Commercialization

November/2022
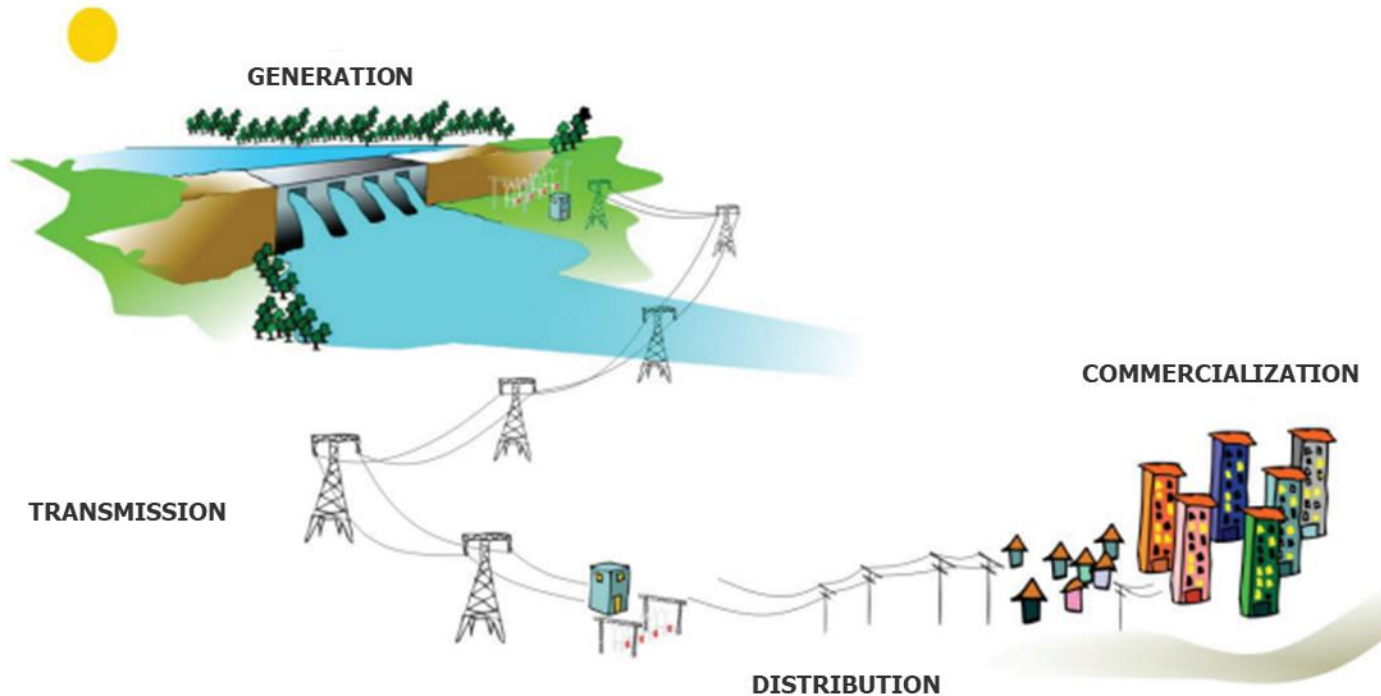
Agenda

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1. General Concepts

What you need to know...

- ✓ What is Natural Inflow Energy (ENA)?

- ✓ How does ENA affect the level of the reservoirs?

