



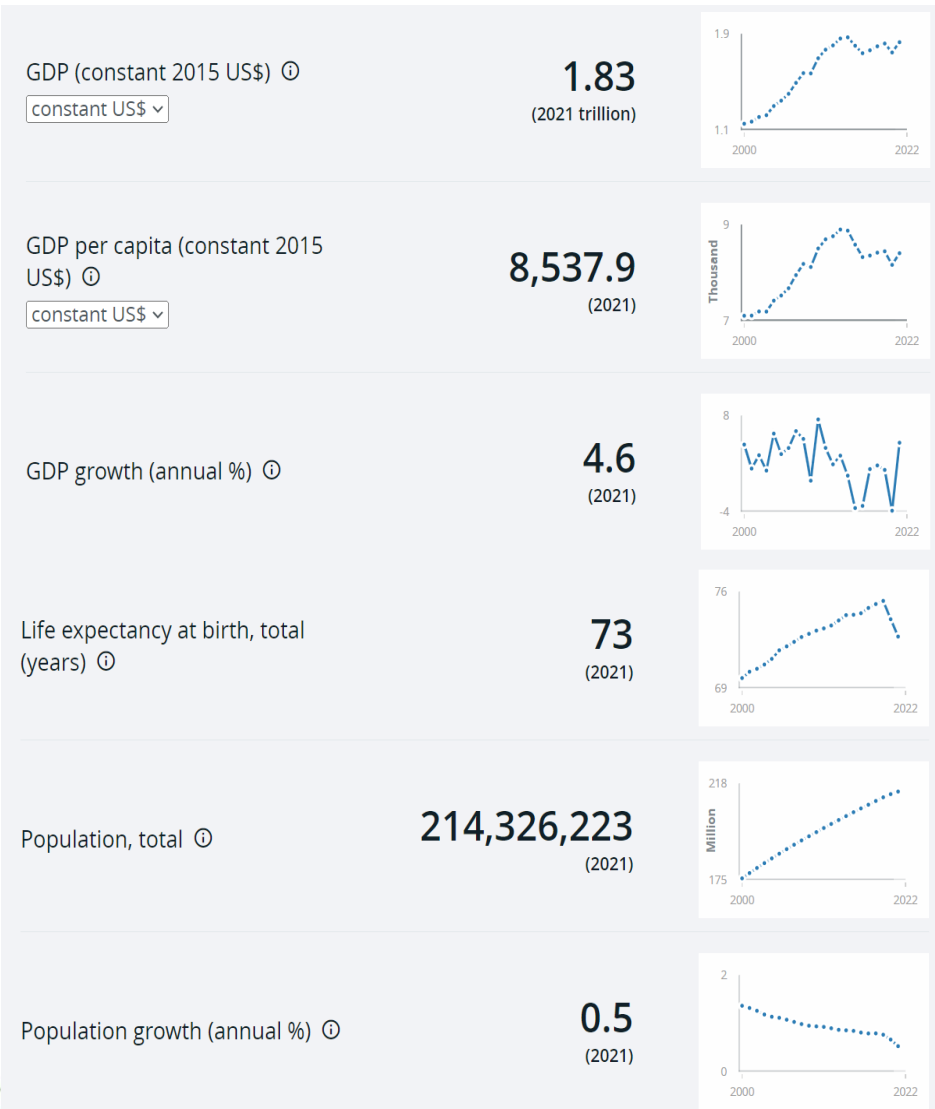
# Country Report: Brazil

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Course: 202208409-J001 Energy Policy

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# 1. General information



The largest economy in Latin America

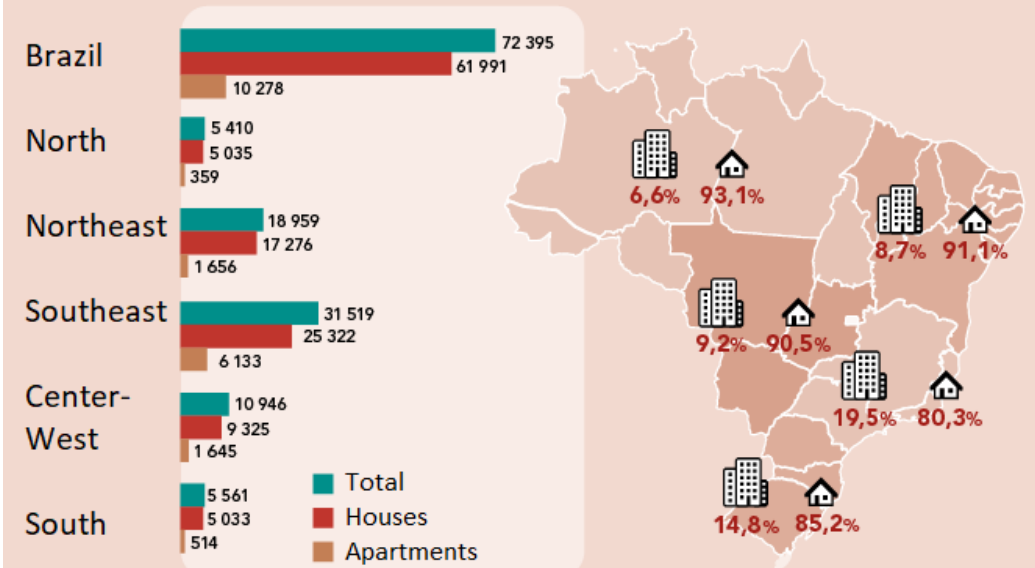
Among the largest economies in the world  
(Rank 12<sup>th</sup> in 2022)

3<sup>rd</sup> largest recipient of Foreign Direct Investment in 2022  
(85 billion USD - OCDE)

Territorial area: 8.514.876 Km<sup>2</sup>  
5th largest country by area

Source: IBGE  
(2020)

No. of households (1000)



