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TRACING CLIMATE COMMITMENT IN BRAZIL AND SOUTH AFRICA, 2000-2020

Compromisso climático no Brasil e na África do Sul, 2000-2020

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ABSTRACT

In democracies, policy is the result of a process in which different groups interact to put forward their interests and ideas. This process does not happen in abstract; it is embedded in social structures that influence the position of each group as well as how they interact in the political game. It is not different regarding climate policy: the likelihood and effectiveness of climate action depends on coalitions in favor of climate mitigation and their strength to counter the force of coalitions against it. In this paper, by employing thick description, process tracing and political economy lenses, we analyze the commitment to climate change mitigation in two BRICS democracies – Brazil and South Africa – between 2000 and 2020.

Key words: Climate change. Coalitions. Political economy.

RESUMO

Em democracias, políticas públicas são o resultado de um processo em que diferentes grupos interagem para fazer valer seus interesses e ideias. Este processo não acontece em abstrato; está inserido em estruturas sociais que influenciam a posição de cada grupo assim como o modo por meio do qual interagem no jogo político. Isso não é diferente em política climática: a probabilidade e efetividade da ação climática depende de coalizões a favor da mitigação da mudança do clima e de sua força para conter coalizões contra a mitigação. Neste trabalho, por meio do emprego de descrição densa, *process tracing* e das lentes da economia política, analisamos o compromisso do Brasil e da África do Sul, duas democracias dos BRICS, com a mitigação climática entre 2000 e 2020.

Palavras-chave: Mudança climática. Coalizões. Economia política.

1. INTRODUCTION

Despite the seriousness of the climate crisis and warnings from the scientists on the need to reduce Greenhouse Gases (GHG) emissions, they continue to rise. Between 2000 and 2020, global GHG emissions increased by 32%. Energy contributed the most to it (Figure 01): energy emissions increased by 35% in the period, and this sector has consistently answered for more than 70% of total emissions since 2000 (Figure 02). This role of energy in total global emissions is due to the global dependence on fossil fuels: coal, oil and gas answered for 80.50% of total global energy supply in 2000 and 80.10% in 2020 – and energy supply increased by 39.66% in the period (IEA 2024).

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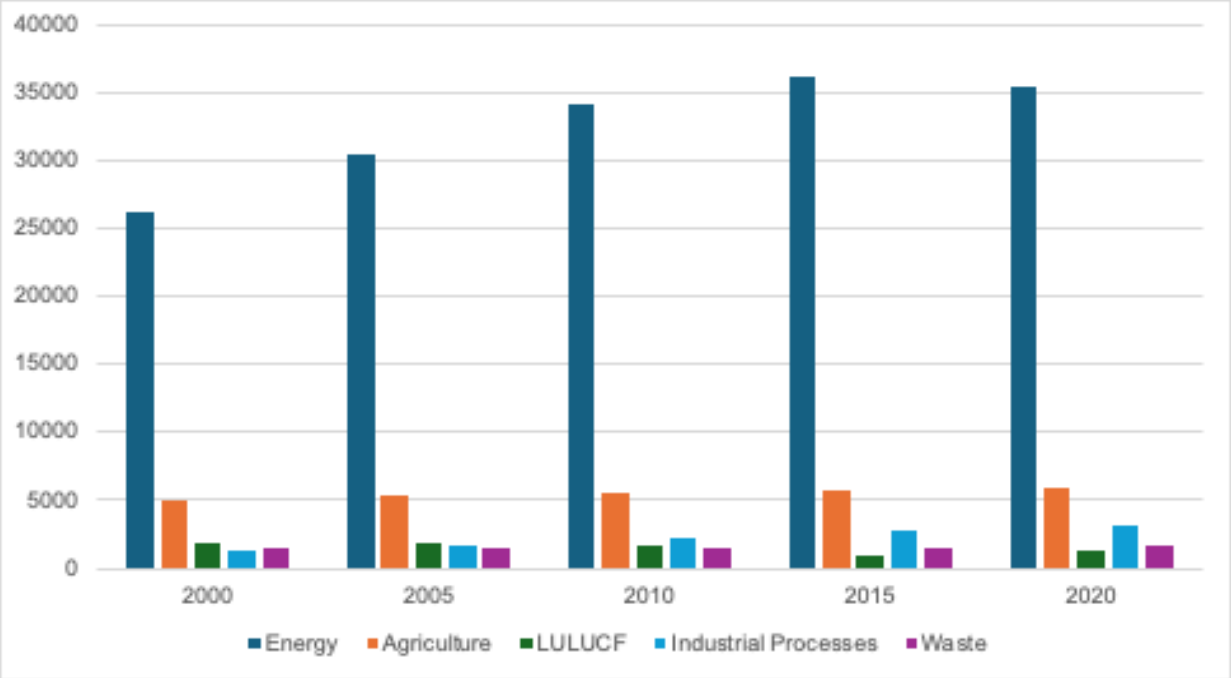
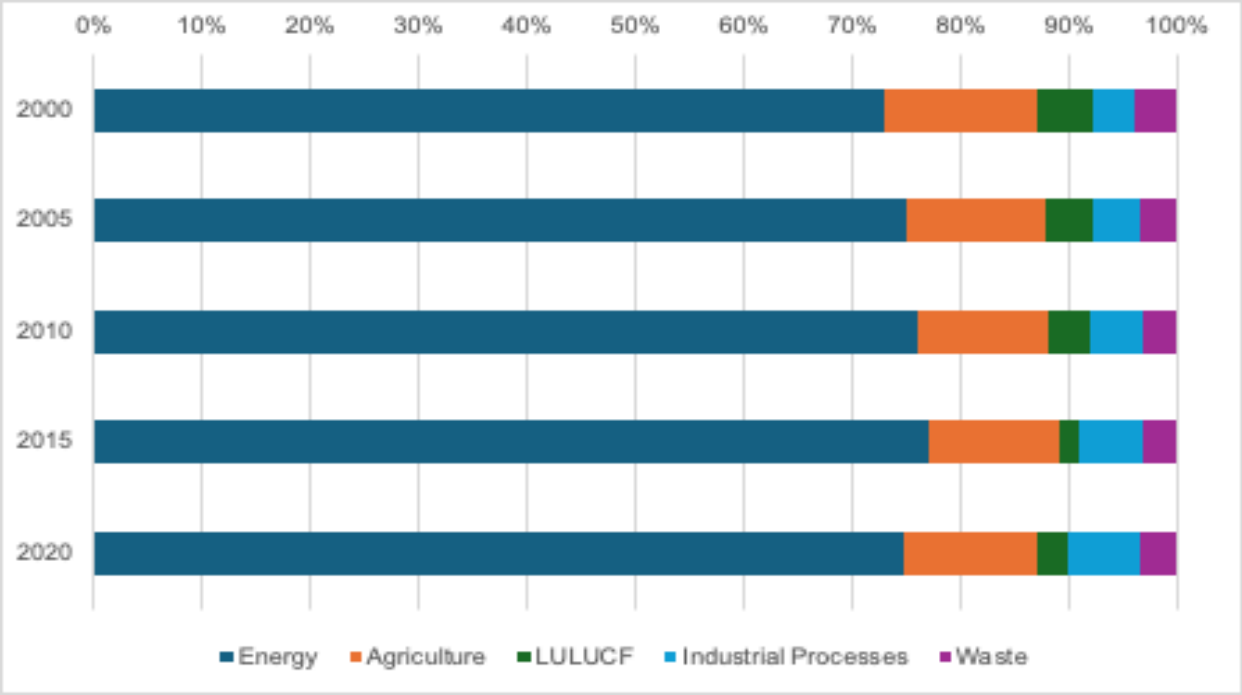
Figure 01: Global GHG emissions, per sector (million tons of CO_2e)



Source: Own elaboration, based on data from Climate Watch (2024).

Figure 02: Global GHG emissions, per sector (% of total emissions)



Source: Own elaboration, based on data from Climate Watch (2024).

Yet, other sectors also play a role in total global emissions. Agriculture, for example, answered for 14.11% of global emissions in 2000 and 12.34% in 2020; industrial processes, for 3.87% and 6.58%; and waste, for 4.07% and 3.48%, respectively (Figures 01 and 02). Land Use, Land Use Change and Forestry (LULUCF)'s share in total global emissions has decreased between

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2000 and 2020, from 4.96% to 2.93% (Figure 02) – although the picture is different if national emissions profile are at focus.

Climate action is mostly effective when it aims to reduce emissions in the sectors contribute the most to it. Globally, given the role of energy in total global emissions, this means reducing emissions from energy – or energy transition. This is also true for most countries, since their GHG emissions profile is similar to the global average. Yet, other countries have different emissions profile. Thus, understanding and evaluating a country's commitment to climate change mitigation requires checking its GHG emissions profile and trajectory and the action aimed at reducing them.

This paper analyses commitment to climate change mitigation in Brazil and South Africa. The article proceeds in four sections after this introduction. The following section presents our conceptual framework. The third section describes the composition and trajectory of GHG emissions in Brazil and South Africa, identifying the sectors in which action is mostly needed to reduce emissions: deforestation in Brazil and replacing coal in electricity generation in South Africa. After it, two sections describe the political economy context and struggles to reducing those emissions. Finally, the conclusion offers insights on how future research could contribute to a better understanding of climate commitment.

2. CONCEPTUAL FRAMEWORK AND CASE SELECTION

In this paper, we aim to answer to the questions: (i) have Brazil's and South Africa's commitment to climate change mitigation changed between 2000 and 2020 and (ii) why? In order to do so, we employ a framework that combines features of the climate change issue, historical institutionalism theory, political economy lenses, thick description and process tracing.

Commitment to climate change mitigation is framed as consistent action to reduce GHG emissions in the sectors that answer for most of it according to the country's total emissions profile (Viola, Basso and Franchini, upcoming). Reducing GHG emissions requires policy change, and policy change does not happen in abstract: it is embedded in social, economic and political structures, or institutions (Hall 2016). Institutions are product of a particular time and place; they frame the interactions in the political game, establishing accepted and non-accepted behavior and distributing power among the political actors (Hall 2016; Thelen and Steinmo 1992; Pierson 2016). Since power relations are unequal, coalitions are formed by actors to enhance their power and push their interests in political interactions (Pierson 2016, 175). According to this framework, commitment to climate change mitigation is more likely to increase when there are strong political coalitions in favor of action to reduce emissions in sectors that play a key role in total national emissions and weak opposition to it; commitment is less likely to increase, remaining low or decreasing, when the opposite is true.

