

## Environmental licensing of new transmission systems in Brazil: framing criteria by environmental agency

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**Abstract:** The growing demand for electricity in large Brazilian cities and the distance to the region with the largest energy production have encouraged the construction of transmission lines thousands of kilometers long, crossing several states of the federation. Therefore, the heterogeneity of requirements in federal, state and district environmental laws tend to lead to uncertainty for the investor regarding procedures and investments necessary for the completion of the project, as well as the time that the requirements will take to be fulfilled. In the present study, we identify and compare the criteria used by the various environmental licensing agencies for classifying transmission system projects in the different procedures (simplified and ordinary) of environmental licensing. It was possible to expose the differences and demonstrate some inconsistencies in the legislation of some Brazilian states. In particular, we note an absence of proportionality between the licensing requirements and the expected environmental impacts for projects on the physical, biological and social environments. Additionally, it was identified subjectivity in the requirement for social participation through public hearings, demanded by the legislation for the projects classified in the ordinary procedure.

**Keywords:** environmental licensing, environmental permitting, transmission lines, Brazil.

### 1 Introduction

The greatest potentials for power generation in operation in Brazil are found in areas far from large consumer centers and, therefore, depend on a robust infrastructure for the electric power transmission, the National Interconnected System (SIN).

The Decennial Energy Plan 2029 (PDE 2029), prepared annually by the Energy Research Company (EPE), which presents scenarios of expansion of the energy sector in

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the ten-year horizon, pointed out a series of challenges for the expansion of the SIN, such as complexity socio-environmental and land tenure, given that such conditions contribute to the fact that undertaking recommended in the planning do not come into operation on the date of actual need.

It becomes strategic to plan the SIN considering transmission lines alternatives with increasingly higher operating capacities, aiming at a more efficient use of the easement transmission line strips.

In addition to the growth in the contribution of renewable sources in the Brazilian energy matrix, mainly wind and photovoltaic, a continuous expansion of the transmission system (power-grid) is expected, aiming to expand the capacity of local flow and exchange, in order to guarantee the security of operation in the face of a variety of generation availability scenarios.

The incorporation of the environmental variable in impactful undertaking in Brazil was only possible from the regulation of environmental licensing, so that society benefits when the discussion between economics and the environment is combined in the decision-making process (Cardoso Jr, 2019).

Ratified the importance of transmission systems in the country, it is understood that environmental licensing should not be an obstacle to the establishment of the reliability of the Brazilian electric sector, and this article exposes, based on structured research, such challenge.

The objective of the study is to identify and evaluate the state and federal environmental criteria in Brazil that define the rite of the environmental licensing of transmission systems, through the identification of legal frameworks used by environmental agencies; analysis of environmental criteria for framing the environmental licensing of transmission systems in Brazil; and comparison between rules applied in all states of the federation.

## 2 Environmental licensing internationally and in brazilian legislation

The Brazilian Environmental Policy, Law 6938/81, established in its article 9 two relevant instruments for the internalization of environmental discussions in undertakings liable to cause environmental degradation, the Environmental Impact Assessment and the Environmental Licensing.

The regulation of the Environmental Impact Assessment occurred only with the publication of CONAMA Resolution 01/86, which defined as its tool the Environmental Impact Study (EIA) and the respective Environmental Impact

Report (RIMA).

Environmental Licensing, on the other hand, was regulated by CONAMA Resolution 237/97 (Glasson, 2000), which can be defined as an administrative process whereby the environmental regulatory agency formalizes the conditions and measures of environmental control for the construction, installation, expansion and operation of projects, public or private, which cause degradation of environmental quality.

