

# **Liens science et décision dans la construction des trajectoires bas carbone: le cas du Brésil**

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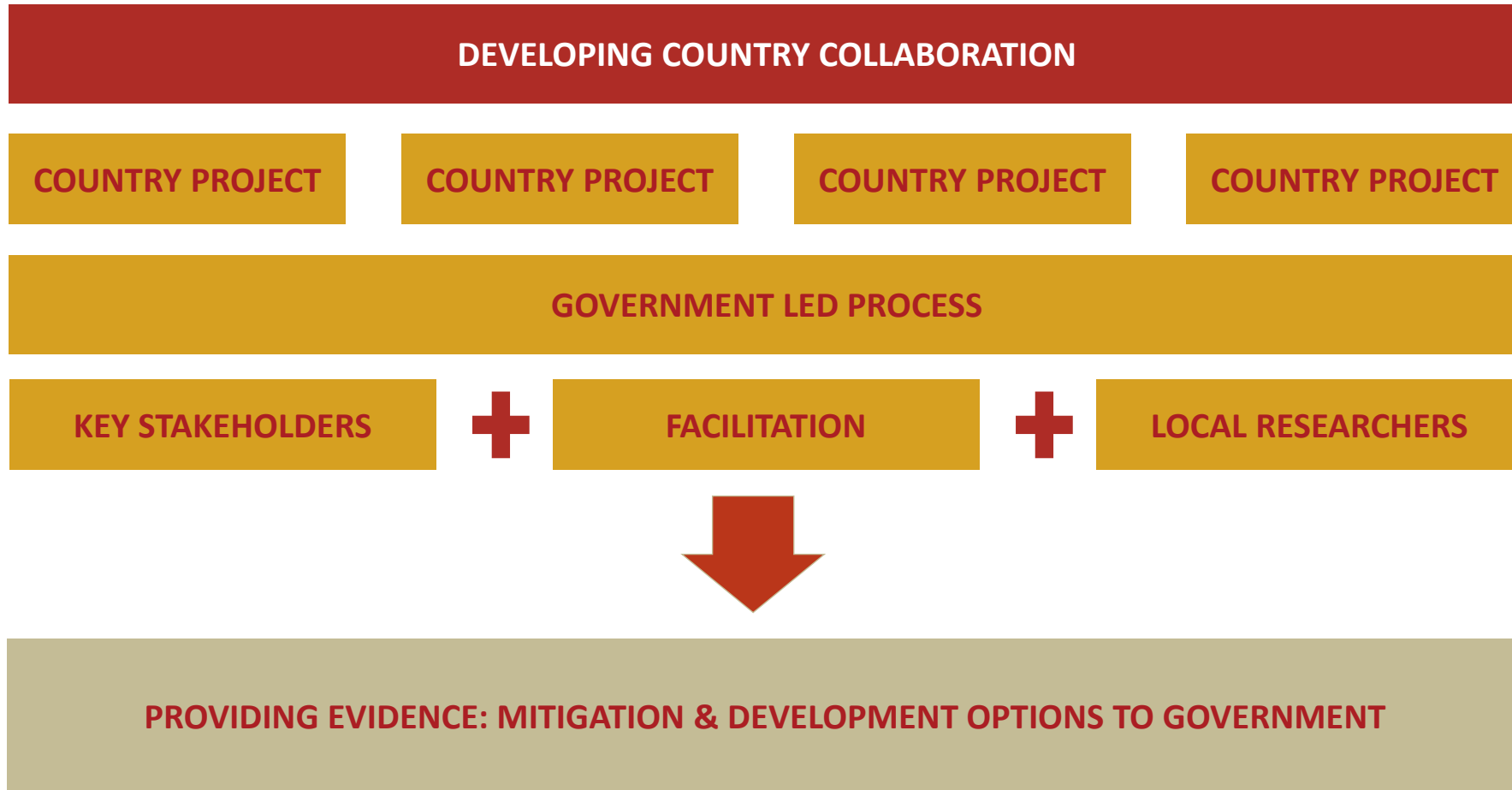
**UFRJ - Université Fédérale de Rio de Janeiro**

**Construction des trajectoires bas carbone  
Quel rôle pour la modélisation prospective?**

**Paris, 18 Décembre 2018**

# What is MAPS ?

## Mitigation Action Plans & Scenarios



# MAPS

Mitigation Action Plans and Scenarios (MAPS) is a collaboration amongst developing countries to establish the evidence base for long term transition to robust economies that are carbon efficient. In this way MAPS contributes to ambitious climate change mitigation that aligns economic development with poverty alleviation.

