SUSTAINABLE ENERGY LAW AND GOVERNANCE: AN ANALYSIS OF THE BRAZIL'S LEGAL FRAMEWORK AND IMPARTING INSIGHTS TO RUSSIA

RENATA THIÉBAUT
Gisma University of Applied Sciences
renata.thiebaut@gisma.com

Abstract *– The need for sustainable development has become increasingly urgent, with global initiatives like the COP (Conference of the Parties) and the SDGs (Sustainable Development Goals) highlighting the imperativeness of countries to commit to achieving carbon neutrality to foster a resilient and equitable future for present and future generations. However, with the understanding that domestic law creates obstacles to international cooperation through overlapping, contradictory actions and different legal understandings, this paper suggests further cooperation as a means of knowledge sharing on a regulatory approach to support the implementation of renewable energy laws and regulations.*

This paper will bring about an in-depth study of the Brazilian legal system, focusing on treaty internalization, the Brazilian Agenda 21, the Proalcohol and Proinfa programs, emphasizing their negative and positive legal characteristics regarding sustainable development and renewable energy. The hypothesis indicates convergences in their domestic legal systems regarding unified legislation, binding target systems, governmental subsidies, and protectionism treatment, which shall be diminished through mutual assistance and harmonizing laws pertinent to providing Russia with lessons.

Keywords*: brazil; renewable Energy; international treaty law; sustainable development; sdgs.*

INTRODUCTION

Law and regulations serve as instruments shaping the trajectory of social and economic development amid the urgent need to achieve the 2030 Sustainable Development Goals (SDGs). Each nation's endeavors to comply with the outcomes of international documents, encompass the integration of specific international legal norms, while concurrently accommodating an array of domestic laws and regulations that coexist and complement within this framework.

Acknowledging that domestic legal systems may lead to overlapping, contradictory, and divergent legal interpretations, it is paramount to assess these challenges. The primary objective of this paper is to analyze Brazil's route to implementing an effective regulatory framework, to then discuss lessons learned for Russia, through the promotion of mutual legal assistance. Brazil is the focal point of this paper, given its international significance and ongoing developments in the adoption of international documents related to sustainability and renewable energy.

Throughout an extensive review of specific materials and a comprehensive analysis of diverse sources, including policy papers, regulations, and scholarly works, it became apparent that the enactment of renewable energy legislation, including national program objectives, incentives, investment in research and development (R&D), and institutionalization have positive contributions to the adoption of a 'green' matrix in Brazil. This research underscores the importance of identifying the main attributes of renewable energy regulations in the country, particularly the Proinfra and Proalcohol programs, while acknowledging its legal structure and legislative frameworks governing and incentivizing renewable energy.

This paper is structured into six distinct chapters. The introductory chapter offers an elucidation of Brazil's regulatory framework, providing the structure of this paper that will be discussed in the upcoming chapters.

A detailed methodology is presented in the second chapter, outlining how an empirical analysis will be conducted through the analysis of international agreements, such as the Agenda 21 and Kyoto Protocol, as well as Brazil's legislative framework.

Following, the literature review chapter synthesizes existing scholarship and accentuates the groundbreaking aspects of this dissertation in the context of legal studies. It grapples with the challenge of the adoption through domestic jurisdictions, international documents of hard and soft laws, such as

the Rio Declaration, the Kyoto Protocol and the 2015 Paris Convention, while the outcomes of the COP28 will serve as a secondary literature to support the main arguments due to its non-binding nature.

In chapter three, the core questions of the research – namely, Brazil's positive and negative aspects of pertinent legislations concerning renewable energy; and policy recommendation for bilateral legal cooperation between Brazil and Russia – will be addressed. These questions are pivotal to shaping the main arguments that underpin the proposed measures.

Chapter four, titled 'Understanding the Brazilian legal system' will be divided into three, which contain an in-depth analysis of the Brazilian Agenda 21 Legal Process, and legal framework to the Proalcohol and Proinfa programs. This chapter articulates their impact on the implementation of a green energy matrix, while catalyzing revolutionary changes in Brazil's domestic legal systems concerning renewable energy.

Chapter five lays out key recommendations as lessons for Russia, based on the investigation from chapter four. The recommendations lay the groundwork for a comprehensive understanding of governmental directives concerning renewable energy law and policies, which can be pertinent for Russia. The assessment for cooperation is approached as means of mutual legal assistance.

Finally, the concluding chapter synthesizes the central arguments and reinforces the main issues addressed throughout the dissertation. It underscores the imperative of implementing mutual assistance between Brazil and Russia, particularly in the context of global initiatives like the COP (Conference of the Parties) and the SDGs.

METHODOLOGY

Research Approach:

For this paper, an empirical analysis approach will be employed to examine Brazil's domestic legal systems in the context of renewable energy laws and sustainable development. This approach will allow for a detailed exploration of the legal approach to the adoption of international soft and hard law documents, in addition to the legal framework and policies to promote sustainable development.

Data Sources:

The primary sources of data for this study will include legal documents, including the Proalcohol and Proinfa programs, academic literature, government reports, and international agreements, such as the Agenda 21 and Kyoto Protocol. These sources will provide the necessary legal and policy context for the analysis and elaboration of recommendations.

Data Collection Methods:

Data collection methods will involve a comprehensive review and empirical analysis of Brazil's legal documents, including statutes, regulations, and treaties related to renewable energy and sustainable development.

Empirical Analysis Method:

The empirical analysis will focus on identifying convergences and divergences in the legal systems of Brazil regarding unified legislation, binding target systems, governmental subsidies, and protectionist measures.

