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A NEW ECONOMY FOR A NEW ERA:

ELEMENTS FOR BUILDING A MORE EFFICIENT AND RESILIENT ECONOMY IN BRAZIL

EXECUTIVE SUMMARY

Elements for building a more efficient and resilient economy in Brazil

The world is currently facing an unprecedented convergence of crises. The COVID-19 pandemic and related social and economic crises aggravate the vulnerabilities generated by low economic growth, growing inequalities within and between countries, and the climate crisis. COVID-19 has highlighted the importance of robust risk management and shown just how interconnected people, communities and the economy are as a whole.

Brazil is no exception. The resources mobilized for economic recovery at the national and subnational level will be an historic opportunity to increase the country's capacity to generate jobs, productivity and economic efficiency, to boost social inclusion, to preserve natural capital and to improve public health.

This study brings evidence showing that Brazil is ready to adopt this new economic course, without disrupting important sectors, by applying existing technologies, laws, or bills pending approval. This new path is also aligned with a low-carbon economy.

Although the study was initiated shortly before the COVID-19 pandemic, the urgency of post-crisis economic recovery makes it even more timely. The goal is to identify economically viable paths to build a more modern, sustainable and inclusive Brazil within an unfavorable fiscal context. Therefore, it focuses on identifying competitive advantages and opportunities that could help transition Brazil towards a new economy more suited to twenty-first century challenges, including climate change. Ignoring these opportunities and advantages may lock-in the country to technologies and models that will soon prove obsolete.

The study was developed in two parts. The first presents three sectoral paths for the transition to a low-carbon economy in Brazil. Each path creates immediate and lasting economic, social and environmental opportunities that are relevant particularly to an economic recovery scenario. Sectoral recommendations include:

- **Quality infrastructure** – promoting integrated planning of projects consistent with the maintenance of natural capital, thus improving economic and societal resilience to increasingly common extreme climate events, and enabling the mobilization of private investments;
- **Industrial innovation** – adopting green technologies and approaches as future growth opportunities in industrial sectors. These approaches will use Brazilian knowledge and capacities, and will generate drivers of innovation and productivity growth for the industrial sector;
- **Sustainable agriculture** – implementing measures to increase efficiency in agricultural production bring several benefits: more efficient land use, increased production and productivity, reduced pressure to deforest, and renewed confidence of consumers and national and international markets increasingly concerned with environmental and climate issues.

The second part of this study consists of showing short-, medium- and long-term results of an economic modeling exercise that projects the impact of sustainable measures on each of these sectors.

The contributions presented have the potential to create millions of jobs, leverage sustainable and competitive growth in Brazil and reduce poverty and inequality.

If adopted, they will make strategic sectors of the Brazilian economy even more productive and competitive at the global level. At the same time, these sectors will become more resilient to the negative impacts associated with deforestation, environmental degradation and loss of natural capital, which threaten human well-being. Below are some highlights for each of the sector-specific policies discussed throughout the study.

Quality infrastructure

Infrastructure is the bedrock of any economic and social system. Nations are increasingly seeking solutions that meet economic and social needs while protecting the environment – solutions such as renewable energy, natural infrastructure, low-carbon cities, and more efficient transportation. For Brazil, investing in modern, quality infrastructure is an economically smart choice. On the one hand, quality infrastructure reduces the costs and impacts of environmental degradation. On the other, it allows future infrastructure to be more resilient to increasingly extreme and frequent weather events (e.g., floods, droughts and fires).

Quality infrastructure could help fulfill the current government's priorities of fostering productivity and competitiveness and increasing international trade. In 2017, Brazil lost 2.4 million tons of soy and corn due to inadequate infrastructure, a loss of R\$ 2 billion (PÉRA, 2017). A study by the Climate Policy Initiative (CPI) estimates that it would be necessary to invest 2% of GDP in improving cargo transport infrastructure to remedy this problem, but the country would have an economic return in three years and thereafter realize savings each year (ANTONACCIO *et al.*, 2018).

Quality infrastructure also creates conditions for the expansion of investment across relevant sectors. The measures proposed by the Ministry of Economy, regarding the use of social discount rates for infrastructure projects and the drafting of bills to establish new governance for the planning and implementation of investments in infrastructure and logistics, are signs that the country is beginning to lay

the foundations for this development path (CHIAVARI *et al.*, 2019). However, as financial resources to build the infrastructure that the country needs are scarce in a recession, it is important to bear in mind that a competitive advantage, and also a risk, are entailed.