# method

Central to MAPS is the way it combines research and stakeholder interest with policy and planning. Our participative process engages stakeholders from all sectors within participating countries and partners them with the best indigenous and international research.

# GOAL

MAPS aims to accelerate political commitment for the formulation and implementation of ambitious and equitable mitigation action in key developing countries by building a broad base of support among domestic stakeholders on a sound evidence base.

# Stakeholders

- Stakeholders are involved in two or more phases: in the design of the Scenarios, and through leaders in sectors reacting to the results of the Scenario process
- The Primary Stakeholders are the Scenario builders
- They are technically skilled persons representing their sectors
- We can group them into a Scenario Building Team

# SBT

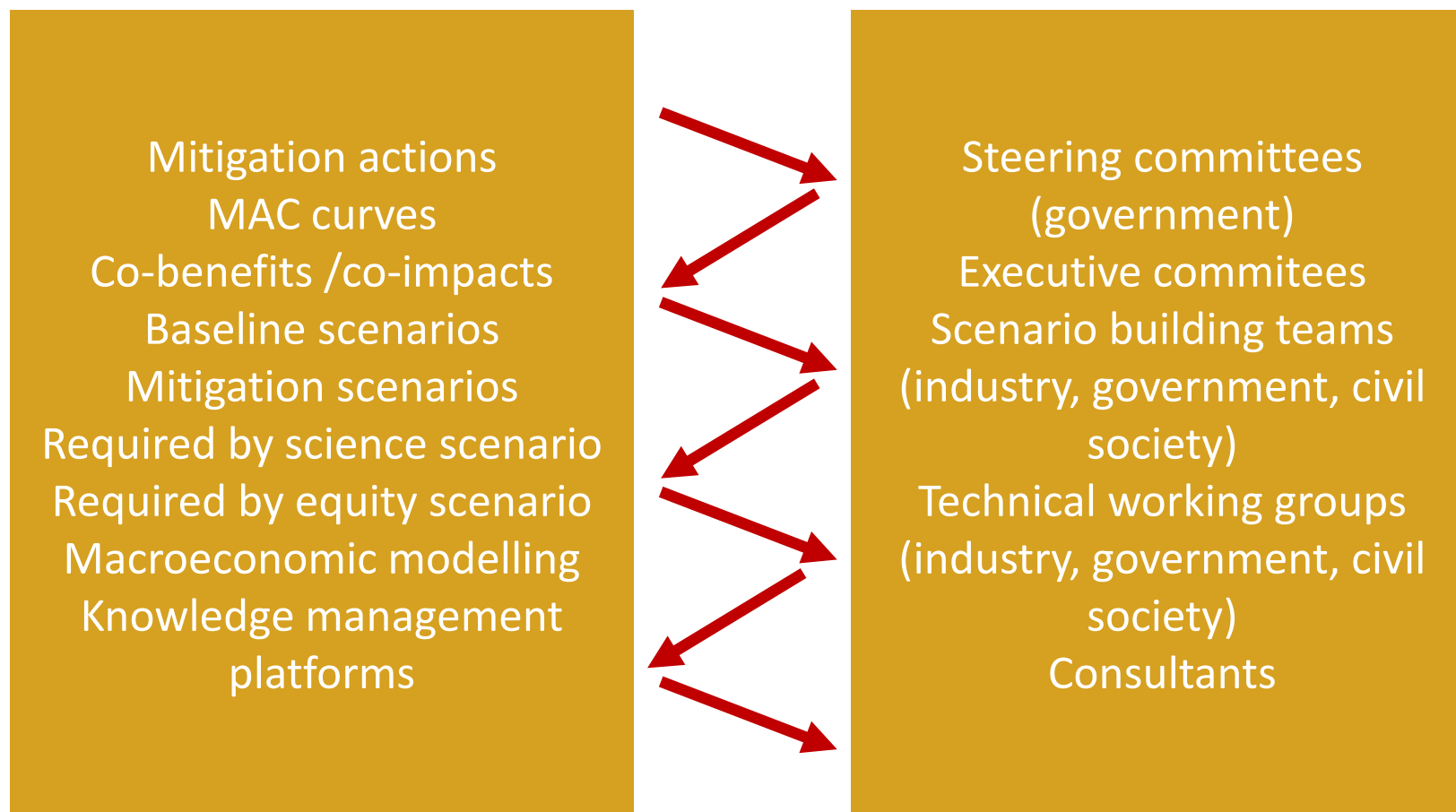
- The Scenario Building Team is supported by the researchers
- Its primary task is to frame the Scenarios, and then agree on all the Scenario inputs
- These can be for example GDP, discount rates, costs etc
- The SBT then instructs the researchers to use the data in modelling processes to look to the future projections
- Packages of inputs are used to build the Scenarios

