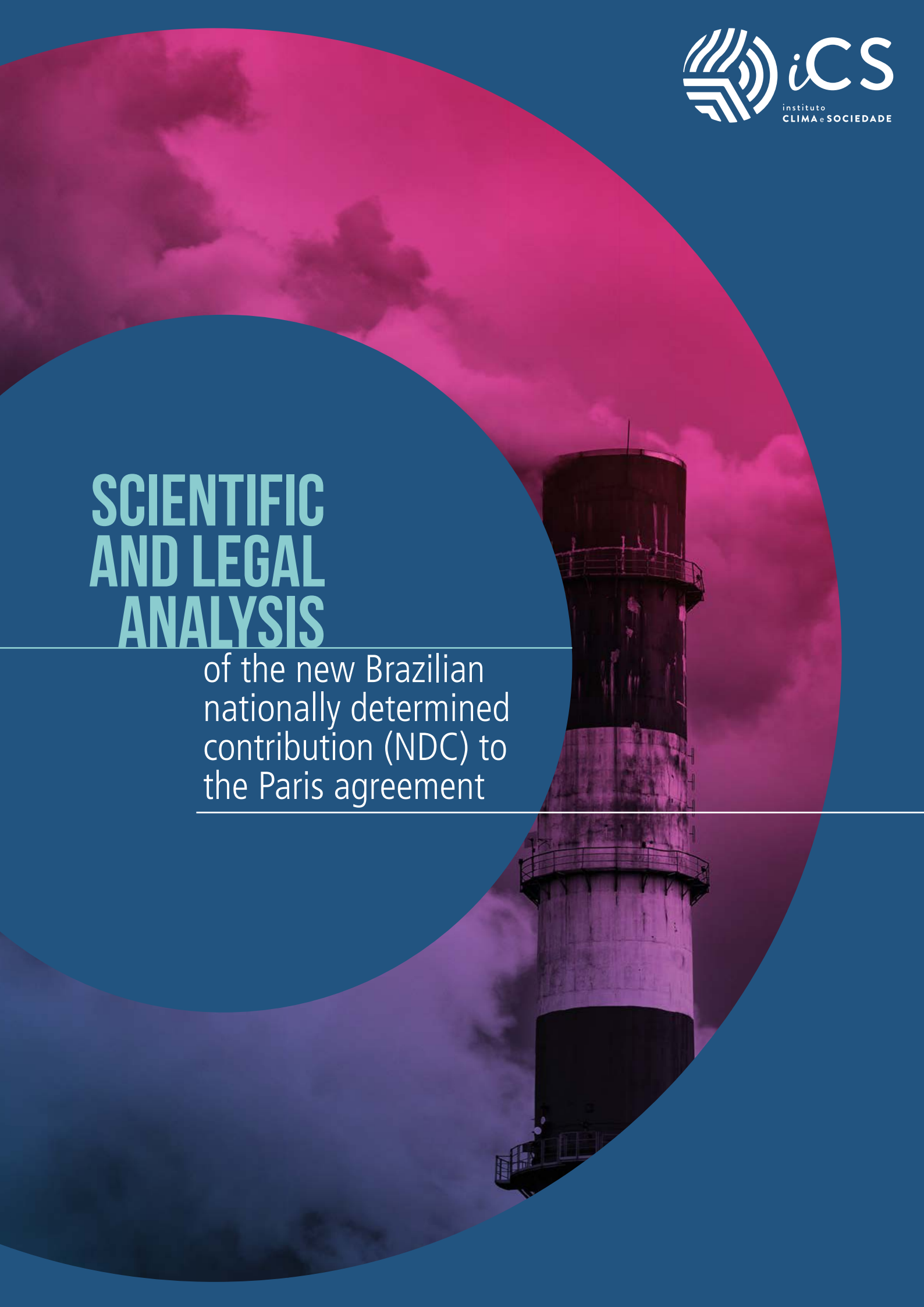

SCIENTIFIC AND LEGAL ANALYSIS

of the new Brazilian nationally determined contribution (NDC) to the Paris agreement

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CREDITS

Scientific and legal analysis of the new Brazilian nationally determined contribution (NDC) to the Paris agreement

Study in the name of
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PREFACE

Ana Toni e Marina Marçal

The positioning adopted by Brazil in relation to the presentation of its Nationally Determined Contribution (NDC), on December 8, 2020, is a matter of concern for Brazilian society and sends a negative and alarming signal to the international community, with respect to the compliance with the climate commitments adopted in the Paris Agreement.

In December, the Brazilian government presented to the Executive Secretary of the United Nations Framework Convention on Climate Change (UNFCCC), what it called a "New First NDC" or an update of the NDC that was presented in 2015.

In this version of the document, the goal of the 37% reduction in greenhouse gas emissions for 2025 was confirmed. This goal had already been presented in the previous version of the first Brazilian NDC. Furthermore, the goal of the 43% reduction for 2030 was made official.

However, in absolute volumes, the Brazilian "new first NDC" indicates that the Brazilian emissions increased in 2015 from 1.3 to 1.8 GtCO2e in 2025, and from 1.2 to 1.6 GtCO2e in 2030, i.e., an increase of 0.5 GtCO2e in 2025 and 0.4 GtCO2e in 2030. This increase has been justified by the Brazilian Government by the change in the calculation basis of the level of net emissions of the country in 2005, which were used as a benchmark.

The risk of adoption of methodological changes by governments that lead to the increase of absolute emission goals is, without doubt, a topic that deserves attention. This is because the Paris Agreement is based on a premise of the progression of the efforts of countries in the continued reduction of their goals of greenhouse gas emissions.

It is also alarming that, since 2015, when the Brazilian government submitted its NDC for 2025, no plan was submitted to ensure that the original goals would be achieved. By submitting the Brazilian "New First NDC" without concerning itself about also presenting a plan to reduce emissions by specific sectors, the Brazilian government gives the impression that the new suggested goals reflect more its preoccupation in relation to the difficulties of achieving the goals established in 2015, and not whether the presented goals are consistent with the Brazilian capabilities of achieving these goals.

Without doubt, with an increase in the absolute emission goals for 2025 and 2030, the increase of the emission in the sector of change of land use, due to the increasing level of deforestation in recent years, would cause other sectors, in particular agriculture and energy, to increase their levels of greenhouse gas emissions.

Why did the Brazilian government not submit an update of the First Brazilian NDC with pro-

gressive and more ambitious goals for 2030, like other countries?

Should methodological changes, with revisions of baselines that lead to the increase of the absolute emissions of greenhouse gases, be accompanied by obligatory revisions with proportional goals assumed in the NDCs?

Brazil submitted an NDC with an ambition sufficiently compatible with its respective capabilities and possibilities for the reduction of emissions, considering its past as performing a leading role in climate activities, of successful mitigation policies, of great potential to capture resources for investments in mitigation, as well as being one of the main beneficiaries of the Sustainable Development Mechanism of the Paris Agreement, in addition to carbon market assets, or do the submitted goals reflect the non-implementation of climate policies in recent years?

Will the revision of the Brazilian NDC, through the "New First NDC," have a negative impact on Brazil's capability to defend its national interests at COP 26?

These are questions that the Institute for Climate and Society are asking Brazilian society in order to start a broader discussion about trajectories and implementation, which should involve the scientific and legal community, subnational actors, the private sector, indigenous peoples, quilombolas, socioenvironmental organizations and the more varied sectors of our society, with respect to the economic and social implications of the Brazilian NDC in the light of the climate commitments assumed in the Paris Agreement.

WILL THE REVISION OF THE BRAZILIAN NDC, THROUGH THE "NEW FIRST NDC," HAVE A NEGATIVE IMPACT ON BRAZIL'S CAPABILITY TO DEFEND ITS NATIONAL INTERESTS AT COP 26?

To stimulate this necessary debate, the Institute for Climate and Society presents two publications about the Brazilian NDC, which was sent on December 8, 2020 to the UNFCCC: a scientific analysis ("Evaluation of the Commitments of the new version of the 1st NDC of Brazil" by the Climate Center of COPPE/UFRJ) and a legal analysis ("The ambiguity of the 'new first Brazilian NDC' and its compatibility with the Paris Agreement" by LACLIMA).

We would like to thank Dr. Emilio Lèbre La Rovere for the scientific contribution and Dr. Caroline Dihl Prolo and Dr. Caio Borges for the legal contribution presented in this publication.

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EVALUATION OF BRAZIL'S COMMITMENTS IN THE NEW VERSION OF ITS FIRST NDC

Emilio Lèbre La Rovere

January/2021

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INTRODUCTION

On December 8, 2020, the Government of Brazil presented an update of the Nationally Determined Contribution (NDC) of the country (Brazil, 2020) to the Executive Secretary of the United Nations Framework Convention on Global Climate Change (UNFCCC).

In this version of the document, called "the new 1st NDC of Brazil" by the Federal Government, the goal of a reduction of 37% of greenhouse gas (GHG) emissions in 2025, already presented in the previous version of the first NDC, was confirmed, and the goal of a reduction of 43% for 2030 was made official, both in relation to the level of the net emissions of the country in 2005, used as the basis for the calculation. However, the absolute level of GHG emissions in 2005 was altered, and the level used now is recorded in the Inventory included in the 3rd National Communication of Brazil to the UNFCCC, which was delivered on April 20, 2016.

