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ENERGY TRANSITION IN BRAZIL: CURRENT DEVELOPMENTS IN LEGAL AND INSTITUTIONAL FRAMEWORKS

"La transizione energetica in Brasile: Gli attuali sviluppi dei quadri giuridici e istituzionali"

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Abstract [En]: This article examines the current legal and institutional outlines of Brazil's energy transitions regarding its regulations and governance, with a particular focus on CNPE Resolution No. 5 of 26 August 2024, which, through the institution of the National Energy Transition Policy (PNTE), the National Energy Transition Plan (PLANTE), and the National Forum for Energy Transition (FONTE), aimed to create a unified governance framework. Through a methodology of bibliographic review, qualitative doctrinal and normative legal analysis and a descriptive examination of policy and institutional frameworks, dividing the study into three parts. The first situates the concept of energy transition and the data of this process in Brazil within academic literature and in institutional sources. The second examines three key pieces of legal regulations in the country: the 1988 Federal Constitution, the 1997 Law 9.748, and the aforementioned Resolution No. 5. The third presents the state of energy governance before and after Resolution no5, with the addition of an official recognition of the effectiveness of energy transition policies through the findings of a governmental audit conducted in 2025.

Abstract [It]: *Il presente articolo esamina l'attuale quadro giuridico e istituzionale delle transizioni energetiche in Brasile in relazione alla normativa e alla governance, con particolare attenzione alla Risoluzione n. 5 del CNPE del 26 agosto 2024, che, attraverso l'istituzione della Politica Nazionale di Transizione Energetica (PNTE), del Piano Nazionale di Transizione Energetica (PLANTE) e del Forum Nazionale per la Transizione Energetica (FONTE), mirava a creare un quadro di governance unificato. Attraverso una metodologia di revisione bibliografica, analisi giuridica dottrinale e normativa qualitativa e un esame descrittivo dei quadri politici e istituzionali, lo studio si articola in tre parti. La prima colloca il concetto di transizione energetica e i dati di questo processo in Brasile all'interno della letteratura accademica e delle fonti istituzionali. La seconda esamina tre atti normativi fondamentali del Paese: la Costituzione Federale del 1988, la Legge No. 9.748 del 1997 e la suddetta Risoluzione No. 5. La terza presenta lo stato della governance energetica prima e dopo la Risoluzione No. 5, con l'aggiunta di un riconoscimento ufficiale dell'efficacia delle politiche di transizione energetica attraverso i risultati di un audit governativo condotto nel 2025.*

Keywords: Energy Law; Constitutional Law; Energy Transitions; Energy Governance; CNPE Resolution no. 5.

Parole-chiave: *Diritto dell'energia; Diritto costituzionale; Transizione energetica; Governance energetica; Risoluzione n. 5 del CNPE.*

SUMMARY: 1- Introduction. **2-** Defining Energy Transitions. **3-** Legal Aspects of Brazil's Energy Transitions. **3.I-** Constitutional Foundations of Energy Governance in Brazil. **3.II-** Law No.

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9.478/1997 and the Institutionalization of National Energy Policy. **3.III-** CNPE Resolution No. 5/2024 and the National Energy Transition Policy (PNTE). **4-** Legal and Governance Aspects of ET in Brazil. **4.I-** Before Resolution No. 5. **4.II-** After Resolution No. 5. **4.III-** Official Interpretation of Effectiveness. **5-** Conclusions.

1. Introduction

As noted by Herman Scheer, «the clock for the traditional energy system keeps ticking louder»,[2] and global contexts such as climate boiling and fossil-fuel disputes demonstrate this daily. For developing countries such as Brazil, the need for alternative energy sources is evident, and their quests to diversify energy matrices and achieve energetic sovereignty are of particular research value.

In its mission to balance energy needs and institutional governance, Brazil has contemplated energy in its Constitution since its promulgation in 1988 and incremented its provisions on the subject gradually. A decade later, it also deemed the matter worthy of its own comprehensive law, namely law No. 9.478/1997, which established the National Energy Policy previous to the rise in renewable energy concerns, and created the National Counsil of Energy Policy (*Conselho Nacional de Política Energética* - CNPE). Plus more recently, the CNPE published Resolution No. 5/2024, which institutes the National Policy of Energy Transition (*Política Nacional de Transição Energética*- PNTE), the National Plan of Energy Transition (*Plano Nacional de Transição Energética*- PLANTE) and the National Forum for Energy Transition (*Fórum Nacional de Transição Energética*- FONTE). These three key pieces of legal regulation provide a panorama of the role of legislation on the subject today, demonstrating also the evolution of this legal coverage.

Taking this into consideration, the objective of this article is, then, to analyze the legal aspects of Brazil's energy transition focusing on Resolution No. 5/2024, and on the governance aspects that stem from this regulation. This study adopts a qualitative doctrinal and normative legal analysis combined with a descriptive examination of policy and institutional frameworks related to Brazil's energy transition. First, a bibliographic review of the academic literature on energy transition is conducted in order to establish the conceptual foundations of the phenomenon and situate the Brazilian experience within broader theoretical debates. Second, a legal analysis of primary normative sources is undertaken. And third, point out the governance of energy in Brazil, and show some internal insight on its effectiveness. To achieve this, the structure is organized in three sections.

Section 2 speaks on the concepts of energy transition (ET) through the lens of legal and institutional sources on the subject and consequently conceptualizes it within the Brazilian system, presenting the data of Brazil's ET from both academic and governmental sources. Section 3 will present the three aforementioned regulatory instruments which currently direct ET in the country. Finally, Section 4 will discuss the legal aspects and those of governance that the new approach to energy transition entails.

