



CASE STUDY TITLE

Requirements for Technical Acceptance of Wind and Solar Projects for Energy Auctions in Brazil



SUMMARY

The objective of this case study is to demonstrate how standards - in particular, those based on IEC international standards - were used to improve the system of energy auctions. The implementation of the revised standards-based instructions must be followed by auction participants. This allowed a substantial increase in the number of compliant projects submitted and better management of submission, analysis and approvals by the Energy Research Office of Brazil. This directly supports the achievement of Goal 7b "expand infrastructure and upgrade technology for supplying modern and sustainable energy services for all"

BACKGROUND

Electricity auctions for the regulated market in Brazil are held 3 to 6 years before the energy delivery. This anticipation, associated with long-term Power Purchase Agreements, ensures the bankability of projects. On the other hand, the uncertainty associated with the construction of new power plants, requires a prequalification stage, in order to guarantee that candidate projects accomplish the necessary requirements. For this prequalification, the Brazilian Energy Research Office set the requirements, aiming for an offer of feasible projects, contributing to increasing the share of renewables in the energy matrix.

STRATEGY

Instructions for project developers were published addressing technical requirements that must be followed for acceptance of projects for energy auctions. The requirements are frequently revised due to technological evolution, aiming the critical points for the success of new power plants. Eventually, the developers are consulted to improve the instructions. For example, there is

AT A GLANCE

COUNTRY

- Brazil

LEVEL

- National

SDG ADDRESSED

- SDG 7 - Affordable & Clean Energy

no clear definition for power capacity of photovoltaics inverters, as it depends on the local temperature (for solar panels, for instance, international standards sets the conditions to measure its parameters). Due to the lack of proper standards for inverters, the Energy Research Office made a public consultation and, with the technical contributions received, set a consensus.

Regarding the on-site measurements (solar and wind resource), the instructions also specify the requirements such as maximum distance from measurement station to project site, campaign duration, necessary instruments, quality of sensors and minimum height, considering the international standards



STRATEGY

(e.g. IEC 61400, ISO/IEC 17025 and ISO/IEC Guide 98-3). The standardized parameters help the developers when installing the stations and allow for the comparison of measured data.

RESULTS & IMPACT

The standardization of requirements for qualifying wind and solar projects results in an increasing number of accepted projects and contracted power plants. Some of the impacts achieved include: (i) Since 2009, the percentage of approved projects was between 55 percent and 65 percent, demonstrating the importance of technical prequalification. (ii) In 2021, auction registered more than 700 wind projects and 900 photovoltaic projects, representing more than 56 GW in proposals from renewable sources. (iii) This process resulted in the contraction of more than 770 (20 GW) wind and 180 (5 GW) PV power plants in last years.

More than 900 wind measurement stations and more than 250 solar radiation stations fulfilled the requirements, reducing uncertainty in available primary resources and energy production estimation. This also contributed to improving the knowledge of the available resources in the territory. The prequalification process is valid for energy auctions on the regulated market, but nowadays, even free-market uses it: some independent companies ask the developer for technical approval by the Energy Research Office before buying energy from new projects. Banks also require Energy Research Office's technical approval when financing new projects, aiming more confidence on its feasibility.

CHALLENGES & LESSONS LEARNED

The main lessons learned include:

- Some projects from different developers were discovered in the same place. Thus, some additional requirements were introduced regarding the right to use the land.
- With the development of wind energy, some projects were very close to each other, especially in regions with good wind, which would result in turbulence and wake effects, reducing the energy production.
 - Due to a big number of candidate projects, a system of management of submission, analysis and approval was developed. This web-based system is accessed by developers, who fill in the project datasheet, and analysts from the Energy Research Office, who check the registered projects and ask for documents and extra data without personal identification.

POTENTIAL FOR REPLICATION

Among the available mechanisms to buy energy, auctions have been considered by many countries, as it encourages competition for lower energy prices and can be used with existing and new power plants. The Energy Research Office published a series of Instructions to be followed by project developers in auctions. The similar process and requirements can be used in others countries that wish to buy energy through the auctions.

CASE STUDY DEVELOPED BY:
Bernardo Folly de Aguiar
Empresa de Pesquisa Energética - EPE
(Energy Research Office)