The new version of the 1st NDC also introduced a long-term indicative objective of achieving "climate neutrality" in 2060. Furthermore, in the last sentence of its Annex, "Information to facilitate clarity, transparency and understanding of Brazil's NDC," the Government of Brazil mentions that "the proper functioning of the market mechanisms might justify considering a more ambitious long-term objective in the future, having as a time horizon, for instance, the year 2050." On the other hand, it makes an explicit reservation: Brazil considers that the entire implementation of the Paris Agreement depends on the prompt approval of its Article 6 and that it is essential that the Sustainable Development Mechanism (SDM) is placed into operation as soon as possible.

The interpretation of the Government of Brazil, as stated in the text, is that the country has increased its goal and continues to present one of the most ambitious NDCs in the world. It justifies this vision by presenting goals not only for 2030, but also for 2025, in order to allow a better monitoring of its mitigation actions; and it believes that it provides an important contribution, in absolute and relative terms, to the international efforts to combat climate change. However, there is an important methodological change with the adoption of the third inventory of emissions, where the total and the net emissions in 2005 are much higher than those considered in the initial NDC. Consequently, the ceilings established for the absolute level of GHG emissions for the country in 2025 and 2030 are now higher.

Accordingly, with the objective of better clarifying the NDC and its consequences, the objective of this opinion is to assess, among others, the following issues:

- What are the main conceptual and methodological differences and their consequences in relation to the ambition of the Brazilian goal between those presented in 2015 and the goal presented in December 2020?
- With the change of the baseline to the third inventory, what is the quantity of emissions in tCO2e that will serve as a reference in 2005 and what are the respective reductions established for 2025 and 2030?
- What is the impact of the methodological change of the 2005 baseline for the ambition of the new NDC of Brazil?
- Considering the current trajectory of emissions, with an emphasis on the increase of deforestation in the Amazon, what are the most probable scenarios of the Brazilian emissions within the time limits of the new NDC and what is the possibility of complying with the presented goals?
- What are the criteria that permit the assessment of a change in the ambition of the Brazilian NDCs? Based on the criteria

developed in the previous question, what is the degree of ambition of the new NDC of Brazil in the light of the new NDCs submitted by other countries? Can the Brazilian NDC presented in 2020 be considered ambitious in comparison to the others?

CONCEPTS AND METHODOLOGY

The signatory countries of the UNFCCC must calculate their annual inventories of anthropogenic GHG emissions and removals that are not controlled by the Montreal Protocol and report them periodically - annually in the case of the Annex I countries and every 4 years in the case of developing countries - to the Secretariat of the Convention, following the methodological guidelines established by the Intergovernmental Panel on Climate Change (IPCC), which includes the best experts from the scientific community on the subject. The calculation of the emissions is simple; multiply the level of the activity that is the source of emissions by an emission factor corresponding to this activity, for each GHG, for a period of one year. The following GHG are considered in the NDC of Brazil:

- carbon dioxide (CO2) – the main gas responsible for the increase of the greenhouse effect and global warming, due to its long permanence in the atmosphere and the large quantities emitted, mainly by the burning of fossil fuels - natural gas, mineral coal and oil and its derivatives - worldwide, and due to land use change, such as deforestation, among others, which is more relevant in Brazil and other countries with important forests such as Indonesia, for example.
- methane (CH4) – mainly emitted in Brazil by cattle breeding, in landfills for urban solid waste and in sewage treatment plants with an anaerobic process, in addition to fugitive emissions in the production chain, processing, transport and end use of fossil fuels.
- nitrous oxide (N2O) – emitted mainly in agricultural activities.
- sulfur hexafluoride (SF6) – used in electric transformers.
- perfluorocarbons (PFCs) – emitted in the aluminum manufacturing process.
- hydrofluorocarbons (HFCs) – products used to replace HCFCs, mainly in refrigerators and air conditioning units.

The quantity of GHG emissions can be gross or net. The net CO2 emissions are the gross emissions less the removals, through activities that transfer carbon from the atmosphere to the Earth's surface, such as plant growth, for example.

The total GHG emissions of a country are calculated by the sum of the emissions of all the GHG converted to the same unit: tons of carbon dioxide equivalent (CO2e). For this, the non-CO2 gases are converted into CO2 and through their coefficients of global warming potential (GWP), normally established for a period of 100 years (GWP-100).

Throughout its existence, since 1988, the IPCC has been improving the methodology for the inventory of GHG emissions, publishing Methodological Guidelines in 1995, 1996 and 2006. In 2019, a "refinement" of the 2006 guidelines was published for certain specific processes. The most important alteration in the measurement of the total quantity of GHG emissions of a country occurred in the GWP coefficients: the methane value, in particular, was estimated by the IPCC, initially, at 1 t CH4 = 21 t CO2e. This value was adopted in 2001, at the time of the Marrakesh Agreements that regulated the market of carbon credits for the Clean Development Mechanism (CDM) of the Kyo-

to Protocol of the UNFCCC. This value was later estimated at 25 and today, after the 5th Assessment Report (AR5) of the IPCC, it is 28 (GWP-100, AR5).

The emission factors of the activities can be determined, in general, with reasonable reliability. This is the case with the burning of fossil fuels, in which the emission factors depend on a first approximation ("tier 1") of the physicochemical properties of the fuels. Naturally, for a more detailed breakdown of the emission calculation, in particular of the non-CO2 GHG, it is necessary to use a much broader information base, not only of the fuels, but also the processes and equipment that are used and the operating conditions and maintenance, among other factors.

The activity levels recorded in commercial transactions make use of reasonably reliable data. In other cases, less accurate estimates must be used. The IPCC guidelines break down the GHG emissions by sources: Agriculture, Forests and Other Land Use (AFOLU), Energy, Industrial Processes and Product Use (IPPU) and Waste.

In the case of Brazil, the largest difficulty in the calculation of the annual inventory of GHG emissions lies in the estimation of the AFOLU emissions. In particular, in the Land Use Change subsector. The emissions caused by deforestation are very important and difficult to estimate, introducing a complexity that is unique in the world for the preparation of the Brazilian inventory. Through the comparative analysis of satellite images, from one year to another, it is possible to determine the perimeter and the area of the polygons where there has been a substantial degradation in the quantity of the biomass. Naturally, the accuracy of the estimate will depend on the quality and resolution of the images and the level of breakdown of the polygons, among other factors. The National Institute for Space Research (INPE) performs excellent work and publishes the annual rates of deforestation for the main Brazilian biomes. However, the accuracy of the estimates for the emissions is much less, because it still depends on the hypotheses regarding the quantity of biomass that existed (above the ground, below the ground, in the ground and the plant litter) in those areas, before deforestation. This information is currently not provided by satellite images and it must be estimated from aerophotogrammetric survey data - sometimes from very old data, such as the RADAM Project - and from forest inventories, which are only available for a small portion of the territory.

Up to the beginning of December 2020, before the submission of the new 1st NDC, three inventories, part of the three National Communications of Brazil to the UNFCCC, had been sent by the Government of Brazil to the Secretariat of the UNFCCC. The 3rd National Communication, delivered in April 2016, includes the 3rd inventory, with the series of annual emissions from 1990 to 2010, including the value for 2005 that served as a basis for the new 1st NDC. The 4th National Communication, including the 4th Inventory, was recently submitted to the UNFCCC in January 2021.

The preparation of the inventories of the GHG emissions of Brazil is coordinated by the Ministry of Science, Technology and Innovation (MCTI). The 3rd and 4th inventories were prepared by a network of scientific institutions of the country, Rede Clima, under the coordination of the MCTI (with the exception of the 2nd inventory, which was prepared by a consulting company hired for this purpose). Rede Clima is made up of institutions that are recognized as excellent in their field, such as the INPE, for Land Use Change; EMBRAPA, for Agriculture, Forestry and Livestock; COPPE/UFRJ for Energy; and

CETESB for Waste, among others. Rede Clima is recognized as one of the institutions that form the governance of the national policy of climate change, as established in Law 12187/2009.

The difference between the total quantity of net GHG emissions of Brazil in 2005 presented in the 3rd National Communication and the Intended Nationally Determined Contribution (iNDC) submitted to the UNFCCC on September 28, 2015 (which became the 1st NDC of Brazil on 21 September 2016, when Brazil presented its instrument of ratification of the Paris Agreement) was mainly due to the significant alteration in the values considered in that year for the subtotal of Land Use Change (where the GHG emissions of the annual deforestation in the various biomes of the country are included), in the AFOLU sector. The value of the Brazilian emissions for 2005 presented by the iNDC was based on values close to that of the second inventory (less a small rounding), which formed part of the 2nd National Communication submitted to the UNFCCC (referenced in the iNDC).

