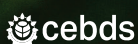


BRAZILIAN COALITION FOR THE CLIMATE TRANSITION

Central
Coordination



Agribusiness



Transport



Mining



Power Sector



Cross-Cutting
Support



ABOUT THE INITIATIVE



CONTEXT | A UNIQUE WINDOW TO ACCELERATE THE TRANSITION

Brazil's updated NDCs and COP30 created an **opportunity to mobilize the business sector** around concrete pathways to **accelerate the country's climate agenda**.



STEP 1 | BUILDING THE 2050 VISION

The **Sectoral Coalition brought together 270 organizations¹** to develop decarbonization pathways for Agribusiness, Transport, Mining, and the Power Sector. Around **150 climate transition levers** were mapped, with estimated **mitigation potential² of approximately 1.1 GtCO₂e/year in 2050**, compared with a scenario of inaction³.



STEP 2 | FROM VISION TO IMPLEMENTATION

The 2050 vision was translated into a **near-term agenda by 2030**. Approximately **30 high-impact levers were prioritized, with mitigation potential of ~0.9 GtCO₂e/year**. The Coalition for the Climate Transition also identified the key enablers needed for implementation. **Biofuels and electrification** were selected as **cross-cutting agendas** to capture synergies across sectors.



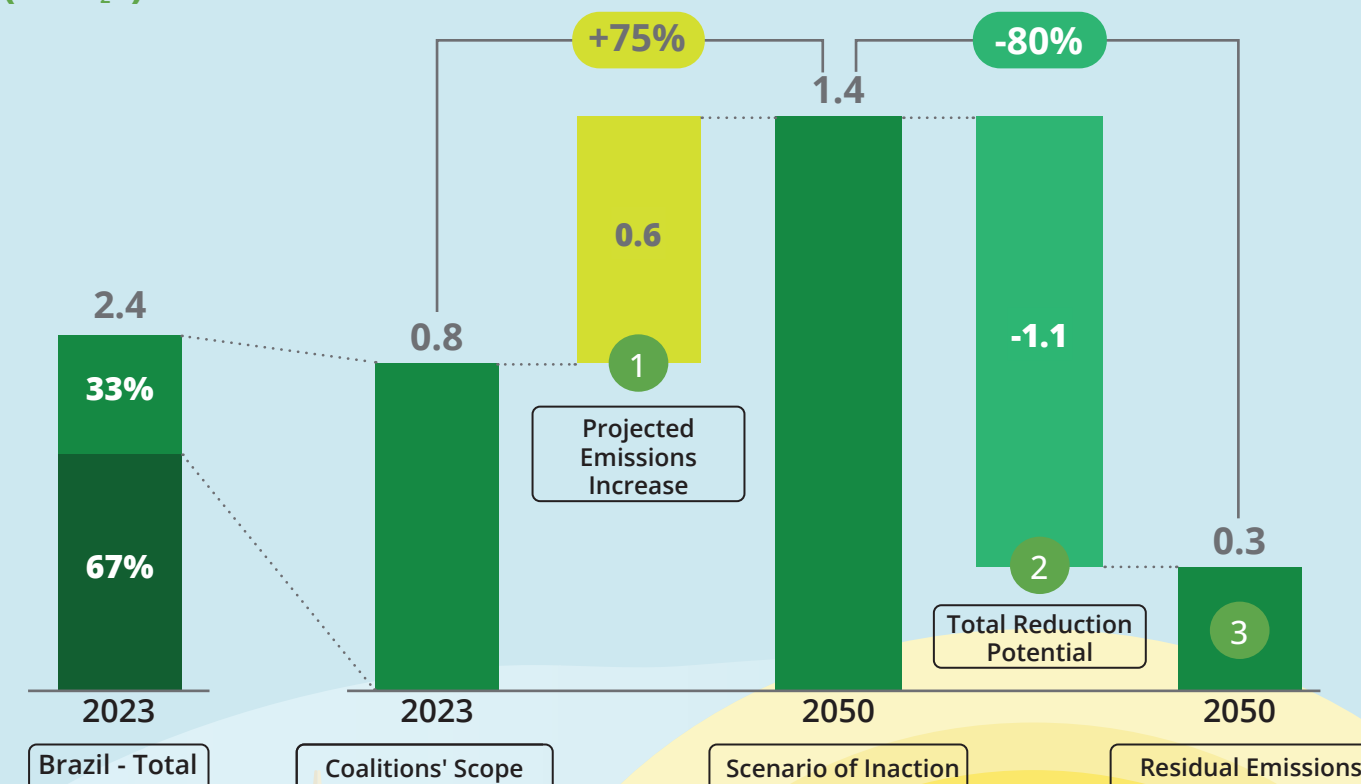
NEXT STEP | ACCELERATE AND TRACK

The focus now turns to **accelerating implementation**. The Coalition for the Climate Transition will serve as a **permanent platform for sector coordination**, with dedicated governance, indicators, and progress tracking to **make results visible and address barriers to execution**.

1. Also includes organizations engaged in the power sector; 2. Covers emissions within the Coalitions' reach, but potentially outside Brazil. In mining, DR-grade and deep-sea shipping are included, but Transition Minerals are excluded; 3. The scenario of inaction estimates absolute emissions in 2050 if no lever or action were implemented by then, accounting for emissions growth driven by population and economic growth over the next 25 years.

STEP 1 | THE ~150 MAPPED DECARBONIZATION LEVERS COULD REDUCE UP TO 1.1 GtCO₂e, OR 80% OF ANNUAL EMISSIONS IN 2050 WITHIN THE SCOPE OF THE SECTORAL COALITIONS

EMISSIONS IN BRAZIL
(GtCO₂e)



KEY MESSAGES

1 THE COST OF INACTION IS HIGH

Without action, emissions in the analyzed sectors could rise by around 75% by 2050, significantly worsening Brazil's climate challenge.

2 COORDINATED ACTION CHANGES THE TRAJECTORY

The roughly 150 levers developed by more than 270 organizations could reduce projected annual emissions by approximately 80% in 2050, relative to the inaction scenario, across the sectors analyzed.

3 DECARBONIZATION GOES BEYOND THE COALITIONS

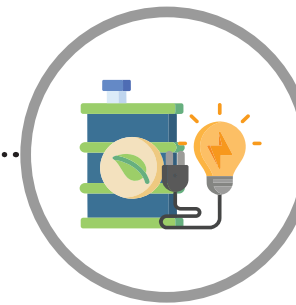
Even with these levers implemented, around 300 MtCO₂e/year of residual emissions would remain in 2050, reinforcing the need for new technologies and complementary mechanisms to achieve net zero.

Notes: Covers emissions within the Coalitions' reach. In mining, DR-grade and deep-sea shipping are included, but Transition Minerals are excluded. The 2023 emissions baseline was estimated by applying the sector shares of total emissions used in the Coalitions' report. Source: Agribusiness, Transport, Mining and Power Sector Coalition reports.

