COP30 and Brazil: Navigating the Gap Between Ecological Ambitions and Economic Opportunism

Abstract

This thesis examines one of the most significant contradictions of the current Brazilian path: the ability of a country to claim to be a leader in the global struggle against global warming, while at the same time increasing its dependence on oil and all the activities of resource extraction that come with it. Starting with the recent COP30 meeting in Belém, the thesis will trace the ways in which the language of ecological transformation and Amazonian protection is being articulated with policies that continue to promote oil drilling in the Atlantic Ocean, as well as the export of all sorts of resources. By retracing the long history that led to the current centrality of resource extraction in the Brazilian path, the thesis will show that, in the end, Brazil is becoming a "hybrid" state, at the same time a leader in the global production of renewable energy and a major oil-producing country.

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Introduction

Brazil's dual positioning in global climate and energy governance

When Brazil welcomed the COP30 meeting in the city of Belém between the 10th and 21st of November 2025, an Amazonian city became the epicenter of international climate diplomacy precisely at the moment the country was solidifying its credentials as a major offshore oil producer in the world. This phenomenon embodies the crux of the analytical concern informing the present dissertation: the simultaneous presence of credible climate leadership and the growth of extractive practices.

Brazil's role in international climate and energy governance is unique in the sense that the country has a critical ecological role to play in the face of climate change and, at the same time, a considerable capacity for extraction. Brazil holds the largest portion of the Amazon forest system, a biome that has been described as hosting ten percent of the world's known species and playing a systemic role in the stability of the climate system through carbon sequestration and other hydrological feedback mechanisms. At the same time, Brazil is a major exporter of primary products and a growth model that remains structurally linked with the extraction and exploitation of natural resources, not only in the oil and gas sector but also in the agricultural and mining industries.

The decisions taken during COP30 were captured in a set of decisions included in the so-called "Belém political package," a set of decisions that, as indicated in the UNFCCC platform, involves the adoption of a presidency-led "Mutirão decision" and a set of decisions on ambition and implementation gaps, finance-related dialogues, and work programming for a just transition. Post-COP30 discussions widely referenced the event as a step towards further work on improving climate targets and finance initiatives, implying that the COP30 presidency led by Brazil sought to be perceived as a convening moment, a catalytic event, rather than a hosting function.

Brazil’s international positioning is also informed by its nationally determined contributions. In October 2023, it made a communication of adjustment reaffirming its absolute net emissions targets for 2025 and 2030. This appears to be a reframing of the climate mitigation narrative in the early Lula 3 period. A subsequent NDC was made in November 2024, which established a target to reduce net greenhouse gas emissions by 59-67 percent below 2005 levels by 2035. This document includes a language of long-term "ecological transformation," while positioning itself as a "key climate player." The 2024 NDC narratively connects several multilateral events, the Rio conferences and COP30, into a diplomatic pedigree, suggesting that Brazil views the convening of these summits as part of its climate identity.

The empirical tension: climate leadership and extractive expansion

However, this rising ambition follows as part of a larger path that also includes ongoing structural vulnerabilities and continued expansion of extractive activities. PRODES-related official communications noted continued deforestation rates reduction in the Amazon region through 2025. However, as noted, this cannot be considered independently of degradation processes, particularly fire and non-forest vegetation loss, which also undermine ecosystem services even as clear-cutting rates decrease.

The Brazilian energy profile also complicates any attempt to read off the linear relationship of 'green leadership' or 'extractive dependence.' Renewables made up 49.1 percent of Brazil's national energy matrix as of 2023. Renewables also supplied 89.2 percent of Brazil's domestic electricity supply as of 2023, with hydropower being the dominant source and wind and solar energy also growing as sources. Yet, Brazil has also seen expansion of offshore oil production through the pre-salt complex, with Petrobras reporting 2.7 million barrels of oil equivalent per day as of 2024. In that same year, Brazil's top export was also crude oil, indicating hydrocarbon's rising macroeconomic significance.

Energy policy, in this sense, takes place in what this dissertation calls a "hybrid regime" characterized by a high renewables power sector and a biofuels capacity, but also by the increasing extraction and export-oriented insertion of the oil and gas sector. This hybridity is not only a technical but also a political-economic concept. Hydrocarbons are related to

industrial policies, the balance of payments, and state fiscal structures related to the rents from natural resources. The oil sector is subject to a set of rules and institutions that define a system of royalties and special participations distributed across federal, state, and municipal governments. This creates a set of expectations and a political coalition in support of the oil extraction. The cumulative effect of the hydrocarbons, agribusiness, and mining sectors in the composition of Brazilian exports means that the economic logics of extraction are not those of isolated sectors but those of mutually reinforcing pillars in the composition of export earnings and fiscal stability.

In a sense, the very same reasons for which Brazil is not a petrostate, the high renewables in the electricity mix and the biofuels sector, are the reasons for which the very same oil dependence cannot be considered a simple "oil dependence" issue. It is a more complex and demanding issue in terms of analytical complexity: the coexistence and interrelation between energy decarbonization and fossil fuel expansion.

Research puzzle and question

In this sense, the configuration described above creates a research puzzle: How can the government credibly engage in climate leadership in multilateral energy governance, hosting COP30 in the Amazonas state and presenting NDCs as a set of commitments to long-run ecological transformation, at the same time as it increases the capacity for the extraction and export of hydrocarbons and reinforces the structures and logics of commodity export? This question is not about the potential inconsistency or "hypocrisy" between the government's words and deeds. It is a question about the structural dependencies in the energy and commodity export sectors and the interrelation between the state and the economy. This dissertation will try to answer the following problematic : To what extent do the energy policies in Brazil reveal structural tensions between the government's ambitions in climate leadership and the economic logics of extraction?

The question is designed to be structural in character. It engages with the field of energy policy not as a purely techno-administrative domain but as a strategic space in which industrial policy, fiscal dependence, and international positioning intersect. It also engages with the field of climate leadership not as a purely discursive space but as a space of interplay between

diplomatic rhetoric, institutional commitment, and the material limits imposed by the infrastructures and mechanisms of the rents associated with energy provision.

Structural Argument

The dissertation argues that the present-day strategies in Brazil's energy policy are the result of historical path dependencies, which have been shaped by the country's development model based on the extractivist approach. The present-day constraints in the transformative potential of climate leadership strategies are the result of the institutional, financial, and territorial configurations that have been shaped by the historical self-reinforcing processes in the country's energy and development policy. The existing tensions in the country's energy policy are not the result of the contradictory positions of the government, nor the shifts in the coalitions that have been formed to pass the climate policies. Rather, they are the result of the historical self-reinforcing processes that have been shaped by the country's past decisions in the area of energy and development policy.

This argument suggests that the existing international climate governance architecture, particularly the pledge-and-review system that has been established in the post-Paris climate regime, makes the gap between the ambitious climate leadership strategies and the limited transformations in the country's climate policy not only domestically sustainable but also compatible with the international climate regime. The Paris climate regime's reliance on the iterative approach to climate governance, in which the countries are forced to commit to the climate targets, be transparent about their actions, and be subjected to political pressure, makes the gap in the country's climate policy structurally sustainable.

Theoretical framework

In order to sustain this argument, the dissertation mobilizes four interrelated bodies of theory, each of which sheds light on one or another dimension of this structural tension.
First, the literature on extractivism and resource political economy supplies the foundation for understanding why hydrocarbon expansion is no anomaly but rather a predictable feature of an accumulation regime organized around resource extraction, export orientation, and rent

distribution. By drawing on Gudynas' definition of extractivism and Acosta's concept of neo-extractivism, the dissertation approaches Brazilian energy politics as part of a larger pattern wherein even governments that prioritize social inclusion or environmental sustainability may remain structurally tied to extractivism. The resource curse literature (Auty; Sachs & Warner; Ross) also helps to specify the mechanisms by which hydrocarbon wealth can shape incentives against rapid contraction. The comparative work of Bebbington and colleagues insists that to understand when and how institutional transformation may be politically feasible, we must also take account of the politics of extraction.

Second, HI and PD help to understand how extractive continuity institutionalizes over time, how incremental change can be combined with structural inertia. Hall & Taylor's overview of the different versions of new institutionalism, Pierson's theory of increasing returns, Thelen's theory of gradual institutional change including the mechanisms of layering and conversion, which she developed in concert with Mahoney, can be used to understand how COP-related commitments and updates of NDCs can be transformed into changes in procedures and institutions without necessarily altering the material energy system at a corresponding pace.

Third, the theory of carbon lock-in developed by Unruh, as well as the more general literature on the political economy of energy transitions including fossil fuel incumbency developed by Andrews-Speed; Kuzemko et al.; Newell; Newell & Johnstone, specifies how fossil energy systems exhibit a particular form of resistance to change. The interplay of the evolution of infrastructures, capital stock, regulation, and industrial competencies gives rise to a techno-institutional complex in which energy transition goes beyond fuel substitution to the restructuring of sunk costs. Energy transition is a spatially highly relevant process.

Fourth, the literature on post-Paris climate governance and the leadership of the emerging powers (Falkner; Keohane and Oppenheimer; Hale; Hurrell and Sengupta; Jinnah) provides the grounds for why a bold international posture is politically rational despite incomplete domestic alignment. The pledge and review mechanism gives primacy to national resolve, incrementalism, and proceduralism, which creates the necessary conditions for the coexistence of diplomatic leadership and material EE continuity. The emerging powers, as both norm takers and norm makers in this regime, can engage in climate leadership as a status strategy and norm entrepreneurship without necessarily being ready or able to dismantle EE political settlements.

Methodological approach

In terms of the research approach, the dissertation follows a qualitative political economy approach, which combines sectoral analysis in the energy sector and energy policy with a historical institutionalist approach. The research triangulates four types of sources: (i) Climate and energy commitments, particularly the various NDC communications from the Brazilian government to the UNFCCC (adjustment in 2023, NDC 3.0 in 2024), as well as the associated national climate plans. (ii) Energy system and production data reported in national documentation, particularly the various ANP production consolidations, royalty and government take statistics, as well as the PRODES deforestation database. International energy assessments are also considered. (iii) Corporate and regulatory communications that frame investment expectations and lock in sectoral trajectories, particularly the strategic plans from Petrobras for the periods 2024-2028+, 2025-2029+, as well as the various ANP licensing rounds and the Potencializa E&P program. (iv) The fiscal-institutional mechanisms for the distribution and consolidation of rents from the extractive sector. This includes the various pieces of royalty legislation and the patterns in subnational revenue distribution. The temporal focus of the study is centered around the mid-2020s, with particular emphasis on the pre-COP30 period of 2025 and the recent updates to the NDCs (2023-2024), with the use of historical materials extending to the formation of the petroleum regime in Brazil and the longue durée of extractive accumulation to provide the trajectory of the study.

Empirically, the study approaches Brazil as an analytically emblematic case of energy-dependent emerging economies because of its unique combination of a high-renewables electricity system, a globally significant forest biome of critical importance to climate regulation, and the importance of its extractive sectors to export and fiscal revenue. As a case study of energy policy, the dissertation approaches energy policy as a set of interrelated policy domains: hydrocarbon policy including the expansion of hydrocarbon exploration and export, the transformation of the electric sector including the integration of wind and solar energy to the predominantly renewable electric system, and biofuels policy as an established pillar of

energy management in the transportation energy system. This approach to energy policy is critical to avoid the analytical error of isolating the energy transition in the electric system, where the structural tensions of the case study of Brazil are most evident in the interplay of hydrocarbon expansion, fiscal rent distribution, and climate leadership claims.

Scope and limitations

Some aspects of the study's boundary need to be made clear. To begin with, the dissertation is a single-country study. Although the Brazilian case serves as a basis for more precise expectation-formation regarding the causes of structural dependencies in energy-dependent emerging economies, the dissertation does not conduct a comparative study across multiple countries. Document-based and secondary source-based analysis characterizes the dissertation. Its approach or analytical tradition is political-economic and institutionalist. It does not conduct any detailed energy systems modeling, econometric analysis, or technical feasibility assessment. Finally, although the dissertation recognizes the importance of the agribusiness and mining sectors for the overall configuration of the Brazilian economy as an emerging economy with an overall extractivist character, the focus is operationalized mainly in terms of the energy policy subsystem.

Contribution

This dissertation contributes to two interrelated debates. First, it adds nuance to the understanding of climate leadership among the new powers through the exploration of the relationship between material political economy and the narratives of climate leadership. The case of the Brazilian COP30 presidency and the formulation of the NDC serve as an exemplary exploration of the narratives of climate leadership at the multilateral level. The dissertation seeks to assess the relationship between these narratives and the established structures of development and revenues. Second, the dissertation contributes to the debate on the relationship between extractivism and the transition to a more ecological energy system through the exploration of the role of structural dependencies in the mediation of the transition to a more ecological system, despite the relatively high share of renewable electricity in the Brazilian system.

Dissertation structure

Chapter I develops the dissertation's theoretical framework, which engages with the literature on the relationship between extractivism and the transition to a more ecological system, the role of path dependency and carbon lock-in in the mediation of the transition to a more ecological system, the political economy of the transition to a more ecological system, and the role of the Paris Agreement in the mediation of the relationship between the new powers and the ecological system.

Chapter II tries to understand the historical foundations and structural characteristics of the Brazilian energy system with the goal of establishing the relationship between the longue durée trajectory of extractivism and the relatively high share of renewable electricity in the Brazilian system.

Chapter III seeks to understand the relationship between ecological ambition and climate leadership within the hybrid Brazilian system with the goal of establishing the ecological pole of the structural tension between the Brazilian system and the multilateral system.

Chapter IV assesses the institutionalized structural tensions in Brazil's energy policy, including the simultaneous presence of upstream expansion and climate commitment, CAPEX asymmetry and frontier licensing, fiscal entrenchment via rent-based coalitions, and institutional layering as managed hybridization, showing that simultaneously high ambitions and extractive continuity can be reproduced in the same policy field.

Chapter V addresses the theme of extractivist resilience and the limits of ecological transformation, clarifying the role of the hybrid configuration to shed light on the structural

limitations of energy-dependent emerging economies and the international climate system under the post-Paris climate agreement.

Chapter I – Theoretical Framework: Extractivism, Energy Political Economy, and Structural Tensions in Brazil's Climate Leadership

The introduction presented the main empirical puzzle: how can Brazil simultaneously enact climate leadership, hosting COP30 in an Amazonian city and submitting NDCs with long-term ecological transformation ambitions, while expanding hydrocarbon production capacity and consolidating commodity export structures? Answering the puzzle goes beyond descriptive work; it requires a set of conceptual tools that can shed light on the mechanisms that produce the simultaneous presence of these two phenomena.

This chapter will elaborate a theoretical framework that helps to understand the gap between the leadership that Brazil displays in the international arena regarding climate issues in the prelude to COP30, which will take place in Belém between 10-21 November 2025, and the persistence or reconfiguration of the logic of extractivism in the energy policy of the country. The basic idea is to understand that there is no inconsistency between these two phenomena, but rather that there is an institutionalized gap that is the result of the interplay between the model of extractivism, the path-dependent character of the institutional dynamics, carbon lock-in, and the power of incumbency, and the post-Paris architecture of international climate governance that emphasizes nationally determined contributions and iterative review processes.

In empirical terms, the "gap" becomes explicable insofar as international commitments and narratives (for instance, NDC submissions, COP leadership claims) coexist with domestic political-economic incentives to expand or maintain hydrocarbon projects and rents (for

instance, investment strategies prioritizing pre-salt production, the salience of royalties and special participation, and the continued licensing of new frontiers). The framework developed in this chapter is intended to be testable, and the mechanisms and implications outlined will be used to guide the empirical chapters to be written on NDC trajectories, COP30-related commitments, pre-salt and frontier licensing, and the investment strategies of Petrobras and the Brazilian state.

The basic premise of the chapter is that in order to explain the "gap," it is necessary to move beyond a discourse-based understanding (greenwashing) or a technology-based understanding (infrastructure inertia). The chapter seeks to integrate the literature of the political economy and the institutionalists to demonstrate how discourse, procedural institutionalism, and continuity in the energy system can be compatible in a single political settlement.

The intellectual foundations of the analysis draw upon the work of Eduardo Gudynas, Alberto Acosta, Richard M. Auty, Jeffrey D. Sachs, Andrew M. Warner, Michael L. Ross, Anthony Bebbington, Peter A. Hall, Rosemary C. R. Taylor, Paul Pierson, Kathleen Thelen, James Mahoney, Gregory C. Unruh, Philip Andrews-Speed, Caroline Kuzemko, Peter Newell, Phil Johnstone, Andrew Hurrell, Sandeep Sengupta, Robert Falkner, Robert O. Keohane, Michael Oppenheimer, Thomas Hale, and Sikina Jinnah.

I.1 - Extractivism and Resource Political Economy

The first building block concerns the concept of extractivism, which can help us understand the permanence of hydrocarbon expansion as a policy issue that is less of an anomaly and more of a predictable outcome of an accumulation regime that is organized around the appropriation of resources, export orientation, and rent distribution. In Gudynas' highly influential definition, extractivism can be defined as the appropriation of natural resources on a large scale and/or high intensity, where at least half of these resources are exported as raw materials without or with limited processing inside the exporting country. The reason this definition is important is that it helps us avoid falling into the trap of conceptualizing "extractivism" as simply a moral issue, as simply as "polluting activity." Instead, it can be linked to specific criteria related to scale and intensity of extraction, export orientation, and value-added content or lack thereof.