Furthermore, we assume that institutions operate differently in democracies and non-democracies. In democracies, institutions limit, at least partially, the concentration of power in the hands of a few, increasing chances of diverse political coalitions to be present, and heard, in

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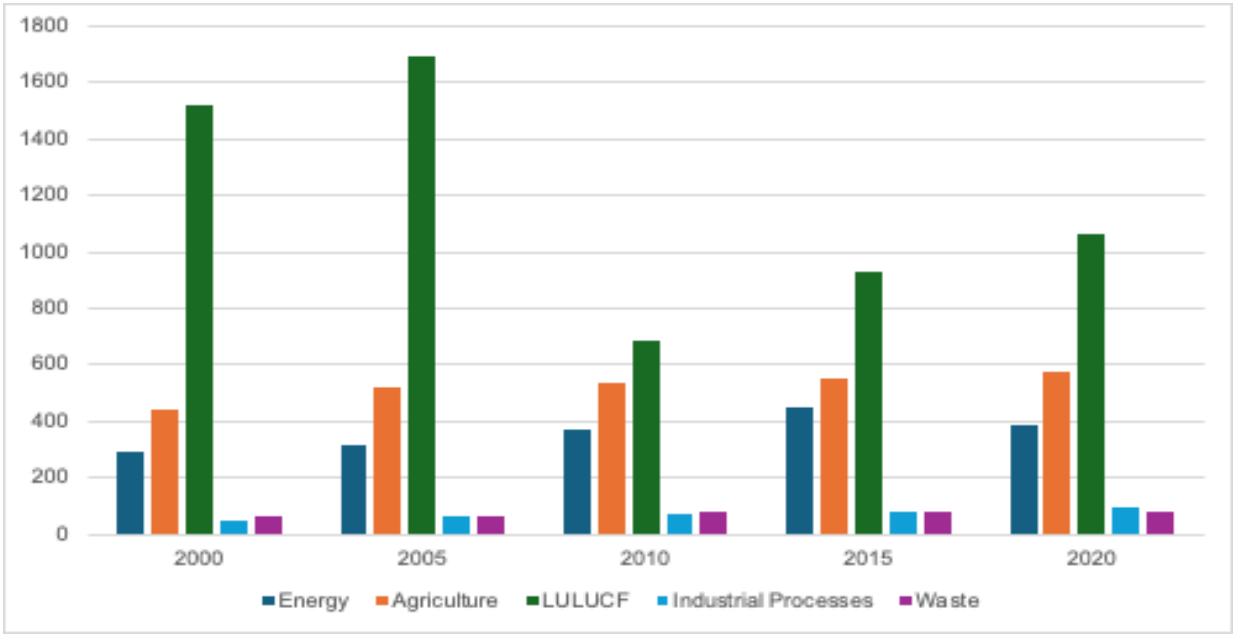
the political game. These differences will somehow be present when we observe closely the political struggle for policy change. In non-democracies, given the concentration of power, policy change might depend on different drivers.

Given limited space and resources, we choose to trace commitment to climate change mitigation in Brazil and South Africa. Both countries are emerging economies, which, alone or in coalitions such as the BRICS, have been questioning the structure of the international system. Both countries are democracies (Nord *et al.* 2024; IDEA 2023), but scoring high in inequality indexes (e.g. Gini, 2024) and with periods of authoritarian rule in their recent past. These shared features affect the distribution of economic and political power and might indicate similarities in the struggle for political action for climate change mitigation. Finally, given our theoretical framework, the paper focuses on tracing commitment to climate change mitigation in each of the two countries; some comparison, although not the focus, will be made in the conclusions to encourage further research.

3. BRAZIL AND SOUTH AFRICA: EMISSION PROFILE AND TRAJECTORY, 2000-2020

In Brazil, total emissions have decreased and then increased again between 2000 and 2020: the U-shape is clear when we compare the total of 2362.02 million tons of CO_2e in 2000, to 1739.48 million tons of CO_2e in 2010 and 2195.26 million tons of CO_2e in 2020 (SEEG, 2024). LULUCF sector answers for the greatest share of total Brazilian emissions (Figure 03). Despite having decreased between 2005 and 2010, LULUCF's emissions have consistently increased since then (Figure 03) – they answered for 64.39% of total Brazilian emissions in 2000, 39.33% in 2010 and 48.46% in 2020 (Figure 04).

Figure 03: Brazil, GHG emissions, per sector (million tons of CO_2e)



Source: Own elaboration, based on data from SEEG (2024).

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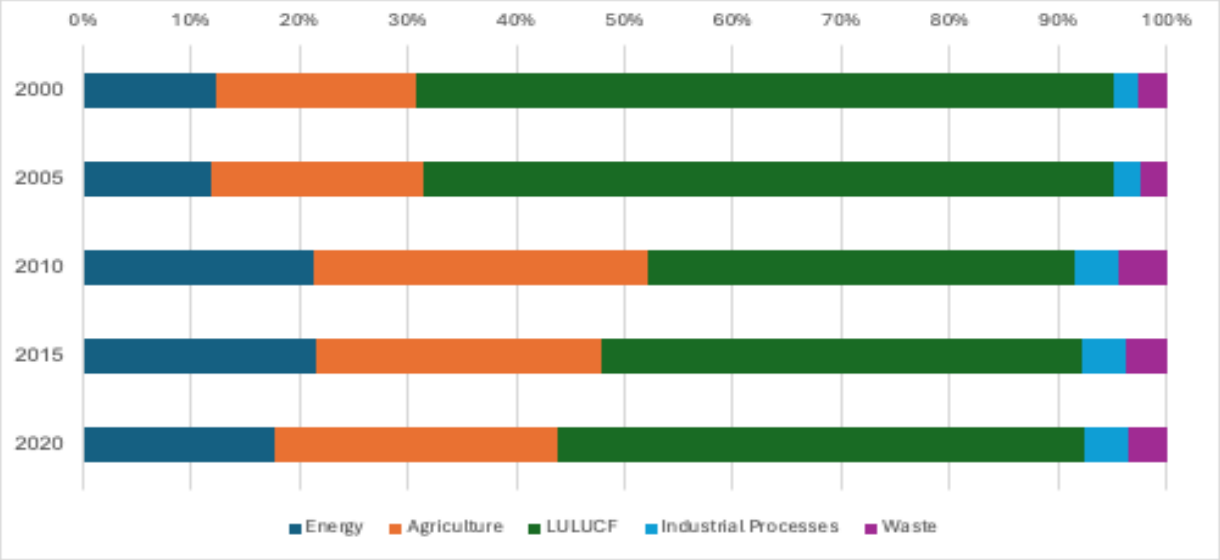
In addition to LULUCF, energy and agriculture have important roles in total Brazilian emissions. Agriculture answered for 18.55% of total Brazilian GHG emissions in 2000 and 26.26% in 2020; energy, for 12.25% of Brazilian GHG emissions in 2000 and 17.65% in 2020 (Figure 04).

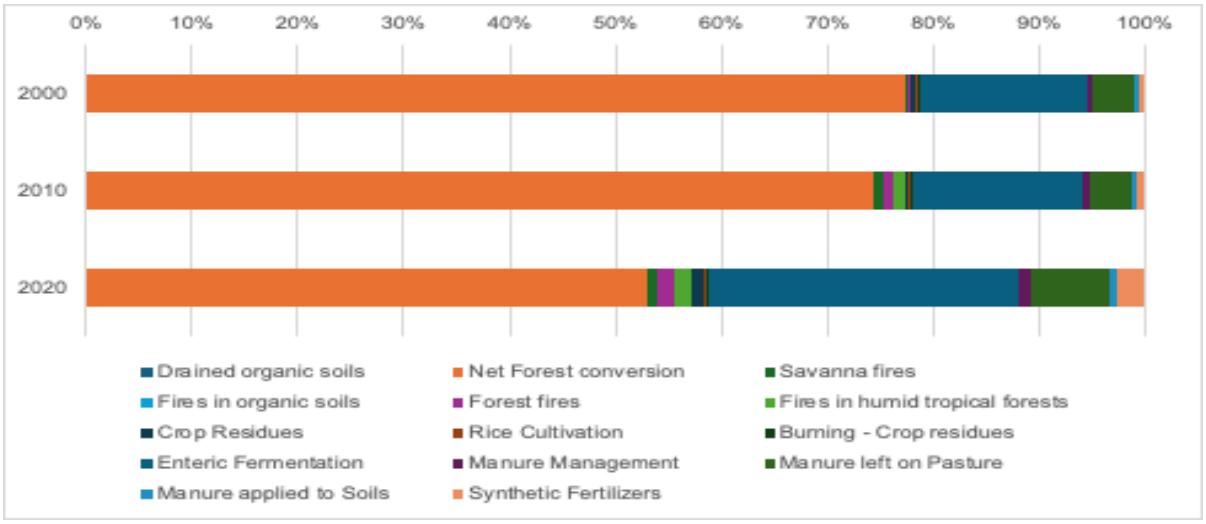
Figure 04: Brazil, GHG emissions, per sector (% of total emissions)



Source: Own elaboration, based on data from SEEG (2024).

By decoupling sectorial emissions to understand which activities contribute to it, we note that in Brazil net forest conversion – or deforestation – drives LULUCF and agriculture emissions. Despite having decreased between 2010 and 2020, net forest conversion still answers for the bulk of emissions in those sectors, followed by enteric fermentation – emissions derived from the process of digestion from cattle (Figure 05).

Figure 05: Brazil, activities in LULUCF and agriculture's emissions (%)



Source: Own elaboration, based on data from FAOSTAT (2023).

