, including sugar and ethanol production, fuel distribution, renewable energy and lubricants. Established in 2011 as a joint venture between Cosan and Royal Dutch Shell, it has grown into one of the world's leading sugarcane and ethanol producers. Over the years, Raízen expanded its infrastructure, achieving key milestones such as the inauguration of its ethanol pipeline and debut bond issuances. In 2018, the company entered the Argentinian market by acquiring Shell's assets, reinforcing its regional footprint. In 2019, Raízen demonstrated its commitment to renewable energy by launching its first solar energy plant in Piracicaba, São Paulo state. The company went public in August 2021 on the B3 Stock Exchange, raising BRL 6.9bn through its IPO.

By 2024, Raízen was Brazil's second-largest fuel distributor, operating a vast energy infrastructure, including 35 bioenergy parks, over 8,000 Shell-branded service stations and more than 70 fuel distribution terminals. In the fiscal year 2023/2024 (April 2023 to March 2024), Raízen reported a 10% y/y decline in net revenue to BRL 220.5bn and a 67% drop in adjusted net profit to BRL 1.3bn, driven by a 31% collapse in ethanol prices (falling from 3,481/m^3 to BRL 2,388/m^3) and a 2% rise in agro-industrial costs. The renewables segment's EBITDA plunged 62% due to weak biofuel margins, although this was partially offset by a resilient performance in the sugar segment.

Among recent developments, Raízen has pursued asset divestments and capital market transactions to optimise its portfolio and strengthen its financial position. On April 22, 2024, the company agreed to sell 31 solar projects with a combined 114.4 MWp (Megawatt peak) capacity to Elis Energia, a company controlled by the Brazilian Patria Investimentos, for USD 134.5mn, with payments made as the projects are developed and built by Raízen and transferred to the buyer by December 2025. Additionally, on September 13, 2024, Raízen Fuels Finance, a subsidiary of Raízen, issued USD 1bn in green bonds, maturing in January 2035 at a 5.7% annual interest rate, to refinance debt and fund selected sustainable investments under its Green Financing Framework. On December 20, 2024, it also closed the sale of another 31 distributed solar plants with a combined 128 MWp capacity to Brasol, a Brazilian energy company, for USD 76.2mn, with payments extending until March 2027. In the same market notice, Raízen announced a renegotiation of terms related to a November 2021 agreement involving its acquisition of a 50% stake in Barcos y Rodados (B&R), a Paraguayan fuel distributor now operating as Raízen Paraguay, for USD 130mn. The company had initially committed to paying USD 40mn at the deal's closing, with the remaining balance due in five annual instalments. As part of the new arrangement, Raízen will avoid disbursements of up to USD 54mn by November 2026 and it will gradually reduce its ownership in the subsidiary from 50% to a maximum of 27.4%.

Neoenergia

Neoenergia is a publicly traded company controlled by the Spanish energy group Iberdrola, which holds a 53.5% stake in its share capital. Operating in Brazil's electricity sector since 1997, the company is engaged in power generation, transmission, distribution and commercialisation. The company serves more than 16.5mn customers across 18 states in Brazil and the Federal District, as of December 2024. At the same time, Neoenergia had 4.4 GW of installed generation capacity, including 44 wind farms, five hydroelectric plants and two solar parks (Luzia Solar Complex), with 88% of its capacity coming from renewable sources. Additionally, it operates a 550 MW combined-cycle gas-fired power plant, Termopernambuco, located in Pernambuco. As for transmission, it had 13 assets in operation, totalling 3,287 km of lines, with five more under construction that will add 5,320 km upon completion.

For 2023, Neoenergia reported a net profit of BRL 4.46bn, down by 5.4% y/y compared to BRL 4.72bn in 2022. Total revenues increased by 3.6% y/y to BRL 44.3bn, reflecting a resilient sales performance despite market volatility. However, the costs of goods and services rose by 9.9% y/y, to BRL 28.8bn, which exerted pressure on margins and contributed to the decline in profitability. EBITDA totalled BRL 11.69bn, contracting by 2.8% y/y, reflecting higher operational expenses despite revenue growth.

