

Brazil Utilities: Power Utilities Biweekly Monitor

Brazilian power consumption in the full month of August increased by 0.7% YoY. CCEE released data for power generation and consumption covering the full month of August. The data suggests the overall consumption trend is mixed, with demand increasing in the North (+7.6% YoY) and South (+1.7%), but decreasing in Southeast/Midwest (-0.2%) and Northeast (-1.1%).

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Key highlights from the biweekly data

Consumption by region

- Overall consumption trend is mixed across the regions:
 - **Southeast/Midwest** -0.2% YoY, +0.4% MoM;
 - **Northeast** -1.1% YoY, +2.2% MoM;
 - **North** +5.1% YoY, +7.6% MoM;
 - **South** -0.3% YoY, +1.7% MoM.

Consumption by industry (considering free market consumption only)

- Wood, pulp and paper (+18.4%), Services (+14.2%), and Beverages (+11.5%) had the largest increases in demand.
- Textiles (-1.8%) and Non-metallic mining (-0.8%) were the only industries with a decrease in demand.

Regulated Market vs. Free Market

- Consumption in the Regulated Market decreased -2.1% YoY, while in the Free Market it increased 5.9% YoY.
- The largest discrepancy was in the South, where Regulated Market consumption decreased by -2.3% YoY, while in the Free Market it increased by +8.6% YoY.

Our view on the sector

Brazilian Utilities are up +6.4% YTD vs. IBOV +5.7%. The sector yields a 12.8% real IRR, which equates to a ~600bps spread to Brazil sovereign bonds. We see the sector benefiting from its resilient profile in a potentially volatile year. We believe the sector enjoys cheap valuations and strong cash flow generation, that could lead to

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compelling dividend payments as well as M&A activity. With attractive valuation levels presenting opportunities in high quality names, among our Buy-rated names we highlight Energisa, Equatorial and Eletrobras, which we believe offer compelling valuation and growth potential for the next years.

What is inside this note?

Within, we highlight a number of monthly data points for the Brazilian Power Utility sector, aiming to provide investors with the key information necessary to track power generation and consumption in the country.

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CCEE released data for power generation and consumption covering the full month of August. The data suggests the overall consumption trend is mixed, with demand increasing in the North (+7.6% YoY) and South (+1.7%), but decreasing in the Southeast/Midwest (-0.2%) and Northeast (-1.1%).

The most recent data points suggest a decrease of -0.4% YoY in demand. We have been monitoring power demand data released daily by the system's operator (ONS). Per the latest data released for a workday (09/16), power consumption is down -0.4% vs September/2021 average. ([link](#))

Recent featured research

Equatorial Energia (EQL3.SA): Investor Day feedback ([link](#))

Engie Brasil SA (EGIE3.SA): Announces sale of 345MW TPP Pampa Sul, following global ESG approach ([link](#))

Brazil Utilities: Refreshing our views on listed sanitation companies ([link](#))

Copel (CPLE6.SA): Feedback from 2022 APIMEC Meeting ([link](#))

Eletrobras (ELET3.SA): PN/ON spread is below fundamentals and could widen in the short term ([link](#))

Brazil Utilities: Highlighting upcoming events for our Top-Pick stocks ([link](#))

Brazil Utilities: Updating estimates for select names ([link](#))

Eletrobras (ELET3.SA): Additional charges related to Compulsory loan liabilities ([link](#))

Brazil Utilities: BNDES to sell its stake in Energisa, and Equatorial in exclusive talks to acquire Enel GO - per press reports ([link](#))

Brazil Utilities: Lower House extends deadline for the development of projects with TUSD benefit ([link](#))

Enel Chile S.A. (ENIC): Updating estimates ([link](#))

Energias do Brasil SA (ENBR3.SA): Announces the sale of HPP Mascarenhas ([link](#))

Recent news flow on power utilities

Government cancels two more electric energy auctions. According to an article in Valor, the Ministry of Mines and Energy canceled two auctions that were scheduled to happen this year — the reserve capacity auction, scheduled for November, and the isolated systems' energy purchase auction. The cancellation of the reserve capacity auction is to give MME more time to adjust the proposal to allow different sources,

while the cancellation of the isolated system's auction was due to lack of need. Earlier this month, the Ministry had already canceled the A-6 new energy auction, previously scheduled to happen this Friday (9/16), due to lack of demand by distribution companies. ([09/15 Power Monitor](#))

ISA CTEEP announced the commercial start-up of IE Biguaçu. On September 2, in a notice to the market, ISA CTEEP announced that ONS (Brazil's Electric Energy System Operator) authorized the commercial start-up for the IE Biguaçu transmission line, more than 12 months before the deadline set by ANEEL (Brazil's National Electric Energy Agency). The line has 57km of extension and is located in the state of Santa Catarina, in the South of Brazil. The total RAP for the project is R\$49.7mn (2022/23 cycle), which is about 2% of the company's current operational RAP. We note that the commercial start-up period was in line with our estimates. ([09/05 Power Monitor](#))

Aneel approves thermoelectric auction scheduled for September 30. On August 30, Brazil's National Electric Energy Agency (ANEEL) approved the A-6 thermoelectric auction scheduled for September 30, on the back of Eletrobras' capitalization law 14.182/21, that required the implementation of 8GW of new thermal installed capacity in different regions of Brazil (1GW in Northeast, 2.5GW in North, 2.5GW in Midwest and 2GW in Southeast). The approved auction provides the initial contracting of 1GW in the North region and 1GW in the Northeast (300MW in the State of Maranhao and 700MW in Piaui). Also, there are 37 projects registered for the auction. ([08/31 Power Monitor](#))

Cemig signs supply contracts for Boa Esperanca and Jusante solar power projects. On August 23, Cemig issued a notice to the market announcing that it has signed supply contracts for Full EPC (Engineering, Procurement and Construction) with CET Brazil Transmissao de Energia Ltda., a subsidiary of State Grid, for the development of Boa Esperanca (85MW of installed capacity) and Jusante (70MW of installed capacity) solar power projects located in the State of Minas Gerais. These supply contracts have an estimated capex of around R\$824mn (R\$447mn for UFV Boa Esperanca and R\$377mn for UFV Jusante). The operational start-up of both projects are not expected to occur until September 2023. ([08/24 Power Monitor](#))

Neoenergia announced a tariff readjustment for Elektro. On August 23, Neoenergia issued a notice to the market announcing that the annual tariff readjustment for Elektro was approved by ANEEL (Brazil's National Electric Energy Agency). The average cost increase to be collected by consumers is 15.77% — 11.61% and 23.72% for low and high tension customers, respectively. As a result, Parcel B reached R\$2,655mn, increasing +9.32% yoy, mainly affected by the 10.08% accumulated inflation (IGP-M) since the last readjustment. ([08/24 Power Monitor](#))

Equatorial announced a tariff readjustment for Cemar. On August 23, Equatorial issued a notice to the market announcing that the annual tariff readjustment for Cemar was approved by ANEEL (Brazil's National Electric Energy Agency). The average cost increase to be collected by consumers is 1.62% — 1.23% and 3.68% for low and high tension customers, respectively. As a result, Parcel B reached R\$1,794mn, increasing +8.1% yoy, mainly affected by the 10.08% accumulated inflation (IGP-M) since the last readjustment. ([08/24 Power Monitor](#))