Acosta's conceptualization of extractivism as a primary export regime that has been around since colonial times and that has been linked to dependence on external markets and to environmental degradation and social exclusion, even when it has been presented as a development strategy by governments, can be seen as compatible with Gudynas's definition but as more historically and politically informed. The concept of neo-extractivism that Acosta uses to describe contemporary processes of extractivism also helps us understand that governments may combine elements of redistributive or development rhetoric with continued expansion of hydrocarbon exports, even with a more active state role in rent distribution. Conceptually, this can help us understand how it's possible to theorize how a state can engage in climate leadership as part of its international policy while continuing to reproduce extractivism as part of its domestic political economy.

These definitions suggest that the energy sector should not be viewed in isolation from other sectors. The petroleum-centric strategy is located within broader fiscal and coalition frameworks of government take, state enterprise strategies, export revenues, and subnational distributive politics. The Brazilian case serves to illustrate the empirical plausibility of this framework. Official data from Agência Nacional do Petróleo, Gás Natural e Biocombustíveis indicate government take (*participações governamentais*) in 2024 at R$98.9 billion. In parallel, the ANP's 2025 production consolidation data indicate that pre-salt reservoirs contributed 79.63% of national oil and gas production (in oil equivalent), highlighting the material centrality of pre-salt extraction in the national energy sector.

The discussions in the literature on extractivisms refine the analytical problem. One of the main fault lines in the discussions concerns instrumental vs. structural approaches to extractivisms, in which the former focuses on the need to finance diversification, infrastructure, and the social agenda through extraction, while the latter focuses on how extraction leads to a specialization in extractivisms, rent-seeking institutions, and a hostile political economy to transformation. Gudynas' work stands out for its emphasis on how extractivisms are presented in public discourse as "indispensable" for national development while creating localized conflict that undermines the governing coalition. Acosta's approach similarly highlights how the PE logic of primary-export accumulation can persist regardless of the specific political regime in power, suggesting that ideology alone may not be enough to break out of the logic of extractivisms.

The other important issue in the literature concerns whether extractivisms should be restricted to mining and hydrocarbons or whether agribusiness should be included as well. Gudynas' work clearly includes the latter under a pluralized term ("extractivisms") to acknowledge that different modalities of extractivisms exist and can create inter-sectoral coalitions. More recent work on the conceptual history of extractivisms describes how the term "extractivisms" itself came to be used to describe the extension of the concept beyond traditional resource sectors. For the purposes of this thesis, what this means is that while a theoretical/operational distinction should be made to acknowledge the existence of different extractivisms, the empirical analysis should be centered on the energy policy subsystem.

A third debate concerns causal explanation. Macro-economic analysis risks falling into determinism ("commodity dependence" as destiny), whereas political economy places emphasis on specifying the political conditions and arrangements by which dependence becomes embedded as policy. The comparative research by Bebbington and colleagues on reforms to extractive governance arrangements highlights the significance of understanding how and when institutional change becomes politically possible. The emphasis on understanding political conditions is particularly important to the Brazilian case, as climate pressures are mediated through various domestic arenas (environmental regulation, energy policy, fiscal policy, and state-owned enterprise governance), which configure how international ambition can be turned into actual change.

The extractivism literature also has clear links to the "resource curse" school of political economy. The work by Auty has been particularly influential as specifying the "resource curse thesis" and how mineral dependence can distort development trajectories and create problems of dependence, including diseases like "Dutch disease" and rent-seeking. The empirical specification by Sachs and Warner that countries with high ratios of natural resource exports to GDP in base year tend to grow more slowly on average during subsequent decades also operationalizes dependence rather than simply abundance. For this thesis, the value of this literature lies less in making claims about determinism but rather about specifying plausible mechanisms that enhance the political appeal of rent-preserving strategies during favorable price or fiscal circumstances.

Moreover, Ross's review of the political economy literature serves to highlight two issues that are particularly relevant to hydrocarbons, namely, that there is still debate regarding the

mechanisms and conditions, and that hydrocarbons are the resource most strongly associated with negative political outcomes in some of the literature, in terms of their effect upon authoritarian durability, certain types of corruption, and conflict risks under particular conditions. While not necessarily applying any of these findings to the Brazilian case, Ross's review is of particular analytical interest in that it helps to explain why hydrocarbons have particular stakes in terms of their dense revenues, their capital intensity, and their incumbency protectionism.

Hence, the combination of extractivism and resource curse political economy can be translated into a mechanism-based account of the Brazilian "gap." First, the dependence on rents and the logic of distributive coalitions imply that the revenues from extraction shape the budgetary priorities and the political deals struck, making it risky to contract rapidly from an electoral and budgetary perspective. Second, the macro-exposure to commodity cycles can reinforce the incentives associated with the "windows" problem: when rents and exports are high, governments might be tempted to accelerate extraction rates even as they make ambitious climate commitments. The evidence of the material salience of the export incentives is already visible in the capacity of Petrobras to increase exports in tandem with increases in extraction rates, as suggested in the recent Reuters reports on the record exports in late 2025. Third, the routines and architectures of the extractive sector's governance imply that change is conditioned on the political conditions rather than the international commitments per se. What are the observable implications of the mechanisms for the Brazilian case?

One should expect the presence of institutionally ambivalent policy portfolios: the combination of an ambitious NDC with COP commitments on the one hand and continued licensing, fiscal, and investment decisions that maintain or increase hydrocarbon extraction rates on the other hand. One should also expect the presence of recurrent narratives of developmentalism linking hydrocarbons to state capacity, social policy financing, and energy security, which are codified in formal documents rather than being purely rhetorical. The Brazilian NDC explicitly invokes the notion of differentiated responsibilities and equity considerations, which could serve as a domestic-level justification for the lack of ambition in the implementation of the Paris commitments. One should also anticipate the presence of "signatures of dependence" in the macro-political economy of the country, including the weight of hydrocarbon government take and the dominance of pre-salt production in the country's overall supply, as documented by the ANP.

These mechanisms for extractivism help explain the rationale for continuity. However, they still do not explain how continuity might be stabilized over time as an institution or how incremental yet significant change might be possible. If the mechanisms for extractivism help explain why resource rents matter and why defending them makes political sense, historical institutionalism helps explain how these patterns based on resource rents might be durably institutionalized in the state and how they might be changed incrementally, but not easily. To understand this, a second set of theoretical tools is needed: historical institutionalism and path dependency.

I.2 - Path Dependency and Historical Institutionalism

Historical institutionalism offers a set of tools for thinking through the relationship between climate ambition and domestic inertia or gradual change. In their influential piece on the "new institutionalisms," Hall and Taylor map the landscape of the various "new institutionalisms." Historical institutionalism emerges as a school concerned with power asymmetries, sequencing, and the ways in which institutions shape conflict and favor some interests over others. This is particularly relevant for thinking through the politics of energy policy because energy systems are not simply technical systems; they are systems that institutionalize the costs and benefits of those systems through regulation, planning, taxation, and corporate governance.

Moreover, Pierson's path dependence model, in particular, is based upon the concept of increasing returns, in that, as a policy path becomes more established, the costs of switching become relatively greater, while earlier decisions have significant long-run implications. In the energy field, increasing returns seem particularly relevant, given the capital-intensive nature of investment in the field, the development of specialized skill sets, and the fiscal-political feedback loops that underpin established systems of energy production.

Certainly, in the case of Petrobras, its own planning documents, such as the 2024-2028 investment outlook, which is intended to reassure the market, embed deepwater and pre-salt extraction as key to their profitability, while simultaneously incorporating decarbonization commitments in the same package. Regardless of the accuracy of such statements, they are

relevant in terms of their use by incumbents to embed the idea of "double resilience" in terms of economic and environmental stability in order to maintain path continuity.

One of the central debates has been whether path dependence is a theory of inertia or a theory of reproduction through change. Thelen's work has been important in offering a critique of punctuated equilibrium approaches to institutional change by emphasizing the role of incremental change through mechanisms of layering and conversion. This has important implications for the study of climate policy around the COPs. While the COPs provide the focus of international events and the potential for change, the domestic system is likely to be changed through mechanisms of "change by addition" and "change by conversion" rather than through the replacement of incumbent-supporting arrangements.

The work of Mahoney and Thelen has systematized the incrementalist approach to institutional change by emphasizing the role of ambiguity in the rules, the distribution of power, and the strategies of the relevant actors. In their work, the role of the institution has been to be the site of ongoing struggle. A key implication of their work has been that the COP-facing commitments and the updating of the NDCs can be seen as part of the domestic system of incremental change without necessarily transforming the energy system. For example, the new NDC of Brazil in 2024 has included procedural elements and normative elements of just transition, climate justice, and internal "common but differentiated responsibilities."

The debate on external shocks has direct implications here. The event of hosting a COP can be thought of as an international "focusing event," which can heighten reputation effects and mobilize pro-transition actors. Yet, path dependence also tells us that external factors do not eliminate the costs of switching. This is a sector in which sunk costs are high and project lead times are long. Thus, a rapid transition can imply significant costs to specific actors, heightening the salience of compensation. Yet again, the text on the 2024-28 plan by Petrobras itself ties investment to long-run production plans and deployment of platforms.

The other relevant debate here concerns agency. How do actors seize on institutional ambiguity to promote or hinder transition? Historical institutionalism offers a view of agency as strategically situated. Actors can seize on institutional ambiguity to promote or hinder transition. Institutions facilitate some behaviors while inhibiting others. Yet again, the capacity to repurpose institutions in a way that promotes or hinders climate policy will be a function of

coalitional power. Relevant sites for such strategic action in the Brazilian context could include the process of environmental licensing, in which the Brazilian Institute of Environment and Renewable Natural Resources makes important decisions; hydrocarbon regulation, in which the ANP determines the rules on hydrocarbons; or interministerial coordination, including interministerial coordination on climate policy, including the institutions referred to in the NDC such as the Interministerial Committee on Climate Change.

The mechanisms by which historical institutionalism relates to the Brazilian "gap" follow. First, there is distributive feedback. Once the energy trajectory enables revenue distribution, employment generation, and regional development, a coalition effect arises to sustain the institutions that provide these benefits. Second, there are the increasing costs of switching. Deep hydrocarbons have long lead times and high sunk costs, which generate economic risks of stranded assets and political risks of destabilizing revenue streams. Third, there is the strategic management of the gap through incremental change. This involves expanding procedural climate instruments while leaving incumbent-favorable energy institutions in place. This is consistent with the mechanisms of layering and conversion.

As such, there are observable implications that can be expected to emerge as a result of the mechanisms. The observable implications that can be expected to emerge as a result of the mechanisms include the intensification of new climate devices and discourses surrounding global moments, such as the COP, but without the corresponding elimination of pro-hydrocarbon instruments. There will be "conversions" in the form of the reframing of existing planning and industrial policy instruments to be consistent with the energy transition, while maintaining the underlying incentives for continued extraction. The strategic discourse of Petrobras, for instance, in reconciling oil and gas extraction with the "fair energy transition" can be seen as a form of conversion at the level of organizational discourse, while investment allocation continues to be dominated by upstream extraction. There will be heterogeneity within the state, in the form of climate diplomacy and NDC processes outpacing the pace of change in the underlying regulations surrounding extraction.

Historical institutionalism can help us understand the mechanisms by which rapid change is unlikely, but at the same time, how incremental change can be compatible with continuity. However, to specify the mechanisms of the energy transition, a further specification of historical institutionalism is needed. The mechanisms described above apply to all policy areas,

but in the fossil energy sector, there is a specific form of resistance in the form of "techno-institutional complexes" that have co-evolved in a manner that specifically locks in the fossil trajectory.

I.3 - The Political Economy of Energy Transitions

Moreover, Unruh's theory of carbon lock-in offers a "macro" explanation of why fossil energy systems persist in the face of economically and technologically viable alternatives. "Carbon lock-in" is the result of "technological and institutional co-evolution" driven by path-dependent increasing returns, which cause persistent market and policy failures, slowing the diffusion of carbon-saving technologies. Unruh's focus on the "Techno-Institutional Complex" is crucial to his theory of carbon lock-in, as it indicates that lock-in cannot be explained by lobbying or ideology, but by the interplay of capital stock, infrastructure, regulatory, and institutional factors.

With respect to the Brazilian energy system, the carbon lock-in effect is visible in the sheer scale of pre-salt production in Brazil. In its official consolidation of ANP's 2025 data, the agency indicates that pre-salt reservoirs supplied almost four-fifths of national oil and gas output in 2025, measured in oil equivalent, while overall production had reached a new record level in 2025. While these figures do not necessarily show "lock-in" in action, they provide a basis in evidence for the mechanism, as any energy system in which a particular energy "frontier" dominates in terms of production and revenue generation will experience difficulties in rapidly shifting away from that system without running significant losses.

Andrews-Speed's approach to low-carbon transitions, based upon the role of institutions, is also relevant to the question of energy transitions in that he argues that energy transitions involve fundamental institutional change, that "institutional theory" can offer insights that are not captured by socio-technical approaches, and that the "political" nature of energy transitions is rooted in the connection between energy, national security, powerful interests, and patterns of energy use, which together make technocratic models of energy transition insufficient, particularly in the Brazilian context, in which state capacity, industrial policy, and energy

sovereignty can be mobilized to justify continued energy extraction, including in the name of a "managed" or "fair" transition.

Kuzemko and her co-authors offer an interdisciplinary approach to governing sustainable energy system change that incorporates institutions, ideas, and interests, arguing that governing energy system change involves politics that are contingent on national political institutions. The argument has implications for our understanding of Brazilian policy because it shifts attention from questions of whether or not 'renewables policies' exist to how effectively institutions can mediate contests between forces of continuity and forces of transformation in energy systems.

Newell's argument from IPE theory also has implications that build on these arguments about energy system change. He contends that energy system transitions are influenced by state, globalization's enabling and limiting effects, and global governance. More importantly, he also discusses how there exists a risk of *trasformismo*, where elites respond to demands for energy system transition by rearticulating these demands as modernization rather than transformation of underlying political-economic structures. The concept of *trasformismo* has direct implications for our understanding of the Brazilian gap, as it suggests that government can pursue international leadership discourses that emphasize decarbonization measures (such as operational emissions intensity, innovation, renewable energy projects) while continuing to maintain hydrocarbon rents and expansion as central to Brazilian energy policy.
The language used by Petrobras to discuss how it can balance oil and gas focus with diversification into low-carbon energy can be seen as an organizational manifestation of this strategy, regardless of actual decarbonization achievements.

This literature also places a strong emphasis on incumbency. In the case of fossil fuel subsidies and reform, Newell and Johnstone conceptualize the notion of "fossil fuel incumbency" as a structural condition driven by the power relations of incumbency, with the extent of incumbency offering an explanation of why governments continue to invest in fossil fuels in the face of climate change risks. Although subsidies are only one part of incumbency, the framework can be generalized to the extent that incumbency can be seen to be driven by the set of rules around access to credit, licensing, taxation, and infrastructure investments, as well as the rhetorical construction of energy security.

Brazil has an empirically relevant context with respect to incumbency mechanisms in the energy sector given the central role of the government and government-linked actors in the oil and gas sectors. In the case of Petrobras' investment planning, the company has decided to prioritize the majority of its upstream CAPEX in the pre-salt region in the period of 2024-2028 (around 67% of its E&P CAPEX). Moreover, the company has conceptualized the new frontier exploration of the equatorial margin as part of its long-term strategy. In addition to these incumbent strategies, the opening of the equatorial margin can be seen to be part of the incumbency mechanisms of the government and Petrobras. In October 2025, Petrobras announced that the operating license to drill an exploratory well was granted by the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA) in the equatorial margin of the ocean. This exploratory well was to be drilled offshore Amapá. This was seen to be part of the incumbent strategies of the government and Petrobras to the extent that the company emphasized the importance of the licensing while also emphasizing that the drilling phase of the exploratory well was to be conducted without any production.

The observable implications for Brazil. A "dual-track" approach should be observable, with the expansion of pro-transition instruments (such as renewables, operational decarbonization commitments, and planning for diversification) and continued decisions that facilitate the extraction of hydrocarbons (such as pre-salt investment prioritization, frontier exploration, licensing, and export growth). Indicators of incumbency should also be observable as concrete policy or institutional mechanisms that lock in the profitability of fossil fuels. A further implication is that the strongest climate reforms will be concentrated in those areas where co-benefits are more immediate and distributive conflict is lower, while reforms that threaten concentrated rents (such as decisive fossil phase-out commitments) will face more resistance.

The political economy of energy transitions thus explains how domestic fossil fuel continuity can be sustained behind rhetoric supporting transitions. Yet, the Brazilian gap also needs to be explained by reference to the international institutional context of leadership. Having identified the domestic mechanisms of energy policy continuity, extractivist rent dependence, institutional path dependence, and carbon lock-in—the framework must now also identify the international climate governance structures that make the gap between ambition and implementation not only domestically sustainable but also regime-compatible. Explaining how it can be rational to sustain an ambitious international leadership position even if domestic

alignment is incomplete requires international climate governance theory and emerging powers.

I.4 - Climate Leadership and Emerging Powers

The fourth block of theory concerns international climate governance and emerging powers. Hurrell and Sengupta argue that climate politics has been reshaped by the diffusion of power, preferences, and ideas, and that emerging powers, often captured by reference to the BASIC group, have been central players in climate negotiations with strong commitments to development and equity arguments. This block of theory is particularly important to understanding the Brazilian gap because it conceptualizes climate leadership as something that cannot be explained by domestic performance on decarbonization alone.

