Submission by the Federative Republic of Brazil

**Seventh Global Dialogue and Investment-focused Event of the Sharm el-Sheikh Mitigation Ambition and Implementation Work Programme**

## 1. Context

Considering the decision -/CMA.7 (para. 19), the Federative Republic of Brazil hereby presents its suggestions for the Seventh Global Dialogue and Investment-focused Event of the Sharm el-Sheikh Mitigation Ambition and Implementation Work Programme (MWP), to be held on 21-23 April 2026, in Yeosu, Republic of Korea.

The six Global Dialogues and investment-focused events held under the MWP have provided a valuable platform for the exchange of views, information, and ideas on mitigation strategies and actions, specifically on energy systems, transport, cities, waste, forests and bioeconomy. Brazil expresses its appreciation to the Secretariat for organizing these dialogues and producing the corresponding reports, as well as for the opportunity for debate. It is time now to transform these dialogues into concrete results in the speed and scale we need.

With the aim of gaining momentum for this implementation phase, Brazil proposes for discussion at the Seventh Global Dialogue, which will focus on enabling mitigation ambition and implementation in industries, drawing on national and regional experience, the following:

- **(i) Uptake of renewable sources in industry.**
- **(ii) Technological innovation and scaling-up Carbon Capture, Use and Storage (CCUS) and Bioenergy Carbon Capture and Storage (BECCS) technologies in the industry sector.**
- **(iii) Development of new high value-added production chains – low-carbon hydrogen, biomaterials, batteries, and others.**
- **(iv) Harmonization of MRV rules for industrial emissions, in the context of mandatory carbon markets.**

Drawing from national experience, Brazil also shares successful plans and policies that can serve as a basis for discussions at event, noting the New Industry Brazil (Nova Indústria Brasil – NIB)[1], specially its Mission 5; the National Strategy for Industrial Decarbonization (Estratégia Nacional de Descabonização Industrial - ENDI)[2]; the National Energy Transition Plan (Plano Nacional de Transição Energética – Plante); the National Mitigation Strategy, and the Industry and Energy Mitigation Sectoral Plans of the National Climate Plan (Plano Clima – Estratégia Nacional de Mitigação e Planos Setoriais de Indústria[3] e de Energia)[4]; the National Bioeconomy Development Plan

[1] NIB (oficial). Monitor NIB (ABDI)
[2] Versão Consulta Pública
[3] The Industry and the Energy Mitigation Sectoral Plans of the National Climate Plan recognize the need for the development of new materials, fuels, and technologies – such as removal technologies (like CCUS, DAC, or BECCS), low-carbon hydrogen, advanced materials, and solutions using artificial intelligence and digitalization – as transformative drivers of industry.
[4] Plano Clima Mitigação. Plano Setorial de Indústria. Plano Setorial de Energia.

(Plano Nacional de Desenvolvimento da Bioeconomia - PNDBio)[5]; and the Green Mobility and Innovation Program (Programa Mobilidade Verde e Inovação - MOVER)[6].

## 2. Industry

### 2.1. Uptake of renewable sources in industry

Brazil is undergoing a fundamental shift in its industrial profile, moving from a historical reliance on fossil fuels and inputs to leveraging its uniquely clean electricity grid and vast biomass resources. The country is strategically set to lead this transition, not just by replacing old energy sources or fossil fuels and materials, but by creating new, low-carbon industrial markets.

With a national electricity matrix that is around 86% renewable - far above the global average - and government-backed plans and investments to guide the process, the foundation for this shift is exceptionally strong. However, the path is complex, involving technological innovation, significant capital investment, and a managed, gradual, and just transition away from fossil fuels.

The most immediate successes in replacing fossil fuels are occurring in the industrial and electricity sectors. The country’s electricity grid, dominated by hydropower and rapidly growing wind and solar sources, as well as biomass, provides a clean foundation for industrial electrification.

Beyond electrification, for energy-intensive sectors like steel and cement, which face significant challenges in decarbonizing, Brazil's abundant biomass offers sensible solutions. For these major players, decarbonization via biomass does not involve the complete replacement of current blast furnaces, but rather alternative routes that the Brazilian Steel Institute and the government are monitoring, such as the injection of pulverized biochar (PCI), the use of natural gas as a transition, or the future migration to Low Emission Hydrogen (H2V) in Direct Reduction (DRI) processes. Some of the country's industry can also use charcoal from planted forests instead of metallurgical coal, as well as the incorporation of biogas and biomethane, positioning Brazilian products favorably in the national, regional and global markets.

