ENERGY TRANSITION IN BRAZIL
10 YEARS SINCE THE PARIS AGREEMENT

TEN YEARS AFTER THE PARIS AGREEMENT, BRAZIL IS ADVANCING IN THE ENERGY TRANSITION WITH AN INCREASINGLY CLEANER MATRIX, ROBUST PUBLIC POLICIES, AND ACTIONS FOR ENERGY SECURITY AND THE ERADICATION OF ENERGY POVERTY

WHAT IS ENERGY TRANSITION?

"Process of transformation of the infrastructure, production and consumption of energy by the different sectors, aiming to contribute to the neutrality of the country's net GHG emissions." (CNPE Resolution No. 5/2024).

WHAT IS THE PARIS AGREEMENT?

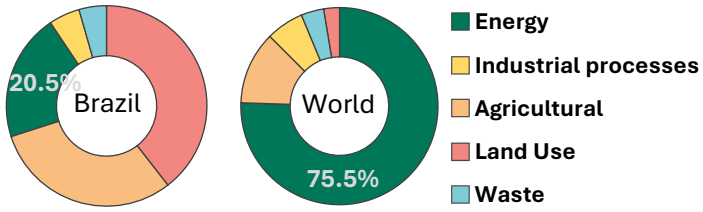
International treaty that aims to restrict the increase in the global average temperature to well below 2° C, with efforts to limit the increase to 1.5° C, adopted at COP21 in 2015, strengthening the commitment of countries to act to combat climate change.

THE BRAZILIAN ENERGY SECTOR IS A REFERENCE IN RENEWABLES

Each country has specific challenges and opportunities to consider in their transition strategies.

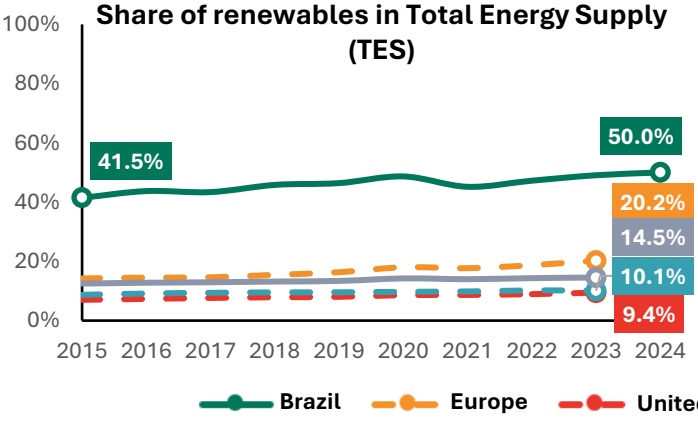
While the world seeks to decarbonize its energy, Brazil stands out in renewables. Yet it faces energy poverty and justice challenges that must be part of the transition.

Emissions by sector

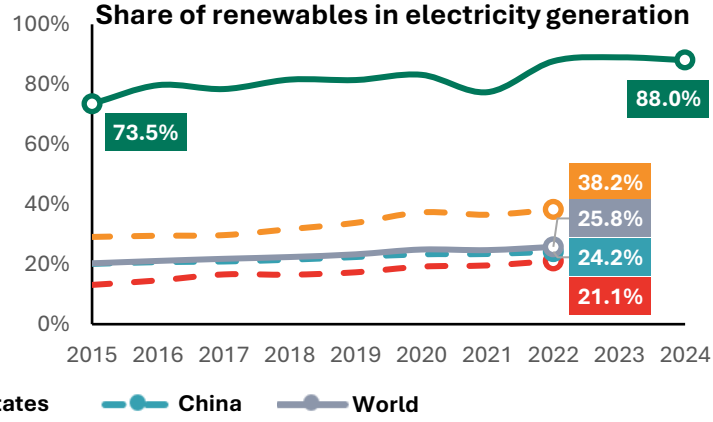


Source: MCTI/SIRENE (Brazil); Climate Watch (World). Data from 2022.

