

# Assessment of Initial Investment Valuation Methodology of Brazilian Power Transmissions Auction

André L. V. Gimenes, Raphael B. Heideier, Miguel E. M. Udaeta, Marco A. Saidel

Department of Electric Power and Automation, Polytechnic School of the University of Sao Paulo, Sao Paulo, Brazil  
Email: [gimenes@gmail.com](mailto:gimenes@gmail.com)

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## Abstract

This paper aims to assess the Initial Investment Valuation Methodology of the local regulator, facing the results of auctions, due to the high occurrence of low clearing prices observed from 2003 to 2008 and the high percentage of auctions without any bidder recently. The regulator investment forecasted defines the maximum value of Yearly Allowed Revenue and the bidder that offers the lowest YAR value wins the auction. The first type of analysis considers project cost, location, execution deadline, transmission line extension and type of all actions from 1999 to 2015, totalling about 3.36<sup>1</sup> billion USD. It was not found any correlation of those variables and the result of the actions. The second analysis compared the equipment and the additional costs breakdown of the regulator investment forecast with the real investment in projects from 2009 to 2013 and it rarely surpasses 5%. Suggestions are proposed based on the analysis.

## Keywords

Brazilian, Auction, Clearing Prices, Transmission Line, Valuation

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## 1. Introduction

As the largest electricity market of the world, Brazil has implemented reforms to liberalize its energy sector to increase efficiency and promote low tariffs. Thus, an extensive restructuring process started in 1995 where distribution, transmission, and generation were unbundled to promote competition and motivate financing from the private sector to expand the power system. These changes have characterized the existence of an electricity free market [1]. However, this mod-

<sup>1</sup>Exchange rate from central bank of Brazil, assessed at 11/07/2016, 3.30 BRL per USD. Available at: <http://www.bcb.gov.br>

el, known as the “new model” of Brazilian Electricity Sector—BES, was not effective in attracting investments, resulting in rationing in 2001. Improvements to the “new model” and the current model are regulated by law No. 10848 of March 2004.

It is a precondition for investments attraction to the expansion of BES, the existence of a well-structured regulatory agency. The National Energy Policy Council (NEPC) is an advisory body to the President of the Republic with the task of formulating energy policies and guidelines, integrated by:

1. Minister of Mines and Energy, who presides;
2. Minister of Science and Technology;
3. State Minister of Planning, Budget and Management;
4. Minister of Finances;
5. Minister of the Environment;
6. Minister of Development, Industry and Foreign Trade;
7. Chief Minister of the Civil House of the Presidency;
8. A representative of each State and the Federal District;
9. A Brazilian citizen expert on energy; and
10. A Brazilian university representative, an expert on energy.

The Monitoring Committee of the Electricity Sector (MCES): Its function is to monitor and continuously assess the continuity and safety of the electric supply throughout the country to ensure the proper balance between supply reliability and the reasonableness of rates and prices.

The Energy Research Company (ERC) provides services in the field of studies and research to support the planning of the energy sector, such as electricity, oil, natural gas and its derivatives, coal, renewable energy sources and energy efficiency, among others.

The National Electric Energy Agency (ANEEL in Portuguese): Regulates and supervises the production, transmission, distribution and sale of electricity in accordance with the policies and guidelines of the federal government. ANEEL coordinates with the States and the Federal District the energetic use of water courses and compliance with national water policy.

The National System Operator (NSO): A non-profit private law entity, responsible for coordinating and controlling the operation of generation and transmission of electricity in the National Interconnected System (NIS), under the supervision and regulation of ANEEL.

The operator consists of associated and participating members, with commitment to operate NIS in an integrated manner, with transparency, fairness and neutrality to ensure security, continuity and the economic efficiency of the electricity supply in the country.

The Chamber of Commerce of Electric Energy (CCEE): It is intended to facilitate the sale of electricity.

Each year, NSO is responsible for proposing in the Expansion and Reinforcements Plan the expansion and improvements needed to the basic network facilities in Expansion and Reinforcements Plan for a two-year horizon, based on

demand growth and systemic risk. In Brazil, since 1999, projects of Transmission Lines (TL) or Substations (SS) are grouped in batches. These batches are bid by means of auctions conducted by ANEEL, in which public and private companies participate.

