THE INVESTOR'S HANDBOOK FOR RENEWABLE ENERGY IN BRAZIL

AN INSIDER'S GUIDE

REA CONSULT

Preface

Favorable geographic conditions, growing electricity demand, progressive regulatory reform, and maturing supply chains, have made Brazil one of the most exciting countries in the world for renewable energy investment.

According to Bloomberg's **2019 Climatescope report**, Brazil ranks third most attractive in the world for clean energy investments. Brazil also ranks third globally in terms of installed capacity from renewable energy sources, after only China and the United States, according to **IRENA** analysis. Despite this, Brazil only ranks 7th in the world for installed wind power capacity and 22nd for solar.

The real renewable power in Brazil comes from hydroelectric, where it is only second to China. Large hydropower plants account for around 80% of domestic electricity generation, providing flexible and low-emission base power supply. However, further expansion is constrained by the remoteness and environmental sensitivity of remaining hydropower resources.

As a result, reforms in the Brazilian energy market over the last decade have focused on diversifying the country's energy mix. While natural gas plays a role in this new power landscape, the key focus has been to promote the development of wind and solar power generation by creating the technical, socio-economic, and political conditions required to encourage investment.

Transmission capacity and technology have improved to account for intermittent supply, new financing mechanisms have been put in place to suit a wide range of projects, and more supportive regulation has been established. From 2017 to 2020 (ytd) the average annual installed capacity growth of centralized solar power was approximately 35%. In the same period, distributed solar power grew by more than 120% on average, benefiting from the world's most progressive net metering regulation. The more mature wind sector saw an average increase in

the generation capacity of 8% per year, while total wind capacity is expected to double between 2017 and 2024.

There is a famous saying here, we say that "Brazil is not for beginners". Despite reform, Brazil is still an emerging market with many of the inefficiencies and cultural hurdles you would expect of a populous Latin American country. However, those who can navigate Brazil's dense legal and regulatory jungle will discover a renewable energy market that is brimming with potential. Since I began working in the renewable energy sector, I have seen markets peak and stall. The conditions are right, now is the time for Brazil.

The Investor's Handbook for Renewable Energy in Brazil has been developed by REA Consult to support that journey. It serves as an insider's guide for those developing projects renewable energy in Brazil and anyone curious about the inner-workings of this lucrative market. A new chapter will be released every week, all free to read and share. See all the chapters published so far and **follow the evolving story here**

Rachel E. Andalaft

Founding Partner at REA Consult

REA Consult is a management and consulting firm committed to building bridges for international sustainable investments. Born in Brazil with offices in Europe, Asia, and South America, REA Consult has a global track record of supporting successful projects.

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GRID ACCESS REGULATION IN BRAZIL

ACCESS TO GRID CAPACITY IS RULED BY THE KEY REGULATOR ANEEL. NAVIGATE THE APPLICATION PROCEDURES & GET ACQUAINTED WITH THEIR PRE-REQUISITES

- △ Market Overview
- △ Access
- △ Information
- △ Energy Auction & DAL

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Power Grid Regulation in Brazil

Overview

Agência Nacional de Energia Elétrica (ANEEL) is the Electricity Regulatory Agency for the government of Brazil. Linked to the Brazilian Ministry of Mines and Energy, ANEEL was created in 1997 to regulate the Brazilian electricity sector, through Law No. 9,427 / 1996 and Decree No. 2,335 / 1997.

ANEEL's stated mission is to "provide favorable conditions for the electricity market to develop in a balanced environment amongst agents, for the benefit of society."

The main duties of ANEEL include:

REGULATING the generation, transmission, distribution, and sale of electricity

SUPERVISING the concessions, permissions, and electric energy services

IMPLEMENT the federal government's policies on exploitation of electric energy

ESTABLISH tariffs

SETTLE differences between agents, and between agents and consumers

PROMOTE the activities of granting concessions, permission, and authorization of electric energy projects and services

Market Recap

As explored in more detail in chapter 2, energy trading activity in Brazil takes place in two distinct environments:

1. **Unregulated market (ACL):** where generation and distribution companies, energy traders, energy importers, and exporters, as well as free and special consumers, do business.

2. **Regulated market (ACR):** where generation and distribution companies participate in auctions.

While in the ACR, Power Purchase Agreements (PPAs) are defined within the set of rules designed for each auction, the ACL allows a diversity of contracts negotiated bilaterally between renewable energy sellers and buyers.