Limitations of the Study:

This study may have limitations, including potential language barriers when accessing Russian legal documents, availability of up-to-date information, and the evolving nature of legal frameworks in Russia. These limitations may not impact the depth and scope of the analysis since the object of analysis was the Brazilian legislation.

LITERATURE REVIEW

Conductive to build consistent arguments, the literature was carefully selected and divided into three, covering the subjects sustainable development and renewable energy in toto, which are vastly explored along the chapters; the study of international documents related to sustainable development, and the legal principles pertinent to their adoption in the Brazilian jurisdiction; and finally, the Brazilian Agenda 21 Legal Process, Brazilian Legislation related to the Proalcohol Program and the Brazilian Legal Features of the Proinfa Programs, which enable to develop the proposals in the context of legal assistance between Brazil and Russia.

The crucial legal facette of the overall research is to undertake an empirical analysis grounded on legal assistance and harmonization conducive to facilitating optimum legal mechanisms of collaboration. Terms of harmonization and means of realization are herein defined in both theoretical and practical spheres.

Comparative law is the method chosen due to its suitability to new themes related to internationalism and environmental-related topics. As a goal, this study enables one to attain a deeper knowledge of the Brazilian legal system as well as understanding its characteristics, through the identification of existing legislations.

The key method of analysis of this paper is to identify the causal effects of the legal renewable energy framework present in Brazil albeit the comprehension of its legislative system.

To discover peculiarities and correlation regarding both sustainable development and renewable energy, reliable documents developed by International Organizations (and adopted by States in their domestic legislations) are analyzed. The most important international sources of law versing those topics are: Our Common Future or the 1972 Brundtland Report, the Rio Declaration, the 2000 Millennium Declaration, the 2002 Johannesburg Declaration on Sustainable Development, 2012 Rio +20 or Future We Want; and the 1997 Kyoto Protocol, 2012 Doha Amendment and the 2015 Paris Convention. The Sustainable Development Goals as and the outcomes of the COP28 will serve as a secondary data source to support the main arguments.

The examination of these documents supports the understanding and evolution of the term sustainable development as well as its normative aspects. The international legal approach to sustainable development is given from different realms. The most appropriate method is to understand sustainable development's principles not as a topic confined to the international scenario but the possible reflection and influences domestically. International compliance has a direct impact on domestic regulations, through a framework of environmental, energy and/or renewable laws and regulations. Since sustainable development is a goal that can be achieved through the development of renewable energy, when analyzing domestic laws, a whole set of literature regarding renewable energy directives is necessary.

International Organizations have indeed provided qualified guidelines that go from the definition of the term sustainable development to best practices and policies to increase energy efficiency. These guidelines are pertinent regarding developing countries that might not have structure to invest adequately, suitable for Brazil and Russia.

International reports, guidelines and other documents prepared by the International Organization were specifically given recognized importance as secondary sources, since they are in line with international treaties and agreement. These documents are the most current and developed materials in the field of renewable energy regulation at the moment, since they were drafted in order to support States with different economic and legislative backgrounds to reach sustainability, hence their core ideas are a valid asset.

Brazil is the focal point of this study due their importance to renewable energy globally and regionally. Brazil has shown efficiency in implementing renewable energy sources since the 1970s. Nowadays, the country is a leader in biofuel, biodiesel, and hydroelectric power technologies. In addition, Brazil's efforts to implement a sustainable development agenda with relative success have brought the country to the international spotlight of the Eco-92 and Rio+20.

Russia's renewable energy developments are far behind Brazil. This makes Russia an interesting case study in the field, hence being the driving force to encourage the Russian government to adopt an incisive approach to sustainable development and enhance cooperation with Brazil.

Brazil and Russia have indeed different cultural, economic, and legal backgrounds, which pose a difficulty when comparing one to another in a simplistic way. Their nuances and similarities are seen as an attempt to extract best practices yet respecting their unique characteristics. Thus, the unit of analysis that enlightens the research is the law itself. Concerning renewable energy in Brazil, Ottinger (2013) raises his concerns: "(...) Brazil is below the world's average in use of nuclear, natural gas and coal for electricity production[1]", however it is important to mention the country's achievements in biomass for biodiesel and biofuel with its own technology is substantial. It is important to mention that the Brazilian programs Proalcohol and Proinfa, are superficially analyzed by the author, who argued that they are successful without explaining the reasons yet questioning the full establishment of these complex programs. Proalcohol and Proinfa were and are still important for renewable energy developments in the country and have achieved and even surpassed the goals proposed. At the international level, this paper is supportive to the principles of international cooperation to achieve sustainable development, hence legal assistance is pertinent for this paper.

RESEARCH QUESTIONS

Clear Articulation of the Main Research Questions:

This paper aims at answering the questions: 'How does the legal framework in Brazil address renewable energy and sustainable development, and what are their respective strengths and weaknesses?' and 'What legal and policy recommendations can be made to foster bilateral cooperation and knowledge sharing in the context of renewable energy laws and regulations?' which were carefully chosen to develop a comprehensive understanding of all major variables affecting legal cooperation. Considering that Brazil does not yet possess a Renewable Energy Law, other main legislation pieces and national-level programs are considered instead.

Justification for the Chosen Research Questions:

The selected research questions are paramount for addressing the knowledge gaps and provide a comprehensive understanding of the Brazilian legal systems, enabling the formulation of meaningful recommendations for promoting international cooperation and knowledge sharing in renewable energy and sustainable development.