EMISSIONS IN 2005 AND GOALS OF THE GHG EMISSIONS FOR BRAZIL IN 2025 AND 2030

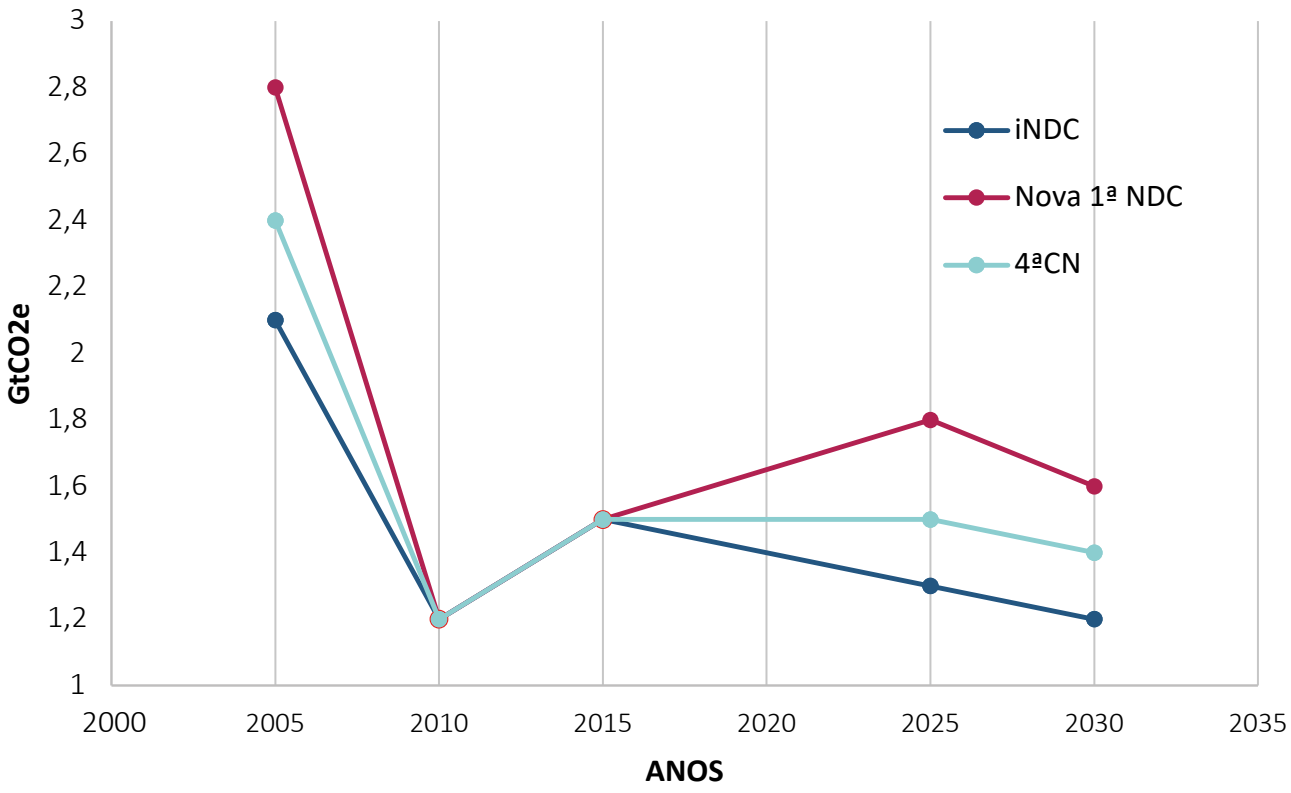
The new 1st NDC of Brazil, presented on December 8, 2020, to the UNFCCC, alters the level of the total emissions of the country in 2005, which was the reference for the goals established in the percentages: of a 37% reduction in 2025 and a 43% reduction in 2030. Table 1 and Figure 1, below, present the reference emissions in 2005 and the respective reductions established for 2025 and 2030, in accordance with the iNDC sent in 2015 and ratified in 2016 (based on the 2nd National Communication) and with the 1st new NDC submitted in December 2020 (based on the 3rd National Communication). It also presents the most recent updated values for the GHG emissions of the country for 2005, 2010 and 2015, in accordance with the 4th National Inventory submitted as an integral part of the 4th National Communication of Brazil to the UNFCCC, in January 2021.

TABLE 1 | Net GHG emissions in Brazil in 2005-2015 and the goals for 2025 and 2030 in billions of tons of carbon dioxide equivalent (GtCO2e)

GHG EMISSIONS BRAZIL	2005	2010	2015	2020	2025	2030
iNDC (2015)	2.1				1.3	1.2
New 1st NDC (2020)	2.8				1.8	1.6
Fourth National Communication (2021)	2.4	1.2	1.5		1.5	1.4
%	100%			?	2005 Value -37%	2005 Value -43%

Sources: Brazil (2015); Brazil (2016); Brazil (2021)

FIGURE 1 | Net GHG emissions in Brazil in 2005-2015 and the goals for 2025 and 2030 in billions of tons of carbon dioxide equivalent (GtCO2e), in accordance with the iNDC, the New 1st NDC and the 4th National Communication of Brazil.



It can be ascertained that the increase, from the iNDC to the new 1st NDC, of the total number presented in the inventory of net emissions of the country for 2005, of approximately 0.7 GtCO2e, also altered the absolute level of the goals of emissions in 2025 (an increase 0.5 GtCO2e) and in 2030 (0.4 GtCO2e).

This is evidently a substantial increase in the limit of emissions of the country: approximately 40% more in 2025 and 33% more in 2030, in relation to the previous absolute number. The level of ambition, in terms of the mitigation effort of emissions is, therefore, significantly lower.

The voluntary objective presented by Brazil in 2009, at the time of the 15th Conference of the Parties of the UNFCCC (COP15), was a reduction of 36.1% to 38.9% for the total emissions of 2020, in relation to a reference scenario projected with counter-factual hypotheses - all the future electric generation using natural gas, and gasoline as the liquid fuel for additional consumption in light vehicles, etc. -, resulting in a very high baseline. Using the current GWP values, from the 5th Assessment Report (AR5) of the IPCC, the Brazilian commitment presented at COP15 would be not to exceed the limit of 2.0 -2.1 GtCO2e of the total emissions of the country in 2020 (Brazil, 2015). Therefore, it is still possible to say that the goals established for 2025 and 2030, even with the new metric, remain more ambitious than those presented at COP15 in 2009.

However, it is important to emphasize that the presented figures are not definitive. In item

"f" of the 1st page of the Annex to the new 1st NDC, presented on December 8, 2020, the Government of Brazil states that "Information on emissions in 2005 and reference values may be updated and recalculated due to methodological improvements applicable to the inventories."

In fact, at each methodological update, the entire time series must be recalculated according to the new methodology, in accordance with good practice in statistics, in order to ensure the comparability between the values of past and recent years. In this context, Table 1 also includes the number of net emissions of the country in 2005 of 2.4 GtCO2e, presented by the 4th National Inventory, which was submitted as an integral part of the 4th National Communication of Brazil to the UNFCCC, in January 2021. This should lead to a new alteration of the Brazilian voluntary goals to 1.6 GtCO2e in 2025 and 1.5 GtCO2e in 2030 (see Table 1).

It is expected that the emission targets will be 1.5 GtCO2e in 2025 and 1.4 GtCO2e in 2030. This signifies that the absolute limits for GHG emissions in 2025 and 2030 would be higher than in the iNDC of 2015, but lower than in the new 1st NDC of 2020.

SCENARIOS OF GHG EMISSIONS OF BRAZIL UP TO 2030

In its annex with additional information, only for clarification purposes, the Brazilian iNDC lists additional mitigation measures for its GHG emissions, in addition to those already underway, emphasizing that the paths to be adopted to achieve the objectives of 2025 and 2030 are flexible, because they refer to goals of emissions for the country as a whole. Some measures, referring to mitigation actions in the sectors of Energy, Agriculture and Forestry and Land Use Change, were quantified (Brazil, 2015):

- In the energy sector, achieving an estimated 45% share of renewable energies in the composition of the energy matrix in 2030, including:

  - expanding the use of renewable sources, in addition to hydropower, in the total energy matrix to a share from 28% to 33% by 2030;
  - expanding the domestic use of non-fossil energy sources, increasing the share of renewable energies (in addition to hydropower) in the supply of electric energy to at least 23% by 2030, including the increase of the share of wind, biomass and solar power;
  - achieving 10% efficiency gains in the electric sector by 2030.

- In the agricultural sector, strengthening the Plan for Low Carbon Emission in Agriculture (ABC Plan) as the main strategy for the sustainable development in agriculture, including through the additional restoration of 15 million hectares (Mha) of degraded pasture land by 2030 and the increase of 5 million hectares (Mha) of integrated crop-livestock-forest systems (iCLF) by 2030.

- In the sector of forestry and land use change:

  - strengthening policies and measures with a view to achieving zero illegal deforestation in the Brazilian Amazon by 2030 and the offsetting of greenhouse gas emissions from the legal suppression of the vegetation by 2030;
  - restoring and reforesting 12 million hectares (Mha) of forests by 2030, for multiple uses.

It is important to verify the progress achieved up to now in the realization of these measures, as well as the available projections of the scenarios of the GHG emissions for 2025 and 2030, in order to assess whether the

country is on a trajectory that complies with its commitments to the Paris Agreement.

Several scenarios of this type have been prepared over the years, although it is necessary to continually update the hypotheses of realistic economic growth for the country. Furthermore, the projection of the annual rates of deforestation in the different biomes of the country is only viable from its consideration as an exogenous variable. This is because it would be foolhardy to estimate any trend up to 2030 based on past results, which present strong fluctuations.

Considering the abovementioned limitations, the results presented here are from the study performed for the Initiative for Climate Action Transparency (ICAT), conducted in 2018 and published in early 2019, (La Rovere et al, 2019). This is the most recent work available that includes the participation of experts from different segments of society, gathered together in the Thematic Chambers of the Brazilian Forum on Climate Change (FBMC).