Share of renewables in Total Energy Supply (TES)



Share of renewables in electricity generation



Brazil · Europe · United States · China · World

Source: Brazilian Energy Balance (EPE, 2025 - Data from Brazil); IEA (Data from other locations).

EVOLUTION OF THE BRAZILIAN ENERGY MIX (2015-2024)

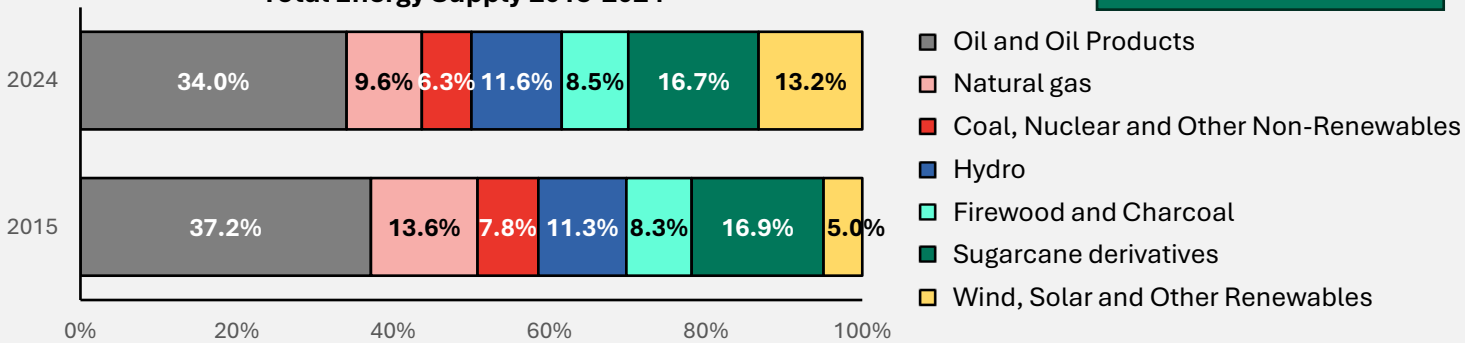
50% renewable and lower share of fossil fuels

The Total Energy Supply (TES) grew **0.8% per year**, reaching 322 MMtoe.

The share of oil and gas fell from 50.8% to 43.7%.