Water, sanitation and energy services



# 1. General information

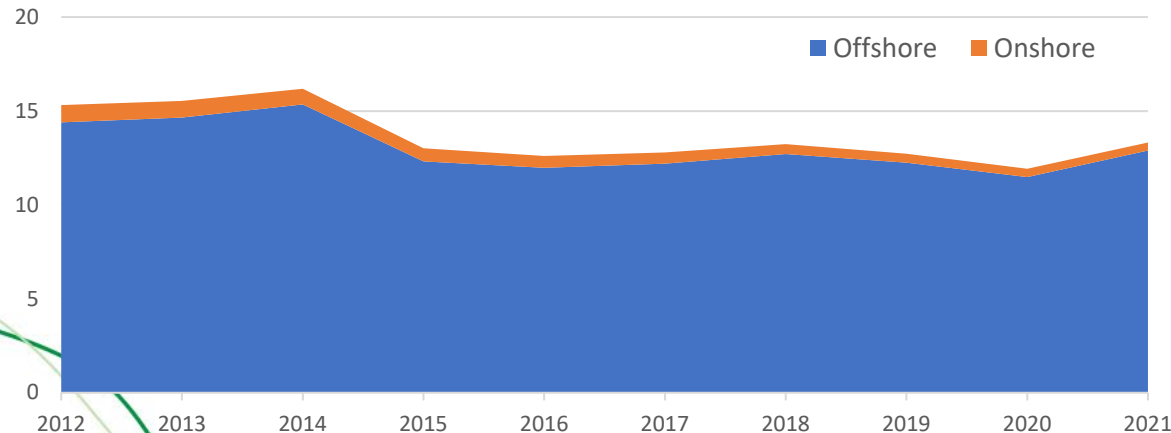
## Institucional Energy Framework



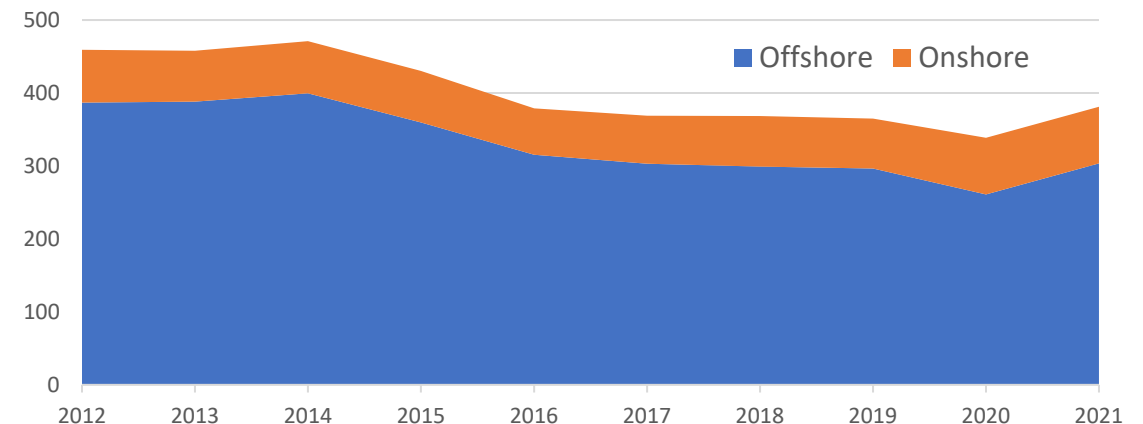
	Oil	Natural Gas
<b>Production:</b>	<b>3.3</b> Million bpd of oil production (Feb 2023)	<b>146</b> Million m <sup>3</sup> /d of gas production (Feb 2023)
<b>Reserves:</b>	<b>14.9B</b> Bbl in proved oil reserves (Dec 2022)	<b>406B</b> m <sup>3</sup> in proved gas reserves (Dec 2022)

## Reserves of energy and mineral resources (Source: ANP, 2022)

Proved Oil Reserves (billions of barrels)

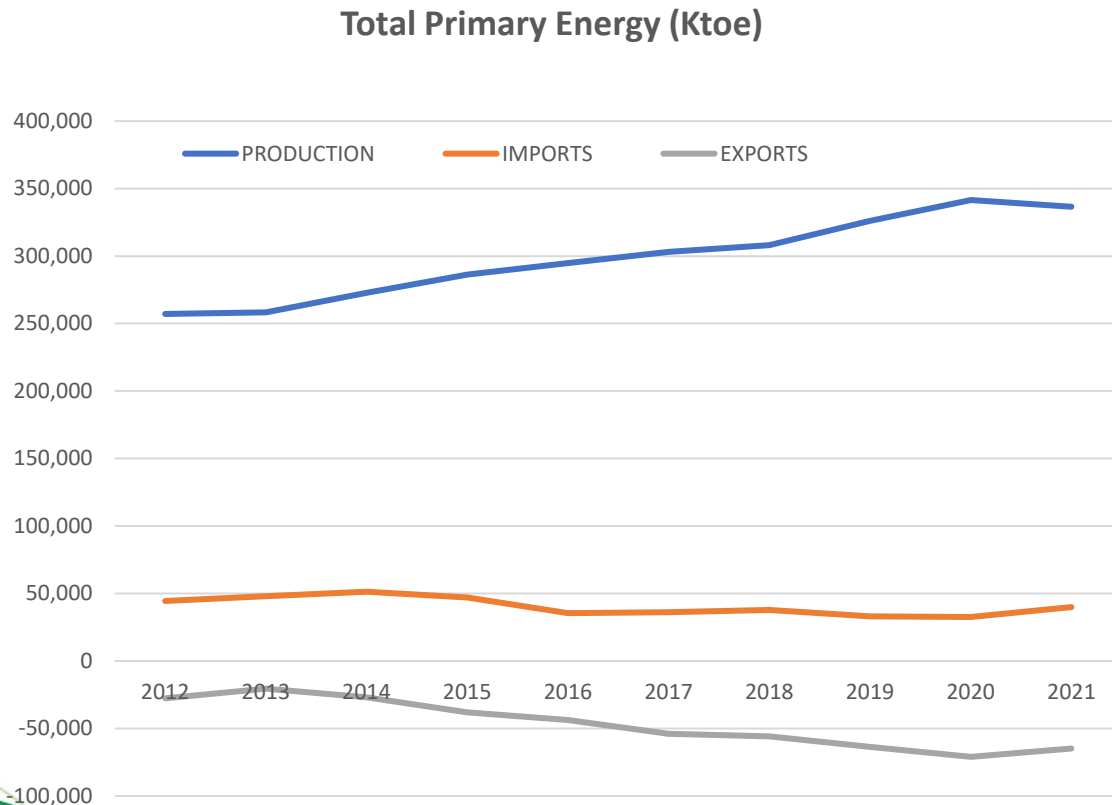


Proved Natural Gas Reserves (BCM)