In comparison with other countries, such as USA, Germany, France and China, it was possible to identify that, for example (Cardoso Jr, 2014):

- At the USA for new electricity transmission undertakings that exceed the extension of 10 miles without using the administrative easement of ducts or roads and 20 miles using the administrative easement of ducts and roads, an Environmental Impact Study must be carried out;
- In Germany, an Environmental Impact Study is required for construction of electricity transmission lines with voltage equal to or greater than 220 kV and whose length is greater than 15km;
- In France for undertakings of transmission or distribution of electricity, regardless of the cost of implementation, an Environmental Impact Study applies to those with voltage above 63 kV;
- In China and Environmental Impact Report must be carried out for projects involving more than one province, autonomous region or city (projects that more than one federation unit), and projects approved by State Council, with value more than 20 million yuan.

Cardoso Jr. and Hoffmann (2019) report that several authors (Bonatto, 2004; Campos, 2010; Cardoso Jr., 2014; De Castro Et Al., 2012; Santos, 2017) discuss the environmental criteria and associated risks for the optimized definition of routes for transmission systems that incorporate Environmental Impact Assessment.

Other authors suggest the need to optimize the rules associated with the EIA due to the needs of different sectors of the economy (Bragagnolo, 2017; Costanzo And Sánchez, 2019).

There are still authors who report the low quality of environmental studies delivered to the environmental agency (Almeida And Montano, 2017; Veronez, 2018).

### 2.1 Federal environmental licensing

CONAMA Resolution 237/97 described the usefulness of each of the environmental licenses:

- Preliminary License (LP) - granted in the planning

stage of the project approving its location and design, attesting the environmental feasibility.

- Installation License (LI) - authorizes the installation in accordance with the specifications contained in the approved plans, programs and projects, including environmental control measures and conditions.
- Operation License (LO) - authorizes the operation of the undertaking, after verifying the effective fulfillment of previous licenses.

CONAMA Resolution 237/97 determined that, for electric power transmission projects with a voltage equal to or greater than 230kV, the environmental licensing will depend on a previous Environmental Impact Study and the respective Environmental Impact Report (EIA / RIMA) (Bragagnolo, 2017), with holding of public hearings guaranteeing its publicity (Chanchitpricha, 2013).

In 2011, two legal Brazilian publications were relevant, such as Complementary Law 140/11, which established the environmental licensing competence of the Union, States, Federal District and Municipalities, decentralizing environmental licensing.

For example, IBAMA (Federal Agency) is responsible for the environmental licensing of projects: (i) involving Brazil and a neighboring country; (ii) in territorial waters and the continental shelf; (iii) on indigenous lands; (iv) in federal conservation units, except in Environmental Protection Areas; (v) involving two or more states; (vi) with a military character; and (vii) involving nuclear energy.

For energy transmission projects at the federal level, Ordinance MMA 421/2011 was published, which states that licensing may be simplified, based on the Simplified Environmental Report (in Portuguese RAS); or ordinary, based on the Environmental Assessment Report (in Portuguese RAA) or the Environmental Impact Study (in Portuguese EIA) and the respective Environmental Impact Report (in Portuguese RIMA).

It is observed that there are rare cases of federal environmental licensing of transmission systems by the ordinary rite by means of RAA that, due to the environmental impact foreseen in these projects included in the ordinary rite, the environmental licensing agency usually chooses the most complete study, the EIA /RIMA.

An energy transmission project may be included in the simplified licensing procedure, regardless of tension, when it does not simultaneously imply in: (i) removal of the population; (ii) allocation of integral protection conservation units; (iii) location at: breeding and resting sites on migratory bird routes; restricted endemism and officially recognized endangered species; (iv) intervention in indigenous land; (v) intervention in “quilombola”

territories; (vi) physical intervention in natural underground cavities through the implantation of towers or substations; (vii) suppression of native tree vegetation above 30% of the total area of the easement area defined by the Declaration of Public Utility or in accordance with NBR 5422 and its updates, as the case may be.

Related to these aspects are the main impacts foreseen for the implementation and operation of transmission lines, such as removal of population and impact over traditional communities; impact on the landscape and avifauna; physical intervention in natural underground cavities and removal of vegetation.