- ✓ What is spot price?
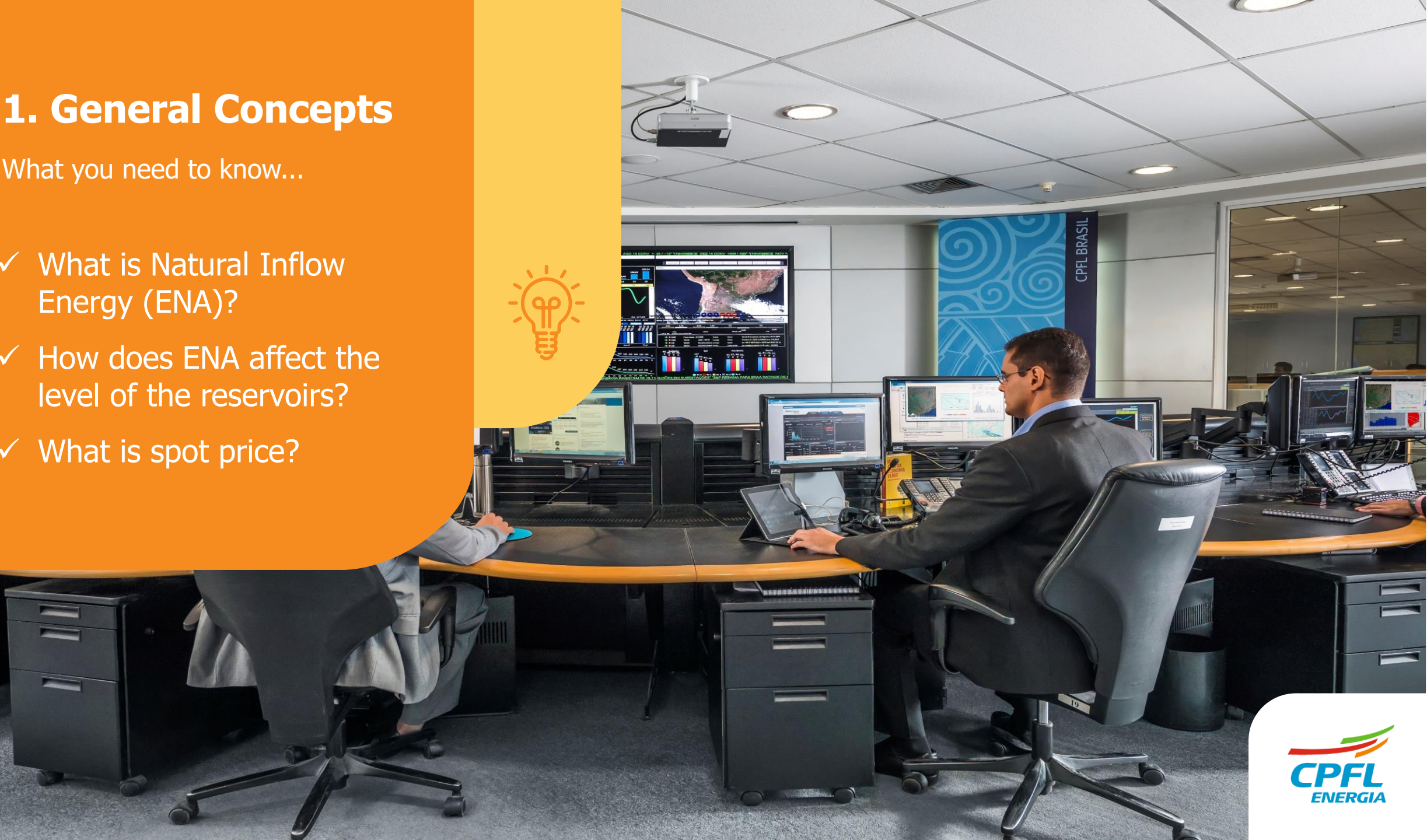
Source: ANEEL

Commercialization

The segment of the market, known as **ACL - Free Contracting Environment**, in which the operations of purchase and sale of electric power are carried out, subject to freely negotiated bilateral contracts, according to specific rules and commercialization procedures.
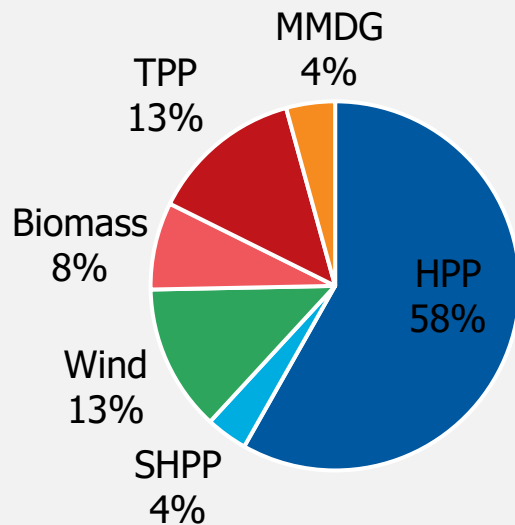
Created in Brazil in the late 90s, its role is much more related to the **economic and institutional context** than to the physical process of energy production and transportation.