PPA contracts are divided into:

- **PPA onsite**: energy is generated close to or at the consumer's site and connected directly to its power grid

- **PPA offsite:** tenergy is generated where best suited, being delivered through the regular power grid

Projects owning PPAs offsite are required to engage into a grid connection request procedure ruled by ANEEL.

The following pages explain the procedure generation companies must undergo and present a roadmap to navigate the regulatory requirements and documentation in order to reach grid connection milestones. connected.

Access

When developing an energy generation project, ANEEL's process starts with the access inquiry and the access request. They are the two sets of documents interested parties must submit to the distribution company responsible for the concession area.

The requestors should keep in mind the timeline to gather the mandatory permits and contracts to connect its generated energy to the regular power grid.

Distribution companies should provide all the requested documents and permits to access the power grid to potential energy generation companies, including the timeline and mandatory steps of the process for all stakeholders.

Energy generation companies must submit the access inquiry document to distribution companies to understand the power grid connection requirements.

The access information document is provided by the distribution companies to generation companies in order to define the parameters to access the regular power grid.

The above-mentioned documents are mandatory for generation companies that request the authorization to sell energy in the regulated market.

The table below shows the mandatory and optional steps for different stakeholders:

Stakeholder			Procedures	
			Access Inquiry / Access Information	Access Request / Access Advice
Consumer Unit			As set in the electric energy supply general conditions	
Power Plant	Without Auction Participation	Registry	Optional	Mandatory
		Authorization	Mandatory	Mandatory
	With Auction Participation		N/A (Check Dal)	Mandatory
	Concessionaries		As set in the bidding terms	
	Authorization Change		Mandatory	Mandatory
Distribution Company			Optional	Mandatory
Energy Importer Or Exporter			Optional	Mandatory

The stakeholders should consider the procedures and timelines to connect the energy generation systems to the regular power grid.

The main requirements are:

- Access Inquiry
- Access Information
- Access Request
- Access Opinion
- Contracts signature
- Recommended construction works, when necessary.

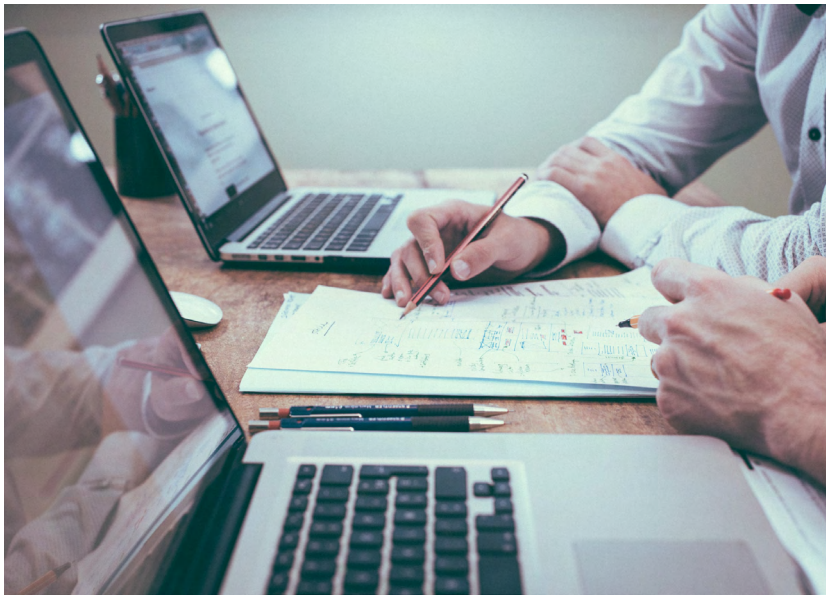
Depending on the scenario and the energy plant specificities, the requirements can have different timelines to be reached.

This is vital to prevent the energy plant from having operational restrictions, as grid connection works for both transmission and distribution lines need to be carried out first.

Information

The procedural information is stated on the respective distribution company's power grid access guide, available on its website. It contains:

- Regulatory documentation
- Necessary steps
- Deadlines and stakeholders' responsibilities
- Standard forms
- List of Documents to be submitted
- Inquiry steps
- Auction access documentation (DAL)
- List of technical studies applicable to each step



Access Inquiry & Access Information

Access Inquiry is the document through which the energy generation companies obtain the necessary power grid access information. It is shared once the generation company provides the enterprise's details in a specific form. Access Information is the document which the distribution company presents the generation companies' the best connection alternative, based on the minimum global cost, and explains the procedures to request power grid access.

