



Decarbonization in Brazil

Emilio L. La Rovere, William Wills and Pedro N. de Carvalho

Centro Clima/COPPE/UFRJ

**Institute of Research and Post-graduate Studies of Engineering
– COPPE, Federal University of Rio de Janeiro - UFRJ**

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National context and priorities for decarbonization

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Current national political and economic context: Key features

Mixed Picture with positive and negative factors for decarbonization

- Current Federal Government (Lula's presidency 2023-2026): Climate Change prioritized again
- Economic activity is doing well: GDP growth of 3.2% in 2023 and 3.4% in 2024, 2.1% expected in 2025.
- Unemployment rate in May, 2025 = 6.2% (lowest in the last ten years).
- Higher inflation rates than the target cap: 4.6% in 2023 and 4.8% in 2024, 4.9% expected in 2025.
- 2025 interest rate: 15% p.y; Public debt = 76% of GDP (2034 BAU projection: 94%); Tax reform underway.
- Congress dominated by opposition blocking presidential bills and expenditures cuts.
- Corruption scandals -> Lula's record low popularity -> uncertainty about October 2026 elections
- Brazilian economy is increasingly dependent on oil and gas production and exports: e.g. the 26 June 2025 5th tender of pre-salt oil fields with potential production of 74.5 Million barrels has ensured public revenues of 4.5 billion Euros up to 2027. Oil products is the most important item of Brazilian exports.
- There is strong pressure from the Congress, Ministry of Mines and Energy and state governors for opening a new frontier for O&G drilling in the offshore Equatorial Margin, including environmentally-sensitive areas (e.g. in the Amazon river delta).

Current national climate change agenda: Key features

Mixed Picture with positive and negative factors for decarbonization

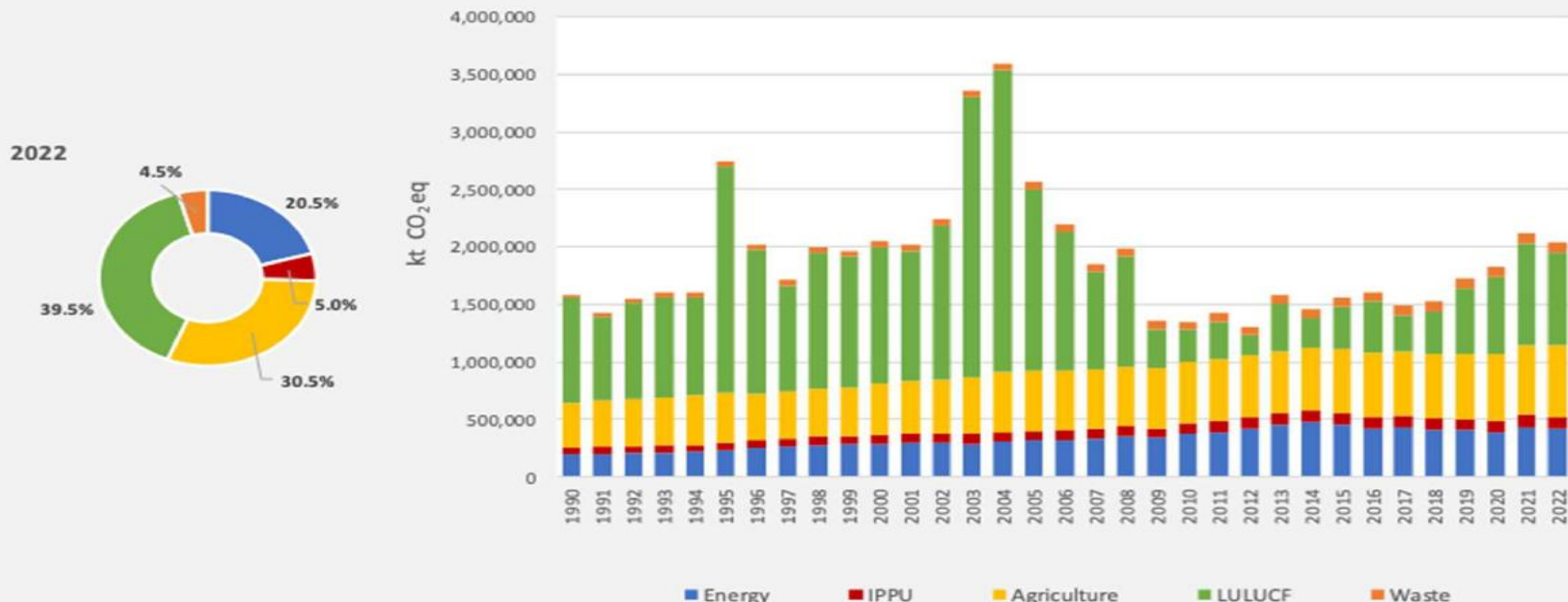
- Interministerial Climate Committee Resolution in 2023: New Climate Plan to be elaborated including 16 Sectoral Adaptation Plans and 7 Sectoral Mitigation Plans – ongoing public consultation -> COP30?
- Second NDC presented at COP29 with a new 2035 economy-wide GHG emissions target (from 850 to 1050 MtCO₂e/y) and confirmed targets from the 1st NDC: 1.32 GtCO₂e/y in 2025, 1.2 GtCO₂e/y in 2030 and net-zero GHG emissions in 2050.
- In 2024, the New Ecological Transformation Plan was launched by the Ministry of Economy at COP29; the New Industry Plan by the Ministry of Industry; the Energy Transition Policy, the Low-Carbon Hydrogen Law and the Future Fuel Law by the Ministry of Mines and Energy.
- A Federal Law approved in 2024 has established a domestic cap-and-trade system for GHG emissions to become fully operational by 2030; scope: all firms > 25 ktCO₂e/y excepted the Agricultural sector.
- Congress considers to extend subsidies to coal-fired thermopower from 2045 to 2050 and has imposed a mandate for additional 4.25 GW of natural-gas fired thermopower (increasing Brazilian electricity carbon footprint as 89% of power generation is renewable).