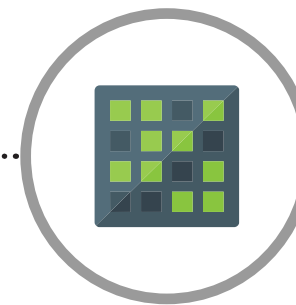
STEP 2 | METHODOLOGY FOR DEFINING PRIORITIES ACROSS SECTORAL AND CROSS-CUTTING AGENDAS TO ACCELERATE THE CLIMATE TRANSITION BY 2030



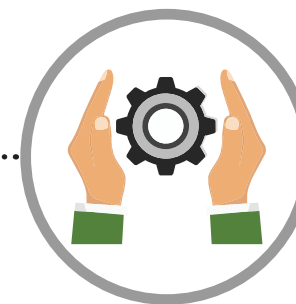
Of the roughly 150 climate transition levers mapped by the Sectoral Coalitions, those with the **greatest mitigation potential** were prioritized for inclusion in the sectoral implementation and tracking agendas through 2030.



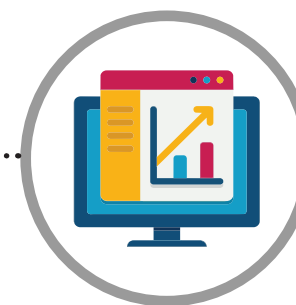
Biofuels and electrification levers, shared by several sectors, were selected because of their high materiality and the potential benefits of cross-sector coordination.



To enable the implementation of these prioritized decarbonization levers, the **key enablers required** were also identified.



Based on these enablers, a **dedicated governance structure** was established to support the implementation and tracking of priority sectoral and cross-cutting levers.



To make progress visible, **priority levers** will be tracked publicly through the **Intersectoral Climate Hub**, a tool available on the CEBDS website that provides access to key indicators and the implementation status of enablers.

STEP 2 | THE METHODOLOGY RESULTED IN ~30 PRIORITY LEVERS AND A CLEAR FRAMEWORK TO TRACK IMPLEMENTATION THROUGH 2030...

...WITH INDICATORS AND ENABLING ACTIONS TRACKED THROUGH THE INTERSECTORAL CLIMATE HUB



METHODOLOGY ROLLOUT



The ~150 climate transition levers mapped in Step 1 were assessed against four criteria:

- ➔ Mitigation potential¹
- ➔ Thematic relevance²
- ➔ Sector coverage³
- ➔ Broad enabling potential⁴



Indicators for each lever were designed against four dimensions:

- ➔ Ability to measure progress
- ➔ Clarity on the expected outcome
- ➔ Availability of data
- ➔ Transparency in measurement and tracking



Enabling actions to support each lever's implementation were selected based on three principles:

- ➔ Need for support to drive progress
- ➔ Ability of Coalition support to add value
- ➔ Potential to deliver tangible impact in the near term, through 2030

RESULTS



~30 levers were prioritized, with **mitigation potential of ~0.9 GtCO₂e/year**, equivalent to **~64% of emissions projected for 2050** under the scenario of inaction within the Coalitions' scope.



More than 100 indicators, including outcome and leading indicators⁵, were defined to track the implementation of the sectoral agendas.



More than 50 enabling actions were **recommended as essential** to the successful implementation of each lever.

1. Focus on levers with the highest emissions-reduction potential; 2. Prioritize themes, modes and value-chain segments identified as most relevant to decarbonization, including cross-cutting topics such as **biofuels** and electrification; 3. Ensure all sectors are **represented** by levers; 4. Assess the ability to enable or accelerate other relevant levers, even where direct emissions reductions are limited; 5. Outcome indicators measure whether each lever's ambition was achieved, while leading indicators indirectly assess whether implementation is on track, enabling course correction.



AGRIBUSINESS

~30% of national emissions, potentially reaching 790 MtCO₂e by 2050 under a scenario of inaction.

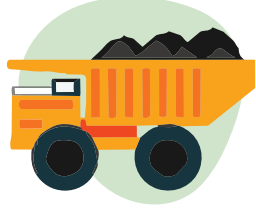
15 levers have the potential to reduce annual emissions by up to 80% by 2050.



TRANSPORT

~11% of national emissions, potentially reaching 424 MtCO₂e by 2050 under a scenario of inaction.

90 levers have the potential to reduce annual emissions by up to 70% by 2050.



MINING

<2% of national emissions, potentially reaching 144 MtCO₂e by 2050 under a scenario of inaction.

24 levers have the potential to reduce annual emissions by up to 90% by 2050.



POWER SECTOR

<2% of national emissions, potentially increasing under a scenario of inaction.

20 levers have the potential to reduce annual emissions by up to 50% by 2050.



STEP 1: SECTORAL COALITIONS

STEP 2: COALITION FOR THE CLIMATE TRANSITION

7 priority levers for the coming years account for ~85% of the estimated decarbonization potential across all levers.



15 priority levers for the coming years account for ~85% of the estimated decarbonization potential across all levers.



6 priority levers for the coming years account for ~80% of the estimated decarbonization potential across all levers.



Step 2 results for the power sector will be released in supplementary material.