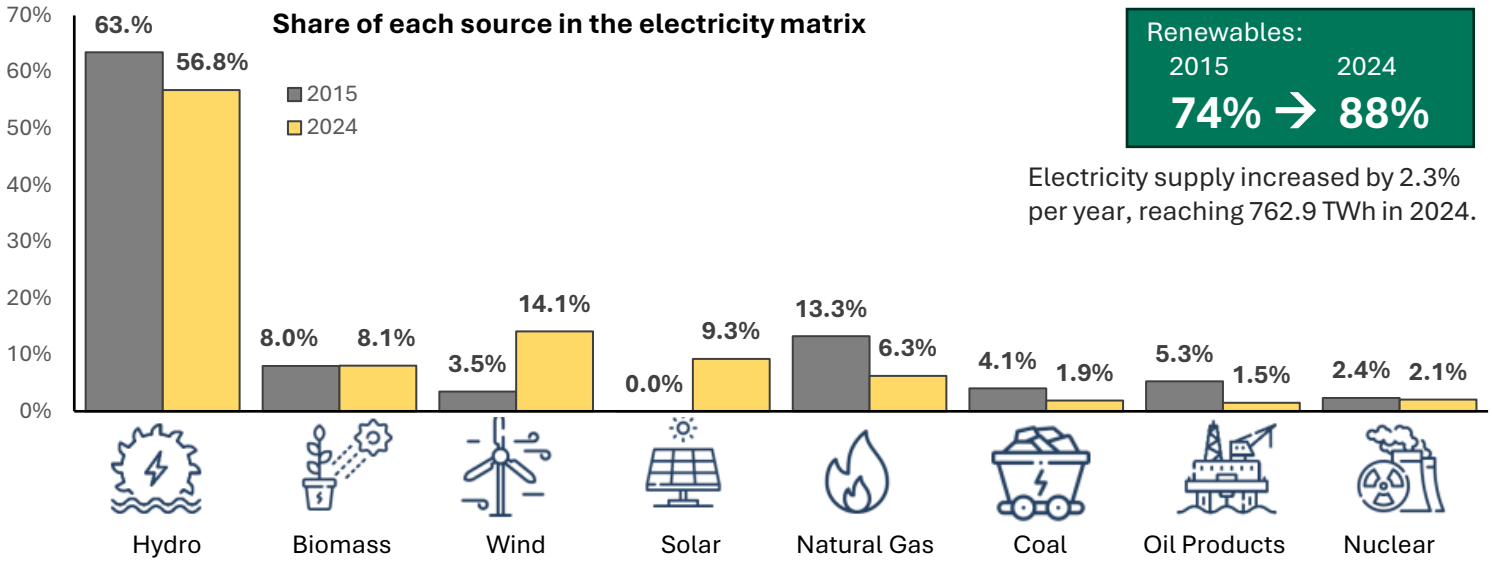
Renewables:
2015 2024
42% → 50%

Total Energy Supply 2015-2024



Source: Brazilian Energy Balance (2025)

ELECTRICITY MIX (2015-2024)
with more wind and solar



Renewables:
2015 2024
74% → 88%

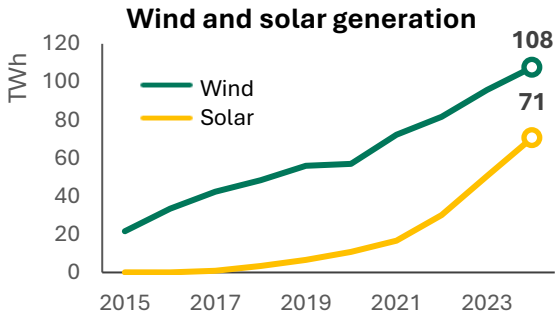
Electricity supply increased by 2.3% per year, reaching 762.9 TWh in 2024.

Hydraulic generation still represents half of the generation, but its share has been falling and depends on hydrological conditions.

The share of solar and wind generation increased from **3.5% to 23.4%.**

The operation of the National Interconnected System becomes hydro-thermal-wind, with greater demand for flexibility.

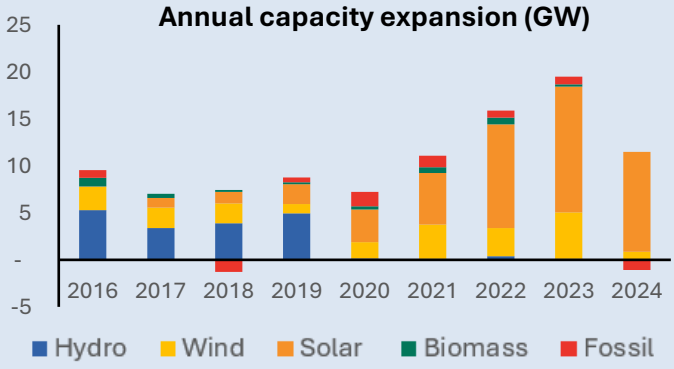
Source: Brazilian Energy Balance (EPE, 2025)



INSTALLED CAPACITY with renewable expansion

The installed capacity of electricity generation has reached **236 GW** in 2024.