AFOLU: main GHG emissions source in Brazil = 70% of economy-wide GHG emissions in 2022

Deforestation is the main source of LULUCF GHG emissions (CO₂) = Around 40%

Enteric Fermentation is the main GHG emissions source (CH₄) from Agriculture = 30% of total

49% of overall energy mix = renewables, 89% of power generation = non-fossil => Energy = 20% of total



Net GHG Emissions – kt CO₂e

Source: Biannual Transparency Report – MCTI (BRASIL, 2024)

Strategic priorities for decarbonization in Brazil

- Resuming policies successfully adopted in the recent past (2004-2012) to sharply reduce annual deforestation rates: both command-and-control and economic instruments; reversing the 2019-2022 trend, reduction of annual deforested area was of 11.2% in 2023 and 32.4% in 2024 (combined figure of 40% reduction in 2022-2024).
- Carbon Pricing: design the regulations and implement a well-structured cap-and-trade scheme. A significant share of avoided emissions can be obtained at negative or very low costs.
- Boosting the forestry sector to capture a large share of emissions to make it possible to achieve net-zero target by 2050 helps to lower costs and provides time for disruptive technologies to be economically viable.
- Developing innovative financial mechanisms - IFMs to reduce capital costs, de-risk and foster the funding of investments in mitigation actions, and mainly in forest cover restoration and low-carbon infrastructure.
- Substantial support of key Annex I countries to foster financial flows targeted at mitigation actions in the global South, including both the climate finance tools within UNFCCC (GCF, article 6 of PA) and international financial initiatives to channel private capital to low-carbon investments: key enabler of de-risking low carbon projects.
- Design and start implementation of a LT-LEDS for Brazil, assessing the economic and social implications of decarbonization, and including policy tools to ensure a just transition.

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Strategic analytical priorities for the JUSTPATH project