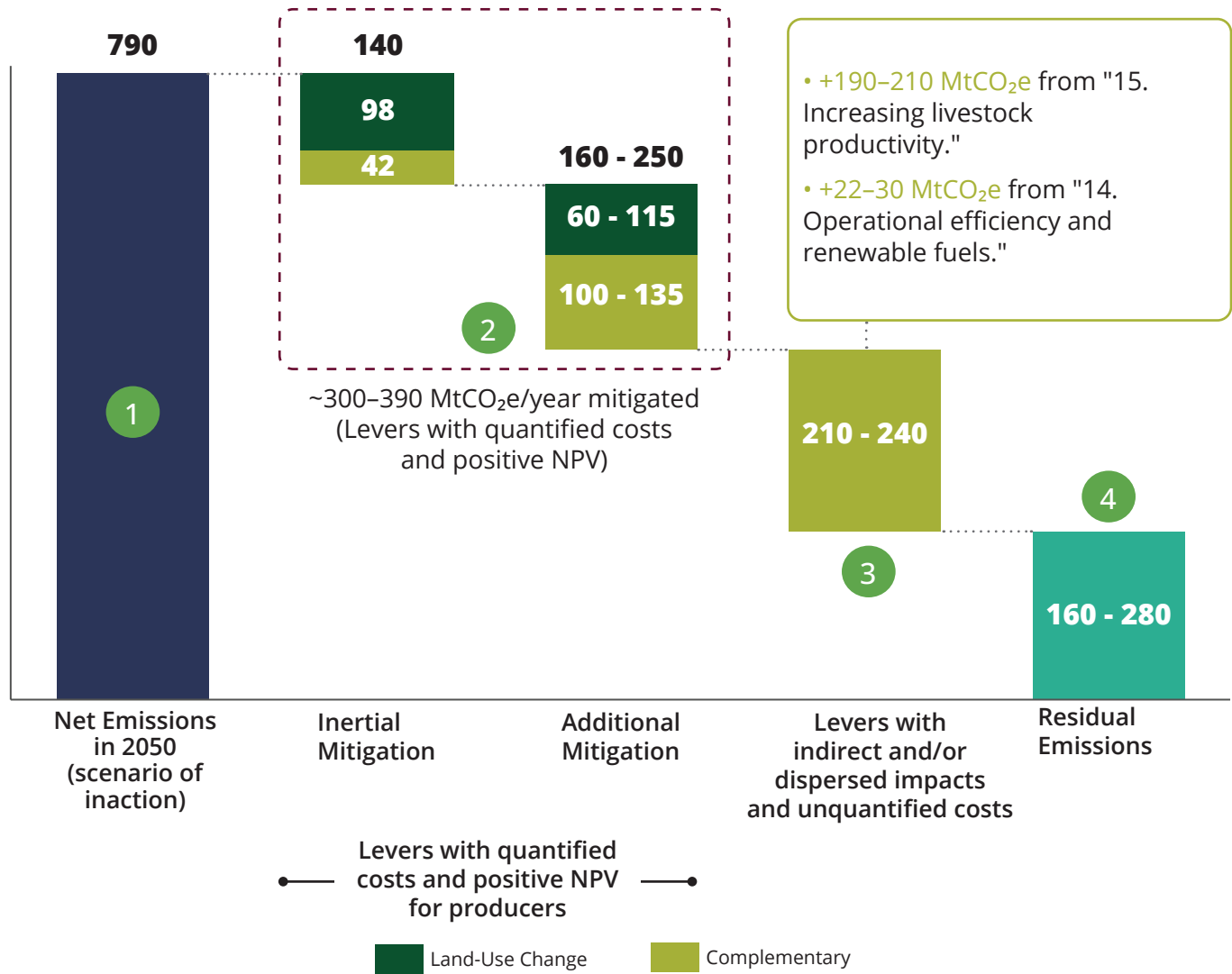


THE AGRIBUSINESS COALITION

Initially led by CEBDS, Amaggi, Nestlé, Tereos, Syngenta, Bayer, and Citrosuco, the Coalition engaged more than 45 organizations across the agricultural value chain, including producers, traders, input and technology manufacturers, associations, confederations and cooperatives, consumer goods manufacturers, banks and financial cooperatives, academic institutions, think tanks, and research centers.

Launched in 2025, the initiative delivered important results, including the mapping of 15 major regenerative and low-carbon agriculture levers, with the potential to mitigate 510–630 MtCO₂e by 2050, and an estimate of the investment needed to enable this agenda, ranging from USD 130 billion to USD 180 billion through 2050.

EMISSIONS AND REDUCTION POTENTIAL (MtCO₂e, ~2050)



Source: SEEG, MAPA, Embrapa, Landscape Accelerator Brazil, World Bank, ABIEC, sector experts.

KEY FINDINGS

1

Expected growth in agriculture and livestock production, along with the expansion of cropland and pasture areas through 2050, could increase the sector's decarbonization challenge to 790 MtCO₂e/year.

2

The sector believes emissions can be reduced by around 50% through 13 mapped levers, with the expansion of integrated systems, no-till farming, and high-vigor pastures among the most impactful.

3

Improved livestock productivity and the use of biofuels in operations could mitigate up to 240 MtCO₂e by 2050. Together with the other 13 mapped levers, these measures could contribute to an overall emissions reduction of up to 80% across the sector.

4

Development and deployment of new technologies should focus on addressing estimated residual emissions of 160–280 MtCO₂e.



COALITION FOCUS IN 2026

This work sets priorities for implementing the agribusiness sector's climate transition in the near term, through 2030. Of the 15 levers mapped by the Coalition, 7 were prioritized for the implementation tracking agenda. Together, they represent approximately 85% of the sector's estimated decarbonization potential (540 MtCO₂e/year).

Delivering this agenda depends on progress across roughly 2 main enablers. Progress will be tracked through the Intersectoral Climate Hub's dashboard, which will monitor more than 30 indicators of the sector's climate agenda implementation.

Broad Themes		Levers
Land-Use Change	Livestock	① Restoring medium- and low-vigor pastures.
		② Expanding high-vigor pastures.
	Agriculture	③ Adopting integrated systems (ICL, ICF, ILF and ICLF).
		④ Expanding no-till planting and no-till systems.
Complementary	Agriculture	⑤ Using cover crops and second- or third-season crops.
		⑥ Using biological inputs / specialty fertilizers with enhanced efficiency.
	Livestock	⑦ Increasing livestock productivity.

PROGRESS ON THE
7 PRIORITY LEVERS
REQUIRES TWO
MAIN ENABLERS

Enablers

Technical
Capacity Building



Expand technical assistance and training programs for producers

- Standardize technical packages by production system:** Define practical protocols for pastures, ILPF, no-till farming, cover crops, and livestock productivity.
- Build and expand technical capacity for priority levers:** Incorporate low-carbon agriculture into agricultural science curricula and strengthen rural technical assistance and extension services (ATER), training technicians and local agents to support implementation and access to credit and incentives.
- Provide ongoing technical assistance beyond one-off training:** Structure support programs that include diagnostics, farm plans, targets, and regular visits to increase adoption and productivity.
- Integrate data and MRV into technical support:** Use management records, production indicators, and audits to demonstrate adoption and provide assurance to lenders.

Financial
Resources



Tailor credit access and incentive mechanisms to producers' needs

- Align credit with the implementation cycle of each lever:** Provide credit lines with interest rates and grace periods suited to producers' circumstances and the time required for the adopted practices to mature.
- Co-finance the entire transition cycle:** Combine credit, barter, CPR/CRA instruments, and insurance to cover implementation, operating costs, and maintenance.
- Reduce risk for producers and financiers:** Use guarantees, technical validation, MRV, and milestone-based disbursements.
- Create economic incentives beyond credit:** Buyers can pay premiums, guarantee offtake volumes, or recognize low-carbon/regenerative attributes.
- Leverage public programs with private capital:** Banks and cooperatives can supplement RenovAgro/Plano Safra with private credit, technical assistance, and blended finance.

Notes: ATER (Assistência Técnica e Extensão Rural): technical assistance and rural extension services in Brazil; MRV: monitoring, reporting and verification. CPR (Cédula de Produto Rural): Rural Product Note; CRA (Certificado de Recebíveis do Agronegócio): Agribusiness Receivables Certificate.

