In collaboration with
Oliver Wyman

WORLD ECONOMIC FORUM

Finding Pathways, Financing Innovation: Tackling the Brazilian Transition Challenge

WHITE PAPER

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Foreword

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Brazil, the fifth largest country in the world, is a formidable global economic and political power. It is not only the largest economy in Latin America but also a key global supplier of agricultural, mineral and oil and gas resources. It is also the largest greenhouse gas emitter in Latin America and the Caribbean and home to 60% of the Amazon basin. It thus plays a critical role in the global fight against climate change.

As a party to the United Nations Framework Convention on Climate Change (UNFCCC) and a signatory of the Paris Agreement, Brazil last updated its nationally determined contributions (NDCs) in April 2022, pledging to achieve climate neutrality by 2050 (down from 2060 in the 2020 NDCs). Achieving its ambition will require cross-industry collaboration, the development and adoption of adequate financing instruments that help bring promising innovations to life, deepened public-private dialogue and broad-based civil-society support. Brazilian business and public-sector leaders carry significant responsibility in the race to avert a climate catastrophe and, through numerous efforts, are attempting to contribute to the fight against climate change.

The World Economic Forum, as the international organization for public-private collaboration, offers a platform for industry and public-sector actors to jointly take positive action. It has launched numerous high-impact initiatives to address the climate crisis both globally and across Latin America. The Forum's Centre for Financial and Monetary Systems is home to the Financing the Transition to a Net Zero Future initiative[1] – in collaboration with knowledge partner Oliver Wyman – which aims to accelerate the mobilization of capital towards innovative, breakthrough technologies that enable industrial decarbonization.

As many global efforts to combat climate change continue to be led by the United States and Europe, there is a growing realization that policies and industry strategies must reflect significant differences between developed and developing economies. China is a case in point: throughout 2022, and building on previous work, the Forum and Oliver Wyman convened industry and public-sector experts to explore promising pathways for financing large-scale decarbonization in China. The insight report *China's Climate Challenge: Financing the Transition to Net Zero*[2] showed that the industrial and financing system in China is unique.

Brazil, on the other hand, offers a more representative case study for transition opportunities and challenges in emerging economies. This is why the Forum and Oliver Wyman brought together industry leaders, financing experts and policy-makers in multiple workshops and interviews to explore transition pathways, financing mechanisms and the required policy architecture from Brazil's perspective.

We thank all our partners and those who contributed their expertise to this work for their insights, and hope that this paper, which summarizes our initial findings, proves useful. More than a policy paper, this is a call to action, and the Forum, in collaboration with Oliver Wyman, will continue to provide a platform in Brazil and throughout Latin America for business and public-sector leaders to come together as a regional and global community to tackle the most important challenges.

Executive summary

Brazil has the potential to affect the global fight against climate change beyond its national borders.

Brazil has committed to reducing its greenhouse gas (GHG) emissions by 37% by 2025 and by 50% by 2030, based on 2005 levels, with the ultimate goal of achieving carbon neutrality by 2050. In recent years, the country has adopted several policies to achieve these commitments, such as the launch of nationally determined contributions (NDCs) by the Ministry of the Environment in 2015 (ratified in 2016 and updated in 2020 and 2022), the creation of the Amazon Fund in 2017 and the implementation of the National Green Growth Program in 2021.[3] The country can become a green production hub and encourage the generation of carbon credits, due to its rich biodiversity and reforestation potential. It also holds a competitive advantage with regards to renewable power generation and, due to its rich endowment with feedstock, infrastructure and technology, has the capacity to produce biofuels.

However, significant challenges remain and must be overcome in the coming years if Brazil is to realize this potential:

- **Immediate halt of illegal deforestation:** After a successful programme to stop illegal deforestation in the first decade of this century, Brazil experienced a sharp increase in rates of deforestation in the Amazon forest, as well as in its savanna biome known as the Cerrado. In more recent years, land grabbing in public areas, illegal mining in reserves assigned to Indigenous peoples, opening of new areas for cattle-raising and crops – despite the existence already of vast areas for agricultural purposes – became well documented as the government became less active in monitoring and environmental protection initiatives. Brazil urgently needs to resume its efforts to combat illegal deforestation.

- **National and sectoral decarbonization strategies:** Brazil must develop a clear strategy to decarbonize different sectors of the economy. This involves conceiving sectoral decarbonization pathways that establish specific goals and guidelines for each sector, taking into account the country's unique features. These goals should be globally recognized and aligned with those of the Paris Agreement.

- **Financial instruments for the transition:** As part of the work done for this paper, Oliver Wyman estimates that the required investment to achieve Brazil's climate transition by 2030 amounts to approximately BRL 1 trillion ($200 billion). This number requires significant investment in transitional technologies and strategies. To attract and facilitate these investments, Brazil must establish robust financing structures, including the development of new financial instruments, such as green, social, sustainable and sustainability-linked bonds. In addition to new financial instruments, the mobilization of private funding must be accompanied by the development of a national taxonomy. The difficulty in understanding Brazilian specificities currently presents a major obstacle to realizing greater capital flows.

- **Policy support and low-carbon agriculture:** Simply leaving industry to take action and adopt fit-for-purpose financing instruments will not be sufficient to address the scale of the climate challenge Brazil is facing. It requires a proactive approach by policy-makers to provide clear targets, supporting measures and certainty for industry leaders to move forward. The agricultural sector, an important and growing contributor to GDP, presents a particular challenge for Brazil and developing a low-carbon land-use model is of fundamental importance.

- **Education, skilling and support for SMEs:** A lack of talent is a critical obstacle to accelerating Brazil's transition efforts. Professionals must be educated at the secondary and higher education levels, and current employees – where appropriate – reskilled or upskilled. In addition, transition initiatives by large industry players almost always affect their supply chains, which can often incorporate small and medium-sized enterprises (SMEs). It is necessary to promote greater dialogue between large industry players and smaller enterprises on climate and sustainability in order to increase awareness and encourage and trigger concrete actions.

Introduction

This paper aims to shed light on Brazil's climate goals and examine the country's unique enablers and distinct challenges in achieving these goals.

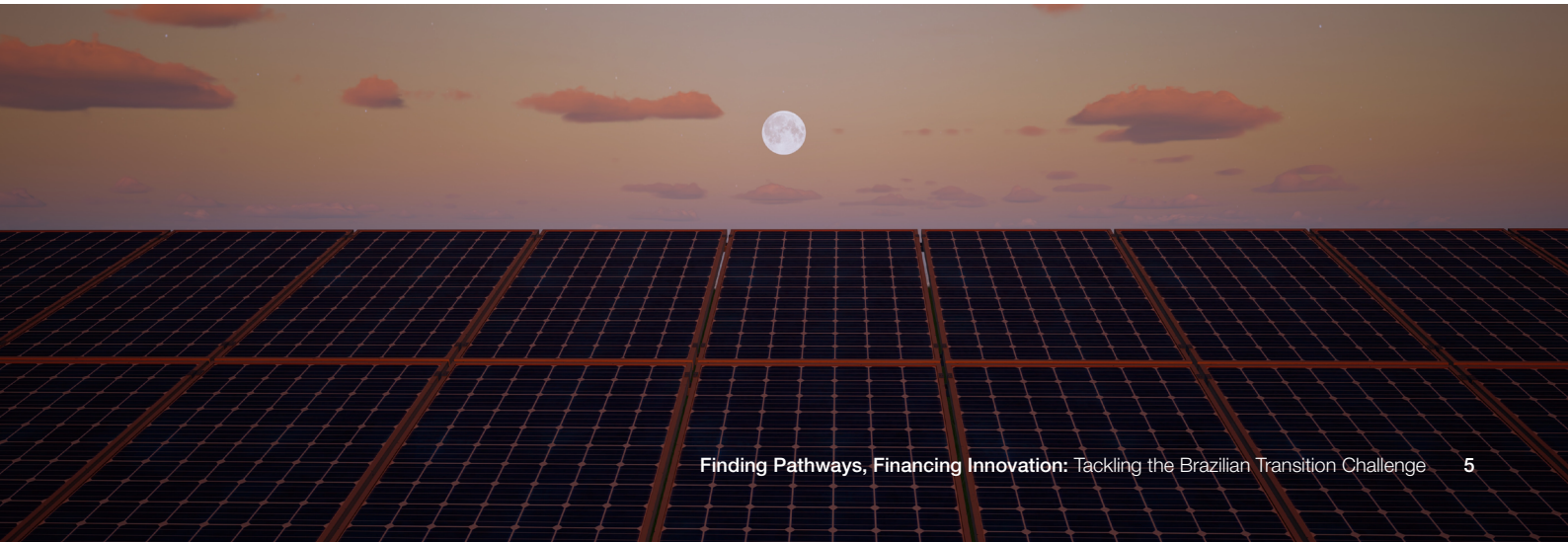
This call to action follows more than six months of workshops in São Paulo, expert interviews and desk research. The multistakeholder dialogues facilitated by the World Economic Forum and Oliver Wyman showed the need for: 1) clearly articulated decarbonization pathways for high-emitting industries; 2) the development and adoption of innovative financing instruments to enable these pathways; 3) adequate policy support; and 4) the education of required talent in universities, up/reskilling of current employees and the empowerment of small and medium-sized enterprises (SMEs) throughout the various supply chains.

Addressing these four priorities, the paper aims to provide insights to business, public-sector and civil-society leaders about the Brazilian reality concerning climate goals and highlight local market challenges and opportunities. In addition, it emphasizes how Brazilian enterprises can influence and contribute to the global carbon neutrality agenda.