### 2.2 Technological innovation and scaling-up CCUS and BECCS in the industry sector

Carbon Capture and Storage (CCS) can be explored in value chains composed of multiple technologies aimed at reducing emissions through the capture and permanent storage of large volumes of $CO_2$. CCS involves the use of a wide range of technologies and opens up multiple opportunities for research, innovation, and development, with different technological pathways capable of enabling its deployment. These technologies are part of mitigation strategies, as they promote the reduction of greenhouse gas (GHG) emissions and directly contribute to hard-to-abate industrial sectors, while simultaneously fostering economic opportunities and the development of the carbon market. According to data from the International Energy Agency (IEA), there are currently 47 CCS projects in operation worldwide, with a combined announced capacity ranging from 74 to 82 $MtCO_2$ captured per year. These projects are predominantly concentrated in countries such as the United States, Canada, China, and several European nations.

[5] PNDBio
[6] Programa MOVER

Despite its high potential, large-scale implementation of CCS/CCUS/BECCS requires overcoming several challenges, including infrastructure adaptation, financing, the development of transport and storage chains, and coordination between public and private stakeholders. Economic viability remains the main barrier, requiring the creation of financing mechanisms, fiscal incentives, and the structuring of a regulated carbon market to make projects attractive.

Another critical aspect is the need to ensure the “social license to operate,” which demands transparent communication strategies and active engagement with local communities to mitigate negative perceptions regarding the environmental risks associated with these activities. Technical safety and public acceptance also depend directly on robust monitoring standards. As geological storage involves leakage risks, the existence of a framework establishing operational safety standards throughout the entire project life cycle is vital to mitigating environmental impacts and ensuring the “social license to operate”.

A well-defined framework must establish clear guidelines for the recognition of negative emissions, ensuring the traceability and permanence of removed carbon. Finally, the definition of long-term civil liability is identified as one of the most sensitive issues for operators. The regulatory framework must establish clear rules regarding the transfer of ownership and responsibility for reservoirs from private agents to the government after the conclusion of injection activities.

International cooperation is a strategic element for the development of CCS/CCUS technologies, as it enables collaboration with countries and institutions that already possess consolidated experience in this field. Such cooperation facilitates structured exchanges of technical, regulatory, and operational knowledge, contributing to the adoption of more efficient solutions aligned with international best practices.

From the institutional perspective, Brazil has made progress with the enactment of Law n. 14.993/2024 (The Fuel of the Future Bill), which established the country’s first legal framework for carbon capture and storage activities. Brazil is pioneering the use of bioenergy with carbon capture and storage (BECCS) to create carbon-negative industrial products and biofuels. This technology allows the plant to produce ethanol that is not just low-carbon but actually removes carbon from the atmosphere, considering its full lifecycle.

The inclusion of BECCS projects in the regulated carbon market allows for the formal recognition of captured and permanently stored $CO_2$ as greenhouse gas removals, characterizing it as a carbon sink. As a result, the sequestered carbon becomes an economic asset, eligible for certification and trading, including through long-term contracts. This enables agents with negative emissions to supply credits to hard-to-abate sectors, contributing to the achievement of climate targets.

In light of a regulatory framework currently under consolidation, Brazil may also serve as a reference in offering GHG mitigation solutions tailored to the realities of emerging economies.

### 2.3 Development of new high value-added production chains

Building on the foundations of a clean grid and biomass, Brazil is now strategically positioning itself to develop entirely new, high-value industrial chains. These sectors - namely sustainable fuels such as low-carbon hydrogen, biomaterials, batteries, and

other advanced components - represent the next frontier, where the country aims to transform its natural assets into sustainable industrial products.

Low-carbon hydrogen is a central pillar of Brazil's strategy to add high value to its renewable energy dominance. Leveraging its exceptionally clean electricity grid, Brazil has the potential to become one of the world's producers of sustainable hydrogen (produced via electrolysis using renewable power) - a position that could be replicated in other developing countries. Developing countries could thus not just decarbonize their own hard-to-abate industries, steel and fertilizers, but also become exporters to other markets. Developing this hydrogen chain is critical for moving Brazil and other developing countries beyond being raw commodity exporters toward being suppliers of advanced, low-carbon industrial inputs.

Brazil is also moving beyond traditional biofuels to develop a broader bioeconomy, which includes sustainable aviation fuels (SAF), biobunker, sustainable plastics, and biochemicals. By utilizing waste from the sugarcane and forestry industries, Brazilian companies are aiming to create high-value products that serve as direct replacements for fossil-fuel-based materials. This sector represents a clear path to creating high-value-added production chains that align with global demand for sustainable packaging, textiles, and specialty Chemicals. Such perspectives could also be fostered in several developing countries, thereby creating positive impacts beyond the energy transition.

The development of a domestic electric vehicle battery manufacturing industry is a key objective. This is intrinsically linked to the growth of the electric vehicle market in Brazil. Currently, Brazil´s strategic goal, supported by the country´s industrial policy, is to move up the value chain by manufacturing battery cells and components, instead of simply exporting the raw materials. In Brazil´s view, it is crucial that these new sustainable value chains present concrete opportunities for different countries and regions according to their circumstances.

