STATE CAPACITIES FOR CLIMATE ACTION

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1. INTRODUCTION

The climate crisis is the great challenge facing contemporary societies. Public opinion sees climate change as a risk, and the scientific consensus has been well established for decades: the modern economy rests on energy, production and land-use systems that emit excessive amounts of so-called greenhouse gases, under a production model that has raised the planet's temperature, with severe consequences and direct impacts on ecosystems and people all over the world. The Paris Agreement goal of limiting warming to 1.5 °C above pre-industrial levels is already considered unachievable by the "*Emissions Gap Report 2026: The Point of Return*" published by the United Nations Environment Programme (UNEP), which sheds light on how the urgency of climate action involves two interrelated fronts: mitigation, which reduces emissions, and adaptation, which reduces exposure and vulnerability to impacts that can no longer be avoided.

In the past, the ecological transition and decarbonization were seen as a collective sacrifice, involving reduced consumption, higher taxes and abstaining from the use of natural resources. Today, there are good reasons to understand it as capable of raising productivity, lowering household costs, reducing pollution, and improving living conditions. This only happens, however, if it is deliberately steered and coordinated to deliver these results (Mazzucato, 2021).

In light of new scientific and economic parameters and the growing social and environmental impacts of the crisis, the climate question is no longer merely a problem of international collective action. Increasingly, the climate debate is framed as a **problem of coordinating and implementing action:** aligning investments, rules, infrastructure and expectations so that the ecological transition takes place at the scale and pace required (Mason, 2021).

The climate transition also generates distributive conflicts, as it devalues assets and creates groups that resist change. This happens when resources and economic activities lose value in a decarbonized world (stranded assets). The challenge, therefore, is to govern this transition by accounting for the groups harmed and seeking solutions that generate benefits for different actors (Aklin and Mildenberger, 2020; Colgan, Green and Hale, 2021).

This new horizon is an opportunity for productive transformation, better services for the population and a new role in the international debate, especially for developing countries. It calls into question, however, the capacity of States to lead major transformations in their economies, land use, energy, mobility, sanitation and communications infrastructure, the provision of public services, and the functioning of their cities.

Furthermore, according to the United Nations Environment Programme (UNEP), if the Nationally Determined Contributions (NDCs) were fully implemented, warming would be between 2.3 °C and 2.6 °C; under current policies, it would reach 2.8 °C (UNEP, 2026). A twofold challenge thus arises: the ambition gap, whereby States Parties put forward insufficiently ambitious targets; and the implementation gap, which reveals that the policies in place cannot deliver even those targets.

This document argues that developing state capacities for climate action is key to enabling more ambitious targets and their effective achievement.

Countries themselves have acknowledged this: in the synthesis report of the new NDCs, 84% of Parties mention capacity-building needs, and two thirds make implementation conditional on such support (UNFCCC, 2025). Comparative research shows that countries with similar politics will adopt very different climate policies because they differ in institutional capacity and fiscal space (Meckling; Benkler, 2024). And the link between capacities and finance is central: **without the capacity to design, implement and monitor, resources, whether donated or raised domestically, tend to be wasted; with it, the costs of climate action can fall dramatically**.

In the negotiations, the topic has already been debated and matured, particularly in connection with the notion of *capacity-building*, under the Decision 2/CP.7 (Marrakech Agreement) , Article 11 of the Paris Agreement and the work of the Paris Committee on Capacity-building (PCCB).

The fifth review of the capacity-building framework, concluded in Bonn in 2026, acknowledges gaps that lie outside its current scope and begins to refer to long-term capacity and domestic enabling environments (UNFCCC, 2026). The Brazilian COP 30 Presidency included in the Action Agenda objective 26, dedicated to governance, state capacities and institutional strengthening, alongside objectives on government procurement (objective 22) and on digital public infrastructure, artificial intelligence and technologies (objective 27). There is continuity between the 30 objectives of COP 30 and the 10 thematic axes of COP 31, with attention to the cross-cutting nature of governance.

In this context, Brazil has the opportunity to broaden the traditional approach to capacity-building, often associated with training and one-off projects, to incorporate the notion of state capacities, understood as the lasting strengthening of institutions, public policy instruments and the structures for implementing climate policies.

State capacities should be understood in a broader, cross-cutting way, as the State's governance for implementing the climate policies needed to meet established commitments and targets. In Brazil, the Ministry of Management and Innovation in Public Services (MGI) has as its institutional mission to strengthen state capacities to deliver better services to the population, helping the State plan, coordinate, and implement public policies in an effective, integrated, and sustainable manner.

Through the creation, modernization and articulation of management instruments, governance mechanisms, institutional structures and competences, the MGI has worked to incorporate the climate agenda into the process of State transformation, expanding its capacity to respond to the challenges of climate change.

IThis document examines how state capacities are applied, across the main assets of the Brazilian State, with special attention to the initiatives of the Ministry of Management and Innovation in Public Services that support the fulfilment of the commitments of Brazil's new Nationally Determined Contribution (NDC) and of the Climate Plan (Plano Clima).

2. WHAT STATES CAPACITIES ARE

The concept of state capacities gained traction in political science from the 1980s onwards. In Bringing the State Back In, Skocpol, Rueschemeyer and Evans (1985) sought to show the analytical importance of the State and its public policies in explaining social phenomena. This new lens updated the conception of the State as an actor endowed with a certain autonomy, capable of formulating its own interests, of pursuing long-term plans even against the opposition of established groups and, ultimately, of transforming societies and economies (Skocpol, 1985).

In this document, we adopt a pragmatic definition. State capacities are the people (qualified and stable bureaucracies), the organizations (with a mandate and continuity), the systems (information, registries and monitoring), the funds (predictable resources), the legal prerogatives (the mandate to act and to enforce) and the coordination arrangements (across levels of government and with society) that enable the State, at its different levels, to set objectives, implement them and sustain them over time. They are the infrastructure that makes action possible.