Discussions informing this paper took place in the context of a dramatic macroeconomic shift marked by rising inflation and a slowdown in global growth. This presented significant challenges, in particular to emerging economies such as Brazil, triggering fears about a possible global economic crisis. In the case of Brazil, the country is expected to keep pace with global economic realities and perform moderately in the coming years.[4] Workshop participants and interviewed experts stressed that this context matters as the climate crisis does not exist in isolation. Dynamics that deepen inequalities among and within countries hamper progress towards the Sustainable Development Goals (SDGs) and the Paris Agreement.[5]

Yet despite the current challenges, the tone during discussions hosted in preparation for this paper was upbeat. Business leaders recognize the opportunity Brazil has and the investments made: the country has a mostly renewable electricity matrix, with 88% of electricity generation coming from clean sources in 2022. In addition, it is the second largest producer of biofuels in the world, with ethanol accounting for approximately 20% of the volume of fuels sold in the country. In the agricultural sector, modern planting and crop management techniques ensure high productivity and multiple harvests per year. And despite fluctuating deforestation rates and ongoing illegal activities threatening the environment, Brazil still has 59% of its land covered by native forests and is home to the highest concentration of biodiversity on the planet.[6,7,8] This natural endowment, paired with the ingenuity of its people, is both encouraging and promising.

While the country's commitment to climate action remains a subject of ongoing debate – and requires continued attention and collaboration among business, government, civil society and international partners – business leaders and experts who contributed to the findings presented in this paper are already taking action. What they need is a platform and a common narrative that enables them to scale their impact. Brazil has the potential to be a catalyst for positive change in the global fight against climate change. For the country to fully realize its potential, the remaining barriers outlined in this publication must be overcome. The authors welcome your response to this call for action and invite you to join regional Forum initiatives and future convenings.



Brazil has a considerable competitive advantage, given that its electricity matrix is among the lowest in greenhouse gas emissions. The Brazilian electricity sector can further contribute to this differential by adopting an ambitious strategy of decarbonization and achieving net zero. Joining efforts around a decarbonization agenda, which leads us to an efficient, fast and socially just energy transition, will allow us to move towards a more prosperous and sustainable society. In this sense, the sustainable management of financial capital, driven by credit operations structured under sustainability aspects, is an important enabler for achieving this bold goal.

Ivan de Souza Monteiro, Chief Executive Officer, Eletrobras

BOX 1 | **How the Forum is shaping the sustainable finance agenda globally and in the region**

Financing the Transition to a Net Zero Future:[9] The Financing the Transition to a Net Zero Future initiative, a collaboration between the World Economic Forum and knowledge partner Oliver Wyman, was launched in June 2020 to accelerate the mobilization of capital towards breakthrough decarbonization technologies in the early stages of development. The initiative has engaged a multistakeholder community of financiers, industry stakeholders, philanthropists and public institutions to analyse specific technologies in the most important hard-to-abate sectors, develop mechanisms for different stakeholders to co-design solutions and identify policy interventions necessary to mobilize private capital.

First Movers Coalition (FMC):[10] The FMC is a coalition of companies using their purchasing power to create early markets for innovative clean technologies across eight hard-to-abate sectors. These in-scope sectors are responsible for 30% of global emissions – a proportion expected to rise to more than 50% by mid-century without urgent progress on clean technology innovation. Although formulating purchase commitments and aggregating demand against these commitments is core to the FMC, the coalition's activities go beyond this, with a focus on supporting members in delivering on their commitments and creating an enabling environment.

Tropical Forest Alliance (TFA):[11] The TFA, hosted by the World Economic Forum, is a leading partnership platform that brings together partners around the common goal of implementing solutions to tackle deforestation linked to the production of agricultural commodities. The alliance includes more than 180 partners representing the private sector, government, civil-society organizations, Indigenous peoples' groups and multilateral organizations committed to ensuring the sustainable production of palm oil, soy, beef, cocoa and pulp and paper. The TFA fosters cross-sector collaboration and works across Latin America, Africa, China and South-East Asia.

1 Brazil's commitment to combatting climate change

Brazil's leadership is intent on promoting effective action to mitigate the impacts of climate change, while its private-sector leaders are setting out ambitious transition strategies.

In 2019 Brazil was responsible for about 3% of global greenhouse gas (GHG) emissions, and was the sixth largest emitter and the ninth largest economy in the world. Approximately 70% of emissions came from changes in land use, deforestation and agriculture.[12,13]

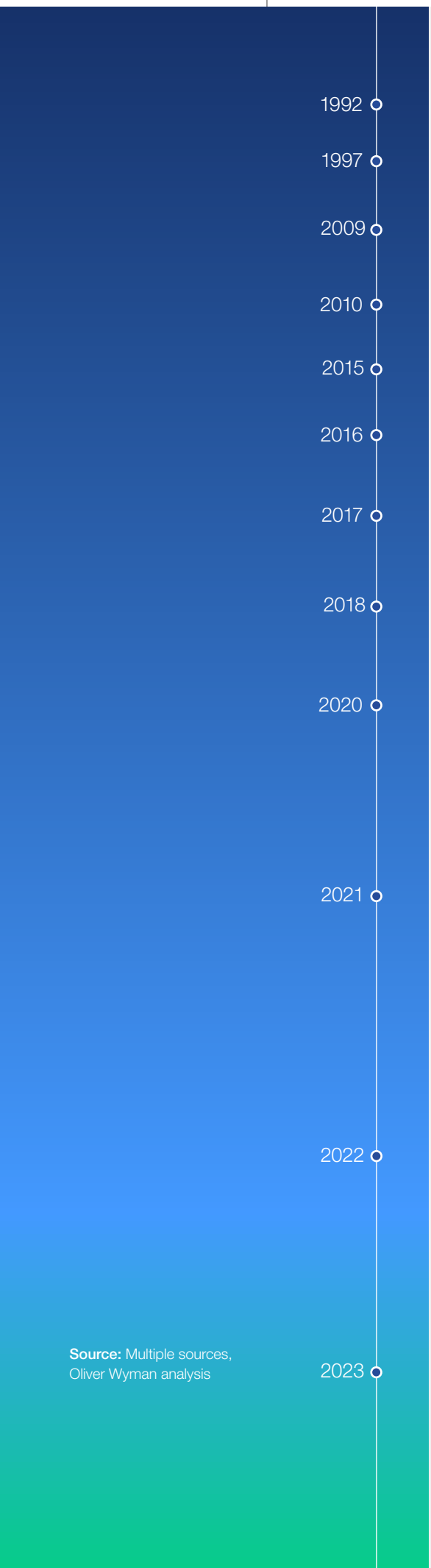
In 2022, the country raised the ambition of its nationally determined contributions (NDCs), pledging a 50% reduction in GHG emissions by 2030 and committing to achieve net-zero emissions by 2050.[14] However, while reiterating the commitment to a reduction above what would be expected for a developing country with historically low responsibility for rising global temperatures, the new NDC focuses less on advancing climate goals, placing more emphasis on maintaining past achievements. In fact, the new NDC represents a reduction in the level of ambition in absolute terms. Although a target of 50% reduction by 2030 has been established, the accounting methodology of Brazil's absolute emissions in its baseline year (2005) was updated with the Third National Inventory, increasing the level of emissions from 2.1 $GtCO_2$ (gigatons of carbon dioxide) to 2.8 $GtCO_2$. In practice, this allows the country to emit an additional 400 million tons of GHGs compared to the previous target (43% reduction by 2030). Moreover, the new NDC does not include ambitions related to reforestation and renewable energy present in the 2018 NDC, making the implementation of sectoral action less transparent.

BOX 2 **Explainer: Nationally determined contributions (NDCs)**

NDCs are at the heart of the Paris Agreement and the achievement of its long-term goals. NDCs embody efforts by each country to reduce national emissions and adapt to the impacts of climate change. The Paris Agreement (Article 4, Paragraph 2) requires each party to prepare, communicate and maintain successive NDCs that it intends to achieve. Parties shall pursue domestic mitigation measures, with the aim of achieving the objectives of such contributions.[15]

Historically, Brazil has been an important protagonist in the global climate change journey. The country has been a signatory to the United Nations Framework Convention on Climate Change (UNFCCC) since 1992 and has ratified the Paris Agreement, which seeks to limit global warming to less than 2°C, preferably less than 1.5°C. Over the years, the country took important steps in combatting climate change, including implementing policies to reduce deforestation, promoting reforestation and creating initiatives to support the low-carbon economy (Figure 1).

FIGURE 1 | **Brazil's main actions and policies in the fight against climate change**



1992 — **Signature of the UNFCC**

1997 — Signing of the **Kyoto Protocol**, committing to reduce the country's GHG emissions by 5.2% below 1990 levels by 2012

2009 — Announcement of the **National Policy on Climate Change**, which increased the GHG emission reduction target from 36.1% to 38.9% by 2020 (vs. 2005 emissions)

2010 — Approval of the **Forest Code**, with measures to reduce deforestation and promote reforestation

2015 — Submission of Brazil's original nationally determined contribution (**NDC**), committing to reduce GHG emissions by 37% by 2025 (vs. 2005)

2016 — Ratification of the **Paris Agreement**

2017 — Announcement of the creation of the **Amazon Fund**, offering financial incentives to landowners and companies that do not practise illegal deforestation

2018 — Publication of the Ministry of the Environment's Initial Proposal for the Implementation of Brazil's **NDC**

2020 — Introduction of a **federal development strategy** (2020–2031), which includes **environmental aspects** with the aim of preserving biodiversity, reducing illegal deforestation, recovering native vegetation and making sustainable use of national biomass

2021 — Commitment to **zero illegal deforestation until 2028** (vs. previous commitment for 2030) and reducing emissions by 37% by 2025 and 43% by 2030

Creation of the **National Green Growth Program**, which aims to offer financing and subsidies to encourage sustainable economic projects and activities, prioritize the granting of environmental licences and generate so-called "green jobs"

Debates about and forwarding of **law no. 528**, which aims to allow the regulation of the carbon credit market, stimulating reforestation, combatting deforestation and sustainable agriculture projects

2022 — Publication of **decree no. 11,075**, which establishes a deadline of 180 days (extendable by another 180 days) for the submission by the private sector of proposals for sectoral plans to mitigate climate change

Updating of the **NDC** to reflect the current ambition of a 50% reduction in GHG emissions by 2030 and carbon neutrality by 2050

Presentation of **provisional measure 1,151** to make room for the **commercialization of carbon credits**, which may result from the reduction of emissions or the removal of CO_2, in addition to allowing the Brazilian National Development Bank (BNDES) to enable financial agents to act in the financing of the National Fund on Climate Change (FNMC)

