



Brazil's Energy Matrix and the Paris Agreement: between lack of ambition and the many challenges of NDC implementation

*“Tracing the link between Climate Justice Action;
the NDCs” – CIDSE Energy-NDC Task Force,
Climate and Energy project 2021-2022”.*

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Brazilian energy matrix in the context of the Paris Agreement: between lack of ambition and the challenges for the implementation of NDCs

EXECUTIVE BRIEF

INTRODUCTION

In 2016, Brazil submitted its Nationally Determined Contributions (NDC) to the Paris Agreement. The NDCs state the targets for reduction of gas emissions responsible for intensifying the greenhouse effect. The targets are compulsory and must progress at each NDC submitted.

This study analyzes the NDCs drafted by the Brazilian government with regards to the energy sector, which counts on sectoral planning, plans, policy instruments and regulation, including transparency mechanisms. The goal is to present society with a clear view of Brazil's efforts and its level of compliance with the Paris Agreement targets. The report produced is part of the "Tracing the link between Climate Justice Action & the NDCs" - CIDSE Energy-NDC Task Force, Climate and Energy project 2021-2022" initiative, conducted by Fastenaktion, in partnership with the Institute for Socioeconomic Studies - INESC, which assesses the Brazilian case.

In order to assess NDC targets for energy sector, we should take the complexity of the sector into consideration. That is because the pieces of government planning follow metrics, standards and methodologies that go beyond emissions and the scope of the NDCs. In this sense, this report is divided into two parts. In the first, we

assess the NDCs' limitations, given the drafted targets and Brazil's energy planning. In the second part, we assess 13 energy initiatives with regards to level of implementation, its effects on social participation, besides ascertaining whether or not the NDCs are mentioned.

With the return of long-term planning in the energy sector in Brazil in the 2000s, it was drafted documents, like the National Energy Plan 2050 and the Ten-Year Energy Plans, which establish a general tendency toward investment and future expansion for the sector. The plans make it clear that energy expansion in Brazil hinges on the increased use of fossil fuels, with focus on meeting demand. This is aimed at systemic efficiency and strength; however, there is no effective and ambitious guideline toward energy transition.

Furthermore, the study points out that planning under the authority of the Ministry of Mines and Energy presents difficulties regarding adjustment and dialogue about the energy expansion projects with indigenous and traditional communities; furthermore, it does not establish dialogue with crucial socioenvironmental elements.

There is a long road ahead for the Brazilian government toward more connection between energy planning, emissions reduction, compliance with the NDCs and, not less importantly, climate and energy justice.

LIMITATIONS FOR NDC IMPLEMENTATION IN BRAZIL IN 9 POINTS

Most of the targets set by the Brazilian government for the energy sector were met. However, we should look at the results more critically. For such, the study links 9 discussion points from a climate and social justice perspective.

ACTIONS	TARGETS	RESULTS
<i>Renewable energies in the energy matrix</i>	<i>45% by 2030</i>	<i>48.4% 2020</i>
<i>Sustainable biofuels in the energy matrix</i>	<i>18% by 2030</i>	<i>30.2% 2020</i>
<i>Efficiency gains in the electric sector</i>	<i>10% by 2030</i>	<i>7.4% for the 2013-2025 period</i>

Source: "Diretrizes para uma Estratégia Nacional para Neutralidade Climática" (Brasil E 2020)

1) The NDCs' lack of ambition: the large percentage of renewables (especially hydroelectricity) makes it so that Brazil does not take on ambitious targets. In this sense, Brazilian energy planning does not consider energy transition or meeting the NDCs as key pillars; in turn, this emphasis is placed on domestic demand for energy.

2) Strong presence of hydropower: compliance with the NDCs is largely due to the history of exploitation of Brazil's large hydro potential. But this did not take into consideration the chronic social and environmental impacts that resulted from this energy policy.

3) A matrix with large influence from the agricultural production chain: the expansion of renewable sources in the Brazilian matrix is also due to the increase of biofuels, largely related to the large-scale agricultural and livestock raising chains, which indirectly contribute to the emission of environmentally harmful gases.

4) Energy efficiency: in this case, the study points to the lack of intragovernmental integration as a means to boost the system's large efficiency potential, which includes many sectors, especially transportation.

5) Coal thermoelectric generation: power generation from coal-fueled thermoelectric plants, a highly

polluting source, is still a reality in Brazil. This is basically due to subsidies granted to this market.

6) Oil and gas production and the problem of non-measured emissions: the fact that Brazil is currently one of the largest oil producers in the world entails two issues. The first regards the burning of fossil fuels in the country, which represents 19% of emissions; the second regards the fact that fossil fuel exports are part of a global emissions problem.

7) The new gas market and its effects on the energy matrix: the government has incentivized the presence of gas in Brazil's electric sector since 2016, a fact that was materialized by the privatization of Eletrobras, which approved an 8 GW increase in the system.

8) Lobbying and its effect on energy planning: the purpose of political pressure from businesses in the fossil fuel sector onto public administrators is presenting thermoelectric plants as the only way to ensure steady energy to the electric sector.

9) Lack of social participation: the plans for energy expansion are a problem civil society has been pointing out for decades and it directly relates to historical errors, as was the case of large hydropower projects in Northern Brazil.

SYSTEMATIZATION OF ENERGY POLICIES

Beyond the broad view on NDC implementation in accordance with long-term energy planning instruments, the study also systematized and classified documents produced based on government implementation of NDCs. The goal was to understand whether the NDCs impact energy policies implemented in the country. 13 initiatives that are an important part of Brazil's energy policy were selected.

1) National Biofuels Policy - RenovaBio (2007):

the main purpose is to expand the production and use of biofuels in the national energy matrix.

2) National Policy on Climate Change - PNMC (2009):

refers to the drafting of sectoral plans for emissions reduction in electrical energy generation and distribution in public transportation.

3) National Emissions Registration System - Sirene (2017):

makes available the results of the National Inventory of Anthropogenic Emissions by Sources and Removal by Sinks of Greenhouse Gases not Controlled by the Montreal Protocol, among others.

4) Energy Contracting Auctions:

actions taken by the Brazilian state for the expansion of electrical energy supply that directly translate into the construction of enterprises supplying renewable and non-renewable energy to the energy matrix.

5) National Electricity Conservation Program - Procel (1985):

promotes efficient use of electrical energy and combats waste by elaborating national energy efficiency indicators.

6) Green debentures (2020):

incentive to the financing of infrastructure projects with environmental and social benefits, aimed at incentivizing solar, wind and residue energy generation, as well as small hydroelectric plants.

7) Energy Systems of the Future Program (2016):

aims to improve general conditions in

order to integrate renewable energies and energy efficiency into the Brazilian system.

8) Resolution No. 29, of December 12, 2019:

addresses supply and planning expansion in the electric system.

9) Resolution No. 15, December 9, 2020:

establishes national guidelines for public policies aimed at micro- and mini-generation throughout the country.

10) Mini-reform of the electric sector (2020):

changes in the sector's legal framework, addressing investments in Research and Development, besides changing the Incentives Program for Alternative Sources of Electrical Energy and the Energy Development Account.

11) Science, Technology and Innovation Plan for Renewable Energies and Biofuels (2018):

document identifying the main technological problems in the production chains of renewable energies and biofuels.

12) Addition of Biodiesel to Diesel (2016):

addresses the percentage of biodiesel added to diesel traded nationwide. Furthermore, it implements relevant biofuel measures regarding the agriculture sector.

13) More Light in the Amazon Program (2020):

aims to meet demand for electrical energy in remote Amazon regions through renewable sources of electrical energy.

RESULTS

The thirteen measures were assessed. The quality of the information reported by the government was based on four criteria: **implementation, effects, mention to the NDCs and social participation.** For each criterion, we conducted a qualitative analysis with valuation levels, as per the table below:

CLASSIFICATION	Valuation criteria
IMPLEMENTATION	<i>Level 1 = Available information is not enough to pinpoint what was implemented</i>
	<i>Level 2 = Available information on carried out activities or lessons learned or next steps</i>
	<i>Level 3 – Available information on all carried out activities, with data on lessons learned and next steps</i>
EFFECTS	<i>Level 1 = No reported improvements</i>
	<i>Level 2 = Partial improvements were reported in environmental, energy or social aspects.</i>
	<i>Level 3 = Improvements were reported with regards to carbon emissions, amount of renewable energy available as a result of this measure, environmental, energy and social improvements.</i>
MENTION TO THE NDCS	<i>Mentions: There are mentions to the NDCs.</i>
	<i>No mentions: There are no mentions to the NDCs.</i>
PARTICIPATION	<i>Level 1 = There was no legal requirement for participation of those affected by the measure.</i>
	<i>Level 2 = There was a legal requirement for participation of communities affected by the measure.</i>

With regards to **implementation**, 8 out of the 13 analyzed initiatives did not have enough information regarding accomplished actions, lessons learned and next steps. Another 3 initiatives do not even have any information or data on implementation. Those that obtained satisfactory results were Procel and *More Light in the Amazon* programs.

As for **effects**, the analysis revealed that 12 out of 13 initiatives have partial or no information whatsoever on their effects. The social aspect is clearly overlooked in government documents assessing the initiatives. Procel was the only program that obtained satisfactory results in this criterion.

Only 5 of the analyzed cases mentioned commitments registered in the NDCs, and it was not clear that the targets are being met or that their goals can be considered ambitious. Once again, Procel is the only case encompassing all valuation criteria.

Finally, under the category **participation**, the analysis evidenced a huge gap, being that only the National Policy on Climate Change obtained satisfactory results, as it contains legal provisions for social participation.

CONSIDERATIONS AND RECOMMENDATIONS

Considering that the study's premise was that the Brazilian government must align the energy policy with the Nationally Determined Contributions, it became evident that a simple assessment of fulfilment of targets is not enough to: a) understand the expansion of renewable energies *versus* fossil fuels in the country, especially considering the targets' low ambition levels; b) assess socioenvironmental impacts of energy expansion projects carried out by the government. The study reports the need to advance in the building of transparency and social participation mechanisms so that the country has a solid structure for the accuracy and verification of data and information. Only this way can there be advances toward energy transition with social justice.

Finally, we recommend that:

- 1) the Interministerial Committee on Climate Change and Green Growth formally defines social participation in the elaboration of a national strategy for the implementation of the United Nations Framework Convention on Climate Change and the Paris Agreement, which is currently under the authority of the NDC Working Group, coordinated by the Ministry of the Environment;
- 2) the federal government instates, as of 2023, a broad listening process of experts and social participation for the elaboration of the "National Strategy For Climate Neutrality";
- 3) the Court of Auditors of the Union (TCU) monitors the federal government's actions for implementation of the Paris Agreement, with focus on the monitoring of the Interministerial Committee on Climate Change and Green Growth, as it is part of the Court's scope of action to assess the federal government's actions aiming both at perfecting the policy and the climate governance structure;
- 4) civil society organizations elaborate, in collaboration and based on the sizeable and diverse expertise of the organizations comprised, a proposal for an Improved Transparency Structure, supported by the guidelines established in the United Nations Framework Convention on Climate Change - UNFCCC, which takes the country's specificities into account.

Introduction

THIS REPORT is part of the initiative “*Tracing the link between Climate Justice Action & the NDCs*” - CIDSE Energy-NDC Task Force, Climate and Energy project 2021-2022” conducted by Fastenaktion, having the Institute of Socioeconomic Studies (Inesc) as the partner responsible for the development of the Brazilian case related to the initiative.

The analysis carried out is part of a research effort on the Brazilian political and institutional framework concerning the energy matrix with regard to its connections with the commitments voluntarily assumed by Brazil under the Paris Agreement (2015), promulgated in September 2017 by the federal government. The Paris Agreement works on a five-year cycle of climate action, with 2020 being the base year in which countries should submit their Nationally Determined Contributions (NDCs). Within the scope of such contributions, countries communicate their individual greenhouse gas emission reduction targets, which are mandatory and must follow a progression principle; that is, targets must always be more ambitious than the previous ones.

The Brazil’s NDC was presented in 2016 based on the year 2005¹. Given that the agreement requires States to report their new targets every five years,

¹ For a better understanding of the political context in which the NDCs were presented, it is necessary to keep in mind that, although the process of negotiation and formulation of policies and norms for the Paris Agreement began during Dilma Rousseff’s administration (2011-2016), the first nationally determined goals were effectively presented during Michel Temer’s administration (2016-2019). Therefore, the new revisions of the NDCs were presented by Jair Bolsonaro’s subsequent administration (2019-2022).

in December 2020 Brazil presented an update of its NDCs during the COP 25. In addition to that, in October 2021, at COP 26, the Brazilian government presented a letter to the UNFCCC entitled “Guidelines for a National Strategy for Climate Neutrality” in which it presented the anticipation of long-term emission reduction targets. Officially speaking, however, the second update for the NDCs was presented for the UNFCCC² in February 2022³.

Unlike the Nationally Appropriate Mitigation Actions (NAMAs)⁴, which work by sector, the reasoning behind Brazil’s NDCs was aimed at the economy as a whole, with some actions that are indicative of mitigation, listed in the NDC’s annex.

However, it is assumed that the goals taken up by the federal executive branch must be aligned with energy planning and its various instruments of policies, planning, and regulation. Moreover, it is necessary and relevant that the government have effective, continuous and consistent transparency mechanisms regarding the alignment between energy policy and climate policy, including broader elements related to the issue of climate justice. Such mechanisms are essential so that society can have a more objective and critical view of the country’s efforts both in the commitment and in the fulfillment of the goals voluntarily established under the Paris Agreement.

By climate justice this study means an approach anchored in the understanding that the climate crisis is deeply related to economic structures based on inequality, racism, classism and that climate change is not just an environmental problem whose effects are indistinctly felt. Thus, it is closely articulated with the issue of social justice⁵.

In order to contribute to the necessary construction of the relationship between the NDC and climate justice with a focus on the energy sector, the present study is divided into four main sections. In the **first one**, a contextualization of the energy sector and its relationship with the NDC is established, including aspects related to the governance of climate policy and transparency of the parties in the efforts to reduce emissions that make up the commitments assumed with the United Nations Framework Convention on Climate Change (UNFCCC). The **second part** presents and problematizes the energy sector goals according to the Brazilian NDC and its lack

2 The documents submitted by the government to the UNFCCC are available at: <https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx>

3 An assessment of the second review submitted by the Brazilian government is provided by the Politics as a Whole initiative in “Brazil’s NDC: Assessment of the Update Carried Out in 2022”. According to this analysis, the 2022 goal “projects increases in the absolute final volume of emissions, when compared to the 2016 goals: an additional 314 million tonnes in 2025 and 81 million tonnes in 2030 specifically. That is, it commits to higher future emission levels than previously stipulated, rather than a drop in emissions”. The full analysis is available at: <https://www.politicaporinteiro.org/2022/04/07/atualizacao-da-ndc-brasileira-vai-contra-acordo-de-paris-ao-nao-elevar-ambicao-climatica/>

4 The NAMAs were presented by the Brazilian government to the UNFCCC in 2011, with effect until 2020. As determined by the National Policy on Climate Change (PNMC), all NAMAs correspond to Sector Plans established by the government at a national level.

5 <https://www.ecodebate.com.br/2016/02/19/o-que-e-justica-climatica/>

of ambition, as well as brings elements that call for attention in the debates on climate justice. The **third part** brings about a documental and instrumental analysis of the challenges related to the adherence to policies, plans, and other governmental measures related to the energy sector and the commitments established in the NDC. This part is composed of the following topics: methodology; presentation of selected initiatives, including their classification and research findings. The **fourth section** addresses expert analyses on the subject. At last, **final remarks** and recommendations will be presented.

Contextualizing the Brazilian energy sector and its relationship with the NDC

THE BRAZILIAN GOVERNMENT HAS A REGULATORY AND DEVELOPMENTAL ROLE for energy measures provided by federal laws such as Law No. 9.478, of August 6, 1997, and Law No. 10.848, of March 15, 2004. Such overseeing and regulatory role is due to the privatization of the electricity sector and the end of Petrobras monopoly promoted throughout the 1990s and 2000s.