2. Defining Energy Transitions

The term "energy transition" at its core refers to the transformation of energy systems from a fossil-fuel baseline toward low-carbon and/or renewable sources such as wind, solar, and hydropower.[3] However, because of the intrinsic relationship between modern life and energy, the literature has come

[2] H. SCHEER, *Energy Autonomy: The Economic, Social and Technological Case for Renewable Energy*, London, Routledge, 2012, p. 3.

to understand that it should be a concept that extends beyond fuel substitution, but rather as a complex socio-technical process in which technological innovation, institutional change, and societal behavior evolve simultaneously to reshape the energetic reality of any given location. In this sense, Smil describes energy as «the only universal currency: one of its many forms must be transformed to get anything done».[4]

Due to this evolution in the comprehension of energy and its use in society, different scholars have proposed varying definitions of the term. Smil argues that energy transitions are large-scale structural shifts in the energy mix of societies, such as the historical movement from biomass to coal or from coal to oil,[5] while O'Connor conceptualizes them as «a particularly significant set of changes to the patterns of energy use in a society.»[6] Sovacol further highlights Smil in his description of the authors observations of the temporal aspect of an energy shift, by describing it as the period between the introduction of a new primary energy source or technology (which currently are understood as clean/renewable/"green") and the point at which it reaches a significant share of the energy market, highlighting the temporal dynamics of this change.[7] Araújo set out to refine a description of this concept that encompasses all these aspects in the Routledge Handbook of Energy Transitions, arriving to it as such:

> a considerable shift in the nature or pattern of how energy is used within a system, including the type, quantity, or quality of how energy is sourced, delivered, or utilized. This can be a planned or unplanned change that encompasses the emergence and decline of an energy industry, together with geopolitical, economic, social, and ecological factors that connect to all stages of energy utilization.[8]

In Brazil, while a developing country, the general objective of the energy policy is to power its economic growth,[9] but the concept of energy transition has recently been categorized in Resolution No. 5/2024 (which will be further analyzed ahead) as the «process of transforming infrastructure, energy production, and consumption across different sectors, with the aim of contributing to the country's net-zero GHG emissions».[10] Through this phrasing, regulators tie the country's ET with its climate and environmental protection goals in the totality of its territory and industries, placing this policy and other similar pieces of legislation at the forefront of this effort.

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[3] S. JOSHI-M. SHARMA-A. KUMAR-T. JOSHI-A. JOHRI-M. ALFEHAID, *Sustainable energy transition towards decarbonization among developing countries: a systematic literature review*. in *Frontiers in Sustainability*, 2025, p. 2. DOI: 10.3389/frsus.2025.1641299.

[4] V. SMIL, *Energy and Civilization: A History*, Cambridge, MIT Press, 2017, p. 23.

[5] V. SMIL, *Energy Transitions: History, Requirements, Prospects*, Santa Barbara, Praeger, 2010, p. 1 ss.

[6] P.A. O'CONNOR, *Energy Transitions*, Boston, Boston University- Pardee Center for the Study of the Longer-Range Future, 2010, p. 8.

[7] B.K. SOVACOOL, *How long will it take? Conceptualizing the temporal dynamics of energy transitions*, in *Energy Research & Social Science*, 2016, p. 203 ss., DOI: 10.1016/j.erss.2015.12.020.

[8] K.M. ARAÚJO, *The Evolving Field of Energy Transitions: A World of Change*, in *Routledge Handbook of Energy Transitions*, Routledge, 2022, p. 2 ss., DOI: 10.4324/9781003183020.

[9] MINISTERIO DELLE MINIERE E DELL'ENERGIA (MME)-EMPRESA DE PESQUISA ENERGÉTICA (EPE), *Summary Report 2025*, 2025, disponibile su: https://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/PublicacoesArquivos/publicacao-885/topico-767/BEN_Síntese_2025_EN.pdf (ultima consultazione: 5 gennaio 2026).

[10] BRASILE-CONSELHO NACIONAL DE POLÍTICA ENERGÉTICA (CNPE), Resolução No. 5 del 26 agosto 2024, recante "Institui a Política Nacional de Transição Energética - PNTE, o Plano Nacional de Transição Energética - Plante, o Fórum Nacional de Transição Energética - Fonte, e dá outras providências".

The government's definition now closely reflects its own local scholarly works, with authors like Benites-Lazaro *et al.* arguing that energy transition involves both shifts in energy technologies and changes in the political, social, and economic structures.[11] They further note that this process is characterized by diversification rather than substitution, reflecting the coexistence of expanding renewable sources with continued fossil-fuel development.[12] Other studies, like that of the International Renewable Energy Agency (IRENA), emphasize Brazil's distinctive starting point as that country already possesses one of the world's most renewable-based electricity systems.[13]

Currently, 50% of Brazil's energy matrix is fueled by renewable sources, divided between the burning of biomass (namely sugarcane byproducts- 16.7%), hydro power (11.6%), firewood and charcoal (8.5%), black liquor and other renewables[14] (8.1%), wind power (2.9%) and solar power (2.2%).[15] These 50% are a steady increase from 2022, when renewable energy contributed with 47.2% of the energy matrix, and from 2023, when that number reached 49.1%. These 50% generate a share of 88.2% of the country's electricity mix.[16]

Still, in 2023 the country ranked among the ten largest GHG emitters worldwide, accounting for less than 4.5% of global emissions.[17] However, when emissions are considered specifically from fossil fuels and industrial processes, Brazil's position shifts to twelfth globally, contributing approximately 1.3% of the world's total fossil emissions. These specific types of emissions make up for roughly 75% of global GHG emissions.[18] This divergence reflects the structural composition of Brazil's emissions profile, however, unlike most major emitters, around 75% of Brazil's GHG emissions originate from agriculture, forestry, and land-use change, leaving less than 20% of the country's total emissions to derive from fossil-fuel combustion and industrial processes.[19]