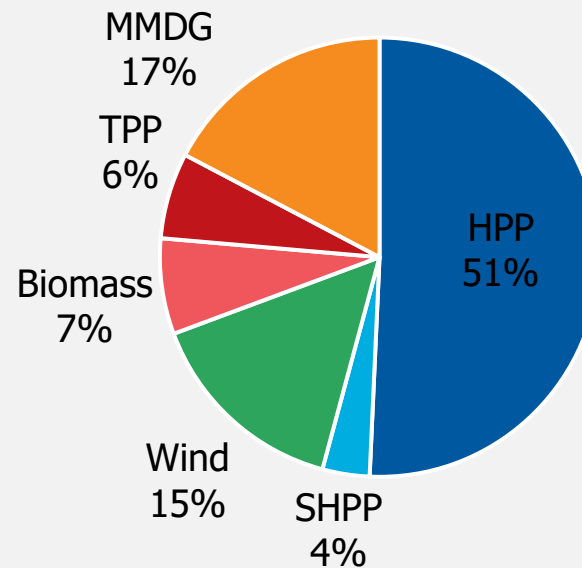
Brazilian Electrical Matrix

Evolution of Installed Capacity (GW)[1]

Dec/21

MMDG 4%
TPP 13%
Biomass 8%
Wind 13%
SHPP 4%
HPP 58%

187 GW

Contrated **Dec/31**

MMDG 17%
TPP 6%
Biomass 7%
Wind 15%
SHPP 4%
HPP 51%

215 GW

Reference Senario

RD 1%
MMDG 14%
TPP 15%
Biomass 6%
Wind+Solar 16%
SHPP 4%
HPP 44%
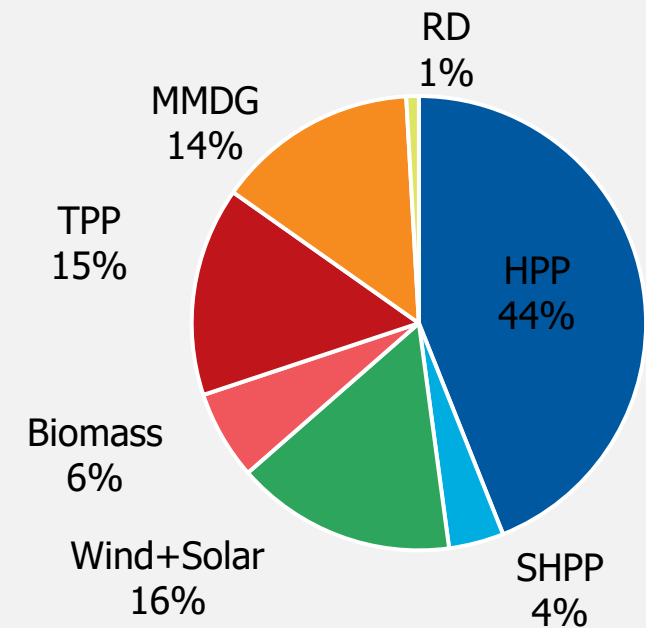
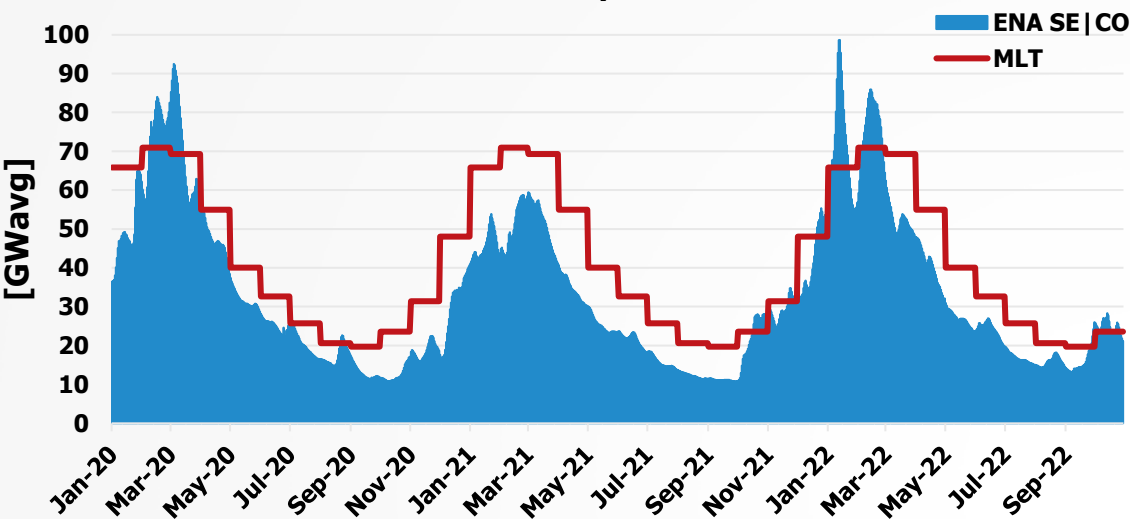**260 GW**