Besides the regulatory and overseeing role, carried out mainly by the National Electric Energy Agency (Aneel), the State also appears as a promoter of energy planning and management to guarantee the security of energy supply for the country. The responsible entities are the Ministry of Mines and Energy (MME), the Energy Research Company (EPE), and the National Energy Policy Council (CNPE).

The expansion of the electricity sector takes place through public energy auctions, established and regulated by Aneel and held by the Chamber of Electric Energy Commercialization (CCEE), where licenses for the production and distribution of energy are auctioned.

As for biofuels, the auctions was carried out by the National Petroleum Agency (ANP). This agency also holds auctions and regulates oil exploration, given that the subsoil and its mineral and energy resources belong to the Brazilian State⁶.

⁶ The regulation on biofuel auctions changed in 2022, but they are outside the scope of analysis. According to these changes, there will be no more biofuel auctions via the ANP, as this responsibility has been passed on to market agents, that is, producers and distributors.

There is state participation in the production of energy by the shareholding composition in joint-stock companies, such as Centrais Elétricas Brasileiras S.A. (Eletrobras)⁷ and Petróleo Brasileiro S.A. (Petrobrás), companies with significant participation within the energy matrix (Esposito, 2012; Lorenzo, 2001; Santos et al, 2008). Another kind of governmental action in the sector takes place through subsidies, which amount to almost 100 billion reais in the field of fossil fuels.⁸ (Inesc, 2020).

In other words, beyond the sector's planning, an understanding of how energy policy operates in the country requires a broad approach that includes the multiplicity of public and private actors involved, the process of legal and infra-legal regulation, subsidies, as well as investments.⁹

It is worth mentioning that the Brazilian government resumed the idea of a long-term energy planning in the early 2000s, mainly due to the energy crisis that took over the country in that period¹⁰. In this context, studies began to be carried out and long-term guidelines developed by the Energy Research Office (EPE) were adopted.¹¹.

Such resuming of the planning started to incorporate the assumed NDCs from 2016 onwards, including their subsequent updates. For example, the National Energy Plan 2050 (PNE 2050) cited the energy sector NDCs at least 10 times. The document included the updated NDCs for 2020, referring to them as a basis for expanding the energy matrix. In addition to that, all Ten-Year Energy Plans (PDEs) prepared between 2016 and 2020 incorporated the energy NDCs milestones in their analyses. There is also reference to other political and legal instruments of a socio-environmental nature, such as the United Nations Sustainable Development Goals (SDGs).

Even though these documents do not constitute any public policies per se, they are relevant because they present a general trend for future investments. In this sense, they are also indicative of a contradiction: even though the energy expansion is in line with the basic premises of the NDC, the expansion of fossil fuels remains. Such line of action is seen by academia as an attempt to reconcile intricate economic interests with latent environmental issues. (Altemani and Lessa, 2012).

7 Bolsonaro's government has been recently discussing the reduction of the direct state presence in the management of energy projects, such as the privatization of Eletrobrás, responsible for generating 1/3 of Brazil's electricity, mostly hydraulic. There is also an ongoing discussion for the privatization of Brazil's main oil company, Petrobras, through the sale of refineries and subsidiaries to the private sector. Experts argue that this reorganization of the energy sector directly affects the Brazilian government's ability to act more efficiently for the sustainable energy transition. (Dieese, 2021).

8 Martello, Alexandro. "Governo Concedeu Em 2019 Quase R\$ 100 Bilhões Em Subsídios Para Combustíveis Fósseis, Diz Estudo." G1, 2020. <https://g1.globo.com/economia/noticia/2020/11/12/governo-concedeu-em-2019-quase-r-100-bilhoes-em-subsidios-para-combustiveis-fosseis-diz-estudo.ghtml>

9 The task of evaluating the type and format of public investment in the energy sector is quite complex due to the institutional division of regulation and investments that took place after privatization.

10 This energy crisis affected all sectors of the economy because of the lack of capacity to supply energy, due to a deficit in the rainfall patterns: the participation of hydroelectric plants in that period was 85% in 2001, with 81 GW of installed capacity. In 2021, Brazil reported 186 GW of installed capacity, with a 65% share from the hydro source.

11 Established in 2004, the company is a public research agency linked to the Ministry of Mines and Energy. It aims to produce studies that optimize and reduce transaction costs and information asymmetry between state and non-state actors in the national energy sector. The EPE team consists of permanent civil servants who are highly qualified professionals, selected through a rigorous process of public searches, but the leadership positions are appointed by the president of the republic. Thus, the company represents a branch with relevant participation in the medium and long-term planning of the State's energy sector.

Thus, even if governmental planning documents have demonstrated adherence to the Brazilian NDC in recent years, the government's main focus has been what is defined as the expansion of the energy matrix to supply demand; that is, efficiency and systemic solidity are sought without an effective orientation for the energy transition.

The 2050 National Energy Plan, which is the main body of long-term energy expansion studies, considers that there is a lack of “specific policies for the energy transition in Brazil” (Brasil A 2020; p. 35). Besides, the Ministry of Mines and Energy’s planning has presented difficulties in adapting and dialoguing energy expansion projects with indigenous and traditional communities, lacking in consideration for crucial socio-environmental elements, such as fauna, landscape, territorial organization, *quilombola* communities, as well as small and midsize farmers (Brasil D, 2018; Neto, 2021).

This brief contextualization of the Brazilian energy sector shows a long way to go by the Brazilian government towards greater connectivity between energy planning, emissions reduction, NDC compliance, and last but not least, climate justice. Two pillars in structuring this connectivity between the NDCs and energy are **transparency** and **governance**.

As pointed out by Ruviano & Grossmann (2021)¹², the architecture of **transparency commitments** of the parties in the efforts to reduce emissions has been built since the first United Nations Framework Convention on Climate Change (UNFCCC), in 1992.

An important step towards the evolution of the transparency framework was taken during the COP 15 (Copenhagen, in 2009), with more objective advances achieved at the following Conference — COP 16 (Cancún, in 2010). In the occasion, developed countries agreed to report greater transparency of the finances and support they provided, and developing countries also agreed to promote greater clarity about their actions. As of COP 17 (Durban, in 2011), it was established that the parties, with the exception of the least developed countries and Small Island Developing States, should submit a Biennial Report (BR), subject to an international evaluation and review process, combining a specialized technical review with a peer-to-peer process, having each peer cooperating with each other, in a process of multilateral evaluation. The review would fall under the Subsidiary Body for Implementation (SBI). With the decision, as of 2014, Brazil and other developing countries began to **prepare and submit biannual reports to the UNFCCC, called the Biennial Update Report (BUR)**. Therefore, Brazil has already submitted four reports to the UNFCCC, the last one being presented in 2020.

With the Paris agreement, the COP 21 in 2015, and an approach based on the Nationally Determined Contributions (NDCs), an **Enhanced Transparency Framework (ETF)** was also built between the Parties, representing a key factor in the bottom-up governance architecture proposed by the Agreement. As the authors have observed, in the Paris Agreement the information in the NDCs must be clear, transparent, and comprehensive (Article 4, paragraph 8), it must be reviewed every five

¹² The information gathered here on the transparency architecture built since 1992 under the UNFCCC as well as the core elements of the Enhanced Transparency Framework (ETF) that is part of the Paris Agreement is based on the analysis by Ruviano & Grossmann (2021).

years (Article 4, paragraph 9), and the country-party may, at any given time, adjust the ambition level of its goals (Article 4, paragraph 11). Furthermore, the Parties assume responsibility for their actions and need to account for their Nationally Determined Contributions, recording anthropogenic emissions and removals, promoting environmental integrity, transparency, accuracy, completeness, comparability and consistency, and ensuring that there is no double count (Article 4, paragraph 13).

Finally, as the authors point out, the scope of the ETF is listed in Article 13 of the Paris Agreement and “*aims to build mutual trust and promote effective implementation, establishing a strengthened transparent framework for action and support, flexible enough to take into account the different capacities of Parties and based on collective experience. Its design is directly linked to the effectiveness of the agreement, as it determines that the new obligations to be implemented are reviewed and published in a non-intrusive and non-punitive manner, respecting national sovereignty and avoiding imposing unnecessary burdens on the Parties*” (Ruviano & Grossmann, 2021:8).

The base documents for reporting each country's efforts to reduce emissions and comply with the NCD will be the **Biennial Transparency Reports (BTR)**, to be submitted from 2024 onwards¹³.

This brief summary of the transparency architecture evolution within the scope of the UNFCCC is relevant to show that, in the last and fourth biannual report to the UNFCCC, the reference for structuring information was the NAMAs and not the NDCs.

In other words, a communication and transparency structure that records, based on the ETF, national efforts to fulfill the goals assumed by the country in the Paris Agreement has yet to be implemented internally. Furthermore, as the goals are meant for the economy as a whole, that is, they are not divided by sector, the construction of requirements for an effective transparency of the country's efforts involving a wide set of policies and institutional structures is of the highest relevance and encompasses enormous challenges.

This point leads us to a second element, which is the issue of governance of public policies related to climate change as well as the country's accountability to the UNFCCC alongside the transparency framework provided for in the Paris Agreement.

The institutional structure responsible for establishing guidelines, articulating and coordinating the implementation of public actions and policies related to climate change in Brazil is the Interministerial Committee on Climate Change and Green Growth (CIMV), established through Decree No. 10.845/2021. This Committee, in turn, replaces the former Interministerial Committee on Climate Change (CIM), created by Decree 10.145/2019.

¹³ Brazil has relied on external financial support for the preparation of its reports, as evidenced by the fourth Biannual Report. For a new reporting stage (BTR) the government will receive support from the Global Environment Facility (GEF) between 2022 and 2027, which includes: the Brazil's Fifth National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) of the Fifth Biennial Update Report (BUR) and the first two Biennial Transparency Reports (2024 and 2027).

Among the responsibilities of the CIMV, there is “following up the implementation of the NDC presented by the country in the context of the Paris Agreement, and activities of transparency and provision of information, in compliance with the decisions of the UNFCCC”. For the purposes of this study, one must highlight the competence to “decide on the country's strategies for the elaboration, implementation, financing, monitoring, evaluating and updating policies, plans and actions related to climate change, among which Brazil's successive Nationally Determined Contributions – NDC are”.

Chaired by the Ministry of Civil House (the president's chief-of-staff) with an executive secretariat in the Ministry of the Environment, the CIMV has the Council of Ministers as its deliberative body, with the presence of eight more chambers, in addition to the Environment Ministry.¹⁴.

Given the aforementioned institutional scenario, it is clear that a monitoring, by civil society, of the Brazilian NDCs, focusing on the energy sector, as well as others, involves an effort of understanding and detailed following up of the CIMV's actions. This Committee is, then, expected to mobilize a work of aligning sectoral policies, plans and regulations with climate policy, according to the NDC and with full transparency for the UNFCCC (based on the ETF), but also for the entire Brazilian society. In other words, the work of this Committee for the construction of the Biennial Transparency Report (BTR) must have social participation and transparency as key requirements.

At last, it is worth noting the importance of social participation as part of the climate agreement. Transparency and compliance are two key points that reinforce each other. The ability to know what each actor linked to the agreement is doing is essential to demand, in the face of inaction, that an institution or government take action.

“Transparency for environmental governance is important as it provides responsible monitoring without prejudice to the nations bound by the Agreement, enabling non-governmental actors to use this data to develop their roles in defending environmental guidelines. Such data must be managed and published in order to advance in the objectives established for environmental protection and in the fight against global warming, as this will only occur with an increase in civil society's participation in decision-making and access to quality and transparent information on the part of governments” (Ruviano & Grossmann, 2021: 11).

14 The CIMV's deliberative body is the Council of Ministers, composed of the Minister of State, Chief of Staff, who will preside over the council, Minister of Foreign Affairs, Economy, Infrastructure, Agriculture, Livestock, and Supply, Mines and Energy, Science, Technology and Innovations, Environment, responsible for the Executive Secretariat, Regional Development, Labor and Welfare and the Head of the Government Secretariat for the President's office.

PART II

Energy sector goals in the Brazilian NDC: brief introduction and problematization

ANALYZING THE ENERGY SECTOR IN LIGHT OF THE BRAZILIAN NDC is an admittedly complex challenge and a learning process.

Firstly, because the main pieces of government planning, the National Energy Plans (PNE) and Ten-Year Energy Plans (PDE), follow metrics, parameters, and methodologies that go far beyond the dimension of emissions and the scope of the NDC. Therefore, it is worth mentioning that part of Inesc's accumulation of lessons is the study “**Electric and energy expansion: advances, risks, and limitations of the proposed pathways**”¹⁵, as well as the monitoring of fossil fuel subsidies, now in its fourth edition¹⁶.

Secondly, because the history of Brazilian energy policies, in addition to being shaped by a series of plans, policies, legislative, regulatory and financial measures, is crossed by strong economic interests and inter-sector dynamics.

An extensive example, which will be explored later by this report, is Renovabio, which promotes an expansion of the production and use of biofuels in the national energy matrix, considered to be the government's flagship program for “green” energy policies. At the same time that such a policy contributes to making the Brazilian energy matrix more renewable, it has a strong interface with land usage and deforestation dynamics, given that the expansion of biofuel production encourages the incorporation

15 Available at: <https://www.inesc.org.br/expansao-eletrica-e-energetica-avancos-riscos-e-limitacoes-das-trajetorias-propostas/>

16 Available at: <https://www.inesc.org.br/campanhas/campanha-combustiveis-fosseis/>

of new areas for the planting of commodities, especially soybeans, which represent 70% of the biodiesel composition. In this way, the analysis focused on the energy matrix disregards important connections and developments between emissions from the energy sector and emissions linked to land and forest usage. And beyond emissions, the connection with issues related to climate, social, and environmental justice.

Another example is the environmental, social and climatic effects arising from the importance and the incentives to water sources in the Brazilian energy planning. In other words, the strong presence of hydropower energy in the Brazilian electricity matrix results in indirect ecosystem, social, and climate impacts that escape the metrics of the energy sector, reinforcing the limits of the strict approach to the division between renewable and non-renewable energies and emissions by sources.

That being said, the present analysis starts from the observation that the goals foreseen in the NDC for the energy sector, which are largely anchored in the historical dynamics and in the pre-existing trajectory of the energy matrix, do not imply significant challenges for the country, whether in terms of reducing energy emissions, whether in terms of the energy transition.

A panoramic view of the current status of the goals linked to the **energy matrix** e à **electricity matrix (see Box)** and their fulfillment already reaffirms this conclusion. Namely:

- **Goal 1:** In the energy sector, **achieving 45% of renewable energy in the energy matrix** by 2030, including:
 - » **Goal 1.1:** Expansion of the use of renewable energy sources, except hydroelectric, in the total **energy matrix** between **28%** and **33%** by **2030**;
 - » **Goal 1.2:** Expanding the use of non-fossil fuel energy sources domestically, increasing the share of renewable energy (except for hydropower) in the domestic energy supply to at least **23%** by **2030**, including increasing the share of wind, biomass and solar energy;
 - » **Goal 1.3:** Achieving 10% of efficiency gains in the electricity sector by 2030.
- **Goal 2:** Increasing the share of sustainable biofuels in the Brazilian energy matrix to approximately **18% by 2030**, by expanding the consumption of biofuels, increasing the supply of ethanol, including raising the share of advanced (second generation) biofuels, and raising the share of biodiesel in the diesel mix.

Box 1: relevant concepts to understand Brazil's goals for the energy sector

Energy matrix – or domestic energy supply – represents the set of energy sources available for transport, food preparation, and electricity generation, referring to a broader conglomerate of energy sources within the infrastructure sector.