On February 5, 2025, the French utility EDF (Électricité de France) acquired a 70% stake in the Baixo Iguaçu hydroelectric plant from Neoenergia for BRL 1.43bn. The 350 MW plant, operational since 2019 following an investment of BRL 2.3bn, holds a concession valid until 2049 and it supplies electricity to approximately one million people. The sale aligns with Neoenergia's strategy to optimise its portfolio and reduce leverage, as its net debt stood at BRL 42.2bn by Q3 2024. The transaction remains subject to approvals from Brazil's Administrative Council for Economic Defense (CADE), the National Electric Energy Agency (ANEEL) and financing agents, while Copel, which retains a 30% stake in the project, holds a pre-emptive right to acquire the asset.

CPFL

CPFL Energia, a holding company established in São Paulo in 1912, has significantly evolved over the years. In 2017, State Grid Brazil Holding, a subsidiary of the Chinese state-owned State Grid, acquired shareholder control of the company with an 83.7% stake in its share capital. Since then, CPFL Energia has expanded its operations across 679 municipalities in São Paulo, Rio Grande do Sul, Paraná and Minas Gerais, servicing approximately 10.6mn consumer by the end of September 2024. For 2023, the company reported a net profit of BRL 5.54bn, rising by 6.1% y/y from BRL 5.22bn in 2022. EBITDA increased by 3.2% y/y to BRL 12.97bn, reflecting an improved operational performance. However, total revenues decreased slightly by 0.7% y/y to BRL 39.76bn, primarily due to lower energy tariffs and adjustments, while the costs of goods and services declined by 6.4% y/y to BRL 22.54bn, contributing to margin stability.

CPFL Energia derives 96% of its energy from clean and renewable sources. As of December 2024, the company had an installed generation capacity of 4.22 GW, comprising eight hydropower plants (UHEs), 49 small hydroelectric plants (PCHs), two thermoelectric plants (UTEs), 49 wind farms, four biomass plants and one solar plant. In the distribution segment, CPFL operates under four key brands—CPFL Paulista, CPFL Piratininga, CPFL Santa Cruz and RGE—covering a concession area of over 300,500 km^2 across São Paulo, Rio Grande do Sul, Paraná and Minas Gerais. By the end of 2024, CPFL held a 13% market share in total distributed energy over the past 12 months, ranking among Brazil's largest electricity distributors by volume, with 72,897 GWh supplied throughout the year.

On December 18, 2024, CPFL Energia announced plans to invest BRL 29.81bn between 2025 and 2029. The investment will be allocated as follows: BRL 24.73bn for energy distribution, BRL 3.67bn for transmission, BRL 1.02bn for generation and BRL 382mn for commercialisation and services. The highest spending will occur in 2025, with BRL 6.49bn projected, followed by BRL 6.31bn in 2026 and BRL 6.07bn in 2027. Investments are expected to decrease slightly in 2028 and 2029, with BRL 5.43bn and BRL 5.50bn, respectively. CPFL has emphasised that these projections are based on expectations and are not a guarantee of future performance.

Eletrobras

Eletrobras, or Centrais Eletricas Brasileiras, is Latin America's largest electricity sector company in terms of installed capacity and generation, boasting a rich history dating back to its inception in 1962. As of the end of 2024, the company's generating capacity represents a substantial 22% of Brazil's total installed capacity, with approximately 97% of this capacity sourced from low greenhouse gas emission sources. Furthermore, Eletrobras dominates electricity transmission in Brazil, controlling a significant 37% share (73,958km) of

total transmission lines within the National Interconnected System (SIN). In 2022, marking its 60th anniversary, Eletrobras underwent a transformative capitalisation process, resulting in the dilution of the Union's ownership stake from 61.69% to 36.99%. The privatisation, accomplished through a public offering of shares, generated BRL 33.69bn. These funds came from investors worldwide and included the participation of 370,000 Brazilian workers, who contributed a total of BRL 6bn from their Severance Guarantee Fund (FGTS) reserves.