UNDERSTANDING THE BRAZILIAN LEGAL SYSTEM

The Brazilian legal system is fundamentally based on Portuguese, French, Italian and German Civil law traditions, "… still strongly marked by codes dating from the time of Augustus and the Roman Empire, and their basic principles change slowly.[2]" As a civil law jurisdiction, the norms are distributed in the shape of a pyramid according to their hierarchy, with four levels divided into:

- Federal Constitution
- Complementary Laws
- Ordinary Laws, Provisional Measures, Delegated Legislation, Legislative Decrees, Resolutions
- Regulatory decrees, Ministerial Instructions, Circulars, Ordinances, Orders of Service.

According to the Kelsen pyramid, every norm takes its value from a superior norm. The Federal Constitution is on the top of the pyramid, being the fundamental law that organizes the state, governance, and civil rights.

[1] Ottinger, R. L. (2013). Renewable Energy Law and Development: Case Study Analysis. Edward Elgar Publishing.

[2] Strange, T., & Bayley, A. (2009). Measuring Sustainability. In OECD Publishing (Ed.), Sustainable Development: Linking Economy, Society, Environment.

The Brazilian Federal Constitution's provisions over international treaties separate the competence of each sphere. It is the exclusive jurisdiction of the Congress to settle on treaties, agreements or international acts that result in charges or commitments against the national property, as stated in the Federal Constitution, Art. 49. I.

Complementary Laws require the majority vote of parliamentarians from both the House of Representatives and the Senate for approval. Its contents are to regulate specific matters, not expressly provided in the Constitution.

Ordinary Laws, on the other hand, have broad coverage on topics related to organization of the judicial power and Public Ministry, nationality, citizenship, individual rights, among others. Ordinary Laws are approved by most parliamentarians in the Chamber of Deputies and the Senate present during the vote.

The process of acceptance and ratification of the terms of an international treaty is done through different steps and a multilayer that involves different governmental powers. At the international sphere, negotiations are empowered by the Head of State, the president, or the representative in charge, which will then be sent to the Congress as an Executive Message.

For Rezek (2010):

"Não se pode entender a ratificação senão como ato internacional e como ato de governo. Este o poder Executivo, titular que (…) aparece idôneo para ratificar – o que no léxico significa confirmar-, (…) aquilo que deixara pendente de confirmação (…) Parlamentares nacionais não ratificam tratados porque, primeiro porque não têm voz exterior […][3]" (One cannot understand the ratification but as international act and as an act of government. The Executive power, (...) appears suitable to ratify - which means in the lexicon confirm-, (...) what left pending confirmation (...) National Parliamentary do not ratify treaties first because they have no exterior voice).

The president (head of State) is the incumbent to conclude treaties, conventions and international acts, ad referendum of the National Congress (Art. 84. VIII). The Ministry of Foreign Affairs has limited power to support in the negotiations, so de facto power belongs to the president.

The National Congress's role examines the treaty terms and decides for its adoptions through a voting procedure that requires a minimum quorum, and an absolute majority of the total members present at the session.

Finally, the Supreme Court is incumbent to declare the unconstitutionality of treaty or federal law (Art. 101. b) and the Supreme Court of Justice is incumbent to counteract a treaty or federal law or deny them effectively (Art. 105, III. a).

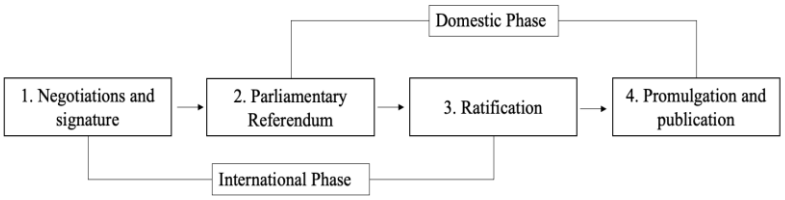
The law allows refusal, total or partial adoption of an international treaty, to also be decided by the Congress. Once the treaty is voted and accepted through legislative decree, it then returns to the hands of the president for ratification as a customary law.

The collaboration between Executive and Legislature is part of the process of internalization of international treaties within the Brazilian system. In addition, the judiciary has a role to adequate its terms to avoid conflict of laws.

Once the treaty is ratified, promulgated, and published, it enters in the domestic normal hierarchy pyramid as ordinary laws. International Treaties over Human Rights, have specificities in the Brazilian legal system.

[3] Rezek, F. (2010). Direito Internacional: Curso Elementar [International Law: Elementary Course] (12th ed.). Editora Saraiva.

Graph 1. Treaty Adoption Process in Brazilian Jurisdiction



Source: Mazuolli, 2013, p. 94.

According to the latest Amendments of the 1988 Federal Constitution, though the Constitutional Amendment number 45 from 2004, article LXXVII, point 3 states that international treaties and conventions about Human Rights that were approved, in each House of Representative, in two rounds, for three thirds of the members' votes, will be equivalent to Constitutional Amendments:

"Once the President concludes negotiation of the treaty, the text of the treaty is sent to the House of Representatives in the form of an Executive Message. After the House of Representatives approves the treaty, the text is sent to the Senate. If the House of Representatives fails to approve the treaty, the legislative process is ended, and there is nothing to be sent on to the Senate. Approval by the Senate takes the form of a Legislative Decree, which is issued by the President of the Senate, and is published in the Diario Oficial do Congresso Nacional, the official publication for Congress's formal acts.[4]"

The supranational aspect of international treaties that verse about Human Rights, guarantees that their contents are in line with the Federal Constitution in force. The Convention on the Rights of Persons with Disabilities and its Optional Protocol from 2006 was adopted in the Brazilian legal system through the Constitutional Amendment 6949/2009.