3. Legal Aspects of Brazil's Energy Transition

3.I Constitutional Foundations of Energy Governance in Brazil

Although the 1988 Constitution is brief in its energy provisions, it establishes a structure governing the ownership, regulation, and exploitation of energy resources.[20] These provisions collectively shape the normative boundaries within which all infraconstitutional laws and in the energy sector must operate. The first explicit constitutional reference appears in Article 20, which provides that hydraulic energy potential constitutes property of the Union.[21] This provision is part of a broader constitutional structure separating ownership of land from ownership of subsoil resources and energy potential, which is reinforced by Article 176 when it clarifies that mineral deposits and hydraulic

[11] L.L.B. LAZARO-R.S. SOARES-C. BERMANN-F.M.A. COLLAÇO-L.L. GIATTI-S. ABRAM, *Energy transition in Brazil: Is there a role for multilevel governance in a centralized energy regime?*, in *Energy Research & Social Science*, 2021, vol. 77, p.1. DOI: 10.1016/j.erss.2021.102404.
[12] Ivi, p. 11.
[13] INTERNATIONAL RENEWABLE ENERGY AGENCY (IRENA), *The Energy Transition in Brazil*, Abu Dhabi, IRENA, 2025, disponibile su: https://www.irena.org/Publications/2025/Nov/The-energy-transition-in-Brazil (ultima consultazione: 10 gennaio 2026).
[14] Biodiesel, Other biomass, Biogas and Charcoal industrial gas.
[15] MME- EPE, *Summary Report 2025*, op cit.
[16] Ivi.
[17] Ivi.
[18] Ivi.
[19] Ivi.
[20] Costituzione della Repubblica Federativa del Brasile, 5 ottobre 1988.
[21] Ivi, art. 20.

energy potential belong to the Union, irrespective of who owns the land title.[22] Consequently, private property does not entail ownership of the exploitable energy resources within it.

In addition to ownership, the Constitution assigns to the Union the authority to exploit energy resources derived from watercourses and other sources, «directly or through authorization, concession, or permission», which extends to the exploration of electric power services and installations. [23] The constitutional design thus centralizes control over strategic energy resources at the federal level. Legislative competence follows a similar pattern, with Article 22 conferring exclusive authority upon the Union to legislate on energy matters.[24] Although complementary legislation may authorize states to decree about specific issues, the primary normative power remains centralized which results in the reflection of the strategic and infrastructural nature of energy systems, requiring uniform regulation across a territorially vast federation.

Nevertheless, the multilevel nature of Brazil's constitutionalism[25] is still present in matters of energy, with the presence of cooperative and distributive mechanisms in the '88 Constitution. Article 20, paragraph 1, guarantees participation for subnational entities (states/municipalities/the Federal District) in the financial results of energy exploitation within their territories or equivalent compensation.[26] This aspect of revenue-sharing demonstrates a federal balance between national sovereignty over strategic resources and territorial equity.

Environmental protection further frames energy governance as seen in article 225, which establishes the right to an ecologically balanced environment and imposes duties upon public authorities and civil society to defend and preserve it.[27] Although the Constitution does not explicitly prioritize renewable over fossil sources, its environmental principles inform the interpretation of energy regulation, particularly as climate considerations gain prominence, especially because, as put forth by Sarlet and Farnsterseifer, principles in the Brazilian system are «species of the "norms" genus and, as such, are effective [and] applicable».[28]

Additionally, regulatory practice has recognized small-scale distributed generation as operating outside the strict exclusivity of federal exploitation where output remains limited and non-commercial,[29] for example through residential solar installations. While grounded in statutory and regulatory developments rather than explicit constitutional text, this accommodation reflects a

[22] Ivi, art. 176.
[23] Ivi, art. 21, inc. XII.
[24] Ivi, art 22.
[25] Brazilian multilevel constitutionalism, at the domestic level, derives from the federal structure established by the 1988 Constitution, which distributes legislative, administrative, and fiscal competences among the Union, the States, the Federal District, and the Municipalities. Rather than establishing a hierarchical chain of subordination, the Constitution allocates autonomous spheres of authority to each entity, subject to the supremacy of the Federal Constitution and judicial review by the Supreme Federal Court. Brazilian States adopt their own Constitutions, while municipalities are governed by organic laws, both operating within constitutionally defined substantive and procedural limits. On Brazilian federalism and the theory of constitutional distribution of competences, see *cfr*: G. BERCOVICI, *O federalismo no Brasil e os limites da autonomia estadual*, São Paulo, 2004; L.R. BARROSO, *Curso de direito constitucional contemporâneo*, ed. 9., São Paulo, 2022.
[26] Cost. Brasile, cit, art. 20, § 1º.
[27] Ivi, art. 225, titolo.
[28] I.W. SARLET-T. FENSTERSEIFER, *Princípios do Direito Ambiental*, ed. 2, São Paulo, Saraiva, 2017, p. 33.
[29] Cost. Brasile, cit, art. 176, paragrafo 4.

constitutional openness to participatory energy production consistent with principles of subsidiarity and social inclusion.

Overall, the structure of these provisions in the Federal Constitution of 1988 delineates the legal attitude of the Brazilian state regarding its energy, in a pattern of three clear aspects. First is a centralized approach in which ownership of energy resources is placed solely in the hands of the Union, or the above-all federal government, and normative primacy is made clear with the presence of energy in the Constitution itself. Second, despite this unified outlook, cooperative federal participation is still a key aspect of energy management. And third, energy is bound by environmental worries and constraints, which is a foundation stone for energy transitions. It is through this Constitutional foundation that the subsequent statutory reforms were constructed, and they will be exposed now.