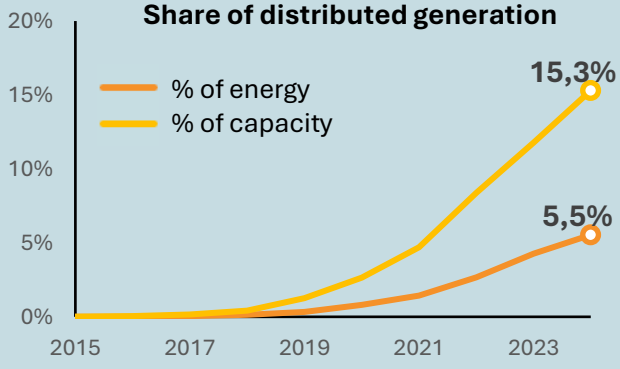
In the last 10 years, **95,5 GW** of installed capacity were added, of which **97%** **from renewable sources**



Source: Statistical Yearbook of Electricity (EPE, 2025)

MINI AND MICRO DISTRIBUTED GENERATION (MMDG) grows exponentially

At the end of 2024, there were **36 GW** installed, 99% of which were photovoltaic solar energy, reaching 15% of the installed capacity and 5.5% of the electricity generation, with **4.8 million consumers** (MMDG Data Dashboard – EPE, 2025).



Source: Brazilian Energy Balance (EPE, 2025)

The expansion with renewable energies is the result of energy auctions, incentive policies for renewable sources and normative instruments for MMDG, such as ANEEL Resolutions No. 482/2012, No. 687/2015, No. 786/2017 and Law No. 14,300/2022 (MMDG Legal Framework).

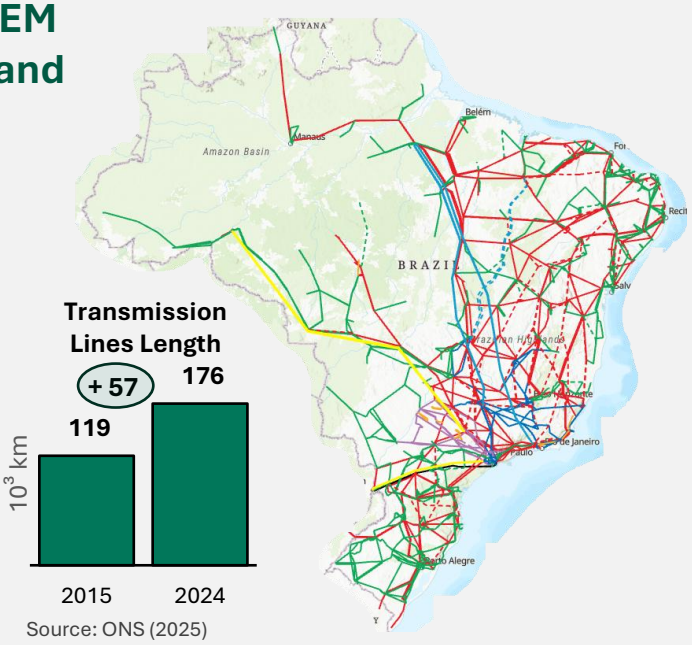
ELECTRIC POWER TRANSMISSION SYSTEM increased by 47%, and continues to expand

Brazil's transmission system is one of the most complex and robust in the world, connecting all states in the country.

Transmission has been expanding to give greater reliability and robustness to the flow of an electrical system with growing demand and with more non-controllable renewable sources.

Investments of US$ 43 billion were made in **19 transmission auctions** held between 2015 and 2024, evidencing the success of this mechanism in the electricity sector (Results of transmission auctions - ANEEL, 2025).

Note: Values adjusted for inflation and converted to US dollars at an exchange rate of BRL 5.79/USD (December 2024).



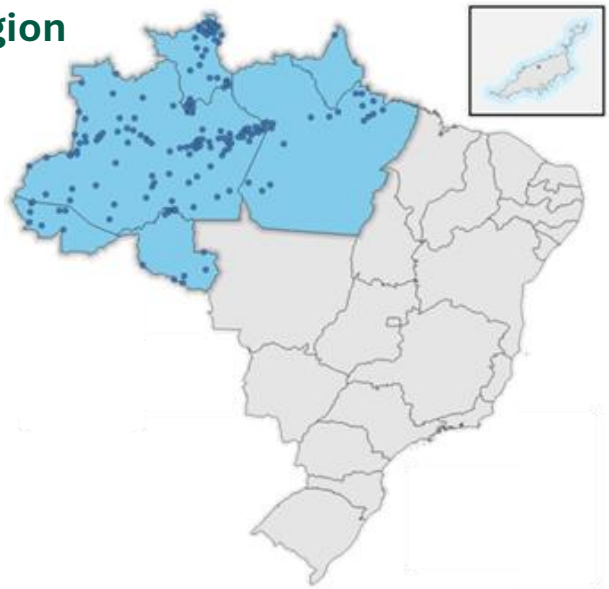
Source: ONS (2025)