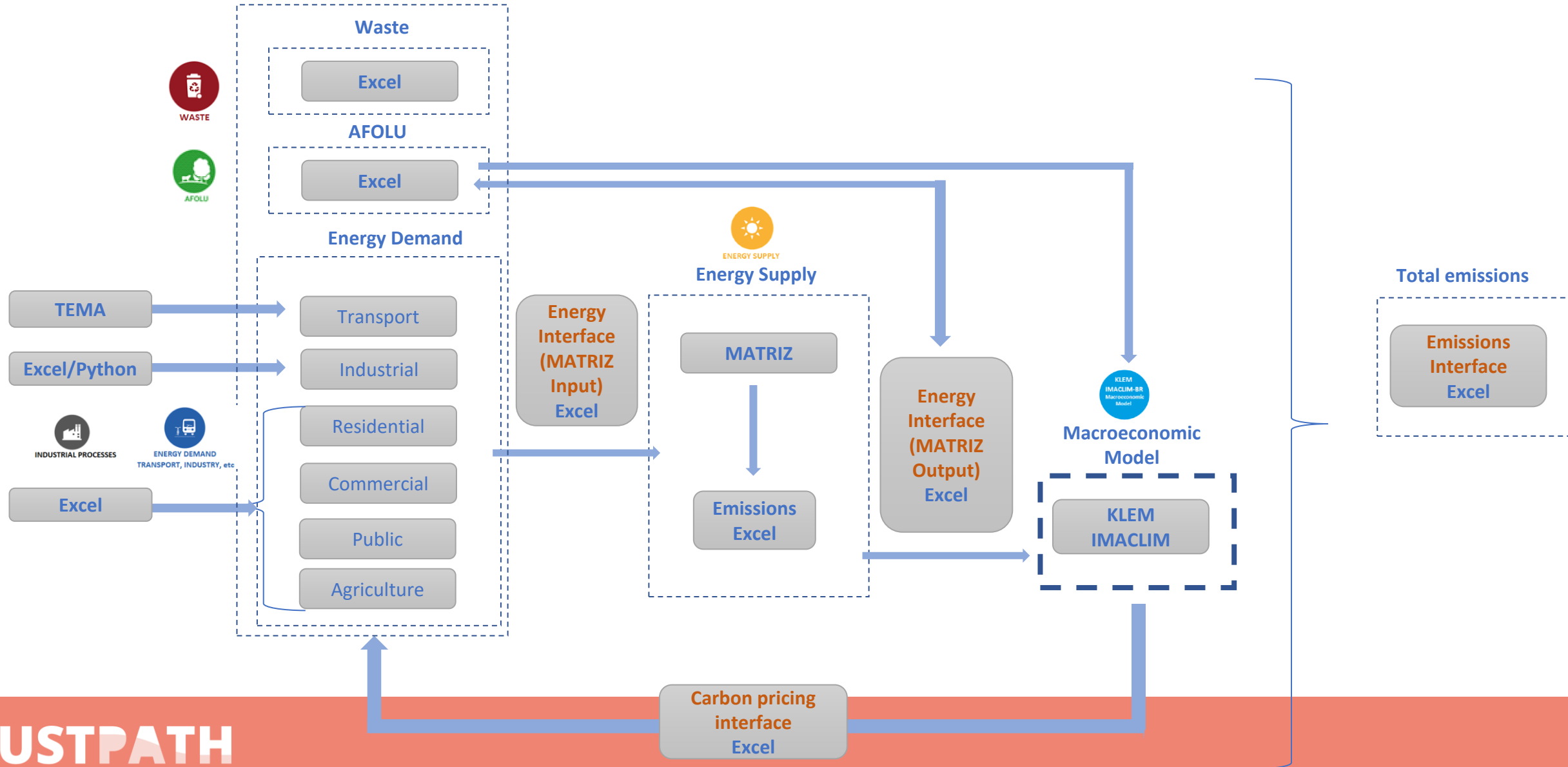
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JUSTPATH - Work Programme

Work Programme:

- Modeling improvements: KLEM-BR + IMACLIM-BR
- Scenario development
- Analysis of socioeconomic impacts of the transition
- Stakeholder engagement at the domestic level
- Translation of First GST outcomes at the domestic level

Methodology - Integrated Modelling



KLEM-BR modeling: SFC integration

Better representation of financial flows

Initial version of KLEM-BR was not able to model capital markets, implicitly proposing a perfect market allocating available capital, resulting from the accumulation of savings, in such a way as to equalise the profitability of investments in each production sector.

Million BRL	COMPOSITE	ENERGY	C	G	I	X	
COMPOSITE	4,360,402	200,561	3,645,385	1,087,483	1,064,450	740,060	11,098,342
ENERGY	243,828	158,569	198,737	-	-	62,739	663,873
L net	2,385,800	29,329					
L taxes	534,480	10,955					
Y taxes	57,243	2,468					
K	1,917,933	99,429					
R	99,682	271					
M	749,026	78,758					
SM		16,892	COMPOSITE				
		-101,581	ENERGY				
		91,005	C				
		-	G				
		-	I				
		-6,316	X				
SALES T	749,948	83,533					
EXCISE IC	-	-					
EXCISE FC	-	-					
EXCISE	-	-					
	11,098,342	663,873					
			COMPOSITE ENERGY				
			9,599,368	501,582			Distributed output

Balance sheet matrix

How Innovative Financial Mechanisms - IFMs may increase low-carbon investments in Brazil ?