Despite this potential, advancing industry decarbonizing depends on the ability to overcome important bottlenecks, such as the high cost of emerging clean technologies; the uncertainty regarding the demand for sustainable products; the lack of adequate financial instruments for industry, such as guarantees and blended finance; the long payback period for investments; and gaps in methodologies for tracking and proving emission reductions.

Brazil suggests, in this context, that the industry decarbonization debate considers the relevance of regional/local characteristics, in order to promote local development and allow developing countries to be able to be included in new supply chains created by the transition to a more sustainable economic model.

### 2.4 Harmonization of MRV rules and carbon accounting methodologies for industrial emissions, in the context of mandatory carbon markets.

The harmonization of MRV (monitoring, reporting, and verification) criteria for industrial emissions is essential to ensure the environmental integrity and efficiency of mandatory carbon markets. By establishing standardized and comparable methodologies, information asymmetries between regulators and companies are reduced, transparency is enhanced, and trust among market participants is strengthened. This enables different sectors and jurisdictions to adopt consistent metrics, facilitating the linking of markets, preventing the double counting of emissions and credits, and ensuring that reported reductions are real and verifiable. Furthermore, harmonized MRV criteria help reduce compliance costs for industries, promote greater regulatory predictability, and encourage

investment in low-carbon technologies, aligning climate goals with industrial competitiveness.

The improvement and updating of emissions accounting methodologies can positively affect alternative routes in particular. Additionally, current methodologies often omit relevant emission categories, such as those associated with mining, the transportation of raw materials over long distances, and the extraction of the fossil fuels themselves used in the process. These exclusions compromise the completeness of the analyses and hinder the identification of real mitigation opportunities.

Another critical point is the lack of interoperability of the different existing methodologies. The results obtained by different methods are not directly comparable, which generates confusion, compromises the reliability of the data and prevents more sustainable solutions to compete in a leveled playing field.

This issue is of strategic importance for Brazil, as Law No. 15.024/2024, which establishes the Brazilian Emissions Trading System, is currently under regulation, with one of the first steps being the definition of MRV criteria for the activities that will be subject to regulation.

## 3. Opportunities, best practices and solutions

### 3.1 Industrial electrification and efficiency gains

One of the most immediate and scalable mitigation opportunities in industry lies in the electrification of processes combined with energy efficiency measures. Energy efficiency improvements across industrial processes remain a cost-effective mitigation option, with short payback periods and significant co-benefits, including productivity gains and reduced operational costs. Best practices include digitalization and automation of industrial processes, advanced energy management systems, waste heat recovery, and modernization of equipment. Public policies and financial instruments that de-risk investments in electrification and efficiency, especially for small and medium-sized enterprises, can accelerate adoption at scale.

### 3.2 Fuel switching and sustainable use of biomass

Fuel switching from fossil fuels to sustainable biomass represents a key mitigation pathway, particularly for medium and high-temperature industrial processes that are harder to electrify in the short term. Best practices in Brazil include the use of charcoal from planted forests in the steel industry, co-processing of biomass and waste-derived fuels in cement kilns, and the integration of biomass residues into industrial energy systems. Ensuring sustainability criteria, traceability and land-use integrity is essential to maximize climate benefits and avoid negative environmental and social impacts. These experiences offer replicable models for other developing countries with biomass potential.

### 3.3 Development of low-carbon industrial value chains and sustainable markets

Beyond incremental mitigation, Brazil sees significant opportunities in developing new low-carbon industrial value chains. These include low-carbon hydrogen and derivatives, sustainable aviation fuels, biomaterials, chemicals, and battery value chains linked to critical minerals. Best practices involve integrated industrial strategies that combine climate policy, industrial policy and innovation support, as reflected in national initiatives such as the New Industry Brazil (Nova Indústria Brasil – NIB), the National Strategy for Industrial Decarbonization (ENDI) and the National Energy Transition Plan (Plante).

Creating demand through public procurement, standards, carbon markets and international cooperation can help scale these solutions and facilitate their replication in other countries, contributing to global mitigation while supporting sustainable development.

### 3.4 Development of a Domestic Electric Vehicle Battery Value Chain

Brazil is advancing efforts toward the development of a domestic electric vehicle battery value chain, with a focus on strengthening national industrial capabilities across key segments, including lithium-ion cell production, battery pack assembly, and recycling and second-life applications. Initial initiatives are already underway, supported by partnerships between public institutions and industry stakeholders, aiming to establish pilot and industrial-scale facilities in the near term. These efforts are aligned with broader national strategies to promote sustainable industrialization and technological innovation. By fostering greater vertical integration and enhancing local value addition, the initiative seeks to contribute to the resilience of supply chains, support the energy transition, and create opportunities for qualified employment, while positioning Brazil to engage more actively in global battery markets.