PLANNING FOR SERVING ISOLATED SYSTEMS (SISOL)
Interconnections and auctions reduce emissions and foster development for communities in the Brazilian Northern region

Isolated systems are locations that are not connected to the National Interconnected System (SIN).

Diesel fuel's share in SISOL:
2018 2024
97% → 67%

Number of isolated systems:
2018 2024
270 → 175
By the end of 2029, +33 interconnections are planned.



Interconnection of Roraima to the National grid
in September 2025, connecting all states in Brazil.

PLANNING CYCLE	2018	2019	2020	2021	2022	2023	2024
Number of Isolated Systems	**270**	**271**	**258**	**251**	**212**	**196**	**175**
Number of utilities	9	9	9	9	8	8	8
Population served	**3.25 mi**	**3.3 mi**	**3 mi**	**2.98 mi**	**3.1 mi**	**3 mi**	**2.6 mi**
Verified load (GWh)	4291	4042	4164	4068	4018	4051	4145
% of diesel in generation	**97%**	**93%**	**95%**	**94%**	**79%**	**69%**	**67%**
CCC budgets – sector accounts	US$ 1,0 bi	US$ 1,1 bi	US$ 1,3 bi	US$ 1,5 bi	US$ 2,1 bi	US$ 2,1	US$ 1,9

Source: Planning for Serving Isolated Systems – 2024 Cycle (EPE, 2024). Values converted to US dollars at an exchange rate of BRL 5.79/USD.

Strengthening energy infrastructure drives community development.

+ DEVELOPMENT
+ ENERGY SECURITY
+ QUALITY OF LIFE

Innovations in Aucion No. 1/2025:
- 22% Renewables Required
- Hybrid Generation Model
- Carbon Price

ERADICATION OF ENERGY POVERTY
is part of a just and inclusive energy transition

Energy poverty: “situation in which households or communities do not have access to a basic package of essential energy services or do not have their energy needs fully met” (CNPE Resolution No. 5/2024).

Brazil is close to achieving universal access to energy

Sustainable Development Goal 7.1
By 2030, ensure universal access to affordable, reliable and modern energy services.