The electrical matrix, inserted in the energy matrix and constantly mentioned in the bibliography referenced throughout this study, is not an interchangeable concept for the energy matrix. The electrical sphere is formed by the set of sources available only for the generation of electrical energy (EPE, 2019).

In terms of **more self-evident results**, the state of the art for meeting the goals set out in the NDC can be summarized in the following topics, as reported by the Brazilian government in October 2021, in the document “Guidelines for a National Strategy for Climate Neutrality” (Brazil E 2020):

- For goals **1.1** and **1.2**, data from the National Energy Balance (BEN - Base Year 2020) show that the country has exceeded the target set for 2030 by reaching 48.4% of renewable sources in its energy matrix with: 19.1% from sugarcane derivatives; 12.6% from hydraulic energy; 8.9% from charcoal and vegetable firewood; and 7.7% from other renewable sources.
- **Goal 1.3**, achieving 10% efficiency gains in the **electricity sector** by 2030, unlike the others, has had a critical performance.
- Regarding **goal 2**, the country reached the level of 30.2%¹⁷ in the use of sustainable biofuels in the energy matrix, higher than the 18% goal established by the NDC (Brazil C 2020).

The data can be illustrated in the following chart:

Chart 1 – Actions, goals and results

ACTION	GOALS	RESULTS
<i>Renewable energies in the energy matrix</i>	<i>45% by 2030</i>	<i>48,4% 2020</i>
<i>Sustainable biofuels in the energy matrix</i>	<i>18% by 2030</i>	<i>30,2% 2020</i>
<i>Efficiency gains in the electricity sector</i>	<i>10% by 2030</i>	<i>7.4% for the entire period 2013 - 2025</i>

Source: “Guidelines for a National Strategy for Climate Neutrality” (Brazil E 2020)

¹⁷ 19.1% of sugarcane biomass; 8.9% of firewood and coal; 1.7% biodiesel; 0.4% from other types of biomass (including rice husk, elephant grass, and vegetable oils), and 0.1% from biogas.

However, behind the apparently encouraging results, some questions must be addressed:

1. THE NDC'S LACK OF AMBITION

Compared to other countries, Brazil has considerable historical and comparative advantages. The world and OECD average for the presence of renewable energies in the energy matrix is, respectively, 23% (2018) and 27% (2019) (Brazil B, 2021). However, Brazil already had a 40% renewable energy matrix in 2016 and in the National Energy Plan 2030, released by the government in 2007, 45% renewable energy matrix was expected to be reached in a period of 14 years (Peixer, 2019). Thus, the Brazilian government lack of ambition in updating the NDC has been systematically questioned by the Brazilian civil society.

In the first revision of the NDC presented by the Brazilian government in December 2020, the analysis carried out by the Climate Observatory (OC)¹⁸ pointed out that, although the updated goal by Brazil did not imply a change in the percentage commitment to cut emissions, the change in the baseline resulted, in practice, in a less ambitious goal and in more emissions than initially established in the NDC. According to the analysis, with the change in the baseline, the emission limit for 2025 was significantly increased: from 1.3 billion to 1.76 billion tons of CO₂e, which represents, in fact, a setback in relation to what had been previously established in the NDC. This is a violation of the Paris Agreement's principle of non-regression.

In the second revision of the NDC presented in February 2022, the Talanoa Institute published an analysis by Unterstell & Martins (2022)¹⁹ in which it is evidenced that Brazil is going backwards in relation to the binding commitment submitted by the country in 2016: **i) increasing the level of emissions allowed in 2025 in relation to the goal set in 2016 by 314 million tons of CO₂e; e ii) increasing the level of emissions allowed in 2030 in relation to the indicative goal presented in 2016 by 81 million tons of CO₂e.**

2. HYDRAULIC ENERGY'S STRONG PRESENCE

The electrical matrix — which accounts for a considerable part of the load of renewable energies in the energy matrix — is privileged by the strong presence of hydraulic energy, which accounted for 65.2% of Brazil's generation in 2020 (Brazil B, 2021).

The government's narrative has taken advantage of an energy structure based on easy access to water resources since the last century. The continental geographic characteristics of the country, as well as the enormous hydroelectric potential of its river basins, have been given facts for public investments in the expansion of the network throughout the 20th century. (Ferreira, 2000; Lorenzo, 2002; Santos et al, 2008).

¹⁸ <https://www.oc.eco.br/wp-content/uploads/2020/12/ANA%CC%81LISE-NDC-1012FINAL.pdf>

¹⁹ www.institutotalanoa.org/documentos

The political choice for hydroelectric plants made by successive governments took place in a situation in which there was, on the one hand, the availability of water resources and, on the other hand, the difficulties imposed by the oil crises throughout the second half of the 20th century, as well as the crisis of the external debt, added to the successive crises in the balance of payments. These financial issues imposed difficulties in the importing of energy and capital goods for the development of a national thermoelectric sector. Most of these investments took place between the 1950s and 1980s, a period marked by the authoritarian military dictatorship, but with significant economic growth. During this period, the Brazilian State invested in the electrical integration of the regions and in the construction of a system of reservoirs and large hydroelectric plants, such as the Itaipu Binacional²⁰, the Tucuruí power plant, as well as the Furnas plants and other hydroelectric complexes in the Southeast region. Energy planning and production were mostly centralized by the State in the institutional figure of state-owned Eletrobrás and its regional subsidiaries.

Even though the centralized electrical dispatch system has maximized the hydroelectric plants' efficiency²¹ due to several plants being built in a single water basin (Ferreira, 2000)²², collateral damage to society and the environment has often been muffled by the development plans.

In the most recent period, from the beginning of the 2000s, despite the entire history of technical, economic, and socio-environmental problems that characterized investments in this alternative — including the high costs for the national interconnected system (SIN) to serve the consumer market, located largely in the Southeast region of the country —, governments continued to insist on the continuity of a centralized generation model, with a recurrent focus on large-scale hydroelectric expansion in the Amazon plains.

Investments in Belo Monte projects, in Altamira, in the state of Pará, and in Jirau and Santo Antônio, in Rondônia, have caused irreversible social and environmental damage. The reservoirs altered the local fauna and flora inexorably, in addition to displacing traditional communities, such as riverside and indigenous peoples, whose way of life is directly linked to extractivism.²³ Belo Monte, for example, has displaced between 20,000 and 50,000 people to precarious urban areas, which do not have the traditional sociocultural means for the adequate survival of these displaced communities. (Damasio, 2019; Laurance et al, 2015; Nitta and Naka, 2015). Moreover, there is evidence that the Belo Monte

20 This power plant was considered the largest hydroelectric plant in the world in terms of generation, being only overlapped by the Three Gorges Dam, in China.

21 The national interconnected system, operated in a centralized way, through reservoirs in the same river basin, generated one of the largest interconnected electrical systems in the world, with massive supply strength. This is different from countries like the United States, in which one region will not supply the other if there is a problem with energy, due to the lack of transmission lines integrating the territory.

22 For further information: a system was created in which the same flow of water from the river works as fuel for several dams. "By determining when and how much energy each electric plant will generate, the centralized dispatch system ensures that the available water be used in a more efficient way [...] In 1996, Eletrobrás estimated that, with the optimization of the water flow usage, the centralized dispatch system generated total efficiency savings of US\$ 3.7 billion, equivalent to 2,200 MW of capacity" (Ferreira, 2000, p. 184-185).

23 (Cunha e Ferreira, 2012; Farias et al, 2019; Nitta e Naka, 2015; Souza-Cruz-Buenaga et al, 2019; Kuriqi et al, 2021; Wu et al, 2019).

dam already emits three times more methane than the period without the dam, mostly due to the decomposition of submerged trees (Bertassoli et al., 2021).

Thus, based on the assumption of social and climate justice²⁴, the critical problems involving this investment model should be taken into account in energy planning, beyond the renewable/non-renewable categorization.

3. A MATRIX WITH GROWING INFLUENCE FROM THE AGRICULTURE CHAIN

As it has already been pointed out, the expansion of renewable energy sources use, except for hydroelectric plants, in the energy matrix is associated, in particular, with the increase in the supply of sugarcane biomass and biodiesel, notably derived from the soybean production²⁵. The scenario shows, once again, the importance of critical analysis of potential indirect emissions associated with the energy sector and linked to land use. As reported in BEM 2020, Brazil is the second largest producer of biodiesel in the world, the first being the USA, and the growing domestic consumption is favored by the policy of adding this fuel to fossil diesel.

The agricultural sector – responsible for 28% of Greenhouse Gas Emissions (SEEG) in 2019 and indirectly responsible for an important part of emissions from land usage changes that account for 44% of total emissions²⁶ – has a narrative based on the importance of advancing bioenergy as a solution to reduce carbon emissions in the bioenergy area. Such claims omit the negative effects that the chain as a whole brings to the environment, forests, and emissions.

The relationship between biodiesel production, expansion of soy planted area, expansion of the agricultural borderlands, deforestation, and land concentration has been pointed out since the 2000s, including studies by non-governmental organizations (NGOs), networks, and academic dissertations²⁷.

More recently, towards strengthening the policy to encourage biofuels, these relationships are once again being highlighted and challenged. The graph by the National Energy Balance (BEN, 2021)

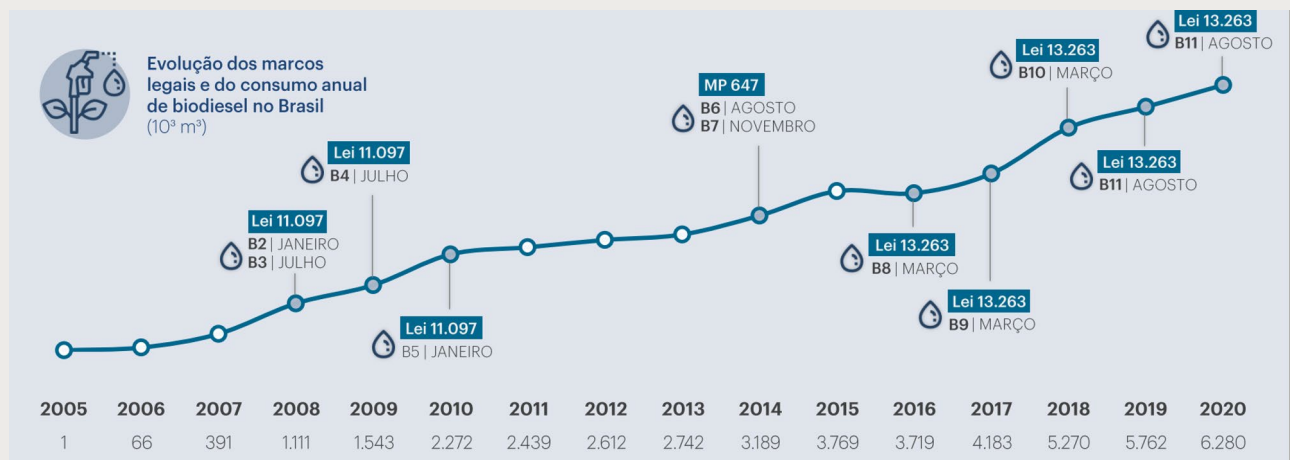
24 Since the second half of the 20th century, organized civil society has defended general principles of environmental and climate justice, which are based on the notion of preservation of the terrestrial biosphere integrated with human life, especially considering the most vulnerable and marginalized populations in the Global South. (Schlosberg and Collins, 2014). Such ethics are defended by CIDSE "Coopération Internationale pour le Développement et la Solidarité" [International Cooperation for Development and Solidarity]. Entitled "guiding principles of renewable energy", these ideals guide the present report. Principles: Lowest impact on biodiversity and recognising ecological limits (planetary boundaries); Avoiding one-size fits all approach through participatory processes and expand opportunities for local ownership; Contributing to the needs of vulnerable communities; Prioritising equitable access and distribution to energy and eradicate poverty; Increasing efficiency; Respecting human rights and address gender impact of energy poverty; Ensuring good governance in regulatory processes, establish transparency mechanisms and inclusive participation (CIDSE, 2018, p.9).

25 As pointed out in **Inesc's first study**, Soybean oil maintains its leadership as the main commodity used to obtain biodiesel in Brazil, especially for the expansion of installed capacity in the midwest region of the country.

26 According to the Climate Observatory and the System of Estimates of Greenhouse Gas Emissions (SEEG), in 2019, Brazil emitted 2.1 gross tons of greenhouse gases, an increase of almost 10% compared to the previous year. From a sectoral perspective, 44% of the 2019 emissions came from changes in land usage, 28% from agriculture and 19% from energy, including activities that use fossil fuels, in addition to 4% from waste and 5% from industrial processes.

27 A solid synthesis of this narrative is presented by Mariana Soares Domingues in her master's thesis. Available at: <https://www.teses.usp.br/teses/disponiveis/86/86131/tde-26082010-200853/publico/mestrado>

reproduced below correlates the changes in the regulatory framework, which favor the addition of biodiesel to fossil diesel, as well as the expansion of the annual consumption of biodiesel in Brazil.



Source: BEN, 2021.

Given that soy represents 70% of the biodiesel composition, even though the growth of the area has its origin in pasture land that has already been deforested, there is no guarantee that this expansion will not result in the displacement of the pasture areas, through land grabbing, in deforestation and land concentration.

On this particular issue, researchers have indicated that RenovaBio's strategies to ensure sustainability are not enough to mitigate the indirect pressures that the demand for biofuels can generate²⁸. Therefore, the rapid expansion of soy-derived biodiesel could harm Brazil's long-term climate goals due to the contribution of Indirect Land Use Change (ILUC) emissions to the impact of life-cycle emissions of this fuel, canceling out the emission savings resulting from the substitution of diesel²⁹.

Thus, the Brazilian government reports a success rate in the energy area, disregarding the negative effects of the dependence on a matrix with high influence from the agriculture chain.

4. ENERGY EFFICIENCY

From the energy efficiency standpoint, the goal 1.3, it is worth recovering the findings of the first study carried out by Inesc, which points out the *“lack of intragovernmental integration, which is crucial not only to incorporate relevant aspects of sectoral policies and planning, in particular, the transport sector, with great potential for systemic efficiency gains, but also the behavior of several other economic sectors and classes of consumers, for which the energy sector provides the necessary input”* (Neto, 2021:p.).

28 <https://brasil.mongabay.com/2021/08/renovabio-expansao-de-biocombustiveis-apresenta-fragilidades/>

29 <https://theicct.org/publication/oportunidades-e-riscos-para-a-expansao-continuada-dos-biocombustiveis-no-brasil/>

5. THERMOELECTRICAL AND COAL GENERATION

The overview of the relevance of renewables in the energy matrix overshadows problems associated with emissions and environmental impacts from fossil sources in the electricity matrix, such as coal³⁰. Coal-fired thermoelectric generation was responsible for 1.9% of electricity generation in 2020 and for 34% of GHG emissions in the SIN³¹. This source, despite its reduced contributions, only becomes economically viable thanks to subsidies granted by the government³² and largely paid by society, on the electricity bill. These are old subsidies, started in 1973 and with legal provision for extinction only in 2027.

The government itself, through the Committee for Monitoring and Evaluation of Union Subsidies — CMAP (2019), reinforced the recommendation to extinguish the subsidy in 2027. According to the report: *“It must be taken into account that the use of coal for energy generation is a process that is harmful to the environment when compared to other technologies used for generation, such as, for instance, hydro, wind, and even the burning of natural gas, with regards to the emission of greenhouse gases, when it comes to the lack of options in the places where the thermoelectric plants operate. Besides, from an economic theory point of view, the generation of negative externalities, in particular, the **impacts of gas emissions** on atmospheric pollution, compared to other means of generation, would justify a higher taxation of the thermoelectric sector originated from mineral coal compared to the other aforementioned sources”* (CMAP: 2019; p.77).

Despite the widespread and recognized need and feasibility of the coal phase-out in Brazil, as an important step in the energy transition, the challenge has been to ensure that the deadline for finalizing the subsidies is met and that the regions that produce coal to supply the thermoelectric plants can also make a transition to overcome the economic dependence associated with the coal economy³³. However, contrary to the transition, and despite the low efficiency of the plants and the environmental problems caused by them, what is widely observed is that the coal lobby has acted strongly to postpone the end of these subsidies.