Falkner's work on the Paris Agreement emphasizes the "new logic" in the agreement by focusing on the recognition of the primacy of domestic politics and the ability for countries to set the level of ambition in mitigation through NDCs, which creates universality and flexibility but also locks in the need for national policy cycles. Keohane and Oppenheimer's work on the Paris Agreement emphasizes the "new logic" in the agreement by focusing on the shift from "targets and timetables" to a "pledge and review" system. The relevance to this thesis is straightforward: the international regime creates a structural opportunity for a disconnect between ambition and domestic transformation because it is based on a model that relies on the use of commitment, transparency, and pressure rather than coercion.

The NDCs from Brazil are useful in illustrating the regime's ability to facilitate ambitious declarative commitments and normative leadership. The adjustment to the NDC in 2023 reconfirms the absolute net emissions targets for 2025 and 2030 and reiterates the long-term objective for climate neutrality by 2050. It also emphasizes the need for equity and the concept of common but differentiated responsibilities. The second NDC in 2024 includes a target for the economy as a whole for the year 2035, ranging from 59% to 67% below 2005 levels, and

includes the concept of differentiated responsibilities and the concept of climate justice in the national framing, which signals a normative leadership strategy through the use of formal communication to the UNFCCC.

Another potential mechanism that can be applied to understand why COP moments can be significant, but not necessarily ensure domestic alignment, is the concept of catalytic cooperation developed by Hale. According to Hale, cooperation is possible in situations in which there are joint products, preference heterogeneity, and increasing returns in the context of mitigating climate change, which allows for catalyzing cooperation. In the context of the international role of Brazil in hosting the COP, this would imply that the international role of Brazil can be strategically designed to catalyze cooperation, which could potentially change domestic incentives over time. However, the same mechanism would imply that there is a need to ensure that low-carbon increasing returns are developed at home, failing which fossil increasing returns and rents will continue to prevail.

Jinnah's work on the normative engagement of emerging economies in the global climate politics framework stresses that the former can be both norm-takers and norm-makers in a mutual socialization process, thus influencing climate change norms while still being limited by the demands of their economic development and internal political economy. This can be used to explain the climate change policy of Brazil as potentially hybrid, as opposed to duplicitous. The post-Paris framework can be used to explain the potential for the ambition–implementation gap. Procedural obligations (communicating and updating NDCs, reporting on progress) can be quickly enhanced, but the internal political economy of energy can be a slower process. The latter can be particularly relevant in the pre-COP period, as the international stage can create a reputation risk for the COP host, as indicated by the UNFCCC's framing of the COP30 outcomes. However, the reputation risk does not address the underlying fossil rent, investment, and regional revenue sharing conflicts.

One can observe the following implications for Brazil. There will be a heightened level of pre-COP activity, including announcements, narratives, and commitments made in the context of equity and justice, as well as procedural governance. There will be a continued gap in the improvement of the targets and reporting architecture, as opposed to the improvement of the instruments that govern the internal energy policy of the country in relation to the extraction of hydrocarbon resources. The catalytic cooperation framework can be used to explain the

expected level of alignment, which will be greatest in areas that experience increasing returns to low-carbon investment, but less so in areas dominated by incumbent power and lock-in, such as frontier oil exploration.

These international mechanisms account for the compatibility of leadership with domestic discretion. The four theoretical blocks developed above extractivism, historical institutionalism, carbon lock-in, and the political economy of the post-Paris governance, each highlight a different side of the Brazilian "gap"; yet none is individually adequate to account for the phenomenon. The last step is to synthesize the various mechanisms into an operational notion of structural tension.

I.5 - Conceptualizing Structural Tension

The various sections above converge toward a basic conceptual result: the Brazilian "gap" can be conceptualized as a structural tension built into various layers of governance rather than an occasional inconsistency. The last step is to synthesize the various mechanisms into an operational notion of structural tension: a durable tension between, first, the discursive ambition and procedural compliance of climate leadership and international commitments and, second, the rents and fiscal dependence of the extractivist energy accumulation paradigm; and finally, the third component of structural tension is added with the help of historical institutionalism: the path dependency of the Brazilian trajectory increases the costs of abrupt change while offering the opportunity for incremental change via layering and conversion.

In order to operationalize this tension, the framework employs a three-layered analytical grid that consists of the discursive, institutional, and material layers. The discursive layer refers to how leadership and transition are discursively constructed, including the rhetorical linkages made to climate, development, and sovereignty arguments. The NDC texts are critical to this layer as they contain leadership and normative arguments that are embedded in international communication. The institutional layer refers to rules, procedures, and governance arrangements that operationalize climate commitments into domestic policy planning. Finally, the material layer refers to investment trajectories, infrastructure configuration, production profiles, licensing and exploration activities that operationalize energy system realization.

Consolidation of ANP production, government take figures, and Petrobras licensing and investment practices are critical to this layer.

The analytical grid employed here avoids two types of fallacies. The first is discursive reductionism, which would see the gap as simply greenwashing and therefore ignore institutional and material factors that make partial misalignments politically sustainable. The second fallacy is infrastructural determinism, which would see the gap as inevitable based on energy system materiality and therefore ignore the institutional and discursive factors that manage distributional conflict and incremental change. In operationalizing this approach to structural tension, it's possible to be ambitious in discursive leadership, actively engaged in institutional reform, and continuity-oriented in material practices.

The integrated causal chain that will guide the empirical chapters can be specified as follows: international pressures and opportunities related to COP hosting and the post-Paris regime will boost the incentives for climate leadership and procedural commitments. Translation at the domestic level will be shaped by the presence and nature of institutions that mediate power asymmetries and strategies. Finally, incumbent resistance and carbon lock-in will constrain the scope and ambition of reform. Gap management will involve gradual changes in institutions, with layering adding climate instruments and procedures without subtracting pro-hydrocarbons ones and conversion reframing existing institutions as "transition" instruments, thereby consolidating a hybrid path that remains politically governable.

This framework generates a set of empirically testable expectations that will be followed through in the empirical chapters. Discursive and procedural ambition will be higher in the run-up to COP moments and through the update of the NDC. This will be evident in the content and form of Brazil's NDC communications and in the leadership narratives told for COP30. Institutional innovation will be more visible in the domains of planning, reporting, and governance coordination than in the elimination of hydrocarbons-friendly instruments, suggesting a layering rather than a conversion approach. Finally, material outcomes will reflect continuity where lock-in and incumbency are strongest, including the persistence of pre-salt dominance in production, the continued prioritization of upstream CAPEX, and the opening of new exploration frontiers through licensing and investment.

The remainder of the thesis may, in other words, discuss the Brazilian "gap" not as a paradox of inconsistency but as an empirically discernible configuration of structural tension across the discursive, institutional, and material planes. The objective of the empirical work that follows is to trace the points at which this structural tension increases or decreases in intensity, with the catalytic potential of international events and the dynamics of domestic coalitions possibly shifting the balance of increasing returns in the direction of low-carbon pathways, or the rents and lock-in of the extractivist model continuing to define the dominant trajectory in spite of leadership claims. The analytical framework has now been developed to the point at which this investigation may begin. Chapter II employs the analytical tools developed in this chapter to the historical development of the energy model in Brazil, identifying the extractivist pole of the structural tension in terms of the centuries-long accumulation of institutional, fiscal, and territorial configurations that provide the foundation for the contemporary energy model in terms of the logics of resource-based development.

Chapter II – Historical Foundations and Structural Features of Brazil's Energy Model

Chapter I developed a theoretical framework around the concept of structural tension—a persistent friction, institutionalized across the discursive, institutional, and material planes, between the leadership claims on climate and the limiting potential of the existing energy accumulation model based on the logic of extraction.

II.1 - Long-term extractive trajectories and development of Brazil’s resource-based political economy

Since the first Portuguese settled in the 1500s, the economic model in Brazil was based on export-oriented extraction. The name "Brazil" itself was coined because of the first major export: the redwood dye that Portuguese colonizers traded for. Over the next few centuries, Brazil went through a series of different extraction-based economic models: sugarcane in the 1600s and gold in the 1700s. Each model spurred the growth and development of colonial settlements and a rent-based economy. As economic historians argue, "the sugar cane and gold cycles were the main periods of economic expansion in the economic history of Brazil as a colony, and they are associated with rent-seeking activities by the colonial power (Portugal)." This means that the economy was based on large-scale export-oriented sugarcane and gold production using slave and forced labor, with the profits remitted back to the metropoles or the imperial center. As another economic historian writes, "since its colonial beginning, the country had depended in turn on one of a series of raw products – brazilwood, sugar, gold – as the export which had formed the base of its economy, under a social order dominated by a landholding elite."

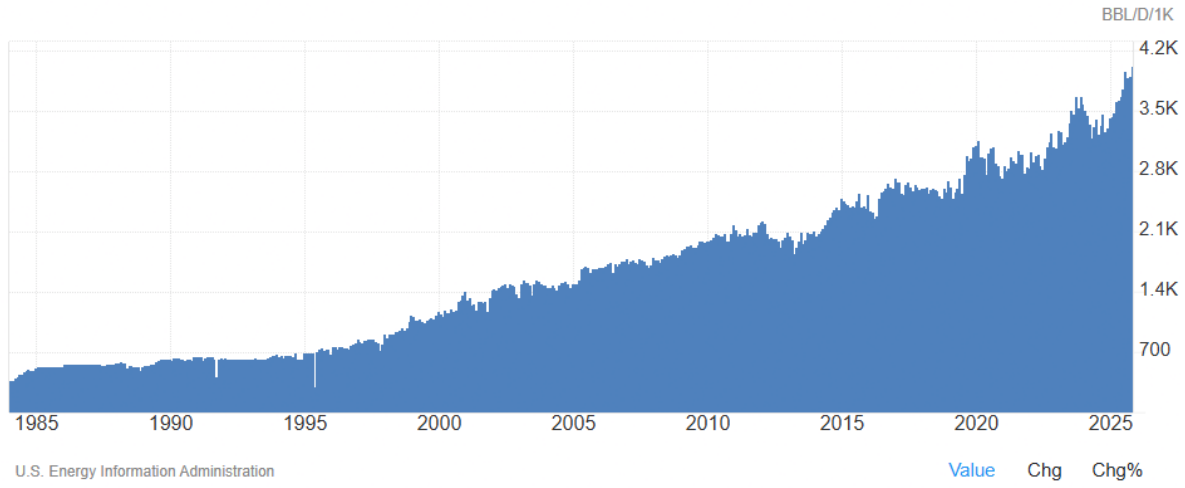
Independence (1822) did not disrupt this pattern. What happened was that Brazil's Empire changed its focus on export commodities but continued with the export pattern. Coffee emerged to replace sugar and gold. It propelled Brazil to an export boom in the 19th century. By the 1840s, coffee was already above 40% of Brazil's exports. By the end of the century, coffee dominated the export earnings. The coffee producers in Rio de Janeiro and São Paulo extended the railroads and ports to accommodate the new coffee plantations. This led to the emergence of a powerful agro-export oligarchy. However, the coffee economy was still an extractive and an oligopolistic economy. As one historian has noted, "this economy, which was based on the extraction of natural resources, did not provide any stimulus to the development of industry. Although the emergence of coffee did not completely reverse the pattern of the colonial… economy, it did encourage the development of industry and the emergence of a middle class…". This meant that the coffee economy only strengthened the coalition of the land elite but continued with the export pattern. Even with the abolition of slavery and the emergence of immigrants, the disparities remained. The sugar-producing regions in the Northeast were replaced by the coffee-producing regions in the Southeast.

The 20th century brought a new form of state-led modernization, which continued to build on the old extractive base. From 1930 to the military period (~1980), Brazil followed a policy of import substitution industrialization under a developmental state. This involved nationalizing strategic sectors of the economy, developing steel plants, and building highways. A specific example of this policy was when Getúlio Vargas founded Petrobras in 1953 as a fully state-owned oil company to control domestic oil production. This policy was successful in helping Brazil develop a diverse economy in some sectors, such as textiles and automobiles. However, it failed to break away from its traditional extractive base. Instead, it changed its form. The state had now become the "capital" in the game of extraction. Banks and agencies provided credit support to the industrial sector, while a complex of firms provided support to the agricultural and mining sectors. Oil production increased rapidly in Brazil under this policy, from 2.7 thousand barrels per day in 1953 to over 2 million in 2010. However, it increased in the same offshore fields off Rio de Janeiro and Sao Paulo states that had been explored for decades.

However, with the advent of neoliberal reforms in the 1990s, institutions were reshaped without breaking with these historical patterns. The constitutional reform of 1997 eliminated Petrobras's monopoly and opened oil and gas concessions to private and foreign companies. A

new institution, ANP (National Petroleum Agency), was created as a regulatory agency, and oil and gas concessions were opened to competition through auctions rather than ad hoc negotiations. Yet these reforms were simply layered on top of the existing institutional structure. Petrobras remained a majority state-owned company and continued to dominate oil exploration. Revenues from export taxes on soybeans, iron ore, and oil remained crucial to state coffers. The reforms enacted after 1997 demonstrate institutional layering. New institutions of market-oriented concession auctions and foreign joint ventures were layered on top of the old institutions of the developmental/extractive coalition. The underlying incentive structure of exploiting rents remained unchanged. In effect, the same coalitions of rural elites, oil technocrats, and regional governments adjusted to these reforms. The state's fiscal situation remained linked to prices and royalties, even as it reduced subsidies and control over these industries.

This 21st-century hydrocarbon boom, therefore, is best understood as part of the longue durée pattern of hydrocarbon cycles in Brazil's history. From 2006, vast deepwater pre-salt oil fields were discovered in the Santos and Espírito Santo basin, beneath layers of salt.



Annex 1 – Evolution of Brazilian Crude Oil Production (1985–2025), thousand barrels per day

Source: U.S. Energy Information Administration (EIA).

The long-term trajectory of Brazilian oil production reveals a clear structural pattern rather than episodic fluctuation. From the mid-1980s until the early 2000s, production

expanded gradually, reflecting the consolidation of offshore extraction capacities developed after the creation of Petrobras and the deepwater advances in the Campos Basin. However, the most striking feature of the curve is the acceleration observed after the mid-2000s, corresponding to the discovery and progressive development of the pre-salt reserves.

The state's response to the boom, therefore, was to institute a new production-sharing model, in which a new arm of the ANP, Petrosal, would be established to manage pre-salt contracts, while requiring that Petrobras be a part of all contracts in the pre-salt zone. Thus, the state's response to the hydrocarbon boom in the 21st century is to double down on its model of state-led hydrocarbon development in Brazil. Oil exploitation in Brazil in the 21st century, therefore, is best understood as an exemplification of increasing returns, in which learning and economies of scale achieved in the Campos basin in earlier times were extended to the deepwater fields off the Brazilian coast, facilitated by Petrobras's investments in the field, regardless of the vagaries of global oil prices. Analysts have noted that these deepwater reserves have become so productive that Brazil turned into a net oil exporter in 2017.

Moreover, the new revenues have strengthened the same pattern of fiscal dependency in the producing states of Rio de Janeiro and Espírito Santo, which now capture the lion's share of federal royalty revenues, thus reinforcing their budgets' dependency upon hydrocarbon rents. Thus, the pre-salt hydrocarbon boom added a new layer to the hydrocarbon coalition in Brazil, in which oil-state interests and managers of Petrobras continued to hold sway, now in conjunction with new international partners.

In short, every era of Brazilian development has reinforced the extractive model. Colonial-era plantations and mining operations financed the colonial state and regional elites; the coffee boom did the same in the Empire; ISI expanded industrial capacity without breaking with commodity production; and contemporary oil politics are a continuation of the same. As a recent review of the literature puts it, "Brazil has experienced the commodity exporter model, import substitution industrialization, neo-extractivist developmentalism…and these models have been accompanied by the creation of institutions that have consolidated contradictions." What this means in practice is that the energy model of the 21st century in Brazil was not a rupture from the past. Rather, the extraordinary growth in oil production under the aegis of

Petrobras, from a few thousand barrels a day to millions, and the continued dominance of hydrocarbons and agricultural products in exports, should be understood as a reiteration of the old model. Having established the long-term of extractive accumulation in Brazil, the next section turns to the structural expansion of the pre-salt hydrocarbon complex to show how the oil boom of today concretely represents those centuries-old incentives and coalitions in its technical, legal, and corporate form.

II.2 - Structural expansion of the pre-salt hydrocarbon complex

Continuing the historical trajectory established above, the present section focuses on the petroleum subsystem itself, from the creation of Petrobras to the pre-salt discoveries, in order to document the technical expansion of the hydrocarbon complex.

Brazil's state-centered petroleum model began with President Getúlio Vargas's Petroleum Law (Lei do Petróleo), passed in 1953. This law created a state monopoly over the entire oil value chain (i.e., through the creation of Petrobras). Over the following four decades, Petrobras was under close state guidance. During the military dictatorship (1964-85), Petrobras changed from a focus on refining to a focus on exploring. Notably, after the 1973 oil shock, President Médici and then Geisel pushed Petrobras to invest upstream in domestic exploration. By 1974, Petrobras discovered the Campos Basin offshore Rio de Janeiro, and the oil boom began. Hence, the 1970s marked a turning point in the state-centered petroleum model. Indeed, the state rapidly built the drilling infrastructure and acquired the technical skills needed for deepwater drilling, a skill set that would prove critical for the exploitation of the pre-salt layer.

In the 1990s, a major policy change occurred. With the rise of neoliberalism, Brazil terminated Petrobras's monopoly over oil and gas exploration with a constitutional amendment in 1995 and a Petroleum Law in 1997. The new policy framework featured a bidding system for oil fields based on a 10 percent royalty system. With the end of the state monopoly, the oil and gas sector opened up to foreign and private capital. The results were dramatic. With the concession system, the oil and gas sector expanded dramatically. Between 1998 and 2004, the oil and gas sector expanded by 318 percent (i.e., from 2.7 percent to 10.5 percent of GDP). Petrobras, with the threat of competition, acquired international technology and expanded offshore drilling.