SDG7 Indicator 7.1.1

99.8%

of the population with access to electricity in 2023

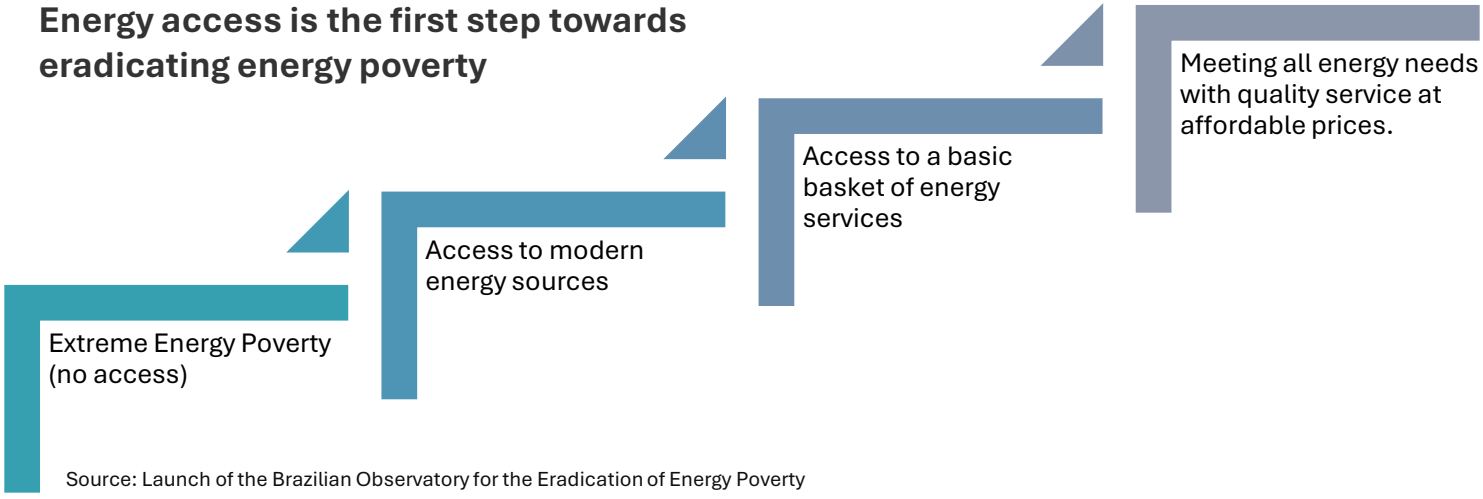
SDG7 Indicator 7.1.2

94.5%

of the population with primary access to clean fuels and technologies in 2023

Source: IBGE (2025)

Energy access is the first step towards eradicating energy poverty



Source: Launch of the Brazilian Observatory for the Eradication of Energy Poverty

Brazil has important policies for eradicating energy poverty

Luz para Todos (Light for All)

622 k

Households served 2015-2024

Includes electrification programs “*Luz para Todos – Rural*”, “*Luz para Todos – Regiões Remotas da Amazônia Legal*" and financial resources from utilities

(MME, 2025)

Luz do Povo

FREE electricity for the first **80 kWh/month** for low-income families and social discount for low-income families consuming up to 120 kWh/month.

(Law No. 12,212/2010 and Law No. 15,235/2025)

Gás do Povo

Free LPG or payment to mitigate the effect of LPG prices on the budget of low-income families.

(Law No. 14,237/2021, amended by Provisional Measue No. 1,313/2025)

Brazilian Energy Poverty Eradication Observatory - OBEPE

Interactive platform to monitor and analyze a solid base of energy poverty indicators in a multidimensional way, with socioeconomic, geographic and environmental elements.

It helps explain where and why this poverty persists and supports more effective evidence-based public policies. For more information, click here.

BIOFUEL POLICIES PREVENT EMISSIONS

Biofuel policies began in the 1970s, with the Proálcool program, and lead to reduced emissions, increased energy security, industry development, and positive social impacts.

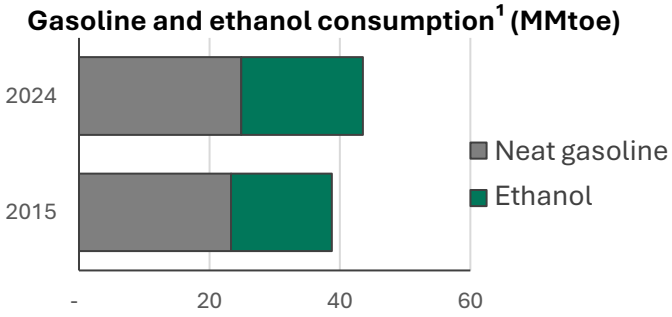
Brazilian Biofuels Policy – RenovaBio

It aims to reduce the carbon intensity of the transport matrix, expanding the use of biofuels, ensuring predictability for the market and inducing efficiency (Law 13.476/2017).
Instruments:

- Mandatory decarbonization targets for each fuel distributor;
- Issuance of the Certificate of Efficient Production of Biofuels;
- Issuance of Decarbonization Credits (CBIO's).