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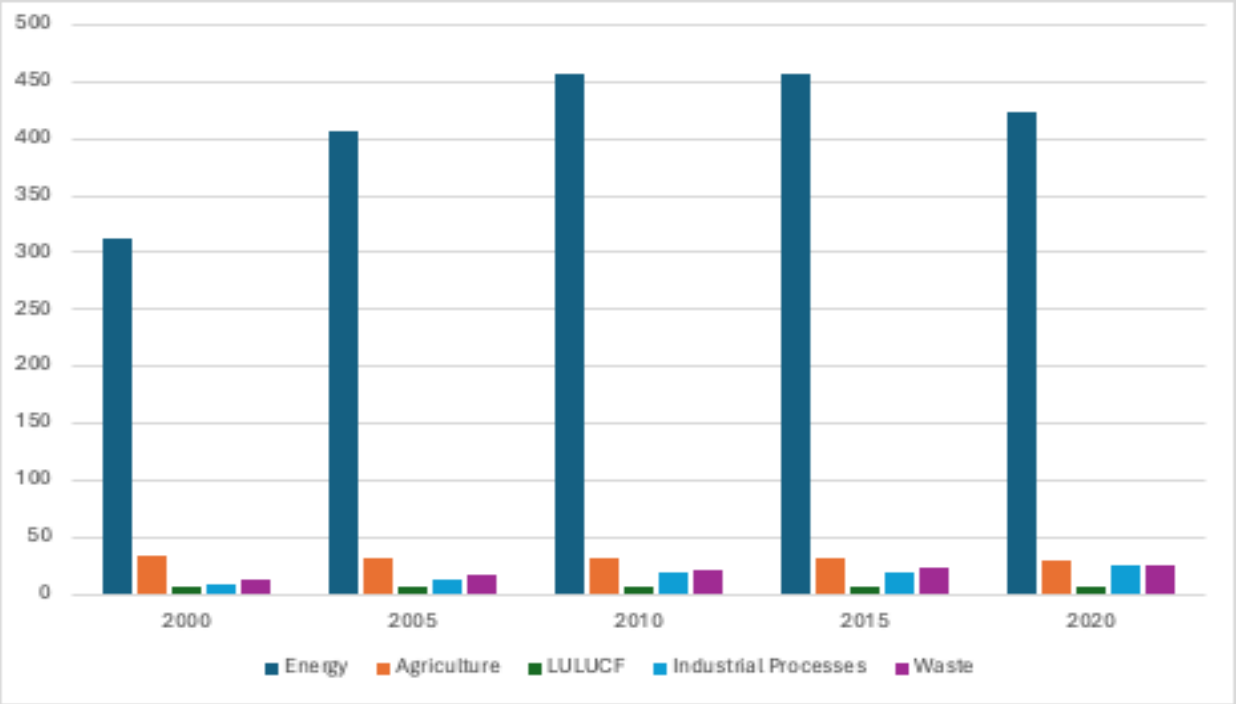
South Africa's emissions profile is different from Brazil's and more similar to the global's. South African emissions have consistently increased between 2000 and 2015: from 375.79 million tons of CO_2e in 2000 to 537.04 million tons of CO_2e in 2015 (Climate Watch 2024); between 2015 and 2020, emissions have decreased slightly (Figure 06) – in 2020, South African emissions were 508.38 million tons of CO_2e –, but this is due to the impact of the Covid-19 pandemic on economic activity, reducing energy emissions.[2] If numbers more up-to-date were available, they would probably show that these emissions have resumed their rising trajectory after 2020.

Figure 06: South Africa, GHG emissions, per sector (million tons of CO_2e)



Source: Own elaboration, based on data from Climate Watch (2024).

Energy answers for the bulk of South African emissions, always above 80% of total emissions – 83.28% in 2000 and 83.22% in 2020 (Figure 07).

[2] Literature is rich on the correlation between economic growth and emissions (for example: Mardani et al, 2019; Onofrei et al, 2022; or the commentary by Singh in the IEA blog <https://www.iea.org/commentaries/the-relationship-between-growth-in-gdp-and-co2-has-loosened-it-needs-to-be-cut-completely>), as well as on the impact of the Covid-19 pandemic on emissions (for example, Liu et al, 2020; Kumar et al, 2022; Ray et al, 2022).

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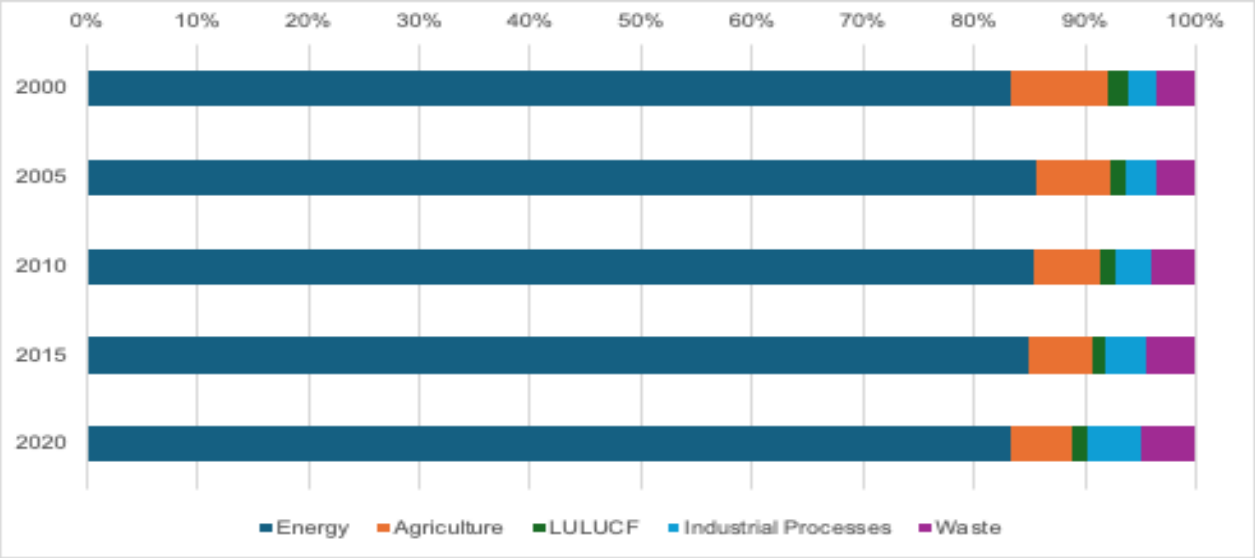
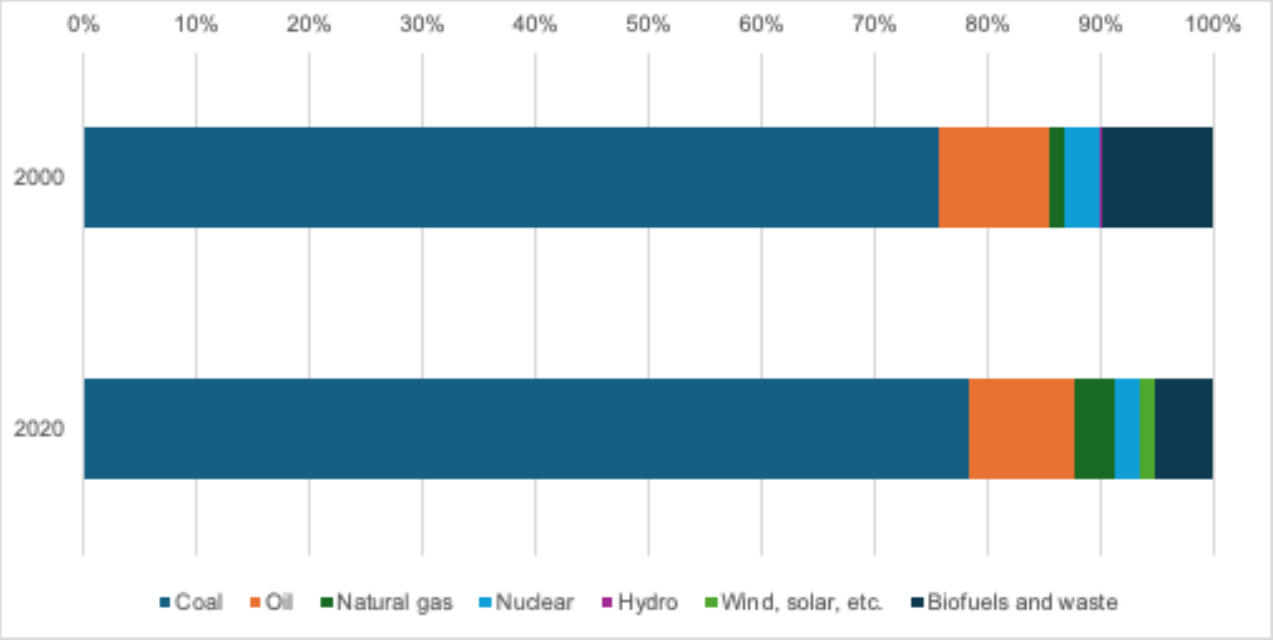
Figure 07: South Africa, GHG emissions, per sector (% of total emissions)



Source: Own elaboration, based on data from Climate Watch (2024).

This is so because South Africa is highly dependent on fossil fuels – especially coal –for its energy supply. Coal is, among the fossil fuels, the primary energy source which combustion emits the greatest amount of GHG. In 2000, fossil fuels answered for 86.78% of South African's energy supply – coal alone for 75.56% of it –; in 2020, fossil fuels answered for 91.20% total energy supply – coal, for 78.40% (Figure 08). In 2022, coal answered for around 45% of South African GHG emissions (Cunliffe 2023, 05).

Figure 08: South African energy mix (% of total)



Source: Own elaboration, based on data from IEA (2024).

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While climate change mitigation takes place by reducing emissions from any sector, effectiveness of climate action requires checking for emissions profile and trajectory to understand if (i) the main sectors are being targeted and (ii) action is successful in reducing emissions. Considering the emissions profile, action to reduce emissions in Brazil is required firstly in reducing deforestation; in South Africa, in reducing dependence from coal. Considering the trajectory of emissions, in Brazil they increased between 2000 and 2005, decreased between 2005 and 2010, and increased again between 2010 and 2020; in South Africa, they have increased consistently between 2000 and 2020.