ANEEL calculates the expected cost of each batch for the construction and operation of the installations, according with a project determined by the agency itself in its auction bidding terms and conditions. Then, ANEEL establishes, for each new TL/SS lot, a maximum value of Yearly Allowed Revenue YAR [2].

By determination of the local regulator (ANEEL), the company or consortium that wins the auction is the one that offers the lowest YAR value for the project in question, during the concession period.

Hundreds of projects have been auctioned, totalling more than 67,166 km of TL and their respective substations from 1998 to 2015. Currently, the Brazilian transmission system is made of 128,000 km of Transmission Lines [3].

However, part of the auction results have showed high percentages of low clearing price, in some cases superior to 50%, which could indicate the project evaluation process lead by ANEEL have significantly overestimated project costs. At the same time, cases of lack of interest are verified, which are called empty auctions.

Between 2012 and 2015, for instance, there was at least one non-hired lot in each auction. Apparently, this is due to the lack of interest that stems from the low ceiling price of the established YAR [4].

Such facts have resulted in severe criticism of the methodology used in these auctions, particularly by the Court of Accounts of the Union, the federal entity in charge of controlling the finances of the public activities in Brazil [5].

There is a premise that possible errors in the calculation of the accomplished project values have influenced the low clearing prices values. This has provoked numerous analyses about the consistency of the method used by ANEEL, all intending to modernize such methodology [6].

The calculation of YAR is carried out from the estimate of initial data, from the composition of project cash flow and from the specific calculation for determining the price ceiling of YAR.

The initial data considered in the financial model of ANEEL auctions is:

1. Initial investment, according with an estimate made from a specific database;
2. Construction deadline;
3. Revenue obtained by the transmitter with the investment;
4. Cost of Capital of the company and of others;
5. Percentage of the Cost of Capital of the company and of others;
6. WACC—Weighted Average Cost of Capital;
7. Operation and Maintenance—O & M;
8. Tax and Depreciation period;
9. Sector Taxes and Charges; and
10. Year and payment value.

The projects cash flow is composed as Free Operating Cash Flow:

$$\text{GOC} = \text{R} - \text{CS} - \text{T} - \text{SC} - \text{OM} \quad (1)$$

$$\text{FOC} = \text{GOC} - \text{IOA} \quad (2)$$

where:

FOC = Free Operating Cash Flow;

GOC = Gross Operating Cash Flow;

SC = Sector Charges;

OM = Expenses with O & M;

DP = Depreciation;

R = Revenue;

T = Taxes;

CS = Cost of Sale;

IOA = (Dis)investment in operating assets.

The estimation YAR is defined by simulation, in such a manner that the project NPV (Net Present Value) becomes null, which would make the estimated profitability of the project to be the WACC (Weighted Average Cost of Capital) of the Brazilian electrical sector itself.

The main goals of the process inherent to the Brazilian auction model are to guarantee the execution of the investments to adequate the operation of the whole system affordable and to have the participation of stakeholders in the project.

It is important to highlight that the issue of the transmission is key for electrical industry sustainability, because it brings along not only supply security, but also affordability. It is possible to observe that the financial model does not include the interests related to the construction period and that the accounting of depreciation is simplified. However, exhaustive analysis of this model and its alternatives confirm the statement that the application of a finer and more precise financial model would increase the YARs offered in auctions, in an average development of 11% [7].

In this sense, such refinement would not be enough to explain the high percentages of low clearing prices that have occurred in the auctions, although in theory it could contribute to the reduction of the occurrence of empty auctions.

### Initial Investments Valuation

According to the methodology of ANEEL, the total cost of a project is shaped based on the following components [2]:

$$\text{Total Cost} = \text{ME} + \text{MC} + \text{AC} + \text{IWP} \quad (3)$$

where:

ME—Main Equipment, related to a transmission line or substation, from which MC and AC are calculated;

MC—Minor Components, a set of fixed components, linked to the constructive module of a certain type of main equipment, for instance: control cables, isolators, etc., besides civil works. This parcel is calculated as a percentage of the

main equipment;

AC—Additional Costs, associated to the engineering services, basic and detailed projects, auxiliary constructions, supervision and viability study, as well as to services of purchase and inspection of civil works along with the administration by the concessionaire, being normally calculated based on the percentage of direct equipment costs;

IWP—Interests over Work in Progress, also calculated based on the percentage of direct equipment costs.