Ethanol consumption replaces fossil gasoline, with:

- mandatory content of anhydrous ethanol in gasoline C, which reached **30%** in 2025 in volume (CNPE Resolution No. 9/2025),
- the fleet of **flex-fuel light-duty vehicles** fueling with hydrous ethanol, and
- the **RenovaBio**.

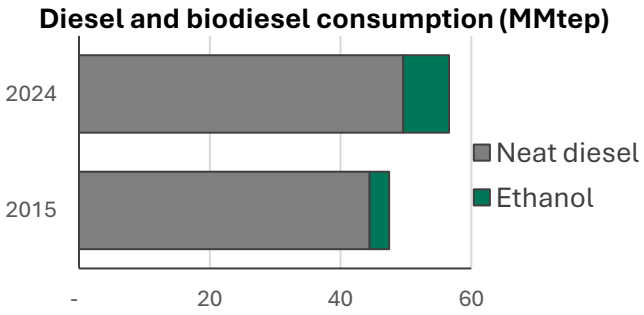


The **Brazilian Program for the Production and Use of Biodiesel** (2004) introduced biodiesel into the energy mix. With regulatory advances, the mandatory addition of biodiesel to diesel reached 15% in volume in 2025. As a result, biodiesel consumption has more than doubled in 10 years.

Biodiesel blending

B7 → B15

2015 2025



Source: Law No. 13,033/2014, CNPE Resolution No. 8/2023 and CNPE Resolution No. 8/2025

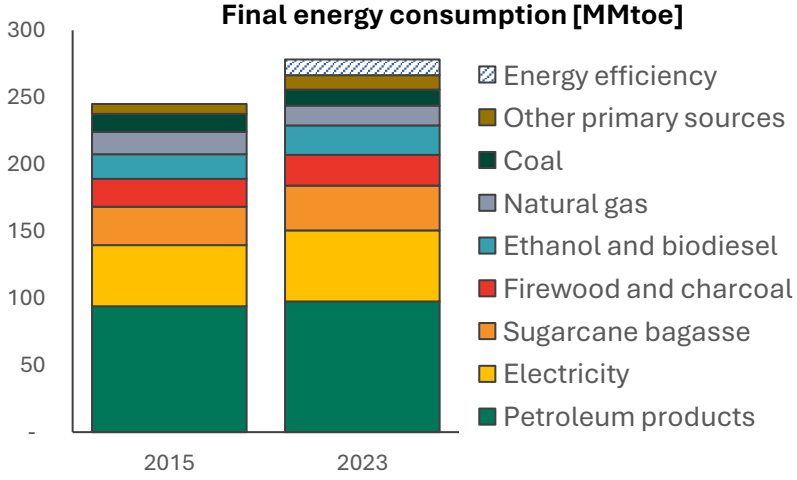
Source: Brazilian Energy Balance (EPE, 2025)
[1] Final energy consumption

AN INCREASE IN ENERGY EFFICIENCY OF 4.3% (2015-2023)

Energy efficiency brings several benefits, including GHG emissions reduction. The energy savings in the period was **11.8 million toe.**