30 <https://energiaeambiente.org.br/sul-tem-condicoes-para-substituir-100-do-carvao-por-energia-eolica-e-solar-aponta-iema-em-glasgow-20211109>

31 Electricity Statistical Yearbook 2021 - Base year 2020. Available at: <https://www.epe.gov.br/pt/publicacoes-dados-abertos/publicacoes/anuario-estatistico-de-energia-eletrica>

32 This subsidy is granted through the Energy Development Account (CDE) to maintain the production of coal plants in the south of the country. The budget for CDE-Carvão Mineral in 2020 was R\$ 660 million.

33 Today, approximately 36.000 people work directly in the coal industry, with about 11.000 in lignite mines and 25.000 in electric generation plants (IDEC, 2021). The economic and social dependency produced by coal mining, as in other mines and regions, suggests that closing mines and building a fair transition takes both time and planning.

6. OIL & GAS PRODUCTION AND THE PROBLEM OF NON-MEASURED EMISSIONS

As demonstrated in the fourth edition of the monitoring of fossil fuel subsidies carried out by Inesc, Brazil is an important part of the planet's oil geopolitics today. The country is among the ten largest oil producers in the world. In 20 years, the production of oil equivalent in Brazil rose from 1.65 million barrels/day at the end of 2000 to 3.52 million barrels/day at the end of 2021. This represents a growth of 113%, according to data from the Oil National Agency. Its exports have also been growing and reached a new record in 2020, with an average of 1.4 million barrels/day throughout the year.

Brazil's contribution to the escalation of global emissions from fossil fuels must be seen from two perspectives. Directly speaking, because emissions from burning fossil fuels represent 19% of the country's emissions. Indirectly, due to the fact that the fossil fuels that Brazil delivers to the world via exports constitute energy sources for the most different sectors and are part of the global problem of emissions. These facts being taken into account in a scenario already outlined by the Intergovernmental Panel on Climate Change's (IPCC) report that should “sound like a death sentence for fossil fuels, before they destroy the planet”³⁴.

This indirect view of the relationship between fuel exports and responsibility for global emissions is still far from receiving proper attention, either in Brazil or in the context of the global climate debate.

7. THE NEW MARKET FOR GAS AND ITS EFFECTS ON THE ENERGY MATRIX

As it was also pointed out in the fourth edition of the monitoring of fossil fuel subsidies, despite the significant growth of renewable energies, especially solar, wind, and biomass, and the negative effects that gas generation represents in terms of emissions compared to non-fossil sources, there is, in Brazil, a strong economic and political movement to ensure the rapid growth of gas in the energy matrix.

Recent legislative changes are a result of this trend. In 2021, the “New Gas Bill” was approved by the National Congress (Law No. 14,134/2021) and, additionally, the mandatory contracting of eight thousand megawatts from gas-fired thermal plants was included in the Law that authorized the privatization of Eletrobrás, operating at minimum capacity of 70% for at least 15 years. Thus, a market reserve was established, even in areas that do not produce gas and despite the conditions to generate energy from renewable sources (solar, wind, and water).

According to the Institute of Energy and the Environment (Iema): “*Considering a capacity factor of 70% for the installed plants, annual emissions would represent an increase of 17.5 MtCO₂e or a percentage increase of 32.7% in relation to the emissions from the electricity sector registered in 2019 and 60% in relation to emissions from the natural gas thermoelectric park in the same year. The accumulated emissions referring to the 15 years of operation in this installed capacity would total 260.3 MtCO₂e, more than the emissions of the entire transport sector in 2019*” (Iema, 2021).

³⁴ <https://valor.globo.com/mundo/noticia/2021/08/09/e-um-sinal-vermelho-para-a-humanidade-diz-antonio-guterres.ghtml>

8. LOBBIES AND THEIR EFFECTS ON ENERGY MANAGEMENT

Guided by the electricity lobby, the idea of “systemic solidity” has been recurrently used to defend the use of polluting and more expensive thermoelectric plants as a way of guaranteeing the immediate dispatch of energy. Once there was no prior planning for the implementation of distributed renewable generation and alternative sources, dependence on polluting thermoelectric plants remains, especially in a period of water crisis caused by climate change, in which hydroelectric plants produce less energy³⁵.

Other critical elements that can be mentioned are, for example, the continuity of the centralized generation model.³⁶, or even the accommodation of economic and political interests³⁷ of investors of large hydroelectric plants, pre-salt projects, and the coal sector in the State of Santa Catarina.

The establishment of run-of-the-river hydroelectric plants (ROR) in the Amazon is another example of the economic interest from the large construction companies involved – since such projects cause gigantic socio-environmental impacts and lower energy return. The example of Belo Monte is more than illuminating as the plant has been producing less than 3% of its total capacity in the dry season, in addition to producing less than expected in other periods. This is due to the type of project and the critical location in which it was implemented³⁸.

The narrative of energy security also serves as support for the use of fossil energies – such as gas and coal thermoelectric power – “not to ration energy” in the face of lack of water in reservoirs due to the low incidence of rain, which is also a serious and cyclic issue in the matrix. Climate change has affected rainfall in the country, lengthening the dry season and shortening the rainy one.

The reduction of the participation of hydropower in electricity generation (according to the National Energy Balance, the participation of this source has decreased from 83,8% in 2009 to 55,99% in 2021) was accompanied by a significant growth in variable renewable sources, which are increasingly competitive, especially wind and photovoltaic ones. It was in this context that the PDE 2030 understood that hydroelectric plants and the national interconnected system (SIN) – which should be expanded to support a more frequent exchange between the regions of the country – would back the expansion of new renewables, with natural gas thermoelectric plants having a complementary role, only in times of greater need.

35 The experts consulted for the preparation of this document assess that the Brazilian government has been planning to expand the use of fossil fuels through the exploration of Petrobras’s pre-salt layer, for example. They also state that the country has not been planning and organizing a systemic project of gradual abandonment of fossil fuels, nor investing enough in technologies and regulatory norms that advance this agenda in the energy sector.

36 Such model implies large investments, expands socio-environmental impacts, discourages decentralized generation and alternative forms of energy storage.

37 More evidence of the influence of organized pressure groups on national energy planning can be found in the number of public contributions to the PNE 2050 plans made by entities representing the private sector. Out of the 84 participating institutions, only 4 of them had a direct relationship with socio-environmental entities.

38 Pereira, Renée. “Sem Água, Belo Monte Opera Com Meia Turbina Desde O Início de Agosto.” CNN Brasil, September 21, 2021. <https://www.cnnbrasil.com.br/business/sem-agua-belo-monte-opera-com-meia-turbina-desde-o-inicio-de-agosto/>.

This scenario has changed, however, due to the gas lobby that has, as seen in the previous item 7, boosted the creation of a new market for the sector.

To sum up, varied and strong economic interests instrumentalize the passing of bills in the National Congress and change the relevance of renewables in the Brazilian energy matrix. Thus, as pointed out by Bara (2021), the risk scenario assumed in the PDE 2030 itself was then fulfilled: *“the greatest risk of increased emissions from the electricity sector is due to the pressure by inflexible UTEs, which are obviously following the interest of the natural gas sector by guaranteeing a firm demand for its supply”*.

On the other hand, pressure groups related to the renewable energy generation sector have also operated³⁹⁴⁰; they use their influence to increase the participation of these sources in the electricity matrix through a narrative in favor of consumers — more access to better quality services at a lower cost, reduction of electrical losses and lower charges in the electricity bill through clean energy. As indicated by the present analysis, however, such lobbying has been an important but not definitive effort to guarantee a more expressive role of renewables in the matrix..

9. LACK OF SOCIAL PARTICIPATION IN THE BRAZILIAN ENERGY AND CLIMATE POLICIES

Evidence of the fragility of social participation is the complete absence of government communication with civil society for the updating process of the Brazilian NDC.

The lack of social participation in the planning of energy expansion in Brazil has been pointed out by civil society for decades, and is directly related to historical errors, such as the construction of the Belo Monte power plant in Pará. The lack of social participation is also an element that favors the long-term maintenance of a centralized generation model, with a recurrent focus on large-scale hydroelectric expansion in the Amazon plains, disregarding all the historical technical, economic, and socio-environmental problems that have characterized the investments in this alternative, as pointed out by Bara (2021).

The historical deficit of social participation in defining the directions of energy policy is superimposed by the deficit of social participation in climate policies. The example of the technical and political problems associated with the lack of ambition in updating the Brazilian NDC, seen in topic 1, sheds light on such gap. Today, there are specialists in academia and civil society in Brazil with a high capacity for technical contribution to a process of updating the NDC, as well as a set of social

39 Abeeólica applauds decree that regulates offshore wind, Available at: <https://diariodonordeste.verdesmares.com.br/opiniao/colonistas/egidio-serpa/abeeolica-aplaude-decreto-que-regulamenta-eolica-offshore-1.3185393>

40 Absolar: GD's legal framework will make solar energy more attractive to Brazilian consumers, Available at: <https://www.portalsolar.com.br/noticias/mercado/geracao-distribuida/absolar-marco-legal-da-gd-tornara-energia-solar-mais-atrativa-para-consumidor-brasileiro>

actors reinforcing the demand for Brazil to reconsider its level of ambition. Furthermore, and based on the Paris Agreement, it is essential that the climate policy implementation process under the requirements of the Enhanced Transparency Framework (ETF) be more open to social participation.

It is worth mentioning that in the second update of the NDC, submitted to the UNFCCC in March 2022, the government informs that the Brazilian Forum on Climate Change - FBMC is the space for participation and dialogue between the government and civil society:

“The institutional dialogue between the Brazilian government and civil society takes place through the Brazilian Forum on Climate Change, instituted by decree 9.082, of 26 June 2017. The forum aims at raising “awareness and mobilize society and to contribute to the discussion of actions needed to deal with global climate change, in accordance with the National Policy on Climate Change, the United Nations Framework Convention on Climate Change and its resulting international agreements, including the Paris Agreement and Brazil’s Nationally Determined Contributions”

The reality is that this Forum has had, in recent years, a functioning deficit as a space for dialogue between government and society. On this issue, it is worth noting that, in November 2021, during the COP 26, the executive coordinator of the Forum resigned, stating that the function of the Forum is “to put the government and society in contact”, but he had not been summoned by the government to dialogue⁴¹.

In summary, government planning in the energy sector is marked by a strong gap in social participation and this is reflected in the absence of mechanisms to influence the direction of energy policies with regard to the goals linked to emissions reduction and even towards climate justice.

The nine points listed above, far from exhausting the critical issues of the energy matrix analysis from a political and climate justice perspective, indicate the limits of a strict analysis, whether of the NDC goals or from the perspective of the matrix. There has to be a process of accumulating and aggregating new and different perspectives. Thus, the present study can be added to Inesc's initial efforts on this topic (Bara, 2021), suggesting limits to energy planning which result from strong lobbying that operates in distant and forceful directions, shaping the trajectories of the Brazilian energy policies.

This brief analysis of the NDC makes it clear that the country starts from a relatively low ambition in terms of changing the trajectory of emissions associated with this sector. Moreover, it brings some

41 <https://www.poder360.com.br/governo/durante-cop-coordenador-do-forum-brasileiro-de-mudanca-do-clima-se-demite/>

elements for a critical reflection about the limits of an analysis focused on the strict fulfillment of the goals foreseen for the energy sector. It points out the importance of a more in-depth debate on the connections between emissions from the energy sector in interaction with other sectors, especially in the land usage sector, and more broadly, highlights the need to problematize the country's potential and effective efforts towards the energy transition.

Therefore, and as it has already been shown in the previous study carried out by Inesc (Bara, 2021), it is important to bring to light the advances, risks, and limitations of the proposed pathways for the expansion of the energy and electrical matrix.

Such efforts go beyond the scope of the present work, but the information gathered in the next section takes a step in this direction, as they offer a proposal for classifying the main government initiatives related to the energy sector and extracting from them an analysis of the connection, alignment, and challenges concerning the NDCs.

Governmental initiatives linked to the energy sector and commitments established in the NDC

1. METHODOLOGY

The methodology of this section of the work is centered on the survey, systematization, and classification of government documents, including legal and infralegal framework planning documents and other government-related documents concerning the objectives hereby outlined.

In this part of the research, the objective is a first analysis of the energy sector in light of the Brazilian NDC, around the following guiding questions:

1. Does government planning for the energy sector as of 2016 reflect the international commitment made in the Paris Agreement?
2. Are there effective, ongoing and consistent transparency mechanisms to verify these measures? Are the Brazilian government's projects easily traceable, both by civil society and by the Convention of the Parties?
3. Are there mechanisms for civil society participation in the elaboration of these energy measures?

By gathering the documentation and criteria for delimiting the scope of the research, **13 federal government initiatives** for the energy sector were selected. By initiative, it is understood: plans, programs, and policies that form important parts of what can be called Brazilian energy policy planning.

Subsequently, a classification of policies was carried out in relation to four criteria: access to documents that prove implementation; practical

effects towards the NDCs goals; the degree of civil society participation in the creation of policies; and whether there any was mention of the NDCs in the elaboration of the policy.

The **scope of analysis** is restricted to online accessible public government information within the Brazilian federal sphere.⁴² Regarding the temporal delimitation, the ratification of the Paris Agreement in 2016 leads to the delimitation between the years 2016 and 2020.

However, there are also some measures outside this temporal scope that were inserted in order to encompass previous initiatives, which are relevant to the goals established in the Brazilian NDC for the energy sector.

Other delimitations in the scope of the presented measures should be underscored:

- Norms and decisions to deal exclusively with the effects of the pandemic were discarded from the research⁴³.
- Bills in progress were not taken into account.
- Actions with a direct impact on the energy sphere were analyzed, but those directly related to other segments, such as the agriculture and transport sector, were left out.
- Initiatives to expand the non-renewable energy sector – mainly oil, gas, and coal – in Brazil also did not enter the scope of the analyzed policies, since the Brazilian NDCs do not focus on this agenda in any specific way.

Finally, in addition to the analysis and classification of policies, interviews were conducted with experts from academia and organized civil society entities. These interviews included experts from Fundação Getúlio Vargas (FGV), the Department of Energy at the Federal University of Campinas (Unicamp), and the Institute of Energy and the Environment (Iema). These experts contributed with a strategic and critical perspective on government measures, as will be subsequently pointed out.

42 The transparency portal (Complementary Law 131, of May 27, 2009) will be used as a detailed research tool — whenever necessary to check the progress of a given public policy.

43 **Examples of measures disregarded in this research, due to the focus on fighting the pandemic:** CNPE's Decarbonization goals aimed at RenovaBio; Provisional Measure 950/2020, on emergency measures for the electricity sector; Res. 878/2020, on the preservation of the provision of the electricity distribution service; Order No. 131/2020, which creates the sectoral committee to monitor covid; Decree 10.350/2020, covid account; Res. 815/2020 extends deadlines for oil and natural gas exploration and production contracts; CNPE Resolutions 12/2017 and 4/2019, which set technical and economic parameters for biddings for electricity generation concessions and creates the Gas Market Competition Committee.