According to Pires and Gomide (2016), these capacities have two dimensions. The technical-administrative dimension brings together competent bureaucracies and the organizational, financial and technological resources to conduct government action in a coordinated manner. The political-relational dimension concerns the ability to include social, economic and political actors in policy processes and to build consensus and supporting coalitions. The first is associated with effectiveness; the second, with legitimacy, learning and innovation. The authors also show that capacities should be observed not in the State as a whole, but in the institutional arrangements of each policy. Both dimensions are reinforced in more recent debate, which argues that the stock of capacity does not automatically translate into results; it must be mobilized by political coalitions (Centeno; Kohli; Yashar, 2017).

In the climate debate, reflection on state capacities has developed its own strand, treating institutions, rather than individuals, as the decisive level of response to climate change (Scavenius; Rayner, 2018). Another strand places back at the center of the climate debate the capacities that Evans (1995) identified in developmental States: the State can build green coalitions by supporting sustainable industries with credit, public procurement and research, making more ambitious targets politically viable (Meckling; Sterner; Wagner, 2017), and can organize its action into missions that bring different sectors together around common objectives (Mazzucato, 2021; Dweck; Mazzucato, 2025).

Implementing ambitious objectives, such as those inherent to the climate change agenda, therefore requires state autonomy linked to economic sectors, a State with territorial presence and reach, an inclusive civil society, democratic legitimacy, stakeholder engagement (buy-in) and lasting political coalitions.

3. STATE CAPACITIES AND CLIMATE

Strengthening state capacities has gained prominence in the climate debate, as these capacities are seen as essential to overcoming some of the main bottlenecks to implementing climate targets. Chudnovsky and Fernandez (2024) emphasize that the State's organizational capacity to address climate change involves, among other aspects, the ability to turn political commitments into concrete action. Complementarily, Steinebach and Limberg (2022) demonstrate the importance of bureaucratic capacity for implementing climate policy instruments, showing that the existence of formal objectives and mechanisms does not, in itself, guarantee their effective execution.

State capacity is, therefore, climate policy (Dweck and Mazzucato, 2025). Strengthening these capacities thus means creating the institutional conditions to turn climate commitments into effective policies that link decarbonization, adaptation, economic development, and social justice.

In this context, States need strengthened capacities across the entire policy cycle. In policy design, sound diagnoses, scenario assessment, coalition-building, and a clear definition of the instruments to be mobilized are required. Implementation is where most climate action is frustrated, and where the greatest determinant of differences in outcomes between countries lies. . In monitoring and evaluation, it is only possible to correct the course of what can be seen and measured. In communication, credibility and trust are also important attributes for the success of climate action. The capacity to deliver legitimizes state action in the eyes of the population. Legitimacy and ownership have virtuous effects on climate action itself, creating greater sustainability, greater political and electoral support and helping to consolidate the coalitions needed for the ecological transformation (Adger et al., 2018; Meckling; Nahm, 2022).

A **decisive contribution** to the contemporary literature comes from innovation economics, particularly the work of Mariana Mazzucato and Rainer Kattel (UCL Institute for Innovation and Public Purpose), which shifts the debate from a static view of capacity to a dynamic one: the State as a "market-shaper", endowed with dynamic capabilities - the ability to learn, adapt and adjust course in the face of uncertainty - and not merely static execution capacities (Mazzucato & Kattel, 2026).

In the study *"State Capacity and Capabilities for a Just Green World"* (Dweck & Mazzucato, 2025), launched at COP 30, this perspective is applied directly to the climate transition: state capacity "is not bureaucracy; it is the ability to work with others while holding the course", depending on institutions able to plan, implement and coordinate across ministries and levels of government. The authors propose a model structured around six capacities:

- **Directionality in policymaking:** setting clear missions, with measurable targets and defined deadlines, instead of generic support for low-carbon technologies;
- **Investment in dynamic capabilities:** the ability to learn, adapt and coordinate across ministries and levels of government in the face of uncertainty;
- **Policy instruments:** the purchasing power of the State (sustainable public procurement) and the design of subsidies conditional on socio-environmental targets;
- **Dynamic institutions:** public development banks, state-owned enterprises and innovation agencies as vehicles for directed investment;

- **Governance of data, artificial intelligence and digital public infrastructure:** as a basis for climate monitoring, transparency and decision-making; and
- **A new social contract:** conditionalities in public-private partnerships, participation and co-creation with workers and communities.

This model speaks directly to the earlier literature on the "entrepreneurial State" and mission-oriented industrial policy (Mazzucato & Kattel, 2018), applying it specifically to the challenge of turning NDCs into verifiable mitigation and adaptation outcomes.

An alternative typology was recently proposed by Collington (2026) for the governance of economy-wide decarbonization:

Capacity	***Description***
Planning	Ability to set long-term targets, sectoral pathways and tracking instruments (e.g., national climate plans, carbon budgets).
Disciplinary	Regulatory and enforcement capacity to ensure compliance with environmental and climate rules, imposing costs for non-compliance.
Strategic	Capacity to align economic instruments (public procurement, credit, subsidies, public banks) with a direction of low-carbon productive transformation.
Legitimation	Capacity to build and sustain political and social support for climate policies, including in the face of short-term distributive costs.
Adaptive	Capacity for institutional learning and course correction in the face of technological, economic and climate uncertainty.

The question of which capacities to strengthen needs to be specific to each type of climate action. A bureaucracy capable of structuring a carbon market has little in common with one that supports a municipality in mapping its risk areas: the knowledge, instruments and relationships each one mobilizes are different.

In another typology, proposed by Driscoll (2026), the State can mobilize empowered agencies and competent civil servants to adopt, coordinate and implement policies; fiscal, monetary and credit instruments to mobilize capital at the necessary scale**;** investments, acting as an entrepreneurial State that de-risks nascent technologies and coordinates experimentation with firms; social protection measures to protect people and regions affected by the climate transition; and public services and territorial investments.