2023 — Proposal for disclosure by the Ministry of Finance of the **Ecological Transition Plan**, which aims to boost the economy with sustainable actions distributed in six pillars, addressing incentives for carbon credits, technological innovation, bioeconomy, energy transition for carbon capture and storage (CCS), the circular economy and adaptation to climate change[16]

Source: Multiple sources, Oliver Wyman analysis

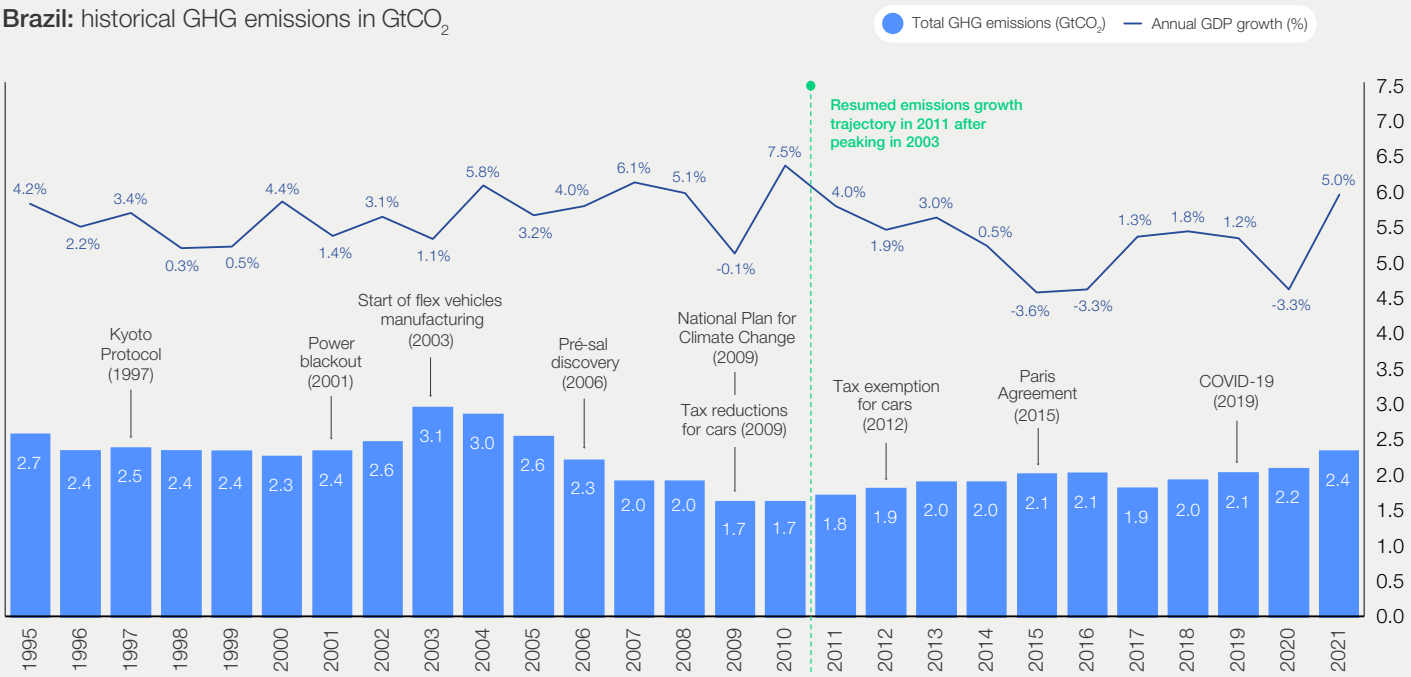
As shown in Figure 2, during the 1990s, the country kept its GHG emissions stable despite upticks in economic growth. Then, emissions started to rise at the beginning of the century, mainly related to the expansion of new agricultural areas, peaking in 2003. The government began to take greater action to avoid new emissions and was able to implement deforestation control actions that led to significant reductions in emissions in the years that followed, even when the country was experiencing strong economic growth and a substantial increase in agricultural output.

However, since 2011 annual GHG emissions have been on the rise once again, despite a strong retraction of economic activity, including the COVID-19 crisis in 2020. Unfortunately, the recent increase in emissions has been contradictory to the commitments made, resulting in a weakening of the country's once prominent position in the climate transition compared to its peers.[17,18,19]

FIGURE 2

History of GHG emissions in Brazil vs. annual growth of Brazilian GDP
(In $GtCO_2$ and %)

Brazil: historical GHG emissions in $GtCO_2$



Source: SEEG, BCB

Currently, Brazil is seeking to recapture the leading role it held during the first decade of the 21st century with the development of a series of initiatives such as the Ecological Transition Plan, the creation of the Inter-Ministerial Commission on Climate Change to mobilize and align the multiple actions of the federal government, a new provisional law to create a national regulated carbon market (emissions trading scheme, see below) aligned to its NDCs and the development of a national taxonomy for sustainable finance. In addition, the country is preparing to host important events such as the G20 summit in 2024, where climate change will be top of the agenda, and the 30th UN Conference of Parties on Climate Change (COP30) in 2025 in Belém do Pará, the second largest city in the Amazon region.

While challenges remain and adjustments will have to be made, Brazil's commitment to combatting climate change is strengthening. The country's leadership is determined to promote effective actions to mitigate the environmental impacts, and its private-sector leaders are starting to implement ambitious transition strategies.

BOX 3

Explainer: Emissions trading scheme (ETS)

An ETS is a market mechanism that allows bodies (such as countries, companies or manufacturing plants) that emit GHGs into the atmosphere to buy and sell these emissions (as permits or allowances) among themselves. The central theory of an ETS is that creating a price for carbon is the most cost-effective way of achieving significant cuts in GHG emissions.[20]

2

Sector pathways to net zero

Decarbonization pathways represent possible trajectories for emission reductions across different sectors of the economy over time.

The main factors influencing the establishment and use of reference pathways by governments and organizations include:

- Alignment with the Paris Agreement, usually with low or no overshoot of the 1.5ºC limit of global warming compared to pre-industrial levels
- Providing a reference for how fast GHG emissions should fall, and to what level (target)
- Identification of actions to be taken or the sectoral changes required to drive the transition, including investments, policies and applicable legislation
- Forming the basis for the establishment of a regulated carbon credit market

Pathways should be developed based on robust data and analysis, taking into account the specificities of each economic sector. It is necessary to consider factors such as the current contribution of emissions from each sector and the potential for reduction, the technical and economic feasibility of decarbonization solutions and national targets and commitments.

Pathways should be globally recognized to ensure comparability and consistency with other countries and regions. The participation of experts, academic institutions, companies and civil-society organizations is fundamental, ensuring an inclusive and collaborative approach.

Developing specific pathways for Brazil requires identifying the main drivers of GHG emissions in each sector, establishing ambitious and feasible reduction targets and clear guidelines for planning and implementing decarbonization policies and measures. In addition, the pathways will also serve as a strategic planning tool for the country, allowing the identification and exploration of investment opportunities in low-carbon technologies, stimulating innovation and sustainable development in different sectors of the economy.

The European Green Deal is a regional strategy signed in December 2019 that aims to make Europe the first continent to become climate neutral by 2050. Among its initiatives are the investment of ~€800 billion (~$900 billion) to increase offshore wind energy production from 12GW to 300GW by 2050, the development of new technologies, the encouragement of sustainable mobility (e.g. more than 30 million zero-emission vehicles in circulation in Europe by 2050), the elimination of industrial pollution and the preservation of biodiversity.

Organizations specialized in decarbonization for specific industries have been proposing pathways. The International Energy Agency (IEA), one of the industry's leading reference organizations, defines three main decarbonization scenarios:

- **Net Zero Emissions by 2050 Scenario (NZE):** sets out a narrow but feasible path for the global energy sector to reach net zero CO_2 emissions by 2050 without relying on emission reductions outside the sector. This scenario predicts that global temperature rise will be limited to 1.5°C by 2100 (with a 50% probability).
- **Announced Pledges Scenario (APS):** assumes governments meet all aspirational climate targets on time. In this scenario, it is estimated that by 2100 temperatures will rise by 2.1°C (with a 50% probability).
- **Stated Policies Scenario (STEPS):** reflects the sectoral policies that are already in place as well as those that have recently been announced by governments around the world. This scenario estimates that by 2100 global temperatures will increase by 2.6°C (with a 50% probability).

> **Brazil would have to develop a clear strategy to decarbonize different sectors of the economy, particularly those whose absolute emissions are material to our national GHG inventory. When establishing climate targets, country-specific decarbonization scenarios are preferred over global models, once they capture value-chain aspects that are particular to the country's reality and, therefore, result in more plausible decarbonization pathways. Paris-aligned national decarbonization scenarios are not yet available for all of Brazil's material sectors in terms of GHG emissions, but are likely to be developed along with regulatory advances, such as the regulation of the carbon market. In the meantime, many banks have adopted national decarbonization pathways where possible and will update sectoral emissions reduction targets once national credible scenarios are available.**
>
> Marcelo Sarno Pasquini, Head of Sustainability, Bradesco Bank

Two categories of organizations have published pathways for Brazil:

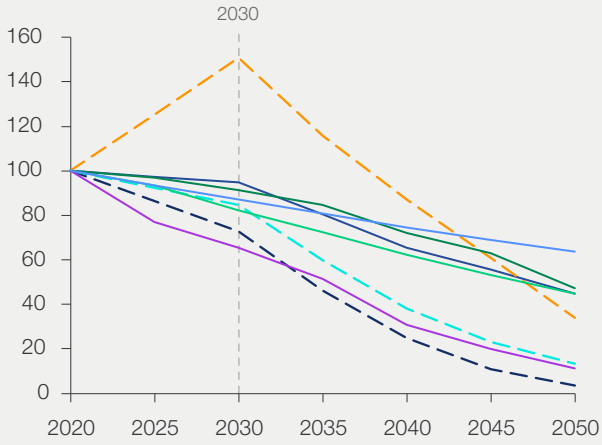
- **Globally recognized organizations**, such as the IEA, the Network for Greening the Financial System (NGFS), the Intergovernmental Panel on Climate Change (IPCC), the Organisation for Economic Co-operation and Development (OECD) and the Science-Based Targets initiative (SBTi). However, these pathways do not yet fully address Brazilian particularities and, in many cases, do not engage with different sectors in detail (for example, the IEA provides pathways only for the transport sector in general, without breakdowns for road, rail, maritime or aviation segments).