3.II Law No. 9.478/1997 and the Institutionalization of National Energy Policy

Law No. 9.478/1997, published nearly ten years after the Constitution, represents the first comprehensive statute of Brazil's national energy policy,[30] and it initially reflected a development-oriented and fossil-fuel-based framework. The law begins by establishing a set of guiding principles and objectives for Brazil's national energy policy in article 1. In its first iteration, the article was composed of 11 items, none of which tackled renewable sources. Instead, the focus fell on: preserving national interest and promoting development, expanding the job market, and enhancing energy resources (items I and II); protecting the environment and conserving energy (Item IV); protecting the interest of the public in their condition as consumers and guaranteeing that petroleum is made available throughout the national territory (items III and V); expanding the use of natural gas while also identifying better solutions for energy supply (items VI and VII); using alternative energy sources to whatever extent possible (item VIII); promoting free competition in the market and attracting investments for energy production (items IX and X); and increasing Brazil's competitive status in the international energy market (item XI).

The law also established two key institutions: the National Council for Energy Policy (*Conselho Nacional de Política Energética* - CNPE) and the National Petroleum Agency (*Agência Nacional do Petróleo* - ANP).[31] The CNPE was entrusted with advising the President and proposing strategic guidelines for energy policy,[32] while the ANP was created as an independent regulatory authority responsible for overseeing petroleum, natural gas, and later biofuel activities, including licensing and market supervision.[33]

In accordance with the guidance of the Constitution, this law also reflects an intention to secure control over energy resources, but it does so combined with a philosophy of market liberalization. Also, similarly to the '88 Constitution, at least in its original form, environmental considerations appeared as one objective among many, rather than as the core of policy orientation. Therefore, energy transitions were not yet conceptually articulated.

This scenario began to shift in 2005, when an amendment inserted a new item into Article 1 with the phrasing «[to] increase, on economic, social, and environmental grounds, the share of biofuels in

[30] BRASILE, Legge No. 9.478 del 6 agosto 1997, recante "Dispõe sobre a política energética nacional, as atividades relativas ao monopólio do petróleo, institui o Conselho Nacional de Política Energética e a Agência Nacional do Petróleo e dá outras providências".
[31] Ivi, arts. 2–8.
[32] Ivi, art. 2.
[33] Ivi, arts. 7-8

the national energy mix».[34] This marked the first explicit legislative recognition that renewable energy could serve both developmental and environmental objectives, a trend that continued with the 2011 amendments which deepened this reorientation. These six new items focused on: guaranteeing biofuel throughout the national territory and utilizing the by-products of biofuel production to generate energy, in light of their «clean, renewable» character and their complementary nature to hydraulic sources (items XII and XIV); promoting Brazil's competitiveness in the international market in terms of biofuel and attracting investment for the transport and biofuel stocking (XV and XVII). Finally, item XVII attached a new dimension to energy policy in Brazil by calling for investments in research and development of renewable energy in those terms, still in 2011. These amendments did not dismantle the fossil framework but layered renewable priorities onto it.

The most recent statutory amendments to this article were enacted in 2025. Item XVIII (which had been added in 2011 but received new wording in 2025) calls for the need to mitigate greenhouse gas emissions in the sectors of energy and transportation (the latter being the sector that consumes the most energy overall),[35] also through the use of biofuels, low-emission hydrogen and its derivates and the capture and geological stock of carbon dioxide. Item XIX encourages production and promotes competitiveness in Brazil and in the international market, as well as attracting investment in infrastructure linked to the low-carbon hydrogen industry and its derivatives. Item XX involves the idea of using the sea to generate energy in a rational and sustainable manner, in the continental platform and other bodies of water belonging to the Union. Item XXI calls for energy generation offshore, and item XXII elevates hydroelectric power by recognizing its widespread reach within the county, its role in achieving energy security and its differentiated tax regime. Lastly, item XXIII breaks the streak of renewable sources to reaffirm a fossil fuel option, intending for Brazil to maximize the use of its national natural gas reserves.

This juxtaposition reflects a transitional model rather than a fully post-fossil paradigm. Brazil's legislative framework thus embraces decarbonization while preserving fossil resource development as an element of energy security and economic strategy. Doctrinally, the amendments broaden the normative content of federal energy competence without altering its constitutional basis, and consequently climate mitigation becomes embedded within energy policy rather than treated as an external regulatory constraint.

3.III CNPE Resolution No. 5/2024 and the National Energy Transition Policy (PNTE)

Within the authority conferred by Law No. 9.478/1997, the CNPE adopted Resolution No. 5/2024 establishing the National Energy Transition Policy (*Política Nacional de Transição Energética* - PNTE), the National Energy Transition Plan (*Plano Nacional de Transição Energética* - Plante), and the National Energy Transition Forum (*Fórum Nacional de Transição Energética* - Fonte).[36] Although formally a regulatory act instead of a more concrete law, the Resolution represents a substantial consolidation of transition governance.

Article 1 describes the objective of the National Energy Transition Policy as the guiding framework to shift towards a low-carbon infrastructure, contributing to the achievement of the country's net-zero greenhouse gas (GHG) emissions, and conceptualizes the policy itself as «a mechanism to support the integration and coordination of government policies and actions at the federal level, in coordination

[34] Ivi, art 1, item XII.
[35] MME- EPE, *Summary Report 2025*, cit.
[36] BRASILE, Resolução No. 5 del 26 agosto 2024, cit.

with subnational entities, and to foster dialogue with civil society and the private sector ».[37] It also reiterates that the PNTE must adhere to the objectives set out by law NO. 9.478 (i.e. those 23 items presented earlier in this section) and act in accordance with the national and international policies and commitments made by the country in matters of climate change, describing it as part of strategy to «make viable the ecological transformation of the Brazilian economy, the consolidation of production chains and the creation of added value within the country, and climate change mitigation and adaptation».[38] It abstracts the policy as a mechanism for federal coordination both national- and internationally (through subnational cooperation) and for dialogue with civil society and the private sector.