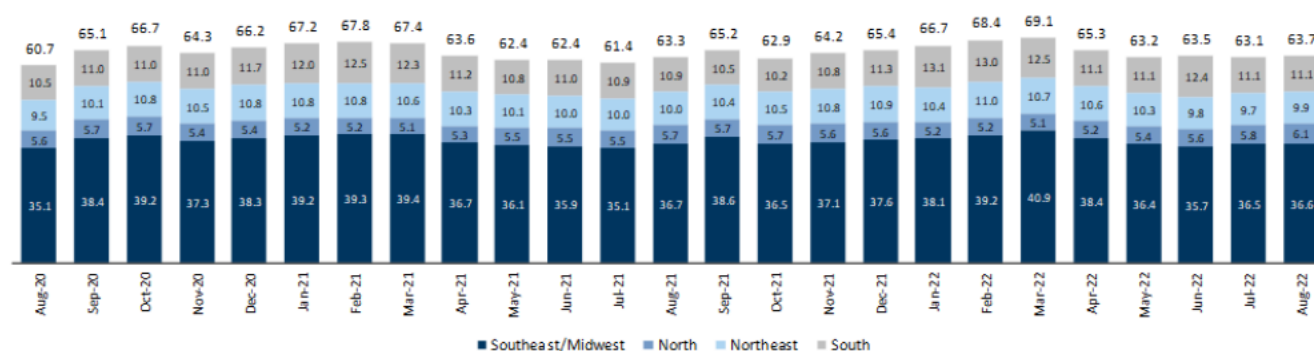
Energisa announced a tariff readjustment for EPB. On August 23, Energisa issued a notice to the market announcing that the annual tariff readjustment for Energisa Paraiba (EPB) was approved by ANEEL (Brazil's National Electric Energy Agency). The average cost increase to be collected by consumers is 1.03% — 0.34% and 3.49% for low and high tension customers, respectively. As a result, Parcel B reached R\$893mn, increasing +9.52% yoy, mainly affected by the 10.08% accumulated inflation (IGP-M) since the last readjustment. ([08/24 Power Monitor](#))

Power Consumption Data

Power consumption by region and type (regulated market/free market)

Power consumption by region. Brazilian power consumption is up +1.0% MoM (+0.7% YoY), while the Southeast/Midwest is up +0.4% MoM (-0.2% YoY), Northeast is +2.2% MoM (-1.1% YoY), North -0.3% MoM (+1.7% YoY), and South -0.3% MoM (+1.7% YoY). We note that consumption data in the report is net of technical/commercial losses.

Exhibit 2: Power consumption by region
GWavg



YoY (%)	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22
Total	4.3%	0.1%	-5.7%	0.0%	-1.2%	-0.7%	0.9%	2.5%	2.5%	1.2%	1.8%	2.7%	0.7%
Southeast/Midwest	4.4%	0.5%	-6.8%	-0.6%	-1.7%	-2.9%	-0.2%	3.6%	4.5%	0.9%	-0.4%	3.8%	-0.2%
North	2.6%	1.1%	-0.7%	3.7%	3.9%	0.6%	0.2%	-0.1%	-2.2%	-0.9%	0.9%	6.6%	7.6%
Northeast	5.7%	3.4%	-2.7%	2.8%	0.5%	-3.9%	1.8%	0.8%	2.2%	1.8%	-2.2%	-2.7%	-1.1%
South	3.7%	-4.7%	-7.3%	-2.6%	-3.3%	8.9%	4.1%	1.6%	-1.3%	2.7%	13.3%	2.2%	1.7%

Source: CCEE, Goldman Sachs Global Investment Research

Power consumption by state. Northeastern states presented the largest decrease in demand (-1.1% YoY), while Northern states had the largest increase (+7.6% YoY).

Exhibit 3: Power consumption breakdown by state

GWavg

GWavg	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	MoM	YoY
Brazil	61.4	63.3	65.2	62.9	64.2	65.4	66.7	68.4	69.1	65.3	63.2	63.5	63.1	63.7	1.0%	0.7%
Northeast	10.0	10.0	10.4	10.5	10.8	10.9	10.4	11.0	10.7	10.6	10.3	9.8	9.7	9.9	2.2%	-1.1%
AL (EQTL)	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.0%	-0.8%
BA (NEOE)	3.4	3.3	3.3	3.2	3.3	3.4	3.5	3.7	3.7	3.7	3.5	3.4	3.4	3.4	1.0%	2.6%
CE (ENEL)	1.7	1.8	1.8	1.9	1.9	1.9	1.7	1.8	1.7	1.7	1.7	1.7	1.7	1.7	4.4%	-3.4%
PB (ENGI)	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.7	2.5%	-2.1%
PE (NEOE)	1.9	1.9	2.0	2.1	2.2	2.2	2.1	2.3	2.2	2.2	2.1	1.9	1.8	1.9	0.8%	-1.3%
PI (EQTL)	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	4.8%	-5.3%
RN (NEOE)	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7	4.3%	-6.7%
SE (ENGI)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	5.2%	-2.6%
North	5.5	5.7	5.7	5.7	5.6	5.6	5.2	5.2	5.1	5.2	5.4	5.6	5.8	6.1	5.1%	7.6%
AM (Other)	1.1	1.2	1.1	1.2	1.1	1.0	1.0	1.0	1.0	1.0	1.1	1.0	1.2	1.2	4.1%	3.5%
AP (Other)	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	10.3%	-1.6%
MA (EQTL)	1.1	1.1	1.2	1.2	1.2	1.2	1.0	1.1	1.0	1.1	1.1	1.2	1.2	1.3	8.1%	15.7%
PA (EQTL)	2.8	2.8	2.8	2.8	2.8	2.9	2.7	2.6	2.6	2.6	2.7	2.8	2.9	3.0	3.2%	6.8%
TO (ENGI)	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	11.5%	7.4%
Southeast/Midwest	35.1	36.7	38.6	36.5	37.1	37.6	38.1	39.2	40.9	38.4	36.4	35.7	36.5	36.6	0.4%	-0.2%
AC* (ENGI)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	-6.0%	-3.8%
DF (Other)	0.8	0.8	0.9	0.9	0.7	0.6	0.8	0.8	0.9	0.9	0.8	0.8	0.8	0.8	5.6%	1.6%
ES (ENBR)	1.4	1.4	1.5	1.4	1.4	1.5	1.5	1.6	1.6	1.6	1.5	1.4	1.4	1.4	5.6%	1.1%
GO (ENEL)	2.1	2.2	2.4	2.2	2.1	2.1	2.0	2.1	2.2	2.3	2.2	2.2	2.2	2.2	2.2%	0.6%
MG (CMIG, ENGI)	7.4	7.4	7.7	7.3	7.3	7.3	7.1	7.3	7.7	7.6	7.5	7.5	7.5	7.5	0.4%	0.6%
MS (ENGI)	0.6	0.7	0.8	0.7	0.8	0.8	0.8	0.8	0.8	0.7	0.6	0.6	0.7	0.7	-2.3%	-4.3%
MT (ENGI)	1.2	1.3	1.4	1.3	1.2	1.2	1.2	1.3	1.3	1.3	1.2	1.2	1.3	1.4	0.6%	3.5%
RJ (LIGT, ENEL)	4.8	5.1	5.5	5.2	5.4	5.9	6.5	6.4	7.0	6.0	5.3	4.8	5.1	5.0	-2.7%	-2.5%
RO* (ENGI)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.6	0.5	-1.8%	3.6%
SP (CPFL, ENEL, ENBR, NEOE, ENGI)	16.4	17.0	17.7	16.8	17.6	17.5	17.5	18.3	18.8	17.4	16.7	16.6	16.8	16.9	0.8%	-0.3%
South	10.9	10.9	10.5	10.2	10.8	11.3	13.1	13.0	12.5	11.1	11.1	12.4	11.1	11.1	-0.3%	1.7%
PR (CPLE)	3.8	3.9	4.0	3.8	3.9	4.0	4.5	4.5	4.6	4.2	4.2	4.2	4.2	4.2	0.2%	5.7%
RS (CPFL, Other)	3.8	3.7	3.2	3.2	3.5	3.8	4.8	4.5	4.1	3.6	3.6	5.0	3.7	3.6	-2.0%	-1.5%
SC (Calesc/ENBR)	3.3	3.3	3.3	3.2	3.4	3.5	3.8	3.9	3.7	3.3	3.3	3.3	3.3	3.3	1.0%	0.5%