- **National organizations** with technical capacity and in-depth knowledge of conditions on the ground in Brazil, such as the Talanoa Institute and the Climate Center of COPPE-UFRJ Climate Center (see Case study 1). Although these organizations do not yet have global accreditation, they have published pathways for Brazil and are progressing towards combining local perspectives with global standards, thus becoming reference points in the national debate.

As seen in the examples below (Figure 3), the need for nationally agreed pathways for Brazil makes it harder to enforce investments in the transition to a net-zero economy. In the transportation sector, IEA NZE does not present any analysis of the Brazilian case, which has peculiar dynamics given the prevalence of light vehicles using flex engines (ethanol and/or petrol). For the agriculture sector, the recent SBTi FLAG (forest, land and agriculture) also does not present any reference for Brazil, which once again has particular characteristics based on soil, climate and local technologies. On the other hand, there are pathways proposed by local organizations offering different trajectories.

FIGURE 3 | **Examples of pathways and adequacy in the case of Brazil**

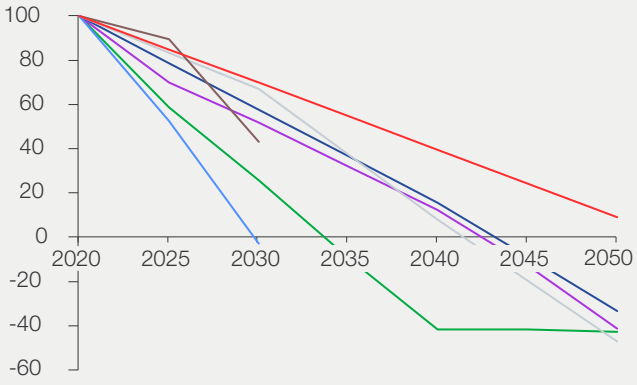
Example of pathways for the transportation sector
CO_2 emissions, normalized to 2020 levels to 100



IEA APS	-5%
IEA NZE – Net Zero Road Transport	-27%
IEA NZE – Net Zero Aviation	+51%
IEA NZE – Net Zero Shipping	-15%
IPCC SSP1.9	-18%
NGFS GCAM – Net Zero	-9%
NGFS GCAM – Divergent Net Zero	-35%
FBMC[1]	-31%

Curves for transportation subsectors (road, aviation and shipping) are available globally but not for Brazil

Example of pathways for the agriculture sector
CO_2 emissions, normalized to 2020 levels to 100



NGFS – GCAM Net Zero	-74%
NGFS – GCAM Divergent Net Zero	-48%
FBMC	-43%
Climate Center COPPEUFRJ	-33%
Talanoa/Cebeds – CMA1	-57%
Talanoa/Cebeds – CMA2	-103%
SBTi FLAG – Unavailable for Brazil at a sector level	-30%

SBTi FLAG, the main benchmarking for the agricultural sector, is unavailable for Brazil

1 Brazilian Forum of Climate Change, 2018

Source: Oliver Wyman analysis; Brazilian Forum on Climate Change, 2018; IEA, 2022; UTS, NFGS, SBTI and FBMC

CASE STUDY 1

Talanoa Institute and Climate Center of COPPE-UFRJ: Launching the "Climate and Development: Visions for Brazil 2030" initiative

In 2021 the Talanoa Institute, an independent Brazilian civil-society organization dedicated to enhancing climate policies, joined with the Climate Center of COPPE-UFRJ to launch the "Climate and Development: Visions for Brazil 2030" initiative. This opened a dialogue on how to increase Brazil's efforts under the Paris Agreement and at the same time strengthen the country's position in the face of a new economic reality, through the outline of a development strategy compatible with GHG emission reductions by 2030 and carbon neutrality by 2050.[21]

The scenarios raised by the initiative were:

- **Economic recovery scenario (REF):** predicts an increase in deforestation by the end of 2023, a decline/stability by 2030, and the continuation of current mitigation plans. It will not address new climate policies until 2030.
- **Fair recovery and transition scenario (CMA1):** predicts that two-thirds of GHG reduction efforts will be directed at land-use change and the other third achieved via carbon pricing. This scenario champions measures to reduce emissions and stimulates not only mitigation but also policies for land management and energy security. Revenues from carbon pricing are applied in public initiatives to promote income distribution.
- **Recovery scenario with just transition and zero deforestation in the Amazon and Atlantic Forest (CMA2):** predicts that most GHG reductions will come from land-use change and that deforestation rates by 2030 will be zero in the Amazon and Atlantic Forest biomes, while decreasing in the other biomes.

The CMA1 and CMA2 scenarios allow for reducing emissions by 2030, positioning the country to neutralize GHG emissions by 2050 and mitigate inequalities through carbon pricing, strategic investments and public policies. In addition, the scenarios serve as a benchmark for aligning actors under the Paris Agreement (e.g. investors and entrepreneurs can reference proposed scenarios and pathways to invest in business opportunities, while governments and private institutions can formulate and revise their intermediate net-zero transition goals).

Given the current lack of clear sector guidance for hard-to-abate sectors in Brazil, participants in the discussions convened by the Forum stressed that current gaps between national considerations and global developments must be addressed. They highlighted in particular the need to:

1. Strengthen collaboration between national organizations and global institutions
2. Seek a joint approach involving the exchange of best practices
3. Locally validate methodologies and establish benchmarks

The creation of sectoral pathways to net zero adapted to conditions on the ground in Brazil, globally recognized and supported by highly credible institutions, will allow for more effective targeting of decarbonization actions in each economic sector. In addition, it will provide a strategic guide for defining targets and implementing transition measures aligned with the country's climate commitments, including the establishment of a regulated carbon market.

Within this context it is important that the Brazilian government works closely with representatives from hard-to-abate sectors, supported by industry and academic experts, to develop national pathways aligned to its decarbonization commitments (as outlined in the NDCs). These pathways should provide guidance on the efforts needed in several areas, including technological innovation, capital investments, development of new competencies and talent, financial flows and national infrastructure. This will then serve as the basis for directing the country towards a greener economy, as more developed nations such as European countries have done as part of the Green Deal and as the United States has done in announcing initiatives such as the Inflation Reduction Act (IRA)[22] and the First Movers Coalition.[23]

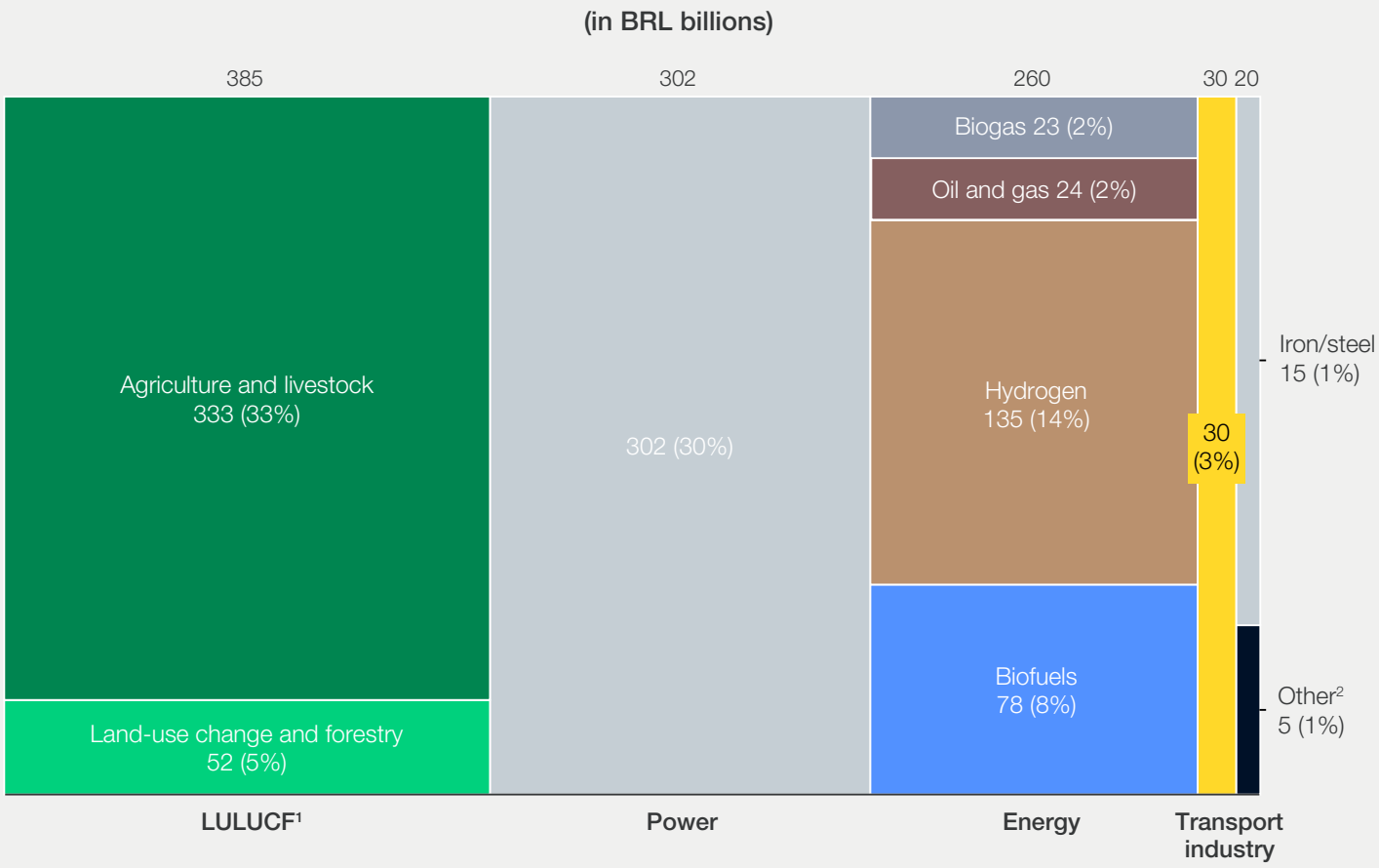
3 Sustainable finance instruments

A successful transition to carbon neutrality requires a clear understanding of the necessary financial flows and the identification of enabling instruments.