2. SELECTED INITIATIVES, CLASSIFICATION AND RESEARCH FINDINGS

2.1 Selected initiatives

The present research selected and assessed **thirteen relevant initiatives** for the analysis of energy policies in its correlation with the Brazilian NDCs and its relationship to the energy sector. The initiatives and measures are:

- 1) National Biofuels Policy (RenovaBio)**. Established as an integral part of the national energy policy by Law No. 13,576/2017⁴⁴, its main purpose is to expand the production and use of biofuels in the national energy matrix, with emphasis on the regularity of fuel supply. Furthermore, the Policy seeks to contribute to meeting the Brazilian government commitments in the Paris Agreement. The Policy assumes that by ensuring predictability for the fuel market, gains in energy efficiency and reduction in greenhouse gas emissions are induced. (ANP, 2021).
- 2) National Policy on Climate Change (PNMC)**⁴⁵ Established by Law 12,187 of 2009. This Policy sets out sectoral plans for mitigating and adapting to climate change for the consolidation of a low-carbon economy (MMA, 2021). Among the guidelines is the elaboration of sectoral plans in the generation and distribution of electric energy, in urban public transport, and in the modal systems of interstate transport of cargo and passengers, which aim at a greater reduction of emissions.
- 3) National Emissions Registry System – Sirene**⁴⁶ (2017) publishes the results of the National Inventory of Anthropogenic Emissions by Sources and Removals by Sinks of Greenhouse Gases Not Controlled by the Montreal Protocol, as well as making available information related to other emissions accounting initiatives.

44 Other infra-legal norms are linked to Law No. 13,576/2017, which establishes RenovaBio: CNPE Resolution No. 14/2017; Decree No. 9.888, OF JUNE 27, 2019; ORDER No. 103, OF MARCH 22, 2018; ANP - Public Consultation and Hearings No. 10/2018; MME - Public Consultation No. 46 of 04/05/2018; RESOLUTION No. 5, OF JUNE 5, 2018; ANP Resolution No. 829/2020; CNPE Resolution No. 8/2020; ANP Resolution No. 823/2020; MME Order No. 419/2019; ANP Resolution No. 802/2019; CNPE Resolution No. 15/2019; Decree No. 9.888/2019; ANP Resolution No. 791/2019; ANP Resolution No. 758/2018; ANP Order No. 303/2018. All the norms were considered as part RenovaBio.

45 The infralegal norms: DECREE No. 9,578, OF NOVEMBER 22, 2018, DECREE No. 10,145, OF NOVEMBER 28, 2019, and DECREE No. 10,223, of 2020 were also considered as complements for the measure's analysis.

46 Meets principles determined in the PNMC.

- 4) Energy contracting auctions**⁴⁷ are a recurring initiative by the Brazilian State to expand its supply of electricity. The ones considered for research were those held between 2016 and 2020 and directly translate into the construction of projects that supply renewable and non-renewable energy to the energy matrix.
- 5) National Electric Energy Conservation Program (Procel)**⁴⁸. Created in 1985 through Interministerial Order No. 1877. Its objective is to promote the efficient use of electricity and combat its waste. Therefore, the program builds national indicators of energy efficiency through the presentation of data in several economic segments⁴⁹.
- 6) Green Debentures** (2020) are incentives to finance infrastructure projects with environmental and social benefits. They are currently regulated by Decree No. 10.387/2020, which amended Decree No. 8.874/2016. For the energy sector, the standard norm is to encourage projects based on renewable technologies for generating solar, wind, and waste energy; as well as small hydroelectric plants with a minimum power density of 4W/m² (four watts per square meter) of flooded area.
- 7) Future Energy Systems Program (2016)** seeks to improve the general conditions for integrating renewable energies and energy efficiency in the Brazilian energy system.
- 8) Resolution No. 29, of December 12, 2019**⁵⁰. Expansion of the supply and planning of the electrical system⁵¹.
- 9) Resolution No. 15, of December 9, 2020**. Establishes National Guidelines for Public Policies aimed at Distributed Microgeneration and Minigeneration in the country.

47 Total number of considered Auctions: 8 new energy auctions; 1 energy reserve auction held and another cancelled; 4 existing energy auctions; 1 energy auction for the isolated system. It is worth mentioning that, between 2016 and 2019, 2,873.70 MW/h of energy for natural gas thermal plants was contracted in total through auctions regulated by the Regulatory Agency of the sector. However, it should be noted that in 2021, 4.1 GW of the source was contracted in a capacity reserve auction and 1.177.8 MW of the source was contracted in an emergency energy auction, due to the water crisis faced in Brazil in 2021. **The amount of natural gas acquired to meet the demand represents more than three times this source of energy contracted between 2016 and 2019.**

48 The norm used here is LAW No. 13,280, OF MAY 3, 2016 – Procel, which takes into account the text of another modified ruling: Law No. 9,991, of July 24, 2000.

49 Among the areas in which Procel operates are: more efficient equipment and home appliances; promotion of the efficient use of energy in the civil construction sector, in residential, commercial, and public buildings; support to city halls in the planning and implementation of projects to replace equipment and improve public lighting; tools, training and assistance in the planning and implementation of projects aimed at lower energy consumption in municipalities; training, manuals and computer tools aimed at reducing energy waste in the industrial and commercial segments; elaboration and dissemination of qualified information on energy efficiency.

50 Order No. 59, OF FEBRUARY 20, 2020 was also considered as a supplementary norm of the measure.

51 Initiatives 8 and 9 were selected considering that **the National Energy Policy Council (CNPE)** (2019-2020) decisions are relevant to the dynamics of the energy matrix.

10) Mini-reform of the electricity sector⁵² (2020) provides changes in the sector's legal framework and deals with: investments in Research and Development; legal remuneration for the investment of public electric energy service concessionaires; regulates the service concession regime; makes changes to the Incentive Program for Alternative Sources of Electric Energy (Proinfa) and the Energy Development Account (CDE)⁵³.

11) C,T&I Plan 2018-2022 - Sciences, Technology and Innovation Plan for Renewable Energies and Biofuels is a document of strategic orientation by the Ministry of Sciences, Technology, Innovations and Communications (MCTIC) for action in the areas of renewable energies and biofuels. The objective established in the Plan is to identify the main technological challenges in the production chains of renewable energies and biofuels, as well as to establish initiatives to encourage Research, Development, and Innovation (R,D&I) integrated between academia and the productive sector, necessary to overcome the 160 identified challenges.

12) Addition of Biodiesel to Diesel - LAW No. 13,263, OF MARCH 23, 2016⁵⁴ deals with the percentages of biodiesel to diesel oil addition sold in the national territory. The proposal also seeks to implement measures relevant to biofuels and is strongly linked to the agriculture sector.

13) National Program for Universal Access to and Use of Electricity in the Legal Amazon. “Mais Luz para a Amazônia” [More Light to the Amazon] (2020) aims to supply electricity to remote regions in the Amazon, with such supply being made through renewable sources of electricity generation. The Program plans to bring clean and renewable electricity to 219.221 families in communities that are mostly riverside, indigenous, and *quilombola*.

2.2 Classification of initiatives

After the selection of initiatives, an assessment was carried out on the content quality of the information reported by the government, based on four classification criteria:

- **Implementation:** verifies available information on the implementation;
- **Effects:** checks the available information on the effects achieved by the initiatives;

⁵² The measure is linked to the norms: Amends to Law No. 9,991, of July 24, 2000, Law No. 5,655, of May 20, 1971, Law No. 9,427, of December 26, 1996, Law No. 10,438, of April 26, 2002, Law No. 10,848, of March 15, 2004, Law No. 12,111, of December 9, 2009, Law No. 12,783, of January 11, 2013, Law No. 13,203, of December 8, December 2015, and Decree-Law No. 1,383, of December 26, 1974; transfers to the Union the shares held by the National Nuclear Energy Commission (CNEN) representing the capital stock of Indústrias Nucleares do Brasil S.A. (INB) and Nuclebrás Equipamentos Pesados S.A. (Nuclep); and takes up other measures.

⁵³ Art. 26, §1-G of Law 14,120 specifies that: The Federal Executive Branch will define guidelines for the implementation, in the electricity sector, of mechanisms for the consideration of environmental benefits, in line with mechanisms to guarantee security of supply and competitiveness, within 12 (twelve) months from the date of this paragraph's publication.

⁵⁴ Complementary norms for the measure were considered: LAW No. 13,033, OF SEPTEMBER 24, 2014; RESOLUTION No. 16, OF OCTOBER 29, 2018.

- **Mention about NDC:** checks whether there is a direct and explicit connection between the initiative and the NDCs;
- **Participation:** checks whether mechanisms or processes for civil society participation in the initiatives have been reported.

Finally, to facilitate the evaluation, a valuation effort was made according to the following chart:

Chart 2: Classification of Initiatives

CLASSIFICATION	Criteria by value
IMPLEMENTATION	<i>Level 1 = not enough available information to identify what has been implemented</i>
	<i>Level 2 = information available about undertaken activities, or lessons learned, or next steps</i>
	<i>Level 3 = information available on all carried out activities, with data on lessons learned as well as next steps.</i>
EFFECTS	<i>Level 1 = No improvements reported.</i>
	<i>Level 2 = Partial improvements in environmental, energy or social aspects are reported.</i>
	<i>Level 3 = Improvements are reported in terms of carbon emissions, amount of renewable energy available as an effect of this measure, as well as environmental, energy, and social improvements.</i>
MENTION ABOUT NDC	<i>Existing mention = There are mentions of NDCs.</i>
	<i>Non-existent Mention = No mention of NDCs.</i>
PARTICIPATION	<i>Level 1 = There was no legal obligation for the participation of those mostly affected by the measure</i>
	<i>Level 2 = There was a legal obligation to engage affected communities with the policy</i>

2.3 Overview of research findings

The analysis of the **13 initiatives**, according to the chosen criteria, generated a first assessment that can be summarized in the chart below⁵⁵.

⁵⁵ In the annex to this report, you can find the justification for the classification of each measure within the determined criteria.

CLASSIFICATION	Criteria by value
IMPLEMENTATION	<i>Level 1 = 3 measures: Future Energy Systems Program; Green Debentures; Mini and Micro Generation</i>
	<i>Level 2 = 8 measures: RES 29/2019 - Expansion of the supply and planning of the electricity system; C,T&I Plan; Energy Contracting Auctions; Mini Reform of the Electric Sector; RenovaBio; Addition of Biodiesel to Diesel; PNMC; Sirene</i>
	<i>Level 3 = 2 measures: Procel; Mais Luz na Amazônia</i>
EFFECTS	<i>Level 1 = 5 measures: Future Energy Systems Program; C,T&I Plan; PNMC; Green Debentures; Micro and Mini Generation</i>
	<i>Level 2 = 7 measures: RES 29/2019 - Expansion of supply and planning of the electrical system; Energy Contracting Auctions; Mini Reform of the Electric Sector; RenovaBio; Addition of Biodiesel to Diesel; Sirene; Mais Luz na Amazônia</i>
	<i>Level 3 = 1 measure: Procel</i>
MENTION ABOUT NDC	<i>Existing mention = 5 measures: C,T&I plan; RenovaBio; Procel; PNMC; Sirene</i>
	<i>Non-existing mention = 8 measures: RES 29/2019 - Expansion of supply and planning of the electrical system; Future Energy Systems Program; Energy Contracting Auctions; Mini Reform of the Electric Sector; Addition of Biodiesel to Diesel; Green Debentures; Mais Luz na Amazônia; Mini and Micro Generation</i>
PARTICIPATION	<i>Level 1 = 12 measures: RES 29/2019 - Expansion of supply and planning of the electrical system; Future Energy Systems Program; Energy Contracting Auctions; Mini Reform of the Electric Sector; RenovaBio; Procel; Addition of Biodiesel to Diesel; Siren; Green Debentures; Mais Luz na Amazônia; Mini and Micro Generation</i>
	<i>Level 2 = 1 measure: PNMC.</i>

• **Notes on implementation:**

Eight out of the thirteen analyzed measures were classified as Level 2, that is, insufficient information was found regarding actions taken, lessons learned and next steps on the policy implementation. Moreover, there is no implementation data for 3 of the analyzed measures (Level 1). Both measures with a satisfactory level of available information (Level 1) are **Procel and the Mais Luz na Amazônia** – programs dedicated to energy efficiency and electrical energy.

In addition to that, as for the auctions, despite containing information about the participants, they have limitations of reported information regarding specific lessons, lacking observations on corrections and changes over the course of the auctions.

- **Notes on effects:**

Regarding the reported effects, we sought to analyze records based on the following aspects: relevance of the initiative in terms of reducing carbon emissions, importance of the initiative in terms of favoring/expanding renewable energies in the energy matrix, effect of the measures in terms of environmental and social improvements. Research shows that 12 out of 13 cases studied have partial or no information about their effects. The social aspect is notably neglected in government documents assessing the initiatives.

Procel is the only initiative in which it is possible to identify information reported by the government in terms of its effects. The reports indicate improvements in terms of carbon emissions, the amount of renewable energy available as an effect of the initiative, along with verified environmental, energy, and social improvements. Furthermore, the available reports are updated annually.⁵⁶ It should be noted that Procel has been in effect since 1985, having gone through a long process of implementation and review since its creation. In the Brazilian biannual report made for the UNFCCC 2020, there is a lot of information about this initiative.

The initiatives **RenovaBio** and **Sirene** were the only ones where it was possible to identify effects in terms of reducing emissions. However, both are not transparent about the social effects resulting from their implementation.

- **Notes on the Mention about NDC:**

Out of all the initiatives listed here, five report the commitments signed in the NDCs, within the scope of the Paris Agreement. However, the analyzed documents do not offer evidence that the initiatives contain differentiated or more ambitious efforts than other measures that do not have any mention – that is, mentioning NDCs does not bring any advantage or disadvantage in the application of the measure for the energy context. The only exception to this analysis is Procel, an example of a measure that deviates from such observed behavior.

- **Notes on Participation:**

In this category, we sought to assess whether the initiatives include mechanisms and obligations related to social participation in their construction and implementation. In the vast majority of measures, such participation is not even foreseen. PNMC is the exception, as there was a legal obligation for social involvement.

Finally, it is worth noting the absence of mechanisms for social participation in the **Mais Luz Amazônia Program**. Available information about its execution attests that “R\$ 114.18 million of resources from the Energy Development Account were released to the executing agents. By

⁵⁶ Updated data can be accessed on the website coordinated by Eletrobras, the state-owned company responsible for executing the program: <http://www.procelinfo.com.br/main.asp?Team=%7B505FF883%2DA273%2D4C47%2DA14E%2D0055586F97FC%7D>

the end of the first half of 2021, the executing agents had registered the service of 460 consumer units with Eletrobras” (Eletrobras, 2022)⁵⁷. Ensuring social participation in the Program would be a fundamental measure to involve the beneficiaries as well as helping to identify issues in the implementation of such important Program.

MAIN FINDINGS:

This section of the report had three main guiding questions which were formulated in the reference document that originated to the present study:

- 1) Does government planning for the energy sector as of 2016 reflect the international commitment made in the Paris Agreement?
- 2) Are there effective, ongoing and consistent transparency mechanisms to verify these measures? Are the Brazilian government's projects easily traceable, both by civil society and by the Convention of the Parties?
- 3) Are there mechanisms for civil society participation in the elaboration of these energy measures?

Throughout the research and given the understanding of the transparency and governance structure involved in the construction and monitoring of the NDC, based on the Paris Agreement, the questions proved to be ambitious and, to a certain extent, even premature.

This is because, as explained in Part I, the Enhanced Transparency Framework (ETF) and the Biannual Transparency Report (BTR) should guide the accountability that should come into effect from 2024 onwards.

In other words, although the NDC should be a guide for the sectoral planning process and for the Climate Change Policy as a whole, there is still an ongoing process of detailing the adherence of policies, plans, sectoral regulations to the NDC and how transparency should be provided throughout this process of implementing the NDC and building the BTR.

This critical qualification does not invalidate the efforts undertaken here. On the contrary, it shows how much progress is needed in the construction of mechanisms of transparency and social participation so that the country has a solid structure of transparency and verification of data and information.

Additionally, given that the NDC is not sectoral, it is essential that the transparency mechanisms ensure the detailing of how the different sectors — and, consequently, the different plans, policies and regulations — are linked and contribute to the achievement of the established goal for the economy as a whole.