The advantage lies in the ample existing supply of natural infrastructure (e.g. forests, mangroves, and rivers), which has been proven to reduce overall costs of investments in infrastructure and logistics, if natural resources are used in a smart way. This study shows, for instance, that if the implementation of natural infrastructure were optimized by territorial planning, the result would be rates of return on investment of between 13% and 28%, which are compatible with the investment rates of traditional sanitation infrastructure.

However, in a country exposed to climate change, there is risk in prioritizing current infrastructure approaches without taking into account their inadequacy when it comes to increasing extreme events and emerging technological standards. The consequence of not taking climate risk into account is that they are perceived by potential investors as possible future stranded assets, making it even harder to attract private capital and finance.

Finally, not opting for sustainable, climate smart infrastructure could lock the country into an infrastructure model that is old fashioned and would quickly translate into delayed and inefficient social and economic development.

Promoting innovation by opting for sustainable technologies

Policies to foster new innovation in Brazil have the greatest chance of transforming the economic recovery plan into an opportunity to modernize and rejuvenate underprivileged regions in the short- and medium- term. This transformation involves significantly reducing inequality in access to basic services and markets, which could happen through existing green technologies in Brazil. With adjustments to the regulatory framework and investments, these technologies could thrive and increase access to national and international markets.

One of the greatest opportunities for Brazil to modernize underdeveloped regions in the short- and medium-term, as discussed in this study, is through innovation in the industrial sector based on low-carbon solutions in clean and smart transportation

and renewable energy. This could be achieved by promoting Brazilian made technologies that operate on a small scale. Low-carbon solutions could also gain market share and prominence through regulatory advancements or significant investments.

Despite Brazil's privileged position in terms of renewable energy availability, the industry and transportation sectors still rely heavily on the use of fossil fuels. Such dependence is in many cases unnecessary as alternatives can have a positive impact on the economy and spur local development. For thermal energy, the use of distributed renewables or biomass fuels can provide logistical advantages over the use of fossil fuels, especially in locations that are far from large consumption centers and lack infrastructure.

For example, the Gold Standard, which certifies environmental projects, reported that an energy bundling project in Ceará State has switched the fuel used by five ceramic factories from illegal firewood to agricultural and industrial residues. This switch generated US\$ 4.5 million in revenues for local communities, improved working conditions, increased water availability and avoided deforestation of 1,750 hectares in ten years, in addition to reducing greenhouse gas (GHG) emissions by 36,173 tons of carbon dioxide equivalent (CO₂e) per year (GOLD STANDARD, 2019).

Brazil is also in a privileged position to take advantage of its natural gas for use in the shipping industry, which is increasingly used by the global maritime industry to replace bunker fuel in vessels, in part aiming to reduce atmospheric emissions from the sector (SZKLO *et al.*, 2018). However, despite Brazil's plentiful natural gas resources in the pre-salt region, commercialization is hampered by logistical barriers to entry and distribution in the Brazilian energy market (ALMEIDA, 2017). Investments could also be made to improve the machinery and liquefied natural gas (LNG) storage system on vessels, to remove these logistical barriers and to develop systems for the supply of natural gas for use in vessels.

Electric buses, both for urban mobility and potential exports, represent another opportunity for low-carbon development and competitiveness in Brazil. The production chain of this asset, including batteries, recharging stations, renewable energy generation and improvements in the electricity distribution infrastructure, results in direct and indirect job creation.

Experts identified that there are no major bottlenecks for the Brazilian industry to produce electric buses (SLOWIK *et al.*, 2018), and the implementation of adequate public policies could attract private sector investments, increase scale-up and reduce cost barriers. It is, therefore, an example of a sustainable opportunity with feasible implementation that could mean a big leap forward in innovation for Brazilian industry.

The transition to low-carbon energy technologies is a strong 21st century trend. It is no longer a matter of *if*, but of *when* it will happen.

This is made explicit mainly by the fact that it is already among the pillars of China's and Europe's post-COVID-19 economic recovery plans. Brazil is also in a position to take advantage of this trend in favor of its development, harnessing its natural capital and resources to boost economic growth and industrial productivity.