Globally, the investment needed by 2050 to achieve carbon neutrality in line with the Paris Agreement is estimated to be approximately $125 trillion.[24]

For Brazil, Oliver Wyman has estimated that the required investment to achieve national transition targets[25] by 2030 amounts to approximately BRL 1 trillion ($200 billion). Investment per sector, detailed in Figures 4 and 5, was estimated by consolidating projections for investments related to climate mitigation of the main companies, sectoral perspectives and government plans.[26]

FIGURE 4 **Expected investments for climate change mitigation in the Brazilian economy until 2030**



1 Land use, land-use change and forestry
2 Aluminium, real estate, chemical and cement

Source: Oliver Wyman analysis

FIGURE 5 | **Main investment focuses until 2030 for Brazil's climate transition**

Transportation		Electrification of vehicles, efficient public transport networks
Power		Wind and solar farms, energy storage technologies, incentives for distributed generation and energy efficiency measures
LULUCF	 	Agriculture and livestock: sustainable practices such as integrated crop-livestock-forestry (ICLF), recovery of degraded pastures, no-tillage practices, irrigated systems and bio-inputs, as well as reducing deforestation Land-use change and forestry: monitoring and combatting illegal deforestation and promoting reforestation and biodiversity
Industry		Energy efficiency, circular economy, carbon capture, utilization and storage (CCUS), green hydrogen and electrification
Energy	  	Bioenergy: production of ethanol, biodiesel, HVO (hydrotreated vegetable oils), SAF (sustainable aviation fuel) and biogas Oil and gas: reduction of flaring, CCUS/EOR (enhanced oil recovery), platform electrification Hydrogen: green hydrogen from solar and wind power

Source: Oliver Wyman analysis

In the Brazilian market, the most diverse sectors have space to attract capital for investment in projects with social and environmental benefits. The agricultural sector is an example that has been increasingly accessing the labelled debt market through Agribusiness Receivables Certificates (Green CRA), which, in addition to having tax exemption for individuals, make it possible to finance projects aimed at sustainable agriculture and renewable energy such as biofuel. Other structures go in the same direction, as thematic bonds, transition bonds and the so-called social impact bonds. Despite the various gateways to this market, there is still room for improvement, such as greater ESG integration within companies that wish to access this market and the development of metrics to monitor the impacts of these projects. In this sense, financial institutions have a crucial role in supporting, fostering and educating these companies.

Mariana Oiticica, Co-Head of ESG & Impact Investing, BTG Pactual

To facilitate the investment required, it is essential to establish robust financing structures, such as the development of sustainable finance instruments, mobilization of private investments and access to international resources to combat climate change.

The World Economic Forum report *Financing the Transition to a Net Zero Future*[27] highlights the importance of using different forms of capital to ensure the successful transition to carbon neutrality and the achievement of established targets. While mature technologies such as wind, solar, vehicle electrification and ethanol can benefit from traditional financing instruments, other emerging technologies critical to decarbonization face challenges in attracting the required funding.

Technologies such as green hydrogen, carbon capture, utilization and storage (CCUS) and sustainable aviation fuel (SAF) are considered promising for decarbonization. Still, they are not yet sufficiently mature or lack significant scale. These technologies face technical challenges, high costs and the need to develop adequate infrastructure and supply chains.

Given this backdrop, exploring new financial and support instruments is essential to boost the development and implementation of such emerging technologies. Currently, five main debt and loan instruments are being used to finance sustainability projects:

- **Green bonds or loans:** issued to finance projects with environmental benefits, such as renewable energy and sustainable agriculture.
- **Social bonds or loans:** resources directed to projects with social benefits, such as basic infrastructure and food security.
- **Sustainable bonds or loans:** a combination of green and social bond models covering sectors such as sanitation.
- **Transition bonds or loans:** issued to fund the transition of hard-to-abate sectors such as iron and steel to production methods with a reduced environmental impact or lower carbon emissions.
- **Sustainability-linked bonds:** no specific allocation of resources. Linked to the company's sustainability performance targets (SPTs), measured by key performance indicators (KPIs).

In Brazil, as shown in Figure 6, although there have been innovations in developing financing instruments aimed at the climate transition, with a sharp increase in the number of green operations between 2020 and 2022, greater coordination is still needed to boost adoption of these instruments: the volume of transactions in Brazil in 2021 reached BRL 85 billion ($17 billion) and represented only 1% of the volumes transacted globally of approximately BRL 8 trillion ($1.6 trillion).

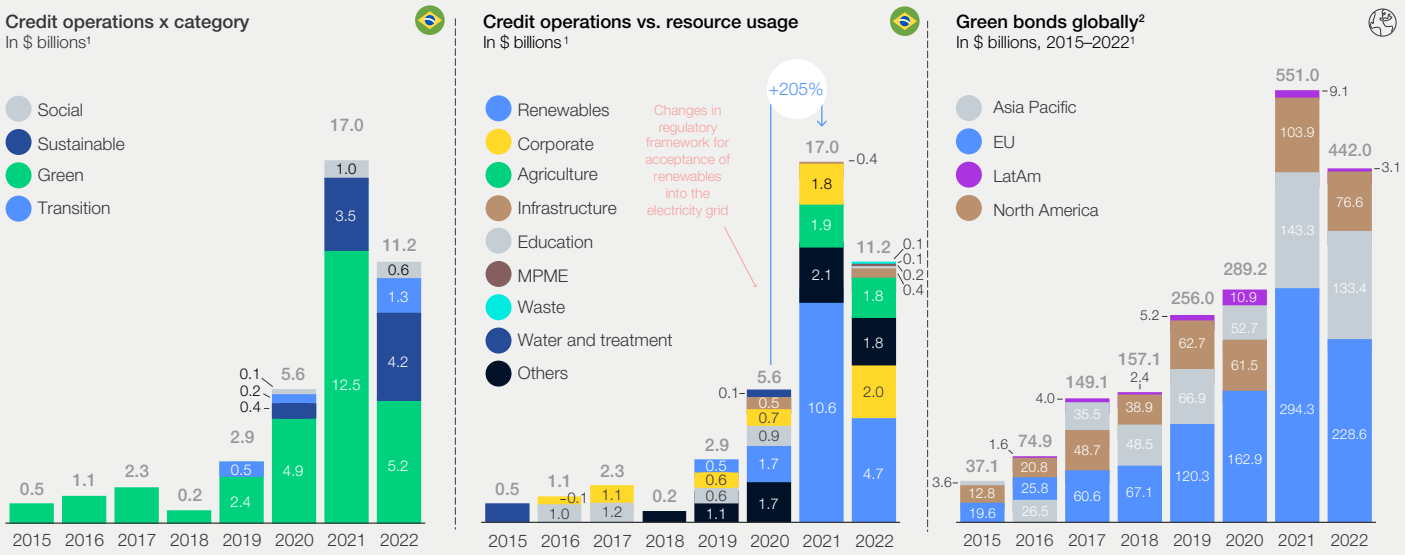
Although the market for these financial instruments has robust growth potential, the volumes are still a fraction of the capital needed to meet the country's climate commitments. As the market becomes more mature, coordination among regulators, government and market participants is going to be essential, as will the proper collection and effective management of data to mitigate any risk of allegations of greenwashing.

FIGURE 6 **Volume of credit operations labelled in Brazil vs. world, by category or by use of the resource**

Strong representation of green credit, with an increase in sustainable credit in recent years ...

... where the increase between 2020 and 2021 stems from growth related to renewable energy and ...

... despite green credit growth, Brazil is still far behind the volume of Asia and the EU



1 Numbers may not add up due to rounding
2 Figures for Africa remain insignificant

Source: Climate Bonds Initiative, Bloomberg NEF, Oliver Wyman analysis

CASE STUDY 2

Volkswagen do Brasil: Developing a sustainable debt security

In February 2022, Volkswagen do Brasil and the Brazilian bank Bradesco signed an **agreement to raise bank debt through export credit notes linked to environmental, social and governance (ESG) commitments**, making the vehicle manufacturer the first to launch a sustainable debt security in the country. This transaction was worth BRL 500 million ($100 million) over three years and is linked to the commitment to reduce CO_2 emissions from fossil origin in operations and increase the participation of women in leadership.[28] Volkswagen do Brasil has committed to raising the proportion of women in leadership positions from 14% to 26% and in management positions from 9% to 25% by 2024. In addition, the company has pledged to increase to 20% the share of biomethane in the total gas consumed in its plants and to transfer 12% of its CO_2 emissions from fossil to biogenic in the production process.[29]

CASE STUDY 3

Klabin: Placing Brazil's first green bond with a 30-year maturity

Since 2017, Klabin, a Brazilian pulp and paper producer, has been issuing green bonds aiming to reinforce the company's commitment to sustainable development. The first issue in 2017 was worth $500 million with a 10-year maturity, the second in 2019 was also worth $500 million with a 10-year maturity, and in 2020 an additional funding round of $200 million was issued to the market with maturity in 2049 – making Klabin the first Brazilian company to issue a green bond with a 30-year maturity. The sustainability-linked bonds are aligned with three United Nations Sustainable Development Goals (solid waste reuse and recycling; water consumption; and biodiversity conservation), in line with the company's growth plan and subject to interest rate adjustments, which are dependent on achieving specific targets by 2030.

As discussed by participants of the Forum-facilitated workshops, the success of any sustainable financing model depends on the underlying operation's profitability and attractiveness. However, several significant challenges remain:

1. A challenge highlighted by companies is that, in many cases, **sustainable finance instruments become less attractive in terms of cost of capital compared to traditional products**. This is due to the additional costs associated with sustainable credit, such as paying for second-party opinions (SPOs) to verify alignment with green, social and sustainable principles, in addition to SPTs and KPIs, without related incentives. In addition, sustainable financing processes can be more time-consuming than conventional ones, as they are complex and require efficient alignment between the involved parties.

