DEEP DECARBONIZATION PATHWAYS

CLIMATE AMBITION BEYOND EMISSION NUMBERS

Taking stock of progress by looking inside countries and sectors

BRAZIL

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Disclaimer

The results presented in this report are outputs of the academic research conducted under the DDP BIICS project as per the contractual agreement. The academic work does not in any way represent our considered opinion for climate negotiations and also does not reflect the official policy or position of the Government of Brazil.

How is this document relevant to the Global Stocktake?

This document is part of a collective report that assesses the evolution of climate ambition in 26 countries and 3 hard-to-abate sectors through a granular and context-specific analysis of trends and progress of national and sectoral transformations.[1] This approach allows identifying what hinders and spurs action in countries and sectors, and understanding the conditions that can support enhanced ambition, which could be political, social, economic, governance.

These insights are directly relevant to four overarching functions of the Global Stocktake in support of its desired outcome, i.e. "to inform Parties in updating and enhancing, in a nationally determined manner, their actions and support in accordance with the provisions of the Paris Agreement, as well as enhancing international cooperation for climate action" (Article 14.3 of the Paris Agreement):

- Create the conditions for an open and constructive conversation on global cooperation (on e.g., technology, trade, finance, etc.), based on an in-depth understanding of the international enablers of enhanced country ambition.
- Organize a process for knowledge sharing and collective learning, based on concrete examples of actions already in place or being discussed, including best practices.
- Create space for open dialogues across different stakeholders to support better coordination of actions, based on a detailed understanding of the levers to be activated to enhance ambition in national and sectoral transitions
- Facilitate ownership by decision-makers of the climate challenge and the risks and opportunities of the low-emission and resilient transition, based on context-specific and granular analysis of barriers and enablers.

More specifically, the collective report in general – and this document in particular – can contribute to address some of the key guiding questions for the Global Stocktake[2], notably:

- What actions have been taken to increase the ability to adapt to the adverse impacts of climate change and foster the climate resilience of people, livelihoods, and ecosystem? To what extent have national adaptation plans and related efforts contributed to these actions (Decision 19/CMA.1, paragraph 36(c))?
- How adequate and effective are current adaptation efforts and support provided for adaptation (Article 7.14 (c) Paris Agreement)?

1 The full report « Climate ambition beyond emission numbers - Taking stock of progress by looking inside countries and sectors" can be found at: https://www.iddri.org/en/publications-and-events/report/climate-ambition-beyond-emission-numbers-taking-stock-progress

2 Draft Guiding Questions for the Technical Assessment of GST1 (version 20th October 2021), available at: https://unfccc.int/sites/default/files/resource/Draft%20GST1_TA%20Guiding%20Questions.pdf

- What are the barriers and challenges, including finance, technology development and transfer and capacity-building gaps, faced by developing countries?
- What is the collective progress made towards achieving the long-term vision on the importance of fully realizing technology development and transfer in order to improve resilience to climate change and to reduce greenhouse gas emissions referred in Article 10.1 of the Paris Agreement? What is the state of cooperative action on technology development and transfer?
- What progress been made on enhancing the capacity of developing country Parties to implement the Paris Agreement (Article 11.3 Paris Agreement)?
- To achieve the purpose and long-term goals of the Paris Agreement (mitigation, adaptation, and finance flows and means of implementation, as well as loss and damage, response measures), in the light of equity and the best available science, taking into account the contextual matters in the preambular paragraphs of the Paris Agreement:
  - What are the good practices, barriers and challenges for enhanced action?
  - What is needed to make finance flows consistent with a pathway towards low GHG emissions and climate-resilient development?
  - What are the needs of developing countries related to the ambitious implementation of the Paris Agreement?
- What is needed to enhance national level action and support, as well as to enhance international cooperation for climate action, including in the short term?
- What is the collective progress made by non-Party stakeholders, including indigenous peoples and local communities, to achieve the purpose and long-term goals of the Paris Agreement, and what are the impacts, good practices, potential opportunities, barriers and challenges (Decision 19/CMA.1, paras 36(g) and 37(i))?