These values are generated according with the specificities of each project, based on a database named ANEEL Price Reference Database. The objective of the construction of this database is to evaluate the remuneration basis of the concessionaires, based on the method of new replacement value NRV, in order to recognize only the main investments for the adequate rendered services of transmission. In this sense, the prices database is used not only to estimate the investments required to new projects, but also to the YAR revision of the existing ones [2].

Prices Database seeks to reflect the efficient average costs of acquisition and installation of vast equipment. It is structured in the modular form of transmission lines and substations equipment and it corresponds to the average replacement price of goods in efficient conditions. It incorporates the direct costs related to the main equipment and to the accessory material, as well as assembly, civil works, remaining pieces, insurance, transport and non-refundable taxes. The indirect costs of the project—such as management and others are also included [2]. It is important to note that there are three types of batches that compose the auctioned: only Transmission Lines (TL) projects, only Substations (SS) projects and both projects (TL + SS).

From this prices database and according with certain starting parameters, the regulator (ANEEL) calculates the total price of the initial investment that is required for the construction of the project. This value will serve as reference for the determination of the YAR offered in the auction.

## 2. Analysis Methodology

The analysis of the results of the auctions—both in a methodological and in an instrumental manner is carried out based on the evaluation of the economic model used by ANEEL for the project offer, as well as on the study of the initial investment valuation based on the reference prices database.

The analysis that results from the economic model, when applied to the case of this study, presents a possible systemic error of  $\pm 5\%$ . The conducted analysis seeks to identify components of the methodology which are related to the occurrence of empty auctions or of low clearing price.

Firstly, as part of the methodological procedures, the following problems have been observed in the analysis of the investors experience and feedback:

1. Errors in the estimation of the environmental costs, pointed out as a cause of lack of interest and of a significant rise of costs;

2. Errors in the estimation of agrarian costs for the passage and construction of TLs, particularly in the Brazilian states that have a higher land cost or a higher rate of urbanization;

3. Problems related to the monetary adjustments of services and equipment, since the applied index is fixed and these are components with distinct economic dynamics; and

4. Errors deriving from the price scale could change the evaluated project cost depending on the size of the project.

Therefore, numerous simulations performed with auctioned projects are carried out seeking to verify the existence of correlations between the occurrence of low clearing prices or empty auctions.

The analysis assess the correlation of low clearing prices and empty auctions considering the variables: i) project cost; ii) project location; iii) deadline for project execution; iv) transmission line extension; and v) type of project; of all actions from 1999 to 2015, totaling about 3 billion USD.