What explains the trajectories of emissions in Brazil and South Africa, and are they related to action in the sectors where emission reductions are mostly needed? In the following section, we provide the political economy context to help answering those questions.

4. THE POLITICAL ECONOMY OF CLIMATE COMMITMENT IN BRAZIL, 2000-2020

Context: *deforestation in Brazil*

In Brazil, deforestation has taken place since colonial times. In fact, the first Brazilian "export" was *Pau-Brasil*, a noble timber that was highly valued in 17th Century Europe for its red pigment used to die clothes. Sugarcane and coffee production – the greatest Brazilian exports from the 18th until the 20th Century – were also dependent on removing natural vegetation to create plantation areas. And the same is true for current agriculture commodities, especially grains like soybeans and corn. This context gave rise to the view of the forest as an obstacle to development, which remains to date. According to this view, development takes place when modern economic activities – including agriculture, cattle raising and mining – replace the forest, creating income and wealth and pushing Brazil's position in the global economy.

This view has pushed deforestation in all six Brazilian biomes – some of them, were almost extinct in the process – for example, from the original *Mata Atlântica*, only around 12% remain (INPE 2019). Yet, the latest data available present deforestation rates since 1985, not earlier. According to it, Brazil has lost 15.06% of all its forested areas between 1985 and 2022, and 7.11% between 2000 and 2020 (Figure 09). Two pieces of information are important when reading Figure 09. First, the most severe deforestation in all Brazilian biomes except the Amazon (Amazonia) happened before 1985; thus, in all five biomes, total forested areas remaining in 1985 are only a share from the original biome. Second, the different biomes occupy different shares of the Brazilian territory. Thus, decreases of 10% in the Amazon, biome that occupies more than 50% of the territory, and of 25% of Cerrado, with 22% of the Brazilian territory, are very relevant for total LULUCF Brazilian emissions.

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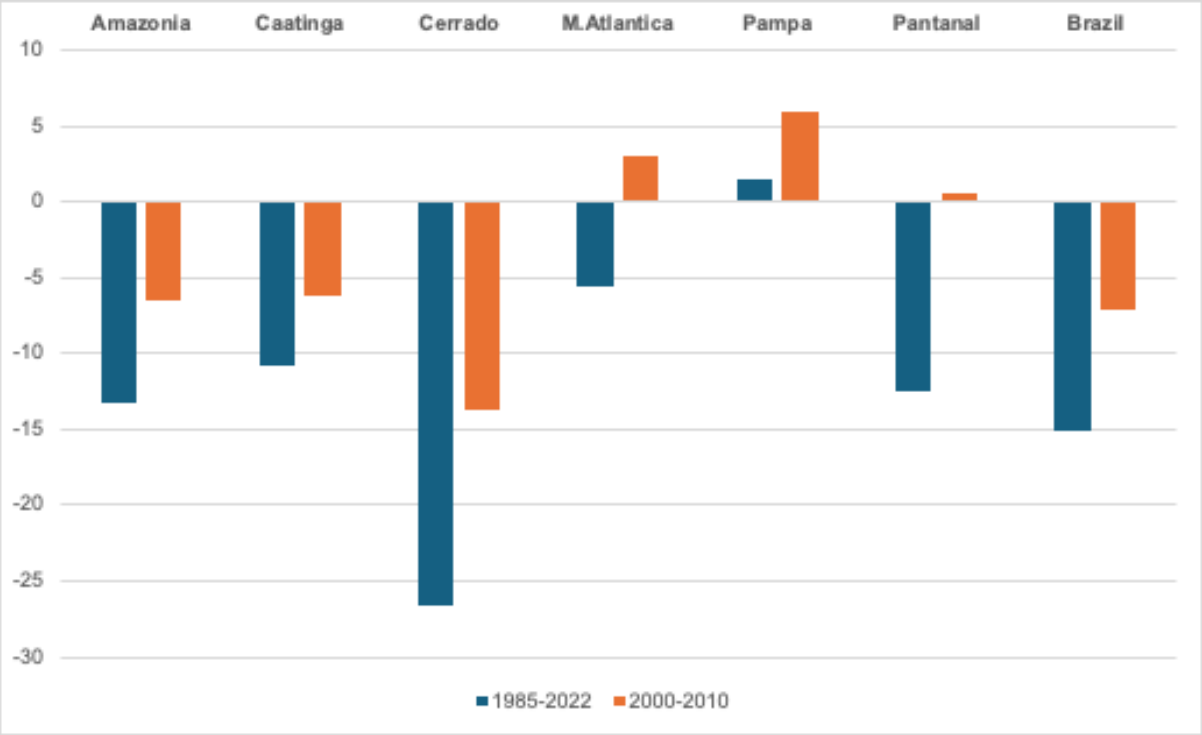
Figure 09: Loss of forested areas in Brazilian biomes (%)



Source: Own elaboration, based on data from MapBiomas (2023).

In Cerrado and the Amazon, where deforestation has the greatest impact on Brazilian LULUCF emissions, deforestation started during the 1970-1980s.

In Cerrado, agriculture is the main driver of deforestation, and incentives were put in place especially for soybean plantations. Soybeans appealed to Brazilian federal government in a context of state-led industrialization, as a modern crop that could be produced in large-scale using machinery and scientific techniques and that was becoming a highly valued international commodity given its increasing role in different industrial food products and animal feed. The federal government created several incentives to promote it in Brazil. Among these incentives were: the creation of *Empresa Brasileira de Pesquisa Agropecuária – Embrapa* (Brazilian Agricultural Research Corporation), affiliated with the Brazilian Ministry of Agriculture, to act as a research and development hub for agriculture and livestock in Brazil; (ii) cooperation agreements between Brazil and Japan to transfer technology on how to reduce acidity of the Cerrado soil, allowing for soybean plantations;[3] (iii) extensive credit and insurance options, subsidies for the purchase of fertilizers and machinery and minimum prices offered to farmers. Currently, deforestation higher the Northern area of the Brazilian Cerrado, the *MATOPIBA* region – referring to the states of Maranhão, Piauí, Tocantins and Bahia – and in Northern Mato Grosso, near the

[3] Japan is dependent on soy imports, and, at the time, the Nixon government restricted US exports to privilege the domestic market. Thus, the Japanese interest in cooperation agreements with other countries.

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limits with the Amazon biome. Brazil is currently the largest global soybean producer, having produced 39% of total soybeans output in the 2023/2024 period (USDA 2024).

In the Amazon, deforestation was embedded in a strategy to systematically occupy the region. The strategy had three objectives. First, to restrict international influence in the region (Becker 2001). Second, to reduce the social tensions in rural areas in the southern Brazil – which were on the rise due to the new agro-industrial model that prioritized mechanization and large farms (Becker 2001; Almeida 2004). Third, to establish modern economic activities in the region (Becker 2001; Almeida 2004). In order to encourage occupation, the federal government (i) promoted rural settlements and (ii) granted property titles to people that occupied and developed economic activity in previously public forested areas (Garrett *et al.* 2021; Loureiro and Pinto 2005). Removing the forest, selling the timber, and putting cattle to graze qualified as economic activity, thus became a common practice.

In fact, economic activities usually take place in sequence and drive deforestation in the Brazilian Amazon. At first, logging, to sell noble timber. After it, cattle ranching. Cattle ranching requires little capital investment, little soil preparation and can be practiced in uneven terrain, so it is easy to practice it in areas where deforestation leaves many non-noble timber trunks behind (Rivero *et al.* 2009). It is usually in this period that land tenure regularization and road development take place. After it, the areas are reverted to agriculture, and soybean and other agricultural crops, such as rice and corn, start to be produced (Rivero *et al.* 2009; Trigueiro, Nabout and Tassarollo 2020; Garrett *et al.* 2021).

There is, however, a different view on forests, one that values the forest in itself. This view is embraced by indigenous populations and traditional communities that have lived in forested areas, for whom the forest is home to them and to large biodiversity that sustains their ways of living. It is also embraced by the environmental movement, and, who, as expanded in Brazil with the re-democratization, strengthened liaison with both with indigenous populations and traditional communities and transnational environmental organizations. Finally, this view is also encompassed by the scientific community, due to increasing scientific findings on ecosystem services provided by forests – for example, regulating precipitation and climate patterns –, and by part of the agriculture producers, who understand that sustainability is part of their long-term interests since it helps maintaining profitability of their business.

Both views coexist in Brazil. Until 2003, the latter had little appeal for the federal administration, either due to different political priorities or a sense that deforestation was too ingrained to be controlled. Between 2003 and 2010, however, it was undertaken by key actors in relation to deforestation in the Amazon biome, forming the basis of a series of policies that helped reducing deforestation until 2012. Later, when the composition of coalitions changed and new political priorities emerged, the picture on tackling deforestation changed as well.

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2003-2010: *reducing deforestation in the Amazon is a political priority*

Between 2003 and 2010, reducing deforestation in the Brazilian Amazon was a political priority. This was due to enabling circumstances and political reasons. Enabling circumstances were three. First, the Brazilian economy was fiscally stable after the adjustments of Plano Real and international commodities prices were high and increasing, providing stable surplus in the balance of payments for the federal government. Second, the climate regime was advancing globally, the Kyoto Protocol and the Clean Development Mechanism having entered into force in 2001. Third, since economic growth, urban security and corruption, always the key issues for Latin American societies, were not in evidence in the period, there was space in the media and public opinion for environmental issues and climate change (Ryan 2017).

Political priority to tackle deforestation in the Amazon was threefold. First, Marina Silva and Carlos Minc in their tenure as Ministers of the Environment prioritized it. Marina Silva is an member of the rubber-tapper grassroots in Acre and former senator, highly knowledgeable about the complexity of the deforestation issue; her presence as a Minister of the Environment was key to negotiate with Lula the priority of the issue during his administration as well as to build the implementation strategy that enable law enforcement around it. Carlos Minc, a very progressive Brazilian environmentalist, continued her legacy. Their leadership was also key to mobilize a pro-environment coalition that shared the view on deforestation (Hochstetler and Keck 2007; Abers 2019; Aamodt 2018; Viola and Franchini 2018; Pereira and Viola 2022).

