

THE CLIMATE PATHWAY PROJECT

DELIVERING ON MID-CENTURY CLIMATE GOALS



Climate Pathway Project

Brazilian Case Study: Amazonas and Mato Grosso

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Introduction

The Climate Pathway Project is led by the Climate Group as the Secretariat of the Under2 Coalition, in coordination with the following consortium partners: Governors Group for Climate and Forests - GCF Task Force, Winrock International, The Climate Strategy Center (CCS) and Libélula. The Climate Pathway Project aims to support state and regional governments in developing a transformational process or "pathway" to reduce emissions.

The development of pathways start with the government's long-term greenhouse gas (GHG) emissions reduction goal, and then works backwards to identify the technologies, infrastructure, interventions and investments that will be required to achieve it in priority sectors. By working across sectors the process helps policymakers set intermediate milestones to reach the goal, and better understand the costs, risks, trade-offs and co-benefits associated with different policy approaches.

Through the Climate Pathway Project, the governments of Amazonas, Mato Grosso and São Paulo (Brazil), Quintana Roo and Querétaro (Mexico), and Madre de Dios (Peru) have received support to develop tailored long-term priority mitigation actions suited to their local contexts. Through the process, the project regions developed a series of prioritized mitigation actions and a preliminary analysis of the long-term emissions reduction potential, marginal cost-benefit and social and economic implications within the jurisdiction. The pathway approach has given the state and regional governments choice, so that they can make an informed decision on the best way to pursue science-based reduction targets while pursuing other government priorities such as economic growth.

Participating states and regions, in collaboration with communities and businesses, have developed clearly defined actions to deliver effective and long-term emissions reductions through their climate pathway. While the process represents a breakthrough for tropical forests and provides a long-term plan for states to keep forests intact, the pathway itself is just the first step of a long-term process that will require the plans to be converted to action in the coming years.

Subnational governments ultimately will lead the changes to implements actions for a low-carbon future. The prominence of local-level action is explicitly recognized in the bottom-up approach of the Paris Agreement and by the increasing importance of subnational government, networks addressing climate change, including the Under2 Coalition and the Governors' Climate and Forests Task Force. While it is broadly acknowledged that climate goals will not be achieved without action from subnational governments, we also know that they cannot do it alone. The transition from commitment to action will ultimately require coordinated efforts across different levels of government, and perhaps most importantly between states and regional governments and their national government counterparts.

National governments play an essential leadership role by establishing a domestic climate agenda and setting priorities in international climate change fora. Whether it is negotiating at the United Nations Framework Convention on Climate Change, setting domestic policy

agendas, leading national greenhouse gas (GHG) measurement and monitoring, reporting and verification (MRV) systems, or financing and incentivizing the transition to a low carbon economy, national governments control powerful levers that can support – or hinder – the implementation of subnational climate pathways. Alignment with these efforts is essential to ensure subnational climate pathways are implemented efficiently, with sufficient finance, and through compatible or coordinated monitoring and reporting systems.

In recognition of the importance of the relationship between subnational and national governments in the context of mitigation actions, climate change commitments and long-term strategies for decarbonization, the Climate Pathway Project was designed to support analysis and dialogue between states and national governments on the alignment of state-level priority mitigation actions and national climate change strategies.

This report focuses on the alignment of priority actions for the Brazilian states of Mato Grosso and Amazonas with national climate policies, nationally determined contributions (NDCs) and mid-century/long-term strategies (LTSs), and explores potential areas of alignment between existing programs and longer term decarbonization strategies at the states' level. This report is based on literature reviews and desk research on Brazil's national climate policies and NDCs, interviews with the state environmental secretariats (SEMAs) and workshops led by the GCFTF within the knowledge management component of the Climate Pathway Project.