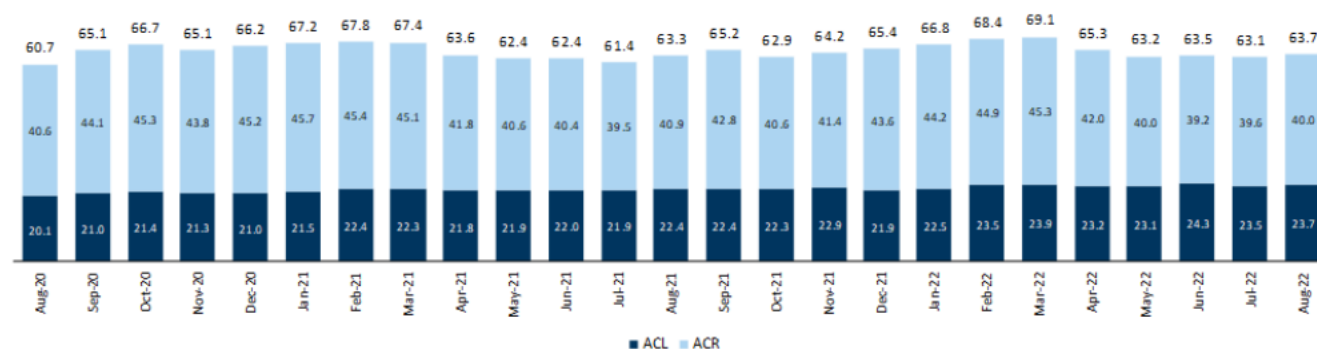
*AC and RO are geographically in the North, but they integrate the Southeast/Midwest sub-market in CCEE's classification

Source: CCEE, Goldman Sachs Global Investment Research

Power consumption by type. Regulated Market consumption is up +1.0 MoM (-2.1% YoY), and Free Market is up +1.0% MoM (+5.9% YoY).

Exhibit 4: Brazilian power consumption by type

GWavg

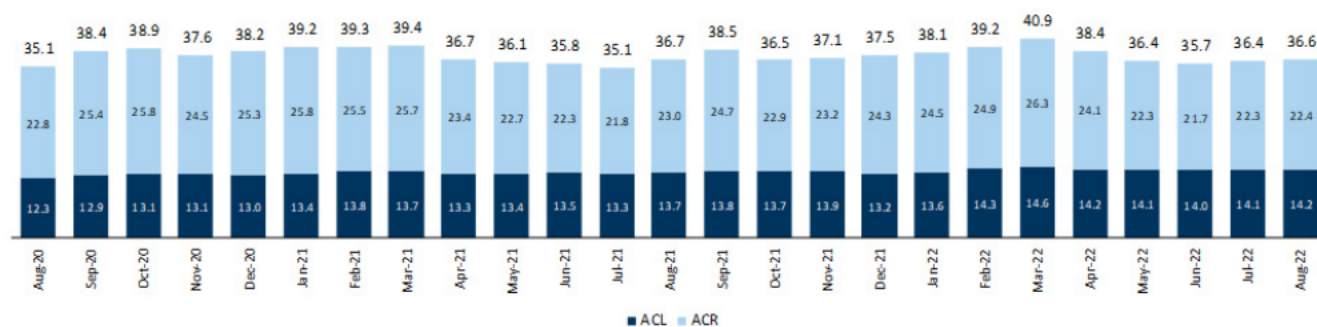


YoY (%)	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22
Total	4.3%	0.1%	-5.7%	-1.3%	-1.2%	-0.6%	0.9%	2.5%	2.5%	1.2%	1.8%	2.7%	0.7%
ACL	11.3%	6.8%	4.2%	7.2%	4.3%	4.8%	4.7%	6.9%	6.5%	5.8%	10.4%	7.1%	5.9%
ACR	0.9%	-3.1%	-10.4%	-5.5%	-3.7%	-3.2%	-1.0%	0.4%	0.4%	-1.3%	-2.9%	0.3%	-2.1%

Source: CCEE, Goldman Sachs Global Investment Research

Exhibit 5: Southeast/Midwest power consumption by type

GWavg

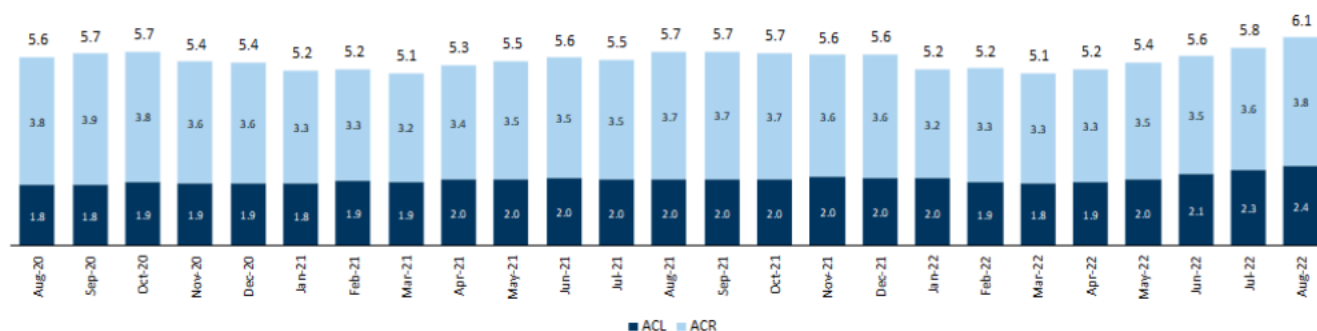


YoY (%)	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22
Total	4.4%	0.4%	-6.2%	-1.4%	-1.8%	-2.9%	-0.2%	3.7%	4.5%	0.9%	-0.4%	3.8%	-0.2%
ACL	10.7%	7.0%	4.2%	5.7%	2.0%	1.9%	3.4%	6.7%	7.1%	5.7%	3.7%	5.8%	3.7%
ACR	0.9%	-2.9%	-11.5%	-5.2%	-3.8%	-5.3%	-2.2%	2.0%	3.1%	-2.0%	-2.8%	2.6%	-2.5%