Article 2 provides 4 definitions for the key matters it regulates around, the first of which (energy transition itself) has already been presented in the previous section. Each of the following concepts express the values of Brazil's ET by their mere mention, making it just to present them as they are listed in the official publication:

> II - Just and Inclusive Energy Transition - an energy transition committed to promoting equity and social participation, minimizing negative impacts on communities, workers, businesses, and social groups vulnerable to changes in the energy system, while maximizing opportunities for socioeconomic development, increasing the competitiveness of the productive sector, and combating inequalities and poverty at the international, regional, and local levels;
> III - Energy Equity - the active pursuit of ensuring universal access to high-quality, environmentally sustainable energy services, with security of supply and at affordable prices;
> IV - Energy Poverty - a situation in which households or communities do not have access to a *cesta básica*[39] of energy services or do not have their energy needs fully met.[40]

In other words, when considered against the evolution of the normative values and policy present in its first and continuing National Energy Policy, from the initial reform introduced in 2005 to its more comprehensive articulation in 2011, the 2024 resolution and the amendments to law 9.478 adopted in 2025 signal a further maturation of the country's legal framework in this field. These more recent measures indicate that Brazil's approach to energy transition is not conceived solely in terms of diversifying the national energy matrix in response to the scarcity of fossil fuels, nor exclusively as a regulatory response to climate change driven by excessive greenhouse gas emissions. Rather, the emerging legislation makes broader normative commitments, emphasizing fairness, inclusiveness, and equitable access to energy services. In doing so, the legislation not only structures policy objectives but provides interpretive guidance for public authorities in the judiciary and executive powers.

Finally, article 3 lays out the directives of the PNTE in 11 items. First, it provides that the policy should encourage measures aimed at mitigating and adapting to climate change within the energy sector, according to the objectives of the National Climate Change Plan (item I). It also determines that the policy must guarantee national energy security (item II) and advance the universalization of access to energy services (item III). In addition, the PNTE is directed toward strengthening the competitiveness of the energy sector so as to ensure the supply of energy at affordable prices (item IV).

[37] Ivi, art. 1, paragrafo 1.
[38] Ivi, art. 1, paragrafo 2.
[39] The Brazilian welfare instrument of a *cesta básica* refers to a care package of basic-need items, usually food staples, that can be purchased or made available to low-income families/individuals.
[40] Resolução CNPE No. 5/2024, op cit, art. 2, II-IV.

The provision further emphasizes the reduction of energy poverty and inequality, alongside the assessment of costs and the creation of incentives for investments related to the energy transition, with the goal of ensuring that the transition occurs in a fair and inclusive manner (item V). It also requires that the PNTE coordinate with other federal public and sectoral policies (item VI) and promote alignment among energy policy initiatives across the federal, state, municipal, and district levels of government (item VII). Moreover, the policy must take into account the country's regional diversity when designing and implementing programs and actions related to the energy transition (item VIII).

The article additionally stresses the importance of transparency, social participation, and diversity in the formulation and implementation of programs and initiatives associated with the energy transition (item IX), while requiring that policy decisions be informed by economic, energy, environmental, climate, and technological scenarios and studies, particularly those developed within the Ten-Year Energy Expansion Plan (PDE) and the National Energy Plan (PNE) (item X). The PNTE should also support the identification and development of priority areas for research, technological development, productive strengthening, innovation, and capacity building connected to the energy transition (item XI). Lastly, the policy must consider the contributions of international cooperation to the energy transition, while safeguarding Brazil's sovereign interests (item XII).

To complete these directives, the Resolution created the two previously-mentioned instruments for its execution: the *Plant*e, a long-term action plan which functions as the strategic organization instrument that guides the actions of the energy transition;[41] and the Fonte, a permanent consultative and participatory forum which makes space for dialogue between all governmental levels and the industry sector and civil society, regarding policy consultation, formulation, implementation, and oversight.[42]

However, one important thing to note about Resolution n5 is that, despite its regulatory power and certain insertion in the legal system, the hierarchy of a resolution and the steps needed to alter it (or even abolish it altogether) are lower and simpler than an ordinary law. Considering the upcoming 2026 presidential elections, and the chasm of difference in policy decision-making between the candidates and parties in the lead, whether the current direction of energy transitions in Brazil will remain in line with what has been presented here remains to be seen. Nonetheless, the following section will aim to describe what this consolidated energy governance looks like today.

4. Legal and Governance Aspects of ET in Brazil

At the federal level, the Ministry of Mines and Energy (MME) functions as the political and strategic coordinator of energy policy,[43] with technical planning support being provided by the Energy Research Company (*Empresa de Pesquisa Energética* - EPE), which prepares long-term demand forecasts and supply-expansion studies.[44] Regulatory oversight is divided primarily between the National Electric Energy Agency (ANEEL), responsible for electricity generation, transmission, and

[41] Ivi, arts. 5-9.
[42] Ivi, arts. 10-15.
[43] MINISTERIO DELLE MINIERE E DELL'ENERGIA, *Competenze*, disponibile all'indirizzo: https://www.gov.br/mme/pt-br/acesso-a-informacao/institucional/competencias-1 (ultima consultazione: 08 gennaio 2026)
[44] EMPRESA DE PESQUISA ENERGÉTICA (EPE), *Plano Decenal de Expansão de Energia (PDE)*, serie di rapporti disponibili su: https://www.epe.gov.br/pt/publicacoes-dados-abertos/publicacoes/plano-decenal-de-expansao-de-energia-pde (ultima consultazione: 7 gennaio 2026).

distribution,[45] and the National Agency of Petroleum, Natural Gas and Biofuels (ANP), which regulates hydrocarbons and biofuels.[46] The National Council for Energy Policy (CNPE), created by Law No. 9.478/1997, serves as a high-level advisory body tasked with defining strategic guidelines, and, as seen, its resolutions have played a significant normative role in structuring policy direction.