# Effect on stakeholders

- Stakeholders are deeply affected by this process in many ways, including:
  - Learning to work with each other, inter-sectorally
  - Resolving conflicts
  - Resolving data disputes, misunderstandings
  - Understanding the system better
  - Hearing the positions of other SBT members
  - Being creative with new possibilities
  - Experimentation



# Research / Process interface



# The MAPS Community

SOUTH SOUTH COLLABORATION

COUNTRY TEAMS



MAPS INTERNATIONAL



SOUTHERN EXPERTS



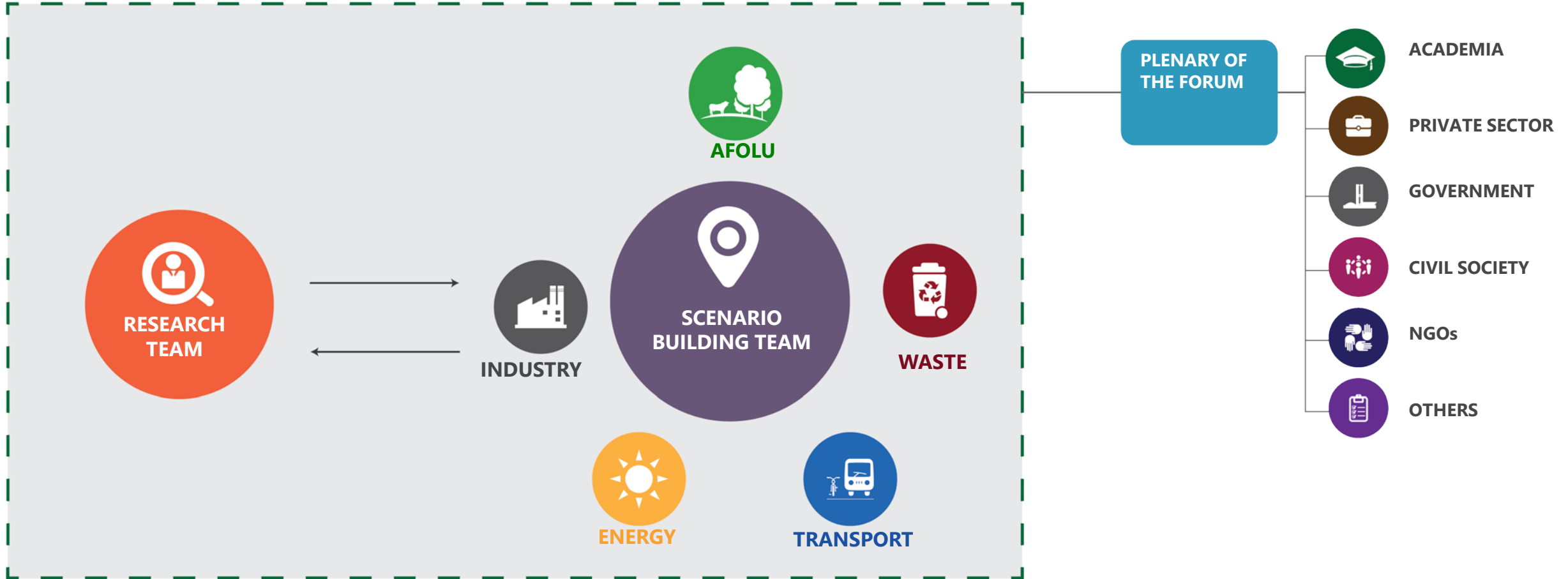
# MAPS & INDCs

- National processes started between 2011 and 2012 – when INDCs did not exist.
- Processes had an emphasis on domestic policy considerations but also included aspects of relevance to the international negotiations.
- Today: All MAPS local teams are directly informing the INDC of their respective countries. The reasons stated:
  - - Evidence generated is robust and credible (local data)
  - - Evidence generated is validated by a relevant set of stakeholders including representatives from academia, public and private sector and civil society.
  - - Evidence integrated in the national context, prioritizing development.