Hence, the neoliberal policy change created increasing returns. Indeed, the initial success led to more investment.

These were the trends that created the stage for the largest oil discovery in the history of Brazil. Indeed, in 2006, exploratory work in the pre-salt layer (ultra-deep offshore sands) indicated the presence of huge oil reserves, the largest in the Western Hemisphere in decades. The pre-salt oil fields, located in the Santos and Campos Basins, have "high-quality oil with low carbon content." Petrobras quickly placed this in the category of the "winning ticket" for Brazil, directly linking it to the nation's development. Indeed, during Lula's first term (2003-10), the government stated that the pre-salt layer oil development would be used to finance social programs. "Huge offshore discoveries, in fact, became a means of financing health, education, and welfare programs." Then, in December 2010, President Lula passed the Production-Sharing Regime for the pre-salt layer (Lei 12.351/2010). Under this arrangement, Petrobras was guaranteed a minimum of a 30% stake in every pre-salt layer oil block.

Petrobras was entrusted with the important decisions in the pre-salt layer oil fields because of a half-vote at PPSA. This arrangement gave the state control of the pre-salt oil fields, and Petrobras' dominance in the new oil fields was secured. Indeed, capital was funneled into oil consortia that had to have Petrobras as a partner. Thus, the incumbency of Petrobras was secured. Indeed, the production-sharing arrangement was criticized in the future for limiting the ability of companies to engage in a bidding war for oil blocks, as in the auction for the Libra oil field, in which there was only one bidder at the minimum price. However, at the time, the arrangement was seen as a means of maintaining sovereignty.

After a brief period of stagnation between 2014 and 2018, the Brazilian oil industry has once again been revitalized, this time based on various policy and market factors. Since 2016, a new wave of offshore auctions, including many pre-salt blocks, has been announced, first under President Rousseff and more forcefully under President Bolsonaro. In 2021-2022, dozens of deepwater and equatorial margin blocks were announced for auction, attracting major international companies. Currently, under President Lula's third term (2023-), the Potencializa E&P program has been announced (September 2024) aiming to boost frontier exploration. Indeed, the government has explicitly announced that, in the absence of new discoveries, the country's oil production could reach a peak in 2031 and start declining.

Potencializa argues that the exploration work now will "guarantee the oil of the future and, with it, Brazil's energy sovereignty and sustainable development." It forecasts higher and higher oil production in the years to come (increasing from 3.5 to 5.3 million barrels per day in 2030, based on pre-salt fields). These projections rely on Petrobras's own strategy. Indeed, the 2024-28 Strategic Plan, approved by Petrobras's board, forecasts higher investment, reaching $102 billion (31% more than in the previous period). Here, 72% of CAPEX will be spent in E&P and two-thirds of that in pre-salt fields. By 2028, Petrobras forecasts that 79% of the company's production will come from pre-salt fields. To summarize, the Brazilian state's policy since the 1970s has systematically expanded the pre-salt-based hydrocarbon complex and integrated it into the country's model of economic and social development. Having analyzed the technical and volumetric growth of the pre-salt-based hydrocarbon complex, the chapter now turns to the macroeconomic and fiscal implications of this growth, making the hydrocarbon complex not only a productive sector but a macroeconomic and fiscal pillar for the country.

II.3 - Hydrocarbons as a pillar of external and fiscal stability

The previous section demonstrated the extent and rate of the growth of the pre-salt expansion; this section will discuss the macroeconomic implications of hydrocarbon production and how it is now an integral component of the Brazilian balance of trade and government accounts, and how this impacts the political cost of a sudden change.

Although the oil and gas sector only represents a small portion of the Brazilian GDP (around 3 to 4%), it is an important macroeconomic indicator. The fossil fuel sector is now an important pillar of the Brazilian balance of trade and government accounts. In the external balance of accounts, the growth of the pre-salt layer has now made crude oil the top export item from Brazil. In fact, as of the end of 2025, the export earnings from the export of only crude oil were $44.7 billion, making it the top export item from the country for the second year in a row out of the total exports of $349 billion (2025). This is important because it has helped the country maintain a surplus of ≈3.0% of GDP in the balance of payments account. In fact, the government now proudly proclaims how the export earnings from the oil sector help the country to secure the dollars needed to offset the balance of payments deficit: “oil exports help us secure the dollars we need to offset the balance of payments deficit.”

In the same way, oil has also become indispensable to public finance. In 2025, Petrobras and other oil producers transferred around R$81 billion to federal, state, and municipal governments as royalties and special participation fees. The major part of these revenues goes to state and municipal governments that are oil producers. In 2025, "states and municipalities received the larger share" of these revenues, which amounted to R$81B. The state of Rio de Janeiro was also "a major beneficiary" of these revenues. To understand these figures, let's recall that the oil taxes and royalties that Petrobras pays to the federal government every year amount to around R$62-81 billion during 2024-25.

These figures represent around 3-4% of Brazil's entire federal budget. A study by the oil and gas industry estimated that revenues from oil and gas extraction amount to more than BRL 325 billion/year (2023), considering all governments. The federal government's revenues from these sources were BRL 155.8 billion in 2023, which would be enough to pay 102% of the entire education budget or 84% of health expenditure. In states like Rio de Janeiro, oil revenues are enormous. In 2023, BRL 30.4 billion (34% of the state's revenue) came from oil revenues. On average, O&G revenues represent around 13% of state budgets. In practice, oil revenues pay pensions, schools, hospitals, and social programs all around Brazil.

The fiscal need for hydrocarbons provides a part of the explanation for the political phenomena. Oil can be relied upon to provide public finances, and therefore, not extracting it in a timely manner is perceived as a problem. Analysts have pointed out that in 2026, Brazil anticipates its largest oil investment and output in history, partly to preserve these finances. Crises in the oil industry, such as a plunge in oil prices, are perceived as a disturbance in the government finances. Therefore, hydrocarbons have been a part of a policy that balanced external and domestic finances. This embedding of oil in the economy is a classic example of increasing returns. Each iteration of expenditure and creation of hydrocarbon-related infrastructure, such as exploration, drilling, or pipelines, increases Brazil's capacity to exploit more of its resources, which in turn provides more dollars to be exported or taxes to be collected, thereby reinforcing the hydrocarbon path. To understand how the hydrocarbon anchoring of the Brazilian economy does not translate into a traditional petrostate form, however, the analysis must also take into account the exceptionally high proportion of renewable energy in the electricity mix that provides a counterpoint to the hydrocarbon anchoring of the Brazilian economy, which in turn provides a basis for its reputation as a global energy transition leader.

II.4 - Renewable Electricity and Energy Hybridization

Having established the external and domestic importance of hydrocarbons, it is now necessary to establish the other dimension of the energy regime in Brazil, which is dominated by renewables. A discussion of the renewable dimension of the energy regime in Brazil is necessary because it is precisely the combination of hydrocarbons and renewables that provides the "hybrid" dimension of the energy regime in Brazil.

In parallel, it has fostered a very low-carbon electricity matrix. Hydroelectricity on a massive scale from Itaipu and other plants dominated the energy mix for decades, supplying around 60-70%. More recently, wind and solar power have taken off in the 2010s, and renewables from wind and solar now account for more than 34% of the electricity mix as of Aug 2025. Currently, "90% of the electric power matrix in Brazil comes from clean sources." It is also a world leader in the use of biofuels. "Ethanol represents almost 30% of the total fuel used in vehicles." Each successive government takes credit for this green energy model. President Lula, in his address to COP30, claimed that "Brazil has been leaders in the use of renewable energy for decades. Ninety percent of the electricity matrix in Brazil comes from clean sources." Energy Minister Alexandre Silveira also claims a "90% renewable matrix" and "dozens of wind and solar plants" across the country. The hybrid view is also reflected in the energy planning. The Ten-Year Energy Plan for the years 2025-34, which plans for investment in oil and gas as well as in renewables and transmission infrastructure for a total outlay of R$3.2 trillion, aims for an "inclusive transition" that benefits the poor and lowers the energy bill for Brazilians.

In reality, however, the two paths of renewable leadership and fossil fuel expansion co-exist with a sense of tension. The energy agenda in Lula III is defined as an "energy transition" revolution, and the agenda includes elements from both sides. The MME document on the COP30 meeting is called "Brazil, World Leader in Energy Transition," but the first chapters reaffirm the need for a fast-track program for E&P. The MME Minister Silveira presents social programs like "People's Gas" and improved access to energy as a priority, but also supports new oil drilling as "energy sovereignty." The clean matrix is essentially a remnant of the past and vulnerable to droughts in hydro. The fossil fuel use in transportation and industry is still high in Brazil. For example, oil taxes are a significant source of revenue for the state.

The MME discourse carefully integrates the narratives on fossil fuel and renewable energy. President Lula talks about "Luz para Todos" and biofuels in the same breath, but also tells investors "Brazil cannot give up knowing its oil potential." The PDE 2034 includes new oil and gas fields as part of the "inclusive transition" strategy. So, in summary, what we see in Brazil at the moment is a hybrid energy model that combines world-class leadership in renewables and a green energy image with the aggressive development and use of oil and gas. The major structural features of the energy mix are in place, and the next question is the institutional and strategic embedding of this hybrid model. This chapter now turns to the question of the institutional and strategic embedding of the energy mix in Brazil. What it shows is that the co-existence of fossil fuel expansion and renewable leadership is not accidental but is "hard-wired" in various dimensions.

This hybrid form is hard-wired into the system and the coalitions formed. The federal Ministry of Mines and Energy (MME) is at the center of the system. In 2023, MME, under the leadership of Minister Silveira, undertook a broad agenda in the field of renewable and hydrocarbons. The flagship program of MME is the Potencializa E&P program, which was launched in September 2024. This program explicitly links the oil sector with the national agenda. MME's own documents state: "It is necessary to increase oil production from 3.5 to 5.3 million bbl/day until 2030 to ensure the country's energy security." The Potencializa program triggered an unprecedented auction held in June 2025 with 34 blocks, mostly in frontier basins. The auction received a new record in signing bonuses: R$989 million. In early 2026, MME again released the strategic sectors of the pre-salt layer and added 18 blocks to the production-sharing auction, the largest ever held in the country with a total of 26 blocks. This auction is expected to generate R$3.2 billion in bonuses and R$1.6 trillion in government revenues. MME is now giving more flexibility to the Brazilian oil regulator (ANP) to structure the upcoming bids. This is seen as streamlining the licensing process. All of these measures are seen as part of the strategic agenda of the Potencializa program: "unlocking the investments, boosting national production, and ensuring the transformation of the pre-salt into the engine of economic development, government revenues, and energy sovereignty."

Parallel to the efforts of the Ministry of Mines and Energy (MME), Brazil’s regulatory bodies and state-owned enterprises have continued to consolidate the hydrocarbon trajectory. The National Petroleum Agency (ANP) has expanded exploration into new frontiers, including

the equatorial margin, while structuring auction designs that remain favorable to incumbent actors. Petrobras, for its part, has reinforced this expansionary orientation.

Under President Lula's third term, the company has been encouraged to increase investment in order to stimulate economic growth. The new strategic plan approved by Petrobras' board reflects this direction. The company intends to allocate approximately $19.6 billion in 2026 alone and a total of $102 billion between 2024 and 2028. Of this amount, 72% is directed toward exploration and production activities, with roughly two-thirds concentrated in pre-salt fields. The scale and allocation of these investments underscore the centrality of offshore hydrocarbons within the company's medium-term strategy.

Petrobras' operational capacity further reinforces this trajectory. The company has access to advanced offshore infrastructure, including platforms such as the FPSO *Almirante Tamandaré*, which reached an output of 270,000 barrels per day in late 2025—approximately 50% above its design capacity. These technical capabilities, combined with substantial sunk costs in deepwater infrastructure, anchor Petrobras to continued hydrocarbon development. The accumulated capital stock, specialized expertise, and long payback horizons embedded in the pre-salt complex collectively sustain the material conditions for expansion.

Simultaneously, Brazil's environmental ministry (MMA) and technical branch, IBAMA, have also on occasion been at odds with the hydrocarbon expansion. The latest drama surrounding Block FZA-M-059 off Brazil's Equatorial Margin was no exception. In Oct 2025, IBAMA (operating as part of MMA) issued an offshore permit to Petrobras to drill near Amapá. The permit was originally refused on environmental grounds. The U-turn came after "an intense discussion" between IBAMA's technicians and Petrobras to enhance their safety strategy. Energy Minister Silveira immediately praised the move as safeguarding "the future of our energy sovereignty." Environmental groups, however, condemned it as self-contradictory. Environmental activists argued that issuing an oil permit on the eve of COP30 was "a double act of sabotage" against Brazil's climate leadership. In this manner, politics clearly came into play as IBAMA's technical concerns about oil spill risks in a mangrove-rich reef area of the Amazon were overridden by federal-level policy imperatives.

The role of subnational actors is just as important. In addition, the governors of the producing states, especially Rio de Janeiro and Espírito Santo, support the oil agenda strongly. This is because their coffers rely on it. In the case of Brazil, the royalties and special participation fees

go to the producing states and their respective municipalities. As previously mentioned, the Rio de Janeiro government received around BRL 30.4 billion in revenue from the oil industry in 2023. This was approximately 34% of the state's revenue. In the case of Espírito Santo, the major towns of Presidente Kennedy receive exceptionally high royalties per capita. In the case of the town of President Kennedy, residents received nearly R$390,000 each between 1999 and 2024. In other words, there exists a coalition of interests. As a result, the government of the respective states has an interest in the increased oil production. This is true even if the overall impact of the oil money spent on infrastructure and the overall welfare of the population in the oil-producing basins is low. In contrast, the states of Brazil that do not produce oil are less organized. As a result, when the government of Brazil wants to introduce new rounds of oil and gas exploration in the respective offshore areas, the governor of the state of Rio de Janeiro has the political muscle to accompany President Lula to the announcement. This is especially true given the reference of the Petrobras board and the MME to "national sovereignty" and "Brazilian ownership" of the respective resources.

In short, the apparatus of Brazil's energy policy, from the MME and ANP to the states, is geared towards the conversion of oil into national wealth. Each policy layer of each decade builds upon the last: the early focus on refineries and pipelines created the skills for deepwater exploitation, the 1997 reforms created the pre-salt exploitation, the pre-salt finds created the new laws and infrastructure, and the Potencializa Program and the auctions built upon the last. Additionally, the corporate strategy of Petrobras mirrors the national policy: the company's board of directors consists of government appointees, and the company's investment strategy mirrors the economic plans of Lula. The continuity of institutions is the overarching reality here. The final piece of the puzzle for this chapter is to synthesize the above four dimensions of the Brazilian oil and gas sector – the longue durée of the extractive trajectory, the pre-salt expansion, the external and fiscal anchoring, and the hybridization of the electricity matrix – into a single structural configuration, as well as to clarify the analytical utility of such a configuration for the empirical chapters that follow.

II.5 - Structural configuration and analytical implications

The preceding sections of the chapter have, in turn, examined the historical trajectory of the oil and gas sector in Brazil, the technical and volumetric growth of the pre-salt complex,

the macroeconomic and fiscal implications of the pre-salt finds, the hybridized electricity matrix that underpins the 'hybrid' label, and the institutional architectures that shape the sector. The final task of this chapter is to synthesize the above dimensions of the Brazilian oil and gas sector into a single structural configuration, as well as to clarify the analytical implications of such a configuration for the empirical chapters that follow.

This is clearly demonstrated in the Brazilian case, which shows the path dependency of institutional factors and increasing returns in perpetuating an extractivist model, despite the rhetorical commitment to a "green" agenda. We can see here the "reinforcing feedback" that is created in the policy process. Thus, the high concentration of output in one region, namely Santos/Campos, which accounts for almost 88% of national oil output in 2025, means that each new discovery will exponentially increase output in that region, making it politically more difficult to divert output to other regions. Moreover, the hundreds of billions of reals invested in pre-salt wells/platforms provide a powerful sunk cost effect to maintain their exploitation, a "carbon lock-in" effect as Unruh (2000) terms it. Similarly, the legal framework has progressively "locked in" a corporate path. Thus, the 1997 concession model established a private oil industry, which, having taken off, is difficult to reverse. On the other hand, the 2010 production-sharing rules re-established state control, which is difficult to reverse, as Lula III is exploiting to his advantage by opening more blocks under the PSA model.

There are also path dependency mechanisms in the political economy dynamic. The initial rent-sharing mechanisms (the 1988 constitution and subsequent legislation) created long-lasting coalitions. Those who benefit from the revenues generated in the 2000s (Rio's state governments, the oil town mayors, the Petrobras unions) have a vested interest in maintaining the status quo. The new legislation only increases these rents rather than reducing them, as seen with the record-breaking auctions and the signature bonuses now paid out. Meanwhile, the opposing side of the equation has relatively little sway over the budgetary process. This is why the new climate commitments at COP30 and other meetings are still layered on top of an energy system with a material foundation still based on hydrocarbons.

Therefore, we see the "structural tension" predicted in Chapter I: a hybrid system – legitimate and supported globally as a leader in renewable and low-carbon bioenergy, with a logic of development still based on extraction. The path dependency elements create high switching costs: the coalitions are along the resource geography, Rio and Espírito Santo benefit from the oil wealth and the rest of the country looks on. The oil giant itself, as the leading firm, is the

very embodiment of fossil incumbency, it continues to lead the way in new oil projects while exploring gas and low-carbon projects on the side. In short, the path to a low-carbon economy is hindered at every level, the economic lobbies, the budgetary process, and the strategic planners all have a vested interest in carbon-intensive outcomes.