Parallel to energy-sector governance, climate governance operates through Brazil's National Policy on Climate Change (PNMC)[47] and the country's Nationally Determined Contribution (NDC) under the Paris Agreement.[48] Therefore, decarbonization objectives are not confined to energy regulation, but are also shaped by environmental licensing, land-use policy, forest governance, and emerging carbon-market legislation.[49] A defining feature of Brazil's governance model is, then, its cross-sectoral character. Unlike jurisdictions where emissions derive predominantly from fossil combustion, Brazil's emissions profile is heavily influenced by agriculture, forestry, and land-use change.[50] As a result, energy transition governance necessarily intersects with environmental and territorial regulation.

4.I Before Resolution n5

Prior to the adoption of CNPE Resolution No. 5/2024, Brazil's energy transition was shaped primarily through sectoral planning instruments and incremental statutory reform rather than through a unified transition strategy. The Ten-Year Energy Expansion Plan (*Plano Decenal de Expansão de Energia*- PDE), prepared annually by the EPE, functioned as the central planning instrument. The first edition (PDE 2006–2015), for example, as its name suggests, was oriented toward ensuring generation adequacy and expanding transmission infrastructure, also supporting projected economic growth.[51] Its analytical core consisted of forecasting demand and capacity-expansion modeling. Diversification of sources was also present, aligned with the 2005 amendments to the law, but was framed principally in terms of system reliability and cost optimization rather than emissions mitigation, even though the objective of the Plan is said to be «in an environmentally sustainable manner». [52]

Over time, successive PDE editions progressively incorporated renewable deployment targets, distributed generation scenarios, biofuel projections, and emissions considerations and by the 2020s, it had effectively evolved into a central instrument structuring Brazil's low-carbon trajectory, and ultimately, although the plans themselves are formally nonbinding, their scenarios operate as *de facto*

[45] BRASILE-AGÊNCIA NACIONAL DE ENERGIA ELÉTRICA (ANEEL), *Institucional- competências e atribuições*, disponibile su: https://www.aneel.gov.br (ultima consultazione: 3 marzo 2026).
[46] BRASILE-AGÊNCIA NACIONAL DO PETRÓLEO, GÁS NATURAL E BIOCOMBUSTÍVEIS (ANP), *Institucional- competências*, disponibile su: https://www.gov.br/anp (ultima consultazione: 3 marzo 2026).
[47] BRASILE, Legge No. 12.187 del 29 dicembre 2009, recante "Institui a Política Nacional sobre Mudança do Clima (PNMC)".
[48] Accordo di Parigi del 12 dicembre 2015, ratificato dal Brasile con Decreto n. 9.073/2017; Brasile, *Nationally Determined Contribution (NDC)*, disponibile su: https://www4.unfccc.int (ultima consultazione: 3 marzo 2026).
[49] BRASILE, Legge n. 6.938 del 31 agosto 1981 (Politica nazionale dell'ambiente); cfr. inoltre Ministério do Meio Ambiente, *Sistema de licenciamento ambiental*.
[50] MINISTERIO DELLE MINIERE E DELL'ENERGIA (MME)-EMPRESA DE PESQUISA ENERGÉTICA (EPE), *Balanço Energético Nacional 2025*, 2025; cfr. inoltre Climate Watch, *Brazil- Greenhouse Gas Emissions*, disponibile su: https://www.climatewatchdata.org (ultima consultazione: 3 marzo 2026).
[51] MINISTERIO DELLE MINIERE E DELL'ENERGIA (MME)-EMPRESA DE PESQUISA ENERGÉTICA (EPE), *Plano Nacional de Energia 2030*, Brasília, 2007, disponibile su: https://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/PublicacoesArquivos/publicacao-201/topico-193/20060702_03.pdf (ultima consultazione: 7 gennaio 2026).
[52] Ivi.

policy signals. This technocratic model illustrates pre-2024 governance: planning-driven, scenario-based, and oriented toward supply security.

Brazil's pre-Resolution governance also relied on sector-specific instruments, for example, for energy from water sources. Hydropower historically constituted the backbone of the electricity matrix,[53] benefiting from federal concessions and centralized planning.[54] Biofuel already had its own coordination through the program RenovaBio, which is one of the clearest examples of climate-oriented energy governance prior to 2024, linking lifecycle emissions accounting to tradable credits (decarbonization credits for biofuel users). [55] In the case of solar, energy generation expanded significantly under ANEEL in 2022, when regulatory resolutions establishing net-metering mechanisms were published,[56] encouraging the residential and small-scale photovoltaic deployment sanctioned by the Constitution, demonstrating how regulatory action also advanced renewable participation.