Source: CCEE, Goldman Sachs Global Investment Research

Exhibit 6: North power consumption by type

GWavg

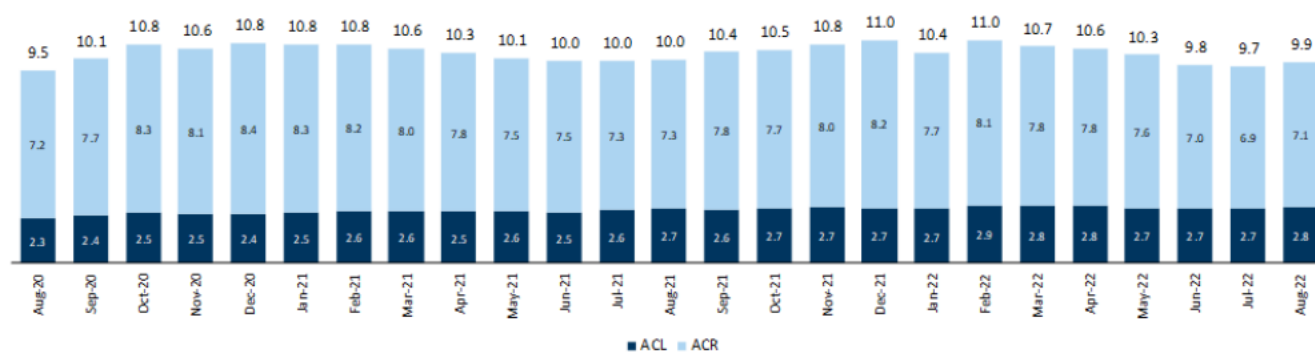


YoY (%)	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22
Total	2.6%	1.1%	-0.4%	3.5%	4.3%	1.0%	0.2%	-0.1%	-2.2%	-0.8%	0.6%	6.5%	7.6%
ACL	9.4%	9.9%	2.9%	9.2%	8.0%	8.6%	-1.3%	-2.5%	-3.6%	-0.6%	5.2%	14.3%	19.1%
ACR	-0.6%	-3.0%	-2.1%	0.6%	2.4%	-3.2%	1.2%	1.3%	-1.4%	-1.0%	-2.1%	2.2%	1.5%

Source: CCEE, Goldman Sachs Global Investment Research

Exhibit 7: Northeast power consumption by type

GWavg

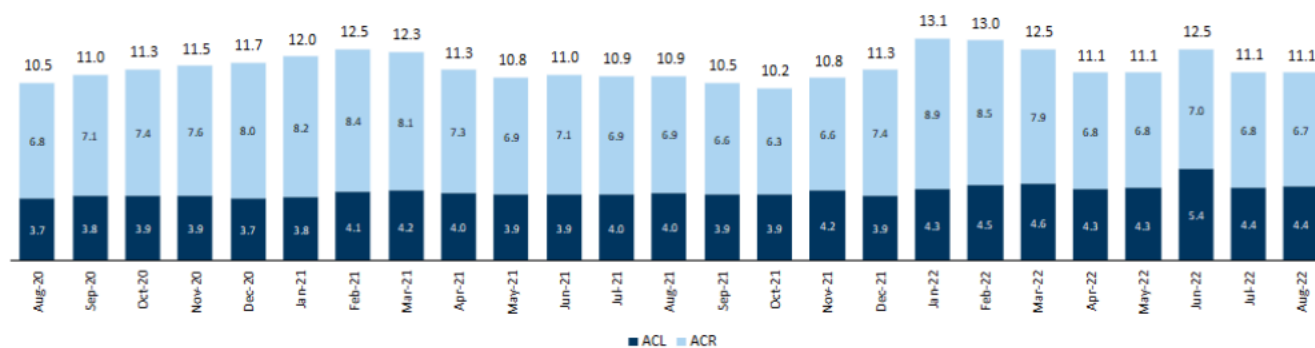


YoY (%)	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22
Total	5.7%	3.4%	-2.8%	1.9%	1.3%	-3.9%	1.8%	0.8%	2.2%	1.8%	-2.2%	-2.7%	-1.1%
ACL	19.4%	10.8%	10.0%	11.9%	11.9%	6.3%	10.4%	9.6%	10.5%	4.6%	7.8%	4.0%	3.4%
ACR	1.4%	1.1%	-6.7%	-1.1%	-1.7%	-7.0%	-0.9%	-2.1%	-0.5%	0.8%	-5.6%	-5.1%	-2.7%

Source: CCEE, Goldman Sachs Global Investment Research

Exhibit 8: South power consumption by type

GWavg



YoY (%)	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22
Total	3.8%	-4.5%	-9.5%	-6.2%	-4.0%	8.8%	4.1%	1.5%	-1.4%	2.6%	13.2%	2.2%	1.7%
ACL	9.0%	2.6%	1.0%	8.5%	5.4%	11.8%	8.6%	10.1%	7.1%	9.9%	38.1%	9.6%	8.6%
ACR	1.0%	-8.4%	-15.0%	-13.7%	-8.2%	7.5%	1.8%	-2.9%	-6.1%	-1.5%	-0.7%	-2.1%	-2.3%

Source: CCEE, Goldman Sachs Global Investment Research

Free market breakdown by industry

Free market breakdown by industry. Data for the full month of August indicates that total free market consumption has increased by +5.9% YoY (+1.0% MoM). We note that free market consumption may be affected by migration from the ACR to the ACL.

- Wood, pulp and paper (+18.4%), Services (+14.2%), and Beverages (+11.5%) had the largest increase in demand.
- Textiles (-1.8%) and Non-metallic mining (-0.8%) were the only industries with a decrease in demand.

Exhibit 9: Free market breakdown by industry

GWavg

GWavg	Jul-21	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22	MoM	YoY
Free Market	21.9	22.4	22.4	22.3	22.9	21.9	21.5	23.5	23.9	23.2	23.1	23.3	23.5	23.7	1.0%	5.9%
Metals	5.5	5.5	5.4	5.4	5.4	5.0	5.2	5.4	5.3	5.4	5.6	5.6	5.7	5.7	-0.1%	4.2%
Chemicals	2.2	2.2	2.1	2.2	2.2	2.2	2.1	2.3	2.4	2.3	2.1	2.2	2.2	2.3	1.8%	1.9%
Food	2.2	2.3	2.3	2.2	2.3	2.3	2.1	2.5	2.5	2.3	2.3	2.3	2.4	2.4	2.4%	6.8%
Non-metallic mining	2.3	2.3	2.3	2.3	2.2	2.1	2.1	2.2	2.2	2.3	2.3	2.2	2.3	2.3	-1.2%	-0.8%
Manufacturing	1.8	1.9	1.9	1.9	1.9	1.6	1.8	1.9	2.0	1.9	1.9	1.9	2.0	2.0	3.7%	7.7%
Services	1.3	1.4	1.5	1.6	1.6	1.7	1.5	1.9	1.9	1.8	1.6	1.7	1.6	1.6	1.2%	14.2%
Metallic mining	1.5	1.5	1.4	1.4	1.5	1.5	1.4	1.4	1.4	1.5	1.5	1.5	1.5	1.5	0.7%	4.3%
Wood, pulp and paper	1.3	1.4	1.4	1.4	1.6	1.5	1.3	1.5	1.6	1.6	1.6	1.6	1.6	1.6	-0.8%	18.4%
Trade	1.1	1.2	1.3	1.3	1.4	1.4	1.3	1.5	1.6	1.5	1.3	1.3	1.4	1.4	-0.5%	9.9%
Vehicles	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.9	7.2%	8.0%
Textiles	0.7	0.7	0.7	0.7	0.7	0.5	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.7	3.0%	-1.8%
Sanitation	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	1.0%	9.1%
Beverage	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	4.3%	11.5%
Transportation	0.2	0.2	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.3	0.3	-1.2%	2.0%
Telecom	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	-0.8%	3.0%