A growth of **1.6%** per year is already **contracted**, driven mainly by MMDG (+29 GW) and wind (+9 GW).
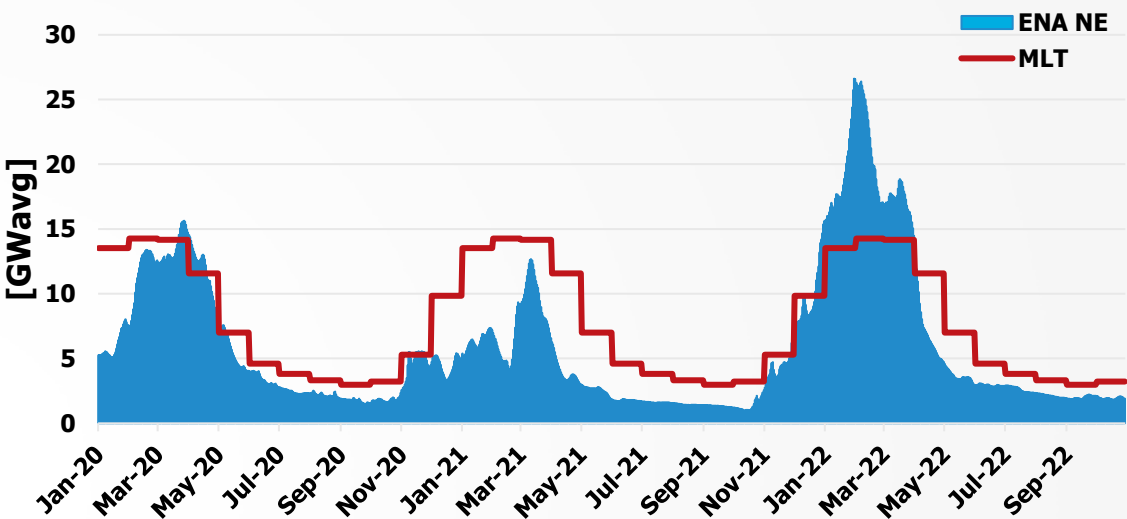EPE estimates in its reference scenario an even greater expansion, of 3.7% per year, mainly due to thermal plants, according to energy policy guidelines.

1) Source: EPE - Ten Year Plan 2031 – p. 70 and 106.