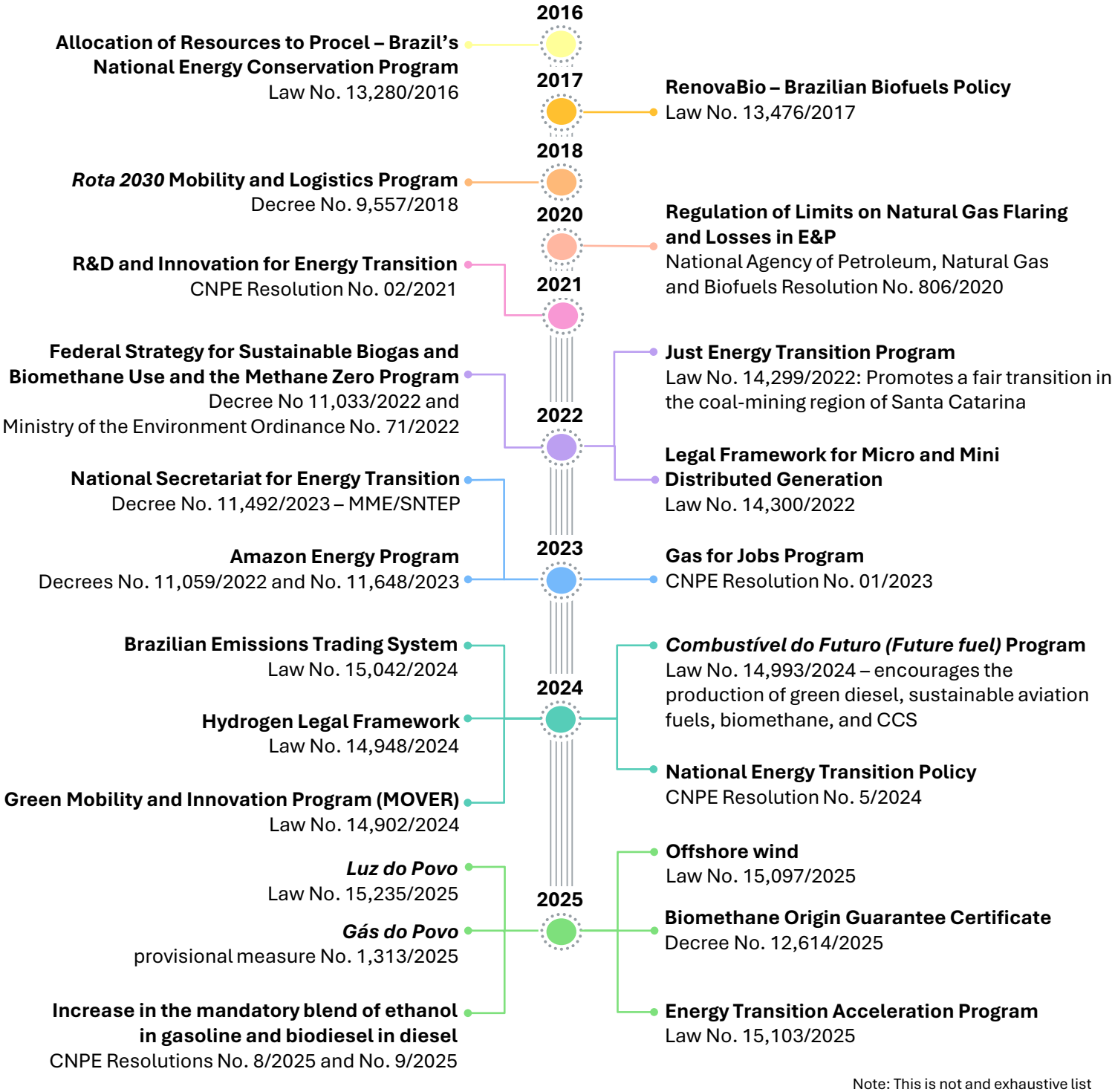
The result encompasses autonomous and policy-induced efficiency measures, such as:

- National Program for the Conservation of Electric Energy – Procel (since 1985)
- PEE/ANEEL (since 2000)
- Minimum efficiency ratios (since 2001)
- Brazilian Labeling Program (since 1984)
- Route 2030 (since 2018)



Efficiency calculated using the ODEX energy efficiency index, based on 25 specific consumption indicators weighted by their share in total consumption.
For details on the ODEX methodology used in the Energy Efficiency Atlas, click here.

BRAZIL IS ESTABLISHING A LEGAL AND INSTITUTIONAL FRAMEWORK TO DRIVE ENERGY TRANSITION FORWARD



Note: This is not and exhaustive list

Over the past decade, Brazil has advanced with a wide range of initiatives, programs, and policies to foster a FAIR and INCLUSIVE energy transition for all

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Note: Icons used throughout this edition were obtained from the platform www.flaticon.com