Several discussions arose with the Constitutional Amendment number 45: can international documents related to sustainable development and environmental protection have the supranational status like themes related to Human Rights?

The fact that Brazil hosted two international environmental events has directly and proactively influenced the country's adoption of international norms. For Mazzuoli, the entry into force of international treaties in Brazilian jurisdiction follows a complex and long process that involved preliminary negotiations, signing, adoption, approval, and ratification to finally adhere to terms of a treaty internally. The Rio Declaration, for instance, resulted in remarkable acceleration of the mechanisms of adoption and entry into force of international standards relating to the environment.

While there are still discussions over the status of environmental documents, the elaboration of the Brazilian Agenda 21 inaugurated a contemporary way to adhere and commit to international law with a unique integration between international and national process.

Undeniably, the Rio Declaration was a milestone to new principles on sustainable development for both developed and developing nations. With the advent of the Earth Summit in 1992, there was a fierce engagement to incorporate international principles domestically yet respecting internal regulatory context of each jurisdiction. In other words, the Agenda 21 domestically allowed diverse legal understanding and formulation of sustainable development, based on the regulatory, cultural, political peculiarities. The document suggested that the development of obliging effective laws and regulations should be in line with efficient social, ecological, economic, and scientific principles. Brazil, a developing and democratic nation, as well as the hostess of the Rio Conferences, has shown strong commitment to the global Agenda 21.

The Brazilian Agenda 21's differs from the global Agenda 21 on some major aspects: format; definition and expanded concept of sustainability; and legal enforceability. The Brazilian Agenda 21 has a very distinctive format. Social problems like poverty stand out because they are more visible and demand

[4] Soares, G. F. (1991). The Treaty-Making Process under the 1988 Federal Constitution of Brazil - Latin America. Chicago-Kent Law Review, 67, 1667-1705.

immediate solutions. Also, topics related to gender, native populations, children, elderly, and disabled people are only bound mainly to the provisions regarding basic rights including health and education. The global Agenda 21 has detailed provisions dedicated to the least privileged groups in Section III. Strengthening the role of the major groups.

The Brazilian Agenda 21 was a result of years of consultation through workshops and seminars with thousands of actors of the society such as environmental departments, development banks, among others, at both federal and regional levels. Throughout the discussions, the goal was to present proposals for a sustainable development agenda with 21 objectives by redefining the development model yet adopting sustainability concepts within the economy, society, environment and institution, where "[T]he economy of savings in the society of knowledge, social inclusion for a solidarity society, Strategy for the urban and rural sustainability, Strategic natural resources: water, biodiversity and forests, Governability and ethics for the promotion of sustainability[5]" form the sustainability's four-pillar.

The updated concept of sustainable development is expansive and progressive. Expensive because it considers economic, social, territorial, scientific, and technological, political and cultural dimensions; and progressive because each of the four themes are fragmented into specific subtopics to avoid complexity.

The consultation phase's results represented a successful scheme that considered the economic context. The concept of needs and limitations were adapted to the Brazilian context, since development paths can vary from region to region, thus different priorities and strategies are considered as per their economic development needs, and specific environmental and societal characteristics: the remote area of Amazon and the arid Northeast region were prioritized in comparison to the Southeast region, which is relatively more developed.

The Agenda 21's process of interaction and internalization in Brazil reinforces the notion of normativity. For the first time, the term sustainable development was internalized, and indeed, had a direct impact on Brazil's values and identities. Domestic characteristics helped to develop a new understanding of sustainable development.

According to governmental data, 5839 proposals were received throughout 26 debates for the subtopics of sustainable agriculture, natural resources management, infrastructure and regional integration, social inequality reduction, science and technology for sustainable development, and sustainable cities. All the 6 themes brought out were then studied and initiatives with strategies, actions and directives were set for each of them, as shown in table below.

Table 1. Selected Sustainable Development Initiatives

Themes					
Natural Resources Development Management and Technology	**Sustainable Agriculture**	**Sustainable Cities**	**Infrastructure & Regional integration**	**Social disparity reduction**	**Sustain Scie**
5 Strategies	4 strategies strategy for biomass	4 strategies	4 agendas	4 strategies	6 the
Actions	Actions	Actions	Actions	Actions	Actio
Execution	Execution		Actions		

[5] Ministério do Meio Ambiente. (n.d.). Agenda 21 Brasileira: Ações Prioritárias [Brazilian Agenda 21: Priority Actions] (2nd ed.). Retrieved from http://www.mma.gov.br/responsabilidade-socioambiental/agenda-21/agenda-21-brasileira.

directives	directives

Source: Brazilian Agenda 21: Result of the National Consultation, 14.

Science and Technology was defined as a mean to achieve sustainable development, being one of the main focuses of the document, with suggested actions that go beyond the realm of the State's borders:

"5.5.2 Desenvolver e incorporar tecnologias de fontes novas e renováveis de energia: a) promover a pesquisa, desenvolvimento, demonstração, difusão e absorção pelo mercado de tecnologias de fontes novas e renováveis de energia; b) priorizar o uso de fontes alternativas renováveis com tecnologias disponíveis, notadamente no meio rural e nas localidades urbanas isoladas, promovendo a universalização do acesso ao uso de energia elétrica." (Develop and incorporate new and renewable energy technologies: a) promote research, development, demonstration, diffusion and absorption of new and renewable energy technologies by the market; b) prioritize the use of renewable alternative sources with available technologies, notably in rural and isolated urban locations, promoting universal access to use of electricity)[6].