ENA – Natural Inflow Energy

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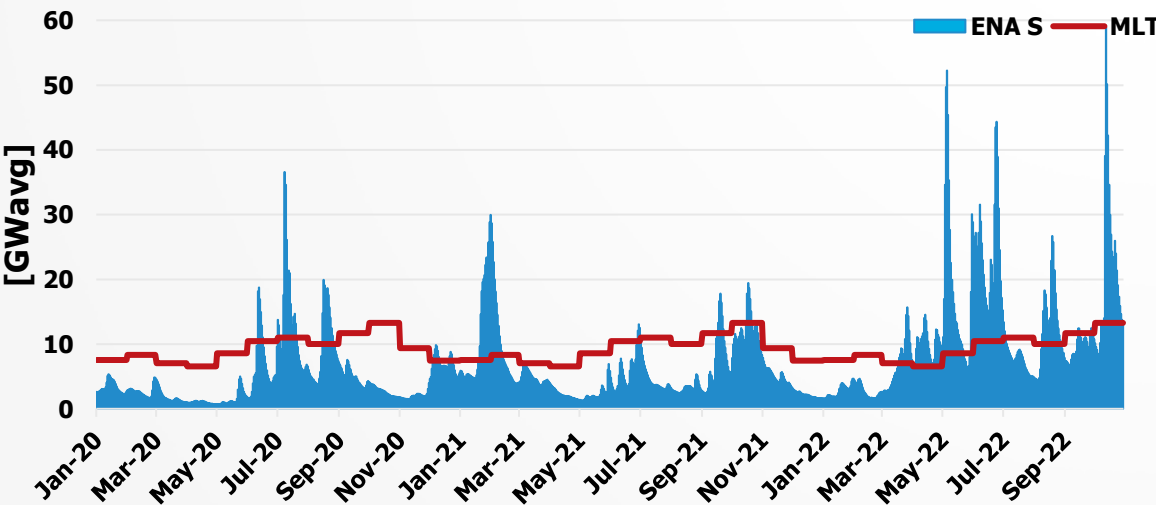
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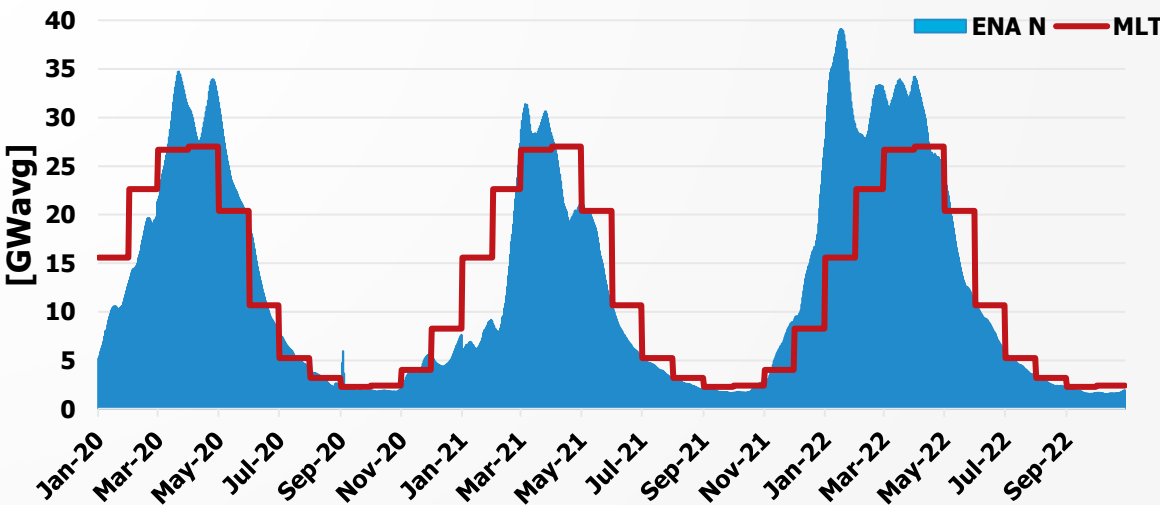
Reservoir water level – National Interconnected System (SIN)

Energy Stored in the SIN

2011 (orange): Jan 63.4, Feb 69.3, Mar 83.0, Apr 88.7, May 87.7, Jun 84.5, Jul 81.9, Aug 74.8, Sep 65.8, Oct 60.8, Nov 56.0, Dec 59.4

2022 (green): Jan 49.6, Feb 62.3, Mar 69.9, Apr 73.5, May 74.7, Jun 73.7, Jul 67.7, Aug 62.7, Sep 57.3, Oct 55.1

2021 (blue): Jan 31.0, Feb 38.4, Mar 45.3, Apr 44.5, May 42.3, Jun 39.8, Jul 35.5, Aug 29.4, Sep 24.2, Oct 25.4, Nov 25.9, Dec 33.1