Foreword

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Country commitments as reflected in enhanced Nationally Determined Contributions submitted to the UNFCCC are insufficient to put the world on track to achieve the collective objective of the Paris Agreement to hold temperature increase below 2 °C or 1.5 °C above pre-industrial levels. Furthermore, concrete policies and actions adopted by countries on the ground are often not sufficient to achieve these NDC targets. These conclusions highlight the need to increase ambition and to provide convincing evidence to accelerate action in the immediate and short term to give effect to this ambition. Yet these assessments are not sufficient to effectively guide the progressive increase of ambition, as organized by the cyclical process of the Paris Agreement.

APPROACH

With this imperative in mind, this report adopts a different, complementary, perspective on climate ambition. It seeks to open the box of emission pathways, by considering multiple dimensions of the conditions that will make these pathways possible. These are technical, economic, political, social and governance considerations in need of attention to enable the required far-reaching and systemic transformation towards the long-term goal. On the one hand, the revision of emission targets needs to be directed by an assessment of how drivers of emissions should change to trigger transformation. On the other hand, converting emissions' targets into pertinent concrete implementation requires well-designed policy packages and investment plans that are also informed by a clear and detailed understanding of the starting point, priorities and interplays between the available levers of transformation.

This bottom-up assessment aims at contributing to the process of collective learning in support of the progressive increase of collective ambition, as inserted at the core of the Paris Agreement paradigm. Approaching climate ambition through the lens of underlying transformations calls for reflecting the heterogeneous nature and the multi-faceted aspects of transitions in different sectors and countries. This forces a move away from a purely global perspective and adopts a more granular approach based on country and individual sector perspectives. Thus, the report explores trends and progress on these transformations, as locally observed over the past years, notably since the Paris Agreement. This 'backwards looking' approach can help identify where developments are going in the right direction, where they should be accelerated and where major tensions remain that should be addressed as a priority to avoid undermining the transition. The picture of the state of the ambition discussion, firmly embedded in the country and sectoral realities, can provide means for reflection and action within the international climate community, particularly to inform focus areas for advancing the collective ambition agenda.

STRUCTURE OF THE REPORT

This country report describes the recent evolutions of domestic discourses on climate ambition, national climate policy, national governance and concrete policies and actions with a significant effect on GHG emissions. The chapter highlights a selection of striking and structurally important elements to advance the transformation towards carbon neutrality from an in-country perspective.

This report is part of a full series of 26 country chapters and three sectoral chapters. The full report includes a "summary for decision-makers" to present 10 cross-cutting messages emerging from the country and sector analysis, as a guide to the selection of priorities for collective action in the post-COP26 period.

You will find the full report at: https://www.iddri.org/sites/default/files/PDF/Publications/Catalogue%20Iddri/Rapport/DDP_beyond%20emissions%20report.pdf

BRAZIL

STATE OF PROGRESS ON CLIMATE AMBITION

INTRODUCTION

Brazil has played a relevant role in international climate change negotiations since its beginning in 1992, as host country of UNCED. While resisting to the establishment of a UN convention on forests, Brazil has favoured the creation of UNFCCC. It was the only non-Annex I country to make a proposal to the design of the Kyoto Protocol in 1997, based upon the historical contribution of each country to global warming. The country was also a driving force leading the establishment of CDM (unfolding from the Brazilian proposal to Kyoto of a Clean Development Fund) and of its rulebook established through the Marrakesh Accords in 2001. It has eventually become one of the three developing countries with larger number of CDM projects hosted.

Domestically, after the creation of an Inter-ministerial Climate Change Commission to approve CDM projects, the first National Climate Change Plan was approved in 2008, setting an institutional framework to internalize climate change into governmental planning implementation and follow-up routines (Brasil, 2008).