Energy governance in Brazil additionally cannot be analyzed independently of land-use governance, because a substantial share of national emissions originates from deforestation and agricultural activity rather than fossil combustion.[57] Thus decarbonization policies such as the ones mentions necessarily implicated various forms of environmental licensing. Hydropower expansion, for example, requires environmental impact assessments and licensing procedures under federal and state law.[58] Bioenergy production intersects with agricultural policy and land management. Offshore wind projects implicate maritime and coastal regulations. These interactions require balancing constitutional principles of environmental protection,[59] economic development, and regional equity.[60] Thus, even prior to 2024, energy governance involved constitutional adjudication and administrative discretion beyond technical planning. Overall, energy governance was fragmented and had differing levels of attention given to them.

4.II After Resolution n5

The adoption of CNPE Resolution No. 5/2024 represents a qualitative transformation of Brazil's energy transition, marking the passage from a predominantly technocratic/sectoral model toward a

[53] MINISTERIO DELLE MINIERE E DELL'ENERGIA (MME), *Apresentação — Política Nacional de Transição Energética*, 26 agosto 2024, Brasília, PDF disponibile all'indirizzo: https://www.gov.br/mme/pt-br/assuntos/secretarias/sntep/dte/cgate/lancamento-pnte-26-08-2024.pdf (ultima consultazione: 04 gennaio 2026).
[54] Cost. Brasile, cit, art. 21, XII.
[55] MINISTERIO DELLE MINIERE E DELL'ENERGIA (MME), *RenovaBio- Política Nacional de Biocombustíveis*, Governo Federal, Brasília, disponibile all'indirizzo: https://www.gov.br/mme/pt-br/assuntos/secretarias/petroleo-gas-natural-e-biocombustiveis/renovabio-1 (ultima consultazione: 07 gennaio 2026).
[56] M. CARRILHO, *Brazil Legal Framework for Energy Microgeneration and Minigeneration*, in *Net Zero Compare,* 9 febbraio 2026, disponibile all'indirizzo https://netzerocompare.com/policies/brazil-legal-framework-for-energy-microgeneration-and-minigeneration (ultima consultazione: 01 marzo 2026).
[57] MINISTERIO DELLE MINIERE E DELL'ENERGIA (MME), *Apresentação — Política Nacional de Transição Energética* cit.
[58] F.G. AZEVEDO DE BRITTO-J.P. SOARES DE AZEVEDO-C.A.S.S. SOUZA DE MELO FRANÇA-R.C. WANICK-L.A. BESER DE DEUS-M.A.V. DE FREITAS, *Quali-Quantitative Analysis of Brazilian Environmental Licensing of Hydropower Plants,* in *International Journal of Geosciences*, 2015, vol. 6, p. 747 ss., DOI: 10.4236/ijg.2015.67066.
[59] Cost. Brasile, cit, art. 225.
[60] Ivi, arts. 3 e 170.

formally articulated governance framework. This shift operates on three interrelated levels: (i) the legal nature and function of the PNTE, (ii) the reconfiguration of planning instruments, and (iii) the institutionalization of participatory governance mechanisms. Each of these dimensions contributes to redefining the role of law in shaping the Brazilian energy transition.

On the first item, there is the need comprehend that the PNTE (which lies at the heart of Resolution No. 5) is not a statutory law, but a set of guidelines published by an advisory body. It must then be understood within the category of acts of political-administrative direction, which guide administrative action without necessarily creating directly enforceable rights or obligations.[61] Nevertheless, the PNTE's legal relevance should not be underestimated. In line with doctrinal interpretations of programmatic norms in environmental and energy law, such instruments may exert indirect binding effects, particularly through the influence they can hold over administrative discretion and imperative criteria in judicial review, plus their subsequent inclusion in regulatory acts (due to their advisory nature). In this sense, the PNTE contributes to the process of "normativization of policy", whereby strategic objectives rise into the legal system.

A second innovation introduced by Resolution No. 5/2024 alters the relationship between existing planning instruments (like the PDE) and the newly established *Plano Nacional de Transição Energética* (PLANTE). The creation of the PLANTE alters this configuration by introducing a hierarchically superior strategic framework, within which the PDE and other plans are now inserted. The PLANTE operates as a long-term policy instrument, designed to translate the objectives of the PNTE into coordinated actions across different sectors and levels of government.

The third innovation is a permanent mechanism for participatory governance by way of the *Fórum Nacional de Transição Energética* (FONTE). From the perspective of administrative law, the FONTE represents a move toward deliberative governance, understood as decision-making processes structured through the participation of multiple public and private actors[62] (in this case, the State, industry, and civil society), in which policy outcomes emerge from iterative and pluralistic interaction.[63] Moreover, the explicit inclusion of concepts such as "just transition", "energy equity", and "energy poverty" within the PNTE framework suggests an attempt to integrate distributive justice considerations into energy policy. The FONTE can thus be seen as an institutional mechanism for operationalizing these principles, enabling affected communities to influence policy design. However, without clear procedural guarantees there is a risk that participation may remain formal rather than substantive, serving more as a legitimizing function without significantly altering decision-making outcomes.

From this exposition, Resolution No. 5/2024 can be interpreted as the start of a new phase in Brazil's energy governance. Notwithstanding these developments, a more nuanced picture emerges from official sources. The Brazilian government has in fact issued a report evaluating the "maturity" of the national energy transition, the key findings of which will be examined in the following section.

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[61] M.S. GIANNINI, *Diritto amministrativo*, Milano, Giuffrè, 1993, p. 112 ss.; S. CASSESE, *Il diritto amministrativo: storia e prospettive*, Milano, Giuffrè, 2010, p. 87 ss.; G. FALCON, *Lezioni di diritto amministrativo*, Bologna, Il Mulino, 2016, p. 145 ss.

[62] J. COHEN-C.F. SABEL, *Directly-Deliberative Polyarchy*, in *European Law Journal*, 1997, p. 313 ss.