# METHODOLOGY



**COORDINATION BY THE BRAZILIAN FORUM ON CLIMATE CHANGE**



# SCENARIO BUILDING TEAM COMPOSITION



Ministry of Agriculture, Livestock and Food Supply

Ministry of Cities

Ministry of Development, Industry and Commerce

Ministry of Environment

Ministry of Finance

Ministry of Foreign Affairs

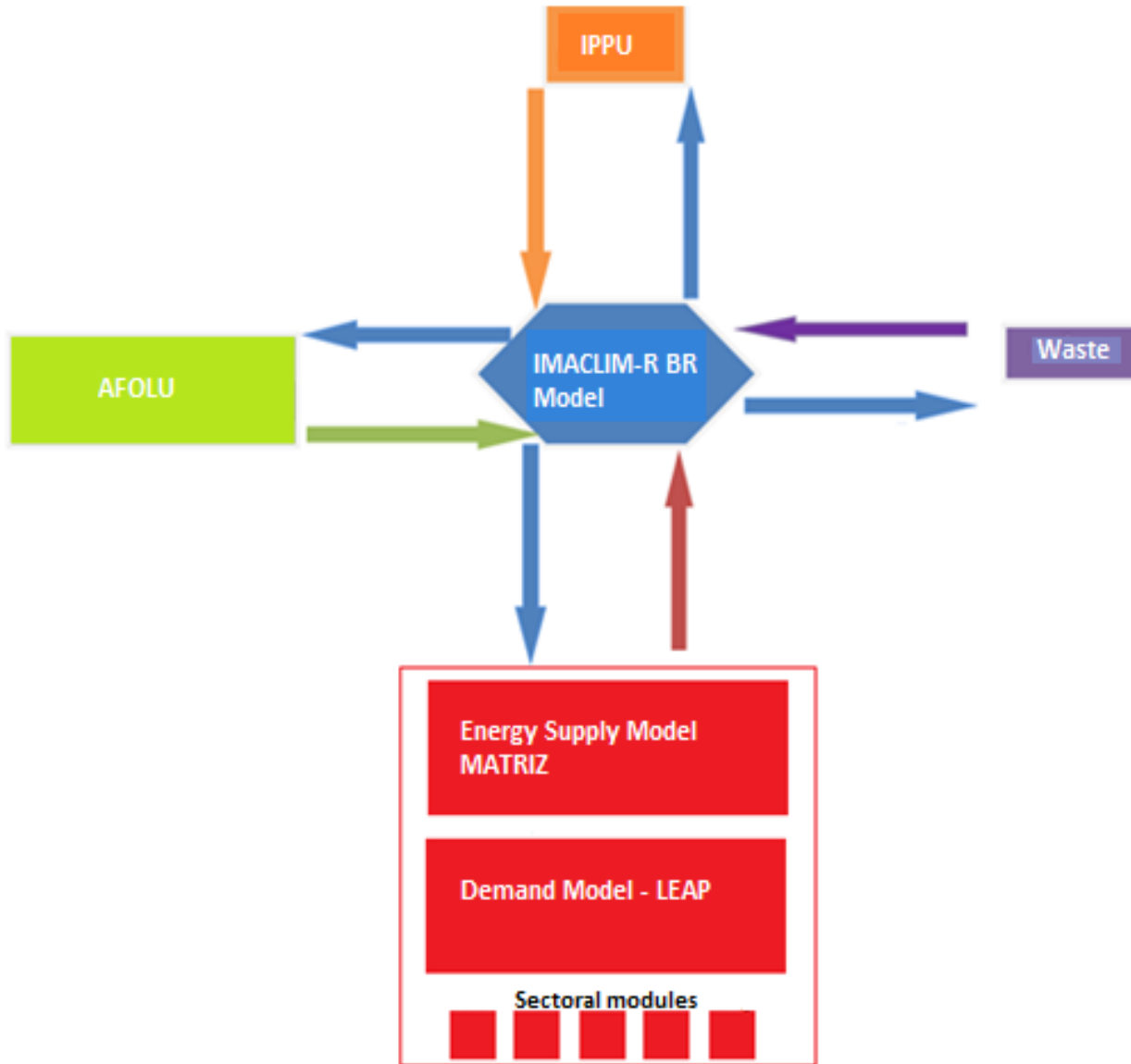
Ministry of Mines and Energy

Ministry of Science, Technology and Innovation

Ministry of Transport

## SCENARIO BUILDING TEAM COMPOSITION

- Aluminium
- Banking and Finance
- Consumer groups
- Cement
- Electricity
- Glass
- Industry Associations
- Mining
- NGOs
- Pulp and paper
- Oil & Gas
- Research groups
- Steel
- Sugarcane
- Trade Unions