In July 2024, Eletrobras integrated its subsidiary Furnas into the holding structure, enhancing its role in Brazil's electricity generation and transmission through its subsidiaries Eletrobras CGT Eletrosul, Chesf and Eletronorte. Eletrobras also holds controlling interests in Eletrobras Participações S.A. (Eletrobras Eletropar). The company operates a diverse portfolio of 47 hydroelectric plants, 31 wind farms, nine natural gas and coal thermoelectric plants, and one solar plant. Additionally, Eletrobras holds a 50% stake in Itaipu Binational, a major hydropower plant shared with the government of Paraguay. The company is also involved, directly or indirectly, in 81 specific purpose entities (SPEs). In operational terms, Eletrobras reached an installed capacity of 44,654.5 MW by the end of 2023, with 96% of its installed capacity from clean energy sources, representing 22% of Brazil's 199,324.6 MW total installed capacity. The company operates an extensive transmission network spanning 73,788.63 km of lines as of the end of December 2023, including 56,367.62 km under operation and maintenance (O&M) and 7,249.47 km held through equity stakes in Special Purpose Entities (SPEs). With 69,225.61 km of lines operating at 230 kV or higher, Eletrobras accounts for 37.5% of Brazil's transmission network in this voltage range. In 2023, Eletrobras reinforced its transmission portfolio by securing Lot 4 in the transmission auction conducted by ANEEL, with a 30-year concession covering 303 km of lines in Minas Gerais, aimed at expanding wind and solar energy transmission. The project entails a CAPEX of BRL 787mn and an Annual Permitted Revenue (RAP) of BRL 68.7mn. Furthermore, in March 2024, the company won four additional lots in ANEEL's transmission auction, representing total investments of BRL 5.6bn, equivalent to 30.8% of the total awarded, strengthening its strategy for portfolio diversification and revenue growth. Eletrobras reported a net profit of BRL 4.39bn for 2023, up by 20.8% y/y compared to BRL 3.64bn in 2022. However, EBITDA fell by 4.9% y/y, to BRL 16.92bn, primarily due to higher operating costs. Not revenues increased by 1.8% y/y to BRL 37.16bn, while the costs of goods and services rose by 22.3% y/y to BRL 14.52bn, exerting pressure on margins.

On December 20, 2024, Eletrobras acquired full control of Brazil's Eletronet, a national fibre-optic network operator, by purchasing the remaining 51% stake from the Brazilian company LT Bandeirante, which previously held it. Brazil's Eletropar owned the other 49% of Eletronet. The acquisition aims to generate commercial synergies by cross-selling energy and data transmission services. Eletronet operates over 17,000 km of fibre-optic network, providing high-speed IP transit and data transport services to telecoms operators, internet providers and data centres. Its network is integrated with Eletrobras' electricity transmission lines through Optical Ground Wire (OPGW) cables.

CEMIG

Founded in 1952, the Cemig Group has evolved into a conglomerate, with 62.1% of its shares controlled by the state—50.9% of ordinary shares are held by the state of Minas Gerais and the remaining 11.14% is owned by the federal government through BNDES Participações SA. Operating across 24 Brazilian states and the Federal District, the company is involved in electricity generation, transmission, distribution and commercialisation, as well as natural gas distribution. As of August 2024, Cemig's corporate structure comprises 131 companies. Within Minas Gerais, Cemig serves over 8.7mn consumers across 774 municipalities. The company is Brazil’s largest electricity supplier in the free electricity market and ranks among the country's leading electricity generation groups. Cemig holds ownership interests in 83

operational generation projects across ten states, including 60 hydroelectric plants, seven wind farms and one photovoltaic facility. In transmission, Cemig operates over 5,060 km of lines as of the end of 2023, positioning itself as one of Brazil's largest energy transmission groups. Cemig Distribuição, its distribution subsidiary, serves 97% of Minas Gerais, covering more than 9.2mn users as of the end of 2023.

CEMIG reported a net profit of BRL 5.77bn for 2023, up by 40.9% y/y from BRL 4.09bn in 2022. EBITDA increased by 23.8% y/y, to reach BRL 8.5bn, reflecting strong operational performance. Total revenues rose by 7.7% y/y to BRL 37.28bn, supported by higher energy demand and tariff adjustments. Meanwhile, costs of goods and services increased by 2.5% y/y to BRL 26.06bn, partially offsetting revenue growth, but maintaining stable margins. Total assets increased by 2.5% y/y, to reach BRL 55bn in 2023, while total liabilities decreased by 4.8% y/y to BRL 30.34bn, reflecting improved financial leverage. Shareholders' equity rose by 13.2% y/y, to BRL 24.65bn, demonstrating strong capital structure and profitability growth.