Both documents are mandatory for enterprises that intend to:

- Obtain an authorization to trade energy in the unregulated market (ACL)
- Change current authorization to trade energy in any market (both ACL and ACR)

To proceed with the Access Inquiry, which is the first step of the grid consultation process, three main inputs are required:

1. Preliminary project approval (APB – Despacho de Aprovação do Projeto Básico)
2. Feasibility study (ASE – Despacho de Adequabilidade do Sumário Executivo)
3. Generation permission application (DRO – Despacho de Requerimento de Outorga), or existing approval in case of an authorization change request.

The stakeholders should consider the following processing times for the Access Information document:

60 DAYS

IF THERE ARE **NO PENDING ISSUES** ON THE GENERATION COMPANY'S SIDE.

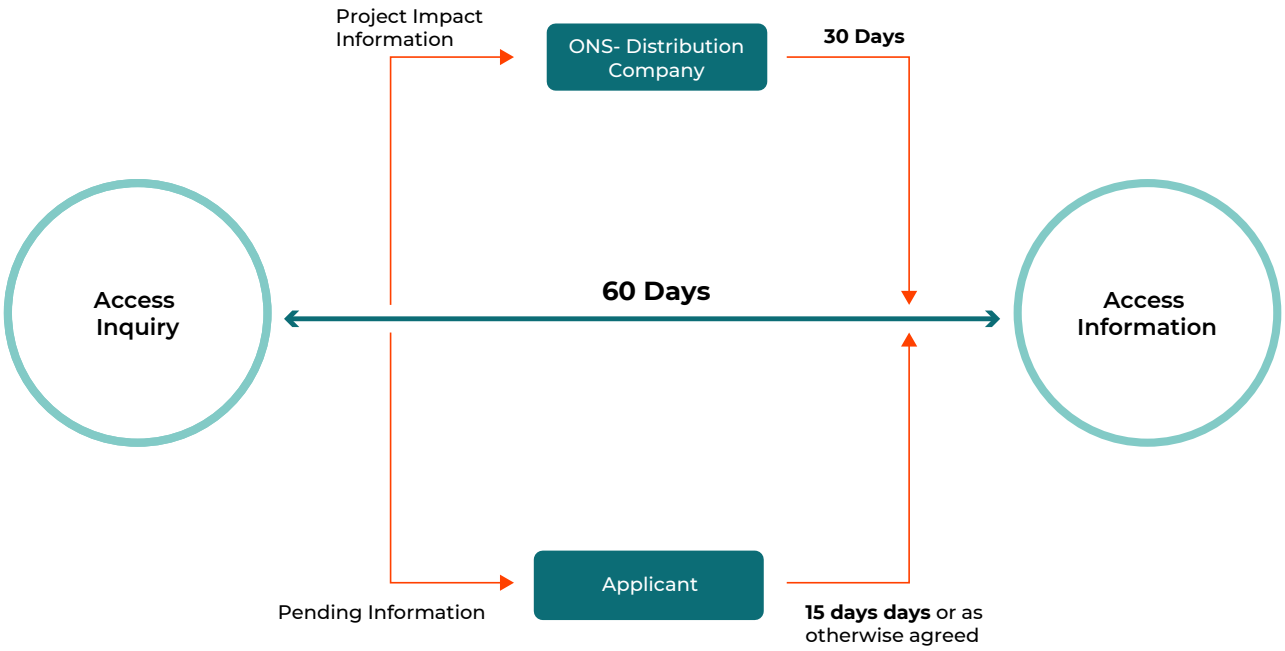
ADDITONAL 15 DAYS

IF THERE IS **MISSING INFORMATION** UNDER THE GENERATION COMPANY'S RESPONSIBILITY. THIS DEADLINE STARTS AFTER THE PROPER INFORMATION IS SUBMITTED.

ADDITONAL 30 DAYS

IF A **TECHNICAL APPRAISAL** BY ONS OR ANOTHER DISTRIBUTION COMPANY IS NEEDED.

The flowchart below demonstrates how the access information document is produced:



It is important to bear in mind that the distribution company is free to suspend deadlines until all the pending issues are cleared.