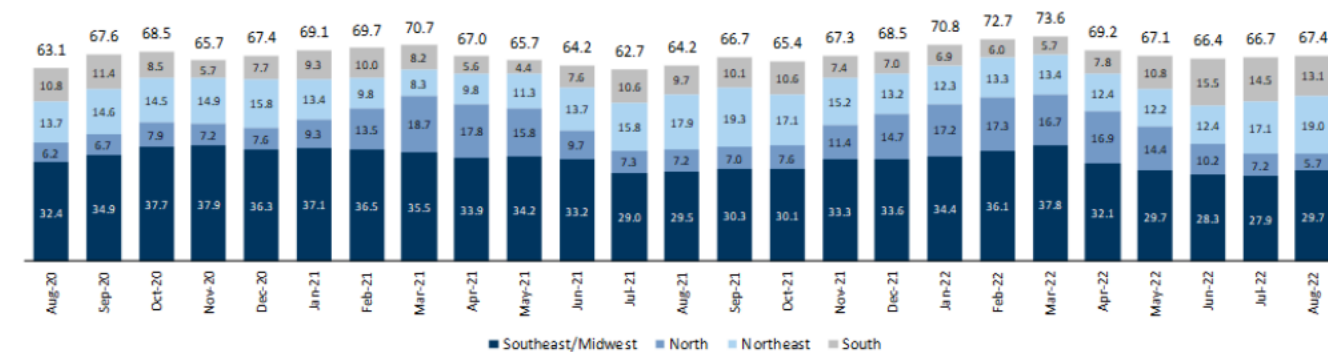
Source: CCEE, Goldman Sachs Global Investment Research

Power Generation Data

Power generation by region and source

Total power generation by region. Brazilian power generation is up +1.1% MoM (+4.9% YoY), while the Southeast/Midwest is up +6.2% MoM (+0.6% YoY), North is down -21.0% MoM (-21.3% YoY), Northeast is up +11.2% MoM (+6.4% YoY), and South is down -9.7% MoM (+34.8% YoY).

Exhibit 10: Total power generation by region
GWavg



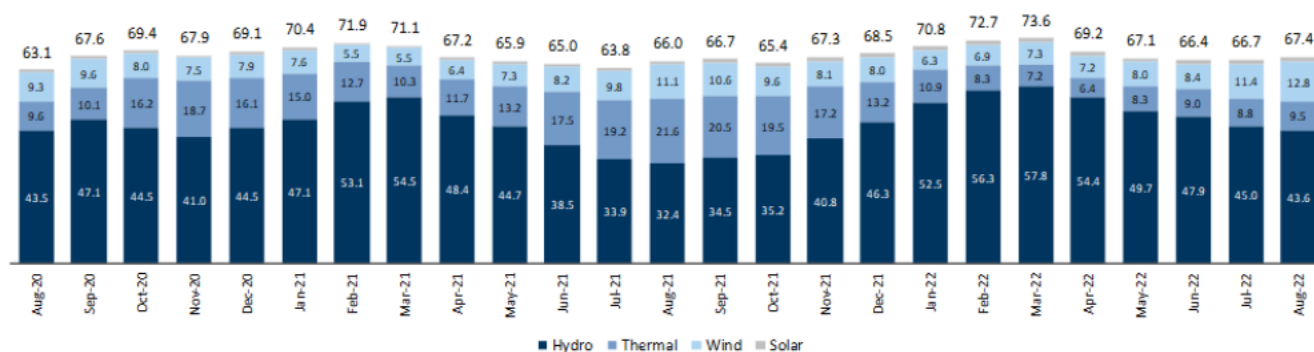
YoY (%)	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22
Total	1.8%	-1.3%	-4.5%	2.3%	1.7%	2.6%	4.3%	4.1%	3.3%	2.2%	3.5%	6.3%	4.9%
Southeast/Midwest	-8.9%	-13.2%	-20.1%	-12.3%	-7.6%	-7.1%	-1.0%	6.4%	-5.2%	-13.3%	-14.8%	-3.6%	0.6%
North	15.3%	5.5%	-3.4%	58.0%	92.3%	84.6%	28.8%	-10.6%	-4.7%	-8.7%	4.8%	-2.1%	-21.3%
Northeast	30.7%	31.9%	17.8%	2.1%	-16.1%	-8.0%	35.4%	60.9%	26.7%	8.2%	-9.2%	8.0%	6.4%
South	-10.5%	-11.5%	25.6%	30.2%	-8.2%	-25.9%	-40.2%	-30.1%	39.5%	147.5%	105.0%	36.6%	34.8%

Source: CCEE, Goldman Sachs Global Investment Research

Power generation by source. Hydro power generation is down -3.2% MoM (+34.4% YoY), thermal is up +7.1% MoM (-56.2% YoY), wind is up +11.7% MoM (+14.9% YoY) and solar is up +16.1% MoM (+82.0% YoY).

Exhibit 11: Power generation by source

GWavg



YoY (%)	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22
Total	4.6%	-1.3%	-5.8%	-0.9%	-0.9%	0.6%	1.1%	3.5%	3.0%	1.8%	2.1%	4.5%	2.1%
Hydro	-25.4%	-26.8%	-20.9%	-0.3%	4.0%	11.4%	6.1%	6.0%	12.3%	11.1%	24.5%	32.7%	34.4%
Thermal	126.1%	102.7%	19.8%	-8.1%	-17.7%	-27.0%	-35.0%	-30.2%	-44.8%	-37.2%	-49.0%	-54.0%	-56.2%
Wind	19.1%	11.3%	20.8%	7.8%	0.7%	-17.4%	25.8%	34.0%	12.4%	10.5%	1.9%	16.7%	14.9%
Solar	15.8%	41.0%	58.1%	72.7%	58.0%	60.9%	99.4%	64.5%	65.8%	52.7%	48.8%	66.6%	82.0%