[63] As per Cammelli, participation is a structural element of administrative action and should be a substantive component of decision-making, which is what the FONTE is supposed to articulate in Brazil. For more, see: M. CAMMELLI, *Amministrazione e partecipazione*, Bologna, Il Mulino, 2003, p. 57 ss.

4.III Official Interpretation of Effectiveness

In 2025, the *Tribunal de Contas da União* (TCU) conducted an audit on the "maturity" of public policies for energy transition, the product of which is called the Executive Summary on the Maturity of Brazil's Public Policies on Energy Transition. This report consequently serves as a diagnostic tool of the evolution of the legal framework and governance of energy in the country.[64] However, rather than confirming the consolidation of an intended coherent transition framework by Resolution no5, the TCU findings expose a persistent gap between normative articulation and effective governance.

Although the report does not define what "maturity" is *per se*, the four questions for analysis reveal its standing. Question 1 inquires about the level of preparedness of the federal government's governance structures to implement energy transitions. Question 2 touches on the financial sector, asking if the existing or planned financing system is aligned with ET's investment needs. Question 3 aims at understanding how oriented the actions of the federal government are towards a just and inclusive transition. And question 4 asks how "advanced" the State's actions on the technological themes[65] of Brazil's ET agenda are.[66] Through this lens, "maturity" can be understood as "effectiveness", and therefore the report implicitly adopts a functional conception of legality.

A central finding of the report concerns the insufficient maturity of governance structures, particularly in terms of coordination across sectors and levels of government, meaning that, at least one year into the application of Resolution No. 5/2024, it had not borne fruit. The persistence of fragmentation reveals a structural limitation of the PNTE, in that it functions as a coordination norm without sufficient binding force to ensure coordination. The report acknowledges that Resolution No. 5/2024 constitutes a step forward yet emphasizes that it remains insufficiently operationalized.[67] One aspect that contributes to this, besides those already mentioned, is an insufficient alignment between energy transition policies and broader climate obligations, suggesting a deficit of systemic coherence, which is a central requirement in contemporary environmental governance.[68] Finally, the report also emphasizes the importance of a just and inclusive transition, in line with Resolution No. 5/2024, but it notices how these principles remain only partially implemented, resulting, from a legal standpoint, in them being programmatic principles rather than (at least currently) enforceable rights.[69]

Thus, the TCU report reveals a fundamental paradox: the Brazilian energy transition framework is normatively articulated but insufficiently operationalized. While Resolution No. 5 represents a significant step forward, it is limited by weak normative force, it lacks enforceable obligations, and it is still plagued by persistent governance fragmentation, besides the uncertainty of its future. The Brazilian model thus exemplifies a form of incomplete "juridification" of the energy transition, requiring further legislative consolidation and stronger integration between policy and law for it to achieve its potential.

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[64] CORTE DEI CONTI FEDERALE (TCU), *Maturidade das políticas públicas para a transição energética no Brasil*, 2025, disponibile su: https://sites.tcu.gov.br/recursos/transicao-energetica/media/Maturidade_das_politicas_publicas_transicao_energetica.pdf

[65] As per the report, these themes are, in no particular order: nuclear energy; renewables in the electrical sector; new technologies in the electrical sector; energetic efficiency; capture, use, and storage of carbon; critical minerals; low-emission hydrogen; electric power for mobility; biofuel; carbon pricing; natural gas. Ivi, p. 10.

[66] Ivi, p. 9.

[67] Ivi, p. 65.

[68] Ivi.

[69] Ivi, p. 66.

5. Conclusions

Brazil's energy governance has evolved through layered statutory and regulatory reforms. Currently, the framework is unified into a National Energy Transition Policy which integrates decarbonization, innovation, distributive justice, and participatory governance without erasing the already-established constitutional structure of federal primacy. The choice to integrate renewable sources progressively into the policy structure demonstrates the power of a strong foundation and some legislative pragmatism. With the expansion of sustainability and technological innovation vocabulary in policy and legislation materials, added to the majority of the energy mix coming from renewables, an evolving interpretation of national energy interest can be perceived.

Before CNPE Resolution No. 5/2024, Brazil's energy transition unfolded through technocratic planning instruments and sector-specific regulation, while the PDE evolved from a supply-security model into a climate-aligned planning tool, and programs such as RenovaBio and distributed generation rules advanced decarbonization within discrete sectors. Resolution No. 5/2024 consolidates these dispersed efforts into a structured governance architecture. By establishing the PNTE, PLANTE, and FONTE, Brazil has moved (or tried to move) from fragmented coordination toward institutionalized transition governance. The shift is not a complete rewrite of the previous status quo, but an integrative, coherent national framework that aligns constitutional authority, planning instruments, regulatory agencies, and participatory mechanisms.

The Brazilian model therefore illustrates a transitional constitutionalism in energy governance: one that does not abandon fossil development abruptly but embeds decarbonization and equity within existing models. Yet, tensions remain, including the reaffirmation of (instead of previously existing demands for) natural gas development coexisting with net-zero commitments, and offshore expansion goals, which may generate environmental and social conflicts. The durability of the PNTE will depend not only on its interpretation and application, but the direction taken by Brazil's politics in the upcoming year.

These tensions are further heightened by the multi-level nature of Brazilian governance, especially internally, where federal, state, and local authorities may pursue divergent priorities, in which context the PNTE's role as a coordination mechanism could become crucial. But the maturity report issued by this government acknowledges that these efforts have not yet achieved their potential.

Whether this architecture will accelerate decarbonization depends on implementation, intergovernmental coordination, and the reconciliation of fossil development with net-zero commitments. What is clear is that Brazil's energy governance has entered a new phase in which transition is not merely an emergent outcome of sectoral evolution, but an explicitly structured and participatory national objective.