Transition to more sustainable and resilient agriculture

Brazil is currently the third largest agricultural producer in the world and the second largest exporter of food (FAO, 2018). Agribusiness¹ accounts for one in every three jobs in Brazil and was responsible for more than 22% of Brazil's Gross Domestic Product (GDP) in 2018 (CEPEA, 2019). It is, therefore, critical to consider the negative externalities and risks that could impact the sector's production, productivity and competitiveness. Many of these risks are of domestic origin and mitigating them requires cultural changes related especially to deforestation, *latifúndios* (large unproductive or under-utilized estates), and use of less efficient agricultural techniques.

Sustainable agriculture is more resilient, as it reduces deforestation and environmental degradation, and it also increases water and land efficiency. As a result, it can ensure water security for the sector and the country. This is strategic for Brazil's long-term development.

There is scientific evidence that deforestation of 20% to 25% of the Amazon biome could lead to

¹ Agribusiness is defined as "the sum of four segments: inputs for crops and livestock, basic or primary agricultural production, agro-industry (processing) and agro-services". The analysis of this set of segments is made for the crop/vegetable and livestock/animal sectors (CEPEA, 2019).

"savannization", a scientific term for "tipping point". This tipping point would cause substantial and unpredictable changes in rainfall patterns in northern, central-western and southeastern Brazil (LOVEJOY; NOBRE, 2018), with a strong impact on the agriculture sector. This risk can and should be addressed and managed during the post-COVID-19 recovery period.

This study shows that in no other sector are the advantages of a rapid transition to a low-carbon economy as strong as in agriculture.

National and international consumers have shown unequivocal signs of the value they place on environmental preservation. Brazil's opting for a deforestation-free agricultural expansion that uses more efficient and intensive means of production could represent, at the same time, a leap towards sustainability, productivity and competitiveness of its already strategic agrobusiness sector.

For example, of the 200 million hectares of pastureland in Brazil, experts estimate that nearly 75% have some degree of degradation. However, cattle ranchers declared in the 2017 Agricultural Census that only 12 million hectares of pasturelands are degraded (IBGE, 2019). The discrepancy between the perception and analysis of experts from EMBRAPA, the Brazilian Agricultural Research Corporation, and the perception of the cattle ranchers reinforces the lack of adequate Technical Assistance and Rural Extension. Out of every four hectares destined for livestock in Brazil, three of them have no kind of assistance and extension (IBGE, 2019). The result is that at least 50 million hectares produce only half of its potentially supported capacity (EMBRAPA, 2019).

Therefore, a major challenge for this sector is not necessarily lack of technology, but rather lack of access to technical assistance. The investment required to restore 12 million hectares of pastureland – the amount of land declared by rural producers as degraded in the 2017 Agricultural Census (IBGE, 2019) – would be approximately R\$ 25 billion. Estimates made in this study indicate that this investment, if applied over ten years, with a discount rate of 8.5% per year, would generate a positive net present value (NPV) of R\$ 19 billion, with just over six and a half years to payback, and potential additional benefits of R\$ 742 million in tax revenues.

Another example has to do with the Brazilian forestry sector. The economic development of this sector, with large-scale planting of native species (native species silviculture), has the potential to position Brazil as a world leader in tropical timber exports. In addition, it would help the country meet national and international commitments, such as the Paris Agreement, as well as enable new business opportunities through carbon credit markets and other environmental services.

This is because, in addition to capturing carbon by increasing forest biomass, there would be a reduction in erosion and soil fertility loss, improving water quality and availability and reducing illegal deforestation for timber production. As a result, economic growth and the creation of jobs in rural areas would also be benefits of developing such a local bioeconomy.

One way to take this leap toward more productive, competitive, sustainable agricultural and forestry sectors in Brazil is to translate the scientific evidence - i.e. methods that increase productivity while preserving natural capital - into policies that make these benefits clear to rural producers, technicians, consultants and companies in the agricultural sector.

For example, subsidies and incentives could be redirected to activities associated with high productivity, sustainable and low-carbon practices, as well as technical assistance. Using credit incentives in a smart way is also critical. For instance, the study indicated that unless rural credit is made conditional on environmental performance, with subsidies for those who concretely foster positive environmental and social externalities, there are few financial incentives to spur agricultural intensification.

The benefits of a new economy for Brazil

This study presents the socioeconomic benefits that could be achieved with the adoption of a broad set of policies around sustainability. The results are encouraging.

The economic modeling carried out to evaluate the benefits was initiated before the COVID-19 pandemic, when the challenges of low economic growth and high unemployment rates in the Brazilian economy were already being seen. That said, the basic modelling results still stand. GDP growth is likely to be negative in 2020, given the economic crisis, but these new economic pathways offer Brazil a stronger and better economic recovery trajectory and employment boost than a business-as-usual (BAU) based recovery.