Once this step is concluded, Access Information documents will contain, at least:

- Description of the selected grid connection option, according to the minimum global cost criteria, together with the list of the other appraised alternatives and the corresponding cost estimates and supporting facts
- Steps and deadlines to be followed by the generation companies in order to guarantee conditions as specified in the access information document
- Forms, documents, and studies under the generation company's responsibility, which are mandatory to submit the access request document in the future. The distribution company is responsible to provide updated information about the electric power system and other supporting information to perform the studies.

When necessary, detailed information about the distribution grid can be obtained in PRODIST (module 3 – Access to Distribution System). You can find access conditions, including the connection and use of the distribution system. It is a rulebook that defines:

- Technical criteria
- Operational criteria
- Project requirements
- Additional information
- Grid connection implementation

It's applicable to both existing and new generation companies, but it does not include information regarding the transmission lines' connection.

Access Request & Access Opinion

Access request documentation must be submitted by the generation company in order to obtain the corresponding access opinion, the document under which the distribution company will appraise the technical viability, based on the enterprise's access requirements.

For this set of documents, the following checklist applies:

Generation Company:

- Fill out a specific form containing the enterprise's information and the formal access request and submit it to the distribution company
- Conduct power plant's grid integration studies, as requested by the distribution company
- Perform specific studies on energy quality for connection purposes, as mentioned in PRODIST's module 8t

Distribution Company:

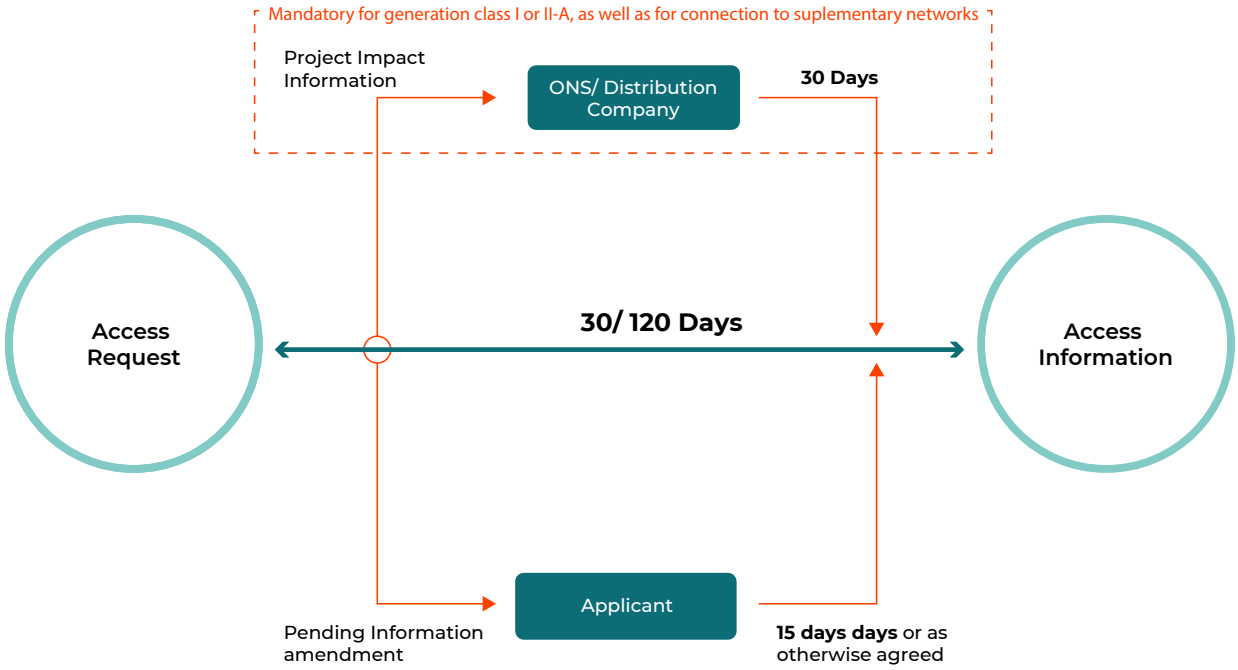
- Define the generation company's best connecting alternative, based on the minimum global cost criteria
- Conduct studies to appraise the impact of new accesses in the power grid performance
- Perform specific studies on energy quality for connection purposes, as mentioned in PRODIST's module 8
- Check the need for a technical opinion by ONS or another distribution company about the impacts of new accesses on the transmission and distribution grids, respectively
- Provide the studies that support the selected grid connection, when requested
- Gather any relevant information for the preparation of the access opiniont

If there are no pending issues, the distribution company provides the access opinion document according to the following deadlines:

- Within 30 days: if no distribution grid construction work is necessary
- Within 120 days:
  - If distribution grid construction work is necessary
  - If technical advice by ONS or other distribution companies is necessary

Deadlines may vary if any information is missing.