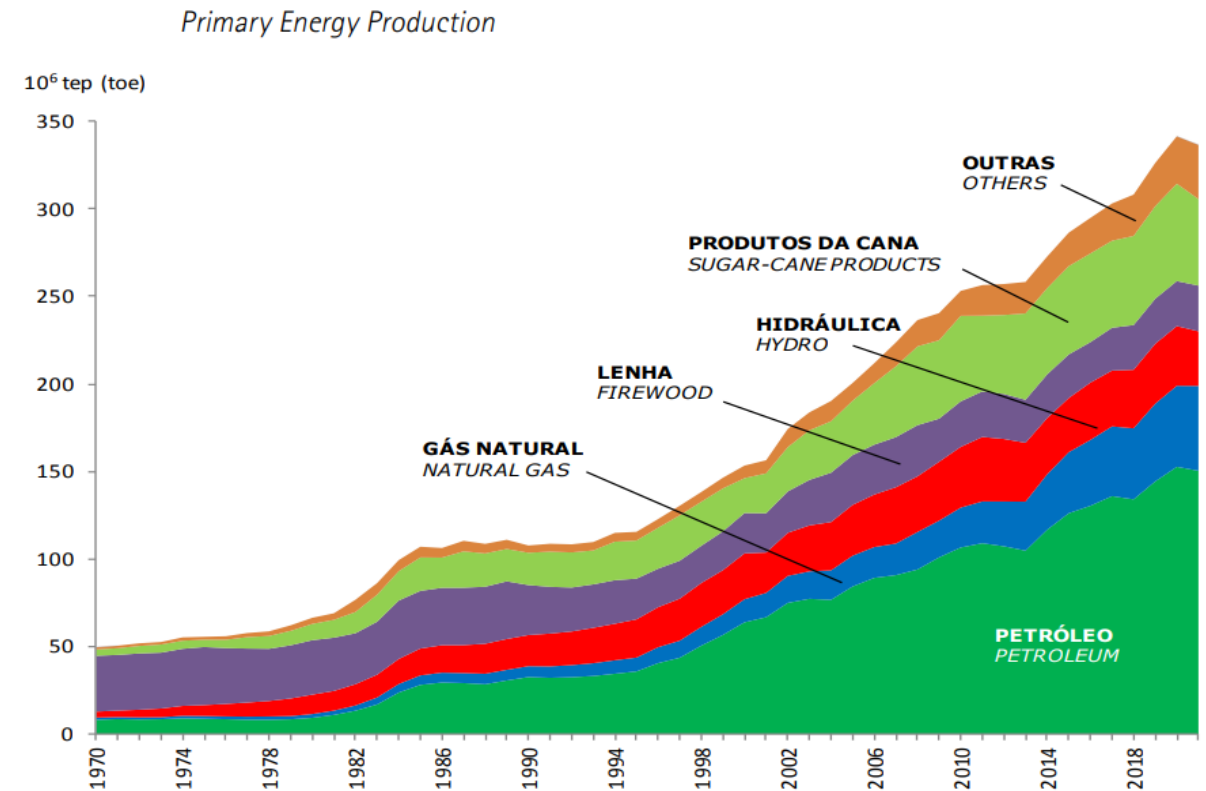


## 2. Past energy demand and supply

### 1) Primary energy supply (Unit: ktoe) (production, imports and exports)

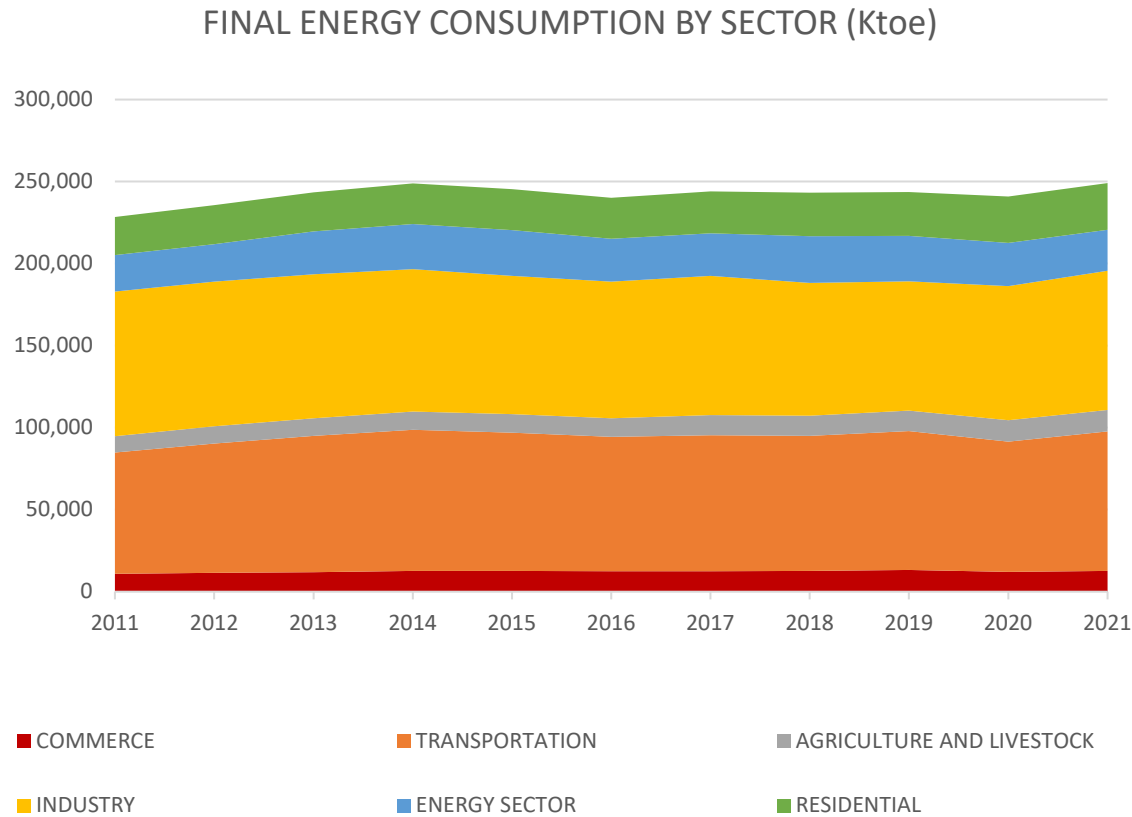


### 2) Primary energy production (Unit: Mtoe) by energy source (coal, oil, gas, electricity (nuclear, hydro, geothermal & solar), biofuels & waste, others)



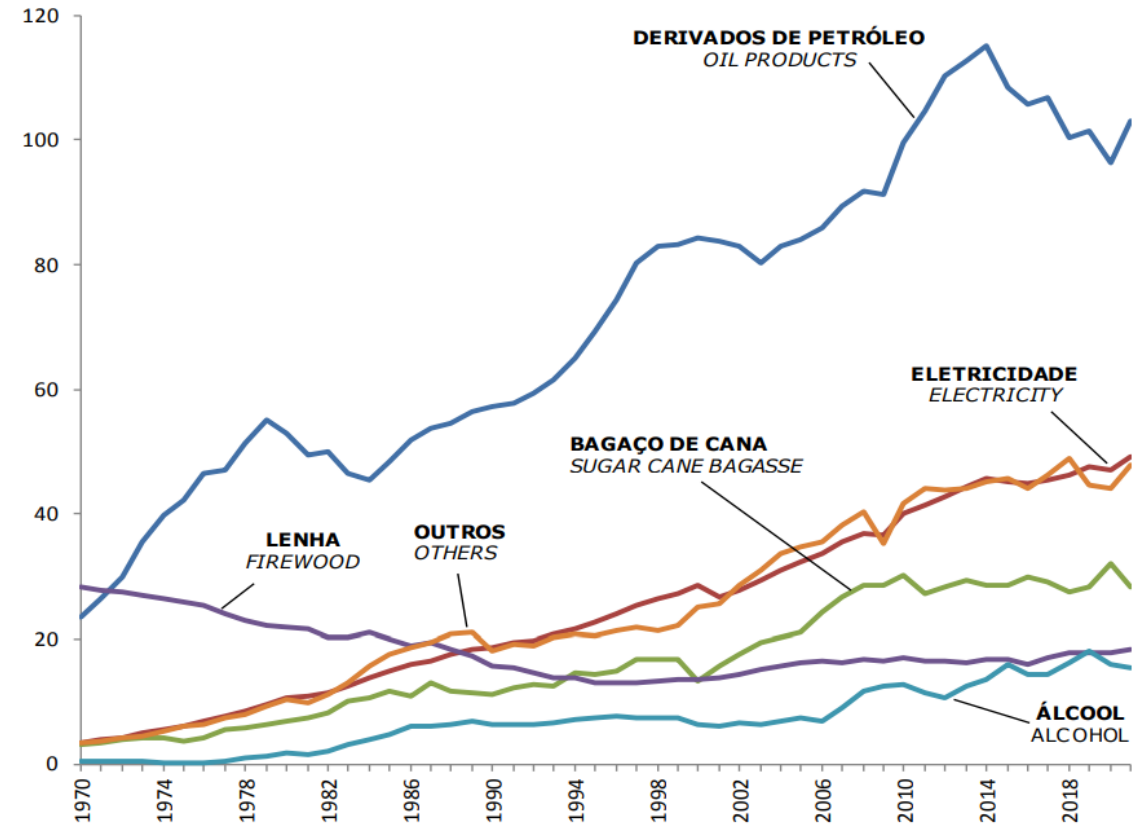
## 2. Past energy demand and supply

### 3) Final energy consumption (Unit: ktoe) by sector



Source: EPE (BEN 2022)

### 4) Final energy consumption (Unit: 10<sup>6</sup>toe) by energy source



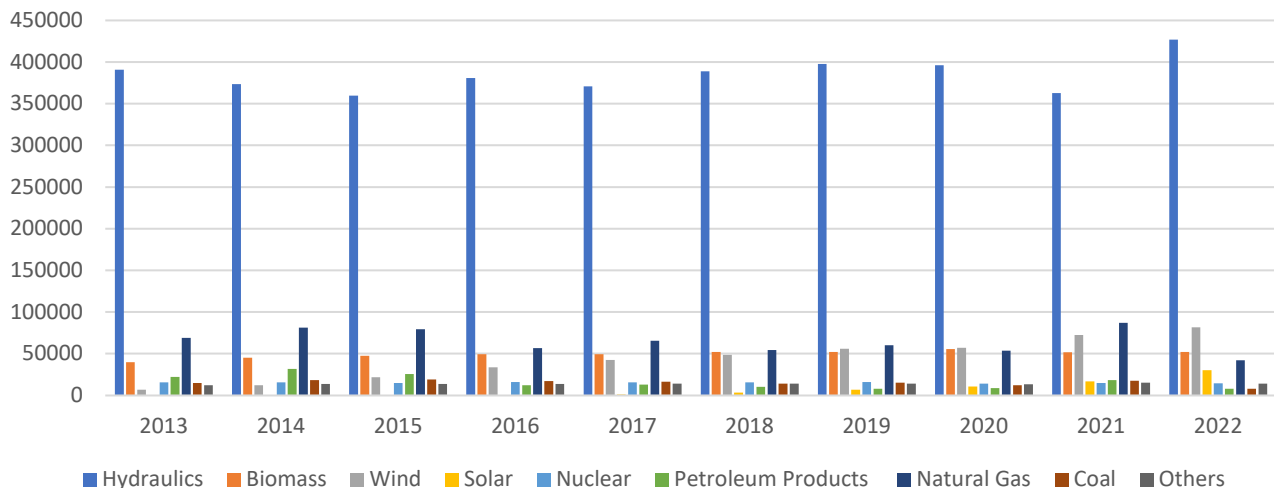
Source: EPE (BEN 2022)