*IMACLIM-R BR: Hybrid CGE model*

*MATRIZ: Energy optimizing model*

*LEAP: Puts together energy demands and builds up an Energy Balance*

*AFOLU: Centro Clima Simulation model (spreadsheet) or BLUM (Agroícone Institute model)*

*WASTE: Simulation model (spreadsheet)*

*IPPU: LEAP*

*Transport: Simulation model (detailed spreadsheet)*

*Other sectors: LEAP*

## Designing an iNDC for Brazil under the assumption of fast economic growth

### Government Plan Scenario (GPS)

Measures already being implemented under the National Climate Change Plan (Copenhagen pledges)

### Additional Mitigation 1 (AM1+T)

Expansion of measures considered in the GPS, plus additional measures

Global carbon tax of US\$ 20/tCO<sub>2</sub>

### Additional Mitigation 2 (AM2+T)

Early implementation or expansion of measures from AM1, plus additional measures

Global carbon tax of US\$ 100/tCO<sub>2</sub>

A domestic carbon tax on the combustion of fossil fuels starting at zero in 2005 and growing linearly until reaching 20 and 100 US\$/ton of CO<sub>2</sub>e, in AM1+T and AM2+T, respectively, in 2030.

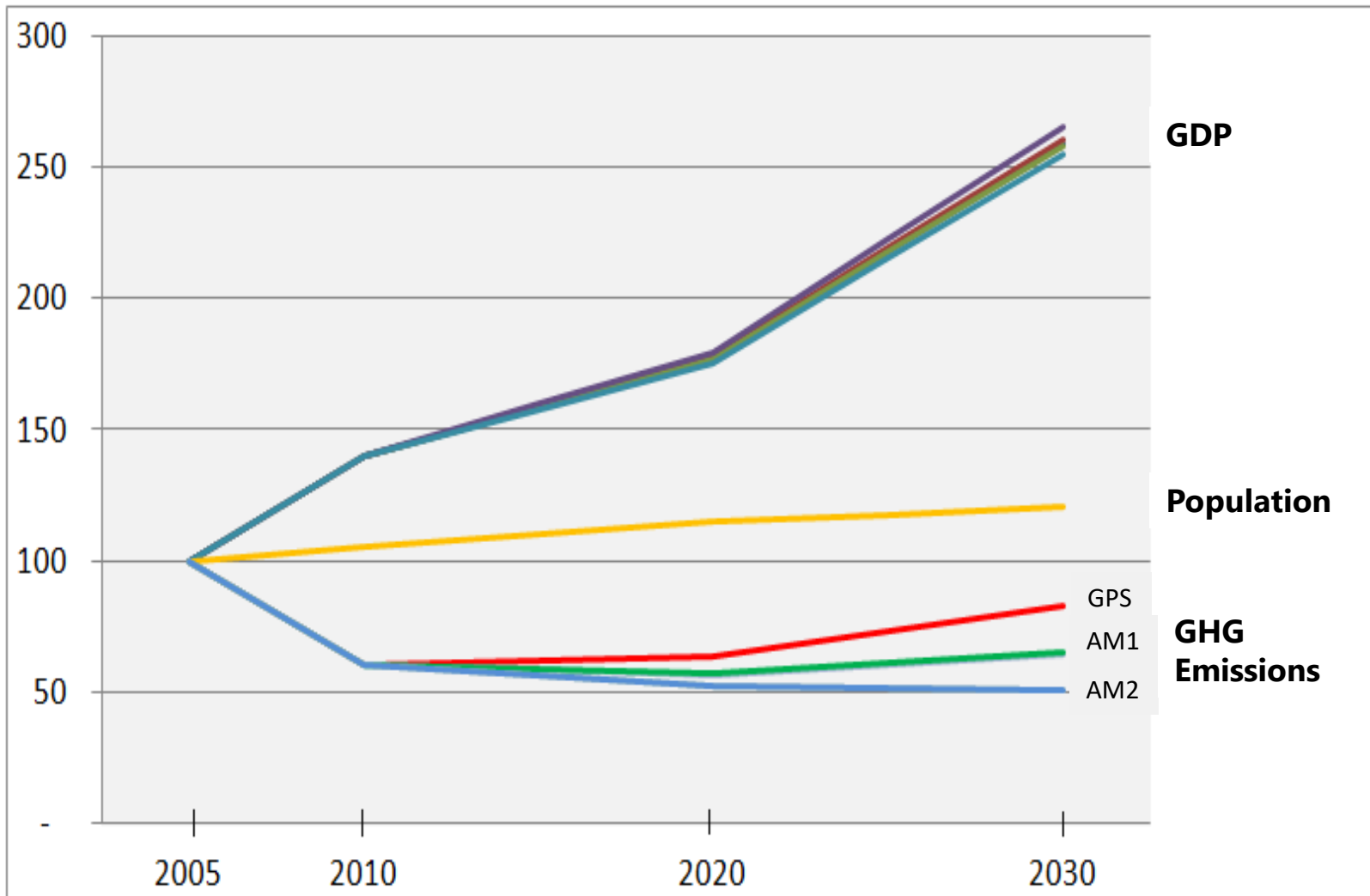
Carbon pricing schemes (taxes or cap&trade) adopted worldwide at similar levels

