Establishing Reference Scenarios, and Scenarios for mid and long-term mitigation scenarios

Ministry of Finance - Brazil

Technical Meeting: Approaches and Tools to Setting Mitigation Scenarios

September/2014

Models to establish reference scenarios

- **IES- Brasil (Social and Economic Impacts: Mitigation of GEE Scenarios on 2030 and 2050)**
  - **Coordinated by:** Brazilian Forum on Climate Change – FBMC
    - FBMC is a forum formed by government and civil society members whose objective is to raise awareness and mobilize society to discuss and take positions on the problems arising from climate change
  - **Objective**: to generate different scenarios of Greenhouse Gases (GHG) emissions for the medium and long term to Brazil, through a participatory process involving government, private sector, academy and civil society
  - These scenarios aim at providing inputs from civil society to the Brazilian Government in the international negotiation process, focusing on the strategy at COP-21 in 2015
  - The project also aims at improving the conduction of the National Policy on Climate Change
  - **Delivery of results**: November 2014

Sectorial analysis: IES-Brasil

- **Sectors considered**: energy, transports, industry, housing , services, waste management and LULUCF

- The baseline of each sector is being built separately, following different methodologies, such as the use of specific softwares (*Long-range Energy Alternatives Planning System* (LEAP) and MESSAGE *(Model for Energy Supply System Alternatives and their General Environmental Impacts)* and projections based on official surveys

Models to establish reference scenarios

- **GEF Project - Mitigation of Greenhouse Gases (GHG) Options in Key Sectors in Brazil**

  - **Coordinated by:** Ministry of Science, Technology and Innovation and executed by PNUMA
  - **Objective**: to help the Brazilian Government to strengthen its technical capacity to support the implementation of mitigation policies in key sectors of the economy (industry, energy, transport, residential and services, LULUCF, waste management and other intersectorial alternatives)
  - **Delivery of results:** November/2015

Sectorial analysis: GEF Project

- **Sectors considered**: energy, transports, industry, housing and services, waste management, LULUCF and intersectorial mitigation options
- The baseline of each sector is being built separately, not all of them are available
- This estimation is robust for it allows us to include several limitations from previous studies, such as technological improvement

Models to establish reference scenarios

- **Macroeconomic assessment of price-based instruments to implement a voluntary national Emission Reduction target in Brazil (BeGreen model)**

  - **Coordinated by**: Ministry of Finance, as a part of the preparation phase of the Brazilian Market Readiness Proposal (MRP) in PMR
  - **Objective:** to identify the macroeconomic impacts of carbon pricing in Brazil, through the CGE model Brazilian Energy and Greenhouse Gas Emissions General Equilibrium Model (BeGreen)
  - **Delivery of results**: project concluded

Sectorial analysis: BeGreen Model

- **Sectors considered**: Agriculture, Energy Use (Generation and Distribution of Electricity, Industrial sectors, Transportation Sector and other Sectors), Industrial Processes
- General equilibrium model
- The reference scenario of this study was constructed from a set of 25 annual simulations with Begreen model, starting in 2006 (the base year of the model is 2005) until 2030
- The scenario incorporates information from several sources, which feed model over time
- Data from official sources were used to calibrate the model
- Regarding GHG emissions, data from estimates of annual emissions of Greenhouse Gases for variations in the period 2005-2010 were included.
- Thus, the model considers that fuel emissions and activity during this period increased according to official estimates (exogenous).

Sectorial analysis: BeGreen Model

- The model included a CRESH (constant ratio of elasticities of substitution, homothetic) function to allow the agents of the model to minimize their costs with energy based on available technologies
- It is important to mention that the model was not able to include transactional costs of the mitigation options or to consider the impact of technological advancement

Macroeconomic reference scenarios

	IES - Brasil	BeGreen	GEF
Methodology	Previous models were, validated by relevant stakeholders	Macroeconomic recursive modeling, based on official data and projections	Macroeconomic modeling (DSGE model)