## 2. Past energy demand and supply



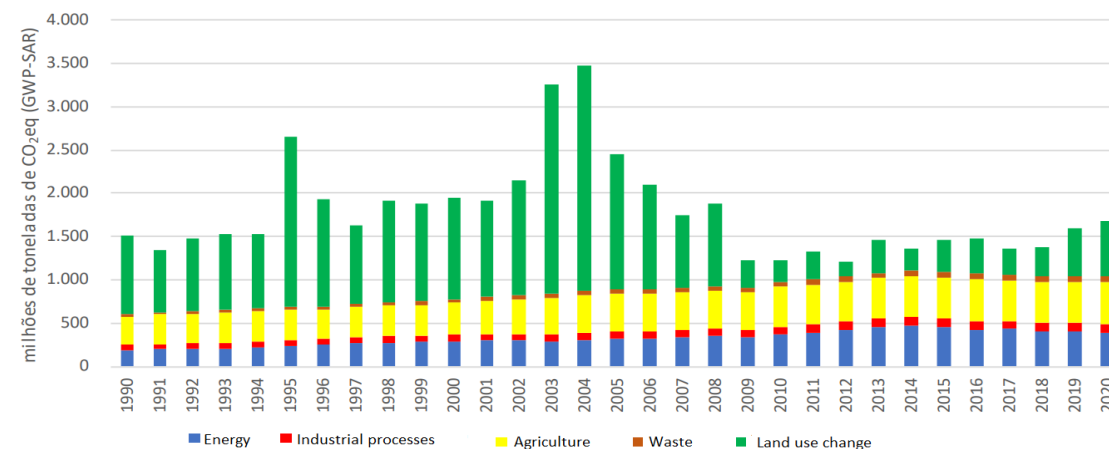
### 5) Electricity generation (Unit: GWh) by energy source (coal, oil, gas, nuclear, renewable sources)

Electricity Generation by source (GWh)



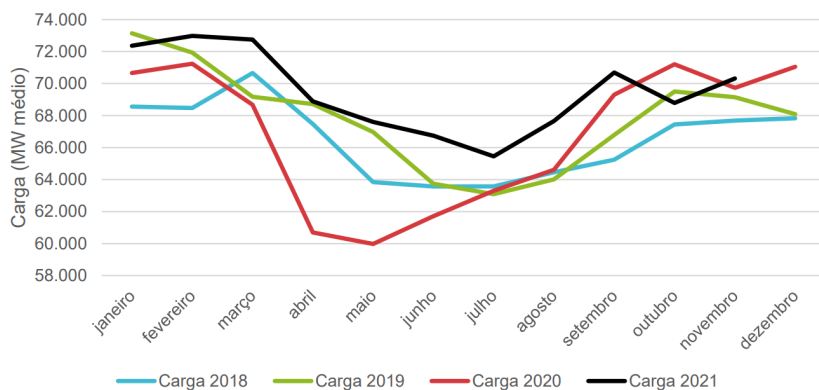
### 6) CO2 emission (Unit: Mt CO2) by sector (industry, transport, others (residential, commercial & public services, others))

Brazilian Emissions by Sector (millions of tCO2eq)

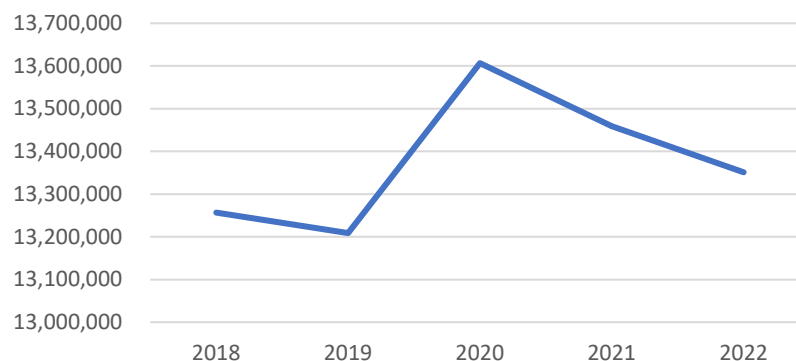


### 7) Evaluation for the presence of an impact of COVID-19 on energy demand and supply in 2021

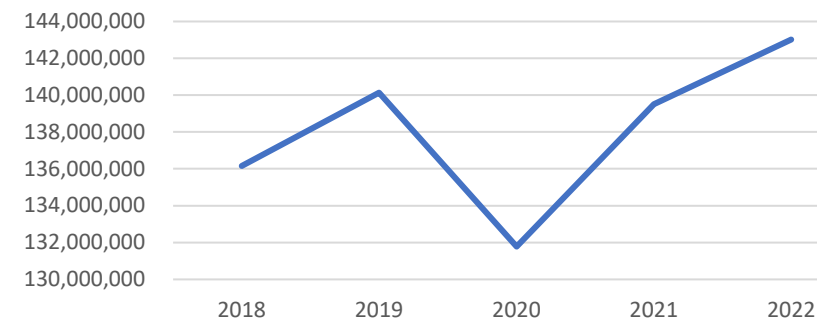
Load curve per year



LPG Sales per year (m<sup>3</sup>)

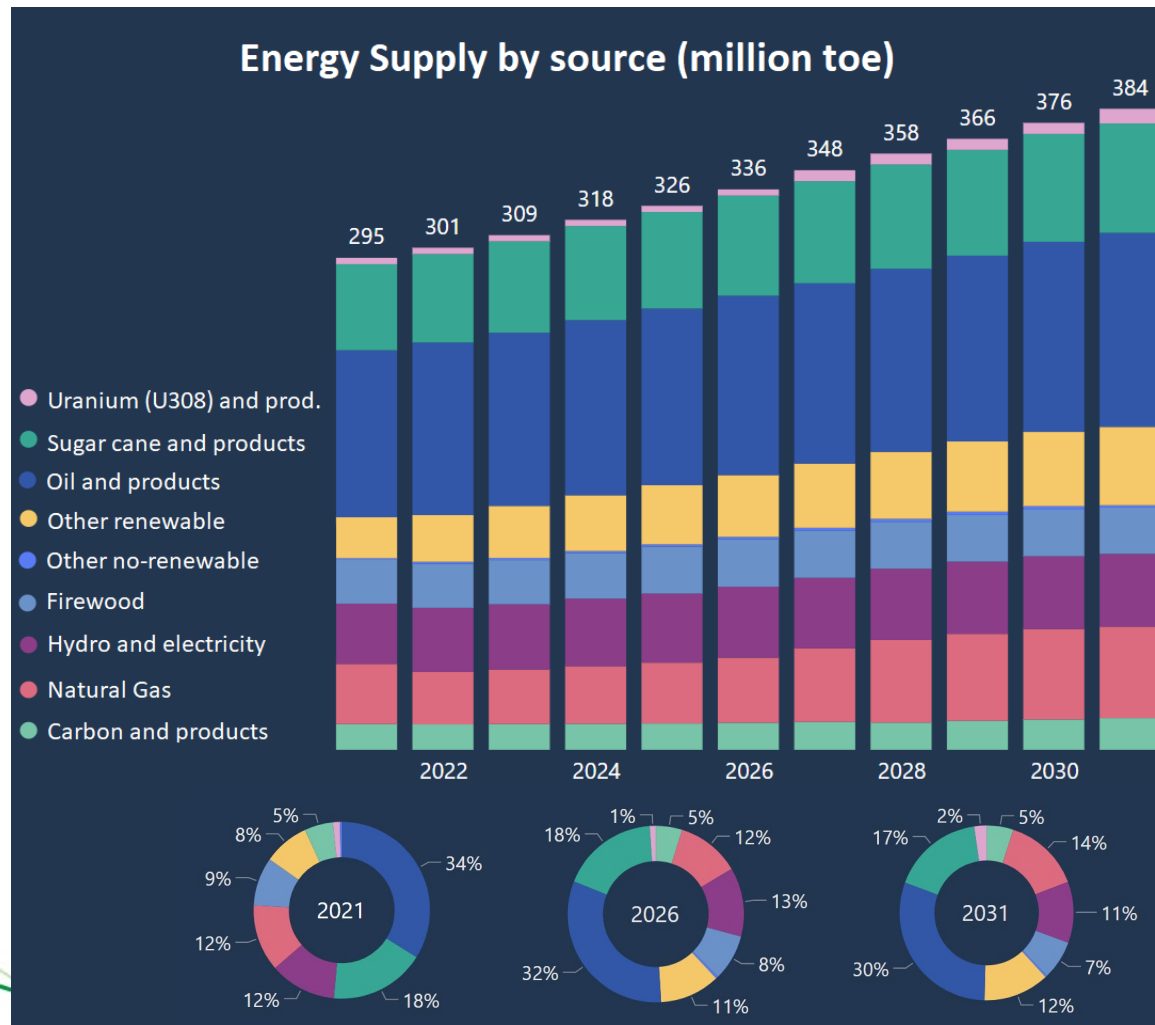


Oil Products Sales per year (m<sup>3</sup>)