Second, unions and socioenvironmental grassroots were important actors of the coalition aligned with Lula's party (Hochstetler and Keck 2007; Abers 2019). Their agenda, especially in the Amazon region, included fighting for deforestation and increasing allocation of forested areas to indigenous communities. Third, Lula's foreign policy focused on establishing Brazil as a major power in the international regime, and advances in environmental protection was key for increasing Brazilian soft power (Viola and Franchini 2018; Pereira and Viola 2022).

Action to reduce deforestation combined a boost in initiatives that started during the Cardoso administration, such as the allocation of protected areas and titling of indigenous lands, and new efforts in three fronts: institutional change; funding; and enhanced capacity in policy implementation and law enforcement, including monitoring tools and collaboration across law enforcement authorities and different levels of government. These new efforts were organized under the umbrella of *Plano de Ação para Prevenção e Controle do Desmatamente na Amazônia Legal* – PPCDAm (Action Plan for the Prevention and Control of Deforestation in the Legal Amazon).[4]

[4] An initiative of the Ministry of the Environment but idealized by the Inter-Ministerial working group in 2003, PPCDAm is a framework policy aiming at creating more conservation areas, strengthening monitoring and enhancing law enforcement in order to reduce deforestation in the Amazon biome.

On institutional change, the implementation of a program collect and manage grants to protect conservation areas in the Amazon began[5] and the Brazilian Forest Service[6] and ICMBio[7] were created as specific agencies under the Ministry of the Environment. On funding, besides the allocation of an increased federal budget to environmental action, grants from international sources to Brazil – for instance, Norwegian and German donations to the Amazon Fund, created in 2008, were transferred to the municipalities on the condition that deforestation was kept under monitoring[8] – and access to rural credit on the condition that land property titles were regularized and environment were protected were key positive incentives.[9]

Finally, on enhanced capacity in policy implementation and law enforcement, action was taken in different fronts. The DETER system, to monitor real-time deforestation in the Amazon was established.[10] More personnel was hired and more equipment was purchased for monitoring agencies and law enforcement authorities, *Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais*, IBAMA (Brazilian Institute for the Environment and Natural Resources, Brazil's Environmental Agency), Instituto Chico Mendes de Conservação da Biodiversidade, ICMBio (*Institute Chico Mendes for the Conservation of Biodiversity*), and the Federal Police (Viola and Franchini 2018; Pereira and Viola 2022; Basso 2023; Basso 2024). Legal authorities, especially federal and states public prosecutors, acted continuously on law enforcement. Finally, coordinated efforts across law enforcement authorities, between them and different ministries and federal agencies, and between the federal government and states governments were also important (Viola and Franchini 2018).[11]

In 2005, deforestation rates in the Brazilian Amazon started to decrease and continued for several years (Figure 10). These successful results in reducing deforestation were key for a more proactive stance from Brazil in the climate regime. In 2009, Brazil committed to reduce, by 2020, emissions by 36-38% from business-as-usual scenarios. Despite being a very positive stance – for the first time Brazil made a pledge to reduce emissions –, achieving this goal was easy, since it

[5] *Programa Áreas Protegidas da Amazônia – ARPA* (Program for Protected Areas of the Amazon), created in 2002 under the legal framework policy of the *Sistema Nacional de Unidades da Conservação – SNUC* (National System for Conservation Units).

[6] Federal law 11284/2006.

[7] Federal law 11516/2007.

[8] The federal decree 6231/2007 charged the Ministry of the Environment with the function of creating a list, to be annually updated, of those municipalities would be allowed to receive transfers from the federal government, on the condition that the given municipality kept control of deforestation verified by INPE's data.

[9] Resolution 3545/2008 by the National Monetary Council.

[10] Established in partnership with *Instituto Nacional de Pesquisas Espaciais – INPE* (National Institute of Spatial Research). PRODES system, also by INPE, has been in force since 1988 and monitors annual rates of deforestation.

[11] Amazon states worked in collaboration with the federal government but also had their own initiatives for environmental protection. The state of Amazonas, for example, implemented cash transfers directly to populations, a policy known as *Bolsa Floresta* (Forest Allowance) (Viola and Franchini, 2018; Pereira and Viola, 2022). Transnational voluntary initiatives such as the soybean (2006) and beef (2009) moratoria also played a role in enhancing environmental protection (Nepstad *et al.*, 2014; Gibbs *et al.*, 2015; Gibbs *et al.*, 2016; Heilmayr *et al.*, 2020).

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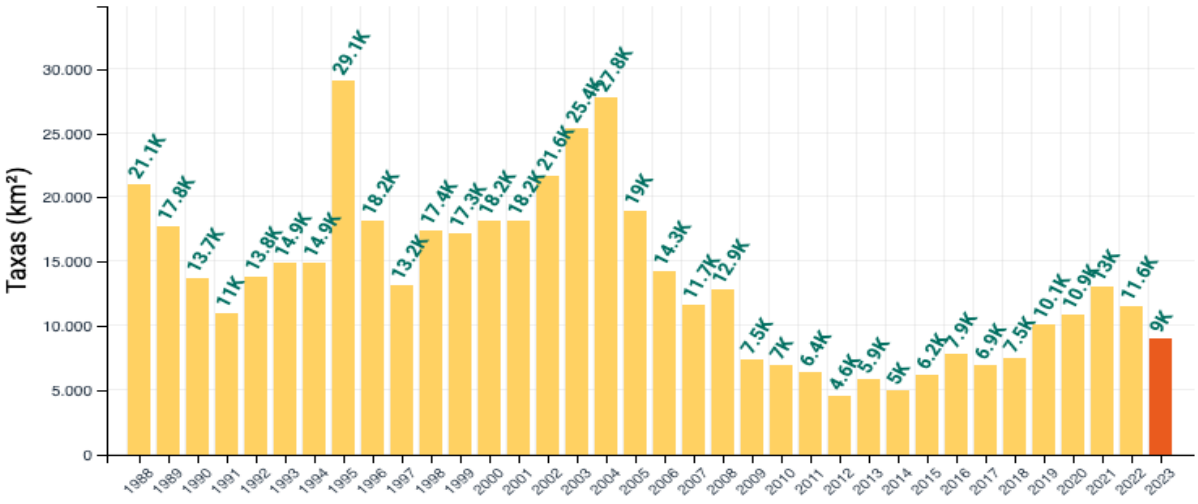
depended only on accounting for the deforestation in the Amazon that was already taking place (Viola and Franchini 2018; Pereira and Viola 2022).

Figure 10: Deforestation in the Brazilian Amazon, 1988-2023 (km^2)



Source: INPE, PRODES (2023).

2011-2020: *new circumstances and political changes*

Between 2011 and 2020, circumstances changed and climate change lost its political priority. In addition, the view on the forest as an obstacle to development, which political space had diminished during 2003-2010, became strong again.

Brazil faced serious economic and political turmoils in the period. Operation Car Wash uncovered massive corruption scandals that shook popular support for the federal administration – and democracy. In this scenario, climate change was no longer a priority for the public opinion. Corruption scandals, lower economic growth – due to the end of the commodities boom and lack of structural adjustments in the period – and slower pace of poverty alleviation and of improvement of public services caused popular unrest that took the streets. In addition, the composition of the Brazilian Parliament changed substantially after the 2010 elections, with rising representation from right-wing and extreme right parties and a stronger rural caucus. Finally, Brazil had in the period three presidents for whom climate change mitigation was not a political priority. Rousseff due to her technocratic style, reducing the administration's alignment with socioenvironmental issues; traditional views on development; and political weakness, which forced political concessions to opposing parties. Temer due to his unpopularity and constant need to negotiate with the Parliament for political support, giving in to the interests of strong groups, such as the rural caucus. And Bolsonaro due to his ideological alignment with the extreme right and anti-science and anti-environmentalist views; his administration put forward a series of

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policies that accelerated losses in environmental protection in general, and deforestation control in particular.

During Rousseff and Temer administrations, these incentives were no longer a priority; in addition, coalitions that support the first view (the rural caucus, for example) became politically stronger. And during Bolsonaro's tenure, support for the first view was open in the federal administration, reducing even more the space for actors that defend the opposing view.

Under these circumstances, the political space for climate action to tackle deforestation was reduced and setbacks took place. A significant example was the New Forest Code, approved in 2012. Three changes allow deforestation to expand legally. First, instead of limiting allowed deforestation in the Amazon biome to 20% of private properties, the law allows that 50% of it can be deforested if the property is locate in a state that has at least 65% of its territory covered by conservation units or indigenous land. Second, the new law cancelled all fines for illegal deforestation that happened before 2008. Third, the law linked the obligation to reforest to registrations in the *Cadastro Ambiental Rural,* CAR (Rural Environmental Registration), which is auto declaratory, therefore, weak in terms of effectiveness.

Key to understanding how this new Forest Code came to be are political changes, two in particular. Firstly, there was enhanced representation of the rural caucus at the Parliament after the 2010 elections, and more and more of its members showed that they had not assimilated the view of forests having value in themselves – prioritizing short-term interests from deforestation over long-term benefits of keeping the forest standing. Secondly, the new law also indicated less attachment of Rousseff with the socioenvironmental agenda compared to Lula, as well as her troubles to secure a political basis to govern and the need to accommodate interests of right-wing parties – which, at the end, resulted in her impeachment.

New setbacks took place during Temer's tenure (2016-2018). Despite having had a short period in power, Temer endorsed several legal documents of interest of the powerful rural caucus: legalized titles of rural properties without questioning the legality of the occupation; cancelled debts from farmers; suspended titling of indigenous lands; enhanced pork-barrel allocations to rural caucus' representatives (Pereira and Viola 2022). Temer's lack of ideological commitment to socioenvironmental issues as well as his political weakness, continuously having to negotiate support to remain in power, are among the causes for the setbacks.