2. From companies' point of view, **the commitment to KPIs can be complex due to data collection requirements and necessary governance mechanisms**. However, for large companies, sustainable loans offer benefits that go beyond the rates to be paid, and can be a way to improve and differentiate the company's image for investors and society.

3. Another limitation of sustainable financing in Brazil **is the risk of greenwashing** due to the lack of a national taxonomy on climate, social and environmental contributions or in situations where the opinion of the SPOs is not always consistent.

4. **When considering a taxonomy, international standards serve as a good reference point but do not fully address conditions on the ground in Brazil, thus creating a barrier to investment**. Therefore, Brazil must develop its own taxonomy, following the example of the European Union and countries such as China, Colombia and Mexico, which have already established their own taxonomies.

5. Understanding Brazilian specificities presents a significant challenge for sustainable financing. **One possible solution would be for financial institutions to adopt internal climate-risk models, allowing them to reap the long-term benefits of risk reduction in companies that**

receive related investments. In addition, the Central Bank of Brazil plays an important role in accelerating the sustainability agenda, having joined the NGFS and become a supporter of the Task Force on Climate-related Financial Disclosures (TCFD). Recently, the Central Bank started requiring financial institutions to publish social, environmental and climate risks and opportunities (GRSAC), in line with TCFD recommendations. These measures aim to promote transparency and proper management of climate risks, boosting financial sustainability and resilience to climate change.

6. For financing instruments to evolve, **it is necessary to improve access to information and data on the climate, social and environmental performance of companies and projects**. This allows investors to more accurately assess the risks and opportunities related to the climate transition, making it easier to make decisions and direct financial resources.

7. Government grants may be a viable option to stimulate investment as they encourage research, development and implementation of pilot projects. **Blended finance** (a combination of public and private resources), through the creation of impact funds, can be an effective approach to attract private investment aimed at initiatives that contribute to reducing emissions, adapting to climate change and developing clean technologies.

8. Another instrument is green venture capital, which involves **funding start-ups and technology companies that develop innovative and sustainable solutions**. This type of venture investment can drive innovation and accelerate the development and commercialization of emerging technologies.

The financial sector plays a vital role in developing new approaches to address the challenges and seize the opportunities presented by the decarbonization of the economy. To realize the full potential of the sector in the climate change agenda, financial players will need to implement new approaches to access new sources of capital and offer new products, including:

1. Adopting a comprehensive approach to assess and manage climate-related risks, including physical and transition risks, to make informed decisions.

2. Reviewing and updating credit policies to align with sustainable financing practices; for instance, incorporating climate, environmental and social considerations into the credit process.

3. Engaging and providing incentives for their commercial teams to prioritize sustainable financing.

4. Structuring a diverse range of innovative products and services to meet the evolving needs of sustainable finance, which can involve collaboration/co-creation with clients.

5. Educating relationship managers, bankers and brokers on the climate challenge and technologies that offer solutions, and training them in the economics of climate transition.

The role of government and multilateral agencies is also extremely important in supporting the financial flows required to transition to a greener economy. Governments will need to identify the right type of incentives in terms of regulation and other mechanisms such as potential tax relief, subsidies, guarantees, de-risking mechanisms, etc. Central banks, insurance supervisors and securities regulators should issue guidelines and monitor climate risks in the sector. Examples of actions taken elsewhere include the climate stress-testing exercise demanded by the European Central Bank (ECB) and the climate disclosure initiatives required by the EU Commission's Corporate Sustainability Reporting Directive (CSRD) and the US Securities Exchange Commission (SEC). In Brazil, and aligned with global initiatives, the Brazilian Central Bank published guidelines in 2021 for banks on disclosing their exposure to climate risk in their operations and portfolio. The Brazilian insurance regulator SUSEP issued similar guidelines in 2022.

Finally, multilateral agencies will need to work closely with commercial banks and act as partners, supporting new funding mechanisms as well as the means to de-risk commercial operations. In 2022 the Brazilian Development Bank (BNDES), which manages the Amazon Fund, announced a series of innovative operations such as a guarantee fund to facilitate credit from commercial banks to entrepreneurs who had difficulty obtaining guarantees to raise funds for energy efficiency efforts by SMEs.

4 Brazil's unique profile and the role of policy-makers

Brazil's main sources of GHG emissions are land-use change, forests and agriculture.

The profile of Brazil's GHG emissions differs from the world average in a number of ways. As presented in Figure 7, while globally the generation of electricity, industry and the oil and gas sector represent more than half of all emissions, in Brazil the main sources of emissions come from changes in land use, forestry and agriculture.

BOX 4 **Land use, land-use change and forestry (LULUCF)**

The LULUCF sector covers emissions and removals of GHGs resulting from direct human-induced land use, land-use change and forestry activities. LULUCF is the only sector in the national greenhouse gas inventory where there can be both emissions and removals of CO_2. These are assessed by classifying all land according to six categories of use: forest land; cropland; grassland; wetlands; settlements; and other land. A seventh category covers harvested wood products.

Carbon is sequestered by forestry and grassland, and afforestation plays a very important role as carbon sink. Forests sequester carbon in dead and living vegetation (below and above ground) and in the soil. On the other hand, carbon losses occur in response to alterations in the processing of the stocks of biomass and organic matter, such as converting forest to pasture, as well as the burning of forest.

The reason for the low share of energy, industry and transport in the Brazilian GHG footprint is a series of investments made in the past. These investments, among others, include: the construction of hydropower plants and transmission lines integrated into the national grid; the consolidation of the second largest biofuels market in the world, including an efficient network of ethanol producers and an extensive and capillary retail network (fuel stations); proven technology and production capacity for manufacturing light-duty vehicles running on flex fuel engines (e.g. gas and/or ethanol); and intensive research and advanced technology on crops and land productivity developed by the Brazilian Agricultural Research Corporation (Embrapa).

BOX 5 **Explainer: The Brazilian Agricultural Research Corporation (Embrapa)**

Embrapa is a public company, linked to the Ministry of Agriculture and Livestock, created in 1973 to develop the technologies needed to sustain the nation's agricultural and livestock industry. The initiative, which aims to guarantee food security, plays a prominent role in the international food, fibre and energy market.

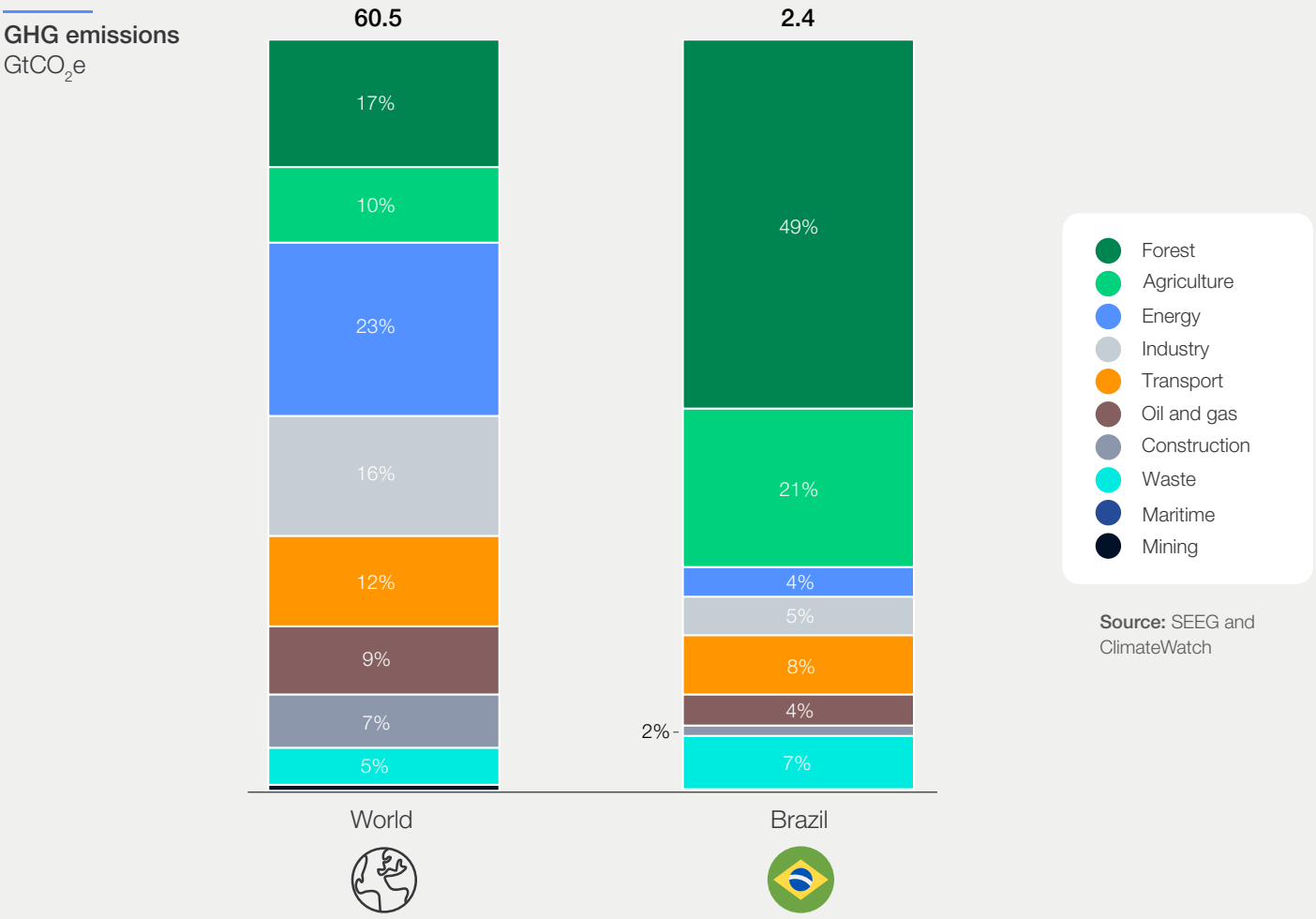
As a result, different sectors in Brazil such as energy, aluminium, transport, cement and manufacturing enjoy a lower carbon intensity when compared to the same sectors in other countries. This represents an opportunity for Brazil to become a global hub of green solutions that also carry potential for other nations. These solutions include clean energy, low-carbon commodities and industrial products and nature-based carbon offsets.