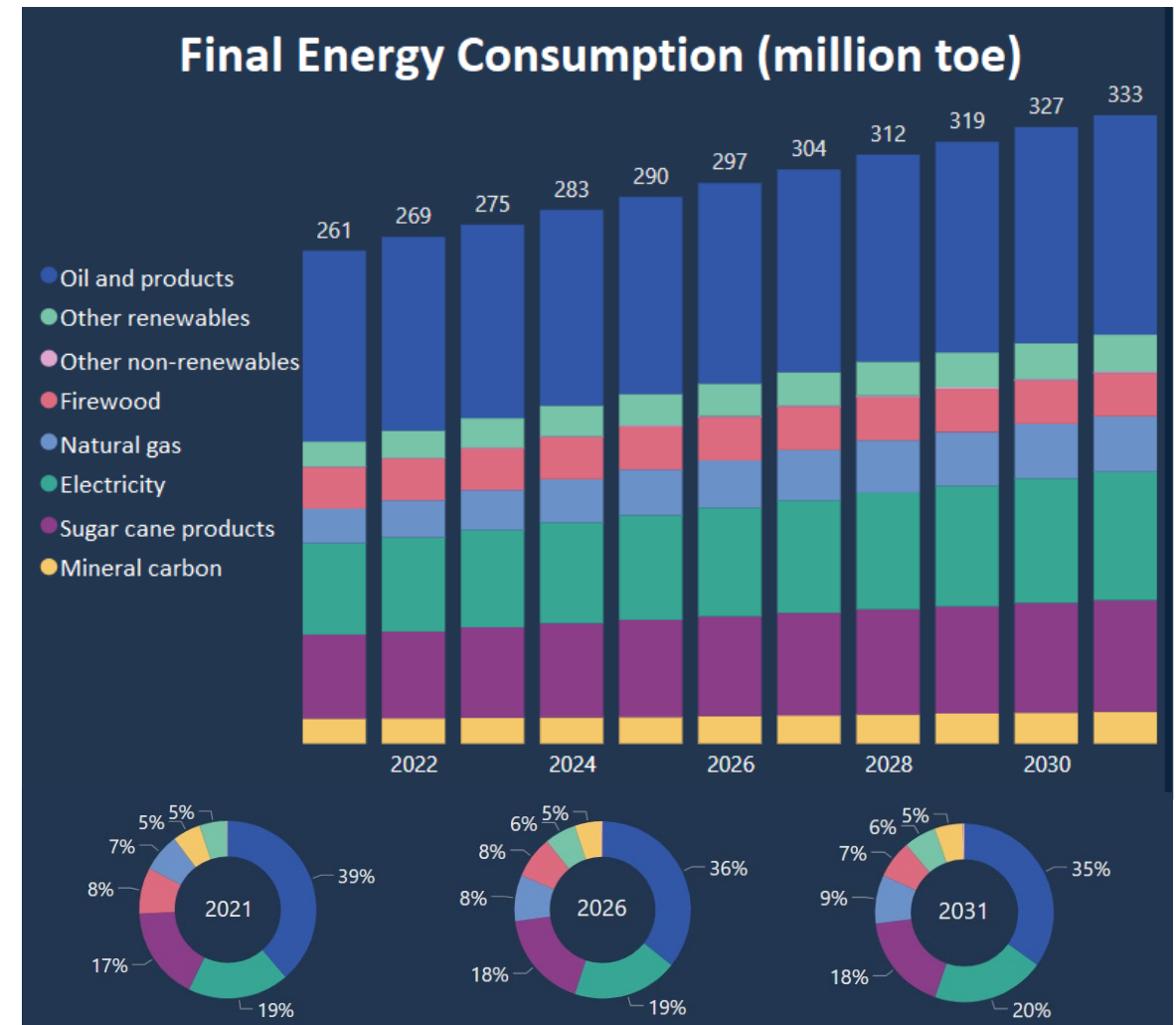
### 3. Outlook of energy demand and supply (2025, 2030, 2040 and 2050 if possible)

#### 1) Primary energy supply by source and energy source



Source: EPE (PDE 2031)

#### 2) Final energy consumption by energy source



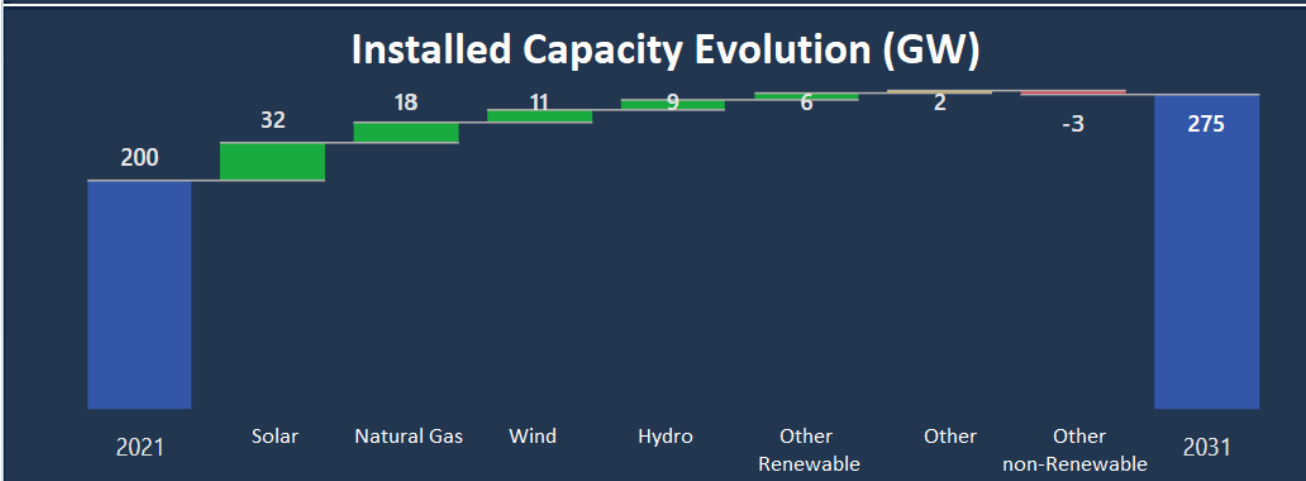
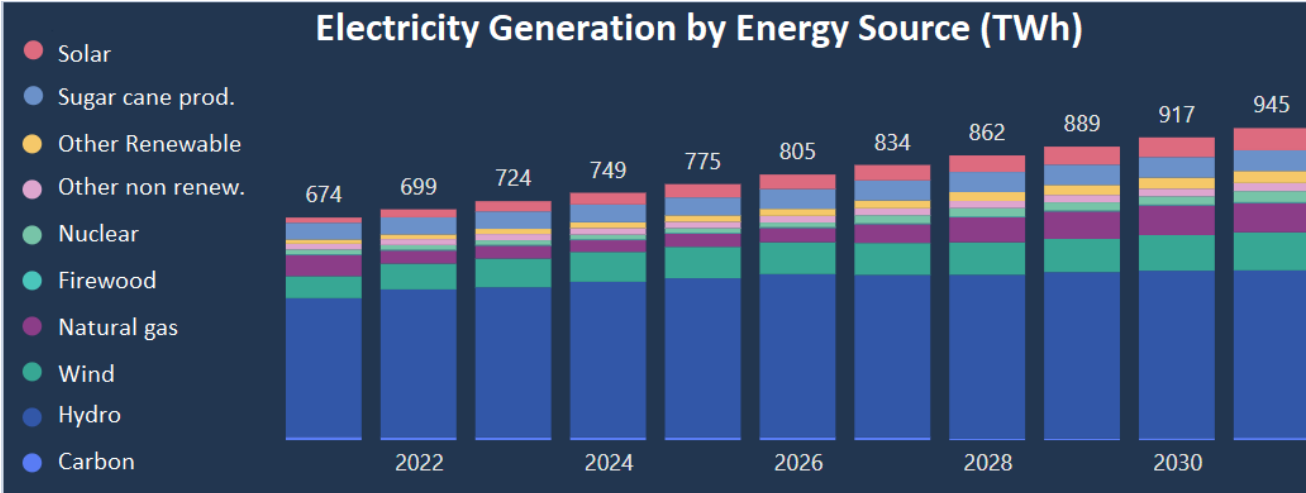
Source: EPE (PDE 2031)