Brazil's Nationally Determined Contributions and Long-term Strategy

At a national level, Brazil's greenhouse gas (GHG) emissions profile is somewhat unique due to the fact that energy-related emissions are relatively low on a per-capita basis as compared with the agriculture, forestry and land use (AFOLU) sector. This is particularly true for states in the Amazon and *cerrado* biomes, where agriculture, livestock and deforestation are major contributors of emissions. Between 2005-2015, Brazil reduced deforestation very successfully, and was considered a global leader for its successes in environmental policy and law enforcement in combating deforestation. During this period, Brazil reduced its overall GHG emissions by over 40% and per-capita emissions by 55% largely due to the reduction in deforestation. However, deforestation in Brazil has been increasing since 2016, and in recent years the weakening of the Forest Code and enforcement of laws and regulations to prevent deforestation have caused an increasing trend in deforestation and associated emissions. The states of Mato Grosso and Amazonas especially exemplify these trends and the importance of the AFOLU sector, and elected to participate in the Climate Pathway Project because they placed a particular emphasis on integrating actions into their pathways that will mitigate emissions from land use change.

Brazil's nationally determined contribution (NDC) was first submitted in 2016 and revised in 2020. In the 2020 submission, Brazil reaffirmed its commitment (but did not raise its level of ambition) to the 2016 target, which was of economy-wide reductions of 37% below 2005 levels by 2025, and 43% below 2005 levels by 2030. For the land use/land use change and

forestry (LULUCF) sector, Brazil's 2016 NDC specified zero illegal deforestation in the Amazon biome, the restoration of 12 million ha of forests and the enhancement of sustainable management of native forests by 2030. However, there is no mention of these commitments in the 2020 submission. Several analyses of Brazil's NDC indicate that the 2020 submission, instead of enhancing targets, as intended under the Paris Agreement, represents a lower level of emissions reductions target overall. This is because of the change in the national GHG inventory between the 2nd and 3rd national communication, where the 2005 baseline of emissions increased by 0.5 Gt CO₂e, primarily because of the revision in methods for the LULUCF sector. This means that the target level of total emissions for 2025 and 2030 increased by 0.35 Gt CO₂e or an increase of around 27% compared to when Brazil ratified the Paris Agreement in 2016. The omission of the LULUCF targets potentially allows Brazil to allow continued deforestation in the Amazon and *cerrado* biomes.

On the other hand, Brazil's NDC submission includes an objective for climate neutrality in 2060, but it is conditional on the receipt of financial transfers and the functioning of market mechanisms under the Paris Agreement. There is uncertainty about what constitutes the "properly functioning market" and there is lack of a clearly articulated position from Brazil about what the standards for such financing would look like. Beyond a functioning market mechanism, Brazil also calls for receiving US\$10 billion a year from 2021 for addressing climate change impacts and for mitigation measures, including the conservation of its native vegetation. There is substantial uncertainty on how the finance is tied to the achievement of specific sector mitigation actions, especially for restoration or conservation of native ecosystems.

Importance of Agriculture, Forestry and Land Use for Decarbonization in Brazil

While there are uncertainties about the strength of Brazil's net zero targets, it is clear that agriculture and LULUCF contributions are critical components of Brazil achieving net zero around 2060. A few modeling studies such as the Deep Decarbonization Pathways Project and the proposal for net zero emissions by 2060 from the Brazil Forum for Climate Change indicate that mitigating agriculture and livestock emissions are critical, and that a substantial LULUCF sink are indispensable to achieving decarbonization or net zero targets across the whole of the economy. This would mean a very big change in the relatively short term to reverse the trends since 2016 of increasing land sector emissions.

The results of the Climate Pathway Project are especially important in this context for several reasons. The states of Amazonas and Mato Grosso have a majority of their GHG emissions from the AFOLU sector, with illegal deforestation, agriculture and livestock expected to be major contributors to the states' emissions profiles. For these states to achieve long-term emissions reductions and implement low emissions development at scale will depend on sector-wide shifts in agriculture, livestock and a wide range of forestry, forest conservation and restoration practices for all stakeholders in these sectors. The technical work of developing preliminary state-level analyses of GHG emissions trajectories and the impacts of priority actions across these sectors under the Climate Pathway Project is essential to

demonstrate the potential emissions reductions of different priority actions, and the cost effectiveness and potential macroeconomic impacts of decarbonizing the AFOLU sector. In the national context of Brazil's NDCs and climate change targets on the international level, as well as for national climate policies and planning for the AFOLU sector, the Climate Pathway Project presents important preliminary work to assess how states could contribute to national climate action, and the states have the opportunity to serve as testing grounds for how effectively these actions can be implemented.