The analysis shows that sustainable and low-carbon practices can lead to significant GDP growth, with a total accumulated gain of R\$ 2.8 trillion by 2030 compared to BAU.

Adopting these measures could lead to a net increase of more than 2 million jobs in the Brazilian economy in 2030 when compared to BAU, yielding benefits from the very first year. Such measures would also lead to a reduction in GHG emissions exceeding Brazil's current commitment for 2025 under the Paris Agreement.

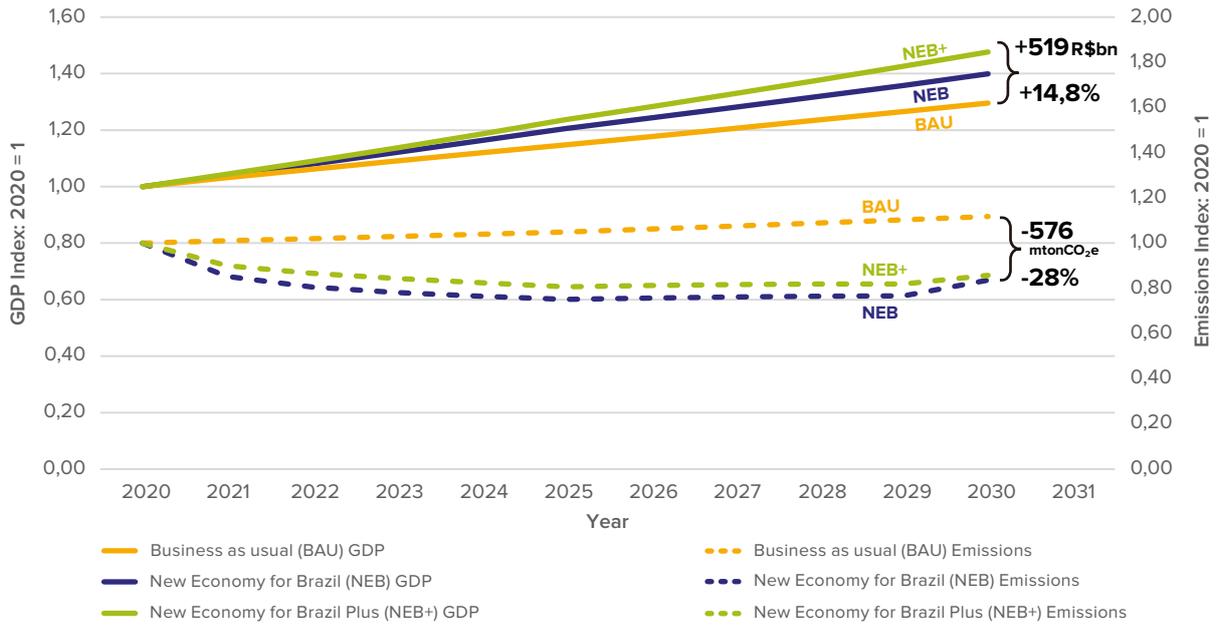
Three scenarios are outlined in this study, each of which incorporates increasing degrees of intensity and penetration of these economic transition measures:

- 1. Business as Usual (BAU);**
- 2. New Economy for Brazil – NEB** – which encompasses a series of low-carbon measures. Such measures include increased use of hybrid and electric vehicles, increased use of charcoal in the iron and steel industry and reducing food loss while maintaining the same level of agricultural production. All together these measures result in a decrease in cropland area and an increase in natural vegetation, through restoring degraded lands, and they also reduce the pace of deforestation;
- 3. NEB+**, a scenario similar to NEB, but whereby half of the land that would return to native vegetation in the NEB scenario is instead used for high productivity agriculture, increasing agricultural production over BAU. This scenario also leads to reduced pressure for deforestation compared with BAU.

Moreover, the NEB and NEB+ scenarios explored in the economic modeling show that the net social, economic and environmental benefits start to accrue as soon as low-carbon investments are implemented, right from the first year. Therefore, they can be an important part of the effort to help Brazil build back better from COVID-19.

Figure ES1

GDP growth and CO₂e reduction under NEB scenarios



Source: Authors' elaboration.