# 3. Outlook of energy demand and supply (2025, 2030, 2040 and 2050 if possible)



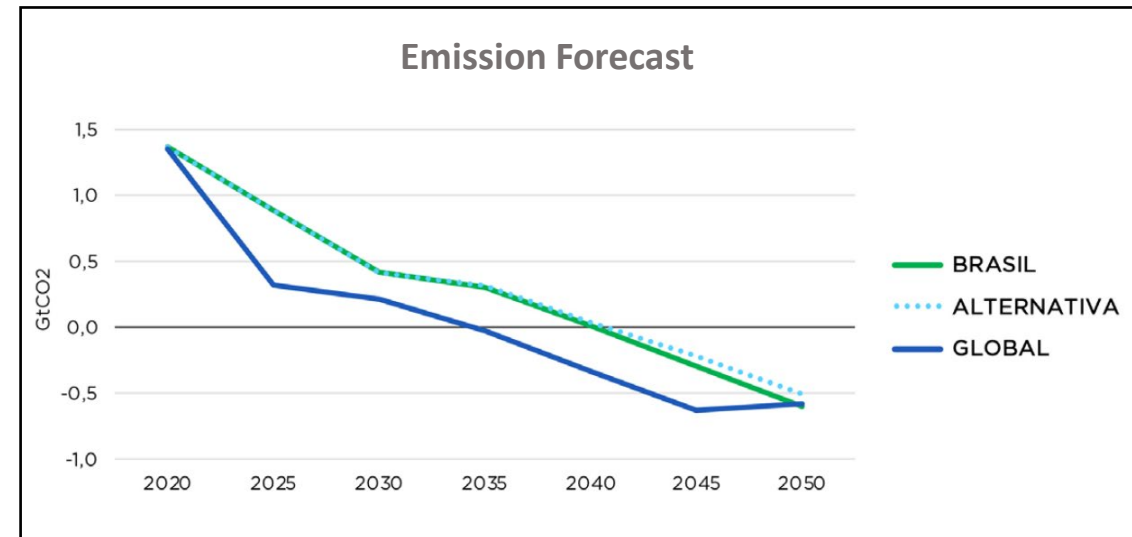
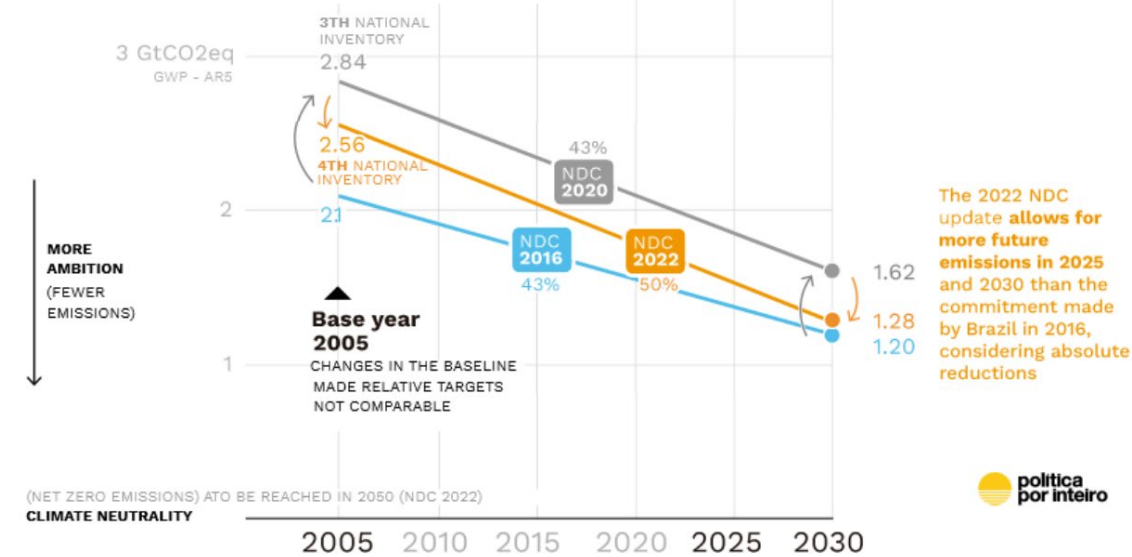
## 3) Electricity generation (Unit: GWh) by energy source



Source: EPE (PDE 2031)

## 4) CO2 emission (Unit: Mt CO2) by sector and energy source

### BRAZIL' EMISSION TARGETS



Source: CEBRI - BID - EPE - CENERGIA (2023)



## 4. Current energy policy and measures/Major difficulties and bottlenecks currently faced in formulating energy policies



### Uncertainties in energy transition

- Technologies
- Indigenous endowments
- Lack of institutional framework
- Need for new laws (H2, CCS/CCUS)



### Natural Gas

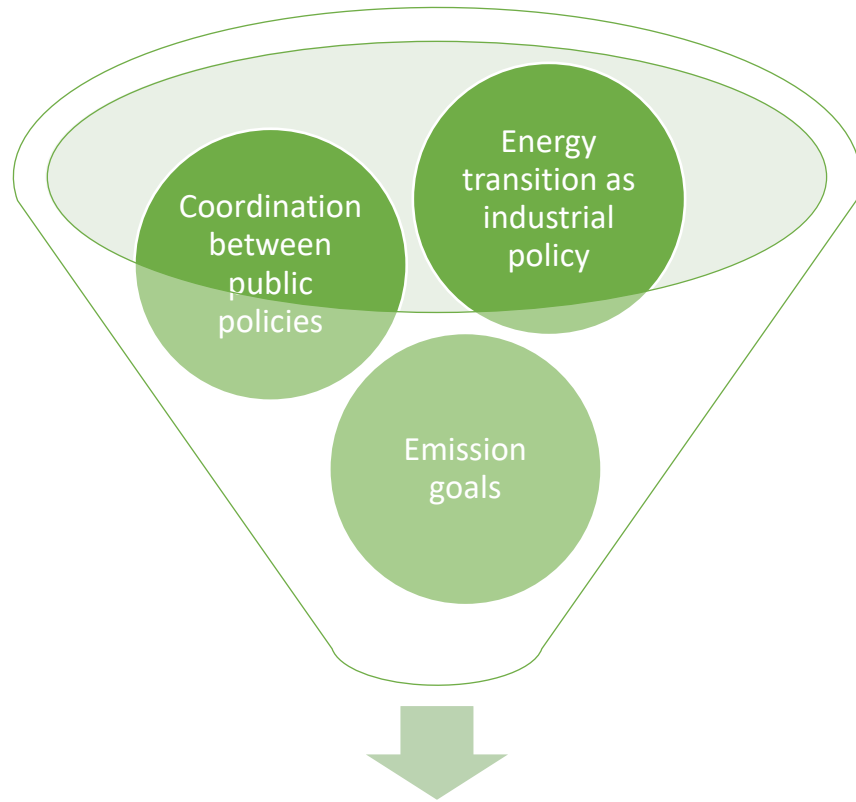
- Transition fuel?
- Associated gas
- Reinjection



### Transport based on roads

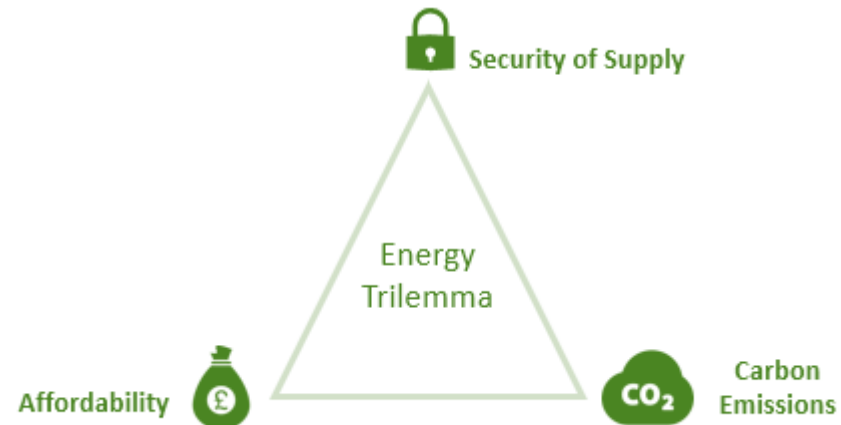
- Electrification fleet
- Cost of electrification
- Large use of biofuels (ethanol and biodiesel)

## 4. Current energy policy and measures/Major difficulties and bottlenecks currently faced in formulating energy policies



Development model

How to think **energy policy** and public policies nationally, in a context of **transition** considering the **energy trilemma**?