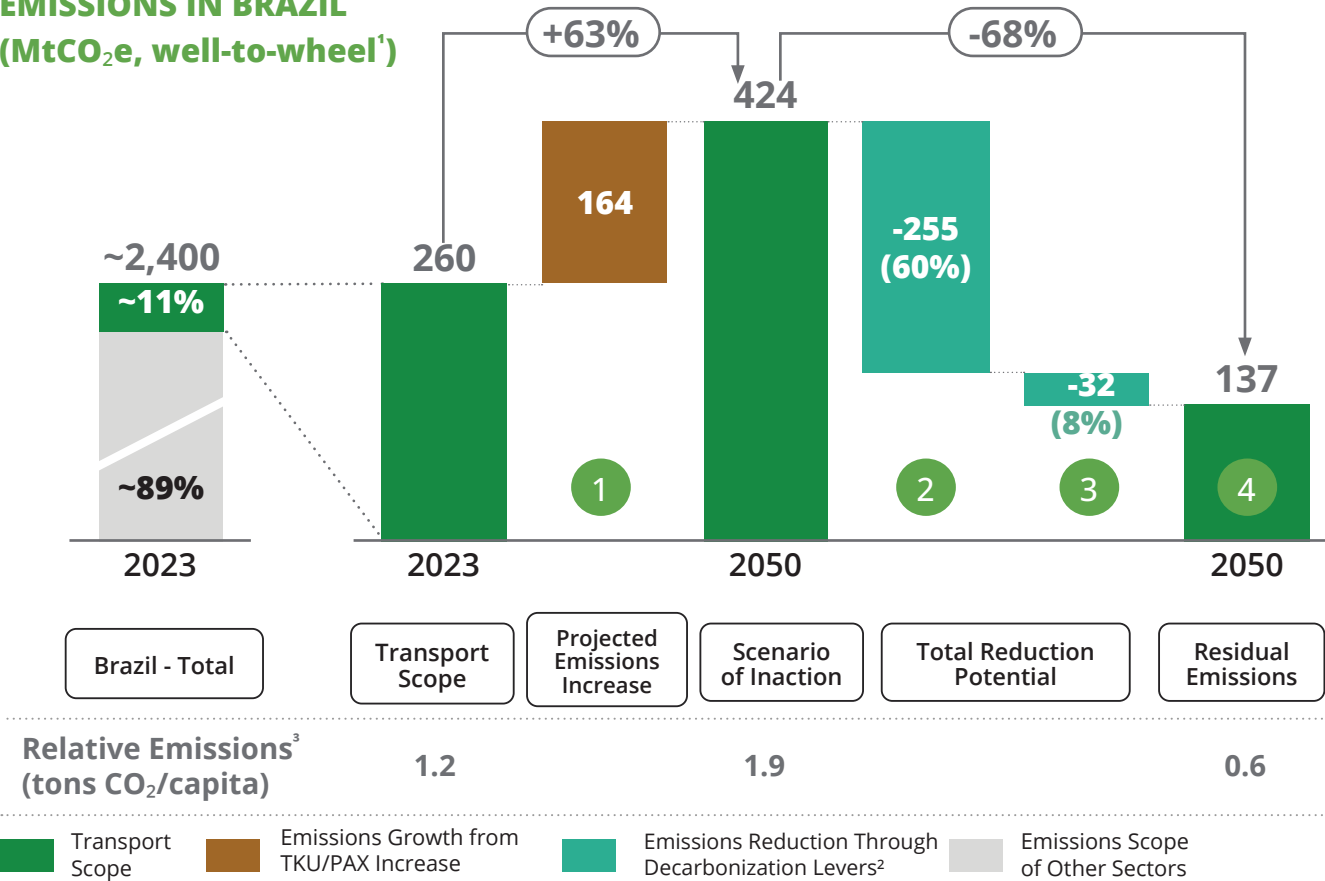


THE TRANSPORT COALITION

Led by CEBDS, Sistema Transporte (CNT - SEST SENAT - ITL), Motiva, and the Insper Mobility Observatory, the Coalition engaged around 120 organizations across six transport verticals: road, rail, waterborne, aviation, urban mobility, and infrastructure/cross-cutting issues.

Launched in November 2024, the initiative delivered important results, including the measurement of the 2050 emissions baseline, the mapping of 90 decarbonization levers, and the quantification of their impacts on the transport sector's decarbonization pathway.

EMISSIONS IN BRAZIL (MtCO₂e, well-to-wheel¹)



KEY FINDINGS

- Expected growth in Brazil through 2050 is projected to increase the transport sector's decarbonization challenge by up to 164 MtCO₂e/year.
- Freight modal shift, expanded biofuels and electrification / Power-to-X could together reduce emissions by up to 60%.
- Other efficiency and optimization levers also play an important role, especially through 2030.
- New technology development and deployment should focus on addressing estimated residual emissions of 137 MtCO₂e.

Notes: 1. Includes fuel combustion in the engine (tank-to-wheel) and the extraction/production, processing and logistics chain (well-to-tank), per GLEC guidelines; 2. Includes different critical levers in each transport vertical; 3. Transport emissions. Source: Transport-sector emissions calculated from external sources beyond SEEG; decarbonization levers identified in Coalition discussions for 2050.



COALITION FOCUS IN 2026

This work establishes priorities for implementing the transport sector's climate transition in the near term, through 2030. Of the 90 levers mapped by the Coalition, 15 have been prioritized for implementation monitoring. Together, they account for approximately 85% of the sector's estimated decarbonization potential (247 MtCO₂e/year).

Delivering this agenda depends on advancing approximately 40 mapped enablers. Implementation will be tracked through the Intersectoral Climate Hub's dashboard, which will monitor more than 100 indicators of the sector's climate agenda.

15 TRANSPORT LEVERS PRIORITIZED FOR THE FIRST TRACKING CYCLE ACCOUNT FOR ~85% OF THE SECTOR'S MAPPED DECARBONIZATION POTENTIAL

	Broad Themes	Levers
 Road	Freight Modal Shift	① Expansion of rail and waterborne transport.
	Electrification	② Adoption of hybrid vehicles.
		③ Expansion of fully electric vehicles.
	Biofuels	④ Increased use of ethanol.
		⑤ Increased use of other biofuels.
 Rail	Efficiency	⑥ Modernizing and renewing the existing fleet.
	Biofuels	⑦ Intelligent optimization of routes and fleets.
		⑧ Using biofuels as a blend with fossil diesel.
 Waterborne	Efficiency	⑨ Expanding infrastructure and optimizing vessel berthing management.
	Biofuels	⑩ Enabling biofuel adoption in vessels.
		⑪ Improving operating practices and landing and takeoff trajectories (e.g., continuous descent).
 Aviation	Biofuels	⑫ Increasing the use of Bio-SAF.
	 Urban Mobility ¹	Avoid
Shift		⑭ Expanding sustainable public transport (e.g., dedicated bus lanes, urban rail, light rail).
Improve		⑮ Scaling solutions that bring vehicle emissions close to zero.