The transition to renewable energy sources is unanimous in both Brazilian and global documents as to reduce gas emissions and implement a sustainable development agenda. The document proposes enhancing the use of existing renewable energy sources, promoting new ones through research and development (R&D) investments; enhancing international cooperation for sections where the country lacks necessary technology, through technology transfer and joint research.

Domestically, existing renewable energy programs had to adapt to the Brazilian Agenda 21. The national government "[…] began with the creation of centers of excellence in wind and solar energy in 1994, biomass in 1996, and small hydropower (SHP) in 1997, and culminated with the publication of the Incentive Program for Alternative Sources of Energy Electric (Proinfa) in 2002 […][7]"

Created by a presidential decree, the Brazilian Agenda 21 was not a government document nor a national sustainable development strategy, but rather a guideline with directives and strategies for new governmental policies. The Brazilian Agenda 21 started to be discussed and developed 4 years after the Rio summit and promulgated in 2002. More important than the delay was the lack of legal enforcement of the document.

Only in 2004 the Agenda 21 premises were incorporated into the government's Multiannual Plan (PPA 2004/2007) by the law number 10933/2004, which reinforced that sustainability is the fundamental principle of the nation's social and environmental development goals. Also, it is the duty of the State to achieve the goals set by the plan. The Brazilian 21 Agenda was thus enacted as a legal document.

The global Agenda 21 has direct legal impacts in the Brazilian jurisdiction that go beyond the PPA 2004/2007. Baptista (2002) argues that environmental laws were given particular attention. In 1994, Brazil ratified the Convention on Biological Diversity and the Framework Convention of the United Nations Climate Change, which were internalized through the Decrees 2519/1998 and 2652/1998; enacted the Law 8974/1995 for preservation of the diversity and integrity of the genetic patrimony and the creation of the National Technical Biosafety Commission (CTNBio) organ responsible to conduct research activities, industrialization and commercialization involving Genetically Modified Organisms

[6] Ibid.

[7] Rosa, V. H. da S. (2007). Energia Elétrica Renovável em Pequenas Comunidades no Brasil. Em Busca de um Modelo Sustentável [Electric Renewable Energy in Small Communities in Brazil. Seeking a Sustainable Model]. Universidade de Brasília. Centro de Desenvolvimento Sustentável. Retrieved from http://www.aneel.gov.br/biblioteca/trabalhos/trabalhos/Dissertacao_Victor_Hugo.pdf.

(GMO); enacted the Environmental Crimes Law 9605/1998; and enacting the Decree 1160 that established the creation of the Inter-ministerial for Sustainable Development (Cides), which was replaced by the Commission for Development Policy Sustainable and National Agenda 21 (CPDS), responsible to develop strategies and monitor the implementation of the Brazilian Agenda 21.

The Environmental Crimes Law 9605/1998, for instance, is perhaps the most important environmental provision in the country until today, which verses about criminal responsibility and administrative liability for conduct detrimental to the environment.

The global Agenda 21 was an important factor not only to introduce the concepts and premises of sustainable development but to also allow new environmental laws to be enacted in the Brazilian jurisdiction. The divergences between the global and the Brazilian Agenda 21 are eminent, however it is necessary to bring about the full elements of interaction and internalization between both.

The Brazilian Agenda 21 indeed proposed a new development model, considering the nation's capabilities and vulnerabilities to comply with the international sustainable development framework and is still the major government's tool to achieve sustainability. It was presented as new laws and programs as well as updated the existing regulations, more specifically the Pro-Alcohol and Proinfa.

1. Brazilian Legislation Related to the Proalcohol Program

The objective of this and the subsequent sub-chapters is to bring about renewable energy developments in Brazil through the two major programs Proalcohol and Proinfa. The Brazilian government's efforts to promote renewable energy are dated back in the 1970s, with the Proalcohol program. The Law-decree number 76593 guaranteed a legal framework in order to support the program's goals and objectives, despite aiming at lowering the dependence on oil imports as well as boosting the sugar cane production, which was in decline with low prices internationally. The initiative resulted into a long-term success, becoming therefore the first step for the adoption of alternative sources of energy even though indirectly. Brazil was indeed the developing country that pioneered in the renewable energy field, being widely recognized for such still in the present.

The purpose of the law was not to increase the production and modernization, but also to seek reduction of regional income disparities, incentivizing inputs for agricultural and industrial activities and lower transport costs. The law per se had 14 articles, and its most significant points were the basic explanations of its purpose, investment and interest rate and price setting.

The law distinctly stated the need to increase production of sugar cane and other raw materials together with the modernization of existing or new distilleries. In fact, according to the author Vanessa Cordonnier (2008), "the Proalcohol mandate was simple enough to implement as alcohol plants already in operation required only simple modifications to produce ethanol[8]" as Brazil had already a strong production basis developed in the decades before the program was established.

In order to modernize the industry, large investments were required accordingly. The interest rates were defined according to the regions. The North and Northeast regions were and still are the least developed in the country, despite being the largest producers of sugarcane.

The alcohol price structure is based on the quantity of imported oil, which explains the main governmental goal to reach 3.5 billion liters of ethanol from sugar cane by 1980. The fixed price system was implemented to guarantee the production to diminish oil dependence and avoid price fluctuation. For this reason, the government had to strategize the program structure to continue with its strict control.