## 5. Subjects you especially would like to learn in this program and Expectation of your superior to this program.

### What do I want to learn?

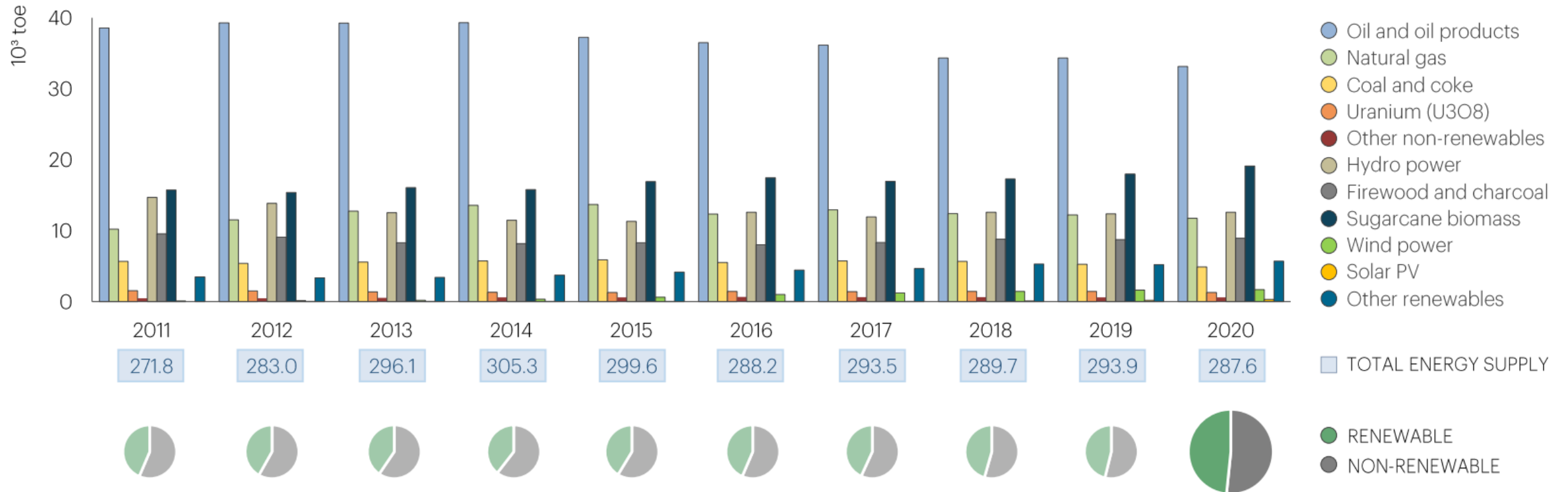
- Energy policy in the context of deep transformation in the energy industry;
- Energy policy and energy dependency;
- Energy and industrial policies: technological development;
- Using fossil endowments in the context of decarbonization;
- Energy policy and regulation.

### My superior expectations

- Brazil has/is:
  - Strong and successful tradition in energy policy for biofuels (ethanol and biodiesel)
  - Seeking to introduce an energy policy to enhance the production of biomethane and biorefineries;
  - Huge potential for solar and wind (onshore and offshore) electricity;
  - Potential to produce clean hydrogen;
  - Developed technology to produce hydrocarbons in ultradeep water;
  - Keep leadership in the clean energy mix;
- **He wants me to discuss worldwide energy policies and try to adapt them considering the Brazilian energy context**

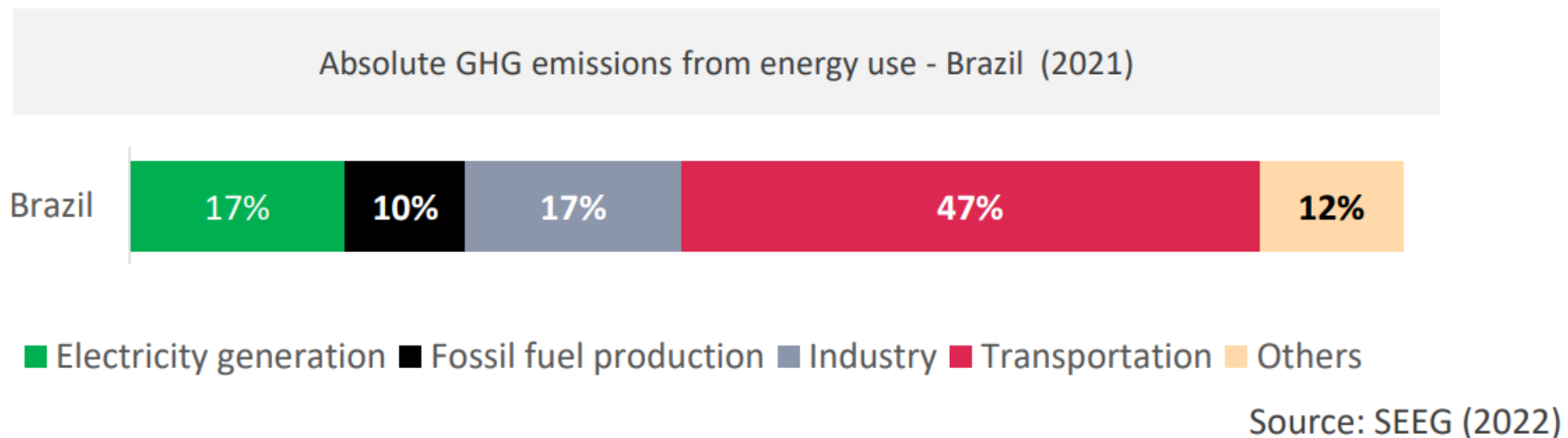
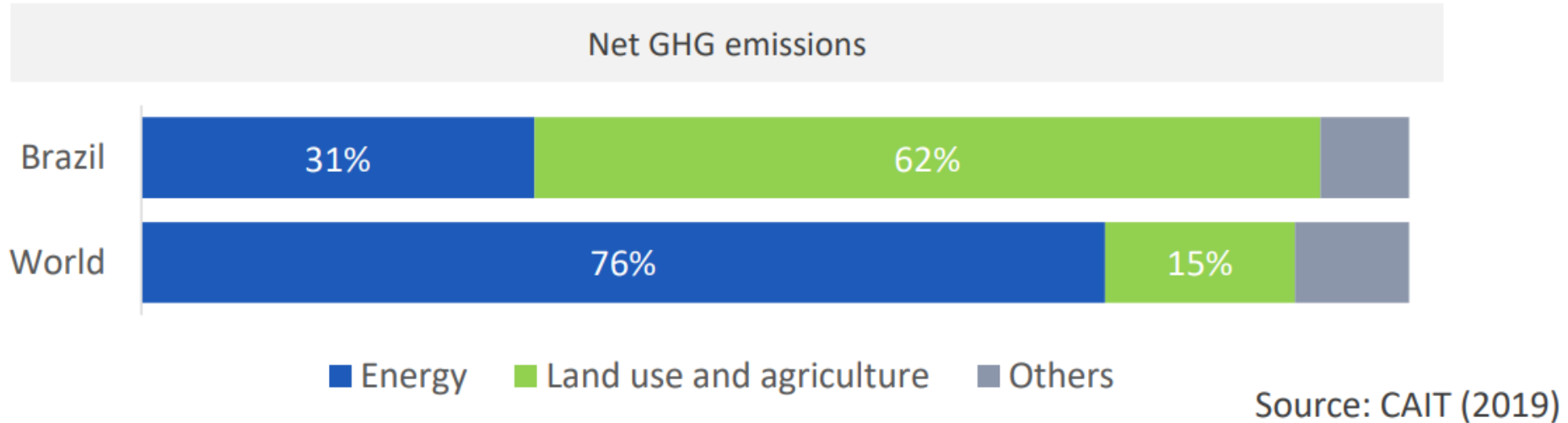
# Appendix