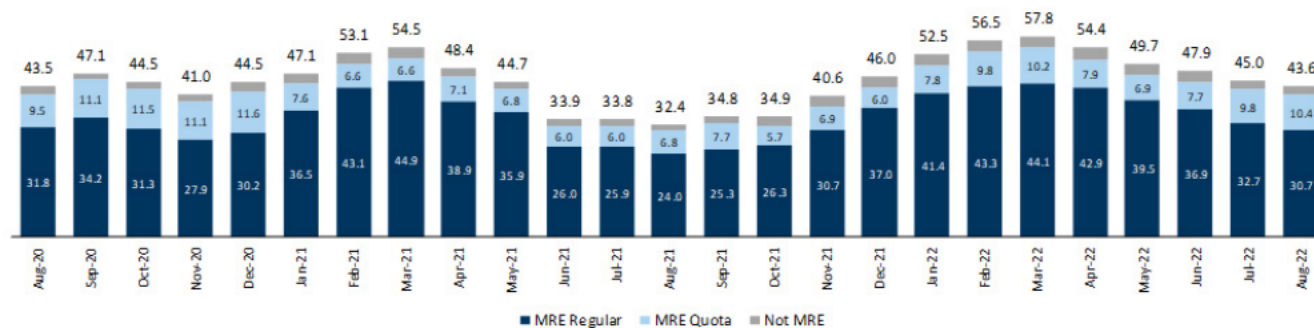
Source: CCEE, Goldman Sachs Global Investment Research

Hydro/Thermal generation by type

Hydro generation by type. According to CCEE data, regular MRE HPPs are down -6.3% MoM (+27.5% YoY), quota regime HPPs are up +5.8% MoM (+52.6% YoY) and not-MRE HPPs are up +1.7% MoM (+59.9% YoY).

Exhibit 12: Hydro generation by type

GWavg

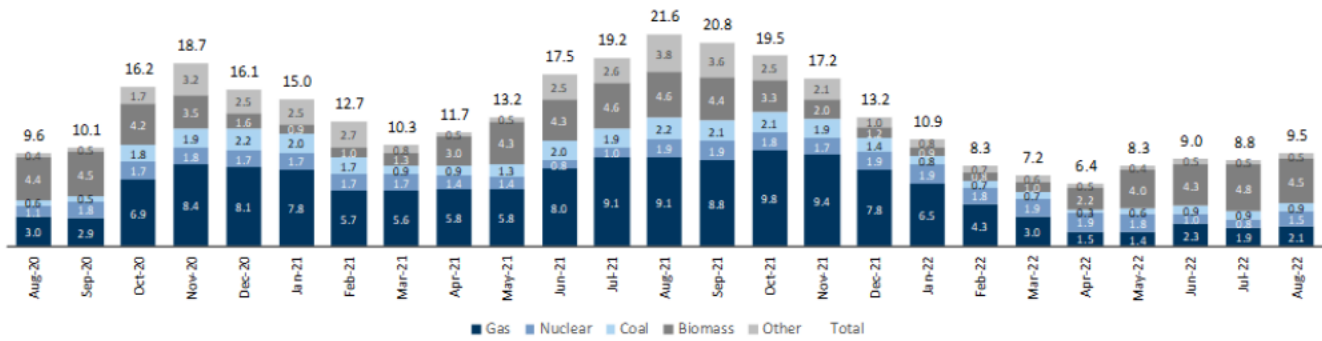


YoY (%)	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22
Total	-25.4%	-26.2%	-21.6%	-0.8%	3.5%	11.3%	6.4%	6.0%	12.3%	11.1%	41.2%	33.2%	34.4%
MRE Regular	-24.3%	-26.2%	-15.9%	10.2%	22.6%	13.5%	0.4%	-1.7%	10.1%	10.2%	42.0%	26.3%	27.5%
MRE Quota	-28.5%	-31.3%	-50.2%	-37.5%	-48.6%	3.4%	47.5%	54.8%	11.4%	1.6%	27.9%	63.7%	52.6%
Not MRE	-27.6%	4.4%	65.0%	49.6%	15.3%	5.6%	1.8%	14.3%	52.1%	57.5%	72.0%	32.0%	59.9%

Source: CCEE, Goldman Sachs Global Investment Research

Thermal generation by type. Gas TPPs are up +7.0% MoM (-77.2% YoY), nuclear TPPs are +85.3% MoM (-20.6% YoY), coal TPPs are +4.6% MoM (-59.0% YoY), biomass TPPs are -6.3% MoM (-2.8% YoY) and other TPPs are +12.1% MoM (-86.3% YoY).

Exhibit 13: Thermal generation by type
GWavg



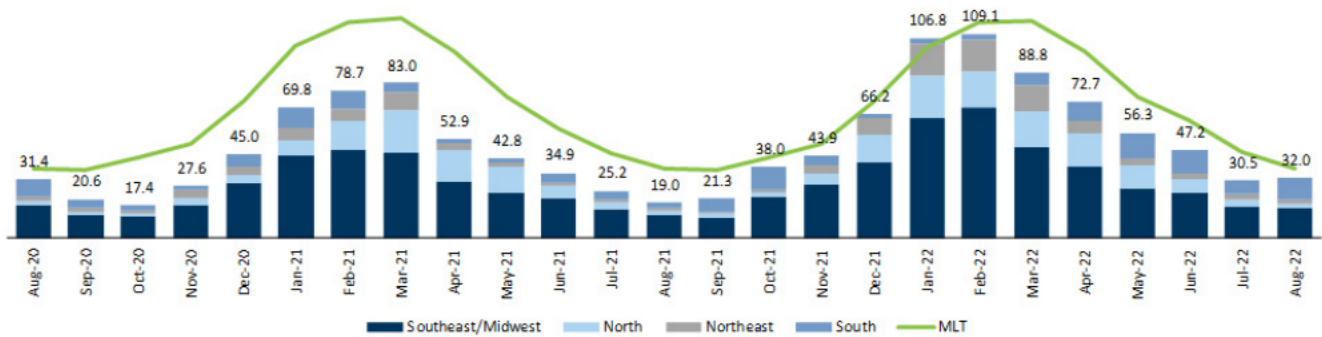
YoY (%)	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22
Total	126.1%	105.7%	19.8%	-8.1%	-17.7%	-27.0%	-35.0%	-30.2%	-44.8%	-37.2%	-49.0%	-54.0%	-56.2%
Gas	198.4%	208.6%	43.0%	11.9%	-4.0%	-17.4%	-24.6%	-46.9%	-73.7%	-75.5%	-71.3%	-78.8%	-77.2%
Nuclear	71.0%	8.0%	2.5%	-1.3%	8.1%	8.3%	2.6%	7.8%	30.0%	34.5%	28.7%	-19.2%	-20.6%
Coal	254.2%	309.1%	15.9%	2.9%	-35.3%	-56.9%	-58.8%	-24.8%	-66.4%	-53.0%	-57.3%	-54.3%	-59.0%
Biomass	5.6%	-2.6%	-21.5%	-41.7%	-25.2%	-0.5%	-14.1%	-17.2%	-24.6%	-6.5%	0.7%	2.7%	-2.8%
Other	779.9%	628.3%	50.0%	-33.7%	-60.5%	-67.8%	-74.0%	-20.9%	-3.3%	-11.1%	-79.9%	-81.9%	-86.3%

Source: CCEE, Goldman Sachs Global Investment Research

Hydrology, reservoir levels, GSF, and spot prices

Hydrology. In August, rainfall levels in the country reached 86% of the long-term August average of 37.1GWavg. We note that the rainy period in Brazil is usually between January and April, as shown in the exhibit below.