1. For Urban Mobility, the methodology follows the Avoid-Shift-Improve framework.

KEY ENABLERS FOR DRIVING SIGNIFICANT PROGRESS IN TRANSPORT DECARBONIZATION IN THE COMING YEARS



Broad Theme	Mode	Enablers
Freight Modal Shift		Expand inland waterway infrastructure and improve access, while increasing port and terminal capacity.
		Expand the national rail network and strengthen multimodal integration.
Biofuels	   	Coordinate demand signals to support the expansion of biofuel production capacity.
	   	Expand logistics infrastructure to improve biofuel cost competitiveness at the point of use.
	   	Ensure technical feasibility and engine compatibility across different biofuel applications.
		Enable book-and-claim mechanisms aligned with international frameworks, including CORSIA.
Electrification	 	Expand the availability of xEVs with favorable TCO across different vehicle segments.
	 	Increase the number of charging points and stations, including the necessary electricity grid upgrades.
Avoid		Promote technologies that optimize urban mobility systems.
Shift		Identify ways to reduce public transport fares.
Improve		Promote the use of electric or biofuel-powered urban fleets.
Efficiency		Expand the availability of more efficient new vehicles at competitive prices across different segments.
		Encourage fleet renewal by replacing older vehicles with more efficient ones ¹ .
		Review operating procedures to reduce train fuel consumption.
		Promote the adoption of systems and technologies that improve rail operational efficiency.
		Review berthing procedures to reduce fuel consumption.
		Promote systems that reduce vessel waiting times.
		Review aircraft takeoff and landing procedures to reduce fuel consumption.
		Promote systems that reduce aircraft taxiing and approach time.
		Promote the adoption of ground support equipment with lower fuel consumption.
	    	Ensure the availability of the resources and investments required to implement all enablers.

Note: Urban Mobility broad themes follow the Avoid-Shift-Improve (ASI) framework, which seeks to avoid emissions-generating activities (Avoid), shift to lower-impact alternatives (Shift), and improve the efficiency of remaining activities (Improve); CORSIA: Carbon Offsetting and Reduction Scheme for International Aviation; xEVs (Electrified Vehicles) is an umbrella term for electrified vehicles; TCO (Total Cost of Ownership) represents the total cost of acquiring and operating an asset over its **useful** life. 1. To generate climate benefits, fleet renewal must be accompanied by retirement of the replaced vehicles.

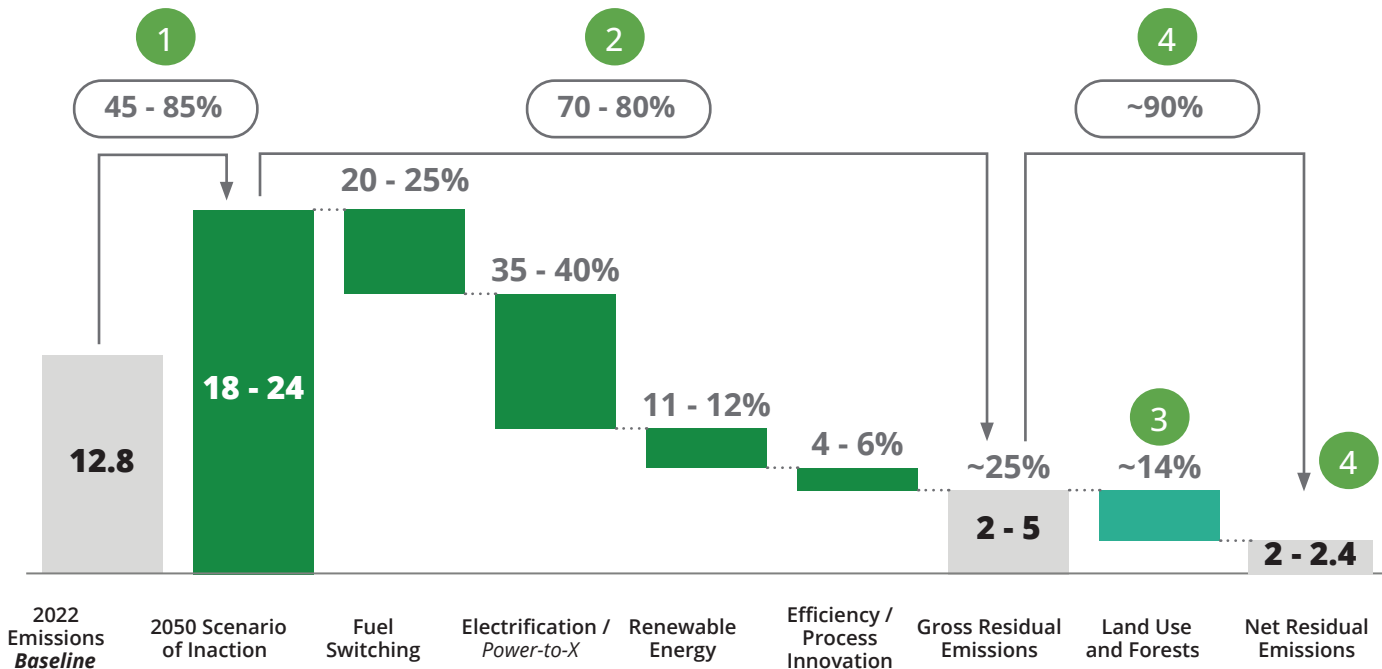


THE MINING COALITION

Led by CEBDS, Vale, and IBRAM, the Coalition engaged approximately 25 organizations from the mining sector and established a shared vision to align the Brazilian mining sector's contribution with national and international commitments to decarbonization and the energy transition.

Launched in 2025, the initiative delivered important outputs, including the establishment of three workstreams: Mining Decarbonization, focused on reducing direct emissions from mining operations; the global Iron Ore Value Chain, positioning Brazil as a strategic supplier in the decarbonization of the steel value chain; and Minerals for the Energy Transition, expanding the supply of Brazilian minerals essential to the global energy transition.

MINING EMISSIONS IN BRAZIL AND REDUCTION POTENTIAL (MtCO₂e, 2022–2050)



KEY FINDINGS

- 1 Projected growth in mineral production through 2050 could increase Brazil's mining sector decarbonization challenge by up to 24 MtCO₂e/year.
- 2 The sector believes it can reduce emissions by around 70–80% through the main levers mapped, with diesel replacement standing out as one of the most impactful measures...
- 3 ...restoring previously degraded areas could generate net-negative emissions by 2050, potentially achieving up to 90% emissions reduction and neutralization.
- 4 The development and deployment of new technologies should focus on addressing estimated residual emissions of 2–3 MtCO₂e.



COALITION FOCUS IN 2026

This work establishes priorities for implementing the mining sector's climate transition in the near term, through 2030. Of the 24 levers mapped by the Coalition, 6 have been prioritized for implementation monitoring. Together, they account for approximately 80% of the sector's estimated decarbonization potential within the Coalition's scope¹ (104 MtCO₂e/year).

Delivering this agenda depends on advancing approximately 15 mapped enablers. Progress will be tracked through the Intersectoral Climate Hub's dashboard, which will monitor around 20 indicators of progress in implementing the sector's climate agenda.

6 MINING LEVERS PRIORITIZED FOR THE FIRST TRACKING CYCLE ACCOUNT FOR ~80% OF THE SECTOR'S MAPPED DECARBONIZATION POTENTIAL

Broad Themes		Levers	
Mining in Brazil	Biofuels	1	Adoption of biofuels in mining fleets to partially or fully replace diesel.
	Processes and Inputs	2	Implementation of efficiency measures for routes and vehicles to reduce fuel consumption.
	Land Use and Forests	3	Active forest restoration in degraded areas.
Iron Ore Value Chain	Biofuels / Power-to-X	4	Prioritization of deep-sea shipping using dual-fuel or low-carbon-fuel vessels.
	Processes and Inputs	5	Adaptation/expansion of existing agglomeration lines for DR-grade.
Transition Minerals	Processes and Inputs	6	Expansion of critical minerals production.