⁵⁷ Available at: <https://eletrobras.com/pt/Paginas/Mais-Luz-para-a-Amazonia.aspx#:~:text=Segundo%20Resolu%C3%A7%C3%A3o%20Homologat%C3%B3ria%20da%20Aneel,%2C%20ribeirinhas%2C%20ind%C3%ADgenas%20e%20quilombolas.>

The first effort undertaken here, of selecting 13 initiatives and analyzing the degree of transparency regarding the criteria – implementation, effects, mention of NDC, and participation – demonstrates how relevant the work of building connections between policies, plans and regulation of the energy sector and the NDC is, but also how much institutional effort should the government be responsible for in this construction, which must be done with transparency and social participation.

Critical and affirmative narratives according to specialists

IN ADDITION TO THE SELECTION AND CLASSIFICATION OF THE INITIATIVES DESCRIBED ABOVE, this work included structuring and conducting interviews with experts from the academia and Non-Governmental Organizations (NGOs). It is understood that these specialists's perspectives are essential for civil society to advance in more incisive narratives and more objective propositions towards demanding more effective commitments from governments for a just energy transition.

These interviews included experts from Fundação Getúlio Vargas (FGV), the Department of Energy at the State University of Campinas (Unicamp), the Institute of Energy and the Environment (Iema), and the International Energy Initiative (IEI).

1. CLIMATE GOALS AMBITION

The anticipation of the Brazilian government goals, with 48.4% of renewable energies included in the matrix and a 30.2% increase in the use of biofuels, was a central topic discussed with the specialists, as well as the alignment between energy planning and the configuration of the Brazilian commitments. The anticipated achievement of the goals set for 2030 makes it clear that there is room for **faster growth in the share of renewable energies in the energy mix in a medium term.**

Three of the four interviewees believe that the goals mentioned in the NDC are “not very ambitious” because they understand that they replicate an “easy to achieve” trend projection, considering the country's energy (and

renewable) potential. Criticisms such as “institutional and technological inertia”, “lack of boundaries in planning to meet ambitious goals” and “Brazil’s accommodation” were also highlighted:

- Iema’s specialist: “**Many goals replicate a trend projection that will be easily achieved. Brazil has achieved all of its targets, except for deforestation. But the goals could be much more ambitious, for sure. We have more wind and solar growth capacity than forecasts provided by the EPE**”.
- Unicamp’s specialist: “The Brazilian goals are not very ambitious. But it is pointless to have ambitious goals if we do not **pragmatically plan how they will be met**, with instruments and monitoring capacity. These are modest goals given the enormous potential for renewable energies in Brazil.”
- IEI’s specialist: “[The goals] could be more ambitious... making big changes is undoubtedly not easy, but there is an excessive caution on the part of planners and formulators due to the difficulties of changing the system that is already in place (cost issues, lasting infrastructure, technical capacity, political culture). **There is institutional, technological, human and infrastructure inertia. Lack of ambition and political will.** Part of this is due to the political and economic interests behind this inertia and to a certain lack of bold strategic vision from decision makers — **Brazil is relying a lot on the comfort of the matrix to be, in relation to other countries, very good.**”

As a counter argument, one of the specialists sees the targets as being opportunely efficient, judging Brazil's role in the international scenario in terms of a clean energy matrix. Unlike the aforementioned comments, critical of the timid stance reflected in the goals defined in the NDC, the interviewee believes in an agenda that gives continuity to the current goals with a greater inclusion of biofuels:

- FGV’s specialist: “[Brazil] **has long stood out for its cleaner energy matrix.** Which other big nation stands out like that? Which country consumes coal in a derisory way like Brazil? Where can one find ethanol like there is here? **In the energy mix, we are doing well, but not because of this government, but because of policies from the 1970s....** I understand that the biofuels agenda, instead of increasing, was reduced due to pressure from the oil industry during the pandemic. The government's effort to prioritize this agenda should be stronger”.

2. PARTICIPATION OF BIOFUEL FOSSILS

The **decrease in the share of fossil energies** is a globally faced challenge, which depends on the greater insertion of renewables in the energy matrix and clear and specific limitations for fossils. In the Brazilian context, favoring the fossil industry is still very tangible according to experts:

- Iema’s specialist: “Considering the transport matrix, advances are still meagre. **Brazil has a difficulty to understand what will be prioritized and how, when it comes to the fuel agenda.** The EPE (Energetic Research Company) is open to reducing the share of fossils — by discontinuing expensive and fossil power plants. However, the [political and economic] status quo prefers to promote all sources — including fossils. So there is no direct impediment to fossils.”

- IEl's specialist: "Natural gas has become the government's main bet (fuel that is not renewable). The Eletrobras privatization law affected the scenario of sustainable development because it added about **81% of natural gas thermoelectric generation by 2030**, in comparison to 2019, which, again, is bad as it strengthens the infrastructure that will remain active for decades."

The solution offered by biofuels to reduce dependence on fossils in the area of transport is **also another relevant challenge**. In addition to biofuel offering a less polluting output than fossil fuels, it has the ability to lower costs paid by consumers in purchasing basic inputs. However, to expand the use of biofuels, it is necessary to increase soil management by the agriculture sector, increasing chain emissions:

- FGV's specialist: "There is a central theme [within agriculture and biofuels]: soil management. How can the soil be used to reduce these [agricultural] emissions?...it is important to make improvements in technology to reach advances in this direction."

3. PATHWAYS TO ENERGY PLANNING ALIGNED WITH CLIMATE JUSTICE

What some specialists believe to be the best chance to overcome challenges inherent to the discouragement of fossil sources and towards a more renewable matrix is the integration in sectoral planning. For the energy transition to take place in a more ambitious way, there must be better communication within **urban planning** so that, **in addition to providing less use of fossil sources and limitation of biofuels**, there is also greater integration with civil society to help shape policies more aligned with the principles of climate justice:

- IEl's specialist: "It is important to work on an **integral**, strategic and organized vision of the sectors, in a **transversal intra and intersectoral way**. Intrasectoral in the sense that **the choice of energy resource mix takes place in an integrated resource planning approach** that looks at resources both on the demand and supply sides. Intersectoral in the sense of **effectively coordinated integration of institutions and policies** related to industrial policies, scientific and technological development, education, information and communication, economic planning, as well as social and environmental development. Social participation is fundamental here"
- Iema's specialist: "It is important to go back to an energy transition plan, which does not include the approval of concessions for coal [as noted in the Eletrobras Privatization process]. The plan must be accompanied by temporal markers. Within the market, it can already be observed that it is possible to meet existing energy demands as there is more supply capacity [from non-hydro renewable energy]. **Integrated planning**, including the different areas involved [civil society, involvement of ministries with an impact on urban plans, affected by developments, etc...] in the construction and installation of a project, **can also contribute to an improvement in the implementation of government measures**".

FINAL REMARKS:

The present study started from the assumption that the goals assumed by the Brazilian government must be aligned with energy planning and its various instruments of policies, plans and regulation. Furthermore, it is necessary and fundamental that the government has effective, continuous and consistent transparency mechanisms regarding the alignment between energy and climate policies. Such mechanisms are essential to provide society with a more objective view of the country's efforts both in the commitment and in the fulfillment of the goals voluntarily established under the Paris Agreement.

Part I of this report contextualized the energy sector and its relationship with the NDC, including aspects related to the governance of climate policy and the transparency of the parties in the efforts to reduce emissions as part of the commitments made to the United Nations Framework Convention on Climate Change (UNFCCC). The information gathered in this section of the work brought about the importance of monitoring the Brazilian NDC by civil society and that this work involves, in turn, an effort to understand and follow up the actions of the Interministerial Committee on Climate Change and the Green Growth (CIMV). It is from this Committee that an alignment and better targeting of sectoral policies, plans and regulations is expected, towards achieving the Brazilian climate policy and compliance with the NDC. Transparency with the UNFCCC is, in turn, a requirement and pillar of the Paris Agreement, based on the Enhanced Transparency Framework (ETF). However, for transparency to be effective, it is essential that it include the participation of the Brazilian civil society.

In part II of the work, based on a stricter analysis of the goals reported by the Brazilian government for the energy sector, it was shown that, with the exception of the goal related to obtaining efficiency gains, all other goals were achieved – and even surpassed in 2020. Nowadays, Brazil has a 48.4% renewable energy matrix, in which 84% of electricity generation is renewable, as well as 30% of biofuel in the energy matrix.

However, the present study also demonstrated that the consolidated data of the energy matrix masks serious contradictions of the renewable nature of the Brazilian energy matrix, which were pointed out in Part II. Among these issues, we highlight here:

- The long-term maintenance of a centralized generation model, with a recurrent focus on large-scale hydroelectric expansion in the Amazon plains, disregarding the entire history of technical, economic, and socio-environmental problems that have characterized investments in this alternative, including the high costs for the national interconnected system (SIN) to serve the consumer market, located largely in the Southeast region of the country.
- The expansion of renewable energy sources use, except for hydroelectric plants, in the energy matrix is associated, in particular, with the increase in the supply of sugarcane biomass and biodiesel, notably derived from soybeans, with non-negligible, scarcely measured, effects

in relation to environmental and socio-environmental impacts, but also in terms of indirect emissions associated with the energy sector and linked to the agricultural sector and changes in land use (deforestation).

Thus, the analysis of the NDC carried out in Part II of the work made it clear that the country has a relatively low ambition in terms of changing the trajectory of emissions associated with this sector. Furthermore, the report called for the need for a more critical reflection about the limits of an analysis focused on the strict fulfillment of the goals foreseen for the energy sector. In this direction, the importance of a more in-depth debate on the connections between emissions from the energy sector in interaction with other sectors, especially when it comes to land usage, was underscored; and, more broadly, the need to problematize the country's potential and effective efforts towards the energy transition.

In Part III, we sought to identify, classify, and analyze federal government initiatives related to energy policies that are more directly correlated with the commitments assumed under the Paris Agreement. To this end, the selection and assessment of **thirteen initiatives** was part of the work, which were considered here as the most relevant for the analysis of energy policies in its correlation with the NDC. The first effort undertaken here demonstrates how relevant the work of building connections between the policies, plans, and regulations of the energy sector and the NDC is, but also how much institutional effort the government must undertake in this construction, which must be done with transparency and social participation.

In Part IV, the commentary from academic experts and NGOs representatives specialized in the subject surfaced, as a main finding, the notion that the anticipated fulfillment of goals set for 2030 leaves room for a **potential and necessary growth in the share of renewable energies, except hydroelectric, in the energy matrix in the medium term.**

Finally, **considering that:**

- for the energy-related goals in the NDC annex can be the subject of demand for more ambition, it is essential that the entire NDC compliance process is more transparent and open to society;
- the country should assume a higher level of ambition in its NDC;
- there is a challenge to be faced, which is the greater connection between the NDC and sectoral planning processes, such as the Ten-Year Energy Plans (PDE), medium-term planning of the federal government through the Pluriannual Government Plan (PPA) — and the various policies, programs, financial instruments, among others, linked to the various Plans; and
- an Enhanced Transparency Framework (ETF) for Brazil's accountability to the UNFCCC should consider transparency and social participation at the domestic level.

It is recommended that:

- 1) the **Interministerial Committee on Climate Change and Green Growth** (CIMV) formally define the instance of social participation in the construction of the **national strategy for the implementation of the United Nations Framework Convention on Climate Change and the Paris Agreement**, which is today under the responsibility of the GT-NDC, coordinated by the Ministry of the Environment⁵⁸;
- 2) the federal government inaugurate, as of 2023, a broad process of listening to specialists and of social participation for the construction of the **“National Strategy for Climate Neutrality”**;
- 3) **the Federal Audit Court** (TCU) oversees the federal government actions for the implementation of the Paris Agreement, focusing on monitoring the CIMV, since it is part of the scope of this Court's work to assess the federal government initiatives with a view to both the improvement of the climate governance policy and structure;
- 4) civil society organizations build, through the **Climate Observatory**, in a collaborative way and based on the high and diverse specialties of the organizations that comprise it, a proposal for an Enhanced Transparency Structure (ETF), based on the guidelines established by the UNFCCC, that takes into account the specificities of the country.

58 According to Article 2, item III of Decree 10.845/2021, which established the CIMV. The CIMV documents are available at: <https://www.gov.br/casacivil/pt-br/assuntos/comite-interministerial-sobre-mudanca-do-clima/atas>

REFERENCES

Angelo, Claudio, and Carlos Ritll. “Análise Das Emissões Brasileiras de Gases de Efeito Estufa E Suas Implicações Para as Metas Climáticas Do Brasil.” Seeg.eco.br. Observatório do Clima, 2021. <https://seeg.eco.br/documentos-analiticos>.

Altemani, Henrique, and Lessa, Antônio Carlos. *Relações Internacionais Do Brasil : Temas E Agendas*. Vol. 2. Saraiva, 2012.

Brasil A - Ministério de Minas e Energia / Empresa de Pesquisa Energética. *Plano Nacional de Energia 2050*. Brasília: MME/EPE, 2020.

Brasil B - Ministério de Minas e Energia / Empresa de Pesquisa Energética. *Balanco Energético Nacional 2021 - Relatório Síntese - Ano base 2020*. Brasília: MME/EPE, 2020.

Brasil C - Ministério de Minas e Energia / Empresa de Pesquisa Energética. *Balanco Energético Nacional 2021 - Relatório Completo - Ano base 2020*. Brasília: MME/EPE, 2020.

Brasil D - “Fourth Biennial Update Report of Brazil to the United Nations Framework Convention on Climate Change.” Brasília: Ministry of science, technology and innovations, 2020. <https://unfccc.int/sites/default/files/resource/BUR4.Brazil.pdf>

Brasil - Ministério de Minas e Energia / Empresa de Pesquisa Energética. *Plano Decenal de Energia 2027*. Brasília: MME/EPE, 2018.

Brasil E - Ministério do Meio Ambiente. *Diretrizes para uma estratégia nacional para neutralidade climática*. Brasília: 2021. <https://www.gov.br/mma/pt-br/diretrizes-para-uma-estrategia-nacional-para-neutralidade-climatica.pdf/#:~:text=%2D%20reduzir%20o%20desmatamento%20ilegal%2C%20a,o%20desmatamento%20ilegal%20em%202028>

Bertassoli, Dailson J., Henrique O. Sawakuchi, Kleiton R. de Araújo, Marcelo G. P. de Camargo, Victor A. T. Alem, Tatiana S. Pereira, Alex V. Krusche, David Bastviken, Jeffrey E. Richey, and André O. Sawakuchi. “How Green Can Amazon Hydropower Be? Net Carbon Emission from the Largest Hydropower Plant in Amazonia.” *Science Advances* 7, no. 26 (June 25, 2021). <https://doi.org/10.1126/sciadv.abe1470>.

Damasio, Kevin. “Ribeirinhos Deslocados Pela Usina de Belo Monte Ainda Aguardam Moradia.” *National Geographic*, September 16, 2019. <https://www.nationalgeographicbrasil.com/fotografia/2019/09/ribeirinhos-deslocados-pela-usina-de-belo-monte-ainda-aguardam-moradia>.

CIDSE. “The Climate Urgency: Setting Sail for a New Paradigm.” *Cidse.org*. Brussels, Belgium, 2018. <https://www.cidse.org/2018/09/19/the-climate-urgency-setting-sail-for-a-new-paradigm/>

Cunha, Denise de Andrade, and Leandro Valle Ferreira. "Impacts of the Belo Monte Hydroelectric Dam Construction on Pioneer Vegetation Formations along the Xingu River, Pará State, Brazil." *Brazilian Journal of Botany* 35, no. 2 (2012): 159–67. <https://doi.org/10.1590/s1806-99592012000200005>.

DIEESE. 2021. "Nota Técnica: Privatização Da Eletrobras: Risco Para a Soberania Energética Do País." Dieese. www.dieese.org.br/notatecnica/2021/notaTec258Eletrobras.pdf.

DUTRA, Ricardo Marques; SZKLO, Alexandre Salem. A energia eólica no Brasil: Proinfa e o novo modelo do Setor Elétrico. In: *Anais do XI Congresso Brasileiro de Energia-CBE*. 2006. p. 842-868.