Brazil was also one of the first major developing countries to present a voluntary commitment to limit its GHG emissions at the UNFCCC COP 15 in 2009. It aimed to an economy-wide GHG emissions reduction between 36.1% and 38.9% by 2020 compared to a projected business-as-usual scenario, which translated into a reduction of the absolute level recorded in 2005, an unseen target from a non-Annex I country. Eventually, Brazil was very active in the negotiations leading to the signature of the Paris Agreement of the UNFCCC, at COP21 in Paris, 2015.

This paper focuses on an update of the analysis of climate ambition in Brazil, presenting the state of the progress achieved since 2015.

NATIONAL GOVERNANCE

In September 2015, Brazil submitted its intended Nationally Determined Contribution (iNDC) to the UNFCCC Paris Agreement, confirmed as the first NDC, in 2016. The economy-wide commitment is to reduce GHG emissions by 37% in 2025 and has an indicative target of reducing 43% by 2030, compared to the 2005 value. It also presented the means of implementation in its annex.

In December 2020, the Brazilian government presented its "new first NDC" to the UNFCCC, confirming the 2030 target and updating the base-year value. The 2005 value of 2.1 $GtCO_2e$ presented in 2015 had come from the Second National Inventory, and the updated value of 2.8G tCO_2e presented in 2020 came from the Third National Inventory, implying a substantial change in the commitment. **The absolute economy-wide GHG emissions cap increased from 1.3 to 1.8 $GtCO_2e$ in 2025 and from 1.2 to 1.6 $GtCO_2e$ in 2030.** On the other hand, the new first NDC also included an indicative target of reaching climate neutrality by 2060 (Brazil, 2020).

In April 2021, the Brazilian president announced the country's commitment to achieving climate neutrality by 2050 at the Summit of Climate Leaders organized by the US President.

ACTIONS AND POLICIES

This analysis focuses on the AFOLU, Transport and Energy Supply sectors, which are key to improve climate ambition in Brazil.

AFOLU

The positive record of environmental governance in 2005-2012 has demonstrated the country's capacity and the viability of achieving simultaneously the goals of economic development, conservation of natural resources and reduction of GHG emissions in the AFOLU sector. The main requirement to resuming this pathway is to restore the political will to promote this new paradigm, that protecting and restoring forests is a mean and not an obstacle to achieve economic development.

After UNFCCC COP15 (2009), the National Policy on Climate Change - PNMC (Law 12,187 / 2009) was created, regulated by Decree 7,390 / 2010 and later by Decree 9,578 / 2018. One of the instruments of the PNMC is the Sectorial Plan for the Consolidation of a Low Carbon Economy in Agriculture (ABC Plan), created to encourage the adoption of sustainable low-carbon production technologies in agriculture. In 2021, Decree 10.606 instituted a new 2021/2030 modern and integrated structure of ABC Plan.

Thanks to the ABC Plan, rural properties using low carbon and carbon capture techniques have reached 40.4 Mha already in 2018, more than the 2020 target of 35.5 Mha. The animal waste treatment target of 4.4 million m3 was reached in 2019 already (Agroícone&Input, 2020). In line with crop-livestock-forest integration systems, the government launched the Carbon Neutral Beef label in 2015. Through specific protocols, the program certifies beef from cattle raised in areas with planted trees for offsetting emissions and providing thermal comfort to the animals. The first line of certified products entered the market in 2020.

Historical data from INPE show that the annual deforested area in the Amazon in the early 2000s averaged 2 Mha / year. In 2004, it reached a peak at 2.7 Mha before a sharp decrease between 2005 and 2012, when it was down to 457 thousand ha (84% reduction). This success in reducing emissions from deforestation was the result of both economic policies and command-and-control measures. Credit for agricultural activities (soft loans by public financial agencies) were conditioned to proof of compli-

ance with environmental laws and regulations. New government plans were launched, and the incentive for creation and management of Conservation Units, as well as the demarcation of Indigenous Lands, also protected areas of native forests against deforestation. However, the approval of a New Forest Code by the Congress in 2012 has granted an amnesty to producers who illegally deforested until July 2008, sending a signal of impunity for illegal land clearing and encouraging future deforestation. On the other hand, it created important instruments such as the Rural Environmental Registry (CAR) and the Environmental Recovery Program (PRA). The problem is that the enforcement of reforestation of native vegetation in private rural properties aimed by these regulations has been delayed by several extensions of the initial deadline for compliance.