Notes: Emissions from coal production are included in residual emissions; Carbon removal from company-owned and directly affected land is treated as sufficient to neutralize land-use emissions. Current GHG Protocol methodology does not allow this for calculating net emissions, but accounting for sequestered carbon could support mining companies' carbon-neutrality goals; 1. Includes direct emissions from mining operations in Brazil, the Iron Ore Value Chain (DR-grade) and deep-sea shipping. Transition Minerals are excluded. Sources: IBRAM (Emissions Inventory); Coalition discussions.

KEY ENABLERS FOR DRIVING SIGNIFICANT PROGRESS IN MINING DECARBONIZATION IN THE COMING YEARS



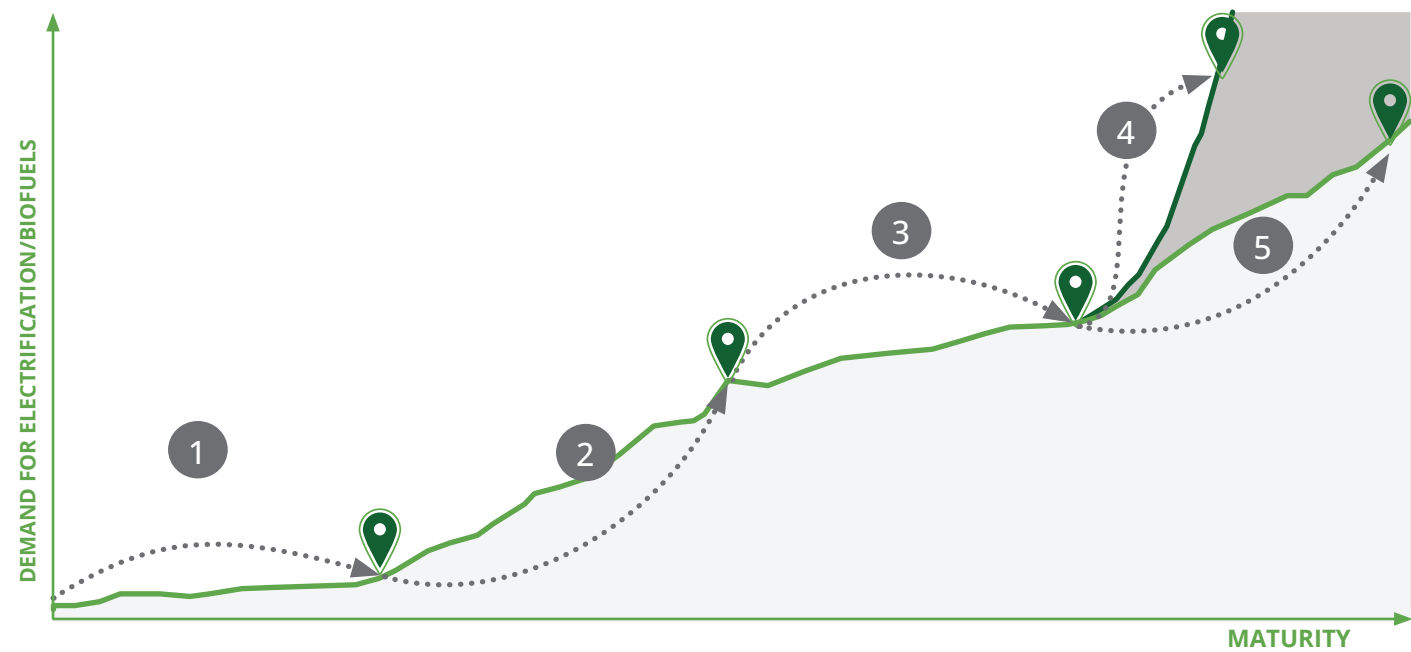
Broad Themes	Workstreams	Enablers
Biofuels	 Mining in Brazil	Expand production capacity by signaling long-term demand.
		Adapt biofuel storage and distribution infrastructure for fleets.
		Ensure the technical and economic feasibility for different biofuel applications.
Processes and Inputs	 Mining in Brazil	Review operational management systems to reduce fuel consumption. Enable the adoption of efficient autonomous equipment and trucks.
Land Use and Forests	 Mining in Brazil	Align active forest restoration with international carbon market protocols. Develop monitoring technologies to support restoration at scale.
Biofuels	 Iron Ore Value Chain	Signal demand to encourage the development of biofuels suppliers and dual-fuel vessels.
		Expand port infrastructure to enable biofuel bunkering.
		Coordinate end-to-end maritime corridors with low-carbon fuel supplies and vessels.
Processes and Inputs	 Iron Ore Value Chain	Ensure the economic viability of using DR-grade iron ore as an input for green steel production in Brazil.
		Develop a national low-carbon certification system recognized in global markets.
	 Transition Minerals	Secure funding and establish mechanisms to reduce risks associated with DR-grade projects.
		Provide technical input to discussions on the regulatory framework and licensing for critical minerals. Increase Brazil's participation in higher-value stages of the critical minerals value chain. Secure long-term financing for mineral exploration and critical minerals projects.

CROSS-CUTTING ACTION TOPICS

Biofuels and electrification were selected as cross-cutting topics because of their strong potential to accelerate decarbonization and unlock synergies through governance and cross-sector collaboration.

A maturity curve was used to classify and prioritize action topics that could benefit most from Coalition support and gain traction in the near term, through 2030.

MATURITY CURVE FOR CLASSIFYING ACTION TOPICS



- 1

Prove technical and operational viability in the primary use case
Ensure technical feasibility of the first biofuel/electrification application, even at limited scale.
- 2

Expand reach within an already proven primary use case
Scale up production/distribution commercially.
- 3

Sustain the primary use case while gradually increasing operating parameters and volume.
- 4

Scale into new use cases that significantly change demand and supply.
- 5

Expand into adjacent applications without materially changing supply and demand.

BIOFUELS

13 cross-cutting action topics were selected as the focus where the Coalition identified the greatest potential to expand biofuel adoption in the coming years.

Action Topics	
1	Increase the competitiveness of hydrous ethanol in regions with low penetration.
2	Expand hydrous ethanol use in agricultural fleets (e.g., tractors and other machinery).
3	Enable the use of ethanol in dual-fuel engines for freight locomotives.
4	Expand the use of ethanol in maritime applications, including positioning Brazil as an exporter.
5	Enable the use of ethanol in stationary engines (e.g., generators).
6	Enable biodiesel blends and B100 for off-road applications (e.g., agricultural and mining machinery).
7	Enable the voluntary use of biodiesel blends above the mandated blend in locomotives (e.g., mining rail operations).
8	Enable biodiesel blends and B100 in marine diesel applications for compatible vessels (e.g., port operations).
9	Enable biodiesel blends above B15 in stationary engines (e.g., generators).
10	Expand the use of biomethane in heavy-duty road freight and passenger transport.
11	Expand the use of biomethane in mobile machinery (e.g., motor graders).
12	Expand the use of biomethane in vessels powered by bio-LNG.
13	Expand industrial use of biomethane as a heat source (e.g., furnaces).