EPE. "Matriz Energética E Elétrica - Empresa de Pesquisa Energética." Epe.gov.br. EPE. 2019. <https://www.epe.gov.br/pt/abcdenergia/matriz-energetica-e-eletrica>.

Esposito, Alexandre Siciliano. O setor elétrico brasileiro e o BNDES: reflexões sobre o financiamento aos investimentos e perspectivas. Banco Nacional do Desenvolvimento Econômico e Social. Brasília: 2012.

Instituto de Estudos Socioeconômicos (INESC). Brasil ampliou subsídios a combustíveis fósseis em 2020, diz instituto (2020). [online] <https://www1.folha.uol.com.br/ambiente/2021/11/brasil-ampliou-subsidios-a-combustiveis-fosseis-em-2020-diz-instituto.shtml>

Independent Statistics and Analysis - U.S. Energy Information Administration (EIA) (2016). Mexico - Executive Summary. [online] Eia.gov. <https://www.eia.gov/international/analysis/country/MEX>.

Farias, Vitor Guilherme Lemos, Gabriel Pereira Lima, Maria José de Holanda Leite, Auderio Tiago Gomes Cavalcante, Ana Claudia Monteiro Silva, Ana Caroline de Almeida Moura, Daniel Lucas Henrique Macedo, José Sales Santos Netto, Vinícius Cezar Alves Gomes, and Roberta Mota Cavalcante. "Socio-Environmental Impacts Caused by Hydroelectric Dams in Northeastern Brazil." *Brazilian Journal of Development* 5, no. 11 (2019): 22846–53. <https://doi.org/10.34117/bjdv5n11-018>.

Ferreira, Carlos Kawall Leal. Privatização do setor elétrico no Brasil. In: Pinheiro, Armando Castelar; FUKASAKU, Kiichiro (Ed.). *A privatização no Brasil: o caso dos serviços de utilidade pública*. Rio de Janeiro: Banco Nacional de Desenvolvimento Econômico e Social, 2000. p. [179]-220.

Laurance, W.F., Peletier-Jellema, A., Geenen, B., Koster, H., Verweij, P., Van Dijck, P., Lovejoy, T.E., Schleicher, J. & M. Van Kuijk (2015) Reducing the global environmental impacts of rapid infrastructure expansion. *Current Biology* 25: R1-R5.

Lorenzo, Helena Carvalho. O setor elétrico brasileiro: passado e futuro. *Perspectivas: Revista de Ciências Sociais*, 2001.

Neto, Pedro Bara. Expansão elétrica e energética: avanços, riscos e limitações das trajetórias propostas. Monitorando a NDC brasileira sob o presidente Bolsonaro. INESC - Instituto de Estudos Socioeconômicos; Brasília. 2021.

Nitta, R. and Naka, L.N. (eds.), 2015. Barragens do rio Tapajós: Uma avaliação crítica do Estudo e Relatório de Impacto Ambiental (EIA/RIMA) do Aproveitamento Hidrelétrico São Luiz do Tapajós. Greenpeace Brasil, São Paulo, SP, Brazil. 99 pp. <http://greenpeace.org.br/tapajos/docs/analise-EIA-rima.pdf> (accessed 14.06.16).

Nordhaus, William D. 2015. *The Climate Casino: Risk, Uncertainty, and Economics for a Warming World*. New Haven, Con.: Yale University Press; New Haven.

Observatório do Clima (A). “Emissões Do Brasil Sobem 10% No 1o Ano de Bolsonaro.” Observatório do Clima, March 22, 2021. <https://www.oc.eco.br/emissoes-brasil-sobem-10-no-1o-ano-de-bolsonaro/>.

Observatório do Clima (B). “Na Contramão Do Mundo, Brasil Aumentou Emissões Em Plena Pandemia.” Observatório do Clima, November 1, 2021. <https://www.oc.eco.br/na-contramao-do-mundo-brasil-aumentou-emissoes-em-plena-pandemia/>.

Observatório do Clima (C). “Investimento Em Energia Limpa Precisa Triplicar Nesta Década, Diz Agência.” Observatório do Clima, 2021. <https://www.oc.eco.br/investimento-em-energia-limpa-precisa-triplicar-nesta-decada-diz-agencia/>.

Piatto, Mariana, and Gabriel Quintana. “Observatório Do Clima | Plano ABC Ganha Nova Fase, Mas Permanece Com 1% Do Plano Safra.” Observatório do Clima, 2021. <https://www.oc.eco.br/plano-abc-ganha-nova-fase-mas-permanece-com-1-do-plano-safra/>.

Peixer, Janaína Freiberg Benkendorf. *A contribuição nacionalmente determinada do Brasil para cumprimento do Acordo de Paris: metas e perspectivas futuras*. Tese (doutorado) - Universidade Federal de Santa Catarina, Centro de Ciências Jurídicas, Programa de Pós-Graduação em Direito, Florianópolis, 2019.

Rennkamp, Britta; Westin, Fernanda Fortes & Grottera, Carolina. *Política de conteúdo local e incentivos financeiros no mercado de energia eólica no Brasil*. Repositório de casos sobre o Big Push para a Sustentabilidade no Brasil. Comissão Econômica para América Latina e Caribe – CEPAL, 2020. <https://biblioguias.cepal.org/c.php?g=981128&p=7143451>

Ruviano, Eduardo Antunes; Grossmann, Elias. *A importância da estrutura de transparência aprimorada prevista no Acordo de Paris para o avanço da governança climática*. PUC/RS, 2021. https://www.pucrs.br/direito/wp-content/uploads/sites/11/2021/08/eduardo_ruviano.pdf

Santos, Gustavo Antônio Galvão dos, Eduardo Kaplan Barbosa, José Francisco Sanches da Silva, Ronaldo da Silva de Abreu . *Por que as tarifas foram para os céus? Propostas para o setor elétrico brasileiro*. Revista do BNDES, Rio de Janeiro, v. 14, n. 29, p. 435-474. 2008.

Souza-Cruz-Buenaga FVA, Espig SA, Castro TLC, Santos MA. *Environmental impacts of a reduced flow stretch on hydropower plants*. *Braz J Biol* 2019;79: 470–87.

Schlosberg, David, and Lissette B. Collins. "From Environmental to Climate Justice: Climate Change and the Discourse of Environmental Justice." *Wiley Interdisciplinary Reviews: Climate Change* 5, no. 3 (February 22, 2014): 359–74. <https://doi.org/10.1002/wcc.275>.

Victor, David G. 2011. *Global Warming Gridlock: Creating More Effective Strategies for Protecting the Planet*. Cambridge, UK: Cambridge University Press.

Kuriqi, Alban, António N. Pinheiro, Alvaro Sordo-Ward, María D. Bejarano, and Luis Garrote. "Ecological Impacts of Run-of-River Hydropower Plants—Current Status and Future Prospects on the Brink of Energy Transition." *Renewable and Sustainable Energy Reviews* 142 (May 2021): 110833. <https://doi.org/10.1016/j.rser.2021.110833>.

Unterstell & Martins, 2022. *NDC do Brasil: Avaliação da atualização submetida à UNFCCC em 2022. Nota Técnica*. Rio de Janeiro, Brasil. TALANOA, 2022. www.institutotalanoa.org/documentos

Wu, Haipeng, Jin Chen, Jijun Xu, Guangming Zeng, Lianhai Sang, Qiang Liu, Zhengjie Yin, et al. "Effects of Dam Construction on Biodiversity: A Review." *Journal of Cleaner Production* 221 (June 2019): 480–89. <https://doi.org/10.1016/j.jclepro.2019.03.001>.

ANNEX I – CLASSIFICATION OF INITIATIVES ACCORDING TO ESTABLISHED CRITERIA

1. Implementation

NAME OF MEASURE	CLASSIFICATION	JUSTIFICATION
<i>RESOLUTION No. 29, OF DECEMBER 12, 2019 - Expansion of the supply and planning of the electrical system</i>	<i>Level 2</i>	<i>There is data available on next steps. There is a record of the meeting in which the resolution was discussed by the National Energy Policy Council. There is also Order No. 59/2020, which provides information regarding the implementation of the measure.</i>
<i>Future Energy Systems Program</i>	<i>Level 1</i>	<i>There is not enough information available to determine what has been implemented. There is only one document that explains what the measure is about, but there is no evidence of its implementation. There is an estimated budget of € 15,700,000 to be used by 2024.</i>
<i>Science, technology and innovation plan for renewable energy and biofuels</i>	<i>Level 2</i>	<i>Data available on activities carried out as well as next steps. There is information on the actions and implementation strategies in the main report of the measure, but there is also information on Public Consultation SETEC/MCTIC nº 04/2018. In addition t that, the measure proposes to work with other measures previously adopted, such as the National Support Program for the Generation of Innovative Enterprises -Centelha Program; National Support Program for Business Incubators and Technological Parks (PNI), among others. However, there is no information on all the actions taken so far.</i>
<i>Energy Contracting Auctions</i>	<i>Level 2</i>	<i>Data available on activities carried out and next steps. There are complete reports on the Aneel website with all the processes and protocols relevant to each auction. Steps taken according to Brazil's fourth biannual update report: from 2018 to 2019, 4 auctions of different formats were held, which included the insertion of solar generation, biomass, and wind energy, among other sources. Effectiveness of the regulatory framework for distributed generation.</i>
<i>LAW No. 14,120, OF MARCH 1, 2021 - MPV 998/2020 - Mini Electricity Sector Reform</i>	<i>Level 2</i>	<i>Data available on some activities carried out to regulate the Law, e.g. Public Consultation No. 078/2020 to receive suggestions from society on the future standard that will allocate unused Research and Development (R&D) and Energy Efficiency resources. In the presented format of the Law that amends other legal norms relevant to the electricity sector, there is no report with the activities implemented after the publication of the text. In addition to that, all processes have been treated separately, a factor that makes it difficult to understand what has and has not been implemented so far.</i>

<p><i>Law No. 13.576/2017 - RenovaBio</i></p>	<p><i>Level 2</i></p>	<p><i>Data available on activities carried out in the biannual report and on other websites.</i></p> <p><i>Implementation of a series of decrees that make up important guidelines for the operation of the policy, such as the establishment of mandatory targets, registration rules for decarbonization credits, and the creation of technical groups.</i></p>
<p><i>LAW No. 13,280, OF MAY 3, 2016 - Procel</i></p>	<p><i>Level 3</i></p>	<p><i>Data available on all activities carried out, with data on lessons learned and next steps.</i></p> <p><i>Information available in annual reports, with data on the actions implemented, lessons learned, and the next steps of the measure.</i></p>
<p><i>LAW No. 13,263, OF MARCH 23, 2016 - Addition of Biodiesel to Diesel</i></p>	<p><i>Level 2</i></p>	<p><i>Data available on activities carried out and next steps. There is the publication of a Resolution 16/2018, which precedes the Law taken within the scope of the CNPE, including other rules adopted by the ANP - ANP Resolution No. 798, of 2019.</i></p> <p><i>Besides, it is worth highlighting the information available on the implementation of the measure in Brazil's fourth biannual update report: Law No.13.263/2016 establishes as mandatory addition percentages be 8% up to 12 months after the date of enactment of this Law; 9% within 24 months after the enactment of this Law; 10% within 36 months after the enactment of this Law. As of 2019, the addition of biodiesel can reach 15% after tests and trials have been carried out on engines.</i></p>
<p><i>LAW No. 12,187, OF DECEMBER 29, 2009 - National Policy on Climate Change</i></p>	<p><i>Level 2</i></p>	<p><i>Data available on activities carried out within the biannual report, including the installation of various committees to carry out sectoral studies.</i></p> <p><i>Among the instruments provided for in the PNMC are the National Plan on Climate Change; the National Climate Change Fund; the Action Plans for the Prevention and Control of Deforestation – Amazon, Cerrado; Plans for Mitigation and Adaptation for Agriculture, Energy and Coal, as well as Brazil's National Communication to the UNFCCC. Also included as policy instruments, among others, are the resolutions of the Interministerial Climate Committee (CIM), the use of fiscal and tax measures, lines of credit and financing, lines of research by development agencies and financial and economic measures related to mitigation and adapting to climate change.</i></p>
<p><i>DECREE No. 9,172, OF OCTOBER 17, 2017 - Sirene</i></p>	<p><i>Level 2</i></p>	<p><i>Data available on activities carried out. Available reports on carbon dioxide emission factors for electricity distributed by the National Interconnected System. The measure is seen as an instrument of the PNCM.</i></p>
<p><i>DECREE No. 10,387, OF JUNE 5, 2020 - Green Debentures</i></p>	<p><i>Level 1</i></p>	<p><i>There is not enough information available to determine what has been implemented. There is information only on the publication of the Decree, which serves to update a Decree edited during Michel Temer's administration.</i></p>

Decree No. 10,221, of February 5, 2020 – Mais Luz na Amazônia	Level 3	Data available on all activities carried out, with data on lessons learned and next steps. Data available on activities carried out, including the publication of ANEEL Resolution REN - 940/202, which regulates the measure and the publication of Ordinance No. 86/GM, of March 9, 2020 - Designating Centrais Elétricas Brasileiras S.A. - Eletrobras as the Program's Operational Body. All other actions are available on the website: https://eletrobras.com/pt/Paginas/Mais-Luz-para-a-Amazonia.aspx#:~:text=Segundo%20Resolu%C3%A7%C3%A3o%20Homologat%C3%B3ria%20da%20Aneel,%20%20ribeirinhas%2C%20ind%C3%ADgenas%20e%20quilombolas
RESOLUTION No. 15, OF DECEMBER 9, 2020 - Mini and Micro Generation	Level 1	There is not enough available information to determine what has been implemented.

2. Effects

NAME OF MEASURE	CLASSIFICATION	JUSTIFICATION
RESOLUTION No. 29, OF DECEMBER 12, 2019 - Expansion of the supply and planning of the electrical system	Level 2	Available effects on energy aspects, but there is no information on environmental or social aspects. Metrics and Parameters of the General Supply Assurance Criteria have been published.
Future Energy Systems Program	Level 1	There is little information on the effects of the measure.
Science, technology and innovation plan for renewable energy and biofuels	Level 1	Despite having established targets for reducing emissions within the plan, there is no information on its final results.
Energy Contracting Auctions	Level 2	The available data contain information on installed capacity by source after contracting renewable and fossil energy provided for in the auctions. However, there is no information on socio-environmental effects in the ANEEL surveys (information on the environmental licensing of each project is not the focus of the auction or seen as a priority). Increase of 498 MW of Installed Capacity for Small Hydroelectric Plants in the period from 2018 to 2019 and Increase of 3,346 MW of Installed Capacity of Solar Photovoltaic Plants in the period from 2018 to 2019.