The flowchart below presents a simplified version of how the Access Opinion document is produced:



The access opinion document will contain, at least:

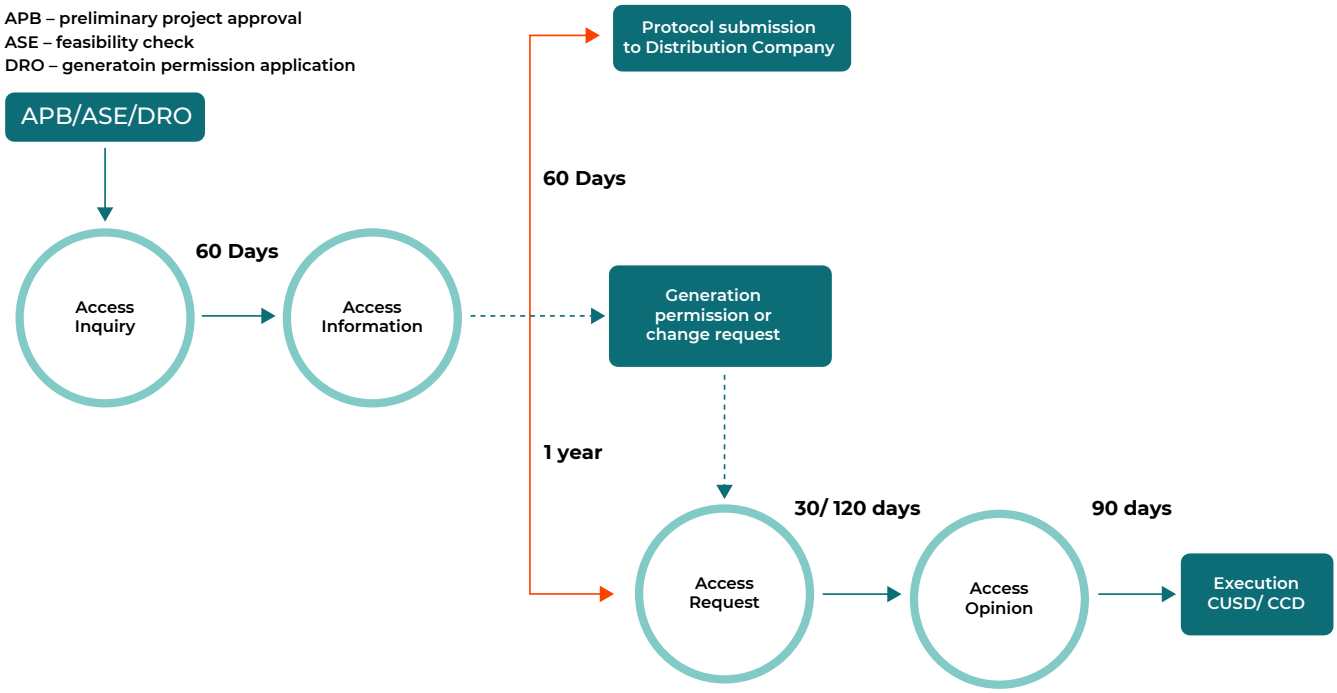
- Description of selected grid connection option, in accordance with the minimum global cost criteria
- List of the other appraised connection alternatives (together with their supporting materials and cost estimates)
- Information about the appraised distribution grid's characteristics
- Information about the characteristics of
- the grid connection point
- If any grid construction work is necessary, a list of installations under the requestor's responsibility and a list of installations under the distribution company's responsibility (together with a work schedule estimate and corresponding deadlines).