The literature also points to a set of complementary capacities, such as:

- **fiscal and financing capacity,** which presupposes the mobilization of public and private resources, notably through blended finance mechanisms, with emphasis on the role of development banks in attracting private investment for mitigation and adaptation action;
- **intragovernmental (whole-of-government) coordination capacity**, based on mechanisms that promote integration among sectoral ministries and avoid the fragmentation of action on an inherently cross-cutting agenda;
- **people and workforce management capacity**, which requires the technical qualification of civil servants, at all levels of government, to design, negotiate and implement climate policies;
- **regulatory capacity over public assets and property**, which entails aligning the mandates of state-owned enterprises and the management of public goods, including real estate, land and natural resources, with climate targets;
- and, finally, **measurement, reporting and verification (MRV) capacity**, essential to ensuring the transparency required by the Paris Agreement and to lending credibility to Nationally Determined Contributions (NDCs) within the multilateral climate regime (UNFCCC, 2025).

The literature thus converges on a notion of state capacity that combines (a) technical and organizational competences (the "know-how"); (b) political autonomy and legitimacy to act (the "power to act"); and (c) dynamic capabilities for adaptation and coordination in contexts of uncertainty ("learning by doing") - all three elements being equally necessary to turn international climate commitments into observable results.

Multilevel governance

The UNFCCC secretariat recognizes that between 50% and 80% of the required mitigation and adaptation actions will be implemented at the subnational or local level of governance, which shifts a significant part of the "capacity bottleneck" to states and municipalities - actors that often lack technical, financial, and institutional resources equivalent to those of the central government. The United Nations Development Programme report on NDC implementation (UNDP, 2025) reinforces this point by identifying, among the critical success factors in national climate planning, the existence of governance arrangements that effectively connect the central and subnational levels of implementation.

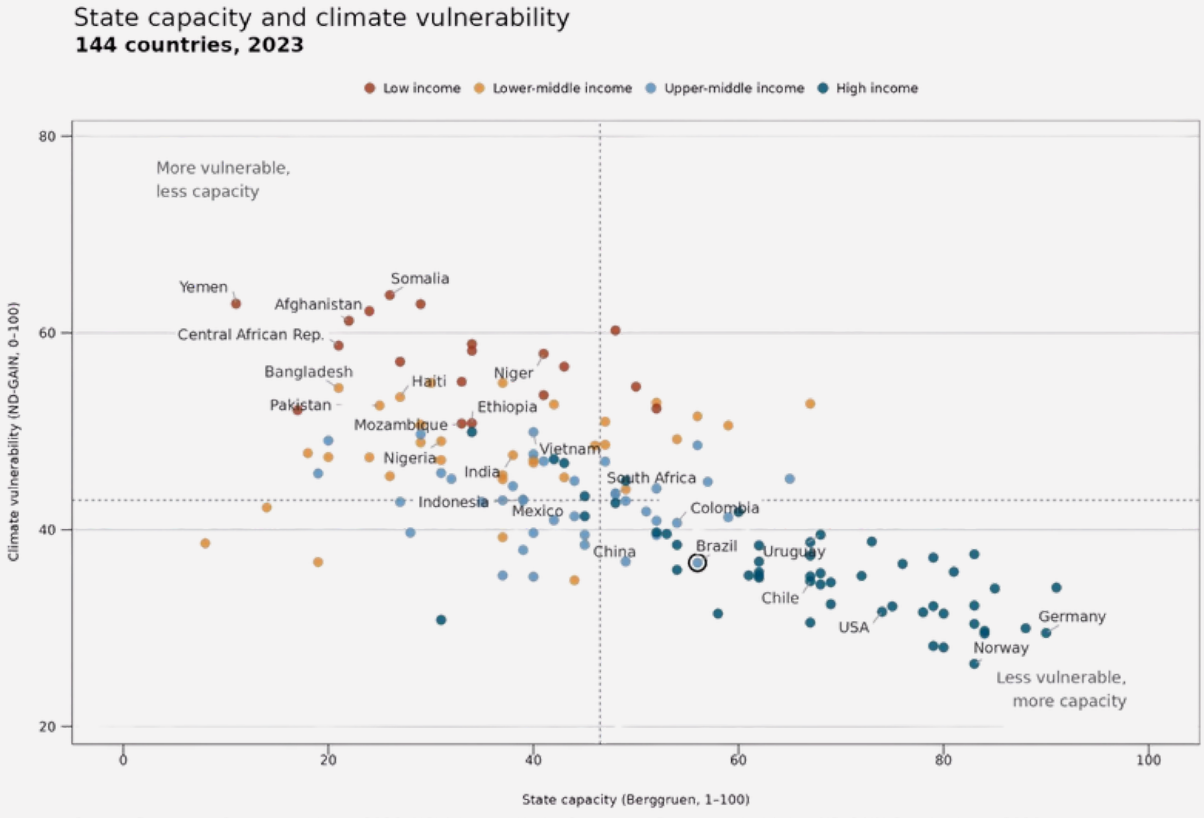
Multilevel governance is crucial to prevent the multiplicity of centers of authority from resulting in overlapping competences, jurisdictional conflicts and gaps, as well as blockages and vetoes instead of cooperation (Abrucio et al., 2020). Moreover, local capacities are highly unequal (Harbers, 2015). In Brazil, around 70% of the 5,570 municipalities have up to 20,000 inhabitants, and their administrative, digital and bureaucratic structures are not comparable. For example, only 65% of municipal governments in towns with up to 10,000 inhabitants have a unit responsible for information technology, compared with 99% in cities with more than 500,000 (Brasil, 2026). Climate action therefore depends especially on strengthening local state capacities.