## Total Energy Supply 2011-2020



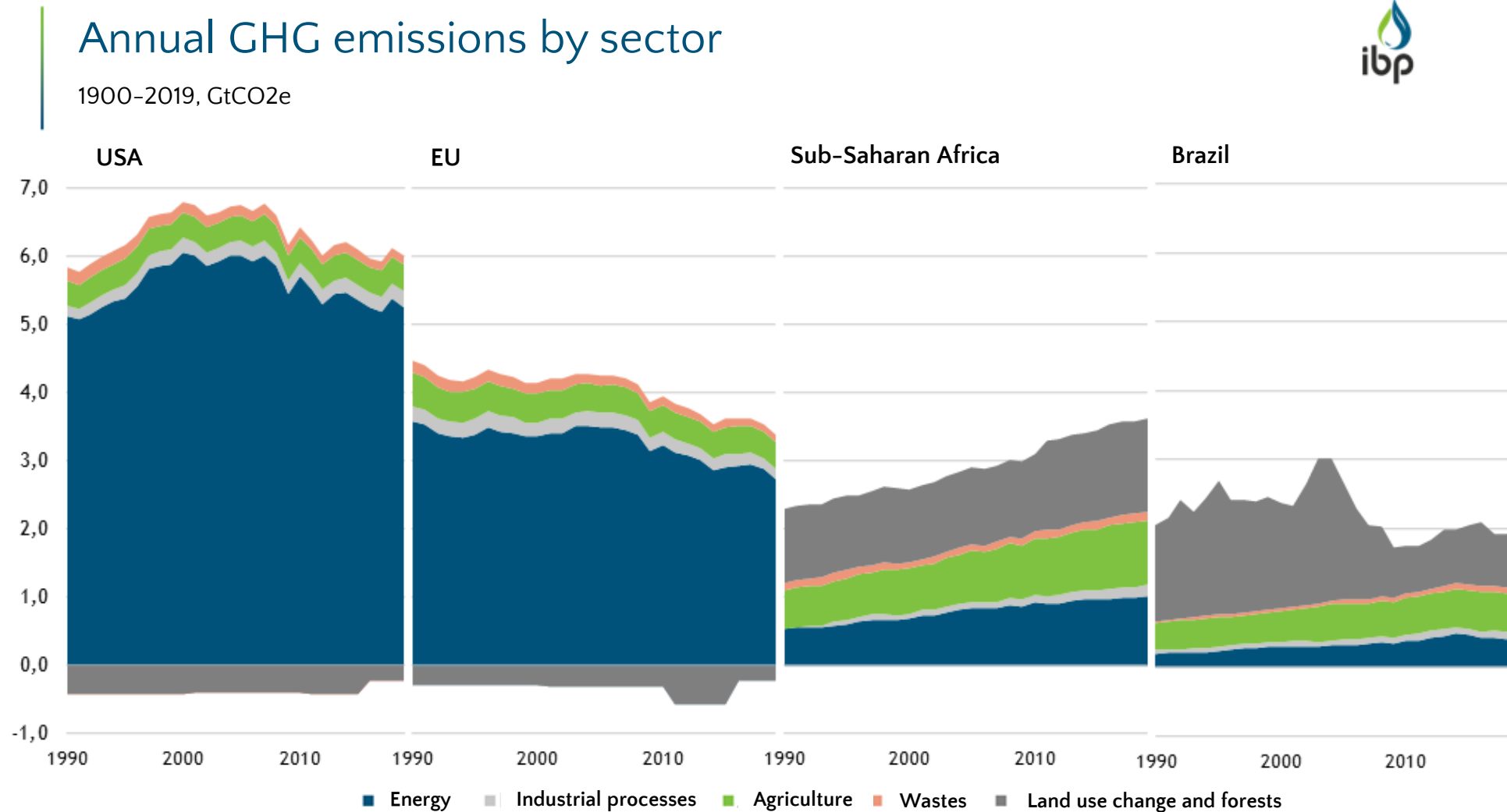
## Appendix

Brazil's emissions profile is completely different from the global profile, which implies reconciling the agricultural, energy and environmental agendas.



# Appendix

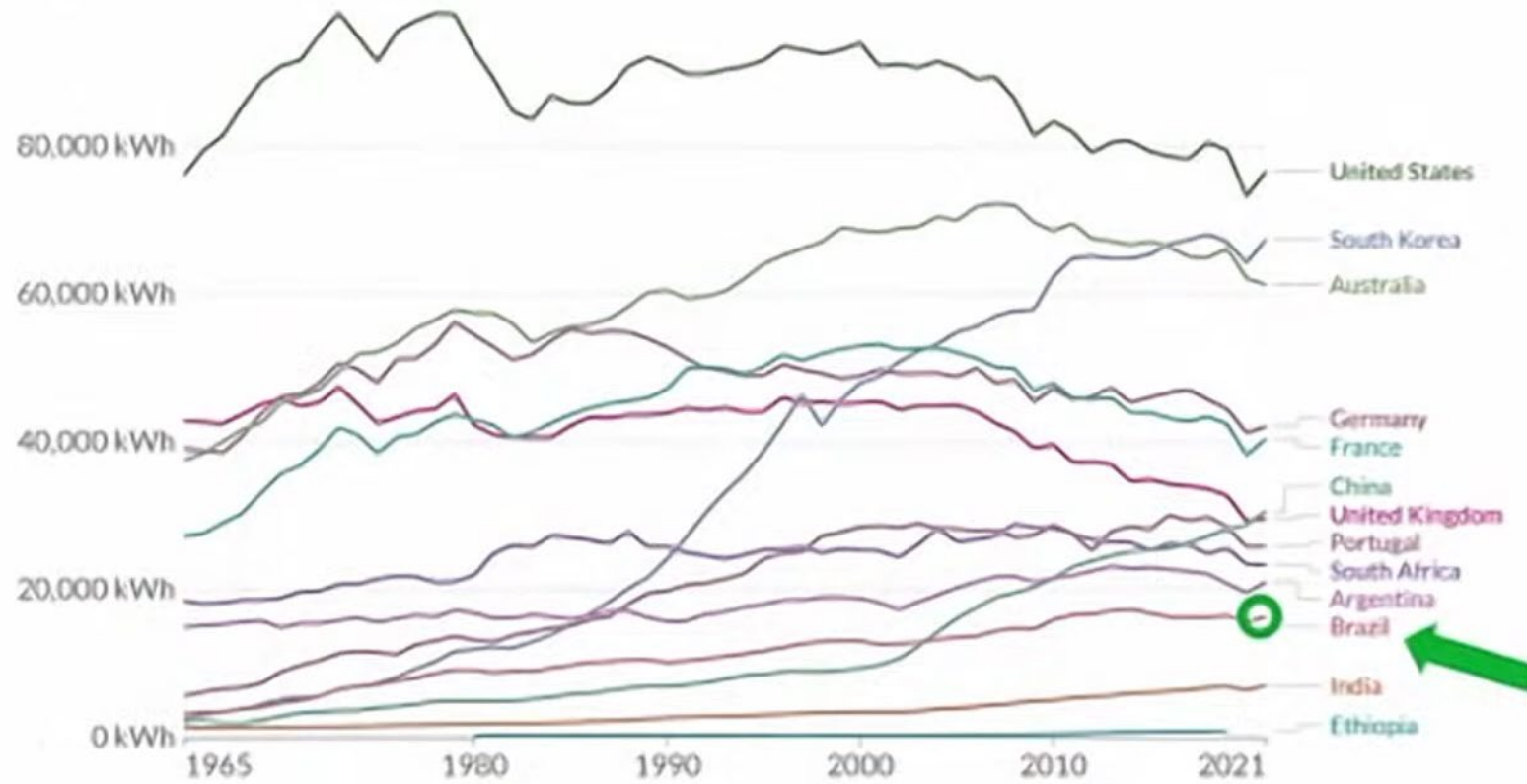
## Brazil in the energy transition



# Appendix

## Energy use per person

Energy use not only includes electricity, but also other areas of consumption including transport, heating and cooking.



Source: Our World in Data based on BP & Shift Data Portal

OurWorldInData.org/energy • CC BY

Note: Energy refers to primary energy - the energy input before the transformation to forms of energy for end-use (such as electricity or petrol for transport).