These contents are then included in both the:

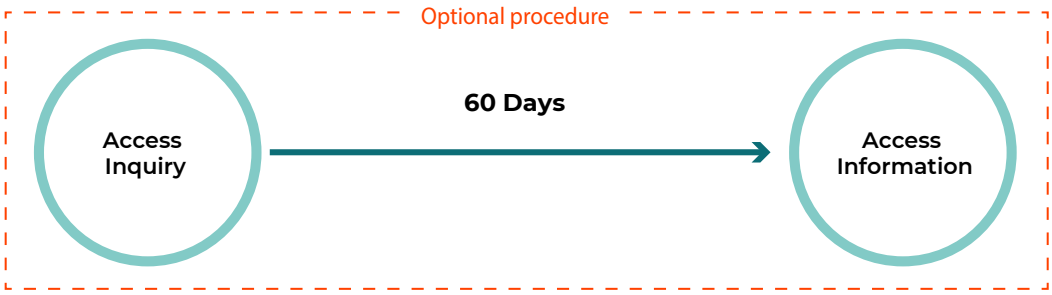
- Distribution System's Use Contract (CUSD)
- Distribution System Connection Contract (CCD)

After the access advice is issued, both CUSD and CCD contracts must be signed within a period of 90 days. Grid construction works, when required, can only start after these contracts are signed.

The flowchart below shows the necessary steps of this process, from Access Inquiry until the CUSD/CCD as outputs.



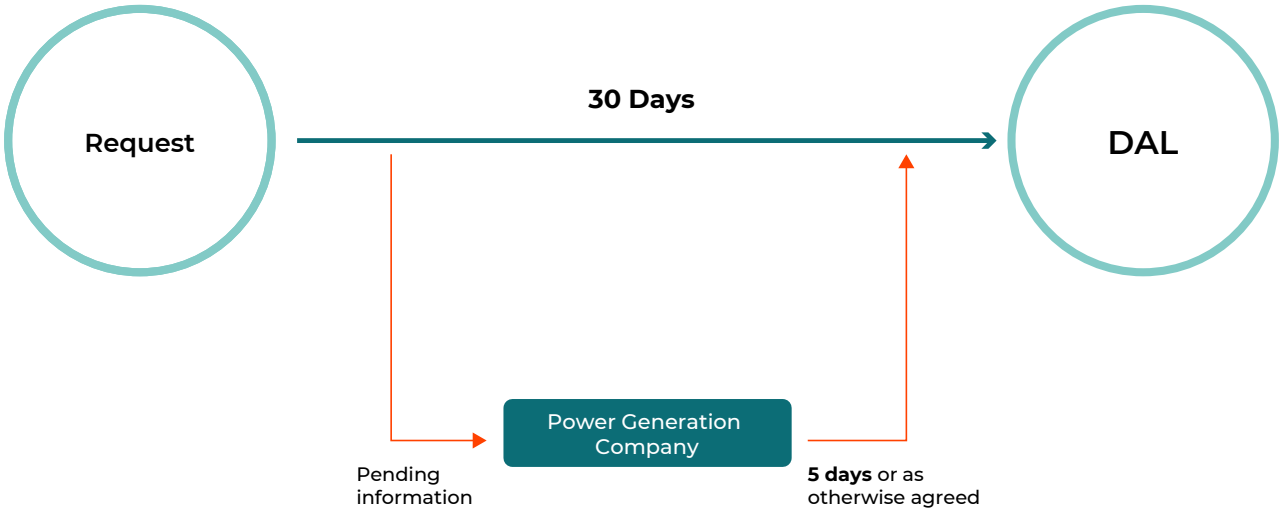
As outlined in Table 1, the process above is mandatory for all generation companies not participating in the auctions as well as those applying for changes and amendments to existing generation permissions. Projects which target participation in the electricity auctions undergo a separate auction qualification procedure, described in the next section. All too often, however, to the benefit of diligent project development, developers may opt to issue an access inquiry and to obtain the access information in order to create comprehensive project documentation for prospective investors.



Energy Auction & DAL

Generation companies wishing to enroll for technical qualification to participate in energy auctions must formally request the Auction Access Document (DAL) from the distribution company.

This document is issued within 30 days, in case there are no pending issues concerning the generation company. Each DAL can only be used for a specific auction.



In a nutshell, power generation companies wishing to operate in Brazil, regardless of the market they participate (ACL or ACR), can rely on the sector's institutional structure. Under the leadership of ANEEL, stakeholders are bound by law to comply with the sector's regulations – which are getting more and more liberal every day. However, it takes a lot of local knowledge to navigate Brazilian institutions and to break the ice of Brazilians bureaucracy. In the next chapter, we will discuss the complexities of land regulation in Brazil, and the important precautionary measures that must be undertaken when conducting due diligence processes for solar or wind projects across Latin America's biggest nation.

Disclaimer

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Please note that the energy field is dynamic, and the material and data presented herein could change.

Sources

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