In conclusion, the Brazilian energy regime may be characterized as a self-reinforcing system in which past investments and institutions generate a bias towards the exploitation of hydrocarbons. Each piece of empirical evidence, from the takeoff in Brazilian oil exports and royalties to the growth in Petrobras CAPEX and the number of blocks being auctioned off, serves as a direct confirmation of the mechanisms of path dependency and increasing returns described in Chapter I. Yet even as the narratives of the environment and the social have become more robust, so too has the material and fiscal lock-in. This helps explain the disconnect between the green rhetoric and the fossil fuel policy and practice. The energy regime still runs on past commitments and constituencies that are extremely difficult to break.

In terms of the analytical framework presented in Chapter I, this chapter has demonstrated that the Brazilian energy regime is a structurally hybrid and yet extractively anchored system, a configuration in which renewable electricity and hydrocarbon exploitation coexist in terms of trade, fiscal, and institutional patterns, and in which the foundations of the latter—the extractive pole—are specified. Chapter III turns to the other pole of the structural tension between the hybrid and the extractive poles, examining the articulation of ecological ambition and climate leadership discursively, institutionally, and materially within and against the hybrid and yet extractive developmental model, and thereby reconstructing the ecological/leadership pole of the structural tension. Chapter IV brings the two poles together in a confrontation.

Chapter III – Articulating Ecological Ambition within a Hybrid Development Model

Chapter II has shown that the energy system in Brazil has a hybrid structure but an extractive foundation—a foundation that has been shaped by the developmental trajectories of hydrocarbon expansion, fiscal rent-seeking, and institutionalization. This set of processes defines the second pole of the structural tension conceptualized in Chapter I. In the present chapter, the opposite pole of the structural tension identified in the dissertation's first chapter will be defined. In particular, the chapter aims to demonstrate the articulation of ecological ambition and climate leadership through four consecutive analytical steps: the recalibration of the NDCs, the central role of the Amazon in the climate diplomacy of the Bolsonaro government, the performance of climate leadership during the COP30 process, and the institutionalization of climate governance.

The present chapter aims to demonstrate the articulation of the climate leadership ambitions of the Bolsonaro government in the context of the period leading to COP30. In the terms of the analytical framework presented in Chapter I of the dissertation, the present chapter focuses on the opposite pole of the structural tension identified in the dissertation's first chapter. In particular, the present chapter focuses on the discursive and institutional layers of the articulation of the climate leadership ambitions of the Bolsonaro government.

In addition, a framework of analysis that guides the chapter can be found. Under the post-Paris pledge-and-review architecture of climate leadership by the emerging powers, as theoretically outlined in Chapter I via Falkner, Keohane, Oppenheimer, and Hale, the level of decarbonization performance in the nation-state is not the primary factor. Rather, it is a complex function of status, norm, procedure, and coalition. Brazil's experience validates the framework in some important ways—but also complicates it in some important ways, as the climate leadership articulated here is articulated within a development model that continues to be characterized by a high level of extraction. The first step in the reconstruction of the ecological pole of the Brazilian experience is to examine the NDC, as this articulates the

quantitative and narrative backbone of the climate ambition of the nation-state in the post-Paris climate regime.

III.1 - Recalibration of climate commitment: NDC 2023–2025

Under the Lula administration (2023–2026), Brazil has undertaken a significant recalibration of its climate commitment within the UNFCCC framework. In October 2023, Brazil communicated a change to its NDC that reaffirmed absolute net emissions targets for 2025 and 2030, expressed as a percentage decrease relative to 2005 levels. The move can be characterized as a normative recalibration in the early Lula 3 period. However, in November 2024, at COP29, Brazil submitted a significantly more ambitious contribution, including an economy-wide target to reduce net greenhouse gas emissions by 59–67% below 2005 levels by 2035. The NDC 3.0 was articulated within a broader discourse of climate federalism, in which the federal, state, and municipal levels of government were explicitly articulated as a function of coordinated multilevel governance.

This trajectory is a particularly good example of the pledge and review mechanism that follows the Paris Agreement, especially in its post-Paris format. As Chapter I theorized, the Paris Agreement is based on an iterative approach to commitment, transparency, and political pressure, rather than centralized enforcement mechanisms. Each new NDC provides an opportunity, indeed an expectation of reputation, to increase ambition in greenhouse gas emissions reduction. Brazil's new commitments, in its 2023 adjustment, its 2024 NDC 3.0, precisely follow this pattern of increasing its declared ambition level, incorporating normative language such as "climate justice" and "differentiated responsibility and equity," and positioning itself as a legitimate player in the procedural architecture of the international climate change regime. Moreover, the text of the NDC itself narratively situates key international events such as the Rio conferences and the COP30 summit in a chain of international events, positioning summit convening and agenda-setting as constitutive of its international identity in the realm of global climate change.

This particular recalibration of ambition is also an exemplification of the theory of "emergence" of new power leadership in the post-Paris international climate change regime, as Chapter I theorized in its framework of analysis. Chapter I's theorization of the new power leadership,

based on the work of Hurrell & Sengupta, as well as Jinnah, posited that new powers, such as the BRICS, would be simultaneously norm-takers and norm-makers in the realm of global international law, while at the same time being constrained by their development imperative. Indeed, Brazil's NDC commitment to 59-67% by 2035 is one of the most ambitious of any emerging power, while its language of equity and differentiated responsibility is normative leadership in the realm of the Global South.

However, the Brazilian experience also creates a certain friction in terms of the established understandings of the leadership potential of the emerging powers. The latter are generally understood to be based on at least a partial alignment in terms of domestic energy and environmental policy. The NDC recalibration in the Brazilian experience was a simultaneous process with the speeding up of the upstream hydrocarbons development through the Potencializa E&P program and the largest auction rounds in the pre-salt region. This means that the discursive level in terms of ambition, targets, and justice language developed at a fast pace, whereas the material level of the energy system developed in a manner that increases the structural challenge in terms of meeting the set targets. The pledge and review mechanism, by design, does not address this issue in a manner that would adjudicate the gap between the discursive and material levels. It simply permits the development of the discursive level without necessarily requiring the material level to keep pace. The experience in the Brazilian case, however, suggests that the mechanism may incentivize the increasing divergence between the discursive and material levels in a manner that the formal commitments are not necessarily addressed. This is a level of complexity that the established understandings of the pledge and review mechanism may suggest but do not necessarily address. The mechanism may incentivize the increasing divergence between the discursive and material levels.

However, the formal mitigation commitments, however ambitious in terms of numeric and procedural detail, are only part of the overall picture. To understand the legitimation, anchoring, and projection of the ecological ambition in the Brazilian experience, the analysis must also engage with the Amazon-centric, sovereignty- and justice-oriented framing as the normative basis and territorial anchoring of the leadership claims. This is the discursive level that works in tandem with the quantitative level of the NDC.

III.3 - Amazon, sovereignty, and justice framing

The climate diplomacy of Brazil during the COP30 period has been grounded on the Amazon, as a climate referent and as a climate referent-political norm. The Brazilian president opened the Belem summit by saying, "It's the heart of the Amazon... There is no greater symbol of the environmental cause than the Amazon rainforest." The choice of Belem, as the venue of COP30, which is located in the Amazon biome, was already a strategy of spatial symbolism that embedded climate diplomacy in the biome that Brazil prides itself on protecting.

In the terms of the three-layer framework of Chapter I, this framing of the Amazon plays a central role at the level of the "discursive layer." The Amazon, as a resource, plays a variety of roles simultaneously: it serves as a sign of environmental concern to the international community, as a basis for grounding the claim to leadership in a specific, tangible, and globally recognized resource, and as a framework of justice by which the government links the protection of the environment to Indigenous peoples, social inclusion, and sovereignty. Lula's discourse explicitly linked the protection of the Amazon to the broader sustainable development agenda, noting that the biome supports 50 million people, including 400 Indigenous peoples that face huge social and economic challenges. The framing of the Amazon was reinforced by the Environment Minister, Marina Silva, in calling for international roadmaps to a "Just Transition" to a post-fossil fuels economy and to end deforestation, a call to action that was adopted at the summit.

This discursive construction thus confirms the literature on the leadership of emerging powers, as surveyed in Chapter I, in the ability of states to engage in "normative entrepreneurship" by articulating distinctive narratives that resonate with the broader regime principles of equity, differentiated responsibilities, and climate justice. The Brazilian framing of the Amazon is a particularly potent form of this because it draws upon a biome of global significance to stake a claim to leadership that few other states can match.

However, the Amazon also demonstrates a profound paradox that challenges the tri-layer framework in a manner that is interesting and useful. Indeed, while the discursive layer promises protection, justice, and ecological stewardship, the institutional and material layers continue to be partially aligned with frontier expansion. To the extent that the Amazon represents a territorial frontier, there are infrastructure development, offshore exploration (the

equator runs off the coast of the Amazon), agribusiness, and mining interests. Indeed, the Congressional override of Lula's veto on the environmental licensing bill, the so-called "Devastation Bill," just after COP30 serves as a dramatic reminder of the tension between the institutional and discursive layers. Indeed, while COP30 symbolized climate leadership, the Congressional action undermined the ability of the state to regulate the environment in the frontier region.

The paradox here is theoretically interesting because it demonstrates that the three layers of the structural tension framework are not simply existing in parallel but may contradict each other in a given sequence. Discursive layer: protection; institutional layer: weakening the ability to protect the environment; material layer: continuing frontier expansion. Indeed, the Amazon represents a microcosm for the broader structural tension framework discussed in Chapter I. It is the place where the climate leadership story is most powerfully constructed and the place where the effects of frontier expansion are most keenly felt. To the extent that the leadership story emphasizes the diplomatic and discursive dimensions of the leadership claim, there may be a tendency to underestimate the extent to which the territorial and material dimensions may undermine the legitimacy of the leadership claim from within.

With the relatively stable discursive and normative foundation for the ecological ambition in Brazil now discussed, the chapter will now shift its focus to the performative moment in which this discourse was promoted and tested in a very public and high-stakes setting: the COP30, in which the ambitions and claims made by the Brazilian leadership were converted into outcomes and institutional processes.

III.3 - COP30 as a strategic climate leadership platform

COP30, which took place in Belem from 10 to 21 November 2025, was the most visible expression of Brazil's climate leadership strategy. The results of the summit were codified in the so-called Belem political package, which includes the adoption of a presidency-led Mutirao decision, as well as a series of decisions on ambition/implementation gaps, finance-related dialogues, and just transition work programming. Thus, the COP30 results should be read as a display of agenda-setting power and diplomatic entrepreneurship in the multilateral climate regime.

In the vocabulary of Chapter I, it can be argued that COP30 exemplifies the catalytic cooperation mechanism developed by Hale. Here, the climate summit provides the necessary diplomatic capital, procedural commitments, and agenda control to facilitate the emergence of coalitions on climate action. Brazil's leadership exploited its presidency of the COP, its chairing of the G77+China in 2024/25, as well as its G20 presidency to maximize its influence in global climate policy. A Tropical Forests Forever Fund of up to $25 billion was launched as the flagship event of COP30, connecting forest conservation to global climate finance. This underlines the leadership pattern developed in Chapter I of the present report, in which leadership is performed through convening power, coalition-building, and the articulation of distinctive normative positions in the climate regime.

Yet, at the same time, the limits of such leadership became visible at COP30. The TFFF managed to mobilize only $5.5 billion of its $25 billion target by the end of 2025, indicating that the organization's leadership is subject to the prudence of multilateral and private donors, which is informed by their knowledge of the domestic political constraints in Brazil. Moreover, most significantly, the procedural and declarative outcomes of COP30 did not translate into binding domestic instruments that would place limits on hydrocarbon expansion, such as carbon pricing, stronger deforestation targets, and the weakening of environmental licensing. This is, of course, in line with the observable implication of Chapter I's historical institutionalism, which posits that commitments to the COP would strengthen during international events but would not symmetrically remove domestic instruments that are supportive of hydrocarbon expansion, given that the costs of change are still prohibitively high for incumbent coalitions.

The problem here is that, while true that there are no domestic outcomes, there is still the reputational constraint that the summit produced, which the executive branch used to justify new instruments of governance, such as the fossil-fuel transition roadmap, as well as the mandate of the Energy Transition Fund. This would imply that the pledge and review mechanism is not just permissive, since there is still endogenous pressure that is being built up by the international community, although whether such pressure is effective in changing the material trajectory of domestic policy, or whether new layers of institutionalization will be built to accommodate such pressure, is still uncertain.

It is now time to ask whether the momentum of COP30 will translate into new domestic architecture, moving beyond the international stage that we have analyzed in the preceding part of the chapter, to the domestic institutionalization of the laws, councils, plans, and coordination that will embed ecological ambition into the architecture of Brazilian climate governance, beyond the performative event of COP30.

III.4 - Institutionalization of climate governance

To effectively steer its intricate climate and energy agenda, the Lula government has designed a range of governance instruments which embody the institutional component of Brazilian ecological governance. In mid-2023, the government issued decree 11,550/2023 to formalize the Interministerial Committee on Climate Change (CIM), an executive body responsible for coordinating the government's climate and energy efforts across ministries. The committee consists of the country's top ministers from the ministries of the Environment and Energy, Finance, Agriculture, and other key sectors and is mandated with monitoring all federal climate actions, approving the upcoming Plano Clima (National Climate Plan 2024–2035), and integrating sectoral programs into the National Climate Change Policy.

Most recently, in late 2025, the Lula government utilized the newly established climate and energy governance framework to issue a presidential decree instructing the Finance, Energy, and Environment ministries to develop a "just and planned roadmap out of fossil fuels," including the establishment of an Energy Transition Fund using oil and gas revenues. This top-down coordination of the country's climate and energy efforts, which seeks to implement a single strategic framework across the country's ministries, is an exemplary case of how climate and energy governance is channeled through the country's newly established institutional mechanisms designed to reconcile the often-conflicting agendas of the country's various ministries.

In the vocabulary of Chapter I, these instruments are a prime example of institutional layering in the precise sense in which Thelen and Mahoney and Thelen conceptualized it: new climate governance instruments are being layered on top of the existing bureaucratic structures—the Ministry of Mines and Energy, the ANP, PPSA—without changing or substituting the mandates that orient these institutions to hydrocarbon expansion. The CIM functions in parallel

to, rather than instead of, the energy sector institutions whose performance metrics are still calibrated to production volumes, licensing activity, and revenue. This is a quintessential example of the institutional layer of the tri-layer framework developed in Chapter I. New climate governance instruments are being created, but they exist in parallel to, rather than instead of, the institutional architecture that reproduces extractive continuity.

The process of conversion can also be observed. Plano Clima, still in the process of being developed, includes a structure that reaches across to encompass mitigation and adaptation strategies for each sector. Approval of the plan, however, must be achieved through consensus in the CIM, giving each ministry a de facto veto power over parts of the plan that affect its portfolios. The Ten-Year Energy Plan (PDE 2034) outlines a plan to invest R$3.2 trillion in oil, gas, renewables, and transmission under a plan to achieve an "inclusive transition that lifts the poor and cuts household energy bills", and specifically includes new oil and gas fields as part of the plan for energy transition. This is a classic example of institutional conversion in the sense in which it was conceptualized in Chapter I. An existing planning instrument is being reframed to achieve the energy transition while remaining oriented to hydrocarbon expansion.

A parallel can be drawn to the strategic messaging of Petrobras. Here, the oil company announces its investment in pre-salt exploration in parallel to its commitments to decarbonize operations. Expansion and climate responsibility are being reframed as part of a single strategic whole. As Chapter I anticipated in the conceptualization of *trasformismo* by Newell, elites are able to incorporate demands for transition by reframing them as a form of modernization that remains fully in keeping with existing power relations.

The analytical friction here is considerable and must be made explicit. The layering and conversion mechanisms that Chapter I identified through Thelen may serve as instruments for gradual transformation or as instruments for conservative accommodation. In the Brazilian case, the ambivalence of these mechanisms is particularly evident. On the one hand, the CIM, the fossil fuel roadmap directive, the Plano Clima, and the Energy Transition Fund represent a set of new institutional footholds that did not previously exist. They represent a set of formal obligations, legal requirements for all ministries to consider climate objectives, presidential directives for transition planning. Future coalition governments may make use of these for more substantive transformation.

The establishment of subcommittees on indigenous peoples and social participation represents a set of governance resources with considerable potential for transformation. On the other hand, these instruments have so far largely been employed at the procedural and declarative level, the CIM has largely produced only non-binding plans; concrete decisions on licensing, investment, and taxation remain in the hands of agencies with existing pro-extraction mandates; and the consensus requirement for the Plano Clima gives veto power over ambitious targets to pro-fossil ministries.

The internal tensions within the executive branch further reinforce this point. Marina Silva, as vice-chair of CIM, has been advocating for strict science-based targets, while the Energy Ministry has been supporting more oil production, including offshore and Amazonian frontiers. In the elaboration of PDE 2035, the Ministry of Mines and Energy has been insisting on ambitious oil targets, while planning bodies that align with environmental goals have been pushing to reinforce signals to investors in renewable energy. These tensions reinforce that policy outcomes are the result of negotiations that balance competing institutional interests rather than the implementation of a unified climate policy. The question of whether these new climate institutions may eventually help to rebalance power or simply be window-dressing that accommodates pressures without altering policy trajectories awaits the evolution of coalitional power, prices, and international pressures.