Interestingly, the investments that led the Brazilian economy to enjoy a competitive advantage in terms of carbon intensity over other global economies were not intended for climate change mitigation strategies. Rather, they reflected challenges stemming from energy and food security concerns given the country's lack of oil and gas resources, import restrictions resulting from a lack of foreign currency reserves, foreign trade imbalances and other macroeconomic constraints that Brazil faced in the 1970s and 1980s.

Regarding public policy, it is essential to recognize that although the country currently enjoys a favourable position, it will only hold it only with a clear strategy and direction for new investments. Other economies facing steeper decarbonization challenges for industry and energy are already investing significant amounts of capital in technology, infrastructure and human resources to capture the opportunities of a greener economy. For instance, EU countries decided to devote at least 37% of the financing they receive under the €672.5 billion (approximately BRL 3.36 trillion) Recovery and Resilience Facility to investments and reforms that support climate objectives.[30] In August 2022, the US government signed the Inflation Reduction Act (IRA)[31] to provide substantial incentives for clean energy, transportation and infrastructure. Out of the $790 billion (approximately BRL 3.95 trillion) IRA budget, $387 billion (approximately BRL 1.935 trillion) will be invested in climate programmes, which are expected to reduce GHG emissions by ~1 billion metric tons in 2030. In Latin America, Chile is ahead of Brazil in terms of a clear strategy and related initiatives. As an example of public policy aimed at capturing economic development opportunities arising from a greener global economy, Chile announced a National Green Hydrogen Strategy in 2020, with the objective of producing the world's cheapest green hydrogen by the end of the decade and being one of the three top exporters globally by 2040. The energy ministry projects that, through a mixture of public and private funds, investment in green hydrogen and other derivatives could reach BRL 225 billion ($45 billion) by 2030 and BRL 1.65 trillion ($330 billion) by 2050.[32]

Brazilian policy-makers must now articulate a national strategy and propose the right set of initiatives to ensure that the country will be able to maintain its current leadership position. Besides promoting and facilitating a new cycle of investments to guide the country towards a greener economy, it is equally important that the government acts to address the most significant sources of GHG emissions: land-use change, forestry and agriculture.

FIGURE 7 **Brazilian and global GHG emissions**



Source: SEEG and ClimateWatch

Building better policies for forest landscapes

Brazil is expected to play a key role at the intersection of global food security and climate change. The country can lead in the application of efficient agricultural techniques to ensure food security in a scenario of increased global demand. At the same time, in the context of GHG emissions, deforestation in the Amazon accounts for a large volume of emissions as tropical forests contain high amounts of stored carbon.

Brazil has implemented several measures to deal with the deforestation challenge, such as the creation of the Amazon Fund in 2008. The fund plays a vital role in reducing deforestation, as it seeks to raise funds for actions to prevent, monitor and combat deforestation and to promote the conservation and sustainable use of natural resources within the Amazônia Legal region. Over the past 10 years, the fund has disbursed more than BRL 1 billion ($200 million) to 103 projects.

On the other hand, Brazil's commitment to the Paris Agreement has been questioned, mainly due to the country's recent rising deforestation rates. According to data from Brazil's National Institute for Space Research (INPE), rates have fluctuated over the years, with a peak in the early 2000s, followed by a decline up to 2012. However, rates have been rising again in recent years, reaching their highest levels in over a decade in 2021. Deforestation in Amazônia Legal increased by 7.1% in 2020 compared to the previous year and been rising since 2012.

BOX 6

Explainer: Amazônia Legal

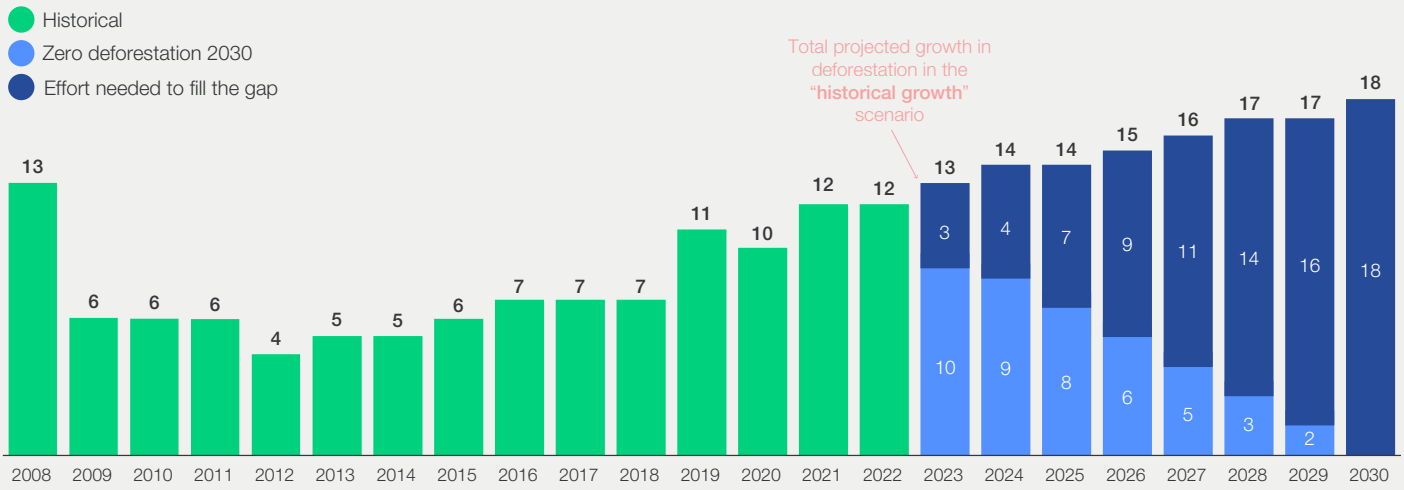
Amazônia Legal encompasses the nine states of Brazil that belong to the Amazon basin (Amazonas, Pará, Acre, Rondônia, Roraima, Amapá, Maranhão, Tocantins and Mato Grosso).

The federal government established it via law in 1953, bringing together regions with identical characteristics, aiming to better plan the Amazon region's socioeconomic development.

FIGURE 8

Deforestation rate in Amazônia Legal per year
(in km²)[33]

Amazon's deforestation rate
In 1,000 km²



Source: INPE, Brazilian Government 2030 Zero Deforestation, Amazon Fund, Projection of an economic and deforestation scenario for the Brazilian Legal Amazon between 2006 and 2030

The main drivers of the increase in deforestation in Amazônia Legal in recent years include:

- The relaxation of command-and-control policies implemented in the past, resulting in low monitoring of land use and low fines for deforestation
- The abandonment of policies and financing for sustainable development activities in the region
- The lack of measures to combat illegal land occupation activities, including illegal mining and land-grabbing, irregular deforestation and other criminal activities in the Amazon region

Signalling a change in posture and a return to good practices, in November 2022, at the 27th United Nations Climate Conference (COP27), Brazil, the Democratic Republic of the Congo and Indonesia announced an initiative to try to channel international funding to forest protection efforts. The plan left many details unresolved, but Brazil's return to discussions on sustainable policies was seen as very positive.

Reducing deforestation improves the quality of human life and benefits the ecosystem overall, and can contribute to sustainable economic development through forest conservation, the generation of carbon credits and the creation of green jobs. Success in reducing deforestation results from a cross-sectoral agenda and the establishment of policies favourable to controlling deforestation rates. Currently, the federal government is signalling the resumption of several of these policies, adopted in the first decade of the century.

Shifts to maximize the impact of the agriculture sector

Agricultural activities are the second main source of GHG emissions in Brazil and represent a significant share of Brazilian gross domestic product (GDP). GHG emissions from agriculture in Brazil are considerably higher than in other economies that have a large representation of agriculture in GDP, such as India and China, indicating that in the agricultural space the country has much room for improvement.

A particular challenge is the importance of animal protein production for the country, especially cattle, as one of the largest sources of GHG is enteric fermentation, which is responsible for more than 60% of emissions in the sector, according to the System for Estimating Greenhouse Gas Emissions (SEEG).

As well as generating a significant portion of GDP, the agricultural sector has been growing in recent years at faster rates than other sectors of the economy. In parallel with the recent growth, there has been an advance of the farming frontier at the expense of forest areas – despite the large amount of arable land already available and the potential to recover degraded areas for agriculture.

In this context, the Forestry Code (Law 12.651/2012) is an important instrument to combat sectoral emissions. Since 2012, this law has established norms for the protection of native vegetation in areas of permanent preservation, legal reserve, restricted use, forest exploitation and related matters.

As presented in Figure 4, investment of more than BRL 330 billion ($66 billion) in sustainable agriculture and livestock practices is expected up to 2030. Several low-carbon practices are being discussed for the decarbonization of agriculture, including ICLF, recovery of degraded pastures, intensive livestock termination (slaughtering animals for meat at a younger age), biological nitrogen fixation in crops, use of bio-inputs, no-tillage systems and genetic improvement of animals, pastures and cultivars.

Historically, the commitment to emissions targets by large rural producers has been limited, with access to sustainable practices, especially for small and medium-sized rural producers, negligible. More recently, an important movement has gained momentum. Led by larger companies in the food value chain, it involves them actively mapping, tracking and monitoring their supply chains, as well as financially supporting producers to meet zero deforestation commitments and promote decarbonization practices associated with higher productivity.

The Brazilian government has deployed programmes focused on sustainable agriculture, such as the National Program for the Strengthening of Family Agriculture (Pronaf) and the ABC Plan (see Case study 4). These programmes, which offer credit lines with special conditions for rural producers who adopt sustainable practices, aim to reduce GHG emissions and conserve natural resources. For the 2022/2023 harvest, the investment under the ABC Plan is BRL 4.7 billion ($940 million).