The Brazilian experience shows that these problems can be addressed through federative institutional arrangements. The 1988 Constitution decentralized the delivery of a large share of social policies, but kept with the Federal Government the capacity to regulate, finance and induce adherence to national objectives (Arretche, 2004). The result was national systems that reconcile local autonomy and coordination. The lesson applies to climate: local delivery works when the center regulates, finances, produces information and trains staff; without this support, decentralization transfers responsibilities without transferring capacities.

The Interministerial Committee on Climate Change (CIM) includes an Interfederative Coordination Chamber (CAI) dedicated to dialogue among the Federal Government, states, and municipalities in designing and monitoring the Climate Plan. This institutional design seeks to operationalize, at the domestic level, what the international literature recommends for connecting national planning (NDCs, national adaptation plans) with subnational implementation (UNDP, 2025).

Inequality between countries and Brazil's place

The most striking finding when discussing state capacities for climate is the great inequality between countries and territories. This inequality follows a perverse pattern: **the greater the climate vulnerability, the lower the capacities tend to be to mitigate emissions and, above all, to adapt to the impacts of global warming** (IPCC, 2022). Income explains part of this difference, but not all of it, which shows that it is possible to build capacities without relying on rapid growth. In low-income countries, the deficit usually spans all dimensions at once, including the most basic ones. In middle-income countries such as Brazil, gaps coexist with islands of high capacity, and the typical challenges are linking sectors, ensuring sound bureaucracies in all areas and designing policies against entrenched interests.



Source: Berggruen Governance Index 2026 (UCLA Luskin, Hertie School and Berggruen Institute); ND-GAIN Country Index 2026 (University of Notre Dame); World Bank income classification. Authors' own elaboration.
Note: dashed lines at sample medians. Correlation = -0.69.

Middle-income countries rarely build climate capacity from scratch. As a rule, they add climate mandates to institutions that already exist and work, drawing on their bureaucracy, reach and legitimacy (Streeck; Thelen, 2005; Dubash; Pillai, 2023). It is this experience of building capacities in contexts of fiscal constraint and territorial inequality, with consolidated public institutions in strategic areas and a significant track record of public policy implementation, such as the Unified Health System (SUS), the Action Plan for the Prevention and Control of Deforestation in the Legal Amazon (PPCDAm) and the Rural Environmental Registry (CAR), that makes Brazil a relevant interlocutor for other developing countries and qualifies it to drive an international agenda for strengthening state capacities for climate action.

The topic at the UNFCCC

As noted above, the UNFCCC addresses capacity-building as a central means of implementing the climate regime, recognized in the Convention, the Kyoto Protocol, and the Paris Agreement (Art. 11), with the aim of "enhancing the capacity and ability of developing country Parties, in particular those with the least capacity, to take effective climate action". Its dedicated institutional architecture includes: the capacity-building framework for developing countries (decision 2/CP.7), whose fifth comprehensive review (2020–2026) concluded in 2026, with a draft decision to be considered at COP 31; the Paris Committee on Capacity-building (PCCB), established at COP21 (decision 1/CP.21), with 12 members and a mandate to identify capacity gaps and coordinate efforts; the Durban Forum on Capacity-building, an annual event of the Subsidiary Body for Implementation; and the Capacity-building Hub, created at COP24.

The PCCB's thematic focus for 2025 was "capacity-building for holistic investment strategies, bankable projects and stakeholder engagement to strengthen the implementation of NDCs and National Adaptation Plans (NAPs)", which suggests an emphasis on project bankability and the mobilization of finance. In short, the UNFCCC's output is robust in terms of dedicated institutional architecture, but it addresses "capacity" mostly as the technical and financial capacity-building of developing countries vis-à-vis the Convention - lacking an equivalent body of reflection on state capacity as a category of domestic public administration (government architecture, interministerial coordination, organizational design, government implementation instruments).

The Working Group on Climate Change and Natural Resources of the CEPA - the technical advisory body of ECOSOC on governance and public administration - offers the most direct complement to the UNFCCC approach, explicitly addressing the capacity of the State (national and subnational) to implement the domestic climate agenda. Since its 21st session (2022), the Committee has studied one aspect of the institutional challenges related to climate action each year, through annual "expert papers".

Based on these studies, ECOSOC has adopted successive resolutions (2021/12, 2022/9, 2023/28, 2024/16, 2025/31, 2026/12) recommending: the use of the State's purchasing power to foster sustainable markets; overcoming institutional fragmentation through policy coherence mechanisms and territorial/ecosystem-based management; building the capacity of governments (national and subnational) to access climate finance; strengthening risk management within government; and periodic multidimensional governance diagnostics to identify institutional constraints and sequence reforms.

In addition, as presented throughout Chapter 4, the topic can be addressed in a cross-cutting manner across the technology, implementation and finance tracks and programmes, as well as other instruments of the UNFCCC architecture.

4. THE BRAZILIAN AGENDA ON STATE CAPACITIES FOR CLIMATE ACTION

The Ministry of Management and Innovation in Public Services (MGI) has placed the debate on state capacities at the center of the Brazilian climate agenda. This work is organized around 6 strategic axes that expand the State's capacity to respond to the challenges of the climate transition:

- The first axis, **Digital Transformation and Data,** seeks to expand the use of digital technologies, digital public infrastructure (DPI) and data governance to improve decision-making, enhance and speed up the delivery of public services and strengthen the monitoring of climate policies.
- The second, **Sustainable Public Procurement,** recognizes the State's purchasing power as an instrument for fostering sustainable development, capable of stimulating low-carbon markets, promoting innovation and incorporating socio-environmental criteria into public contracting.
- The third, **Training and Diversification of the Workforce,** seeks to strengthen the technical and managerial competences of civil servants, preparing the administration to design, coordinate and implement policies in the face of the growing complexity of climate challenges.
- The fourth, **Management of Public Land and Property,** proposes guiding the management and allocation of Federal Government real estate so as to contribute to environmental preservation, climate adaptation and the provision of areas for strategic infrastructure.
- The fifth, **Sustainable Governance of State-Owned Enterprises,** aims to help align the mandates, strategies and investments of state-owned enterprises with the sustainable development goals and climate targets.
- The sixth axis, **Resilience and Response to Extreme Climate Events,** focuses on developing instruments and institutional capacities to prepare the State for the impacts of climate change, improving planning, coordination among agencies and levels of government, and emergency response capacity.