The chapter has demonstrated the ecological side of Brazil's structural tensions on all four policy areas analyzed: recalibration of NDCs, Amazon-centric diplomacy, leadership performance during COP30, and institutionalization of climate governance. These processes reinforce that Brazilian climate policy ambition is not simply rhetorical but rather constructed through policy commitments, institutional innovation, and climate diplomacy in the post-Paris regime. The NDCs evidence the pledge-and-review mechanism, while the Amazon dimension mobilizes a critical biome as leadership potential, COP30 illustrates catalytic cooperation and emerging power agenda-setting, and the new climate governance instruments evidence institutional layering as conceptualized in Chapter I.

At the same time, however, the present chapter has also demonstrated that the ecological pole of the equation is shaped by—and subject to—the limitations of a development model whose extractive underpinnings were the subject of Chapter II. Each of the dimensions of ambition addressed in the present chapter has its own set of frictions: the advance of NDCs outpaces the

evolution of material policy; the Amazon is at once a diplomatic gain and an expansion frontier; COP30 has yielded procedural momentum without resolving distributional disputes over fossil rents; and the addition of climate governance instruments has so far not involved the subtraction of the pro-extractivist architecture. In these terms, the present chapter has provided an account of the "transition" and "leadership" side of the hybrid extractive/transition state conceptualized by the dissertation—a hybrid in which the ecological and the extractive are not seen as contradictory but as complementary aspects of the same political package.

Chapter IV will instead focus on the other side of the coin: the material and institutional mechanisms of the reproduction of the extractive continuity itself, including the pre-salt expansion, CAPEX asymmetry, the fiscal entrenchment via the coalitions of rents, and the institutional layering of the hybridization mechanisms. This chapter and the next form a diptych: the former has demonstrated the construction of the ecological pole; the latter will now show the limits of the latter against the weight of the former as specified in Chapter II.

Chapter IV – Institutionalized Structural Tensions in Brazil's Energy Policy

Chapter II specified the ecological pole of the structural tension by demonstrating how the Brazilian energy system is structurally hybrid yet extractively anchored—a system anchored in the path-dependent trajectories of hydrocarbon expansion, fiscal rents dependence, and the institutionalization of the aforementioned processes. Chapter III then constructed the ecological/leadership pole by tracing the mechanisms of the articulation of ambition via the recalibration of the NDC, the Amazon-centric framing of the climate problem, the COP30 leadership performance, and the institutionalization of the climate governance agenda. This chapter now seeks to confront the two sides of the coin empirically and show how the reproduction of the climate leadership ambition and the extractive continuity are articulated together via the mechanisms of the simultaneous pursuit of upstream expansion and climate goals, the asymmetric CAPEX allocation to fossil frontiers, the fiscal entrenchment via the coalitions of rents, and the institutional layering of the hybridization mechanisms.

This chapter aims to analyze the mechanisms through which the ambitions in climate leadership and the continuity in extraction are co-produced in the energy policy domain in Brazil. The preceding chapters established the theoretical framework in Chapter I, the historical foundations of the hybrid energy model in Brazil in Chapter II, and the co-production of ecological ambitions in the NDCs and COP30 diplomacy in Chapter III. The objective of this chapter is to engage the theoretical mechanisms developed in Chapter I with the empirical material developed in the dissertation as a whole, in order to demonstrate where the theoretical mechanisms are instantiated and where the Brazilian case introduces a degree of friction in the application of the theoretical mechanisms.

The chapter is organized around four analytical dimensions: the co-production of upstream expansion and climate ambitions, the asymmetrical allocation of capital expenditure in fossil frontiers, the fiscal entrenchment of rent-based coalitions, and the institutional layering of

hybridization. The tri-layer analytical grid developed in Chapter I is used as a unifying concept across all four dimensions. The discussion in this chapter, however, is organized around a set of analytical dimensions with a specific orientation towards friction. Each section in the chapter will discuss not only the application of the theoretical mechanisms in the Brazilian case but also the areas where the empirical material introduces a degree of friction in the application of the theoretical mechanisms.

Before proceeding with the analysis, a preliminary confrontation with the relevant literature is necessary. A major counter-narrative to the notion of structural contradiction in the hybrid energy model of Brazil has emphasized the rational nature of the developmental sequencing of the model. This has been done by emphasizing the Lula government's strategy of leveraging oil rents to fuel a gradual energy transition. This emphasis has been bolstered by the fact that Brazil has already largely decarbonized its electricity mix (around 90% renewable energy sources). Moreover, the point has been emphasized by President Lula's repeated calls for an Energy Transition Fund to be set up through the profits of the oil sector. In late 2025, he asked ministers to prepare a roadmap to a "just and planned" energy transition. This emphasis has to be taken seriously because it points to an important institutional logic. However, as the literature on extractivism discussed in Chapter I of the book makes clear—especially with regards to the discussion by Gudynas and Acosta of the nature of neo-extractivist regimes and the way they combine developmental logic with the expansion of the commodity sectors—the political economy of rent dependence has a tendency to reinforce specialization rather than diversification because of the structural interests of the political coalitions that the rents have consolidated. What we need to assess here is whether the evidence points to the latter.

The first empirical test of this argument centers on the most obvious manifestation of this structural tension: the simultaneous deepening of upstream oil and gas development and strengthening of climate commitments, a dynamic that instantiates discursive-material divergence as theorized in Chapter I.

IV.1 - Coexistence of Upstream Development and Climate Commitments

The most obvious manifestation of Brazil's structural tension involves the simultaneous deepening of upstream oil and gas development and strengthening of climate commitments, a dynamic that instantiates discursive-material divergence as theorized in Chapter I. In the period surrounding COP30, which took place in Belém from 10 to 21 November 2025, Brazil submitted its most ambitious nationally determined contribution to date, an economy-wide target to reduce net greenhouse gas emissions by 59-67% below 2005 levels by 2035, while accelerating the Potencializa E&P program, which has as its goal increasing oil production from 3.5 to 5.3 million barrels per day by 2030 through intensified pre-salt and frontier exploration efforts.

In accordance with the logic laid out in Chapter I, this simultaneous dynamic represents the discursive-material divergence that Gudynas and Acosta identify as the logic of neo-extractivism, whereby governments advance redistributive or ecological discourses while also deepening hydrocarbon or other forms of commodity extraction, with the state taking on a more active role in rent capture and allocation. The Brazilian case serves as confirmation of this logic with particular clarity, as the 2024 NDC incorporates language around climate justice and ecological transformation, while also accelerating upstream expansion through the Ministry of Mines and Energy. The discursive side of this structural tension has thus been activated.

However, the Brazilian case also poses a specific analytical problem that the pure neo-extractivism theories do not fully address. The point here is that, given the fact that the Brazilian electricity matrix is already about 90% renewable, the country cannot be considered a fossil-dependent state in the way that the resource curse theories typically assume. The conflict here is not about a coal-intensive electricity matrix versus climate change; the conflict in Brazil is about a fully decarbonized electricity matrix and a simultaneously expanding upstream petroleum sector geared towards export. This poses a problem for the resource curse theories that typically assume a systemic fossil dependence.

The post-Paris pledge-and-review system, as analyzed in Falkner, Keohane, and Oppenheimer in Chapter I of this volume, structurally facilitates such a coexistence. The point here is that the post-Paris system, in its reliance on iterative commitment and political pressure, structurally facilitates the gap between declarative commitment and slower rates of change in the national systems. The Brazilian COP30 presidency and the resulting Belém political package indeed represent the kind of catalytic cooperation that Hale posits. The summit produces the kind of diplomatic capital and procedural commitment that facilitates the resolution of the underlying conflicts, but it does not resolve the underlying conflicts themselves. The rub here, of course, is that the COP30 summit was not entirely without impact at the national level, in the sense that the executive used the resulting reputational constraints to justify the introduction of new governance instruments. The point here, of course, is that the pledge-and-review system may not simply be a facilitative factor but a factor that produces endogenous pressures towards change, whose transformative potential remains to be seen.

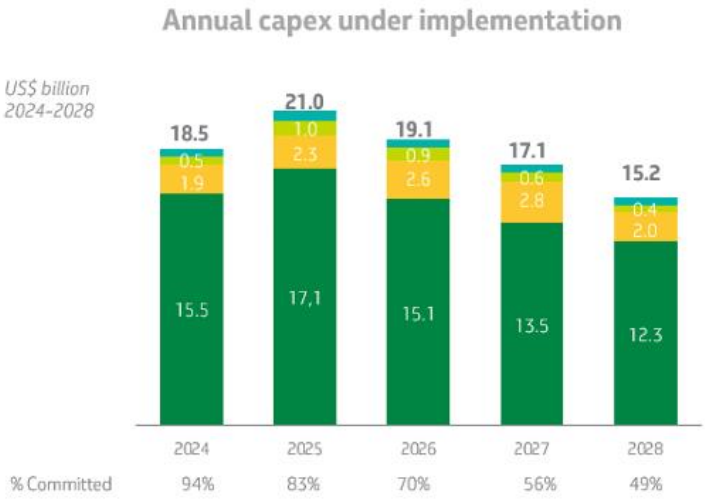
In the domestic sphere, it assumes institutionalized forms characterized by parallel tracks of governance. The Interministerial Committee on Climate Change (CIM), by decree in 2023, has made it compulsory by law for all Ministries to take climate goals into consideration. However, on the same day, the Ministry of Mines and Energy launched Potencializa E&P in September 2024 by explicitly linking oil expansion to energy sovereignty. Energy Minister Alexandre Silveira has argued that the 90% renewable matrix and ambitious oil targets are two sides of the same strategy. The COP30 summit has been ignored by Congress, which ratified most of the licensing bill that undermines environmental regulation—the so-called Devastation Bill—overriding Lula's vetoes just after the summit. This has been evidence of the observable implication that can be derived from HI, as discussed in Chapter I, which states that COP-related commitments increase around major international events but do not cancel out pro-hydrocarbon instruments symmetrically because the political cost of changing course remains too high for incumbent coalitions.

IV.2 - Asymmetry of CAPEX and Frontier Licensing (pre-salt and equatorial margin)

The distribution of capital expenditures in the energy sector of Brazil presents an evident material asymmetry that illustrates the mechanisms of the Carbon Lock-in and the Path-Dependence theories discussed in Chapter I. In its Strategic Plan for the period of 2024-2028, Petrobras has pledged an investment of US$102 billion, an increase of 31% compared to the prior period. In the plan, the company has allocated 72% of its CAPEX to Exploration and Production activities. Out of the latter, two-thirds of the expenditures were allocated to the pre-salt layers. In its new plan for the period of 2026-2030, Petrobras has allocated US$78 billion to Exploration and Production activities, totaling 71.6% of its total capex. In addition, eight new deepwater platforms and several projects in the pre

Such an investment pattern represents a paradigmatic example of the increasing returns process that plays the central role in Pierson's theory of path dependence. Each new iteration of the capital allocation process to deepwater infrastructure, drilling rigs, FPSOs, subsea equipment, increases the relative cost of switching and produces self-reinforcing feedbacks through the development of specialized human capital, consolidated corporate competencies, and fiscal structures calibrated to the assumption of rising production levels. The sunk costs reflected in these multi-year plans create the increasing switching costs identified by Chapter I as generating economic risks of stranded assets and political risks of destabilizing revenue streams should the trajectory be changed.

The CAPEX asymmetry also represents an expression of Unruh's theory of the techno-institutional complex. Carbon lock-in, as theorized in Chapter I, represents the outcome of the co-evolution of capital stock, infrastructure, regulatory regimes, and institutional structures. Petrobras' investment planning is situated within an institutional framework in which ANP structures the concessions and production sharing agreements, PPSA manages the pre-salt contracts, and the Ministry of Mines and Energy frames the upstream expansion as an expression of energy sovereignty.



Annex 2 – Petrobras Annual Capital Expenditure under Implementation (2024–2028), US$ billion

Source: Petrobras, Strategic Plan 2024–2028+, “Annual CAPEX under Implementation”

Figure 4.1 illustrates the annual capital expenditure profile of Petrobras between 2024 and 2028. The data reveal a pronounced concentration of investment in exploration and production activities, which consistently absorb the overwhelming majority of total CAPEX. In 2024 alone, US$15.5 billion out of US$18.5 billion is allocated to upstream operations, a pattern that remains structurally stable throughout the planning horizon.

Yet again, however, the Brazilian case injects a degree of dissonance with the carbon lock-in theory's conventional wisdom. Unruh's theory was originally designed to account for the fossil power sector's reluctance to transition in the face of increasingly competitive renewable energy sources. In the Brazilian case, the electricity sector's transition is already complete: 90 percent renewable. In this context, the carbon lock-in is not the electricity sector at all; it is the petroleum sector and its associated fiscal-institutional infrastructure. This sectoral asymmetry between the electricity and petroleum sectors complicates the techno-institutional complex thesis: the complex in the Brazilian case is not the fossil power sector at all; it is the offshore petroleum and export infrastructure. The implication is that the carbon lock-in theory's sectoral

scope is more nuanced than the original formulation suggests, a nuance the Brazilian case operationalizes.

The equatorial margin is the frontier component of the Brazilian carbon lock-in. In October 2025, the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA) approved an operating license for the state-owned petroleum enterprise Petrobras to drill in the state of Amapá in the north of the country. The conflict between the country's environmental agencies and the Ministry of Energy was long-standing. The granting of the license represents the mechanisms of fossil incumbency that the carbon lock-in theory posits: access to the licensing process, the rhetoric of energy security, and the incumbent's capacity to leverage the executive branch's control over the country's environmental agencies. The conflict between the Ministry of Energy and the country's environmental agencies represents the conflict between incumbents and challengers of the path dependence theory of gradual institutional change.

The June 2025 auction, with 34 blocks and a record amount in signing bonuses totaling R$989 million, and the early 2026 offer of 18 pre-salt blocks for the largest ever PS-Auctions confirm the consolidation of the material layer. In the tri-layer model presented in Chapter I, while the discursive layer strengthens in the run-up to COP30, the institutional layer incorporates a new set of climate change governance tools, the material layer takes a decisive step towards the expansion of fossil fuel extraction capacity with multi-decade long production horizons.

Yet, investment patterns do not take place in a political vacuum. CAPEX asymmetry as described above translates into concrete revenue flows and distributional patterns that solidify powerful coalitions with a structural interest in defending the extractive path. In the following section, I illustrate the fiscal entrenchment of the extractive path at all levels of the federation.

IV.3 - Fiscal entrenchment and rent-based coalitions

The fiscal framework for the hydrocarbons sector in Brazil represents one of the most powerful tools through which the continuity of the extractive path is institutionally reproduced. ANP official data show that the government's *participações governamentais*, or take, for the oil and gas sector reaches R$98.9 billion in 2024. A more recent study by the IBP Institute calculated that oil and gas revenues for all levels of government surpassed BRL 325 billion in

2023. This amount could cover 102% of the total education budget or 84% of the total healthcare budget for the federation. In the state of Rio de Janeiro, for instance, oil revenues account for 34% of the total state revenue.

These figures empirically substantiate the rent dependence and distributive coalition mechanisms that were theorized in Chapter I. As Gudynas indicates, extractivism can be conceptually distinguished based on several observable factors, namely, the scale and intensity of extraction, export orientation, and limited domestic processing. The hydrocarbon sector in Brazil fulfills all these conditions, as pre-salt oil deposits accounted for 79.63% of national oil equivalent production in 2025, oil was the main export product of Brazil in 2024, and most of it was exported as a raw material. The rent flows secure what Ross recognizes as the specific governance stakes that are characteristic of petroleum systems, namely, thick revenue flows that generate significant incentives to maintain fiscal and regulatory arrangements.

The multi-level distribution of these rents to federal, state, and municipal governments generates coalitions that structurally react against attempts to reduce fossil energy extraction. The president's initiative to reduce the rounds of oil and gas tenders and auctions in 2023 was immediately criticized by the governor of Rio de Janeiro, as it was considered "a dagger to the state's economy." These processes confirm the distributive feedback mechanism that was theorized in Chapter I's historical institutionalism, namely, that once energy systems start to distribute rents, coalitions form to defend these institutions that deliver these rents, and these coalitions can activate their political instruments to stop reforms.

Yet, the empirical record also shows a friction in the straightforward rent-coalition theory. Not all subnational actors exhibit uniformly pro-extraction coalitional behavior. Some governors and mayors in the Amazonian states, including those whose budgets are partially financed by federal transfers that have oil revenue as a source, have expressed opposition to oil exploration in the equatorial margin on environmental and indigenous grounds. This indicates that being a rent-dependent subnational actor does not necessarily mean exhibiting uniformly pro-extraction coalitional behavior. Some subnational actors' interests are cross-cut by territorial, ecological, or identity-related concerns. This nuance to the extractivisms literature indicates that coalitions of resource rents are not homogeneous entities; opposition to the dominant trajectory can be present even in the distributive architecture.

The ANP's approval of an updated rule for the calculation of domestic reference oil prices in 2025, with the stated goal of deepening public revenues associated with royalties, a procedural action clearly geared towards the mobilization of regulatory parameters, serves to demonstrate the active role of regulatory parameters in the deepening of rent capture. This is no longer a question of passive reliance but of active reproduction of the relevant institution, thereby reinforcing Bebbington's point that reforms are subject to the political settlement and the materiality of the extraction process, rather than the international commitment per se.

The fiscal and coalitional forces described above create strong incentives for the persistence of the extractive process. However, they do not shed light on the mechanisms by which the dual forces of ambition and extraction are reproduced institutionally. A final set of analytical steps is required to address the mechanisms of incremental institutional change by which climate governance instruments are layered onto the state architecture without disrupting the pro-extraction arrangements that fiscal entrenchment maintains.