Carbon revenues of the domestic tax used to reduce payroll taxes, stimulating the creation of new jobs and offsetting the recessive effect of tax-induced price increases



# CONCLUSIONS: ECONOMIC AND SOCIAL IMPLICATIONS

PARTIAL DECOUPLING OF GDP GROWTH AND GHG EMISSIONS  
(2005=100)



Even in a scenario of high economic growth it is possible to reduce emissions considerably by 2030, thanks to the reduction witnessed in the emissions/GDP ratio.

The ratio between emissions and GDP (measured in tCO<sub>2</sub>eq/million US\$ of 2005), which was halved from 2 to 1 tCO<sub>2</sub>eq per US\$ million between 2005 and 2010, would be 0.7 in the GPS, 0.5 in AM1, and 0.4 in AM2, in 2030

## COMPARISON – INDICATORS iNDC-Brasil x IES-Brasil

SELECTED INDICATORS	2010	2030 iNDC-Brasil	2030 AM1	2030 AM2
<b>TOTAL GHG EMISSION REDUCTIONS (compared to 2005)</b>	40%	43%	35%	49%
<b>TOTAL ENERGY SUPPLY (Mtoe)</b>	268.8		520.8	533.6
% Renewable Energy	45%	45%	46%	49%
% Renewable Energy without Hydropower	32%	33%	35%	38%
% Sugarcane products + Biodiesel	18%	18%	22%	22%
% Sugarcane	17,5%	16% (UN speech)	21%	21%
% Hydropower in the National Interconnected Grid (SIN)	83%	66% (UN speech)	69%	71%
<b>TOTAL POWER GENERATION (average GW)</b>	68.9		131.4	130.1
% Renewable Power Generation	86%		85%	87%
% Hydropower	75%		61%	63%
% Sugarcane products + Other renewables	11%	23%	25%	24%
<b>TOTAL POWER GENERATION / GDP (av MW/billion R\$ 2005)</b>	25.3		23.7	23.0
% of 2010	100		94	91
Improvement of "electricity productivity" (related to 2010) (or efficiency gains in the electricity sector, in the iNDC)	-	10%	6%	9%

## COMPARISON BETWEEN BRAZILIAN NDC AND IES-BRASIL SCENARIOS (MAPS-BRAZIL): AFOLU

- **Enforcement of the New Forest Code, ensuring zero illegal deforestation in the Amazon and offset of GHG emissions from legal forest clearing, through restoration and reforestation of 12 Mha (million hectares): within the range of GPS (11.5 Mha), AM1 (11.7 Mha) and AM2 (13.9 Mha);**
- **Restoration of 15 Mha of degraded pasture land: slightly below the range of 15.5 Mha in GPS to 20 Mha in AM1 and AM2;**
- **Increase of 5 Mha in the area of integrated agroforestry and ranching systems: within the range of GPS (4.2 Mha) to AM1 and AM2 (6 Mha).**

## Conclusions

Outcomes of IES-Brasil: capacity building, evidence generation, impact on policy making :

- A Scenario Building Team mobilised for IES-Brasil and motivated to go forward, involving the key stakeholders of the country
- Evidence about the opportunities to get positive economic and social implications from climate change mitigation policies
- Policy-relevant inputs to the iNDC, future review of voluntary goals and a long-term Low Emission Development Strategy

Illustration of the Relevance of a dialogue between quantitative research, qualitative storylines and policy making