<p>Law No. 14,120, OF MARCH 1, 2021 - MPV 998/2020 - Mini Electricity Sector Reform</p>	<p>Level 2</p>	<p>Available effects on energy aspects. However, it is not possible to verify all the effects of the measure, especially those related to socio-environmental effects.</p> <p>Immediate effects after the publication of the Provisional Measure: (i) non-collection of fees for the return of loans from the Global Reversion Reserve - RGR carried out during the temporary service provision phase by Eletrobras companies; (ii) the use of RGR funds to indemnify part of the assets of the distributors that were already in operation at the time of privatization and that had not been accounted for; (iii) improvement in the criteria for establishing the Fuel Consumption Account - CCC for these distributors, representing a reduction in the average generation cost charged and, consequently, in fees; and (iv) improvement in the criteria for collecting the CDE charge, so that consumers in the states of Acre and Rondônia have the same charge as other consumers in the North Region.</p> <p>The Law established the extension, for another 20 years, of the contracts signed in the sphere of the Incentive Program for Alternative Sources of Electric Energy (Proinfa). Among the results of the program are: 119 projects have an installed capacity of 2,649.87 MW, comprising 963.99 MW in wind farms, 1,152.54 MW in PCHs and 533.34 MW in biomass plants. The electricity generated annually by these plants is enough to supply the equivalent of about 4.5 million Brazilians or three cities the size of Recife.</p>
<p>Law No. 13.576/2017 - RenovaBio</p>	<p>Level 2</p>	<p>Available effects on environmental and energy or social aspects. After verification by the ANP of the data related to the achievement of the goals for the years 2019-2020 of Renovabio, it was found that 14,535,334 Carbon Credits (CBIOs) were retired by fuel distributors until 12/31/20, corresponding to 97 .6% of the mandatory annual target for reducing greenhouse gas emissions set by the CNPE for the reference years. Evidence of individual 2019-2020 goal by fuel distributor available at this link: 2019-2020 Target Compliance Report by fuel distributor. Supply records of 68,400,000 m³ of Ethyl Alcohol added to the fuel matrix in the period from 2018 to 2019.</p>

<p><i>Law No. 13.280, of May 3, 2016 - Procel</i></p>	<p><i>Level 3</i></p>	<p><i>Available effects on carbon emissions, amount of renewable energy available as an effect of this measure. Environmental, energy and social improvements verified. Available reports are updated annually with positive social, environmental and energy effects. The accumulated results of Procel in the period from 1986 to 2020 indicate total energy savings in the order of 195.2 billion kWh. In the same period, investments in the program totaled R\$ 3.47 billion.</i></p> <ul style="list-style-type: none"> <i>• The global energy results achieved by the program are mainly due to the Procel Energy Saving Seal, established in 1993. The popularization of this communication tool on the most efficient and economical equipment and home appliances, over the years, indicates the emphasis that has been given to the end consumer.</i> <i>• Based on market estimates and application of specific methodologies for evaluating results, it is estimated that, in 2020, Procel will have achieved energy savings of approximately 22.02 billion kWh. Such saved energy helped the country to avoid the release into the atmosphere of 1.36 million tCO₂ equivalent</i>
<p><i>Law No. 13.263, of March 23, 2016 - Addition of Biodiesel to Diesel</i></p>	<p><i>Level 2</i></p>	<p><i>Available effects on energy aspects. There is evidence regarding the blending energy target in the biannual report: Supply of 11,274,000 m³ of Biodiesel added to the fuel matrix in the period from 2018 to 2019. However, there is no evidence on the environmental and social effects.</i></p>
<p><i>Law No. 12.187, of December 29, 2009 - National Policy on Climate Change</i></p>	<p><i>Level 1</i></p>	<p><i>Despite being an ongoing policy, as reported in the biannual report, there is no information on improvements in the electricity or fuel sector linked to the implementation of the PNMC. There are advances in terms of collecting information, including information on socio-environmental challenges, but there is no factor that links results to the functioning of the policy and the information it gathers.</i></p>
<p><i>Decree No. 9.172, of October 17, 2017 - Sirene</i></p>	<p><i>Level 2</i></p>	<p><i>Available effects on energy aspects. Available information on carbon emissions in an integrated way, allowing an improvement in the vision of the sectors that need to reduce the carbon incidence linked to each segment. However, there is no information on the effects of these emissions on society or the environment.</i></p>
<p><i>Decree No. 10.387, of June 5, 2020 - Green Debentures</i></p>	<p><i>Level 1</i></p>	<p><i>There is not enough information available to understand the results.</i></p>

Decree No. 10.221, of February 5, 2020 - Mais Luz na Amazônia	Level 2	<p>Available effects on energetic and social aspects. According to Aneel Homologatory Resolution No. 2,891/2021, the initial goal of the Mais Luz para a Amazônia Program is to bring clean and renewable electricity to 219.221 families in communities that are mostly riverside, indigenous, and quilombola.</p> <p>In 2020, nine Terms of Commitment were signed between the MME and the Executing Agents, with the establishment of service goals for each unit of the federation, totaling more than 30 thousand generation systems.</p> <p>The first contracts operated by Eletrobras were signed at the beginning of 2021, and at the end of the first half of the year, planned investments totaled R\$422.90 million, of which R\$380.61 million (90%) refer to resources from the Energy Development Account – CDE.</p> <p>Pursuant to the Program's regulations, R\$ 114.18 million of CDE resources have already been released to the executing agents. At the end of the first half of 2021, the executing agents had registered the service of 460 consumer units with Eletrobras.</p>
RESOLUTION No. 15, OF DECEMBER 9, 2020 - Mini and Micro Generation	Level 1	There is not enough information available to understand the results.

3.Mention about NDC

NAME OF MEASURE	CLASSIFICATION	JUSTIFICATION
RESOLUTION No. 29, OF DECEMBER 12, 2019 - Expansion of the supply and planning of the electrical system	Non-existing Mention	-
Future Energy Systems Program	Non-existing mention	-
Sciences, Technology, and Innovation plan for renewable energy and biofuels	Existing mention	<p>There are mentions, in certain format.</p> <p>To achieve the NDC goals, some pathways were traced: (i) increasing the share of sustainable bioenergy in its energy matrix to approximately 18% by 2030; (ii) restoring and reforesting 12 million hectares of forests; and (iii) achieving an estimated share of 45% of renewable energies in the composition of the energy matrix in 2030, aiming at expanding the use of renewable sources, in addition to hydraulics, to levels between 28% and 33% in the energy matrix and at least 23% in the electrical matrix, with an increase in the share of wind, biomass, and solar energies.</p>

Energy Contracting Auctions	Non-existing mention	No concerns over mentioning NDCs. Auctions are used as instruments to meet the Brazilian government's goals and are included in the government's biannual report.
LAW No. 14,120, OF MARCH 1, 2021 - MPV 998/2020 - Mini Electricity Sector Reform	Non-existing mention	-
Law No. 13.576/2017 - RenovaBio	Existing mention	There are mentions, in a certain format: It mentions the commitments signed in the Paris Agreement: Art. 1 The National Biofuels Policy (RenovaBio) is established, an integral part of the national energy policy referred to in art. 1 of Law No. 9,478, of August 6, 1997, with the following objectives: I - to contribute to meeting the country's commitments under the Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC)
Law No. 13.280, of May 3, 2016 - Procel	Existing mention	There are mentions, in certain format. p. 40 of the Final Result Report (http://www.procelinfo.com.br/main.asp?View=%7B5A08CAF0-06D1-4FFE-B335-95D83F8DFB98%7D&Team=&params=itemID=%7B692C8EE2-0F26-4806-9A14-19F19B11DF76%7D;&UIPartUID=%7B05734935-6950-4E3F-A182-629352E9EB18%7D) The project considers the need to identify a set of detailed alternatives to enable the intended gains by 2030 in the areas of electricity and fuels, based on the macroeconomic and energy efficiency scenarios established in the most recent Ten Year Energy Expansion Plan (PDE 2029). Another fundamental element is the need for an instrument to manage and define the contribution to be achieved by energy efficiency programs in two commitments assumed by Brazil: the Sustainable Development Goals (SDGs) and the Nationally Determined Contributions (NDCs).
Law No. 13.263, of March 23, 2016 - Addition of Biodiesel to Diesel	Non-existing mention	-
Law No. 12.187, of December 29, 2009 - National Policy on Climate Change	Existing mention	There are mentions, in a certain format: IV of the Law: - monitor the implementation of the NDC presented by the country in the context of the Paris Agreement, and activities of transparency and provision of information, in compliance with the decisions of the UNFCCC.
Decree No. 9.172, of October 17, 2017 - Sirene	Existing mention	There are mentions, in certain format: The law that created the Sirene system mentions the government's adequacy to the National Communication of Brazil and other reports prepared for the United Nations Framework Convention on Climate Change, in accordance with the criteria established by that Framework Convention and by its Conferences of the Parties, which include the National Inventory of Anthropogenic Emissions by Sources and Removals by Sinks of Greenhouse Gases Not Controlled by the Montreal Protocol.

Decree No. 10.387, of June 5, 2020 - Green Debentures	Non-existing mention	-
Decree No. 10.221, of February 5, 2020 - Mais Luz na Amazônia	Non-existing mention	-
RESOLUTION No. 15, OF DECEMBER 9, 2020 - Mini and Micro Generation	Non-existing mention	-

4. Participation

NAME OF MEASURE	CLASSIFICATION	JUSTIFICATION
RESOLUTION No. 29, OF DECEMBER 12, 2019 - Expansion of the supply and planning of the electrical system	Level 1	<i>There was no participation of those mostly affected by the measure.</i>
Future Energy Systems Program	Level 1	<i>There was no participation of those mostly affected by the measure.</i>
Sciences, Technology, and Innovation plan for renewable energy and biofuels	Level 1	<i>There was no participation of those mostly affected by the measure. The main document mentions an excerpt on Articulation with Partners, referring especially to representatives of the productive chains, companies, Science and Technology Institutions (ICT), but not the communities affected by the positive or negative effects of the measure.</i>
Energy Contracting Auctions	Level 1	<i>There was no participation of those mostly affected by the measure. A discussion on the socio-environmental impact of each enterprise in the environmental licensing process, prior to the auction, is assumed. However, information is not readily available and it is not possible to check the mandatory discussion with those affected by the enterprise in the process.</i>

<p>LAW No. 14,120, OF MARCH 1, 2021 - MPV 998/2020 - Mini Electricity Sector Reform</p>	<p>Level 1</p>	<p><i>There was no participation of those mostly affected by the measure. However, as it is the result of a Provisional Measure, the matter received different influences from sectors of the economy in the energy sector within the National Congress. Usually, the most influential groups are able to implement more changes that favor their segments more quickly and concretely to the detriment of the rights of societies affected by the effects of these changes.</i></p>
<p>Law No. 13.576/2017 - RenovaBio</p>	<p>Level 1</p>	<p><i>There was no participation of those mostly affected by the measure. Below is a list of actors who were involved in the public consultation and hearing processes on the policy: ABEGAS, ABIOGAS, ABIOVE, ABIQUIM, ABRAVERI, ABS GROUP SERVICES DO BRASIL, APROBIO, ANFAVEA, Brazilian Association of Airlines, Atvos Agroindustrial S.A, BENRI, BFF, Biosul, BRASKEM S.A, CIBIOGÁS, Contributions forwarded by MME, CONTROL UNION, EMBRAPA, GEOFLORESTAS, Brazilian Institute of Oil, Gas and Biofuels (IBP), INMETRO, Instituto Totum de Desenvolvimento e Gestão Empresarial Ltda, LATAM Airlines Brasil, LOGUM, Non-institutional, PASys, PBio, Petrobras, Plural, PwC, SEDECTES/MG - suggestions, SEDECTES/MG - request for inclusion of macaúba, SGS ICS Certificadora Ltda, SIAMIG, Sindipeças, SIFAEG, SINDALCOOL(MT), TechBio Consultoria Ltda, Ubrabio, UNEM, UNICA</i></p>
<p>Law No. 13.280, of May 3, 2016 - Procel</p>	<p>Level 1</p>	<p><i>There was no participation of those mostly affected by the measure. There is, however, the participation of different sectors of the economy (with lobbying and relevant influence) included as partners in the measure: National Confederation of Industry (CNI); National Service for Industrial Apprenticeship (Senai); Brazilian Association for the Compliance and Efficiency of Facilities (Abrinstal); Brazilian Association of Large Industrial Energy Consumers and Free Consumers (Abrace); Driving Systems Optimization Laboratories, from the Federal University of Campina Grande (UFCG); among others; AngloAmerican; Aperam; ArcelorMittal Tubarão; CSN Cimentos; CSN Siderurgia; Gerdau; Nexa Juiz de Fora; Nexa Três Marias; Oxiteno; Rima; Suzano; Vallourec</i></p>
<p>Law No. 13.263, of March 23, 2016 - Addition of Biodiesel to Diesel</p>	<p>Level 1</p>	<p><i>There was no participation of those mostly affected by the measure. However, there is lobbying work behind the measure, by the Vegetable Oil Industry, which enabled the government's decision-making process.</i></p>

<p>Law No. 12.187, of December 29, 2009 - National Policy on Climate Change</p>	<p>Level 2</p>	<p><i>Legal obligation to have the participation of communities affected by the policy. However, despite the existence of a legal determination, there is no evidence that proves that communities participated in the different phases of implementation of the measure.</i></p> <p><i>Art. 3 The PNMC and the actions resulting from it, carried out under the responsibility of political entities and public administration entities, will observe the principles of precaution, prevention, citizen participation, sustainable development and that of common but differentiated responsibilities, the latter in international scope, and, regarding the measures to be adopted in its execution, the following will be taken into account:</i></p> <p><i>I - everyone has a duty to act, for the benefit of present and future generations, to reduce the impacts resulting from human interference on the climate system;</i></p> <p><i>II - Measures will be taken to foresee, avoid or minimize the identified causes of climate change with anthropic origin in the national territory, on which there is a reasonable consensus on the part of the scientific and technical circles engaged in the study of the phenomena involved;</i></p> <p><i>III - the measures must take into account the different socio-economic contexts in which they are applied, distribute the resulting burdens and burdens between economic sectors and the populations and communities concerned in an equitable and balanced manner, and weigh individual responsibilities as to the origin of the emitting sources and the effects caused on the climate;</i></p> <p><i>IV - sustainable development is the condition for facing climate change and reconciling meeting the common and particular needs of populations and communities living in the national territory;</i></p> <p><i>V - national actions to face current, present, and future climate change must consider and integrate the actions promoted at the state and municipal levels by public and private entities;</i></p>
<p>Decree No. 9.172, of October 17, 2017 - Sirene</p>	<p>Level 1</p>	<p><i>There was no participation of those mostly affected by the measure.</i></p>
<p>DECREE No. 10,387, OF JUNE 5, 2020 - Green Debentures</p>	<p>Level 1</p>	<p><i>There was no participation of those mostly affected by the measure.</i></p> <p><i>There is no information available on social participation in the construction of this policy.</i></p>
<p>Decree No. 10.221, of February 5, 2020 - Mais Luz na Amazônia</p>	<p>Level 1</p>	<p><i>There was no participation of those mostly affected by the measure.</i></p> <p><i>However, it is a measure aimed at the affected communities. According to Aneel Homologatory Resolution No. 2,891/2021, the initial goal of the Mais Luz na Amazônia Program is to bring clean and renewable electricity to 219.221 families in communities that are mostly riverside, indigenous and quilombola.</i></p>
<p>RESOLUTION No. 15, OF DECEMBER 9, 2020 - Mini and Micro Generation</p>	<p>Level 1</p>	<p><i>There was no participation of those mostly affected by the measure.</i></p> <p><i>However, there is lobbying work behind the measure, from the photovoltaic solar sector, which enabled the Council's decision-making process.</i></p>

ANNEX II: GUIDELINES FOR INTERVIEWS

1. In your opinion, do you believe that the federal government has prioritized relevant measures for clean and sustainable energy development since the signing of the Paris Agreement? And how about to increase the share of renewable energy in the energy matrix? Is there or was there coordination in government management to meet this goal?
2. Do you see any relevant measures for the Brazilian context that reflect the government's effort to diversify the energy matrix? Which measures do you think are relevant?
3. Is there political will on the part of the federal government to increase the composition of renewable sources within the energy matrix, both by increasing renewables and decreasing fossils? If so, how does this interest manifest itself? If not, for what reasons?
4. In your opinion, is the social participation of social organizations and movements, communities and academics central to the elaboration and implementation of government plans and measures in the energy area? If so, why? If not, why?
5. In your opinion, is social/climatic justice central to the elaboration of government measures in the energy area? If so, why? If not, why?
6. How important is the sector's strategic planning for the implementation of policies?
7. Do you consider Brazil's goals in the NDC to be unambitious? If so, what should they be? And why is the state committing to so little?
8. In your opinion, what should be the priorities for the area? The top 3?
9. In your opinion, has Brazil excelled in carbon reduction when compared to the rest of emerging economies?
10. Would you like to add or make any additional comments?