Between 2019 and 2022, Bolsonaro embraced the anti-environmentalism (Viola and Franchini 2022). This stance was different from earlier ones: instead of lacking ideological alignment with the environment or dismissing environmental concerns for other priorities, Bolsonaro presented an open commitment against the environment. This commitment was translated into action in two fronts. First, by dismantling environmental institutions at the federal level and reducing the budget of the remaining ones. Among other measures, Bolsonaro proposed to place the Ministry of the Environment under the Ministry of Agriculture, only dismissing the

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measure due to consistent opposition from societal actors, including a letter signed by all previous Ministers of the Environment; the Climate Change and Forests Secretariat at the Ministry of the Environment was extinct; the Brazilian Forest Service was put under the institutional umbrella of the Ministry of Agriculture; the budget of IBAMA was substantially reduced; law enforcement on environmental issues was severely reduced.

Second, Bolsonaro repeatedly attacked scientific facts and initiatives that had played a key role in reducing deforestation in previous periods. Scientific data on deforestation and INPE, the independent research institute that has been in charge of monitoring deforestation since 1988, were constant targets; Bolsonaro fired INPE's president, Galvão, when 2019's deforestation rates were published and proposed to hire a private company to replace it. Bolsonaro also proposed to use resources from the Amazon Fund to compensate land grabbers who would lose tenure of their illegally occupied land by legal expropriation.

Third, Bolsonaro offered support to legal initiatives to reduce environmental protection in conservation units and indigenous lands. An example was the provisional measure from January 2019 proposing (i) to replace *Fundação Nacional dos Povos Indígenas,* FUNAI (National Indigenous Peoples Foundation) by the Ministry of Agriculture as the consultative stance on titling of indigenous lands, and (ii) to reallocate FUNAI from an agency under the Ministry of Justice to the Ministry of Family, Women and Human Rights. Although the measure was not approved as such, it shows the depth of Bolsonaro's commitment to anti-environmentalism: the Ministry of Agriculture represents interests opposed to tackling deforestation, and the Ministry of Family, Women and Human Rights was led by Damaris Silva, a politician from the extreme right, ideologically aligned with Bolsonaro and opposed to minorities' rights.

During Bolsonaro's tenure, deforestation in the Amazon increased, as shown in Figure 09, and, as a consequence, emissions from LULUCF increased as well, as illustrated by Figure 03. Between 2019 and 2022, LULUCF emissions also answered for a larger share of total Brazilian emissions, on average: for 48.29% of total Brazilian emissions, compared to 43.68% between 2015 and 2018 and 40.43% between 2011 and 2014 (our calculations, based on data from SEEG 2024).

5. THE POLITICAL ECONOMY OF CLIMATE COMMITMENT IN SOUTH AFRICA, 2000-2020

***Context**: dependence on coal and the Minerals-Energy Complex*

South Africa is not only dependent on coal for energy generation, as illustrated by the numbers in Figure 08. Coal also plays a key role in South African's economy. South Africa is a large exporter of commodities, especially minerals – rhodium, gold, iron ore, palladium and coal itself were the top-5 exported products in 2021 (WITS-World Bank 2024). Such industry is very energy-intensive, so cheap energy supplies are key to maintaining competitive prices for its products. South Africa has large coal reserves – in 2020, South Africa was the 7th greatest global coal producer and the 4th greatest global coal exporter (IEA 2021). Thus, coal is the pillar of the country's Mineral-Energy Complex (Fine and Rustomjee 1996): an economy structurally

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dependent upon energy intensive growth, driven by mining and minerals beneficiation and reliant upon abundant sources of low-cost coal for its electricity (Baker *et al.* 2014, 02).

The Mineral-Energy Complex was established during the apartheid period. Since colonial times, South Africa has been a mining power; Great Britain and the Netherlands have competed for the dominance of the region, interested not only in its location strategic for circumnavigating the continent but also in its mineral wealth. The white dominance remained as South Africa became an independent country: the apartheid was a political regime based on racial segregation and on the control of a few over the economic wealth and politics, deepening structures that had existed since colonial times. Lasting from 1948 to 1994, the apartheid isolated South Africa internationally, since most countries imposed embargos to South African products. In this context, self-sufficiency was the path chosen by the white elites. Coal reserves were used not only to sustain mining and generate cheap electricity to allow a state-led industrialization based on mineral exploitation and processing, but also to make liquid fuel, using the coal-to-liquids technology developed domestically, given that South Africa could not access oil imports due to the international embargos. Efficiency was not key.

South Africa became a racial democracy in 1994 – although inequality between whites and blacks remain very high –, but its economic structure is still reliant on energy-intensive minerals, on different ways. First, they are key for South African's balance of payments. In 2021, minerals, metals and fuels represented 33.61% of South African total value exported (WITS-World Bank 2024). Second, for jobs, especially in mining regions, where little else is available; these are not great jobs – they have a high cost on health issues, for example – but they are considered the best and most secure jobs around there. And considering that unemployment is very high in South Africa, reducing jobs is always a politically-sensitive idea, so coal jobs are defended fiercely by communities and Unions. Third, in the bureaucratic structure. Eskom, South Africa's state-owned electricity provider, was, for most of its history, a coal electricity provider. The Department of Mineral Resources and Energy, responsible for regulating mining in South Africa, for a long-time managed coal relations.

Finally, there is an empowerment narrative that feeds the dependence on coal. Through most of South African's history, coal has generated wealth for the white elites. But when the end of the apartheid was negotiated, the African National Congress (ANC) – the political party that led the process and has won all presidential elections since 1994 in South Africa – traded economic liberalization with black economic empowerment; and one of the avenues for empowerment was ownership of mining structures, including coal mines (Bowman 2019). So, nowadays, coal is also entangled with the racial struggle; reducing its role in the economy means reducing the importance of a new black coal elite, especially when renewable facilities are mostly installed and run by foreign capital.

Considering this context, effective climate action in South Africa is a very complex topic. Reducing dependence on coal is the most important action for climate change mitigation, but the

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economic and social structure of South Africa is embedded into coal. So energy transition in South Africa means not only changing technologies for provide electricity and fuel, but a deep restructuring of social and economic relations, with serious resistance and important consequences to unfold.

2002-2010: *structural and political limitations to diversifying electricity supply*

Between 2002 – when the *World Summit* on Sustainable Development took place in Johannesburg – and 2010, several pieces of policy were enacted in South Africa acknowledging both the seriousness of climate change and the need to reduce the country's dependence on coal as a strategy to reduce GHG emissions. However, dependence was not reduced in the period. In fact, while South Africa's energy supply increased by 23.04% between 2000 and 2010, coal's share in energy supply increased by 23.06% in the same period – a clear correlation and strong evidence of the link between both (own calculations based on data from IEA 2024).

Key policy pieces of the period were three. In 2003, the first version of the Integrated Energy Plan (IEP) was enacted. The IEP is a programmatic policy tool that projects future South African energy demand according to different scenarios of economic growth and establishes, by balancing availability, price and environmental concerns, how different primary energy sources – fossil fuels, renewables, nuclear – should be allocated to answer to the demand. In the same year, the White Paper on Renewable Energy and Clean Energy Development was approved. It establishes a 10-year target to raise the role of renewables in energy consumption in South Africa and establishes that policy interventions should help doing so. Among the interventions, the White Paper indicates provision of guidelines/standards for renewable energy, financial and fiscal instruments and regulations to integrate renewables into the electricity system. To fulfil this mandate, in 2007 the Renewable Energy Independent Power Producers Procurement Programme (REIPPPP) was launched to select, by 2011, the first round of projects. Last, but not least, the Integrated Resource Plan for electricity started to be discussed in the period, but would only be approved in 2011 – reason why it is not among the key policies indicated in this paragraph.

There were important obstacles to the implementation of the policies.

Consistent with its long-term trajectory as a coal electricity provider, Eskom generally opposed the increased role for renewables in South Africa's electricity matrix (Baker *et al.* 2014). In addition, regarding the REIPPPP, disagreements were two-fold. First, over how producers would be paid: a feed-in tariff was favored by the National Energy Regulator of South Africa (NERSA), the private sector and bilateral donors, while a competitive bidding process was backed by the Department of Energy and the National Treasury (Baker *et al.* 2014). Second, over who would build renewable energy facilities: whether Eskom would keep its monopoly over generation and transmission or private independent producers would be allowed (Hochstetler 2020). Finally, a non-predicted circumstance was also key in the process: the crisis of electricity generation that started around 2007-2008.

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In addition to new environmental and climate regulation, building new coal-fired power plants was financially unsustainable in a scenario in which electricity tariffs had been kept artificially low to maintain competitive prices for energy-intensive exports. Without sound tariffs to allow building of profitable new generation facilities, and due to the stalemate regarding the renewables program, power cuts started in South Africa around 2007-2008. Load shedding – alternating electricity supply between areas, leaving some literally in the dark – and buyback agreements, in which high-intensity industrial energy users are paid not to use electricity by scaling-down production, became a standard practice. The situation costed Thabo Mbeki, South Africa's president at the time, his mandate in 2008. When Jacob Zuma came to power, South Africa signed a loan with the World Bank to build Medupi and Kusile coal-fired power plants; he also started negotiating agreements with Russia to build new nuclear power plants.

South Africa's energy situation became dire. Load shedding continued – in fact, to date. After decades of receiving tariffs that were not enough to reward its investment in generation, maintenance and transmission and no longer having its deficits were backed by the National Treasury since the end of the apartheid, Eskom was financially bankrupt. And, due to continued disagreements, the REIPPPP had not been implemented yet.

In 2010, two key political choices were made. First, Eskom's vertically integrated monopoly over the electricity sector was ended; debates on how to unbundle the company into three separate entities, each responsible for a part of the electricity chain – generation, transmission and distribution – started (Hochstetler 2020). Second, the Department of Energy decided to have private firms build the new wind and solar plants instead of Eskom (Hochstetler 2020, 25).