Together, these axes make it possible to incorporate the climate perspective into the instruments, structures and operating processes of the State, linking capacities that are often dispersed across different agencies and areas of government. By connecting the transformation of the State to the implementation of climate commitments, Brazil seeks to contribute to a global agenda that recognizes state capacities as enabling conditions for implementing climate targets and a just transition.

This agenda also opens room to systematize and share the Brazilian experience internationally, promoting cooperation with other countries, especially in the Global South. Nevertheless, this document presents Brazilian contributions and experiences in the axes listed above that offer the most favorable conditions for scaling up and international dissemination: **digital transformation and data governance, sustainable public procurement as an instrument for shaping markets, and a state ownership policy aligned with climate targets.**

4.1 DATA, TECHNOLOGY AND DIGITAL PUBLIC INFRASTRUCTURE

Data and information management are fundamental to the design and implementation of public policies, especially in climate action. These activities depend on basic functions of the State, such as identifying the population and its characteristics, identifying economic activities, and understanding the territory's physical and environmental conditions.

Climate action depends on informational capacity in three ways:

- **The first is *knowing the problem***. To set mitigation targets, it is necessary to know the sources and locations of emissions, the characteristics of the markets and systems involved, the attitudes of the actors, and other elements. For adaptation, in turn, it is necessary to know who is exposed to which risks: where unstable slopes and flood-prone areas are, who lives in them, which health and supply services would be affected by a drought or a heatwave, among others.
- **The second is *acting*.** An early warning system only works if it combines reliable meteorological data with information on the exposed population and a channel to reach it. Countries with less comprehensive warning coverage have disaster mortality almost six times higher than those with broad coverage (WMO; UNDRR, 2024). Likewise, environmental enforcement only gains scale when the State knows where deforestation is occurring and on which property, as the PPCDAm has shown.
- **The third is *accountability*.** The Paris Agreement created an enhanced transparency framework that requires all countries to produce emissions inventories and biennial reports on progress toward their national contributions. Access to climate finance, in turn, increasingly depends on the capacity to demonstrate results. This framework has made the informational inequality between countries visible, as developing countries often face difficulties reporting information and meeting obligations (Moosmann, 2025).

From information to digital public infrastructure

A growing share of countries' informational capacity is now organized around digital public infrastructure, that is, shared digital systems that enable the State and other actors in society to deliver services at scale. The framework adopted by the G20 in 2023 identifies three foundational systems: identity, payments, and data exchange (G20, 2023). Three features distinguish this infrastructure from traditional information systems: (a) common base: it serves many policies and purposes at the same time; (b) open and interoperable standards: public and private entities can build services on top of it; and (c) public governance: the rules of access and use are set by the State.

Building in layers creates savings and ease of access. Each new use or policy can draw on the common base and on interoperability. In Brazil, data sharing between agencies is estimated to have generated administrative savings of around R$13 billion between 2020 and 2025, measured by the time saved by citizens and civil servants (MGI, 2026).

For climate action, this infrastructure reduces costs and increases effectiveness. In adaptation, it enables the rapid identification of, and assistance to, places and families affected by disasters. In mitigation, it can be used to combat deforestation; manage carbon credits; monitor and control emissions; and trace supply chains, increasingly required by importing markets.

Many of these solutions exist today as digital public goods. Digital public infrastructure is the system operating in a country; a digital public good is the component that can be reused in another. It is an open solution, with code, standards and documentation, adaptable for adoption by another country, as is the case of the national carbon registry and the climate transparency system offered by UNDP to developing countries, and of the solutions that make up the catalog of digital public goods for climate action in the Collection of the Digital Public Goods Alliance (DPGA).

Adopting digital public infrastructure and digital public goods presupposes a certain level of technological and data governance maturity. There is also much discussion about financing these solutions within international cooperation and, more recently, about the need for safeguards to prevent exclusion and the widening of inequalities, protect personal data and data critical to the country, mitigate technological dependencies, and ensure transparency and social oversight.

The Brazilian case

Over the last two decades, the country has made significant progress in the digital transformation of the State, evolving from the digitalization of services to a proactive, integrated and data-driven digital State, supported by a robust and sovereign digital public infrastructure anchored in a digital identity that provides a single key for simplified and secure access to public services (Gov.br Account); an instant payment system (Pix); and a data interoperability platform (Conecta Gov.br).

Digital identities

The use of digital identities is a global trend. They allow citizens to prove who they are in digital environments, securely and with privacy. Governmental and intergovernmental initiatives can be cited as examples of this digital public infrastructure. In Europe, there is eIDAS, which aims to reach around 80% of European citizens by 2030. India has Aadhaar, its digital identity, with more than 90% uptake among the population. In Brazil, the gov.br account is Brazilians' digital identity; around 80% of the population currently uses this identity to access public services and interact with the government. The gov.br account and the national identity card (CIN) make up Brazil's digital public identification infrastructure. One example of its use was during the climate tragedy in Rio Grande do Sul, which underscored the urgency of more agile and interoperable public digital systems.

In 2026, Mercosur approved the mutual recognition of authentication and identification means among its member states. The Inter-American Network on e-Government (Red Gealc) is developing IdLAC, an infrastructure that will connect countries' digital identities. These regional initiatives aim to promote interoperability between systems, simplify access to services and promote common standards. Infrastructure of this kind is especially important for climate adaptation action in contexts of disaster-induced displacement.