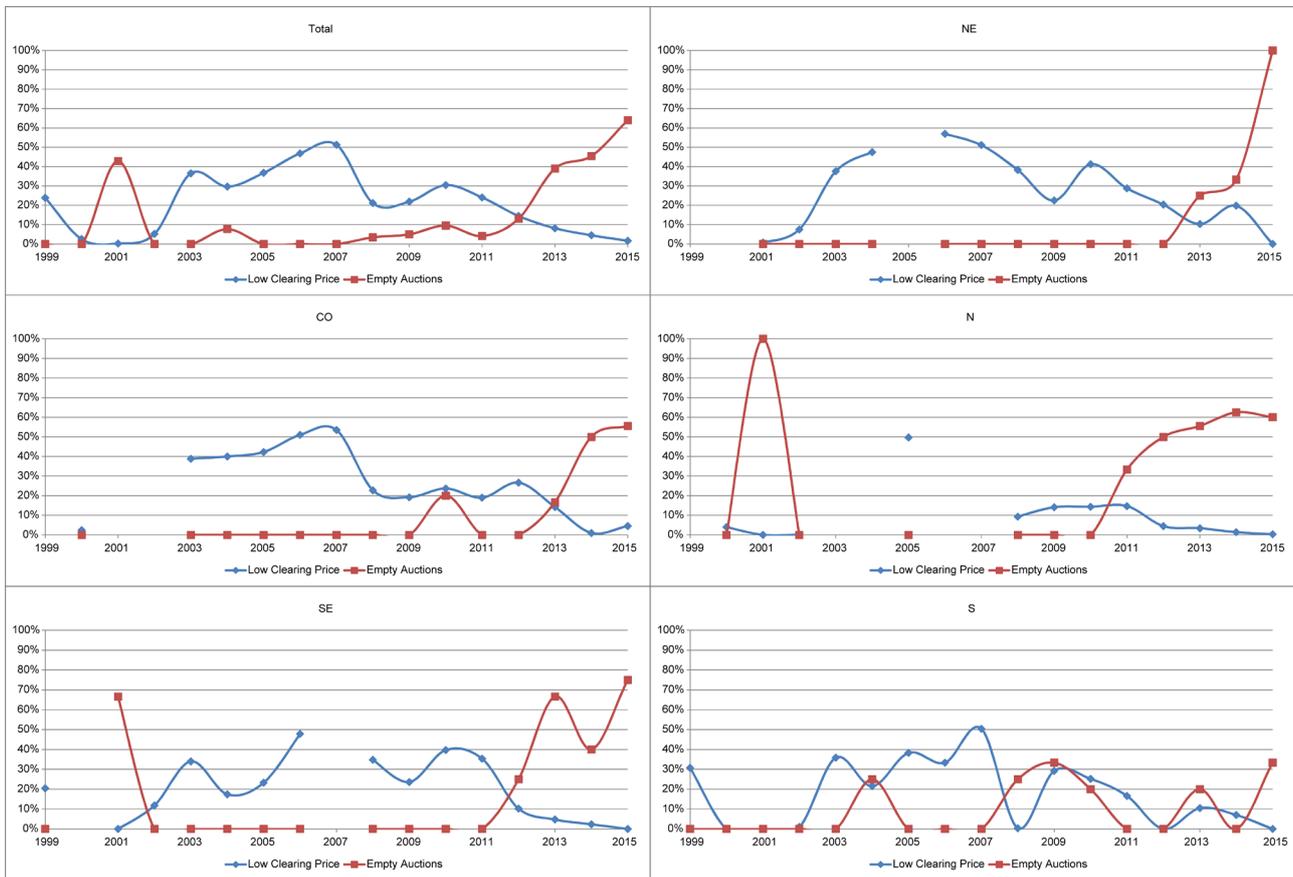
Another path of study is related to the performance of the results of the initial investments valuation methodology—both in total terms and separated by types of equipment and other cost components, according to Equation (3).

Finally, the analysis is conducted based on the investments which were effectively carried out by the winning bidder, disaggregated in: Machines and Equipment, Civil Works, Lands, Environmental Costs and Others; and compared with values obtained through the project valuation methodology of the regulator (ANEEL).

### 3. Effects of the Evaluation and Evidence Analysis

To evaluate the influence of the monetary adjustment on the reference values used for equipment and services in the occurrence of low clearing prices, these are evaluated with respect to the year of occurrence, seeking to evidence possible problems throughout time. The analyses demonstrate a variation in the value (in Reais) of the YARs offered by ANEEL. That piece of information was found in the search for the evaluation of low clearing prices occurrence in relation to the scale problems that pertain to the value of the auctions. Still with the expectation that the invested sum influences the low clearing prices value, data shows that a low clearing price occurrence pattern cannot be established based on the total value of the project. In order to identify the possible correlation between low clearing prices and empty auctions, there is an evaluation of the evolution of occurrences of these possibilities, in terms of annual percentages. Such analysis turns out to be a form of compensating the quantitative difference of auctions throughout the years. The results are presented as follows, in **Figure 1**.

It is possible to observe that, from 2003 to 2007, the occurrence of low clearing prices maintains a rising tendency. However, there is a change in behaviour from 2008 on, where low clearing prices start to decrease. It probable occurs because of the financial crises of 2008. Eletrobras is the largest electric power