It is not interesting to project emissions taking as a premise the maintenance of the economic situation of the country, which, since 2015, has been experiencing a period of recession. The most relevant scenarios for the analysis of the mitigation efforts are those in which there is a resumption of economic growth. Therefore, the study for the ICAT tested the effect up to 2030 of the following main hypotheses, in its scenario of Reference (scenario A, trend):

- resumption of economic growth at an annual average rate of 3.2%, from 2021 to 2030;

- maintenance of an annual average of GHG emissions due to Land Use Change based on the 2005-2017 period, similar to the level recorded in 2015.

Scenario B included a set of mitigation measures that were judged viable for implementation up to 2030 by the experts in each sector, from an analysis of the barriers to their realization and of the instruments to overcome them.

The results for the total of the GHG emissions of the country in 2030 were obtained from the mathematical modeling framework (general equilibrium model of the economy in interaction with the sectorial models of the GHG emissions) of the performance of the ongoing policies and the additional mitigation measures in the sectors of Transport, Industry, Offer of Energy Supply, Waste, Agriculture and Others (Residential, Commercial, Public, and Other Services).

From the premises considered in scenario A, trend, the level of total net emissions of the country would reach 1.6 GtCO2e in 2025, and reach 1.7 GtCO2e in 2030. In this case, it seems unviable to reach the goals of the GHG emissions established by the new 1st NDC of Brazil in 2030. This is even though the reference level of the emissions in 2005 is the one considered by the 3rd National Communication, which is even more distant from the goal, if there is an update of the objectives for 2025 and 2030, in accordance with the recent results for the 2005 emissions of the fourth national inventory.

In the case of scenario B, in the hypothesis of a good performance for the mitigation policies of the GHG emissions and the implementation of additional measures judged viable by the experts, the emissions would be reduced, reaching 1.2 GtCO2e in 2025, and 1.0 GtCO2e in 2030. This result is obtained even with a high rate of economic growth. Naturally, the 2020 figures will have to be revised in light of the significant increase in the annual rate of deforestation in 2019 and 2020, causing a much higher level of AFOLU emissions (see Table 2).

TABLE 2 | Indicators of the iNDC of Brazil in the energy area, 2005-2030

INDICATOR	Unit	Historical data					Scenario A			Scenario B			iNDC
		2005	2010	2015	2016	2017	2020	2025	2030	2020	2025	2030	2030
renewables in the energy matrix	%	44,1	44,7	41,3	43,5	43,2	45,2	45,1	43,9	45,6	47,0	46,9	45,0
renewables, without hydropower, in the energy matrix	%	29,2	30,7	30,0	30,9	31,2	31,7	32,4	31,8	32,1	34,2	34,9	28,0
bioethanol and bio-diesel in the energy matrix	%	13,8	18,2	17,9	18,5	18,6	18,6	19,3	18,7	19,0	20,4	21,0	18,0
renewables, without hydropower, in the electric generation	%	3,1	6,1	11,5	13,7	15,1	18,9	22,1	23,3	19,0	21,9	23,4	23,0

Source: MME/EPE, 2018 (historical data); La Rovere et al, 2019 (scenarios); Brazil, 2015 (iNDC)

In relation to the mitigation measures mentioned in the iNDC, the results verified in scenarios A and B for the indicators of mitigation efforts in the energy sector are presented in Table 2. It can be ascertained that the experts judge the achievement of the expected results viable, even in scenario A (trend), and to be exceeded in the case of scenario B. The exceptions are the energy efficiency objective, which was vaguely and imprecisely stated in the iNDC (10% of efficiency gains, but in relation to which reference?) and the level of renewables in the energy matrix, of 43.9% in the trend scenario, which is lower than the goal of 45% in 2030. Naturally, these results must also be revised in the light of the impact on energy consumption of the evolution of the economy in 2019 and 2020, and also with respect to the performance of the RenovaBio program.

With regard to the mitigation measures for the agricultural sector, some results obtained by the ABC Plan, up to 2018, were very positive and exceeded the goals established in the 2010 Decree, which regulated the voluntary objectives for 2020, assumed by Brazil at COP15, which was held in Copenhagen in 2009, the so-called Nationally Appropriate Mitigation Actions - NAMAs (Mendes and Souza, 2020):

- area of integrated crop-livestock-forest (iCLF) has already exceeded 5 Mha (goal: 4 Mha);
- cultivated area under no-till farming reached 10 Mha (goal: 8 Mha);
- area of 10 Mha using biological nitrogen fixation techniques (goal: 5.5 Mha);

Other measures failed to reach, by 2018, the levels required to comply with the goals for 2020 established in 2009/2010 (Mendes and Souza, 2020):

- management of animal waste;
- planting of forests;
- recovery of degraded pasture land.

The goals mentioned for the agricultural sector in the iNDC, of an additional restoration of 15 Mha for degraded pastures and the increment of 5 Mha for iCLF systems by 2030, are also not being performed at a rate that will comply with the established time period.

Naturally, the major concern of the compliance with the objectives of the NDC of Brazil is with the stagnation and increase in the LULUCF emissions from 2012 to 2018, followed by an enormous regression in 2019 and 2020, with the huge increase in the annual rate of deforestation in several biomes. The paralysis of the process of regularization of the agricultural properties, in accordance with the new Forest Code, and the rapid advance of illegal deforestation oppose the commitments assumed with the Paris Agreement.

After a cycle of recession of 5 years, the COVID-19 pandemic has brought even more negative impacts on all the indicators of the Brazilian economy. The already high level of uncertainty has increased with the resurgence of the pandemic at the end of 2020. In this context, any forecast, even in the short term, becomes random. There is also no way to indicate "more probable" scenarios, even in the medium term.

Emissions have fallen in advanced countries, causing the level of global GHG emissions in 2020 to be approximately 7% lower than in 2019. However, this is a conjunctural fall. The level of global emissions in 2021 depends on whether and when there is a resumption of economic activity, and on what basis.

In Brazil, an opposite trend to the global average was observed in 2020, with the increase of the net GHG emissions of the country. This was due to the increase in the AFOLU emissions, and in particular deforestation, not only in the Amazon and the Cerrado, but also, unprecedentedly, in the Pantanal. The value of the emissions of deforestation in 2020 is even higher than in 2019, when there was a 30% jump in the annual rate of deforestation in the Amazon, reaching double the minimum level obtained in 2012. As a consequence, a dangerous increase was recorded in the Brazilian LULUCF emissions. This reversed a growing part of the significant effort to reduce them through public policies that achieved expressive success on a global scale, eliminating over 1 GtCO2e per year of the emissions from Brazil between 2004 and 2012: in this period, the GHG emissions of the country were reduced by 52%, even with a 32% growth of the GDP (Brazil, 2015).

Therefore, after the deepening of the recession in 2020, new studies of scenarios, with the participation of experts from different sectors, must be encouraged in order to encourage a discussion with respect to the required policies and measures not only to achieve the current objectives for 2025 and 2030, but also for the presentation of more ambitious NDCs in the future, in accordance with the commitment assumed by Brazil when signing the Paris Agreement. The involvement of agents from the different sectors of Brazilian society in this discussion, as occurred when the iNDC was prepared in 2015, can indicate ways to achieve the development strategies of the country with low GHG emissions.

AMBITION OF THE NDC OF BRAZIL

The criteria that allow for the assessment of the ambition of the mitigation efforts of a country are subjective, in accordance with the principles of equity that are chosen as the basis. The Government of Brazil justifies the ambition of the Brazilian NDCs based on the principle of the historical responsibility for the increase of the temperature of the planet's surface. This principle is certainly valid. It provided the basis not only for the principle of common responsibility, but also differentiated the countries from Annex I (advanced industri-

alized countries) and non-Annex I (developing countries) in the signing of the UNFCCC during Rio-92. It also served for the Brazilian proposal in the discussion about the Kyoto Protocol, in 1997. As we know, this principle was not used in fixing the emission limits for the Annex I countries of the UNFCCC in Kyoto. However, a work group was established by the UNFCCC to investigate the scientific aspects of the calculation of the historical responsibility in accordance with this proposal.

However, there are also other valid criteria, such as, for example, the mitigation capability, through the possession of financial, technological and natural resources to reduce GHG emissions. There is extensive scientific literature about this subject. The discussion in the quarterly meetings of diplomats, environment ministers and technical and scientific advisers from the BASIC group (Brazil, South Africa, India and China) also deserves to be remembered. This amply illustrates the difficulty of obtaining consensus with respect to the operationalization of the principles of equity, even within a small group of emerging countries with diverse common interests in global negotiations.

Whatever the criteria, it is certain that the revision of the emission goals of Brazil in 2025 and 2030 performed by the new 1st NDC of Brazil reduced the ambition of the previous NDC, which was presented in 2015/2016 to the UNFCCC, at the time of COP21, due to the substantial increase in the value of the total net emissions of the country in 2005, which was the reference for the setting of the goals.

Table 3 allows a comparison between the goals of Brazil and those of other countries, presented during COP21. Evidently, there have been several alterations in this table since then. For example, in that period, the USA abandoned the Paris Agreement, the European Union and the United Kingdom announced more ambitious goals in the medium and long term, other countries with lower emissions, and Brazil maintained its reduction percentages, but changed the value of the emissions of its base year (2005).