Exhibit 14: Hydrology Info - Part 1
GWavg

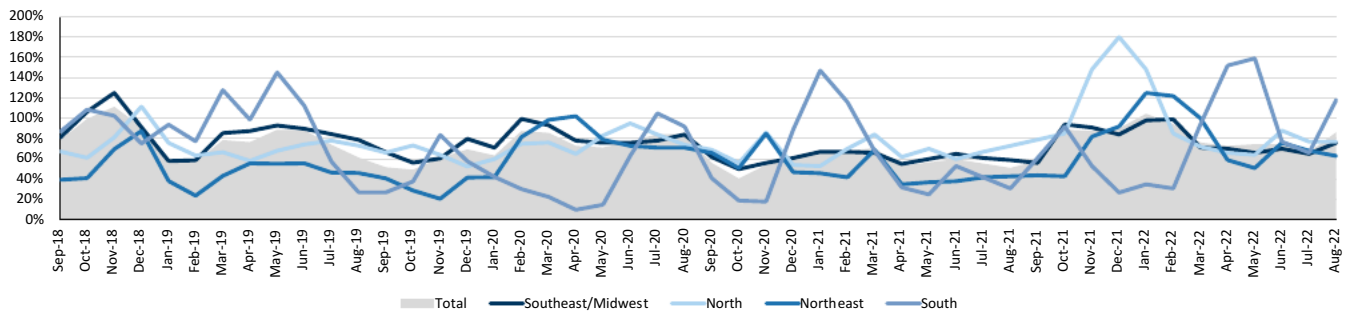


YoY (%)	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22
Total	-39.5%	3.2%	118.2%	59.4%	47.1%	53.0%	38.7%	7.0%	37.5%	31.4%	35.4%	21.0%	68.6%
Southeast/Midwest	-30.3%	-10.3%	87.8%	60.9%	37.7%	45.9%	48.4%	6.7%	27.5%	10.1%	12.8%	7.1%	29.6%
North	-1.5%	14.5%	52.7%	71.2%	229.6%	176.9%	21.5%	-15.2%	6.1%	-9.1%	15.7%	15.0%	4.6%
Northeast	-39.4%	-33.3%	-15.6%	-4.6%	96.2%	167.6%	190.3%	45.0%	71.0%	37.2%	67.1%	63.4%	47.3%
South	-66.5%	48.8%	379.6%	187.6%	-70.1%	-76.5%	-74.0%	35.5%	360.8%	530.4%	133.6%	58.4%	278.1%

Source: CCEE, ONS, Goldman Sachs Global Investment Research

Exhibit 15: Hydrology Info - Part 2

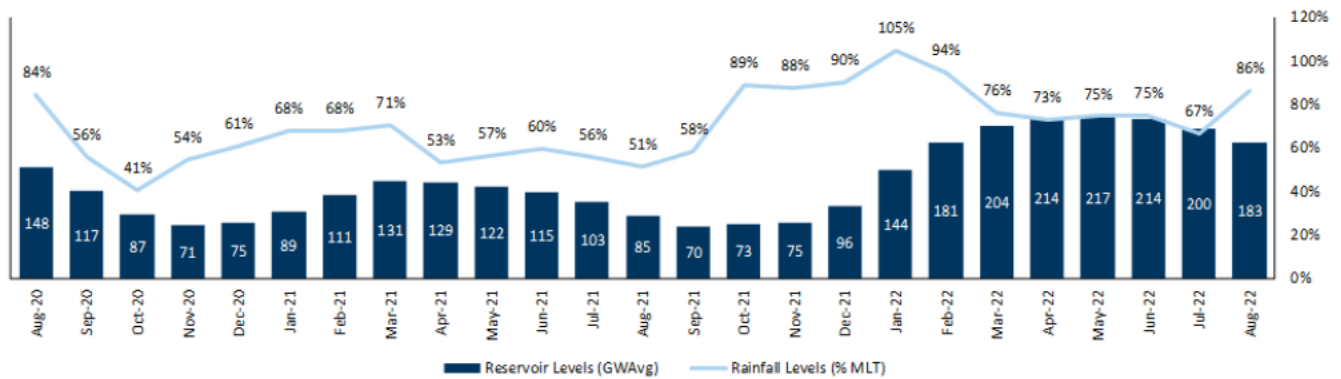
% of long-term average



Source: CCEE, ONS, Goldman Sachs Global Investment Research

Reservoir levels and spot prices. Reservoirs closed August at a 62% capacity (+113.8% YoY) and spot prices (weekly average) across the country are ~R\$77/MWh. We note that this is the consolidated figure; the country actually relies on different reservoirs that are not inter-connected (transfers are carried via power, not via water).

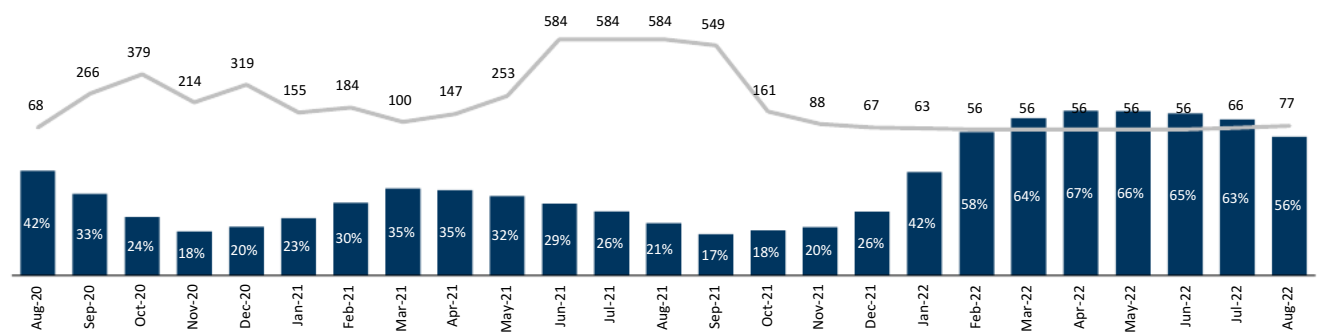
Exhibit 16: Brazilian reservoir levels



YoY (%)	Aug-21	Sep-21	Oct-21	Nov-21	Dec-21	Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22	Jul-22	Aug-22
Reservoir Levels	-42.7%	-40.2%	-15.5%	5.6%	29.2%	61.4%	62.9%	55.3%	66.6%	77.8%	86.5%	94.9%	115.8%

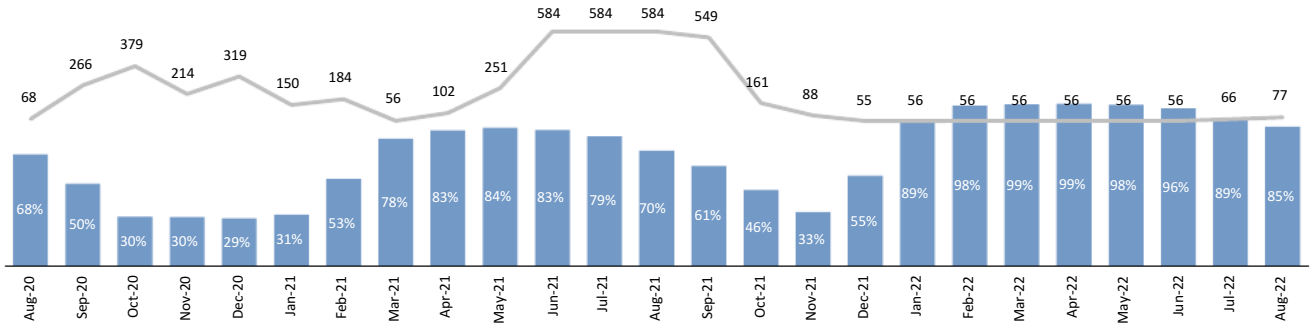
Source: CCEE, ONS, Goldman Sachs Global Investment Research