Further progress and advances in sustainable agriculture and livestock practices in Brazil will require:

- Government to implement tax incentive policies, such as tax exemptions or reductions for equipment, inputs and technologies related to sustainable agriculture. These tax incentives would make investments more accessible, encouraging producers to adopt measures that contribute to the mitigation of climate change and the preservation of the environment.

- Financial institutions to offer sustainable agricultural producers specific credit products that have favourable features, such as lower interest rates and longer durations or a grace period. These products should be supported through public funds, e.g. in the form of blended finance structures. Green financing will play a key role in supporting sustainable agriculture in Brazil, providing the necessary resources for the adoption of practices and technologies aimed at reducing emissions and promoting sustainability in the agricultural and livestock sectors.

- Investors and investment funds focused on social and environmental impacts to direct resources towards sustainable agriculture projects in Brazil. Such investments would aim not only at producing financial returns but also at generating socioenvironmental benefits, contributing to the development of a more sustainable and climate-resilient agricultural sector.

- Finally, collaboration between the public and private sectors to enable the financing of projects and initiatives focused on sustainable agriculture. Through partnerships, governments, banks and organizations can combine resources and expertise to support the implementation of sustainable practices, the development of responsible supply chains and the promotion of technological innovation.

CASE STUDY 4

The ABC Plan

The Sectorial Plan for Adaptation and Low Carbon Emission in Agriculture, better known as the ABC Plan, is a Brazilian government programme whose main objectives are the adoption of more sustainable practices in agriculture and livestock, a reduction in GHG emissions and an increase

in the capacity of agricultural and livestock activities to adapt to climate change. The plan was structured in seven programmes later ratified in the National Policy on Climate Change – PNMC (no. 12,187 of December 2009). The ABC Plan offers several financing lines with below-market interest rates and longer payment terms to encourage producers to adopt these practices. In addition to promoting production systems better aligned with lower CO_2 emissions and preserving the environment, the ABC Plan promotes a portfolio of practices and technologies that take into account economic and social factors – generating business opportunities for rural producers through increased productivity, job creation and more efficient use of resources.

Participants in Forum-led workshops highlighted the following important actions to be taken by policy-makers and regulators in Brazil:

- Formulation of a national strategy to consolidate Brazil's value creation potential in a green economy by mobilizing and aligning actions of the public and private sectors

- Implementation of effective actions to combat illegal deforestation, thereby re-establishing the country's credibility on the international stage

- Establishment of a national taxonomy and sectoral decarbonization curves aligned with assumed commitments (NDCs) that can serve as a guide for the development of sustainable projects and new technologies

- Creation of the conditions needed to allow a model that integrates the regulated (ETS) and the voluntary carbon markets in Brazil (in line with articles 6.2 and 6.4 from the Paris Agreement)

- Development of public policies to encourage climate transition projects with a focus on hard-to-abate economic sectors, including supply chains

- Sourcing of national and international capital to finance projects attracted by a stable business environment with clear rules and legal security

5

Creating networks to build societal resilience

A successful transition strategy requires input from civil society, whose members are affected by climate change and hold the keys to overcoming it.

Any country's transition journey cannot be undertaken successfully by public- and private-sector leaders alone. It requires the buy-in of civil society, too. This, of course, is also true in the case of Brazil. Awareness of and support for sustainability practices have great relevance in reducing the country's GHG emissions. In addition, the population can pressure companies and the government by demanding the adoption of more environmentally responsible positions and concrete actions to combat climate change.

The journey to engaging civil society starts within organizations. Companies need to address internal challenges before reaching out to external stakeholders. Organizations face challenges related to knowledge about climate and sustainability, as well as how best to approach the topic. In some cases, sustainability is treated only as a trend rather than being integrated into the business. The lack of knowledge and alignment of leaders within organizations in relation to the subject often results in limited and insufficient decision-making in the face of the risks and opportunities raised by climate change and sustainability. It is critical that organizations recognize the importance of this issue and strive to enhance their knowledge and commit to the climate agenda.

The challenges for organizations are compounded by the following:

1. Limited availability of talent with climate and sustainability expertise and experience. Large companies compete for talent in a market where the topic is gaining more and more prominence, while sustainability is still not fully addressed in universities. Further, SMEs have limited resources to attract and develop these professionals. Multinational companies face the challenge of translating global climate guidelines to conditions on the ground in Brazil and communicating the Brazilian context to global leaders. It is therefore essential to develop internal knowledge and align sustainability ambitions with the companies' core businesses. This can be done through incentive programmes, bonuses and recognition of environmental, social and corporate governance (ESG) initiatives. In addition, there is the potential to realize mutual benefits among large companies, customers and suppliers through the development of tools for disseminating knowledge about sustainability.

2. When it comes to customer and consumer relationships, businesses face the challenge of communicating climate change and ESG issues in an accessible way, avoiding the use of technical jargon. The lack of prioritization of sustainability in education is one of the main barriers to disseminating this theme broadly. However, there is an increasing number of important initiatives by organizations developing tools and applications that aim to raise awareness and encourage more active participation of civil-society groups in the climate transition. For example, Natura &Co, a Brazilian cosmetics company, offers benefits to consumers who return their empty packaging for recycling, while Ifood, a food delivery platform, suggests an additional charge to customers' orders to offset emissions generated during delivery. Such tools have significant potential to generate positive impact, although some companies express concerns about the risk of being perceived as "activists". It is important to find the right balance to engage consumers effectively without compromising business reputation.

3. Within the public sector, it is common for climate and sustainability issues to be relegated to the bottom of political and government agendas. Yet it is critical to position sustainability as a social priority and prioritize

As the world's most biodiverse country and home to the majority of the Amazon, Brazil has great potential to enhance sustainable development by unlocking decarbonization pathways. This will require the right finance mechanisms in place to redirect capital flows and align incentives with a net-zero and nature-positive economy. Natura &Co places great value on the power of relationships and believes the private sector has an important role in engaging the full value chain in this journey to ensure a multistakeholder, inclusive and collaborative approach. Crucially, we must ensure that the voice of civil society is heard and adequately reflected in decision-making. We are committed to joining forces with others to create a better future for Brazil.

Marcelo Behar, Vice-President, Sustainability and Group Affairs, Natura &Co

the education and development of individuals who can support Brazil's unrealized potential in developing a green economy. Although institutions such as the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA) and Embrapa have an important role in influencing companies and individuals in relation to climate and sustainability, in recent years these institutions have had their decision-making power reduced. Increasing and enhancing the roles and responsibilities of such institutions is essential to promote changes in environmental and sustainability agendas in the public sphere.

Large companies play a crucial role in advancing climate action across their value chains. Brazil has approximately 6.4 million micro, small and medium-sized enterprises.[34] To educate suppliers about climate change, encourage emissions mitigation and promote contributions to a more sustainable and resilient value chain, large companies can take the following steps:

- **Set clear expectations:** establish clear environmental and sustainability standards for suppliers, including targets for reducing GHG emissions. Expectations should be communicated effectively, emphasizing the importance of climate action and the need for collaboration.
- **Supply-chain mapping and transparency:** work towards mapping entire supply chains to identify emissions hotspots and prioritize action areas. This helps in identifying high-emitting suppliers and enabling companies to engage with them more effectively.
- **Provide guidance and support:** offer guidance and support to suppliers by sharing best practices, technical expertise and resources for implementing emissions-reduction measures. This can include providing access to training programmes, workshops and tools that help suppliers measure, manage and report their emissions.
- **Collaborate and share knowledge:** facilitate collaboration among suppliers by creating platforms for knowledge-sharing and fostering partnerships. This can include hosting supplier forums, workshops or webinars where suppliers can learn from each other's experiences, discuss challenges and explore innovative solutions.
- **Incentives and rewards:** create incentives and recognition programmes to motivate suppliers to adopt climate-friendly practices. These can include preferential treatment for suppliers with strong environmental performance.
- **Capacity-building and financial support:** support suppliers in building capacity to address climate change by offering financial support, such as grants, loans or investment in supplier sustainability projects. This helps in overcoming financial barriers and encouraging suppliers to invest in emissions-reduction initiatives.

Conclusion and call to action

Brazil has a major global role to play in advancing sustainability policies.

Transitioning to net zero requires enormous investments worldwide over the next three decades. According to an International Monetary Fund report,[35] the global economy will require between $6 trillion and $10 trillion in public and private investments to mitigate climate change in the next decade alone, which equates to a cumulative 6% to 10% of annual global GDP.

Brazil shares many of the challenges that the global community is facing in its attempt to achieve sustainability and decarbonization goals. In parallel, the set of opportunities and challenges that Brazilian public- and private-sector leaders face is also unique, reflecting Brazil's distinct realities. The country faces several problems, including high deforestation rates, elevated business informality and lack of financial resources from local governments due to fiscal constraints and legal uncertainty. However, Brazil also enjoys distinct advantages in addressing climate issues: these include a mostly renewable electricity matrix and the highest concentration of biodiversity on the planet. This unique endowment not only provides opportunities but also presents a tremendous responsibility. Brazil must act strategically, guided by adequate government support and coordination, to harness its full potential and capture existing opportunities.

The transition to a carbon-neutral economy presents Brazil with the opportunity to unlock investments in renewable energy and expand its influence on the international stage. The country has a crucial role in advancing sustainability policies and, although there is a long way to go, if Brazil follows the right path in the coming years, it could position itself as one of the first economies to reach net-zero emissions and thereby boost its development and contribute to global progress in combatting climate change.

Other emerging economies are certainly looking to Brazil for inspiration and guidance. They are closely observing how the largest economy in Latin America manages to balance its sustainability efforts and other – at times competing – development priorities. It is thus of paramount importance that Brazil gets the transition right.

As this paper outlines, such ambitious goals will require exploring pathways, identifying appropriate financing instruments and educating professionals. It also involves an exchange of best practices with international institutions, an alignment of policies to worldwide standards where fit and the global flow of capital to support Brazil's transition. The World Economic Forum will continue to provide a platform for business leaders, policy-makers and civil-society leaders in Brazil to overcome challenges in the country's transition and partner with global peers. Private- and public-sector leaders should make use of this platform and build on the initial findings of this paper.

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