2001 (red): Jan 40.5, Feb 41.1, Mar 41.5, Apr 38.6, May 35.7, Jun 34.6, Jul 32.4, Aug 27.8, Sep 23.6, Oct 23.4, Nov 23.8, Dec 32.4

Legend: 2021, 2022, 2001, 2011

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PLD – Spot Price

- It is used to **value the energy volume settled** in CCEE – non contracted energy between the agents

- It is calculated in a way to optimize the energy cost, looking for the security in the supply

- Mathematical and statistical models are used: **Newave** (monthly), **Decomp** (weekly) and **Dessem** (daily)

- Since 2021, started to have an hourly base, being daily disclosed by CCEE.

	Minimum Spot Price (R$/MWh)	Structural maximum Spot Price (R$/MWh)	Hourly maximum Spot Price (R$/MWh)	Deficit cost (R$/MWh)
2017	33.68	533.82	-	4,650.00
2018	40.16	505.18	-	4,596.31
2019	42.35	513.89	-	4,981.54
2020	39.68	559.75	1,148.36	5,249.34
2021	49.77	583.88	1,197.87	6,524.05
2022	66.70	646.58	1,326.50	7,643.82

The Spot Price calculation solves the dilemma between **present benefit of water use** and the **future benefit of its storage**, considering:

- Hydrological conditions
- Fuel prices availability of generation and transmission equipment
- Expectation of generation from non-centrally dispatched plants
- Energy Demand
- Deficit cost
- Start-up of new plants

Main Influencers of the PLD

Participation of the main influencing factors of the CMO/PLD (in %)
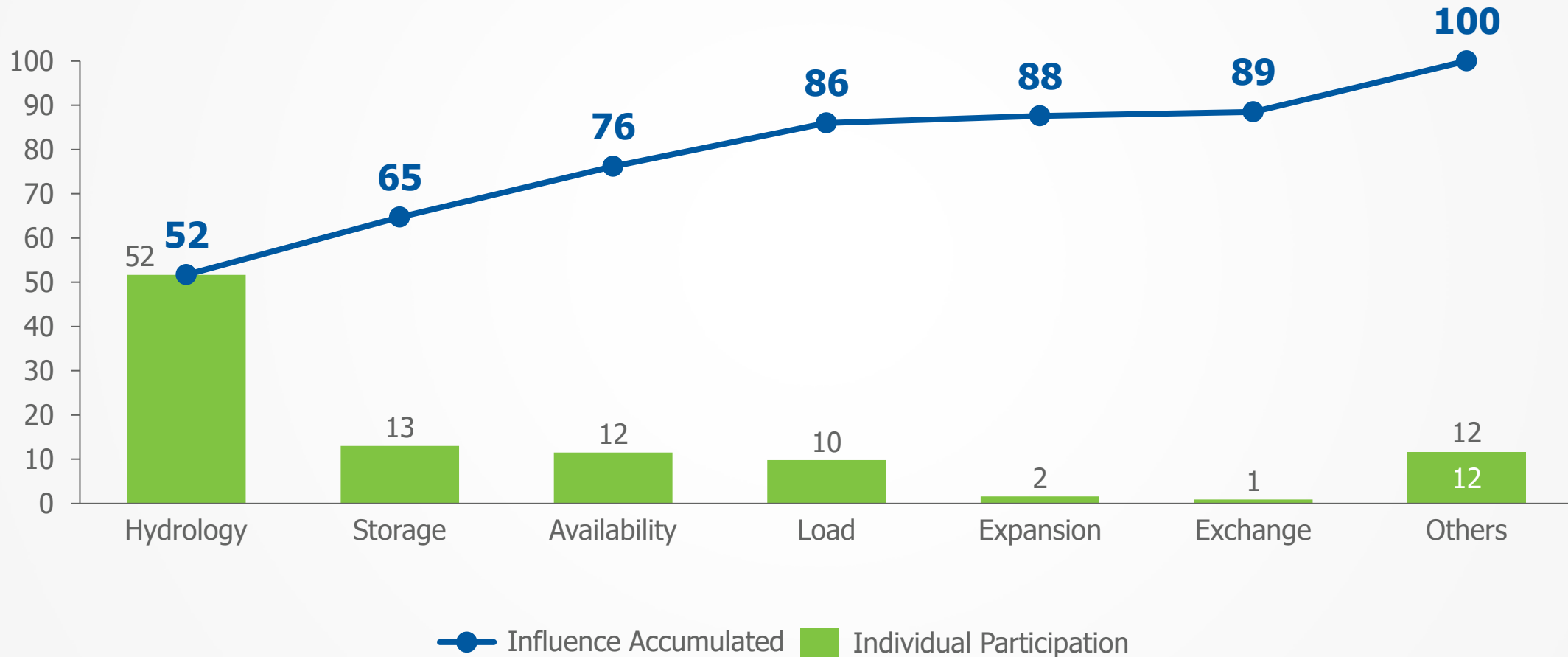
*Estimate based on PMOs from 2014 to 2017 in Southeast/Midwest