National data infrastructure

In 2024, two important instruments began to guide digital government action in the country. The National Digital Government Strategy, federative in scope, strengthened multilevel governance on the topic and consolidated a methodology for sharing the federal government's digital tools and infrastructure with states and municipalities. Among other innovations, the Federal Digital Government Strategy established the National Data Infrastructure, which recognizes data as a critical asset and fosters its strategic use.

For the climate agenda, promising frontiers include geoinformation and artificial intelligence, which are already among the axes of the National Data Infrastructure, and the integration of land-related databases and systems to support environmental, land tenure, credit and market policies.

The territorial and environmental data ecosystem and the Rural Environmental Registry (CAR)

In Brazil, especially in rural areas, land use is marked by fragmented information on ownership and occupation of the territory. Property registration is carried out by registry offices spread across the country, while information on rural properties, occupation and land use is held by different public institutions. Because these databases serve specific purposes and have historically not operated in a fully integrated way, verifying the correspondence between legal records, the geographic boundaries of properties and the actual occupation of the territory remains a challenge. This fragmentation makes it difficult to identify inconsistencies and may allow overlapping land titles, fraudulent records and properties with no clear correspondence to the territorial reality to coexist (Sparovek et al., 2019).

Within the National Data Infrastructure, these data, which are clearly interrelated and interdependent, now form an ecosystem of data relevant to the management of policies that fundamentally concern the territory in the following aspects: registry/notarial, land tenure/ownership, agrarian, fiscal and environmental. These data are managed by 9 federal government information systems and by the Electronic Property Registration System operated by the registry offices. Improving this ecosystem, in both its cadastral and geospatial dimensions, is fundamental to continued progress in environmental policies, notably those to control deforestation and forest fires.

The Rural Environmental Registry (CAR), one of the 9 systems mentioned, has come to be recognized as Digital Public Infrastructure within this ecosystem. The CAR is a mandatory electronic registry for every rural property in the country, required for compliance with the Brazilian Forest Code (Law 12,651/2012), and has become the most extensive georeferenced database of private occupation of the national territory, with information on more than 8 million areas. For this reason, it is one of the central instruments in implementing the Brazilian Roadmap to halt and reverse deforestation and forest degradation.

In 2025, with the support of Norway, CAR was transformed into the Brazilian government's first digital public good, the RER (Rural Environmental Registry), with open code and standards so that other countries can reuse it, and launched at COP 30 as a product of the Solutions Acceleration Plan for Digital Public Infrastructure and Digital Public Goods for climate action (PAS DPI and DPG for climate). More than a piece of software, the RER is an architecture of technological components, with advanced geospatial intelligence, applied in diverse contexts, expanding the capacity for environmental monitoring and for implementing climate policies. At COP 31, Brazil is launching the RER data-sharing platform, which strengthens transparency, in addition to the existing registration module.

The PAS DPI and DPG for climate was developed jointly by Brazil, Norway, India, Co-Develop, the DPGA (Digital Public Goods Alliance) and ITS Rio, under Objective 27 of the Action Agenda. The main distinguishing feature of this initiative is that it turns successful national experiences and infrastructure into digital public goods, available for reuse and adaptation by other countries. The PAS offers this movement an international coalition, a catalogue of solutions, a structured work agenda and a showcase for cooperation between countries, linking digital identity, infrastructure and open data, and climate applications to tackle common challenges.

Another relevant front is policies to foster climate technologies, including the improvement of sustainable public procurement of technology and of technology procurement orders geared towards climate transformation. The Brazilian experience with the development of Embraer's KC-390 illustrates how state demand for prototypes can contribute to building technological and industrial capacities, although it is necessary to distinguish the conventional purchase of products from a procurement order genuinely aimed at technological development. This approach connects to a broader agenda on the role of the State in industrial decarbonization, early warning systems, and strengthening national innovation systems, including through incubators and environments conducive to creating companies dedicated to climate solutions.

4.2 SUSTAINABLE PUBLIC PROCUREMENT

PPublic procurement is one of the largest economic instruments available to States. Across all levels of government, it accounts for around 16% of Brazil's GDP. In most countries, it ranges between 13% and 20% of GDP and accounts for around 15% of greenhouse gas emissions in the world. When the State decides what it buys, from whom, and under which criteria, it does not merely acquire goods and services: it creates predictable demand, reduces risk for those investing in new technologies, and can shift entire production chains. More than a regulator, the State is also a major buyer and investor, capable of steering markets towards mitigation and adaptation targets.

Using this power, however, requires capacities that the tradition of public procurement has not developed. For a long time, contracting was guided by legal formalism and the lowest-price criterion, treating purchasing as an end in itself and wasting its potential as an instrument of development. The alternative is to assess the value of a purchase more broadly, also considering its effects on production, employment, innovation, and the environment. This depends on planning demand in advance, translating sustainability into contract requirements and criteria, having data on what is bought and from whom, professionalizing buyers, and coordinating agencies and levels of government. These are, strictly speaking, state capacities.

Brazil has been building these capacities in stages. The 14.133/2021 Law enshrined sustainable national development as a principle and objective of public contracting. In 2024, the federal government regulated preference margins for domestic products that are innovative and meet sustainability criteria, and created an interministerial commission, chaired by the MGI, to decide where to apply them in line with industrial and ecological transformation policies. The margins already cover almost two thirds of the amount allocated to the purchase of goods by the federal Executive, including buses, railway equipment and photovoltaic systems.

In 2025, this path was consolidated in the National Public Procurement Strategy for Sustainable Development (ENCP), built through a participatory process involving public consultation and workshops in all regions of the country. The strategy organizes the use of purchasing power into four axes. The economic axis supports domestic production, innovation and access for small businesses. The social axis promotes inclusion and decent work. The environmental axis incorporates criteria of sustainability, climate resilience and bioeconomy. And the management axis deals with data, digitalization, training and federative coordination. The strategy has a multi-year action plan and is open to adherence by states, municipalities and state-owned enterprises.