TABLE 3 | Comparison of NDCs presented at COP21 by most countries with most emissions

COUNTRY	Base year	Reduction goal	Year-goal
China	2005	60-65% (carbon intensity of the GDP)	2030
USA	2005	26-28% (absolute value)	2025
EU	1990	40% (absolute value)	2030
India	2005	33-35% (carbon intensity of the GDP)	2030
Russia	1990	25-30% (absolute value)	2030
Canada	2005	30% (absolute value)	2030
Brazil	2005	37% (absolute value)	2025
		43% (absolute value)	2030

Source: http://www.c2es.org/indc-comparison

The comparison between countries regarding their degree of ambition depends on the choice of the base criteria, as explained above. On the other hand, whatever the criteria, it would be difficult to consider countries such as China, USA, India, Russia and Canada as showing higher ambition at COP21 in 2015 than Brazil, in terms of their goals to reduce GHG emissions by 2025 and 2030. The goals of China and India were to reduce only the intensity in emissions per unit of GDP (tCO2e/$), which in practice allows the emissions to continue to grow in absolute values, driven by the increase in economic activity. At the time, China limited itself to promising that it would reach the peak of its emissions by 2030, i.e., that only after 2030 would it assume the commitment to reduce the GHG emissions of the country in absolute values. The level of reduction of the GHG emissions promised by Canada and the USA was lower than that of Brazil, for the same base year of 2025, and the USA withdrew this commitment by abandoning the Paris Agreement. Not only did Russia present a reduced percentage of emissions that was lower than Brazil, but it also chose the base year of 1990 as a reference, which is well-known for being the historical maximum level of emissions for the country, before the significant post-meltdown recession of the former Soviet Union (the famous “hot air”).

Only the European Union presented higher percentages for the reduction of GHG emissions than Brazil. It could not be otherwise, given the overwhelming historical responsibility of its countries to global climate change.

Just as or more important than the comparison between other countries, however, is the analysis of Brazil’s performance in mitigating its GHG emissions in the recent past. It is estimated that between 2004 and 2012 the country managed to reduce its annual net GHG emissions by more than 1 GtCO2e, which is an unparalleled reduction on a global scale. This was made possible, mainly, by the drastic fall in the annual rates of deforestation in the period, thanks to the effects of two types of public policies:

- strong implementation of command-and-control instruments, with coordinated operations to inspect and combat illegal deforestation;
- use of an economic instrument, making the grant of credit by public financing agencies (federal, regional and state) subject to compliance with environmental licensing rules and the Forest Code by the farmers and cattle breeders.

It is noteworthy to emphasize that in the period from 2004 to 2012, Brazil experienced a high rate of economic growth, with a large increase in the production of meat, soybeans and other commodities for export, sugar cane and ethanol, while, simultaneously, reducing its annual GHG emissions at impressive levels. Therefore, there was no indication that the goals for reducing the GHG emissions assumed by Brazil at COP21 would be unviable. On the contrary, in 2012, the country was already at a level of emissions that was very close to the goal initially set for 2030. Also, in 2018, most analysts considered that it was perfectly viable not only to comply with the goals set by Brazil at COP21, but also to extend the reduction of the GHG emissions, seeking a trajectory that would be compatible with the stabilization of the global temperature from 1.5 to 2 °C, which is a long-term objective of the Paris Agreement. Studies performed by the Climate Center of COPPE/UFRJ for iCS and WWF-Brazil, as well as for the Brazilian Forum on Climate Change (FBMC), with the extensive involvement and consultation with sectorial experts, pointed in this direction (La Rovere et al, 2018a; FBMC, 2018; La Rovere et al, 2019).

Another point worth noting is the elimination in the new 1st NDC of Brazil of any mention of

the sectorial measures that were included in the iNDC and provided a reference to monitor the obtained progress. It would be expected that a similar analysis to the one presented above (see Table 2 and the results of the ABC Plan) would be included. In line with the progressive increase of the ambition adopted by the Paris Agreement, when a goal is exceeded, the setting follows of a new, more ambitious goal. When a goal is not achieved, the presentation of a justification, corrective actions and a new time limit for reaching it is expected. This assessment is already available, because the Fourth National Communication was delivered to the UNFCCC in January 2021.

Therefore, it can be said that the Brazilian NDC presented at COP21 was ambitious in absolute terms, in comparison with most other major emitting countries. However, in relation to the mitigation capability for the GHG emissions of Brazil, it could certainly be more ambitious. Analyzing the actual trajectory of the GHG emissions of the country in the recent past, the demonstration can be ascertained of the viability to strongly reduce GHG emissions from the AFOLU sector in a manner that is compatible with economic and social development. Therefore, all the more, it can be stated that there is certainly room for the new 1st NDC of Brazil presented in December 2020 to be succeeded by more ambitious NDCs in the near future.

THE OBJECTIVES TO ZERO NET EMISSIONS IN 2060 BY BRAZIL AND CHINA

The new 1st NDC of Brazil has an indicative objective to zero the net GHG emissions of the country by 2060. Recently, China announced an equivalent proposal, of achieving the neutrality of its GHG emissions also in 2060. Naturally, the national context of the two countries it is completely distinct. The demographic, geopolitical, economic and technological resources of China are undeniably substantially larger than those of Brazil. However, Brazil enjoys a very wide base of renewable natural resources. This is very clear from the stark contrast when comparing the electric matrices of the two countries: while Brazil generated 83% of its electricity consumption in 2019 from renewable energy sources (65% hydroelectric, 8.6% wind, 8.4% biomass and 1.0% solar), China is based on fossil fuels, and in particular on mineral coal (with a higher emission of tCO2e/MWh) to meet its enormous internal consumption. As a consequence, with the exception of 2014, when there was, for the first time, stability in the consumption of mineral coal for electricity generation in China simultaneously with the growth of the world economy, the GHG emissions of China continue to grow by accompanying the rapid evolution of the Chinese economy.

Therefore, achieving the neutrality of its GHG emissions in 2060 represents a challenge of significant magnitude for China. In the specialized scientific literature on the subject, most analyses point out the need for a development of the technology for carbon capture and sequestration (CCS) and a rapid generalization of its adoption in the Chinese thermoelectric and industrial areas, as a condition to enable this. The current stage of this technology, which is still incipient, with expensive costs and limitations in the availability of locations for the geological sequestration of the CO2 or its use (CCUS), signals the significant difficulties to be overcome by China to comply with this objective.

In the Brazilian situation, it is perfectly viable to achieve the neutrality of the GHG emissions in 2060 with the technologies that are currently known and available on the market, with proven technological and economic viability, or that are in the process of being obtained. The report “Brazil Carbon Zero in

2060," requested by the Presidency of the Republic to the FBMC in June 2018, prepared by the technical team from the Climate Center of COPPE/UFRJ and delivered to the president by the FBMC and COPPE on December 26, 2018, provides one among the several possible development trajectories of low emissions that arrive at this objective in 2060. The final considerations of this report summarize this conclusion:

"This work confirms the conclusions of previous studies:

- the potential of renewable natural resources makes the benefits and opportunities of the transition to a low carbon economy particularly important in the case of Brazil, which has a privileged position of competitiveness in relation to other countries, in the scenario of a global effort to achieve the long-term objectives of the Paris Agreement (MCTIC/GEF, 2016).
- a scenario of full implementation of the Brazilian NDC through the appropriate public policies is compatible with a marked improvement in the economic and social indicators of the country, in addition to providing a significant reduction in GHG emissions, allowing the compliance with the commitments assumed by Brazil in the Paris Agreement (Project IES-Brazil 2030).
- a long-term development strategy of Brazil that is compatible with the limitation of the increase of the global temperature to 1.5 ºC would not necessarily result in significantly negative economic and social consequences for the country, if implemented through the appropriate public policies (Project IES-Brazil 2050).

The scenario designed in this study is not the only one possible. There are several possible scenarios that could and should be explored, given the significant uncertainty inherent in analyzing options over such a long-term horizon (2060). The technical progress of the mitigation options, the evolution of behaviors and the structural changes in consumption patterns open up even wider possibilities for a development strategy of low GHG emission to be explored. Therefore, analyses of sensitivity are essential to assess whether the viability of the application of the additional mitigation measures identified in this study would be maintained even if important parameters for the modeling, such as the trajectory of the price of oil, vary over the studied horizon.

The macroeconomic and social implications of the transition to a low carbon economy depend not only on the costs of the mitigation options, but also on the instruments used to make their adoption viable: economic, financial, command and control, or a mixture of these. In order to enable the ambitious scenario depicted here, it is crucial to adopt a pricing of the GHG emissions. This would signal to the economic agents the value of the reduction of their emissions, through a carbon tax, and/or other instruments, such as a market for tradeable shares of GHG emissions, and favorable credit conditions for mitigation projects. These issues should be considered in the next studies on the subject (FBMC, 2018).

FINANCIAL RESOURCES REQUIRED FOR MORE AMBITIOUS GOALS

Certainly, the transition towards a carbon neutral society can be seen as a unique opportunity for Brazil to accelerate its development in a more sustainable manner. However, there are important prerequisites for enabling such a transition, as pointed out in the previously cited studies. Among them, the availability of financial resources to make the required investments occupies an important position. In fact, in general, all the mitigation technologies of GHG emissions require, in comparison

to conventional technologies, higher initial expenditures that can be recovered over the useful life of the projects, thanks to lower operating costs. Unlike Asian countries, the rates of domestic savings recorded in the Brazilian economy are low and need to be complemented by a flow of external financial resources, whether from direct investment or loans, under conditions that are appropriate to enable the required increase in the rate of investment. Likewise, the investments in the additional mitigation required for the transition towards a carbon neutral economy should count on a significant contribution of external financial resources to be viable.