IV.4 - Institutional Layering and Managed Hybridization

The institutional dynamics of Brazil's energy climate governance architecture point to an institutional pattern that can be captured with the vocabulary of incremental institutional change developed in Chapter I through Thelen and Mahoney and Thelen. In particular, instead of disrupting the pro-fossil fuel arrangements in the energy sector, the government of Brazil has pursued an institutional strategy of layering new climate governance instruments onto the existing supportive architecture of the extractive industry.

The creation of the CIM by decree in 2023 is exemplary. It adds a procedural climate layer to the existing regime but operates in parallel to, rather than instead of, the Ministry of Mines and Energy, ANP, and PPSA, whose mandates are still geared toward hydrocarbon expansion. It has issued nonbinding plans to date, leaving it to agencies whose mandates are geared toward hydrocarbon expansion to make decisions. This again supports the observable implication of Chapter I: innovation in institutions in hydrocarbon policy in Brazil is more apparent in planning and coordination than in the removal of hydrocarbon-expansion instruments.

The second mechanism of conversion, as outlined in Chapter I, is also apparent. The Ten-Year Energy Plan (PDE 2034) projects a R$3.2 trillion investment in oil, gas, renewables, and

transmission under a plan geared toward an "inclusive transition." It includes new oil and gas fields in its plan as part of its transition strategy. Thus, it converts a traditional planning document into a tool for transition language without changing its material content. An example of how Petrobras strategically utilizes its resources to promote a transition-friendly image can be seen in its strategic planning documents. It includes its pre-salt oil investment as part of its decarbonization plan. Thus, it can be said that it accommodates the language of transition while still promoting hydrocarbon expansion. As Chapter I outlined in its *trasformismo* argument through Newell, elites can use such strategies to incorporate demands for transition while still maintaining the power structures of the past.

The empirical evidence also challenges the layering-and-conversion framework in interesting ways. Thelen's original argument on layering and conversion focuses on how these are mechanisms of institutional change, albeit gradual. One must ask in the context of the Brazilian hydrocarbon regime whether the climate institutions are entirely inert or whether they lay the groundwork for a possible institutional foothold for elites to push for more radical reforms in the future. While it is true that climate institutions are not being followed in substance, the fact that the CIM legally mandates that all ministries consider climate objectives in their planning does lay the groundwork for a possible foothold for elites to push for reforms in the future. Thus, the creation of climate envoys and transition funds provides institutional resources that did not exist in the past.

The question of transformation or containment cannot be answered theoretically; it requires the dynamics of the evolution of coalitional power and external pressures. The Brazilian case pushes the limits of historical institutionalism by demonstrating the same mechanisms of layering and conversion can be used for either transformation or containment, depending on the coalitional dynamics in the institutional arena. This is a theoretically interesting finding because it implies that managed hybridization is not a stable state but a configuration whose trajectory is empirically open.

The tri-layer grid developed in Chapter I is the most comprehensive theoretical frame for understanding this configuration. Discursively, the regime sends out ecologically friendly messages: "Amazon COP," "just transition," "ambitious NDC." Simultaneously, the regime asserts that "we must take advantage of our oil." Institutionally, the regime layers new climate entities onto old veto players. Materially, the regime configuration means that the largest share

of public revenue comes from oil and commodity exports, and Petrobras remains the largest taxpayer in the country. This configuration means that budgetary constraints always prioritize extractive over green investments.

Intra-executive contradictions offer a further example of managed conflict. Within the Lula cabinet, the Energy Minister and the Treasury prioritize growth-oriented infrastructure, while the Environment Ministry, led by Marina Silva, prioritizes deforestation control. In the process of drafting the PDE 2035, the Ministry of Mines and Energy pushed for ambitious oil targets, while planning agencies advocated for more robust renewable targets. Oil interests succeeded in securing multi-billion dollar investments in new fields, while climate ministries were unable to secure similar budgets. Here, the managed nature of conflict is evident. Again, the vocabulary of Chapter I applies. This is the expected result of a political settlement in which institutions broker power asymmetries. Which actors dominate key arenas and the nature of veto points determines the balance between ambition and continuity.

Managed hybridity therefore appears as a stable form that sustains the existing policy regime under the guise of transformation. However, the stability of the hybrid form should not be overstated. Each layering institution postpones the inevitable confrontation through the appearance of progress while perpetuating the existing policy regime. In this sense, hybridity therefore represents a path-dependent equilibrium. Increasing returns from the extraction path make switching costs high, while layering accommodates sufficient flexibility to respond to climate imperatives without altering the material policy path. However, the structural tension between the two paths remains unaddressed. Rather, the hybrid form manages the tension. Yet the very existence of the climate institutions, contested licensing decisions, and intra-executive contradictions points to the inherently unstable nature of the management. However, the question remains whether this instability will lead to transformation or simply rearrange the terms of accommodation. This is the issue addressed in the following chapter.

To recap, Chapter IV has shown, through the lens of these four mechanisms, that ambition and extractive continuity are coproduced in Brazil, that these processes are not random, but are instead mediated by these four interlocking mechanisms, that is, by the copresence of upstream expansion and climate commitments at the discursive-material interface, by the asymmetry in

the allocation of CAPEX and frontier licensing to fossil pathways, by the fiscal anchoring of rent-based coalitions in all spheres of the state, and by the layering of new institutional arrangements that accommodate climate governance while leaving intact the pro-extractive arrangements that are at the heart of the energy transition in Brazil. This confrontation of theory with evidence thus confirms that the structural tension in the energy policy field in Brazil is not a moment of inconsistency or transition, but rather an institutionalized configuration that is at the same time durable, self-reproducing, and politically managed through the very mechanisms that Chapter I theorized.

Chapter V now moves away from the confrontation of theory and evidence to reflect upon the implications of the hybrid model of extractive transition that is at the heart of the Brazilian energy transition, that is, upon the resilience of extractivism as a model of development in the context of conditional stability, upon the structural limits to the pace of transition, upon the place of Brazil in the new global architecture of energy transition established by the Paris Agreement, and upon the implications of the Brazilian experience for other energy-dependent emerging economies that are similarly navigating the tensions between ecological ambition and extractive path dependence.

Chapter V – Extractivist Resilience and the Limits of Ecological Transformation

V.1 - Extractivist Resilience in Conditional Perspective

Brazil's extractive transition model should not be understood as a matter of destiny, but rather as a conditionally stable equilibrium. Its stability derives from path-dependent investments, institutional legacies, and coalitions that sustain fossil fuel expansion. Yet this equilibrium rests upon a set of underlying assumptions regarding global market conditions and domestic political configurations. Should these assumptions be disrupted by significant systemic shocks, the model's stability could be undermined. Understanding Brazil's hybrid configuration therefore requires conceptualizing it as an equilibrium sustained under specific conditions rather than as a structurally immutable outcome. Building on Chapter IV, the following section refines this analysis by examining the systemic vulnerabilities embedded within that equilibrium through a political economy lens.

As Pierson (2000) and Unruh (2000) demonstrate, path dependence and increasing returns generate self-reinforcing dynamics once a particular policy trajectory has been chosen. In Brazil's case, this has produced a fossil-based "techno-institutional complex" linking hydrocarbons and agribusiness, raising the economic and political costs of switching to alternative energy sources. The resulting lock-in effect generates policy inertia, slowing the adoption of renewables or electric mobility even where these may be economically viable. Scholarship on fossil incumbency, notably by Newell and Johnstone, further highlights how dominant firms shape regulatory frameworks to preserve their competitive advantages, thereby reinforcing carbon-intensive structures. Taken together, these mechanisms explain the relative stability of Brazil's energy configuration. As long as global demand remains strong and oil prices favorable, the current policy trajectory can be sustained. Nevertheless, this stability is accompanied by significant structural vulnerabilities.

A primary weakness lies in Brazil's fiscal dependence on commodity rents, particularly oil. In recent years, revenues from Petrobras and mineral exports have reached unprecedented levels. In 2023 alone, the oil and gas sector contributed R$325 billion to public budgets—an amount comparable to the annual funding of entire federal ministries such as Education or Health. The federal government's share of royalties and taxes from Petrobras now exceeds 10% of total federal spending, while in the state of Rio de Janeiro oil revenues have historically accounted for up to 40% of the state budget.

Such revenues, however, are inherently volatile. Oil price fluctuations translate directly into fiscal instability. As noted by *The Rio Times*, reliance on oil income leaves both federal and state budgets exposed to commodity swings. A 50% drop in Brent prices—or a structural decline in global oil demand—would erase billions of dollars in projected revenues. This vulnerability has already materialized: Petrobras reduced its $109 billion capital expenditure plan for 2026–2030 following a downward revision of oil price assumptions from $83 to $63 per barrel. Lower prices affect not only royalty flows and social spending but also corporate investment decisions. In February 2026, Petrobras announced a "re-optimization" of spending to maintain dividend payments, marking the first reduction of its five-year budget since President Lula's return to office. This episode illustrates how policy space remains constrained by global price cycles.

Subnational governments are particularly exposed. States that have structured their budgets around oil royalties face acute risks. During the 2014–2016 oil price collapse, Rio de Janeiro and other producing states experienced severe fiscal stress as export revenues declined. A renewed downturn—whether driven by price volatility or structural demand contraction—could compel cuts to healthcare and education or force additional borrowing, generating political and social strain. Brazil's public finances thus remain closely tied to the performance of the hydrocarbon sector: what functions as a fiscal lifeline in times of high prices can become a liability under adverse market conditions. Any substantial shock to global oil markets, including a coordinated shift away from fossil fuels, would therefore place pressure on the coalitions that currently underpin the hybrid model.

V.2 - Stranded Assets and Investment Lock-In

Beyond fiscal dependence, Brazil also faces a more forward-looking vulnerability: the risk of stranded assets. Over the past decades, the country has built an extensive hydrocarbon infrastructure—offshore platforms, pipelines, refineries, export terminals—whose economic logic presupposes continued oil demand over the long term. These investments are not isolated decisions but part of a cumulative trajectory in which each new commitment reinforces the next.

Petrobras' most recent strategic planning illustrates this dynamic clearly. In its 2026–2030 plan, the company allocates approximately $78 billion to exploration and production, accounting for 71.6% of total capital expenditure. It projects crude oil output to reach 2.7 million barrels per day by 2028 and plans the deployment of eight new deepwater platforms, alongside continued development of pre-salt assets. These figures signal more than confidence in current profitability; they reflect a deep entrenchment of capital in long-lived offshore projects whose economic viability depends on decades of sustained production.

This trajectory carries structural risk. Large-scale fossil investments assume that global oil demand will remain robust. Yet under a decarbonization pathway consistent with the 1.5°C objective, this assumption becomes increasingly fragile. According to the International Institute for Sustainable Development (IISD), up to 85% of oil produced in Brazil's new projects could prove economically unviable in such a scenario. In other words, a significant share of newly developed reserves could become stranded before the end of their projected lifespans.

At the conceptual level, this situation corresponds to what Gregory Unruh famously described as "carbon lock-in." Fossil-based industrial systems evolve through positive feedbacks: infrastructure, regulatory frameworks, corporate strategies, fiscal arrangements, and technical expertise gradually coalesce around carbon-intensive activities. Over time, these elements form a techno-institutional complex that makes deviation increasingly costly. Brazil's offshore hydrocarbon system exhibits all the hallmarks of such lock-in: high sunk

costs, long payback periods, specialized capabilities in deepwater extraction, and strong fiscal linkages between oil revenues and public budgets.

Lock-in does not imply immobility. It does, however, imply that transition becomes politically and economically demanding. The system is likely to shift only when continued operation becomes irrational relative to alternative pathways. A rapid tightening of global climate policy—through carbon pricing, regulatory constraints, or accelerated technological substitution—could sharply reduce oil demand. In such circumstances, offshore platforms designed for decades of production might no longer recover their costs, transforming productive assets into financial liabilities.

The implications would extend beyond Petrobras' balance sheet. Because the Brazilian state is simultaneously regulator, fiscal beneficiary, and controlling shareholder, stranded assets would pose difficult trade-offs between climate ambition, fiscal stability, and industrial strategy. The risk of stranded assets therefore represents not merely a financial contingency but a structural constraint embedded within Brazil's hybrid extractive-transition model.

V.3 - External Demand Vulnerabilities

Another set of vulnerabilities concerns the external demand side. The export-oriented economy has made Brazil more vulnerable to changes in external fossil and agro-commodity demand. The most notable aspect is that Brazil exports the majority of its oil, gas, and minerals to Asian countries, particularly China. As a matter of fact, in the year 2025, China alone imported about $20 billion worth of crude oil from Brazil. This figure makes China the largest oil importer from Brazil. This creates a potential vulnerability in the sense that if China decides to reduce or stop oil imports due to its own decarbonization drive or economic slowdown, Brazil would be left without a major export market. The same would be the case for other countries. The recent Net Zero Policy Lab research found that "approximately 40% of Brazil's exports are destined for the EU and China, which are both moving rapidly to tighten climate policies. Over 87% of Brazil's $40 billion oil exports go to countries with formal net-zero pledges." These countries are all implementing carbon border taxes and sustainability criteria on imported products.

Practically speaking, this means that Brazil's output will be subject to new constraints. For example, the EU's Carbon Border Adjustment Mechanism (CBAM) will impose carbon tariffs on imports. Sectors included in the initial CBAM (steel, aluminum, cement) cover 75,000 Brazilian jobs and $8 billion in exports. Even agricultural exports, an area where Brazil has a traditional comparative advantage, are subject to the impact of the EU's decarbonization policies. In fact, the EU has just adopted a Forest Carbon Regulation that could reduce $15 billion of Brazilian soybean, beef, and pulp exports if deforestation is not addressed. In other words, even Brazil's oil exports are indirectly subject to the impact of the hybrid model's reliance on external markets. In conclusion, the reliance of the hybrid model on external markets has the potential to be a double-edged sword. On the one hand, export earnings provide the fuel for development. On the other hand, reliance on external markets makes Brazil vulnerable to the impact of foreign policy shifts. A sudden move by importers (for example, the peak of the world's oil consumption, the adoption of a carbon pricing scheme by the EU, the imposition of trade sanctions by the US) could suddenly reduce foreign earnings.

Asian demand is particularly critical. The energy demands of China and other Asian nations are rising, and they currently absorb a large portion of Brazil's exports. Yet, these nations are also major players in renewable energy and electric vehicles. What if, for instance, all auto manufacturers in China were to adopt electric energy? Or, what if they were to require deforestation-free supply chains to import Brazilian commodities? In either case, Brazil's rents could fall significantly. More so, what if tensions arising from trade wars were to cause shifts? Therefore, as Brazil's peers transition to clean energy, Brazil risks being left with stranded assets and unsold commodities. The rupture condition arising from this external demand effect is particularly potent. Brazil's export orientation makes it particularly vulnerable to any fall in these markets.

V.4 - Global Climate Governance Pressures

Apart from the immediate need, there are several other global policy shifts on the horizon which could place tight limits on the hybrid model. Among these are carbon border taxes, climate finance control in international relations, and the push for faster decarbonization in OECD nations. Collectively, these are the pressures of global climate governance on the Brazilian model and effectively increase the cost of carbon-intensive industries in Brazil. For

example, the pressures of the European Union's carbon border adjustment mechanisms will soon extend to more goods exported from Brazil into the European Union. This could extend to fertilizers or chemicals from Brazil into the European Union. Each new measure reduces the total pool of profitable exports from Brazil into the European Union. This is the problem of policy risk: the infrastructure built today will not necessarily have a market tomorrow. Collectively, these pressures could soon divert investment from oil and gas into other areas of the Brazilian economy. The problem with the Brazilian model is the assumption that the international financial system will continue to support the fossil fuel industry in Brazil indefinitely. But if the pressures of global climate governance were to tighten in the coming years (for example, through the issuance of green bonds), then the continued growth of the oil and minerals industries could be blocked at the source. This is an existential threat to the Brazilian model: if no new investment is forthcoming, then the existing infrastructure will at best plateau and at worst shrink.

V.5 - Aggregate Theoretical Perspective

All these vulnerabilities resonate with the three-layer political-economic model that we introduced in Chapter I. Materially, the lock-in of capital and infrastructure creates a one-way ratchet effect because extensive oil infrastructure is already built, and still more is being built. Discursively and institutionally, the hybrid model is made legitimate by the rhetoric of growth, pork-barrel politics, and coalition deals. However, the structural tensions that we have outlined here show that path dependence is not necessarily inexorable. Rather, the model is path-dependent, but there is a critical juncture that can change its trajectory. Pierson's idea is that in the presence of powerful positive feedbacks, systems are resistant to change, but there is a large shock that can upset the equilibrium. In the case of Brazil, positive feedbacks have strengthened the petro-agro path, but their ability to sustain the model depends upon stable external conditions.

Conceptually, the Brazilian model is an exemplar of Unruh's carbon lock-in, in that there is significant institutional support of fossil fuels, and Newell & Johnstone's fossil incumbency, in that large energy corporations drive policy. Economies of scale are at work in the complex, in that it is cheaper in terms of energy to run an existing refinery or drilling rig than to build new

sources of energy such as renewables. This is why, in the absence of a forceful exogenous shock, the hybrid model persists in a familiar pattern of partial reform, significant continuity. However, the vulnerabilities that we outlined above show exactly what constitutes that shock.

V.6 - Conditions for Rupture

We can therefore point to a number of potential rupture scenarios where the hybrid model might fail or pivot dramatically. A continued oil price collapse (for example, in the event of a massive oil supply surge meeting the peak of oil demand) might spark sovereign debt crises and bankruptcies. A new external demand shock (for example, the slowing of the Chinese economy or an EU boycott of all Amazon-origin commodities) might drastically reduce exports and create a need to find new strategies. A new acceleration of global climate policy (for example, agreements moving net-zero dates forward, the imposition of carbon tariffs or the removal of subsidies) might invalidate most of the new projects in Brazil. Even with the forces of credit, a credit crunch against high-carbon projects under new ESG standards, might render most of the new projects unfinanceable. And finally, there might be fiscal reforms in Brazil, for example, a change in the revenue-sharing arrangements with the oil royalties or the fuel subsidies.