The first deliverables show how sustainability is moving from discourse into procurement routine. They include environmental criteria in the federal catalogues of materials and services, aligned with the Brazilian Sustainable Taxonomy; carbon footprint calculators integrated into public works cost tables; the publication of open data on contracts; and rules for purchases in situations of public calamity, drawing on lessons learned from the Rio Grande do Sul floods.

Added to these instruments are the purchases made under the Food Acquisition Programme (PAA) and the National School Feeding Programme (PNAE), which guarantee stable income and markets and cushion the price and production shocks caused by extreme events, as well as crop monitoring, which combines field surveys with agrometeorological and satellite monitoring. These are income-protection and supply capacities already in place across the territory, which have been explicitly geared towards adaptation, for example through climate triggers for releasing stock sales.

In parallel, in 2025 the MGI launched Contrata+Brasil, a digital platform that brings public agencies closer to small suppliers, historically excluded from traditional procurement processes. The platform began by contracting individual micro-entrepreneurs for small maintenance services, a market of around R$6 billion per year, and at COP 30 entered a new phase focused on purchasing food from family farming.

The platform brings together in one place purchasing modalities governed by different rules, such as the institutional purchase of the Food Acquisition Programme and the accreditation procedure provided for in the procurement law, and automatically cross-references the gov.br identity, the Family Farmer Registry and the CadÚnico (Single Registry for Social Programmes). Farmers receive messages with notices of demand in their region, and offers are ranked by proximity and by priority given to Indigenous peoples, quilombola communities and traditional communities. The platform also flags ultra-processed foods and suggests healthier substitutes.

The link with climate resilience lies in stability. Family farmers are among those most exposed to droughts, floods and price fluctuations, and regular public demand guarantees income and markets. By prioritizing proximity, in addition to simplifying how products are offered, the platform shortens supply chains, reducing transport emissions and making local supply less dependent on routes that can be disrupted by extreme events. And by lowering the cost of selling to the State, it helps meet the rule that at least 30% of public purchases related to PAA and PNAE resources come from family farming.

The topic enters the international climate agenda mainly through the COP 30 Action Agenda, voluntary commitments by governments and initiatives for technical and institutional deepening in the run-up to COP 31. At COP 30, under Key Objective 22 of the Action Agenda (“Government procurement integrating climate”), the MGI, in partnership with UNEP and UNIDO (IDDI), and with the collaboration of ECLAC, UNDP, UNOPS, FAO, the University of Oxford's Climate Policy Hub, Instituto Jataí and other partner organizations, launched the Solutions Acceleration Plan on Sustainable Public Procurement (PAS-SPP), with the aim of driving the adoption of sustainable procurement practices on a global scale. The plan is organized into two axes: sustainable procurement as a comprehensive policy in the highest-impact sectors (food, health, transport, construction and technology) and the procurement of low-emission materials in hard-to-abate sectors (cement, concrete and steel).

Together with the PAS-SPP, the MGI proposed the Belém Declaration on Sustainable Public Procurement, a voluntary, non-binding commitment open to national and subnational governments that undertake to incorporate sustainability criteria into public procurement processes, extend their application to new sectors, ensure social participation, and promote cooperation for capacity development. As of October 2026, the initiative had 47 signatories, including eight national governments, five Brazilian states and 34 Brazilian municipalities, with new signatories expected to join during COP 31.

4.3 SUSTAINABLE GOVERNANCE OF STATE-OWNED ENTERPRISES

State-owned enterprises drive the economy by mobilizing investment, boosting strategic sectors, generating jobs, developing technologies, and contributing to the supply of essential goods and services to the population. In this regard, they operate in a globally competitive market, accounting for 126 of the world's 500 largest companies by revenue and around 12% of global market capitalization (OECD, 2024).

In responding to climate challenges, especially with regard to mitigation, state-owned enterprises can play a role in promoting sustainable development that embraces the notion of ecological transformation, understood as the deliberate coordination of public policies and investments aimed at producing a simultaneous virtuous cycle of economic growth, reduced inequalities and environmental sustainability.

This matters because, on the one hand, large state-owned energy and fossil fuel companies are among the corporate entities that historically and currently emit the most greenhouse gases (GHG) in the world. The increase in emissions since the conclusion of the Paris Agreement is most visible in Asia, where the five leading private companies and most state-owned enterprises (8 out of 10) recorded emissions higher than those observed in the 2009–2015 period (InfluenceMap, 2024).

On the other hand, other international experiences show different paths to reducing emissions and promoting climate governance in state-owned enterprises. In Norway, for example, the state ownership policy guides companies such as Statkraft, a benchmark in renewable energy generation, and Equinor, which has been expanding its activities in offshore wind and carbon capture and storage technologies. In France, the Government Shareholding Agency incorporates environmental criteria into its portfolio management and encourages the decarbonization of companies' supply chains. In Canada, the public Canada Infrastructure Bank has mobilized resources to finance clean energy infrastructure, sustainable transport and critical minerals. In South Korea, environmental and social value indicators are part of the performance evaluation mechanisms for state-owned enterprises.

These experiences show that climate action can and should materialize in concrete management instruments, such as:

- **Governance and strategic direction:** incorporating climate objectives into the guidance of the State as shareholder, letters of expectations and companies' planning instruments, bringing greater clarity to responsibilities and expected results.
- **Climate risk planning and management:** encouraging the inclusion of physical and transition risks in corporate risk management systems, taking into account the impacts of climate change on companies' operations, assets, supply chains and financial sustainability.
- **Investment and decarbonization:** promoting the incorporation of climate criteria into project appraisal and capital allocation, encouraging investment in energy efficiency, renewable energy, resilient infrastructure, technological innovation and lower-carbon production processes.