In its new 1st NDC submitted in December 2020 to the UNFCCC, the Government of Brazil states on page 9 that "Brazil will require at least USD 10 billion per year to address the numerous challenges it faces ...". The calculation or any technical reference to support this requirement is not provided.

The problem does not lie in the magnitude of the external financial resources required to invest in the transition to a carbon neutral economy. In fact, the previously cited studies mention additional investment values for mitigation that are higher than this annual amount. For example, for the scenario compatible with the stabilization of the global temperature at 1.5 ºC above the pre-industrial level, prepared in the Project IES-Brazil 2050, the investments in additional mitigation would be about USD 3.5 billion per year in 2021-2030 and would reach USD 32 billion per year in 2031-2050 (La Rovere et al, 2018b), with an annual average over 30 years of about USD 22 billion per year (USD = average 2015 US dollars).

The problem arises from a distorted conception of the financing mechanisms of the transition to an economy of zero net emissions, as can be concluded from the reading of the text that follows in the submission of the new 1st NDC of Brazil: "Further decisions regarding Brazil's indicative long-term strategy, especially the definition of the final date to be considered to this end, will take into account financial transfers to be received by the country." This text appears to lead to the interpretation that the Government of Brazil expects that the resources from the Green Climate Fund (GCF) or from other sources will be placed at its disposal. In fact, public and/or private financial resources will seek the best investment opportunities. An investor or a financial fund manager cannot be obliged to assume excessive risks in projects of dubious viability. To date, Brazil has submitted only one project to the GCF (a proposal worth USD 150 million, which related to the payment by results to reduce emissions from deforestation and from forest degradation – REDD+), which obtained the approval for an amount of USD 96 million.

The capability to attract external flows of capital for investments must be built by the country that aims to raise these resources. The Government of Brazil has a duty to work towards reducing the perception of the country risk, the exchange rate risk, and the risk of breaking contracts, among others, and to build an appropriate institutional and regulatory framework to improve the conditions to attract investments in mitigation for the country. Brazil already has a legitimate competitive advantage, offered by its enormous potential of mitigation and sequestration (especially forest "offsets") of emissions at low costs, in relation to other countries. It can increase its attractiveness through the implementation of innovative financing mechanisms (green bonds and public-private guarantee funds, among others), leveraging external resources with lower capital costs for projects that additionally mitigate the GHG emissions of the country (La Rovere et al, 2018c).

As already demonstrated in the test represented by the Clean Development Mechanism

(CDM) of the Kyoto Protocol, in which Brazil was among the countries that raised the most funds for investments in mitigation projects, the country has all the conditions to be one of the main beneficiaries of the Sustainable Development Mechanism (SDM) of the Paris Agreement and also of the global financial flows in search of low carbon assets. However, a radical change is needed in the attitude of the current Government. Foreign investors require the indispensable security with respect to the continuity of the previous mitigation policies, which proved to be particularly successful in the period from 2004 to 2012. The complementation of the public policies with new financial mechanisms to attract external financing flows could lead the country to a position of leadership in the transition to an economy of zero net GHG emissions that would accelerate the development of the country on a more sustainable basis.

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PROGRESSION OF THE AMBITION AND PROHIBITION ON REGRESSION IN THE PARIS AGREEMENT: A LEGAL ANALYSIS OF THE NEW BRAZILIAN NDC

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INTRODUCTION

On December 8, 2020, the Brazilian government officially presented, in accordance with the formal procedures of the United Nations Framework Convention on Climate Change (UNFCCC), a "New First" Nationally Determined Contribution (NDC).[1] The new NDC of Brazil reaffirmed the goal of reduction of greenhouse gas (GHG) emissions for the whole economy (economy-wide) of 37% for 2025 and converted the existing "indicative" goal for 2030 of a 43% reduction of emissions in relation to the 2005 levels into an official commitment of mitigation. The new NDC also proposes an "indicative objective" of achieving climate neutrality by 2060.[2]

The first version of the Brazilian NDC was submitted as a condition for the ratification of the Paris Agreement, in 2016, and in practice it was a confirmation of the iNDC ("*intended Nationally Determined Contribution*") - an "intended" version of the NDC -, which Brazil had submitted to the UNFCCC prior to the signing of the Agreement, like most countries that ratified the Paris Agreement.

After the announcement by the Brazilian government, several concerns were raised regarding the new Brazilian NDC, both in terms of form and content.[3] Analyses pointed out that there was a "downgrade" in the ambition of the new Brazilian NDC, attributable to a methodological update that altered the indicator of the level of emissions of the base year. This update in the methodology of the accounting of the emissions was related to changes in the measurement of the emissions for the land use sector.

According to the technical analysis by Emílio La Rovere in this publication, the aforesaid methodological update would have impacted the benchmark for the base volume of the emissions and, consequently, would result in a higher volume of greenhouse gas emissions by approximately 400 Mton/CO2-eq in the target years of 2025 and 2030, compared to the volume projected in the first NDC.

Observers have also noted that the "New First NDC" of Brazil would represent a regression in relation to the previous NDC with respect to the specification of the domestic sectorial measures to be pursued for the compliance with the global mitigation goals. In the previous NDC, Brazil detailed policy objectives that would enable compliance with the goals, such as the objective of zero deforestation by 2030 and the increase in the use of renewable energy to 45% in the 2030 mix. These measures were not replicated in this new NDC.

Finally – and only by way of illustration, as there were other criticisms directed at the new Brazilian NDC – concerns have been raised about the long-term strategy of Brazil to become "climate-neutral" by 2060, which was conditioned to financial transfers of approximately US$ 10 billion per year from 2021.

It is important to emphasize that Brazil was the only country with a 2025 NDC that, on the occasion of the resubmission of the 2020 contributions, presented a "new first NDC" or an "updated first NDC." All the other countries that had a goal for 2025 submitted a "second NDC" that was focused on 2030.

As can be seen, the new Brazilian NDC raises several points that, from a legal perspective, need to be evaluated in light of the key provisions of the Paris Agreement and its subsequent regulations. In this article, a legal analysis is carried out of the new Brazilian NDC, considering the web of legal rules (hard and soft law) and normative expectations that can be derived from the Paris Agreement.

The central argument of this article is that the new Brazilian NDC, which is built on questionable interpretations about the obligations of the Parties and replete with ambiguities as to

the commitments made therein, violates the spirit of the Paris Agreement and infringes the fundamental principles that guide its design and implementation. More specifically, the new Brazilian NDC affronts the principle of the prohibition of the regression, implicit in the Paris Agreement, and violates the requirement of the Agreement that the Parties must update their NDCs by seeking to advance the level of ambition.

As will be demonstrated in the remainder of this article, from a legal point of view the new Brazilian NDC only demonstrates the urgent need for the international community to urgently address the open and indeterminate character of several of the obligations of the Agreement, in order to avoid new negative precedents The Brazilian case provides evidence of the need of a collective effort to fill in the gaps and for a better delimitation of the scope and the reach of the main obligations established in the Agreement, especially with respect to the substance of the NDCs and the procedural requirements concerning the information necessary for clarity, transparency and understanding of the individual commitments.

In this vein, this legal analysis departs from the Brazilian NDC in order to untangle two central obligations from the mitigation and transparency clusters of the Paris Agreement. The first is that of "progression" of article 4.3 of the Agreement, which obliges the Parties to submit successive NDCs that represent a higher ambition in relation to the previous commitment. The successive NDCs must also, according to the same provision, reflect the "highest possible ambition" of the Party, taking into account its common but differentiated responsibilities (and respective capabilities) – CBDR-RC, in the light of different national circumstances. The second obligation is that the Parties, when communicating their NDCs, provide the required information for the purposes of clarity, transparency and understanding (CTU) with respect to their individual contributions (article 4.8).

The next section opens the discussion with a crucial question: what is the legal status of the "New First NDC" of Brazil? The section also discusses how the adopted terminologies, and their intended legal consequences, contrast with the substance of the assumed commitments, creating an ambiguity with respect to the Brazilian NDC, reinforced by the lack of clarity regarding the fundamental aspects of its methodological and substantive changes. Two central areas are then discussed: the duty of progression and the prohibition on regression. The conclusion reinforces the need for greater clarity concerning all the substantive and formal elements of the NDC, as a minimum requirement, in order to guarantee the consistency and the integrity of the implementation of the Paris Agreement.

THE LEGAL QUALIFICATION OF THE NEW BRAZILIAN NDC: THE ABSENCE OF A LEGAL BASIS FOR THE "NEW FIRST" NDC

Initially, before delving into the merits of the problem, it is fundamental to analyze, in light of the Paris Agreement and its regulations, the legal status of the updated NDC submitted by Brazil in 2020, comparing the legal quality of the commitment with the terminology that was given to it by the Brazilian government.