- Light-Duty Road

Off-road
- Heavy-Duty Road

Rail
- Waterborne

Equipment / Process
- Aviation

ADVANCING PRIORITY ACTION TOPICS DEPENDS ON SUCCESSFUL IMPLEMENTATION OF ENABLERS

Four key private-sector coordination enablers are essential to expanding the use of biofuel in Brazil, supported by financing and capital structure.



Logistics Infrastructure

Promote shared logistics infrastructure to improve biofuel cost competitiveness at the point of use.

This includes:

- ➔ Inbound logistics (e.g., feedstock transportation and storage silos)
- ➔ Outbound logistics (e.g., biofuel storage tanks and pipelines)



Engine-Fuel Compatibility¹

Develop technologies or expand the use of large engines powered by biofuels to enable new applications.

This includes:

- ➔ New engines
- ➔ Retrofit kits
- ➔ Fuel composition (e.g., blends)
- ➔ Fuel quality standards



Demand-Signaling Mechanisms

Promote clear and reliable biofuel supply and demand signals to improve predictability for producers and offtakers.

This includes:

- ➔ Forward contracts
- ➔ Buyers alliances
- ➔ Quality standards



Chain of Custody

Expand certification of emissions avoided through biofuel use across the value chain, verifying product quality and climate benefits.

This includes:

- ➔ Feedstock Traceability
- ➔ Storage facility monitoring
- ➔ Quality assurance at the point of use
- ➔ Data infrastructure



Financing and Capital Structure²

Enable access to capital for implementing the enablers, including credit, insurance, guarantees, equity structures and other risk-sharing mechanisms.

1. Includes dual- and triple-fuel. 2. The topic may be explored further as the Coalitions and scalable financing solutions develop.



Scale Management



Technology Leap



Certification and Approval

Building on these enablers, actions were prioritized for Coalition support based on four prioritization criteria:



MAPPING ONGOING ACTIONS



IDEATING NEW ACTIONS



PRIORITIZATION



PRIORITIZED ACTIONS (REFLECTING SCORING)

Commitment

Are companies committed to enabling implementation?

This includes:

- ➔ Strong leadership
- ➔ Interested participants
- ➔ Firm commitment from the participating companies

Additionality

Would the action benefit from the Coalition's contribution?

For example:

- ➔ Cross-sector coordination
- ➔ Internal visibility (e.g., engaging member companies)
- ➔ External visibility (e.g., through the Intersectoral Climate Hub)

Materiality

Would the action lead to a material reduction in CO₂ emissions?

This includes:

- ➔ Directly
- ➔ By unlocking other actions

Maturity

Is the action positioned to gain traction today, with a view to delivering impact within 5–7 years?

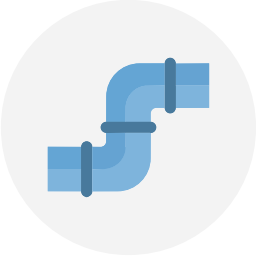
This includes:

- ➔ Proven, available technology
- ➔ Completion of prerequisite actions
- ➔ Economic competitiveness
- ➔ Potential value aligned with the resources required

MANDATORY FOR THE COALITION TO ACT

INDICATIVE FOR ASSESSING RELATIVE IMPORTANCE

DEFINING AN INITIAL LIST OF 7 PRIORITY ACTIONS FOR IMMEDIATE COALITION SUPPORT



LOGISTICS INFRASTRUCTURE

- ➔ Bring together biofuel producers and consumers (e.g., ethanol) to align intended offtake volumes that would support investment in a multiproduct pipeline connecting Brazil's Center-West and Southeast regions.
- ➔ Convene stakeholders interested in expanding biomethane refueling corridors, similar to Paraná's "Sustainable Corridors" initiative, to other regions of Brazil.



ENGINE-FUEL COMPATIBILITY

- ➔ Coordinate a technical consortium to co-finance and track the development or expansion of biofuel-compatible engines (e.g., ethanol and biodiesel) for locomotives.
- ➔ Mobilize interested parties to coordinate fully voluntary testing of higher-biodiesel blends exclusively in captive fleets¹, sharing lessons and refine fuel quality requirements and engine specifications.
- ➔ Bring together shipowners, ports, and biofuel suppliers interested in scaling up operations involving triple-fuel vessels bunkered in Brazil².



DEMAND-SIGNALING MECHANISMS

- ➔ Bring together offtakers and producers to help define the technical and contractual parameters (e.g., price benchmarks and quality specifications) needed to establish a biomethane futures market³.



CHAIN OF CUSTODY

- ➔ Coordinate a technical consortium to define a nationally standardized monitoring protocol (e.g., through ABNT) and promote certification of feedstock suppliers.

This list is a starting point, and any additional actions may be included provided they meet the Coalition's prioritization criteria.

The enablers prioritized for cross-cutting action topics focus on areas where joint private-sector action through the Coalition can accelerate decarbonization. Nevertheless, public-sector support may be critical to unlocking progress in some of these areas, whether through direct investment, regulation, or public policy.

Note: ABNT: Associação Brasileira de Normas Técnicas (Brazilian Association of Technical Standards).

1. Includes off-road vehicles; 2. Includes vessels of various sizes powered by ethanol, methanol and bunker fuel; 3. Biomethane was selected by the Coalition as the starting point, with scope potentially expanding to other biofuels in the future.

ELECTRIFICATION - THE PERSPECTIVE OF THE COALITION'S DEMAND SECTORS

16 cross-cutting action topics were selected as a focus area, reflecting where the Coalition identified the greatest potential to increase the adoption of electrification solutions in the coming years.

These action topics were mapped from the perspective of demand-side sectors (Agribusiness, Transport, and Mining). The Power Sector Coalition developed a broader perspective, which will be detailed in a comprehensive study currently under preparation.

Action Topics

1



Increase the penetration of plug-in electric vehicles (BEVs/PHEVs).

2



Promote the use of electric vehicles in high-utilization light commercial fleets (e.g., vans and urban freight vehicles)¹.

3



Increase the number of electric urban buses in circulation².

4



Electrify key road passenger transport routes.

5



Electrify major road freight corridors³.

6



Increase the electrification of wheel loaders, LHDs, light electric trucks and trolley-assist systems in mining operations.

7



Enable small hybrid/electric tractors and agricultural machinery.

8



Expand metropolitan and regional metro, rail and light rail networks.

9



Develop electric/hybrid shunting locomotives.

10



Enable hybrid freight locomotives following pilot trials.

11



Increase the use of hybrid/electric port-support service vessels (e.g., tugboats)⁴.

12



Increase adoption of small hybrid/electric short-distance vessels.

13



Expand the use of hybrid and electric port-operation equipment and vehicles.

14



Increase the share of hybrid and electric airport support vehicles (e.g., baggage tractors).

15



Expand electrification in agribusiness processes (e.g., crop-spraying drones; pumping, irrigation, climate control, cooling and drying).

16



Increase fertilizer production using green hydrogen to strengthen agricultural resilience⁵.