In addition, if the licensing agency determines the preparation of EIA / RIMA, Article 36 of Law 9985/2000, which instituted the SNUC - National System of Nature Conservation Units applies, in which the entrepreneur is required to support the implementation and maintenance of a conservation unit, through environmental compensation to be calculated by the licensing agency.

Also, in CONAMA Resolutions 01/86, CONAMA 09/87, CONAMA 237/97 and in Ordinance MMA 421/11, it is indicated to hold a public hearing in order to publicize EIA/RIMA, when the licensing agency deems necessary, which does not apply for simplified procedures.

## 2.2 State environmental licensing

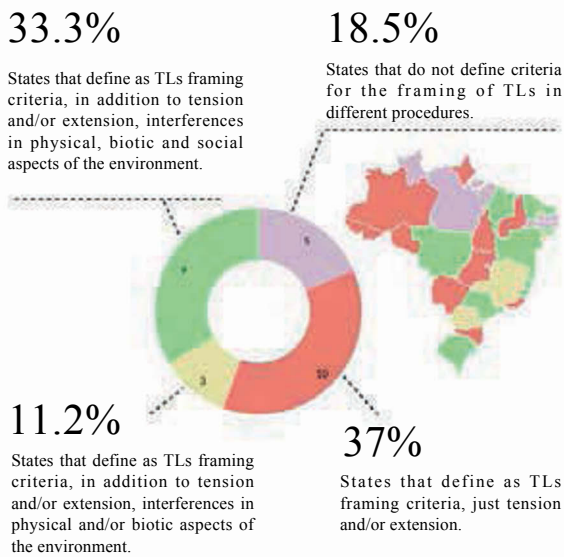
As well as the federal entities competent to legislate, the Brazilian states elaborated their instruments, or chose to follow the federal rule, to establish criteria to define the applicable environmental licensing procedures (GLASSON, 2000).

In the rules of the mapped states, district and federal institutions, that govern their environmental licensing processes, a discrepancy between the framing criteria of the federal licensing agency (IBAMA), and the state licensing agencies were identified.

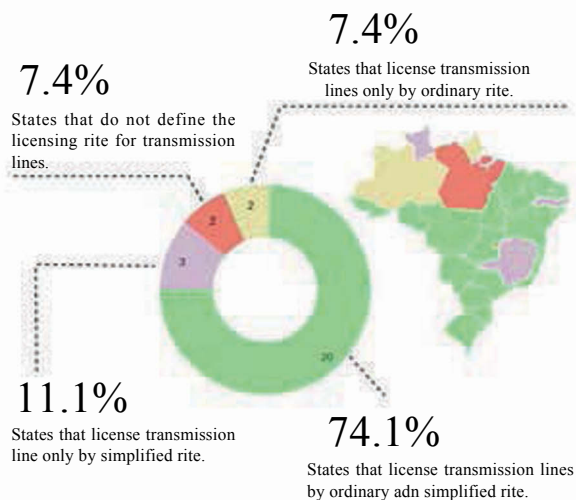
Among the challenges found in the research, it is noteworthy that some official websites of state licensing agencies do not clearly present the regulations used in the environmental licensing processes, while others were out of date, delaying access to information.

The infographics below illustrate the distribution among the units of the federation and (1) their criteria for framing activities during the environmental licensing process and (2) their rites for the environmental licensing of electric power transmission systems.

In the infographic, states that do not define criteria for the framing of electric power transmission lines (TLs) were: Distrito Federal, Pará, Paraíba, Pernambuco and Roraima. Pernambuco and Roraima classify all electric power



**Fig.1 Criteria of States Agencies for Framing the Transmission Lines in the Licensing Rites**



**Fig. 2 Environmental Licensing Rites foreseen by State Agencies**

transmission projects in the simplified rite; DF does not make explicit which rite may be included in transmission system projects; and the remainder provide for simplified and ordinary rites to license transmission systems in their state.