Each of these potential ruptures has its own set of associated stress points. If any of these events were to happen decisively, the resiliency of the Brazilian model might snap dramatically. For example, if the OECD were to effectively declare war on all fossil fuels through the use of tariffs and mandates, Brazil might be forced to diversify. If there were a drastic crisis in the Brazilian state budget due to an oil price collapse, there might be a new emphasis on austerity and diversification. These ruptures depend on the convergence of external and internal pressure. But they do point to the possibility that the Brazilian model, while extremely resilient in the present context, might be subject to change.

V.7 - Lula's Agenda under Pressure

The question to be answered about Lula's agenda is how it must be understood against these structural constraints. The policies he has enacted, reenergizing Amazonian protection and climate leadership, while laudatory, operate under exactly the same rentier logic. Without

major shifts either on the geopolitical or institutional domestic fronts, it's possible that Lula's agenda may simply slow down rather than reverse extractivism. In fact, recent events demonstrate this point clearly: just weeks after hosting COP30, Lula's government gave the greenlight to further drilling in the Amazon, and Congress overturned most of his environmental vetoes. The world's gaze may limit his options, but so too do Brazil's fundamental dependencies on oil rents and agrowealth.

From a structural perspective, we see that Lula's agenda has exactly the same conditionality as all others, externally, it requires engagement with the world to obtain climate finance and open markets for green exports, and domestically, it requires breaking free from clientelistic networks tied to oil rents. The former requires little explanation, as it's simply impossible to obtain climate finance or open markets without alienating significant coalitions. The latter, addressing fiscal and electoral pressures tied to oil rents, is similarly impossible without alienating these same groups. In short, according to our theory from Chapter I, Lula's efforts may result in incremental changes to the discursive and institutional layers, but the material layer of extractivism, capital stock, debt, budgets, will continue on its same course.

V.8 - Conclusion : Beyond Resilience to Strategy

Finally, the recognition that the hybrid model in Brazil is conditionally stable necessarily implies a strategic perspective. One must ask not only how the system responds to perturbations or shocks, but also in what circumstances it may transform or collapse. The evidence confirms that the system has so far been able to absorb the shocks from the decline in commodity prices, the pandemic, and the conservative governments by adapting fiscal targets and discursive frames. Yet this should not be taken for granted. The vulnerabilities discussed above are not minor details but fault lines that may reorient the incentives for the actors in the system.

In a forward-looking perspective, it appears likely that should global pressures increase further, for instance in the form of trade regulation or finance, and should the actors in the system not act to transform the model of extractive governance, the hybrid model in Brazil may either lock in a painful regression or a strategic transition. The question is what the exact consequences may be. What is clear from the analytical perspective is that the model in Brazil is not set in stone but rather its stability is a function of continued global demand and permissive domestic

institutions. Resilience is not a given but a strategic variable subject to the same economic laws as any other resource-dependent state.

General Conclusions

Reframing the Puzzle and Answering the Research Question

This dissertation started from the puzzle that has come to embody climate politics in the mid-2020s: how is it possible for a state to credibly enact international climate leadership via the modalities of summitry, improved nationally determined contributions, and the rhetoric of ecological transformation, while at the same time expanding hydrocarbon extraction and deepening the commodity export structures upon which its macroeconomic stability is built? The holding of COP30 in Belém from 10 to 21 November 2025 crystallized the puzzle with particular intensity: an Amazonian city becomes the center of international multilateral climate diplomacy at the very moment when the country is consolidating its position as one of the leading offshore oil producers globally, with crude oil now being confirmed as the country's top export and with pre-salt reservoirs now producing nearly four-fifths of the country's oil and gas output.

This dissertation has demonstrated that Brazilian energy policy is characterized by deep and lasting structural contradictions between the country's climate leadership ambitions and the established patterns of an extractivist political economy. Such contradictions are not the result of episodic and short-termistic political opportunism; they are not the result of the kind of hypocrisy commonly associated with the notion of hypocrisy itself. Instead, they are the result of a path-dependent extractivist political economy in which the very configurations of the state's institutions, its finances, and its territories create lasting limits to the transformative possibilities of ecological ambition, even in the presence of high levels of renewable electricity generation. Climate leadership, enacted via the modalities of NDC improvement, Amazon-centric diplomacy, and COP30 agenda-setting, is entirely compatible with the continuity of the extractivist path—but it is always conditioned, bounded, and mediated by the weight of an energy model in which hydrocarbon extraction, rent distribution, and export insertion remain the core. The pledge and review system created after Paris makes this gap not only domestically sustainable but also regime compatible, as the Paris regime’s approach is based on iterative commitment and political pressure rather than enforcement, making the coexistence of ambitious signaling and lack of domestic transformation structurally possible.

Brazil as a Hybrid Extractive-Transition State: Empirical Contributions

The analytical path taken in the dissertation's development, as outlined above, showed, step by step, why the reproduction of ambition and expansion is simultaneously possible in the same political economy, and why the Brazilian case is best understood as a hybrid structure, rather than a policy inconsistency.

First, the theoretical framework developed in Chapter I of the dissertation established the necessary conditions to reproduce the ambition-expansion gap as structure, by integrating concepts of extractivism, historical institutionalism, carbon lock-in, and the political economy of energy transitions into a unifying analytical framework, which conceptualized the structure of tensions in three layers of analysis, discursive, institutional, and material, and derived empirically testable predictions about their behavior in the run-up to, during, and in the aftermath of COP events and NDC cycles.

Second, Chapter II of the dissertation analyzed the historical and structural evidence to show that the energy model in Brazil is simultaneously hybrid in its composition, while being located in an increasingly extractive political-economic structure. The longue durée of extractive energy accumulation, from colonial commodity chains to import-substitution industrialization, to the 21st-century expansion of pre-salt hydrocarbons, has given rise to a self-reinforcing system in which infrastructure, fiscal, and coalitional factors all tend to bias outcomes in the energy policy field in favor of hydrocarbon exploitation. While the Brazilian electricity matrix is dominated by clean energy sources to the extent of approximately 90%, the expansion of hydrocarbon extraction in the pre-salt layer of the Atlantic Ocean, along with increasing crude oil export dependence, gives rise to a hybrid structure that cannot be captured by petro-state typologies. Hydrocarbon *participações governamentais* reached R$ 98.9 billion in 2024, while oil and gas revenues to all levels of government exceeded BRL 325 billion in 2023.

The analysis of ecological ambition (Chapter III) clearly demonstrated that Brazilian climate leadership was not only rhetorical but also politically constructed around commitments, institutional innovation, and climate entrepreneurship in the post-Paris regime. The NDCs' evolution was also used to demonstrate how the pledge-and-review ratchet mechanism was operationalized, as the 2023 revision reaffirmed absolute net targets for 2025 and 2030, while

the 2024 NDC included an economy-wide target of 59-67% below 2005 levels by 2035, which included climate justice and differentiated responsibilities as part of UNFCCC communication. The COP30 'Belém Political Package' was also used to demonstrate catalytic cooperation and emerging power agenda-setting. However, all these aspects of climate ambition also had their own contradictions, as NDC targets were moving faster than policy implementation, as the Amazon was used as a climate asset and also as a site of expansion, and as institutional layering was used to add climate governance instruments without changing existing architectures that supported extraction.

The confrontation of evidence (Chapter IV) also demonstrated how these continuities of ambition and extraction were linked to each other through four interrelated mechanisms that were used to reproduce these continuities: the simultaneous acceleration of upstream expansion and climate ambition, as CAPEX was asymmetrically allocated to fossil frontiers (67% of Petrobras's E&P CAPEX was allocated to pre-salt in the 2024-2028 plan), fiscal entrenchment as rent-based coalitions that included federal, state, and municipal governments, and institutional layering as managed hybridization that included climate governance instruments without replacing existing fossil-supporting architectures. The equatorial margin licensing saga, which included IBAMA's blockage and subsequent override in October 2025, was used to demonstrate how fossil incumbency operates as institutional mechanisms even during heightened climate scrutiny.

The discussion of the concept of extractivist resilience (Chapter V) made clear that the hybrid configuration of Brazil actually refers to a conditionally stable equilibrium. Thus, the resilience of the hybrid configurations of Brazil stems from the investments that were made in the past, but the stability of the system relies on the assumption of constant global demand and permissive domestic institutions that could be challenged by a significant change in the prices of the main commodities exported by the country, the presence of binding international trade regulations, and changes in the climate finance landscape of the globe.

Theoretical and Conceptual Contributions

The Brazilian case supports the following theoretical and conceptual contributions to the political economy approach to climate leadership and energy transition:

First, the Brazilian case supports the importance of theorizing climate leadership beyond discourse. Climate leadership claims may be authentic and strategically relevant while still being conditional upon material constraints and rent systems. COP presidency, agenda-setting, and NDC signaling may be considered as a form of power in the UN regime. However, these may not automatically trickle down to all the domestic sites where fossil continuity is reproduced. Hurrell and Sengupta's conceptualization of the emerging economies as being constrained and at the same time as a key player in the shaping of norms and values in international relations has been supported. However, the Brazilian case specifies the constraint as being mediated not only through the more general "development" logics but through more particular institutional mechanisms such as fiscal distribution rules, licensing pipelines, corporate investment cycles, and subnational coalition politics.

Second, the dissertation reinforces the updated understanding of the concept of extractivism in the face of partial decarbonization. Gudynas's and Acosta's conceptualizations of the concept of extractivism and neo-extractivism have been supported as being compatible with a world in which the energy transition is partial and uneven. Decarbonization may be easier in segments such as the electricity sector, while fossil fuel expansion may continue in segments such as the oil and gas sectors. However, the essence of the persistence of the concept of extractivism may not be the carbon intensity of the power grid but the rent systems and the institutional feedback. This may be the case even in a world in which the electricity sector is largely decarbonized.

Thirdly, the Brazilian case provides evidence of hybridization as a possible stable form of transition configuration rather than a mere compromise. Historical institutionalism's understanding of increasing returns to institutional change and gradualism—especially Thelen's mechanisms of layering and conversion, developed in concert with Mahoney—may be used to understand the dominant pattern of managed duality. New climate governance instruments and green investments are simply layered on top of existing fossil-fuel-friendly systems without conversion. Unruh's carbon lock-in theory can be used to understand the stability of the fossil fuel regime in Brazil. The more the oil production systems, infrastructures, and revenue systems are concentrated in the pre-salt layer, the more difficult it becomes to reverse.

Fourthly, the post-Paris climate governance architecture, as conceptualized by Falkner, Keohane, and Oppenheimer, as well as Hale, appears to be not just permissive of the ambition–implementation gap but possibly even generative of it. Each iteration of the NDC cycle provides declarative ambition and diplomatic capital regardless of the domestic investment trajectory. This tension, which the pledge-and-review process tends to gloss over, appears not to be resolved in the Brazilian case.

Implications for Climate Governance and Energy-Dependent Emerging Economies

The dissertation's implications extend beyond the specific case of Brazil to the relationship between the post-Paris climate governance architecture and resource-dependent emerging economies.

The strength of the Paris model has been its universality and iterative flexibility, the very characteristics that facilitated near-universal participation and created a framework for progressively raising ambition. However, the experience of the Brazilian path towards COP30 might imply that the flexibility of the Paris model could solidify a hybrid state characterized by the coexistence of ambitious procedural governance and the material fossil expansion, particularly when rents from extraction finance public services, subnational budgets, and coalition politics. If this experience may be generalized, and similar mechanisms may be at work for other major emerging producers in their confrontation with analogous challenges between climate commitment and hydrocarbon or commodity dependence, the potential for the post-Paris regime to facilitate deep transformation in the face of the centrality of extraction rents might be more constrained than suggested.

Brazil's case also adds a degree of complexity to the just transition concept. This is because the high-renewables electricity system of Brazil has already achieved the task of decarbonizing the electricity system. However, the logic of the extractive economy operates independently of the electricity system. A just transition concept that only focuses on the just transition of the workers in the coal-dependent regions might miss the more subtle but equally enduring logic of the extractive economy that operates through the export-oriented hydrocarbon economy and rent distribution architecture. A more structural just transition concept would need to address

the fiscal and political dependencies that render the continued pursuit of the hydrocarbon economy rational to the political economy of the various levels of government.

Finally, the ecological role of Brazil as the custodian of the Amazon rainforest adds to the overall importance of the hybrid trajectory of the Brazilian political economy. This is because the Amazon rainforest has been identified as an important node of the global climate system. In addition, the IPCC has emphasized the evidence of the weakening tropical forest carbon sinks. This has important implications because the domestic political economy of Brazil has significant implications for planetary climate regulation. This adds to the reputational importance of the ambition-expansion gap.

Limitations, Avenues for Future Research, and Final Reflection

It is important to note several boundaries of the research: the research is a single-country case study, although the Brazilian case was used to refine the causal expectations of the structural dependencies in the energy-dependent emerging economies; the research is not based on a comparative analysis of multiple countries; it is not based on original research or original interviews with the political elites; the research is not based on the modeling of the energy systems or the quantitative econometric analysis; finally, the research is not based on the assessment of the technical feasibility of the transition pathways. In addition, although the research acknowledged the role of agribusiness and mining in the broader framework of the Brazilian extractive paradigm, the research is operationalized primarily along the subsystem of the energy policy.

Overall, the research boundaries indicate the avenues for the further research: the research could be replicated with other major emerging economies: Indonesia, Nigeria, Colombia, or Saudi Arabia; the research could be operationalized along the quantitative modeling of the transitions: it could assess the feasibility of the NDC targets with the help of the quantitative modeling of the transitions; finally, the research could be operationalized along the longitudinal analysis: it could assess the extent to which the new institutional footprints established during COP30, the Interministerial Committee on Climate Change, the fossil fuel transition roadmap, the Energy Transition Fund, become the instruments of the transformation or the instruments

of the conservative accommodation, a problem of the ambiguity of the layering and the conversion processes that the research highlighted as the core problem of the Brazilian case.

This dissertation began with the image of Belém, the Amazonian city that hosts multilateral climate diplomacy in the midst of oil platforms expanding production in the waters beyond its horizon. The image is still analytically appropriate as a concluding frame. The structural tension in Brazil is not a phase to be overcome by a stronger will to politics or a surer sense of targets; it is a configuration, and a configuration that is institutionalized. Yet the analysis has also demonstrated that the configuration is conditionally stable, not fixed. The risks of commodity prices, stranded assets, and shifting international regulations threaten to disrupt the equilibrium, and the foothold provided by climate governance, however modest, offers a potential for leverage in the future.

The management of the structural tension in hybrid states of extractivism and transition will be a crucial factor in the global climate regime's future trajectory. Will the resource rents be used to support the transition to diversification, or will they be used to reproduce specialization? Will the layering of institutions create space for a transition, or will it simply enable the continuity of the existing model of extractivism? The answer will be found in the politics of the institutions, coalitions, and fiscal regimes that mediate the translation of the pledges into action, or into inaction. Brazil, because of its ecological, energetic, and diplomatic significance, will be one of the sites in which the answer to this question will be found.

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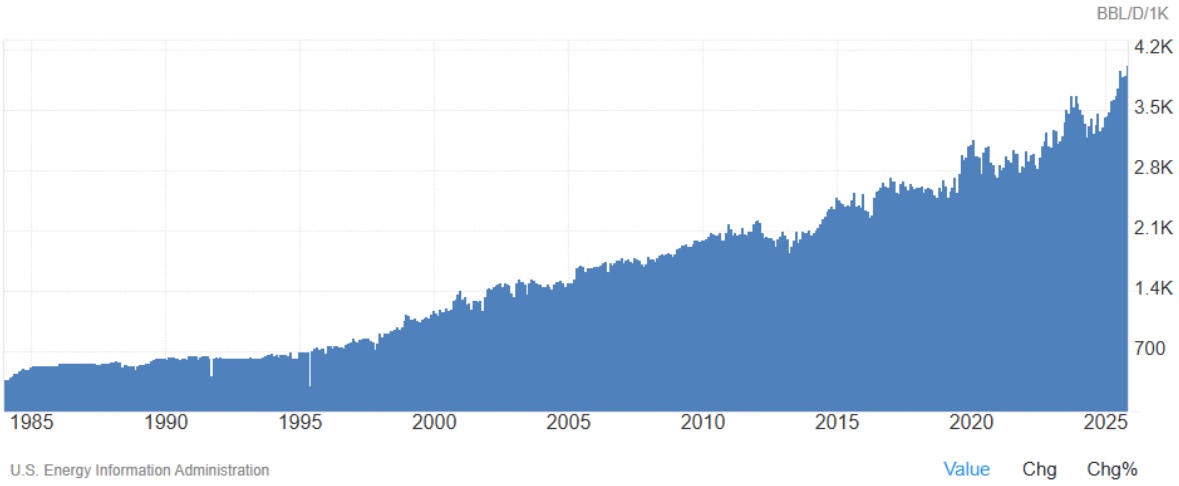
Annex :

- **Annex 1 – Evolution of Brazilian Crude Oil Production (1985–2025), thousand barrels per day**

  Source: U.S. Energy Information Administration (EIA).



- **Annex 2 – Petrobras Annual Capital Expenditure under Implementation (2024–2028), US$ billion**

  Source: Petrobras, Strategic Plan 2024–2028+, "Annual CAPEX under Implementation"