In 2017, the federal government also created the National Policy for Recovery of Native Vegetation - Proveg (Decree 8.972 / 2017), which has the National Plan for the Recovery of Native Vegetation (Planaveg) as an instrument. Proveg aims to articulate, integrate and promote policies and programs to recover forests and other forms of native vegetation in at least 12 Mha up to 2030. Nonetheless, there is a lack of technical and financial incentives to encourage a large- scale reforestation with native species in Brazil. The use of mechanisms such as Payment for Environmental Services, REDD +, and Quotas for Environmental Reserves, foreseen in the National Policy of Payments for Environmental Services (Law 14.119 / 2021), may enable the fulfillment of this goal.

Therefore, between 2013 and 2018, the annual deforestation rate in the Amazon was on average of 658 thousand ha/year (MCTIC,2020). More recently, in 2019, it reached 1 Mha (34% higher than in 2018), and in 2020, 1.1 Mha (INPE, 2021), as a result of the change in environmental governance promoted by the current federal government since 2019. The recent restructuring of environmental agencies such as IBAMA and ICMBIO led to the reduction of command-and-control measures, such as inspection, area embargoes, and the application of fines. Moreover, constant attempts to approve bills that make the regularization of illegal occupation of public lands more flexible tend to encourage economic exploitation and deforestation (MP 910/2019; PL 2633/2020 and PL 510/2021).

Land clearing for the expansion of agricultural activities of soy, beef, and native wood production chains, are the main drivers of deforestation in Brazil. Failures in the traceability of these chains (for example, tracking primary and secondary suppliers of slaughterhouses is particularly challenging in the Amazon region), insufficient engagement of environmental agencies, and little requirement for proof of origin for agricultural and forestry products by consumers and importers are the main barriers to reduce deforestation.

Transport

Despite the successful record on biofuels, the transport sector still faces important political and economic barriers to follow a pathway compatible with the Paris Agreement. Efforts to overcome these obstacles must consider electromobility, practically non-existent in Brazil.

Between 2005 and 2015, there were significant advances in the research, production, and distribution of biofuels. Progressive increases in mandated blends with fossil fuels, such as gasoline, and diesel oil allowed to reach the blending rates of 27% anhydrous ethanol in gasoline (E27) and 13% biodiesel in diesel oil (B13) used in motor vehicles in 2021. Besides, most light vehicles in Brazil are now equipped with "flex-fuel" engines using either gasoline or ethanol according to the consumer's choice based on the prices at the pump. The market share of ethanol is now around 25%, after a decrease in 2010-2017 when gasoline prices were heavily subsidized.

In 2018, the government launched the RenovaBio Program (2018) to further expand the participation of biofuels in the national energy balance. The initiative consists of a cap-and-trade system for fuel distribution companies, with 10-year goals, carbon footprint certification schemes, and the supply of decarbonization credits to producers and importers of biofuels. These cumulative efforts have increased the share of biofuels in final energy consumption to reach 24% in 2020. This performance has already gone far beyond the goal of 18% set by the first NDC for 2030.

In 2018, the government launched the Rota 2030 Program (2018), replacing the Inovar-Auto Program (2012-2017) with respect to energy efficiency of vehicles. Both policy instruments provided tax incentives for research and innovation in the automotive industry. Lastly, efforts to expand the transport infrastructure were made through the Public-Private Investment Partnerships – PPI (2016) and Advance (2017) programs. These programs have promoted public and private investments in strategic infrastructure projects, encouraging credit and financing.