To achieve this, it is necessary to recall the guidelines of Decision 1/CP.21 of the Conference of the Parties (COP) 21, which regulated the process for the preparation and communication of the first NDCs by countries.[4] According to the rule, the Parties must submit an NDC at the time of the ratification, filing, approval or accession of the Paris Agreement (paragraph 22). Originally, it was expected that the Paris Agreement would enter into force in

2020, when the second commitment period of the Kyoto Protocol ended. For this reason, the Decision also requested that, in 2020, the Parties whose NDCs had targets with the time frame of 2025, communicate new goals (paragraph 23). The Parties with targets up to 2030 must also communicate new targets or update them (paragraph 24).

However, the Paris Agreement came into force well before the initially envisaged date, more specifically about three years before, in November 2016, after achieving the minimum number of ratifications. Therefore, the three paragraphs of Decision 1/CP.21 leave room for ambiguous interpretations, given that all the Parties necessarily had to submit an NDC at the time of filing or ratification of the Agreement.

Taking advantage of this redundancy and the lack of clarity of Decision 1/CP.21 with respect to the timing of resubmission and/or updating of the NDCs in 2020, the Brazilian government argued, in the explanatory letter attached to its updated NDC, that the new 2020 NDC could be received as a "New First" NDC. According to the language of the letter, Brazil claims that its new NDC should be governed by paragraph 23, of Decision 1/CP.21, because it contains the time frame of 2025

Considering the context of the facts, the main legal effect intended by the Brazilian government when 'labelling' the new NDC as a "New First" NDC is to remove the applicability of article 4.3 of the Paris Agreement, which requires progression of the ambition in the "successive NDCs." In this regard, the rationale for repealing the application of article 4.3 would be twofold: firstly, it concerns the "resubmission" of the NDC for the purpose of complying with the formality of paragraphs 22, 23 and 24, of Decision 1/CP.21, and not an actual update; secondly, as it would be a "redundant" act, the Party that resubmits its NDC in 2020 would not have the duty of observing the progression requirement. In other words, the interpretation of the Brazilian government necessarily maintains that: (i) the resubmission of the NDC in 2020 is a merely formal act, and not an act that would attract substantive requirements from the block of mitigation obligations of the Paris Agreement, and (ii) the NDC resubmitted due to Decision 1/CP.21 does not fit into the concept of "successive NDCs" of article 4.3, of the Paris Agreement.

However, the interpretation of the Brazilian government that the new NDC is not subject to the requirement of progression of the ambition, in addition to being contrary to the spirit of the Paris Agreement, as will be demonstrated below, comes up against other factual data that is even more serious. Brazil has not only submitted an NDC that does not progress in its ambition, but that effectively regresses in relation to the previous commitment. As we have seen, this regression is due to a methodological update of the inventory of the emissions of the base year (2005), which increased the initial volume that serves as a reference for the application of the percentages of reduction of 37% and 43%.

Therefore, by understanding that there would be no obligation to adjust these percentages proportionally, but only to reiterate them, even with the baseline altered, the Brazilian government submitted an NDC that projects an **increase in the absolute final volume of the emissions in the target years of 2025 and 2030**, which rise from approximately 1.3 Gt/CO2-eq to 1.76 Gt/CO2-eq.

The "New First" Brazilian NDC reflects an understanding of the Brazilian government that this instrument, by not fitting into the definition of "successive NDCs," could effectively regress the commitment originally submitted at the time of the ratification of the Agreement.

As stated in the introductory section, the regulations of the Paris Agreement have not yet

reached the point of filling certain gaps, which includes the precise and objective characterization of what is, and how to measure, the progression of the ambition of the Parties.

It can be seen, from the Brazilian case, that these gaps may represent a real threat to the integrity of the Paris Agreement. In the specific case, Brazil attached to its own individual contribution a series of adjectives (e.g.: "New First") and relied on questionable interpretations in order to submit a problematic NDC, which at the same time (i) does not increase ambition in objective terms and that, (ii) on the contrary, regresses in relation to the previously submitted commitment.

The subsequent two topics analyze these two central issues, namely, the obligation of a Party to comply with the requirement of progression whenever it makes adjustments to its NDC and the prohibition on regression in relation to the previously assumed commitments in the Paris Agreement.

ADJUSTMENT OF NDCS, METHODOLOGICAL CHANGES AND THE REQUIREMENT ON PROGRESSION OF THE AMBITION

By virtue of article 4.3 of the Paris Agreement, after the presentation of the first NDC, in which the Parties enjoyed virtually unlimited autonomy to define the scope, the rigor and the form of their ambition,[5] new NDCs must exhibit an increase in the ambition.

The Brazilian case shows, however, that the Paris Agreement has some ambiguities and gaps in relation to progression in the NDCs, in part due to the type of normative force embedded in the language of these provisions.[6] Furthermore, these provisions present a lack of precision in the scope of the legal obligation contained therein, which may result in a Party submitting an NDC that only contains progression in its surface or, in the worst situations, as in this case, reflects a decrease of the ambition.

The issue must be resolved, therefore, by analyzing the relevant specific provisions of the Paris Agreement in light of its own objectives. To this end, the general rule for the interpretation of treaties of the Vienna Convention on the Law of Treaties is taken as a starting point. By such a general rule, "a treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose" (article 31.1).

In this regard, as is widely accepted in the applicable literature[7], a systematic interpretation of the objectives and provisions contained in the Paris Agreement, added to the analysis of the texts of the negotiation of the Agreement, demonstrate that the architecture of the Paris Agreement is fundamentally based on a system of organic, gradual, continuous and ascending ambition.

In this regard, the progression of NDCs is a key element: the NDC is a powerful mechanism to contain the process of an increase of the average temperature of the Earth's surface that is underway at an accelerated speed. Static NDCs would be inappropriate and insufficient instruments to contain global warming, especially if we consider the cumulative effect of the concentration of the GHG in the atmosphere and the volume of historic emissions. Therefore, NDCs, by definition, need to be progressive in order to achieve the objectives of the Paris Agreement.

It can be seen that the provision of article 4.3, which requests that the Parties communicate successive NDCs that will represent a progression beyond the current NDC and that reflect the "highest possible ambition" is a funda-

mental piece of the architecture of the Paris Agreement. This is a legally binding obligation[8] of conduct,[9] which establishes a "duty of care" upon the States to undertake effective and significant measures to achieve their individually stipulated goals, including by virtue of article 4.2 of the Agreement.

Furthermore, the Paris Agreement contains a specific and clear rule regarding the adjustment of NDCs. Article 4.11 of the Paris Agreement establishes that a Party can adjust its NDC at any time, but only to "enhance its level of ambition". In this regard, it can be said that **any amendment to an NDC can only be made with the objective of increasing the level of ambition**.

Returning to the specific case, the Brazilian government, in the actual NDC document (item 6 (c)), states that the new contribution effectively represents an advance in relation to the previous NDC of 2016 because the 2030 goal, which was previously "indicative", became a formalized commitment and free of any qualifiers or conditions. It is worth transcribing the full text of the item:

> ***(c) How the Party has addressed article 4, paragraph 3, of the Paris Agreement:***
>
> *The target of reducing emissions by 43% between 2005 and 2030 represents an increase of 6% compared to the previous target of reducing emissions by 37% between 2005 and 2025. The current target is also consistent with an indicative long-term objective of reaching climate neutrality by 2060.*

As can be seen, for the Brazilian government the increase of the ambition would lie in the formalization of the goal of 2030 of a 43% reduction in relation to the 2005 levels, which would no longer be "indicative", but have assumed the status of an official commitment.

Leaving aside the problematic methodological update regarding the inventory of emissions of the base year, it can be seen that the Brazilian case raises the urgent need for the regulation of the Paris Agreement with respect to the substantive dimension of the requirement of the "progression of the ambition" of article 4.3.

On these issues, this text does not purport to exhaust, or even deepen, the discussion, but only to flag this gap that must be filled to confer upon the Paris Agreement greater legal certainty and to repeal ambiguities that could weaken the entire normative architecture of the Agreement.

Only by virtue of initiating the debate on how to address this problem, it is suggested that the analysis of whether a Party presented a more ambitious NDC or not must encompass the two-dimensional elements of the dynamic self-differentiation, in accordance with the scholarly work of Voigt & Ferreira, i.e., the content and the form.[10] In this regard, it would be possible to reconcile the Principle of the Common but Differentiated Responsibilities and Respective Capabilities (CBDR-RC), which provides the normative basis for the self-determination both with respect to the content (how much it will reduce) and the form (the type of goal – e.g., sectorial, for the economy, absolute reduction, etc.) of the individual contribution of each country, with the requirement of the progression of the ambition of article 4.3.

Therefore, by reconciling both the normative parameters, in any of these dimensions, or preferably in both, there must be a material - and not just a nominal - progression in the individual contributions. **Amendments to the language of an NDC, including through the use of "qualifiers" or conditional terms, such as the adjective "indicative," cannot serve as an excuse or as a subterfuge for countries to**

submit NDCs that are progressive only in their appearance. By allowing this practice, the integrity of the Paris Agreement is put at risk.

THE PROHIBITION ON REGRESSION

As made clear from the analysis by La Rovere, in this publication, Brazil has promoted a methodological change in a key reference, which was the base volume of the emissions for the reference year of 2005. From the number present in the inventory of the 2nd National Communication to the UNFCCC, Brazil has altered this reference to the inventory number of the 3rd National Communication, whose calculation increased the Brazilian emissions for 2005 by approximately 700 Mton/CO2-eq.