The Proalcohol program was divided into four phases. The first phase, from 1975 to 1979, was the preliminary phase where the policies were developed and implemented without in-depth premises but to focus on the mixing ratio between alcohol and gasoline. The major step was the establishment of the quantity of 22% of hydrated ethanol to be blended gasoline by volume.

[8] Cordonnier, V. M. (2008). Ethanol's roots: How Brazilian legislation created the international ethanol boom. William & Mary Environmental Law & Policy Review, 33(2), 287-318.

As a matter of fact, the social impacts of Proalcohol were felt in the producing regions, so the program was responsible to expand the sugar cane cultivation in 1975, which resulted in an increase of employment rate in the rural area.

The success of Proalcohol was due to the existing sugar cane production structure the country already possessed as well as the favorable economic conditions with the need to reduce the dependence of the oil imports. The program entered its second phase in 1980, which would last until 1989, still influenced by the second oil crisis. In the second phase, incentives were extended to the production of hydrated alcohol besides only anhydrous alcohol, so production could benefit the chemical sectors.

As both international and domestic environments were not favorable, the third phase did not generate the results expected: there was a general increase of the inflation rate, international and domestic debts, and international interest rate. Financing the program became difficult, due oil price reduction and the role of the IMF to control large public subsidies. These combined factors had great influence in the program's outcomes. As expected, both alcohol production and consumption decreased causing a crisis in the sector, thus government adjustment did not suffice. In the third phase, it was characterized by subsidies and government control. Public private partnership and new player market entry were limited.

The fourth and last phase that started in 2003 had brought new alternatives and approaches to the program mainly supported by the flexible fuel technology and Brazil's engagement with international documents regarding environmental protection.

By analyzing its progress, not much emphasis was given on developing new technologies or leveraging it to a more competitive level to attract investments until the last phase. Even though the main purpose of the program was not related to environmental needs, the Proalcohol program became the main tool to boost the biofuel and biodiesel industries, which made Brazil lead these technologies.

Proalcohol is the world's largest commercial program on renewable energy. It has allowed "[…] the creation of a large market for renewable energy based on developing dispersed markets, extending financial services to retail level, building business and maintenance infrastructure and scaling up manufacturing[9]", which enables them to reduce costs and compete with gasoline. This market mechanism allowed Brazil to convert half of its sugarcane crop into ethanol. The ethanol industry has received government investments in infrastructure and R&D in the past decades, which became an alternative to fossil fuels particularly used for transportation.

2. Brazilian Legal Features of the Proinfa Program

The "Programa de Incentivo às Fontes Alternativas de Energia Elétrica" (Proinfa) inaugurated a new era of renewable energy initiatives, which would be in line with the Agenda 21 and its own understanding of sustainability goals. Through Proinfa, Brazil would for the first time, establish directives, targets, and strategies to increase the production of energy from renewable energy sources.

Despite its several negative aspects, Proinfa has as its major achievement to become a mechanism that inserted in the governmental agenda the need to compile renewable energy generation with sustainable development. Thus, it is important to rather highlight its positive aspects as lessons learned.

The program was enacted by Law 10438/02, coming into force in 2004, with the objective of promoting the diversification of the Brazilian energy matrix in Brazil, reducing greenhouse gas emission, and on the social aspect, providing job creation, capacity building and training of skilled manpower in the field. This tri-dimension aspect reinforces the idea of implementing the sustainable development concept within the economic, environmental, and social conjuncture. To achieve these goals, it would be paramount to reinforce the need to promote renewable energy technologies.

Since the Proalcohol, Brazil had enjoyed several public policies at both federal and local levels to boost alternative energy, for instance, the Light for All initiative, but Proinfa, as a unified national program,

[9] Potter, N. I. (2008). How Brazil Achieved Energy Independence and the Lessons the United States Should Learn from Brazil's Experience. Washington University Global Studies Law Review, 7, 331-351.

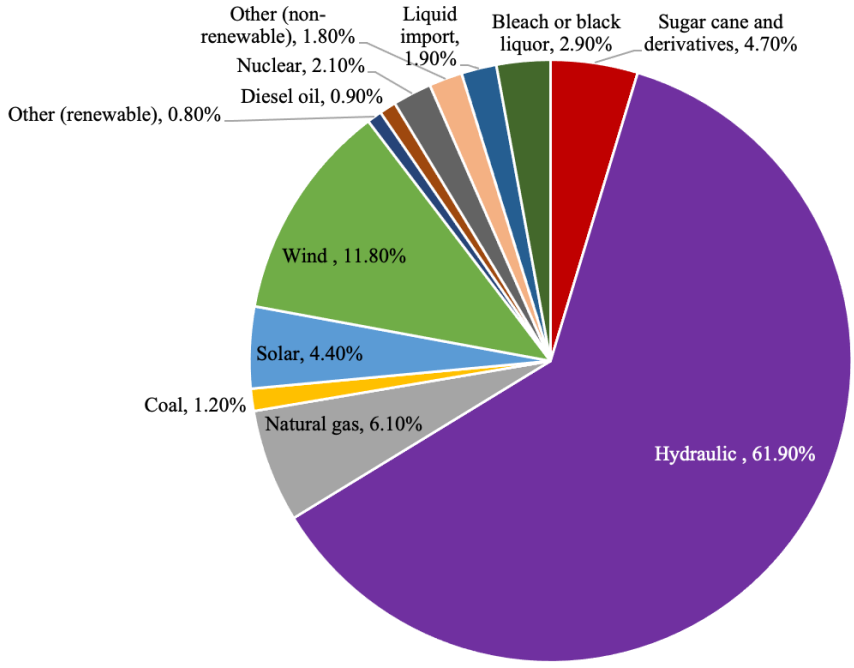
shall need normalization to provide legal binding characteristics of its enforceability, avoiding therefore fragmentation and application overlapping.