The Stock Flow Consistent methodology was introduced (IMAGINE project) to avoid the incompleteness that characterizes most standard models in terms of financial flows and stocks

IMACLIM-BR Model Enhancements & SFC Integration Strategy

Data & Methodology Challenge: SFC requires detailed sector-level financial data, currently unavailable. Work is needed to estimate, balance, and align flows with IMACLIM-BR 19 sectors, and ensure model consistency.

IFM & SFC Integration: Coding of financial mechanisms and SFC logic into IMACLIM-BR, with CIRED support and KLEM-BR as reference.

Feasibility & Parallel Modeling: Given SFC data misalignment with IMACLIM sectors, we will assess data availability. If needed, as a contingency strategy, KLEM-BR will run in parallel as a satellite model to provide financial insights. Scenarios will be aligned, and a soft-linking methodology between the two models will be developed and tested.

Scenario Testing: Pilot simulations to evaluate economic impacts of IFMs and refine model behavior.

Capacity Building: Joint CIRED–Brazilian team workshops to operate the model, interpret results, and co-develop improvements.

Investment Cost Analysis: Updated methods to assess both mitigation and baseline investment needs – insights on how to “Shift the Trillions”.

National Scenario Development

Objective:

- Inform national and global policy processes with robust scenarios that explore the links between mitigation, finance, and socioeconomic outcomes — aligned with 1.5 °C and just transition goals.

Scenario Focus (2060 Horizon)

- **CPS** – Current Policy Scenario: Baseline under ongoing mitigation policies.
- **DDS** – Deep Decarbonization Scenario: Net-zero by 2050 and beyond with aggressive mitigation.
- **DDS IFM** – DDS + Innovative Financial Mechanisms: Explores how IFMs reduce capital costs, attract investment, and support just transition goals.

Contribution to Policy

- Inputs to Brazil's next **NDC** and **LT-LEDS**.
- Insights into financial tools to boost investments for a low-carbon economy.
- Elements to design evidence-based, inclusive, and climate-resilient strategies.

Socioeconomic Aspects of the Transition

Focus: Analysis of GDP, employment, income distribution, inflation, mitigation costs, and investment needs up to 2050.

Scenarios: Compare CPS, DDS, and DDS+IFM to assess how IFMs influence capital costs, investment, and job creation, besides unemployment rates, inequalities, Purchasing power of different household income levels, etc.

Goal: Support just, inclusive, and sustainable policy strategies aligned with climate targets.

Partnerships with External Experts (preliminary): *Unicamp* – ABM (Prof. Marcelo Pereira); *IPEA* – Macro (Dr. Claudio Amitrano); Ministry of Finance; *GMMI*, *WB OMEGA* – for complementary dialogues.

National Stakeholder Engagement

Key Policy Processes to Engage

- Drafting of **LT-LEDS** (Long-Term Strategy) – 2026
- Definition of Brazil's **third NDC** – 2028
- Regulation & implementation of **SBCE (national cap-and-trade system)** – 2025–2030

Engagement Strategy

- Join consultations of the Federal **Climate Plan** and other initiatives
- Active role in the **Brazilian Climate Change Forum (FBMC)**, especially in the Technical Commission on Carbon Economics

Support Needs

- No external support required at this stage

Translating GST Outcomes

Reference Framework

- Based on Imagine project's Technical Summary

Government Perspective

- Brazil seen as a leader in energy transition
- 93% renewable electricity (2023)
- 49% renewables in overall energy mix

Civil Society Concerns

- Delay in **coal phase-out** (3.2 GW subsidized to 2040)
- Need to **transition from oil & gas** (Petrobras expansion (Equatorial Margin), OPEC+ observer)
- Need to **reduce methane** (linked to cattle/beef exports)
- Persistent **fossil fuel subsidies** (Repetro and REPEX up to 2040)



Thank you!

emilio@ppe.ufrj.br

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