2. Freedom of Choice in the Free Market

What do you need to know...

- ✓ Who can migrate
- ✓ When does it make sense to migrate

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Free Market | Who can migrate?

Requirements

Current Rule

Demand >500kW
Bills starting in ~R$ 63k/month

Demand <500kW
By Load Sharing:
Fact = In the same place
Right = same CNPJ[1]

Market

Current Market
- 28.5k Units [10.3k clients]
- 24,949 average MW

Potential Market
- 69.3k Units
- 4,999 average MW

Ways of Migration

Generator

Trader

Retail Trader

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Free Market | Who can migrate?

	Requirements	Market	Ways of Migration
Current Rule	**Demand >500kW** Bills starting in ~ R$ 63k/month **Demand <500kW** **By Load sharing:** Fact = In The same place Right = same CNPJ[1]	**Current Market** • 28.5k Units[10,3k clients] • 24,949 average MW **Potential Market** • 69.3k Units • 4,999 average MW	**Generator** **Trader** **Retail Trader**
MME Public Consultation n° 131/2022	**Grupo A = Voltage >2,3kV (Medium/High)** Bills starting in ~R$ 8k/month Already has contracted demand (infrastructure separated from energy)	**Potential Market** • 106.3k Units • 3,654 average MW **Scale Market**	**Retail Trader**

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Viability Simulation: ACR, ACL and Selfproductor

Assuming captive total tariff = 100 currency units/MWh

	Current Scenario **Captive (ACR)**	Scenario 1 **Free (ACL)**	Scenario 2 **Selfproductor**	
Fio (TUSD or TUST)	20/MWh	10/MWh	10/MWh	Value to make Greenfield feasible
Energy (MWh)	48/MWh	30/MWh (50% incentivized)	33.3/MWh (50% incentivized)	
Charges + Others	15/MWh	16.7/MWh	10.8/MWh	exempt: Proinfa, CDE, EER, ESS
Taxes	17/MWh	11.7/MWh	10.8/MWh	
$\sum$	100/MWh	68.3/MWh	R$ 65/MWh	
		32% saving	**35% Saving**	

*The saving values presented consider 100% of the generation in APE.

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Risk x Return of each product

	Current Scenario **Captive (ACR)**	**Normal trader (ACL)**	**retail trader (ACL)**	**Selfproductor**
Consumption variation	**Absorbed by Discos** (Parcel A)	**Consumption Limits** (Flex, Seasonal and Modulation)	**Absorbed by the trading** (Risk management)	**Generator risk + client**
Subsystems	**Absorbed by Discos** (Parcel A)	**Taken by the trader** (Risk Management)	**Taken by the trader** (Risk Management)	**Taken by the generator and/or client**
Agents in CCEE	**Discos** (Costs allocated in Parcel A)	**Client** (hires a manager to manage)	**Retail trader** (Risk management)	**Client (hires manager to manage)**
Default	**Discos** (Tariff coverage parcel B)	**Trader** (credit analyst)	**Trader** (credit analyst)	**Partnership evaluation**
Others				**Regulatory Risk Model + Capex Generator + Partner**

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