2011-2020: a rising role for renewables, but competing objectives remain

In 2011, South Africa hosted UNFCCC's COP 17 in Durban. In preparations to the meeting, the cabinet approved the National Climate Change Response White Paper. It is a framework policy on the national strategy to tackle climate change in the long run. On climate change mitigation, it establishes that scenarios of national GHG emissions trajectory range and desired emission reduction outcomes for each economic sector were to be established, as well as tools to encourage mitigation, among them a carbon budget, carbon prices and other economic instruments (South Africa 2011a, 05-06). Long-term mitigation scenarios were already being discussed in South Africa, and the 2008 version informed the country's pledge in COP 15 (2009), according to which South African emissions would peak around 2025, plateau until around 2035 and then decline – the peak-plateau-decline trajectory.

The Integrated Resource Plan (IRP) for electricity 2010-2030, establishing rising shares for renewables in South Africa's electricity installed capacity and reducing the role of coal, was approved in 2011. According to it, coal would answer for 48% of the electricity installed capacity in 2030 (South Africa 2011b, 09) – compared to more than 90% in 2010. On capacity added between 2010 and 2030, nuclear would answer for 25%; wind, for 28.8%; and coal, for 16.3%

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(South Africa 2011b, 09). The IRP would be revised periodically, and revisions were published in 2013 and 2016. Yet, the 2013 review targeted a larger share for renewables in 2030 compared to the 2010's version, in the 2016 version investments in nuclear were prioritized instead (Averchenkova *et al.* 2019, 14). Political struggles over these changes abounded (Baker *et al.*, 2014; Averchenkova *et al.*, 2019). Later, it was proved that corruption and state capture towards nuclear deals had been in place during Zuma's tenure (Baker *et al.* 2014; Averchenkova *et al.* 2019; Hanto *et al.* 2022). A new version of the IRP was approved in 2019, for the period 2018-2030.

The REIPPPP became a public procurement program, in which independent power producers compete in bidding rounds for the right to build new electricity installed capacity. Between 2011 and 2015, there were five competitive rounds in which onshore wind, solar PV, solar thermal, biomass solid, biogas, landfill gas and small hydro plants competed. However successful in increasing the role of renewables in South Africa, especially in the province of Western Cape, and more competitive prices offered after the first round (Averchenkova *et al.* 2019, 15), the program has falling short from established goals. Considering that the IRP 2019 aims at achieving 8.2 GW of solar PV and 17.7 GW of wind in the South African electricity grid by 2030, REIPPPP results so far are shy – by 2020, only around 6GW of new renewable electricity installed capacity were procured (Hanto *et al.* 2022, 166). And results are even more meagre compared to the predicted coal's installed capacity in 2030, 33.3 GW (Hanto *et al.* 2022, 166).

Among the obstacles for a larger deployment of renewables was Eskom's refusal to sign power purchase agreements with the winners of bidding round four (Hanto *et al.* 2022, 167); in the period, it championed nuclear instead (Baker, 2017 apud Averchenkova *et al.* 2019, 15). While the round happened in 2015, the contracts were signed only in 2018, delaying the process. Round five was delayed further due to complications around grid connections and local content rules (Hanto *et al*. 2022, 167).

Eskom has been involved in complex financial struggles and political scandals. Eskom is the owner of the largest debt before the South African National Treasury: in 2019, it was around 15% of South Africa's national debt (Averchenkova *et al.* 2019, 15). Rising production costs and falling revenues due to slow economic growth (Averchenkova *et al.* 2019, 15), as well as buyback agreements are among the reasons for it. Mismanagement and corruption complaints are also frequent. Eskom receives frequent bailouts, and unbundling is proceeding slowly. Between 2007 and 2018, the company had ten chief executive officers and six chairpersons, in addition to multiple changes at senior management levels (Kazeem 2019 apud Averchenkova *et al.* 2019, 15), clear evidence of political influence over company interests.

Thus, despite policy being enacted to reduce the role of coal and make renewables more relevant in South Africa's energy mix, dependence on coal remains. And even when the role of coal was slightly reduced, replacement was not by renewables. As illustrated by Figure 11, coal was mostly replaced by oil in 2015, maintaining the South Africa's dependence on fossil fuels –

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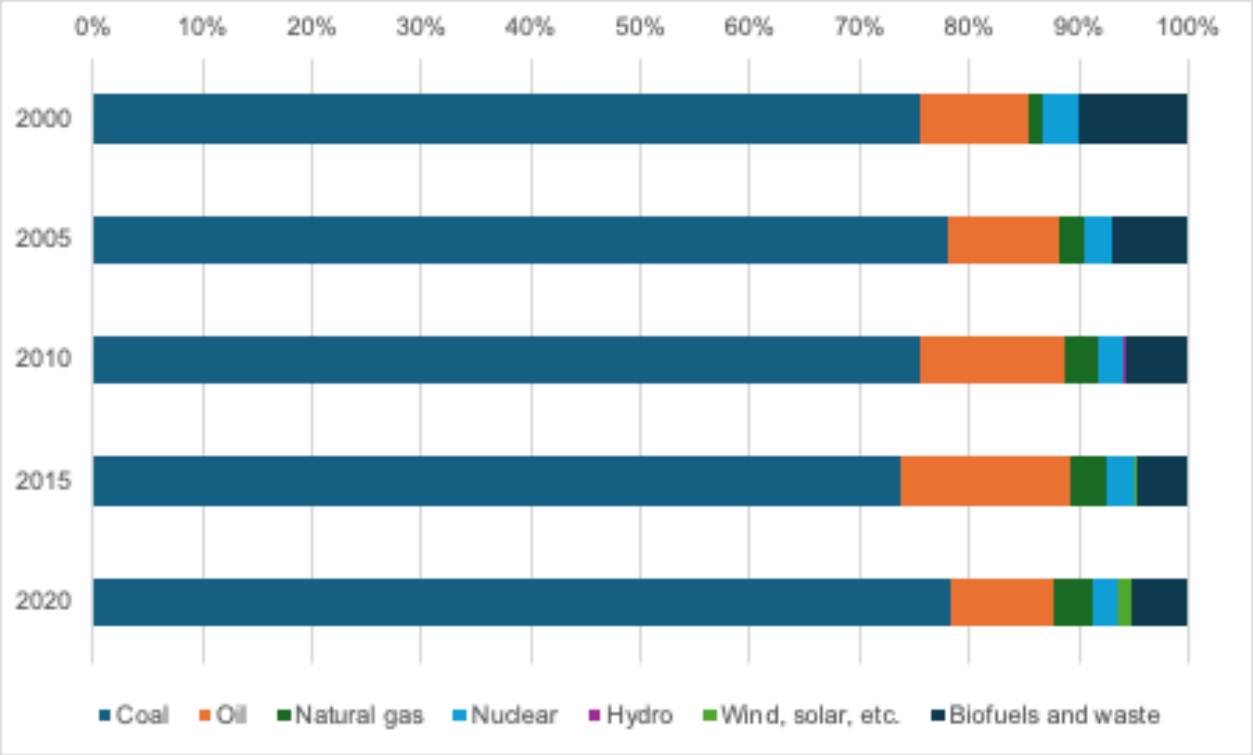
fossil fuels (coal, oil and natural gas combined) answered for 91.74% of total energy supply in 2010, 92.47% in 2015 and 91.20% in 2020.

Figure 11: South African energy mix (%)



Source: Own elaboration, based on data from IEA (2024).

6. CONCLUSIONS

We started the paper proposing to answer if Brazil's and South Africa's commitment to climate change mitigation between 2000 and 2020 changed and why. We defined commitment to climate change mitigation as consistent action to reduce GHG emissions in the sectors that answer for most of it according to the country's total emissions profile (Viola, Basso and Franchini, upcoming). According to the data of total emissions for each of the countries, presented in section three, for the period 2000-2020, emission reduction in Brazil was required mostly in land use, land use change and forestry, especially in reducing deforestation, and in South Africa, in reducing the use of coal for electricity generation. Thus, in sections four and five, we traced the political economy of action to reduce deforestation in Brazil and reduce use of coal in electricity supply in South Africa between 2000 and 2020, describing the context in which deforestation and coal dependency emerged and became embedded in country political economy and the trajectory of the politics and policies related to the issues in the period.

In Brazil, total GHG emissions decreased in the same period that circumstances were favorable to address deforestation. The country had a period of fiscal stability, economic growth, sense of rising wellbeing in the population; since these are issues that have priority for the Brazilian

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constituency, political space for other agendas rise when those are considered controlled (Ryan 2017). In addition, events changed the composition of coalitions in favor of tackling deforestation in the Amazon biome. First, new leadership was elected to the federal government, and they forged alliances with socioenvironmental actors that had been involved with fighting deforestation; leadership in the Ministry of the Environment enhanced the capacity for monitoring deforestation and law enforcement; changes in incentives for state and municipal governments also made these authorities more aligned with the agenda, increasing cooperation between them and the federal sphere. Second, actors who had been absent from debates on deforestation or had positioned themselves against it previously changed positions in the period, especially around 2009 and 2010, pushing for a stronger commitment of Brazil in controlling deforestation. Later, when circumstances changed – economic crisis, corruption scandals and sense of reduction in wellbeing among the population – and political representation of actors not aligned with the agenda of fighting deforestation increased in the Parliament, deforestation lost political priority for many political actors; action to control deforestation in the Amazon was substantially reduced, and Brazilian GHG emissions increased again.

In South Africa, total GHG emissions reduced only slightly, but due to the impact of reduced economic growth. Decreasing the use of coal is the major step towards reducing national GHG emissions, yet coal is not only the major source of energy in the country, but also the pillar of the mineral-energy complex, an economic model that depends on the production and exports of energy-intensive metals and minerals – rhodium, gold, iron ore, palladium. Despite having policies to reduce dependence on coal, including long-term plans and action to increase the role of renewable energy, dependence on coal continues in South Africa. The entrenchment of coal into the political economy of South Africa is deep. Factors contributing to it are the long-established economic structure, which has changed, but not substantially, since the end of the apartheid; the fact that coal generates jobs in a country where unemployment is very high and there are few alternatives in many coal-producing regions; a long-established bureaucratic structure organized along coal, which resists change; and the use of coal as a tool for black empowerment since the end of the apartheid by transferring ownership of mines.