The lack of a national electric vehicle industry, the strong economic recession since 2015 and the national currency devaluation since 2020 are obstacles to local investments in charging infrastructure and vehicles. Action of policymakers is also lacking in the establishment of policy instruments that could accelerate electromobility, such as financial incentives and basic infrastructure.

Public transport has the potential to be the main vector for the penetration of electromobility in Brazil. However, it has been continuously losing passengers to individual motorized transport. Among other factors, this is due to the low quality of concession contracts, insufficient government subsidies, and historical incentives to the automotive industry, for example, by reducing the Tax on Industrialized Products (IPI) on automobiles. Rota 2030 could be another important driver of change, but automakers are not meeting their targets, and the program is limited to light vehicles. Although buses and trucks represent less than 5% of the total vehicle stock, they are responsible for 59% of GHG emissions from road transport.

Alternative biofuels, such as biokerosene and bio-oil, face high costs in research and development, production, distribution, and storage. Even considering the strong ethanol and biodiesel markets, recent controversial decisions by the federal government have reduced their attractiveness. **In 2020, the government exempted anhydrous ethanol from import duties during negotiations with the United States. This measure not only stimulated gasoline consumption but also reduced the competitiveness of the domestic biofuel industry. In 2021, the government reduced the federal tax burden on diesel oil and persuaded state governments to reduce their tax on this fuel. Recently, for the first time, the government approved a reduction in the content of biodiesel in diesel blends (from 13% to 10% in 2021), intending to reduce the price to the consumer.**

Energy Supply

In order to get to carbon neutrality by 2050, the main challenges are to continue the expansion of renewable energy and to solve the problems caused by the growing share of intermittent power generation in the grid without further dispatch and building of natural gas - fired thermopower plants.

Brazil makes great use of renewable energy sources of power generation. As of 2019, hydropower (64%), wind power (8%), and biomass (7%, both from sugar cane and wood) ensure the supply of clean energy electricity, while solar power (1%) is gaining momentum. Political and financial measures have encouraged hydropower since the sixties and other renewables after the oil shocks in the seventies. There are incentives for renewables like discounts on tariffs, reduction of import taxes, and subsidies for wind, small hydro, solar, and biomass. However, given its growing competitiveness, a new bill under discussion at the Congress aims to reduce the economic incentives for decentralized power generation by consumers, which can slow down the growth of solar power generation. Natural gas supplies the main back-up to renewables in periods when they are not available, accounting for 9% of power generation in 2019, so the carbon footprint of the national grid is very low (75 g CO_2/kWh) and GHG emissions from power generation are barely 3% of the total country emissions. However, it is increasingly difficult to build new large hydropower plants as most of the potential to be tapped is located in environmentally sensitive areas in the Amazon region. Anyway, Brazil seems well on track to meet the first NDC goal of 23% of renewables other than hydro in the power generation mix by 2030. The availability of batteries and other energy storage options at reasonably low costs will be key to reach zero emissions from the power sector by 2050.

Fossil fuels subsidies are still high in Brazil. The higher amount goes to the consumption of gasoline and diesel oil. From 2010 to 2017 domestic prices of these transport fuels were kept artificially low, due

to concerns about increasing inflation rates and the political pressure of truck drivers' strikes. Since then, pricing policy is more aligned with international prices, but still subject to stop and go decisions caused by political and economic difficulties during the pandemics. Another substantial amount of long duration subsidies was granted to oil and gas production, in order to attract investments of foreign companies in the development of the huge pre-salt offshore discoveries. Fugitive emissions have been reduced over the years in oil and gas exploration and production, thanks to the adoption of ANP Resolution n. 249/2000 (replaced by resolution nº 806/2020), which requires authorization to burn associated natural gas above 3% of the total produced per field. Its reinjection in pre-salt fields is still high, but the government has recently approved a new bill (Decree nº 9,616 / 2018), aiming to establish a more open, diversified, competitive, and efficient natural gas market to promote investments in infrastructure for increasing its use. Its use for replacing fuel oil as a heat source and in new industrial processes (e.g, steel manufacturing) can help to reduce GHG emissions from industry, but mitigation policies must avoid the carbon lock-in risk of its use for power generation to meet base load demand.