- **Targets, indicators and performance evaluation:** advancing in the definition of environmental indicators and emission reduction targets, integrating these commitments into the mechanisms for monitoring and evaluating corporate management and its executives.
- **Transparency and accountability:** strengthening the periodic disclosure of information on emissions, climate risks, sustainable investments and results achieved, contributing to comparability, transparency and improved management.
- **Climate adaptation and resilience:** encouraging measures that reduce the vulnerability of companies and their infrastructure to extreme climate events, ensuring the continuity of essential services and the protection of public investments.

According to the Aggregate Report on Federal State-Owned Enterprises published by the Ministry of Management and Innovation in Public Services (MGI), Brazilian federal state-owned enterprises have expanded their initiatives focused on sustainability, energy efficiency and the low-carbon transition. One example is the initiative of Companhia Docas do Ceará, which prepared the Port of Fortaleza Decarbonization Plan in partnership with Fundación Valenciaport, enabling a diagnosis of the port complex's carbon footprint and guidelines for reducing emissions.

Another example is the Brazilian Urban Train Company (CBTU), which implemented energy-efficiency and circular-economy measures, including replacing more than 13,000 lamps with LED technology and reusing materials (MGI, 2025). The Brazilian Mint (Casa da Moeda do Brasil), in turn, began operating entirely on renewable energy and offset 1,800 tonnes of CO_2. In the defense sector, Emgepron, through the Naval Energy Programme, carried out actions to adopt clean energy sources, increase energy efficiency and reduce carbon emissions, achieving savings of approximately R$25 million in energy purchases in 2025.

According to this report, regarding financing, Banco do Brasil advanced in implementing the BB 2030 Agenda, which foresees mobilizing R$500 billion in sustainable credit by 2030, including resources for sustainable agriculture, renewable energy, and the bioeconomy. Banco do Nordeste, in turn, contracted R$2.13 billion for renewable energy generation projects, especially wind and solar, and structured the Industry Decarbonization Financing Programme (Prodecar), with an estimated potential to contribute to the mitigation of 2.5 million tonnes of CO_2 equivalent over the next five years. BNDES, for its part, has incorporated its Sustainability Taxonomy into its operations classification, having approved R$45.78 billion in projects associated with the green economy and the transition.

In the field of environmental restoration and climate change mitigation, the joint work of Petrobras and BNDES in the Floresta Viva (Living Forest) programme deserves mention, with planned investments of R$118 million over seven years, distributed across 20 projects, with the goal of restoring approximately 4,200 hectares in the Amazon, Atlantic Forest, Cerrado and Pantanal biomes. Added to this initiative is the Restaura Amazônia programme, developed by Petrobras in partnership with the Ministry of the Environment and Climate Change and BNDES, with a total contribution of R$100 million and the planned restoration of around 6,000 hectares of native vegetation in Protected Areas.

This effort aims to **strengthen the State's role as a strategic shareholder, encouraging state-owned enterprises to act as drivers of the ecological transition. This involves incorporating the climate dimension into governance, strategic planning, asset management and investment decisions, considering both the reduction of greenhouse gas emissions and the identification of opportunities associated with the low-carbon economy.**

One initiative that expresses this direction is the Belém Commitment for a Just Energy Transition, which is open to international adherence and was signed by the MGI together with Banco do Brasil, Itaipu Binacional, Caixa Econômica Federal, BNDES, Banco do Nordeste and Embrapa during COP 30, representing an effort to mobilize state-owned enterprises around a common agenda for a just and sustainable energy transition.

5. RECOMMENDATIONS TO ANTALYA

The literature and the Brazilian experience yield four guidelines for the international agenda:

- **From capacity-building to capacity.** Short-term training courses and one-off projects alone do not create the foundations on which climate action depends. The emphasis should be on organizations with a mandate, permanent staff, information systems and coordination and participation arrangements.
- **Capacities with financing**. Capacities require lasting and predictable resources and, if unused, they dissipate, with the loss of staff, routines and information. The debate on capacities must be linked to the debate on climate finance.
- **Each function requires specific capacities, and transplanting institutions without adaptation tends to fail.** Cooperation should favor exchanges among technical staff, open and adaptable solutions and agreed principles, avoiding rankings and prescriptive formulas.
- **The role of middle-income countries.** In addition to the responsibility of developed countries to provide finance and solutions, middle-income countries have valuable lessons for low-income countries, and Brazil is in a position to lead this cooperation.

COP 31, in Antalya, is the first opportunity to build on what the Brazilian Presidency set in motion. Brazil arrives with its own initiatives under way: the Solutions Acceleration Plans on digital public infrastructure and on sustainable public procurement, the Belém Declaration on Sustainable Public Procurement and the RER (digital public good). The fronts for bringing the topic into the negotiations and the Action Agenda include:

- **Capacity-building.** Support the adoption of the fifth review of the capacity-building framework without reopening the text, and link the framework and the Paris Committee to institutional capacity for implementation.
- **Just transition**. Include public capacities for planning, procurement and management of state-owned enterprises among the functions of the Just Transition Mechanism.
- **Action Agenda.** Strengthen, under objective 26, a coalition of States capable of implementation, with 2030 targets for sustainable public procurement and digital public infrastructure.
- **Turkish Presidency.** Offer the Brazilian experience as a national implementation architecture module in the Turkish Presidency's initiative, with a permanent capacity component, in addition to project preparation.
- **Finance and technology.** Bring the capacity dimension into the debate on aligning financial flows and into the Technology Mechanism, with cooperation on digital public infrastructure, digital public goods and the use of public procurement to foster climate technologies.
- **Cooperation on digital infrastructure and procurement.** Treat digital public infrastructure as state capacity, financing the basic layers (identity, registries and interoperability) and not just isolated applications, and propose coordination among countries of demand for low-emission materials, such as steel and cement, where the scale of public procurement can make new markets viable.

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