On December 28, 2024, the mixed state-owned energy company of Minas Gerais unveiled an ambitious investment plan for 2025-2029, focusing on energy storage and renewable energy growth. A key element is the development of advanced battery energy storage systems to enhance Brazil's renewable infrastructure, as the company aims to modernise its distribution and transmission networks. With a 100% renewable energy generation portfolio, following the shutdown of its Igarapé thermal plant, Cemig is also testing battery storage through a pilot project in Serra da Saudade. The BRL 39.2bn plan allocates BRL 23.2bn for network expansions and upgrades, funded in part by asset divestments, including stakes in Light (a Brazilian electricity distribution company controlled by China's State Grid) and Renova Energia (a renewable energy company from Brazil), as well as the Santo Antônio Hydroelectric Plant. Additionally, Cemig plans to develop 600 MW of large-scale solar energy projects and invest BRL 2.6bn in small-scale generation projects. The company's sustainability efforts, which have earned it a place on the Dow Jones Sustainability Index for 25 consecutive years, aim to support Brazil's decarbonisation and clean energy transition.

Top 15 M&A Deals in Brazil's Electric Power Sector,* Jul 2023 to Dec 2024

Date of Announcement	Target	Deal Type	Buyer	Country/Region of Buyer	Deal Value, USD mn	Deal Stake, %
Jul 2023	Total Eren SA	Acquisition	TotalEnergies SE	France	4,214.81 (Official)	70.8
Nov 2023	Enerfin SA	Acquisition	Statkraft AS	Norway	1,956.73 (Official)	100
Aug 2024	Comerc Energia SA	Acquisition	Vibra Energia SA	Brazil	1,727.17 (Official)	50
Jun 2024	Bp Bunge Bioenergia SA	Minority stake	BP PLC	United Kingdom	1,400 (Official)	50
Oct 2024	Amazonas Distribuidora de Energia SA	Acquisition	JandF Investimentos SA	Brazil	1,162.41 (Market est.)	n/a
Aug 2023	Companhia Paranaense de Energia (Copel)	SPO	Buyer(s) unknown	n/a	1,064.3 (Official)	21.16

Jul 2023	EDP - Energias do Brasil SA	Minority stake	EDP - Energias de Portugal SA	Portugal	900.58 (Official)	31.86
Jul 2023	Rio Energy Projetos de Energia Ltda	Acquisition	Equinor ASA	Norway	738.89 (Market est.)	100
Oct 2023	JV between Hydro Rein and Macquarie	Joint venture	Norsk Hydro ASA; Macquarie Group Ltd	Norway; Australia	665 (Official)	100
Jun 2024	Portfolio of thermoelectric generation assets	Acquisition	JandF Investimentos SA	Brazil	654.8 (Official)	100
Oct 2023	Five solar energy power plants in Brazil	Acquisition	Engie Brasil Energias Complementares Participacoes Ltda; Engie SA	Brazil; France	645.84 (Official)	100
Mar 2024	Alianca Geracao de Energia SA	Minority stake	Vale SA	Brazil	540.83 (Official)	45
Nov 2023	Two transmission assets	Acquisition	Actis LLP	United Kingdom	535.01 (Official)	100
Jul 2024	Tevisa Termeletrica Viana SA; Povoacao Energia SA; Linhares Geradora SA	Acquisition	Eneva SA	Brazil	481.51 (Official)	100
Jul 2024	Companhia de Transmissao de Energia Eletrica Paulista (CTEEP)	Open market purchase	Private investor(s)	n/a	403.63 (Official)	14.11

*NAICS code: 2211

Source: EMIS DealWatch

Main Events

- On February 18, 2025, ANEEL approved the importing of energy from Venezuela to supply the state of Roraima. Bolt Energy, a US-based company, will be responsible for supplying Boa Vista and other areas not connected to Brazil's National Interconnected System (SIN). The energy will arrive via the 230 kV Boa Vista - Santa Elena de Uairén transmission line, although the infrastructure has been unused since 2019 and is outdated. Energy imports began on February 14, but a transmission line failure caused a blackout the following day. A previous interconnection test conducted in January

We also publish

	China	India	Indonesia	Malaysia	Philippines	Thailand	Vietnam	Singapore	ASEAN	Brazil	Colombia	LatAm	Poland	Turkey	CEE	Africa
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Automotive	+	+	+	+		+			+	+	+	+	+	+	+	
Banking	+	+	+	+	+	+	+	+		+	+	+	+			+
Cement	+	+														
Chemical	+	+		+									+			
Consumer Electronics		+		+			+	+								
Consumer Goods and Retail	+	+	+		+	+	+			+	+		+			
Electric Power	+	+	+	+		+				+	+	+	+			
Food and Beverages	+	+	+	+	+	+	+		+	+	+		+		+	
Infrastructure	+	+	+	+	+	+	+		+	+	+	+	+	+	+	+
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Mining			+				+			+		+	+			+
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