The program was designed to be implemented in two different phases, the first would be more experimental, with short-term goals, and the second phrase shall adopt a more realistic approach based on the achievements and failures of the first phase.

The goal of measurement of the first phase was to ensure the purchase of the energy production within 20 years by ELETROBRAS at a price set by the government through subsidy, feed-in tariff, from entrepreneurs who meet all qualification requirements and have their selected projects in accordance with the procedures of Law 10438/02.

The existing regulations, Proinfa and Proalcohol programs, have transformed the Brazilian energy matrix to be predominantly 'green'.

Graph 2. Brazilian Energy Matrix



Source: Empresa de Pesquisa Energética.

Hydraulic power is Brazil's most dominant energy source, which also indicates a heavy reliance on hydroelectricity. Small hydroelectricity had more projects due to the existing expertise, while wind power surpassed its expectations, despite the traditional technological insufficiency in the country.

Natural gas, wind, and solar energy, while contributing significantly, collectively make up a substantial portion of the mix, showcasing the growing importance of renewable technologies in the energy sector.

Wind power was the focus of the government in the second phase due to the need to develop this technology, while solar energy, for instance, was not included in the list, due to high costs.

Natural gas and nuclear energy, which are relatively cleaner sources compared to coal and some other fossil fuels, also play vital roles in the energy portfolio, demonstrating a commitment to a diversified and balanced energy generation strategy.

Several authors have raised different reasons for Proinfa's failure and success. The main issues encountered in the program are summarized as follows: i. bureaucratic procedures to obtain or renew environmental licenses and the Declaration of Public Utility (DUP) for projects; ii. obstacles in connecting to the grid due to lack of investments; iii. deadlines set out in the Programme were repeatedly delayed.

Proinfa's success relies mostly on three achievements: it reached the main goal; introduced new renewable energy technologies; created a market economy of renewable energy; created a well-established institutional organization; and aligned its goals and main premises with national energy plans.

The first phase has reached the expectation, and has reached the stipulated targets, also contributing for Brazil to become the largest wind power producer in Latin America. Proinfa built an attractive regulatory and technical environment facilitating target achievement for integrating RE into the power system. As auctioning power plant concessions has been a common procedure in Brazil, there was no need to design a new and complex regulatory bill, circumventing political conflict and delays.

Proinfa contributed to increase the competitiveness of renewable energy fonts because it could create a market for them through new offer and demand of new renewable energy sources, as well as the development of a new manufacturing industry.

The institutionalization of the program is clearly mentioned in the Law. The Ministry of Mines and Energy (MME) is the organ responsible to coordinate the program, set guidelines, to prepare the planning of the program and define the economic value of each source into the matrix, meanwhile Brazilian Electric Power SA, is the organ responsible for pricing structure and operations. The Brazilian Development Bank (BNDES) is the organ responsible for investments able to finance up to 80% of the projects selected by ELETROBRAS. The institutional structure of the program was clearly designed to avoid overlapping, however, there was an inadequate division of functions between the institutions responsible for the program: ELETROBRAS is the organ responsible to for the electricity purchase, but Aneel and the MME define the contracts such as pricing, qualification, etc. This breakdown of responsibility may interfere in the relationship between the contracted and contractor, once ELETROBRAS has no rights to decide about the contractual aspects. The institutionalization is well coordinated, without causing overlapping.

The PNE 2030 supports Brazil's main sustainable development document through a set of studies conducted to formulate a strategy for the expansion of energy supply in the country, defining a long-term perspective for the integrated and sustainable use of the resources available and projected.

The PNE contemplated all types of energy sources, but Proinfa provides that the governmental central point should be on wind power, biomass, and small hydroelectric centers, which show that they are adopting the same approach towards renewable energy. However solar technology is claimed to be costly. It is for this reason that the industry is not developed in the country. The possibility raised by the PNE to develop this industry in Brazil is in case the prices continue dropping globally, which would make it competitive.

The government has provided the Brazil Energy Source Plan 2010-2030 with a comparison table between the energy supply in 2010 and in 2030, with projections for each energy source. First, oil is still important in the Brazilian energy matrix. The government has attempted to diminish its reliance, which according to the 2010-2030 Plan, the energy supply coming from oil and derivatives will decrease from 37.5% to 28%.

Domestic laws and policies have passed in the Congress mostly as provisional measures to give legal foundation to Brazil Energy Source Plan 2010-2030 for Energy Expansion and the Strategic Energy Plan. Brazil, nonetheless, lacks binding targets.

Efforts including Proinfa can be helpful in laying the foundations for government directives towards sustainable development. It is yet to guarantee a continuous expansion of renewables enabled by a holistic legal framework. In fact, Proinfa temporarily fulfills the gap of a national document versing about renewable energy and energy sustainability, and the solution would be to promulgate a Renewable Energy Law.

Brazil is widely recognized as a model of a "green State" since it has the largest and most cost-effective hydroelectric and biofuel industries in the world. The United Nations has issued multiple statements regarding Brazil's continuous efforts.

"According to United Nations Environment Programme, the Brazilian environmental legislation has been considered one of the most modern of the world. The environmental laws in Brazil are established in the

Federal Constitution, Criminal and Civil Codes and there is also specific and supplementary legislation at federal, state and municipal levels. The result is a collection of acts and decrees that take into consideration the environment as a basic right of human being[10]."