The states that define tension and / or extension as the criteria for Tls framing were: Acre, Amapá, Amazonas, Goiás, Mato Grosso do Sul, Piauí, Rio de Janeiro, Rondônia, Santa Catarina and Tocantins. Amapá and Amazonas classify all electric power transmission undertakings in the ordinary rite and the other states are expected to define for ordinary and simplified rites for Tls.

Among the states that define specific framing criteria for Tls, in addition to tension and / or extension, interference in physical and / or biotic aspects, are Minas Gerais, Paraná and Sergipe. Minas Gerais classifies all energy transmission projects in the simplified rite and the other states have qualify Tls for ordinary and simplified rite.

Finally, the states that define as framing criteria, in addition to tension and / or extension, interference in physical, biotic and socioeconomic aspects are Alagoas, Bahia, Ceará, Espírito Santo, Maranhão, Rio Grande do Norte, Rio Grande do Sul and São Paulo, all with a prediction of framing for ordinary and simplified rite.

### 2.3 Results and discussion

In analysis, it was observed that approximately 33% of the 26 states of the federation and the Federal District follow the same example of Ordinance MMA 421/11, with definition of sensitivities associated with physical, biotic and social aspects.

It is noteworthy that this innovation was only provided for in law recently and exclusively for energy transmission projects associated with the generation of renewable solar and wind sources in the states of Maranhão, Rio Grande do Norte and Rio Grande do Sul.

The largest portion (37%) of the Brazilian states does not adopt the same guideline of the federal environmental licensing in the definition of framing criteria. Rather they apply the tension and/or extension of the transmission line as criteria to request a more complex environmental study (EIA/RIMA).

As a consequence of this reality, sometimes efforts to change the route in order to avoid or reduce environmental impacts in sensitive areas do not necessarily result in optimization of the environmental licensing process, particularly when the legal scenario does not consider the physical, biotic and socioeconomic aspects as framing criteria for Tls.

Therefore, it is concluded that the 37% of Brazilian states that define only tension and extension as a framing criteria added to the 18% that do not define framing criteria, in other words, 55% of the 26 Brazilian states plus the Federal District, represent weaknesses in the Tls framing in the different procedural rites of environmental licensing. Therefore, these states become vulnerable to questioning of society about which criteria were used when assessing the environmental complexity of the project.

Other 11% of Brazilian states and the Federal District consider interference with physical and/or biotic aspects in addition to the tension and extension of the project (as illustrated in Fig. 1).

This fact already represents an advance in the assessment of the environmental complexity of transmission lines. It is noteworthy that among the states in this group, Minas Gerais, Sergipe and Paraná have the regulatory document that defines the environmental licensing framing recently enacted in the years 2017, 2018 and 2019, respectively. These enacts indicate the current demand for improving the legislation applicable to this type of project.

Finally, it is possible to verify that in the states where only the simplified rite for licensing TLs (11.1%) is foreseen, social participation may not be promoted through public hearings, and environmental compensation is not foreseen to conservation units affected by the project.

### 3 Conclusion

The research found that few states exercised the same level of maturity as the federation in evolving its rules to consider environmental criteria to define the necessary studies.

Behind these environmental criteria, when considered in the regulations, the legislator passes on the concept that they are significant, valuing them, so that their avoidance allows the enterprise to be authorized with more simplified and quicker environmental studies, which can be understood in better terms and costs for the entrepreneur and society.

Added to the discussion is the demand for social participation through a public hearing and the mandatory environmental compensation to the conservation units, defined in legislation for the ordinary procedure on demand from the environmental licensing agency, but not clearly indicated in the simplified procedure.

In this way, this work expects to bring to light some challenges faced by those interested in licensing transmission systems in Brazil and, thus, instigate the discussion and search for solutions to the identified difficulties, thus promoting the necessary expansion of the system, in an environmentally and socially appropriate way.

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### Declaration of Competing Interest

We declare that we have no conflict of interest.

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