Light-Duty Road



Off-road



Waterborne



Equipment / Process



Heavy-Duty Road



Rail



Aviation

Notes: 1. Gross vehicle weight (GVW) up to 3,500 kg; 2. Cities such as São Paulo already ban purchases of diesel buses, but the solution still needs to be expanded nationwide (SPTTrans, 2022); 3. Long distances and battery range are among the main barriers; 4. Excludes coastal and deep-sea shipping; 5. Fertilizers already use hydrogen in the form of ammonia.

ADVANCING PRIORITY ACTION TOPICS DEPENDS ON SUCCESSFUL IMPLEMENTATION OF ENABLERS

Four key enablers are also essential to expanding electrification in Brazil, with financing and capital structure playing a supporting role.

 Technology Readiness and Standardization Demonstrate the operational performance of electric motors ¹ and heavy equipment, and standardize high-power charging. This includes: ➔ Range and Power Validation ➔ Domestic Equipment Manufacturing and R&D ➔ Retrofitting assets	 Grid Expansion and Resilience Expand and strengthen the power grid to enable electrification at remote locations and high-demand sites. This includes: ➔ Grid extensions to remote operations ➔ Capacity upgrades at charging depots	 Charging Infrastructure Expand charging infrastructure to increase the availability of charging stations. This includes: ➔ Logistics corridors ➔ Ports, airports and terminals ➔ Urban centers, commercial and residential buildings	 Certification and Circularity Certify the origin of critical minerals for the energy transition and enable battery circularity. This includes: ➔ Digital battery passports documenting responsible mineral sourcing ➔ Battery reuse and recycling
 Financing and Capital Structure² Enable access to capital for cross-cutting enablers through credit, insurance, guarantees, equity structures and other risk-sharing mechanisms.			

1. Includes agricultural, mining and various transport applications, including waterborne, road and rail; 2. The topic may be further explored as the Coalition continues and engages financial institutions.

 Scale Management

 Technology Leap

 Certification and Approval

8 actions were defined as the initial priorities for immediate Coalition support in the near term, through 2030.

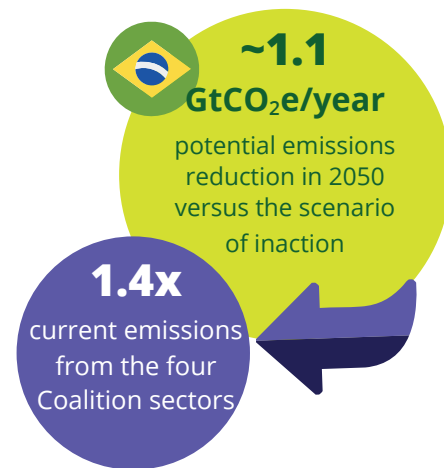
 Technology Readiness and Standardization 1 Mobilize Coalition members interested in sharing lessons learned from voluntarily adopting electric off-road vehicles and machinery in captive fleets ¹ . 2 Define minimum high-power charging requirements for heavy-duty vehicles and machinery ² .	 Grid Expansion and Resilience 3 Bring together consumers, transmission companies, and distribution companies to expand energy storage as a grid-strengthening solution at high-demand locations, following the example of ISA Energia's BESS project in Registro (SP) ³ . 4 Engage consumers, distribution companies, and power generators to map available grid capacity ⁴ and anticipate bottlenecks, including at bus depots and in mining and agribusiness operations.	 Charging Infrastructure 5 Mobilize Coalition members to expand heavy-duty vehicle charging corridors into other regions of Brazil, building on the "Laneshift e-Dutra" project. ⁵ 6 Coordinate distribution companies, regional engineering councils (CREAs), and private-sector organizations to provide technical guidance and accelerate the installation of charging points at homes, businesses and depots. 7 Bring together concessionaires, e-mobility operators, and distribution companies to leverage existing urban infrastructure to expand the electric vehicle charging network.	 Certification and Circularity 8 Coordinate a technical consortium to enable battery reuse and recycling, including the development of digital battery passports.
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Note: CREAs: Conselhos Regionais de Engenharia e Agronomia (Regional Engineering and Agronomy Councils).

1. Includes hybrids; 2. Includes port and airport tractors and off-road machinery, preferably aligned with Megawatt Charging System (MCS) standards; 3. Refers to Battery Energy Storage Systems (BESS); 4. For example, CEMIG's "Load Capacity Map" provides cost and implementation-time estimates beyond the distribution utilities' geographic database made available to ANEEL; 5. Subject to meeting technical requirements.

THE NEXT FRONTIER IS MAKING DECARBONIZATION POSSIBLE AT SCALE

- ➔ The ~150 levers mapped in the Coalition's first phase could reduce emissions by up to ~1.1 gigatonnes of CO₂e per year by 2050.
- ➔ Expected growth in Brazil and the sectors analyzed is likely to make this ambition more challenging to achieve by 2050.
- ➔ Realizing this potential depends on establishing the Coalition as an ongoing implementation platform that mobilizes stakeholders to accelerate progress on the enablers mapped in this second phase, with progress tracked through the Intersectoral Climate Hub.



The Coalition's ambitions for 2050:

BRAZIL TODAY

 **~30% OF THE FREIGHT MODAL MIX** uses lower-emission transport modes (g CO₂/TKU).

 **OVER 30 BILLION L OF BIOFUELS** consumed, accounting for 23% of the energy mix.

 **<1% OF THE LIGHT-DUTY VEHICLE FLEET** was electrified in 2025 (BEVs and PHEVs).

 **36 MILLION TONNES OF TRANSITION MINERALS** produced, accounting for 7% of global production.

 **OVER 1 MILLION TONNES OF DR-GRADE BRIQUETTES** produced in Brazil in 2025.

 **59 Mha OF HIGH-VIGOR PASTURES**, representing around one-third of Brazil's pasture area.

 **21 Mha UNDER INTEGRATED SYSTEMS** Crop-Livestock-Forestry (ICLF)

 **~700 TWh IN ANNUAL DEMAND**, supplying more than 90 million consumers.

BRAZIL IN 2050

 **~55% OF THE FREIGHT MODAL MIX** in lower-emission modes (rail and waterborne).

 **~55 BILLION L OF BIOFUELS** consumed; +25 billion L of demand vs. 2023 for renewable diesel, biomethane, SAF and others.

 **OVER 50% OF LIGHT VEHICLES** electrified and ~300,000 electric buses in circulation.

 **~75 MILLION TONNES OF TRANSITION MINERALS** produced, increasing Brazil's share to up to 13% of global production.

 **OVER 10 MILLION TONNES OF DR-GRADE BRIQUETTES** enabling the global steel industry to shift to green-hydrogen reduction routes.

 **84 Mha OF HIGH-VIGOR PASTURES**, covering nearly half of total pasture area.

 **OVER 37 Mha UNDER ICLF** with a mitigation factor of 5.5 MtCO₂e/Mha/year.

 **OVER 2,000 TWh IN ANNUAL DEMAND**, potentially tripling electricity consumption through electrification of new sectors.