Brazil's approach on sustainable development is a matter of environmental protection and the development of new renewable energy are in accordance with international documents, with environmental laws. To summarize, both environmental and energy legislations are in synergy to facilitate sustainable development, however, binding targets and legislation are still incipient.

LESSONS FOR RUSSIA

Dinah Shelton (2008) points out that soft law documents influence different jurisdictions, but they are applied and used according to domestic law practices: "The Russian Federation considers that recommendations of international organizations are not legally binding, but recommendations of Conferences or Meetings of treaty parties may be used as a subsidiary source of interpretation or application of internal treaties by courts. The Constitutional Court of the Russian Federation has also referred in its decisions to documents of the Conference on Security and Co-operation in Europe[11]."

Fossil energy sources are controversially subject to governmental subsidies, being Russia the best example. Russia's oil and natural gas industry has developed strong relations with other neighboring countries, including joint pipeline projects to connect the country's resources with the Chinese counterpart.

The current reliance on fossil fuels is alarming, since increase of certain traditional energy sources can be seen as both solutions to the increase of energy consumption yet a threat to sustainable development. This scenario is present in all BRICS members,

Renewable energy is not only able to replace fossil fuel sources, but also to integrate all types of electricity systems for both large and small grids at federal level, through two different spheres: establishment of new national strategies to seek diversification of the energy matrix based on the domestic energy potential; decrease government support and incentives to the traditional energy industry.

The Russian renewable energy industry is, nonetheless, new and there is an immediate need to improve domestic legislations for solar power, wind power and hydroelectric power.

The solar power industry, for instance, is nearly nonexistent and the hydroelectric power, even with great potential, needs further development. Russia's deep dependence on hydrocarbons and nuclear energy has shown an increasing deficiency in the energy sector.

In 2013, the government released the programs "Energy Efficiency and Energy Development in Russia 2013-2020" together with the draft law Renewable Energy Source Development Measures, which are expected to develop the green energy industry in the country, especially in the North-West of the country, where large resources able to support green energy projects.

According to the Energy Strategy of the Russian Federation until 2030 (Government Decree No. 1715-r of 2009), the target of increasing the share of renewable energy sources in primary energy consumption from 11% to 13-14% by 2030.

Like Brazil, Russia does have unofficial subsidies to incentivize the renewable industry, with subsidies allowed to company that produce equipment for renewable energy with at least 50% national components. Differently from the oil industry, renewable energy subsidies are not heavily applied by the government. The first subsidy was applied in 2013 to the solar wind and hydro power industry through auction.

Subsidies are often seen as a form of preferential treatment to the local industry or even protectionism, resulting in an obstacle to imports, technology transfer and international cooperation.

[10] Sluter, C. R., & Alencar de Mendonça, A. L. (2014). Dependent Aspects of Brazilian Environmental Laws and National Topographic Mapping Series. Retrieved from http://icaci.org/files/documents/ICC_proceedings/ICC2009/html/refer/22_4.pdf.

[11] Shelton, D., & Kiss, A. (Eds.). (2005). Judicial Handbook on Environmental Law. United Nations Environment Programme.

In the context of the BRICS, Brazil and Russia have enhanced cooperation and investments in sustainable projects in the realm of the New Development Bank (NDB). Both countries can further bolster their collaboration in renewable energy through a comprehensive exchange of best practices, joint research and development projects, and investment incentives. A mutual legal assistance agreement should be established to facilitate the sharing of legal and regulatory expertise, leveraging the lessons learned from Brazil's successful Proinfa and Proalcohol programs, which have proven to be pivotal in promoting renewable energy and biofuels. As both countries do not possess a Renewable Energy Law, a collaborative effort to develop and implement such legislation could serve as a foundation for their shared commitment to achieving the sustainable development goals and carbon neutrality.

Currently, Brazil and Russia have established cooperation in the nuclear energy fieldthrough a memorandum of understanding (MoU) signed between Rosatom and Brazil's Electrobras and Electonuclear in 2017. It is recommended that a bilateral cooperation agenda in parallel to their existing relations through the BRICS and the G20 which will be held by Brazil in 2024. Both countries should establish a joint working group that encompasses comprehensive study for knowledge sharing and discussions on renewable energy policy and regulations. Furthermore, a clear roadmap for both countries could encourage investment and innovation while ensuring accountability in achieving the sustainable development goals through renewable energy.

CONCLUSION

Brazil's government efforts to vary the energy matrix has brought the country to the top two in the world, in terms of renewable energy developments even as a developing State, showing great commitment and compliance to international treaties, sustainable development and renewable energy. This makes Brazil a perfect case study.

Brazil's main accomplishments in renewable energy can be regarded as tools to enhance international legal cooperation, with achievements in hydroelectricity and ethanol technologies. Technology transfer and cooperation in these two fields are feasible, due to its know-how, and would be beneficial to other BRICS members. On the legislation side, Proinfa and Proalcohol have both positive and negative aspects: Proalcohol, sui generis, is regarded as a successful program since it reached a large schedule in the transportation industry and was responsible to reduce the country's reliance on oil and gas through a blending policy as well as contributed to improve social conditions.

The Brazilian government has not enacted a unified piece of legislation regarding renewable energy, which shall be an impediment to further investments and reassurance. The programs, Proinfa and Proalcohol, which are currently the main governmental programs to incentivize green business, have achieved their goals and enabled the creation of a green industry in the country, as well as being responsible to put Brazil as the main producer of ethanol technology. International cooperation through legal assistance can help Brazil to optimize existing programs and develop a more feasible and aggressive agenda towards sustainability.

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