Amazonas

In Amazonas, over 85% of the emissions come from the AFOLU sector (in the period of 2010-2050) according to the business-as-usual (BAU) analysis produced by the Climate Pathway Project, with deforestation being the single largest contributor to the state's emissions. Consequently, there was a focus on priority actions for long-term emissions reductions primarily from LULUCF. **In the technical analysis of 7 priority actions, there were projected reductions of 27% by 2030 and 97% by 2050 relative to the BAU.** The most impactful actions in terms of emissions reductions were forest protection and combating deforestation (referred to in the technical analysis as AFOLU-1), restoration and expansion of forests (AFOLU-3) and sustainable forest management (AFOLU-6), which accounted for 85% of the projected reductions by 2050. When land sinks were included in the BAU analysis, Amazonas' baseline between 2010-2015 was estimated to show a net overall sink of carbon, which changes to a net source around 2020 onwards. Thus, Amazonas' pathway to decarbonization is very much determined by policies, programs and sustainable low emissions development centered around forests.

Alignment of Priority Actions with State Programs

These priority actions are well aligned with, and demonstrate the tremendous potential existing programs in Amazonas have for contributing to decarbonization trajectories. The forest protection action (AFOLU-1) raises the level of efforts to reduce deforestation and control forest fires using the state plan for prevention and control of deforestation and fires (PPCDQ-AM2) and raising the targets for deforestation reduction measures. The forest restoration/expansion action (AFOLU-3) is aligned with Brazil's Forest Code and Amazonas' Environmental Regularization Program (PRA) and PPCD-AM, and the modelled impacts show what expansion of these programs could achieve in terms of long-term emissions reductions. Early in the Climate Pathway Project, Amazonas expressed interest in understanding how the Bioeconomy/Amazonia 4.0 project concept might also be aligned with long-term emissions reduction targets, but this work was largely discussed conceptually and not explored technically within the project. However, if Amazonas or other states in Brazil are to pursue sustainable low emissions development that redefines the paradigm of forest-based economies that rely on extraction and degradation to ensure economic growth, concepts like Bioeconomy and alternative products and livelihoods will be essential.

Alignment of Priority Actions with National Climate Priorities

While there is no process and little experience in Brazil for states and subnational governments to develop a bottom-up approach to NDCs or align state and federal climate change policy, Brazil has a history of being a global leader in addressing deforestation through the Forest Code and programs of monitoring, enforcement and regulation of land use.

The forest protection, restoration/expansion and sustainable forest management actions are all well-aligned with commitments made in Brazil's 2016 NDC submission, and demonstrate the importance and potential of state-level actions for national climate action priorities. However, with LULUCF commitments being left out of the 2020 NDC submission, there is uncertainty as to when or how these state-level priority actions can be aligned with national priorities. As the technical analysis indicates, achieving net zero for Brazil will require both the mitigation of emissions from deforestation as well as the restoration and enhancement of carbon sinks, and a long-term transition to more sustainable land use practices. Given that Amazonas is one of a few states with at least preliminary numbers on the potential for these priority actions to contribute towards net zero targets, a dialogue with the federal government would be important as a future priority.

Mato Grosso

In Mato Grosso, AFOLU emissions accounted for 94% of the state's emissions in the reference period (2010-2015), and remain the majority of the state's emissions through 2050 in the BAU analysis. Land use change, principally deforestation, accounted for 57% of emissions in 2015, with agriculture and livestock accounting for 37% of emissions. While the BAU analysis shows the amount of emissions from deforestation declining in the future, agriculture/livestock tend to increase. Consequently, the priority actions for Mato Grosso were focused on the AFOLU sector. 12 priority actions were modelled, and the projected emissions reduction impact added up to 92% reductions (compared with BAU) by 2030 and 118% reductions by 2050. Preventing deforestation and conserving existing forests (AFOLU-1) was projected as the single most impactful action, accounting for about 23% of the total potential emissions reductions between 2020 and 2050. The protection of secondary forests abandoned and private land (AFOLU-9) was the next most impactful, followed by sustainable forest management (AFOLU-2) and Integrated livestock, agroforestry and crop systems (ILPF) (AFOLU-11). These four out of 12 actions accounted for 69% of the emissions reductions by 2050. The overall results of the modelling work indicate the impressive potential for Mato Grosso to achieve significant decarbonization even within a decade, and to also achieve net zero targets. Once again, the importance of addressing deforestation at the state level, and transition to more sustainable agriculture and livestock systems is reinforced by the pathway modelling analysis.