DOMESTIC DISCOURSE

As the public opinion has repeatedly shown its support to environmental protection, the key issue to align domestic ambition with the Paris Agreement objective remains the political attitude of the federal government.

The structural obstacles to a transition of Brazil towards climate neutrality are well known, including the **financial constraints to fund the high capital costs of low-carbon investments, and the political difficulties to sharply reduce subsidies to oil and gas and to introduce carbon pricing schemes within a reform of the tax system** (La Rovere et al, 2018; La Rovere, 2019). These obstacles and the previously highlighted specific sectorial barriers were aggravated by the economic crisis since 2009, and by the new federal government on duty since 2019.

Although the country's administration has recently shown a negative bias in regard to national climate ambition, some governmental programs such as RenovaBio and the recently approved regulations on the Payment for Environmental Services have provided a framework to a future improvement of climate ambition.

Brazil's Central Bank moves toward incorporating sustainability criteria in its decision-making process, promoting adequate management of climate, social and environmental risks in the banking sector, and sustainable finance. In 2020, it announced creating a "Green Bureau," to be associated with the rural credit information system containing information on farmers' sustainable practices and the intention to boost incentives to move rural credit in a green direction. In 2021, it released for public consultation stricter regulations on the transparency of the business sector about its exposure to climate risks.

Some advancements of the discourse on climate change since the Paris Agreement were recorded in the business sector. Part of the agribusiness has understood the key role of good environmental practices to keep and increase its international market share. They have taken into account some recent menaces of protectionist measures from developed countries' governments and consumers to boycott Brazilian exports of beef, soy products, wood and even all products made in Brazil. Part of industry is also keen to accept a regulated carbon market, in the form of an Emissions Trading System, as a mean to allow greater attractiveness and subsequent acceleration of the entry of financial resources into the country.

In several occasions during the last two years, former ministers of Economy and of Environment, state governors and mayors, scientists and a significant number of large companies have made public statements, sent letters and met the Presidency to demand a more environmentally friendly governmental policy, sticking to the country commitment to the Paris Agreement.

Finally, civil society is increasingly mobilized through environmental NGOs. This has included a pioneer climate litigation process started in Brazil by a process to request that the Court rules the government to present a really more ambitious NDC to the UNFCCC, as the "new" first NDC presented in December, 2020 would not meet the criterion of increased ambition as requested by the Paris Agreement. In parallel, NGOs are mobilizing a wide spectrum of stakeholders to prepare a proposal of a more ambitious NDC.

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The DDP is an initiative of the Institute for Sustainable Development and International Relations (IDDRI). It aims to demonstrate how countries can transform their economies by 2050 to achieve global net zero emissions and national development priorities, consistently with the Paris Agreement.. The DDP initiative is a collaboration of leading research teams currently covering 36 countries. It originated as the Deep Decarbonization Pathways Project (DDPP), which analysed the deep decarbonization of energy systems in 16 countries prior to COP21 (deepdecarbonization.org). Analyses are carried out at the national scale, by national research teams. These analyses adopt a long-term time horizon to 2050 to reveal the necessary short-term conditions and actions to reach carbon neutrality in national contexts. They help governments and non-state actors make choices and contribute to in-country expertise and international scientific knowledge. The aim is to help governments and non-state actors make choices that put economies and societies on track to reach a carbon neutral world by the second half of the century. Finally, national research teams openly share their methods, modelling tools, data and the results of their analyses to share knowledge between partners in a very collaborative manner and to facilitate engagement with sectoral experts and decision-makers.
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