As stated earlier, the Paris Agreement gives wide discretion the Parties to determine the form and the rigor of their individual contributions in order to achieve the common objective of limiting of the average temperature increase to well below 2 °C and ideally no more than 1.5 °C.

Again, based on the Vienna Convention on the Law of Treaties, THE best systematic interpretation of the Paris Agreement is that, whatever the specific situation, the NDC must be progressive, or, at least, **it is certain that no Party is authorized by the Agreement[11] to promote a regression in the ambition of the NDC**.

In addition to there being no exception in the Agreement in this regard, the prohibition on regression in the regime of the Agreement is reinforced by a historical account of the negotiation of the instrument. The text proposals which prevailed denote that there was an explicit choice by the countries during the negotiation: they opted to remove the possibility that regressive targets could be submitted by the Partis.[12] The solution, if the country finds it difficult to honor its commitments, is to seek, within the array of means of implementation (financing, transfer of technology and capacity building) of the Agreement, ways to comply with its obligations and to follow a trajectory of increasing the ambition.

Furthermore, there is an underlying ambition in the actual **concept of mitigation** as established in the initial provision of article 4, specifically in paragraph 4.1, which provides a **"roadmap" of how the Parties must delineate the trajectory of their NDCs** towards the objectives of article 2.1. This roadmap consists of the following (according to 4.1):(1) peaking of GHG emissions as soon as possible; (2) rapid reductions thereafter in accordance with the best available science; and (3) a balance between emissions by sources and removals by sinks in 2050. This ascending trajectory in terms of ambition is, therefore, a necessary quality of the NDCs. **If a Party does not present an NDC with such a quality, it will not be submitting a valid NDC**.

Accordingly, it can be said that article 4.1 - which inaugurates article 4 of mitigation within the Paris Agreement - defines what the trajectory of an NDC is expected to be: a progressive trajectory. Therefore, it is noted that there is a mechanism of ambition embedded in the concept of mitigation within the Agreement.

Finally, article 3 makes it even more clear that this progression is an essential characteristic of the NDCs:

> *"As nationally determined contributions to the global response to climate change, all Parties **are to undertake and communicate ambitious efforts** as defined in articles 4, 7, 9, 10, 11 and 13 with the view to achieving the purpose of this Agreement as set out in article 2. **The efforts of all Parties will represent a progression over time**, while recognizing the need to su-*

pport developing country Parties for the effective implementation of this Agreement."

Consequently, **a "downgraded" revision of a Party's NDC is not permitted by the Paris Agreement**.

In addition to any dispute with respect to the applicability of articles 4.3 and 4.11, there also remains the principle of ***good faith***, which, according to the Vienna Convention, requests the Parties to a treaty to adopt the necessary steps to comply with the objectives and the purpose of the instrument.[13]

FINAL CONSIDERATIONS ON THE NEW BRAZILIAN NDC AND THE INTEGRITY OF THE PARIS AGREEMENT

The new Brazilian NDC, submitted to the central registry of the UNFCCC in December 2020, poses a series of challenges and dilemmas that go beyond the specific case to raise broader issues to the international community and to the bodies of interpretation, compliance and adjudication regarding treaties. Such issues touch upon potential and serious gaps in the Paris Agreement. These gaps need to be filled so that the Agreement does not collapse.

In this regard, NDCs which are replete with ambiguities and questionable interpretations in light of the purpose and the objectives of the Agreement not only make it difficult to monitor the compliance with individual commitments, but also weaken the political--normative structure of the Paris Agreement, which requests progressive ambition in light of national circumstances.

The Brazilian NDC fits into this profile of ambiguity, because: 1) on the one hand, it was submitted as a "new first NDC," i.e., not precisely a successive NDC; 2) on the other hand, it submitted an NDC that, although not successive, was justified as being progressive in relation to the previous NDC; and 3) finally, the verification of the documents presented by Brazil demonstrates that the new first NDC is not effectively progressive in relation to the previous NDC, revealing, at the least, a lack of consistency in the information provided by the Brazilian government - which infringes article 4.8 - and, more worryingly, represents a "downgraded" target in relation to the previous NDC, in conflict with the Paris Agreement.

It must be recalled that article 4.13 of the Agreement states that "*Parties shall account for their nationally determined contributions*" and that "*in accounting for anthropogenic emissions and removals corresponding to their nationally determined contributions*" "*they shall promote environmental integrity, transparency, accuracy, completeness, comparability and consistency*." Therefore, it is the responsibility of the countries, whatever the methodology they use - and they are free to use whatever they want and to modify it when they want, subject to certain rules - to demonstrate the consistency and comparability of the data, so that the real progression of the NDC can be measured, in light of the objectives of the Paris Agreement.

Furthermore, the Parties must provide the required information in order to guarantee that it is clear and understandable, as established in article 4.8. Accordingly, although some Parties may be understood to be beneficiaries of a differentiated treatment, based on their *common but differentiated responsibilities and respective capabilities in light ofnational circumstances*, **the Parties must justify this condition**. It is not self-evident.[14]

It is desirable for the international community, and the bodies and mechanisms that are res-

ponsible for monitoring Parties' compliance with the Agreement, to stipulate clearer, more predictable, objective and uniform criteria so that the Parties account for the increase of their ambition, in accordance with the ratchet mechanism of the Agreement.

These issues of ambiguity related to the NDC can, in turn, constitute systemic problems that must be addressed by the compliance mechanism of the Agreement or take priority in the regulation of the provisions of the Agreement with respect to the transparency of the information for the understanding of the NDCs, in order to allow the collective monitoring of the implementation of the individual commitments.

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ENDNOTES

1. Available at: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Brazil%20First/Brazil%20First%20NDC%20(Updated%20submission).pdf>.
2. The long-term low-carbon development strategies have been adopted by an increasing number of countries, in the form of domestic voluntary commitments or embedded in legal instruments. In the Paris Agreement, these strategies are established in article 4.19, without necessarily figuring as one of the components of the NDCs ("All Parties should strive to formulate and communicate long-term low greenhouse gas emission development strategies, mindful of Article 2 taking into account their common but differentiated responsibilities and respective capabilities, in the light of different national circumstances."). According to Decision 1/CP.21, the Parties should present these strategies by 2020 (paragraph 35), in order to be published by the secretariat of the UNFCCC.
3. See: Climate Observatory, NDC and carbon "pedaling": how Brazil reduced the ambition of its goals in the Paris Agreement, December 10, 2020. Available at: <https://www.oc.eco.br/wp-content/uploads/2020/12/ANA%CC%81LISE-NDC-1012FINAL.pdf>; Natalie Unterstell, "Is the Bolsonaro government really committed to the reduction of carbon?", Revista Época (online), December 9, 2020. Available at: <https://epoca.globo.com/natalie-unterstell/governo-bolsonaro-esta-mesmo-comprometido-com-reducao-de-carbono-24788947>.
4. Available at: <https://unfccc.int/process-and-meetings/conferences/past-conferences/paris-climate-change-conference-november-2015/cop-21/cop-21-decisions>.
5. BODANSKY et al (2017).
6. Note that the language of article 4.3, in English, has a more affirmative than coherent character when compared to the obligation of article 4.2 (regarding the implementation of domestic measures in order to achieve the objectives of the NDC): "Each Party's successive nationally determined contribution will represent a progression beyond the Party's then current nationally determined contribution (…)."
7. RAJAMANI (2016); RAJAMANI & BRUNEÉ (2017); MAYER (2018a).
8. RAJAMANI (2016).
9. MAYER (2018).
10. VOIGT, C., & FERREIRA, F. (2016).
11. Rajamani & Brunée note that a country could invoke the state of necessity or other principles and institutions of public international law and treaty law, as force majeure, in order to justify an exceptional regression, but observes that by the Paris Agreement in itself there is no exception clause to the duty of observing the progression. In any case, the Brazilian government did not provide any justification in this regard. See: RAJAMANI & BRUNEÉ (2017).
12. Rajamani & Brunée and Legal Response International retraced the history of the negotiation of the Paris Agreement to explore

the options available at the time in relation to possible exceptions to the obligation of progression. Both understand that the lack of any explicit reference to a "downgraded" NDC in the approved text demonstrates its opposition to the spirit of the Agreement. Cf.: RAJAMANI & BRUNEÉ (2017); LEGAL RESPONSE INTERNATIONAL (2017).

13. VOIGT (2016).
14. It is important to reinforce that the determination of the "fair share" of each country for the global reduction of the emissions also presupposes the analysis of the component of the "respective capabilities," which must be considered by the State in order to assume commitments in accordance with its "highest possible ambition" (article 4.3). It can be observed that the Paris Agreement reinforced the approach with respect to the component of the "respective capabilities" from a reading of several of its provisions, for example article 4.4, which encourages the developing countries to move over time towards economy-wide emission reduction or limitation targets in the light of different national circumstances. Similarly, the financing for the actions and policies of mitigation and adaptation is treated with more significant nuances in the Paris Agreement in comparison to the strict allocation of duties and obligations with respect to the financial flows of the Convention (in its article 4.7).

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The Institute for Climate and Society (iCS) is a philanthropic organization that promotes prosperity, justice and low carbon development in Brazil. We operate as a bridge between international and national funders and local partners. Consequently, we are part of a wide network of philanthropic organizations that are dedicated to finding solutions to the climate crisis.

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