Our paper contributes to the literature on climate policy in two fronts. First, by offering a definition of commitment to climate change mitigation that combines the GHG emissions profile and action to reduce emissions in sectors where they are most needed. Second, by describing how political economy dynamics, including how activities where emissions need to be reduced, are embedded into the socioeconomic fabric of the country as well as the trajectory and interaction of different political coalitions in policy debates, contribute to the presence or absence of policies to reduce those emissions. The paper's focus on Brazil and South Africa, two emerging economies and democracies that had periods of authoritarian rule in their recent past and score high in indexes of social inequality, shed some light on the struggles for climate action in countries other than Western liberal democracies – which have been the greatest focus of the literature. Change is dependent on time and place; different contexts require different action for change to happen,

so diversifying our research focus is needed to contribute to a better understanding on how action to reduce GHG emissions take place around the around.

Future research delving on the details of the interaction between coalitions in the political debate on action to reduce emissions in other sectors, as well as on the links between political coalitions and transnational forces, including their positions in global value chains, would further even more our understanding of this key issue of our times.

7. REFERENCES

Aamodt, S. (2018). 'Environmental Ministries as Climate Policy Drivers: Comparing Brazil and India'. *The Journal of Environment and Development*, 27(4), 355-381.

Abers, R. (2019). 'Bureaucratic Activism: Pursuing Environmentalism Inside the Brazilian State'. *Latin American Politics and Society*, 61(2), 21-44.

Almeida, M. W. B. (2004). 'Direitos à floresta e ambientalismo: seringueiros e suas lutas'. *RBCS,* 19(55), 33-53.

Averchenkova, A.; Gannon, K. E.; Curran, P. (2019). 'Governance of climate change policy: a case study of South Africa'. *The Grantham Research Institute on Climate Change and the Environment Policy Report*. Available at https://www.lse.ac.uk/granthaminstitute/wp-content/uploads/2019/06/GRI_Governance-of-climate-change-policy_SA-case-study_policy-report_40pp.pdf

Baker, L.; Newell, P.; Phillips, J. (2014). 'The Political Economy of Energy Transitions: The Case of South Africa', *New Political Economy*, 19(6), DOI: 10.1080/13563467.2013.849674

Basso, L. (2023). 'Avaliação e desafios para o alinhamento do Brasil à normativa da OCDE sobre meio ambiente e clima'. *Texto para discussão 2847*, Instituto de Pesquisa Econômica Aplicada (IPEA), Brasília-Rio de Janeiro. Available at https://repositorio.ipea.gov.br/bitstream/11058/11740/1/TD_2847_Web.pdf

Basso, L. (2024). 'The political economy of climate change mitigation in Argentina, Brazil and Peru'. *Iberoamericana – Nordic Journal of Latin American and Caribbean Studies*, 53(1), 01–19. DOI: https://doi.org/10.16993/iberoamericana.614

Becker, B. (2001). 'Revisão das políticas de ocupação da Amazônia: é possível identificar modelos para projetar cenários?' *Parcerias Estratégicas*, 12, 135-159.

Climate Watch (2024). *Historic GHG emissions, South Africa* [Data set]. Available at https://www.climatewatchdata.org/countries/ZAF?end_year=2020&start_year=1990#ghg-emissions

FAOSTAT (2023). *Climate change: agrifood systems emissions*, Brazil [Data set]. Available at: https://www.fao.org/faostat/en/#data

Fine. B.; Rustomjee, Z. (1996). *The political economy of South Africa: from Minerals-Energy Complex to industrialization*. New York-London, Routledge, 1996.

Garrett, R.; Cammelli, F.; Ferreira, J.; Levy, S.A.; Valentim, J.; Vieria, I. (2021). 'Forests and Sustainable Development in the Brazilian Amazon: History, Trends, and Future Prospects'. *Annual Review of Environment and Resources*, *46*, 2.1–2.28. https://doi.org/10.1146/annurev-environ-012220-010228

Gini (2024). GINI Index, World Bank Poverty and Inequality Platform, indicator <SI.POV.GINI>, [Dataset]. Available at https://data.worldbank.org/indicator/SI.POV.GINI?skipRedirection=true

Hall, P. (2016). 'Politics as a process structured in space and time'. In FIORETOS, O.; FALLETI, T. G. and SHEINGATE, A. (eds.), *The Oxford Handbook of Historical Institutionalism*. Oxford University Press.

Hanto, J. *et al.* (2022). 'South Africa's energy transition: unraveling its political economy'. *Energy for Sustainable Development*, 69, 164-178. DOI: https://doi.org/10.1016/j.esd.2022.06.006

Hochstetler, K.; Keck, M. (2007). *Greening Brazil: environmental activism in state and Society*. Duke University Press.

Hochstetler, K. (2020). *Political economies of energy transition: wind and solar power in Brazil and South Africa*. Cambridge, Cambridge University Press.

International Institute for Democracy and Electoral Assistance, IDEA, (2023). 'The global state of democracy 2023: new checks and balances'. *Report*. Available at https://www.idea.int/publications/catalogue/global-state-democracy-2023-new-checks-and-balances

International Energy Agency IEA (2024). *Energy Statistics Data, South Africa*. Available at: https://www.iea.org/data-and-statistics/data-tools/energy-statistics-data-browser?country=WORLD&fuel=Energy%20supply&indicator=TESbySource

International Energy Agency IEA (2021). *2021 Key World Energy Statistics*. Available at https://www.iea.org/reports/key-world-energy-statistics-2021

Instituto Nacional de Pesquisas Espaciais, INPE (2019). *SOS Mata Atlântica e INPE lançam novos dados do Atlas do bioma.* Available at http://www.inpe.br/noticias/noticia.php?Cod_Noticia=5115

Kumar, A. *et al.* (2022). 'Impact of COVID-19 on greenhouse gases emissions: a critical review'. *Science of the total environment*, 806, part I, 150349. DOI: https://doi.org/10.1016/j.scitotenv.2021.150349

Liu, Z., Ciais, P., Deng, Z. *Et al.* (2020). 'Near-real-time monitoring of global CO2 emissions reveals the effects of the COVID-19 pandemic'. *Nature Communications*, 11, 5172. DOI: https://doi.org/10.1038/s41467-020-18922-7

Loureiro, V. R.; Pinto, J. N. A. (2005). 'A questão fundiária na Amazônia'. *Estudos Avançados*, 19(54), 77-98.

Mardani, A. *et al.* (2019). 'Carbon dioxide emissions and economic growth: a systematic review of two decades of research from 1995 to 2017'. *Science of the total environment*, 649, 31-49. DOI: 10.1016/j.scitotenv.2018.08.229

Nord, M. *et al.* (2024). *Democracy Report 2024: Democracy Winning and Losing at the Ballot*. University of Gothenburg: V-Dem Institute. Available at https://www.v-dem.net/documents/43/v-dem_dr2024_lowres.pdf

Onofrei, M.; Vatamanu, A. F.; Cigu, E. (2022). 'The relationship between economic growth and CO2 emissions in EU countries: a cointegration analysis'. *Front. Environ. Sci., Sec. Environmental Economics and Managemen*t, 10. DOI: 10.3389/fenvs.2022.934885

Pereira, J. C.; Viola, E. (2022). *Climate Change and Biodiversity Governance in the Amazon at the Edge of Ecological Collapse?* New York/London, Routledge.

Pierson, P. (2016). 'Power in Historical Institutionalism.' In: FIORETOS, O.; FALLETI, T. G. and SHEINGATE, A. (eds.), *The Oxford Handbook of Historical Institutionalism.* Oxford University Press. DOI 10.1093/oxfordhb/9780199662814.013.7

Ray, R. *et al.* (2022). 'What is the impact of COVID-19 pandemic on global carbon emissions?' *Science of the total environment*, 816. DOI 10.1016/j.scitotenv.2021.151503

Rivero, S. (2009). 'Pecuária e desmatamento: uma análise das principais causas diretas do desmatamento na Amazônia'. *Nova Economia*, 19(1), 41-66.

Ryan, D. (2017). 'Politics and climate change: exploring the relationship between political parties and climate issues in Latin America'. *Ambiente & Sociedade*, 2, 271-286. DOI 10.1590/1809-4422ASOCEx0007V2032017

Sistema de Estimativas de Emissões e Remoções de Gases de Efeito Estufa, SEEG. (2024). *Brazilian total GHG emissions* [Data set]. Available at https:// plataforma.seeg.eco.br/total_emission#

South Africa (2011a). *National Climate Change Response White Paper.* Available at https://www.gov.za/sites/default/files/gcis_document/201409/nationalclimatechangeresponsewhitepaper0.pdf

South Africa (2011b). *Integrated Resources Plan 2010-2030.* Available at https://www.energy.gov.za/IRP/irp%20files/IRP2010_2030_Final_Report_20110325.pdf

Mural Internacional, Rio de Janeiro, Vol.15, e84150, 2024.
DOI: 10.12957/rmi.2024.84150 | e-ISSN: 2177-7314

Thelen, K.; Steinmo, S. (1992). 'Historical institutionalism in comparative politics.' In: SVEN, S.; KATHLEEN, T; and FRANK, L. (eds.), *Structuring Politics: Historical Institutionalism in Comparative Analysis.* Cambridge: Cambridge University Press. DOI: 10.1017/CBO9780511528125

Trigueiro, W. R. *et al.* (2020). 'Uncovering the spatial variability of recent deforestation drivers in the Brazilian Cerrado.' *Journal of Environmental Management*, 275, 111243.

US Department of Agriculture, USDA (2024). 'Production: soybeans, 2023/2024'. [dataset] Available at: https://fas.usda.gov/data/production/commodity/2222000

Viola, E.; Franchini, M. (2018). *Brazil and climate change beyond the Amazon*. Routledge.

Viola, E.; Franchini, M. (2022). 'Governança ambiental: da destruição da florestas até os objetivos de descarbonização'. *Revista da USP*, 134, 143-162. DOI: 10.11606/issn.2316-9036.i134p143-162.

World Integrated Trade Solution (WITS)-World Bank (2024). *Trade Summary for South Africa*. [dataset] Available at: https://wits.worldbank.org/countrysnapshot/en/ZAF/textview