Overall, this study finds that traditional Brazilian sectors are well placed to become even more competitive globally by increasing productivity and promoting activities free of deforestation and environmental degradation. Natural capital provides resources and enabling conditions for Brazil to have a promising economic future. Therefore, protecting this unique resource is not only possible but essential for the country to recover and grow in a sustainable and robust manner in the short- and long-term.

The study also reveals that opting to make sustainability a crosscutting issue would create an additional opportunity for Brazil to leverage scarce public resources by crowding-in green finance for much-needed investments. This opportunity emerges for two reasons. First, as national and international private investors are increasingly shifting away

from high-risk, unsustainable projects, this change in approach would allow greater access to private finance for Brazil. Second, Brazil has sophisticated private and public institutions, and existing policies and regulations that can be enhanced to help create pipelines of sustainable projects that can back the issuances of green securities to fund them.

Therefore, a transition to a new economy would benefit key sectors of the Brazilian economy, help the country gain more international market share and improve infrastructure in times of global recession. As countries mobilize resources to revive their growth and build better and more resilient economies for the future, this green growth path that once seemed remote or disruptive now appears prudent and safe. Now is the time for Brazil to take a new course towards a more prosperous, modern and equitable future.

Figure ES2

The social and economic benefits of a new economy for Brazil

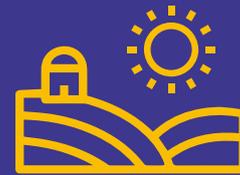
A green economic recovery will allow Brazil's economy to grow more over the next decade than the current development model. By 2030, compared to business-as-usual, a low carbon, climate resilient economic recovery in Brazil could deliver:



A net increase of more than **2 million jobs**



A total GDP gain of **US\$ 535 billion** (R\$ 2.8 trillion)



Restoration of **12 million hectares** or more of degraded pasturelands



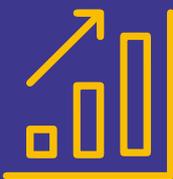
US\$ 3.7 billion (R\$ 19 billion) in additional agricultural production



US\$ 144 million (R\$ 742 million) in additional tax revenues from the agricultural sector alone



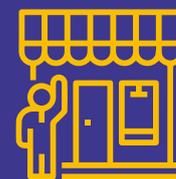
A **42%** reduction in greenhouse gas (GHG) emissions in 2025, compared to 2005 levels



Increased access to **international financing and private investment**



A reduction in **air and water pollution**, with benefits for the health of Brazilians as a result



More resilient livelihoods and **food security** in the face of extreme climate events

NEW ECONOMY FOR BRAZIL

This study pinpoints policies that can help reduce poverty and inequality, contribute to the achievement of economic and sectoral goals, stimulate sustainable economic growth and make Brazil more resilient to future pandemics and other risks, such as climate change and ecosystem destruction. This document is, first of all, a summary of the latest economic data on measures to meet these goals, as Brazil, like many countries, seeks opportunities to boost economic growth, especially after the COVID-19 pandemic.

The study was developed in two complementary parts. Initially, a thorough literature review was conducted, analyzing the benefits and opportunities of policies in three main sectors: infrastructure, industry and agriculture. Then, based on economic modeling, new macroeconomic and long-term results are identified should measures to support the transition to a low-carbon economy be adopted. In addition, the study presents evidence showing that by mainstreaming sustainability as a cross-cutting policy in the planning and implementation of related investment decisions, Brazil could benefit from trends in the financial markets and widen access to private finance.

The whole process of how Brazil should build a more efficient, resilient, fair and sustainable economy is something to be advanced across society. The intent of this study is to present a series of compelling elements showing that Brazil has never been better able to implement this new economy and that the country and its people have much to gain from it.

This study was led by **WRI Brasil** and **New Climate Economy (NCE)** teams and conducted in partnership with Brazilian experts and relevant institutions, namely: the Pontifical Catholic University of Rio de Janeiro (**PUC-RJ**), the Climate Policy Initiative (**CPI**), the Alberto Luiz Coimbra Institute for Graduate Studies and Research in Engineering of the Federal University of Rio de Janeiro (**COPPE/UFRJ**), the Institute for Applied Economic Research (**IPEA**), the Brazilian Federation of Banks (**FEBRABAN**) and the Brazilian Business Council for Sustainable Development (**CEBDS**), a representative in Brazil of the World Business Council for Sustainable Development (**WBCSD**).

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For more information on the **New Economy for Brazil (NEB)** project please contact Carolina Genin, Climate Director, WRI Brasil: carolina.genin@wri.org.

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