Alignment of Priority Actions with State Programs

Mato Grosso's priority actions were selected in alignment with existing state-level programs and strategies, such as the Action Plan for the Prevention and Control of Deforestation and Fires (PPCDIF-MT) and the Produce, Conserve and Include (PCI) Strategy of the state. The

action on preventing deforestation and conserving existing forests (AFOLU-1) and the action on reduction of forest fires (AFOLU-7) aligns with the Forest Code, as well as work the state has done on providing economic incentives for conserving existing forests through payments for carbon and other ecosystem services. Actions related to the regularization of land tenure and consolidation of legal rights (AFOLU-3) and the improvement of state-managed protected areas (AFOLU-4) link to ongoing efforts by the state on promoting the registration, analysis and validation of the rural environmental registry (CAR). Other actions, such as the integrated livestock, agroforestry and crop systems (AFOLU-11) were developed based on ILPF, a variety of diversified agricultural systems that make up the Low Carbon Emission Agriculture Plan (Plano ABC), created by the Brazilian government to reduce emissions from livestock and agriculture.

Alignment of Priority Actions with National Climate Priorities

The technical analysis conducted in this project gives Mato Grosso the opportunity to demonstrate the potential for state-level decarbonization and the contribution of long-term actions in the AFOLU sector to national climate priorities. As discussed above for Amazonas, several of the actions related to reducing illegal deforestation and to the conservation and sustainable management of land give Brazil a diversity of tools in approaching long-term emissions reductions strategies. In the case of Mato Grosso, the scale of gross emissions is larger than Amazonas, but for both, the potential for emissions reductions is aligned with increasing sustainable agricultural production and increased productivity. The technical analysis also demonstrates the potential for integrating command and control measures with positive incentives for conservation, payments for ecosystem services, restoration and a wide range of social, economic and environmental co-benefits. Mato Grosso is positioned as a leader and example of primary productive sector economies taking firm steps towards achieving their climate objectives.

Further considerations

While there was not sufficient time within the Climate Pathway Project to conduct consultations between these Brazilian states and the federal government about implementation priorities, finance and data and MRV – components that were identified by Mato Grosso and Amazonas as priorities for further discussion and engagement with national counterparts – there are a number of takeaway messages to inform the states and their key partners in their pursuit of long-term emissions reductions targets and strategies.

Data and MRV systems for improving emissions estimation and monitoring are essential for states: Developing the baseline scenarios for these states took nearly one year, and providing data on emissions, socioeconomic factors and other inputs for the technical analysis were challenging for the states. Both states expressed throughout the project that developing technical capacity, as well as partnerships with researchers, universities and others to enable the state to update GHG inventories and the baseline or priority action analyses are indispensable to enable the implementation of the long-term decarbonization actions. The

states would also need the capacity to monitor the impacts and performance of different actions in the medium and long-term.

Elaborating implementation costs and benefits, as well as financing is needed: Along with developing the technical capacity to conduct MRV and modelling of different actions, the states have identified finance for implementation as a high priority for approaching the implementation of the prioritized actions. The technical analysis of the project did provide indicative estimates of the cost-benefit and macroeconomic impacts of different mitigation actions, and while these are useful as a preliminary indication, more detailed estimates with improved data relating to costs and economic impacts are necessary. At a minimum, this would involve improving data and mapping out possible funding sources for each of the actions.

Decarbonization plans will require locally contextualized implementation: The differences in scale and sources of emissions in each state's emissions trajectory reflect the importance of taking a jurisdictional approach to developing decarbonization strategies. While there are several challenges associated with such an approach, there are multiple benefits. Just comparing the pathway analyses for Mato Grosso and Amazonas, we see that while both states focused on controlling deforestation and fires, as well as improving forest and land management systems and institutions, the distinct actions and targets chosen, as well as the range of innovative approaches that are suited to the context of each state, are very important. This is an important takeaway for the overall national approach to decarbonization action.



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