Exhibit 17: Southeast/Midwest reservoir levels and spot prices (R\$/MWh)



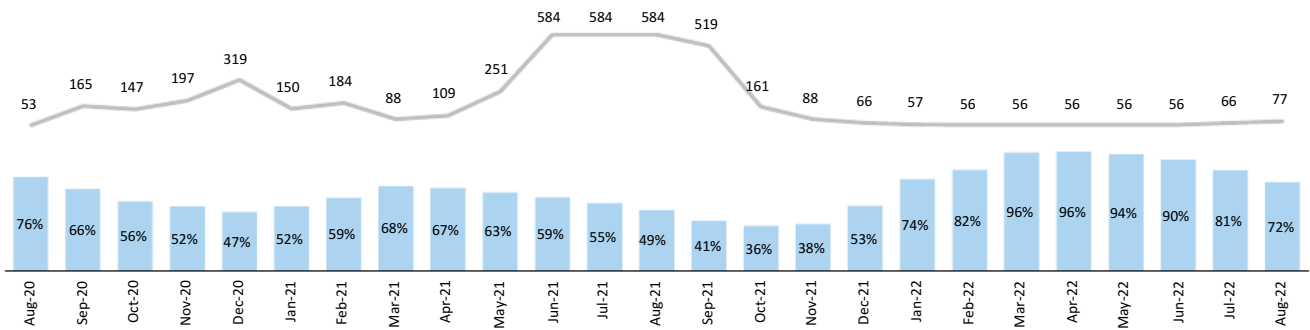
Source: CCEE, ONS, Goldman Sachs Global Investment Research

Exhibit 18: North reservoir levels and spot prices (R\$/MWh)



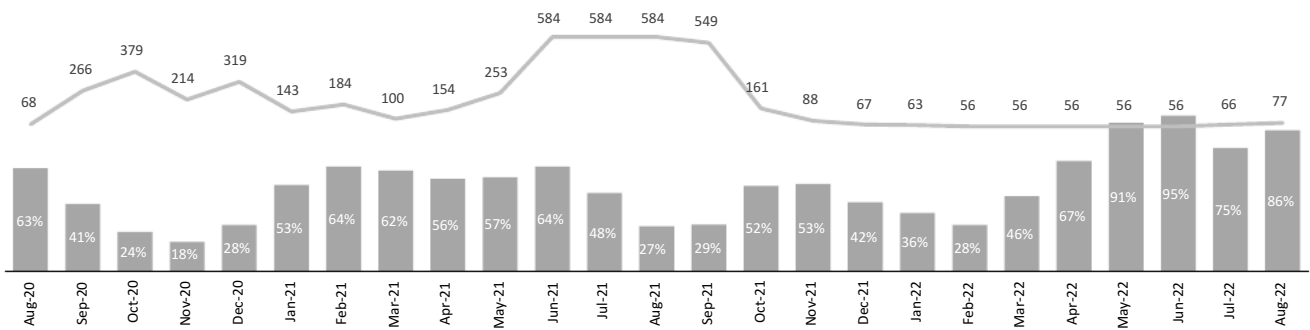
Source: CCEE, ONS, Goldman Sachs Global Investment Research

Exhibit 19: Northeast reservoir levels and spot prices (R\$/MWh)



Source: CCEE, ONS, Goldman Sachs Global Investment Research

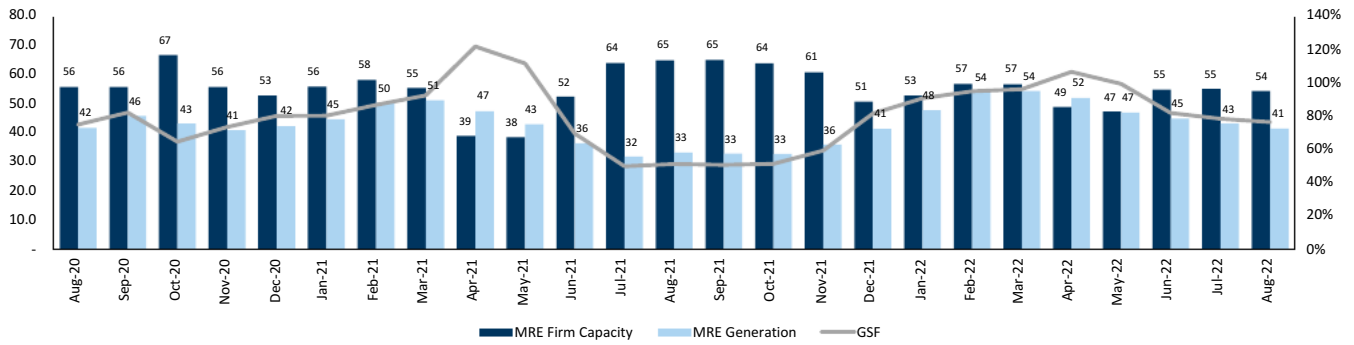
Exhibit 20: South reservoir levels and spot prices (R\$/MWh)



Source: CCEE, ONS, Goldman Sachs Global Investment Research

Monthly GSF. Considering the 41.4GWavg MRE generation and the 54.3GWavg energy allocated in the month, GSF closed the period at 76%.

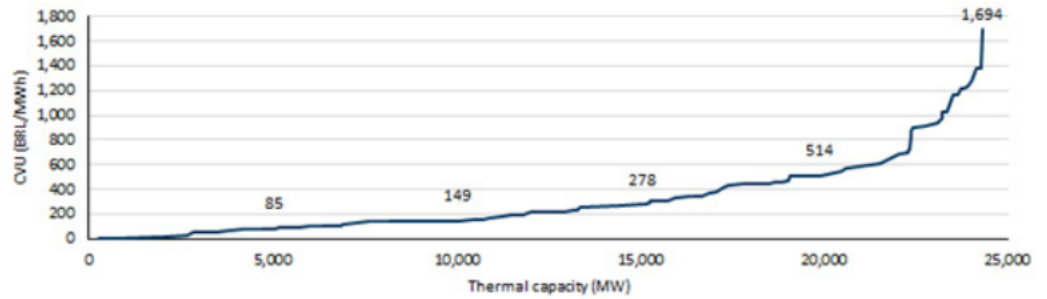
Exhibit 21: MRE firm capacity and generation (GWavg) and GSF (%)



Source: CCEE, Goldman Sachs Global Investment Research

TPP operating cost. Below we present the total cost (CVU in BRL/MWh), by region, of operating the available thermal plants.

Exhibit 22: CVU (BRL/MWh) vs. Thermal capacity (MW)



Source: ONS, Goldman Sachs Global Investment Research

Disclosure Appendix

Reg AC

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