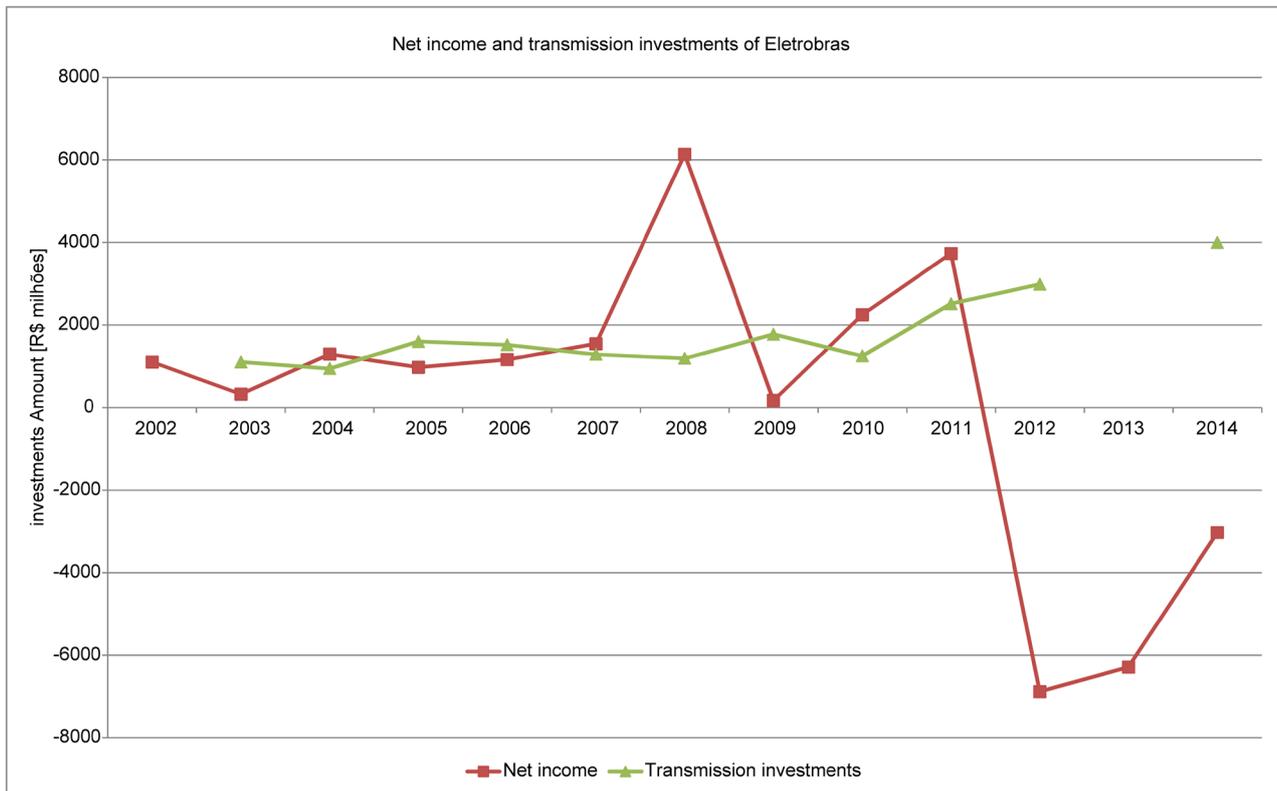
**Figure 1.** Low clearing price and empty auctions variation along time per region (N: North, NE: Northeast, S: South, SE: Southeast and CO: Midwest).

holding company in Brazil. Through its subsidiaries it owns about 40% of the generation capacities and 50% of the transmission lines of the National Inter-connected System. From 2011, the auctions results without any bidders, empty, start to rise. Observing **Figure 2**, which presents the net income and transmission investments of Eletrobras, it suggests that companies are not able to afford such level of investment at the BES. The same pattern is observed analyzing each region.

In disaggregated analysis by type of physical component of the projects on each batch (SS, TL and TL + SS), it has not been possible to establish a conclusive correlation about them. For the majority of the analyzed cases, the components vary in a range of up to 10% from one batch to another of the same kind of project.

It was observed that the three components possess low variation even between the extremes of low clearing price range. The ME component varies between 66.8% and 69.4%. The MC component varies between 10.0% and 11.6%. Finally, the AC component has a variation of 20.4% to 22.2%—considering all the analyzed years.

The low variation in the percentages of components (ME, MC and AC) for all verified range of low clearing prices may indicate that these do not influence the



**Figure 2.** Evolution of net income and transmission investments of Eletrobras.

low clearing prices values between the YARs proposed by ANEEL (local regulator) and those offered by the winning bidder.

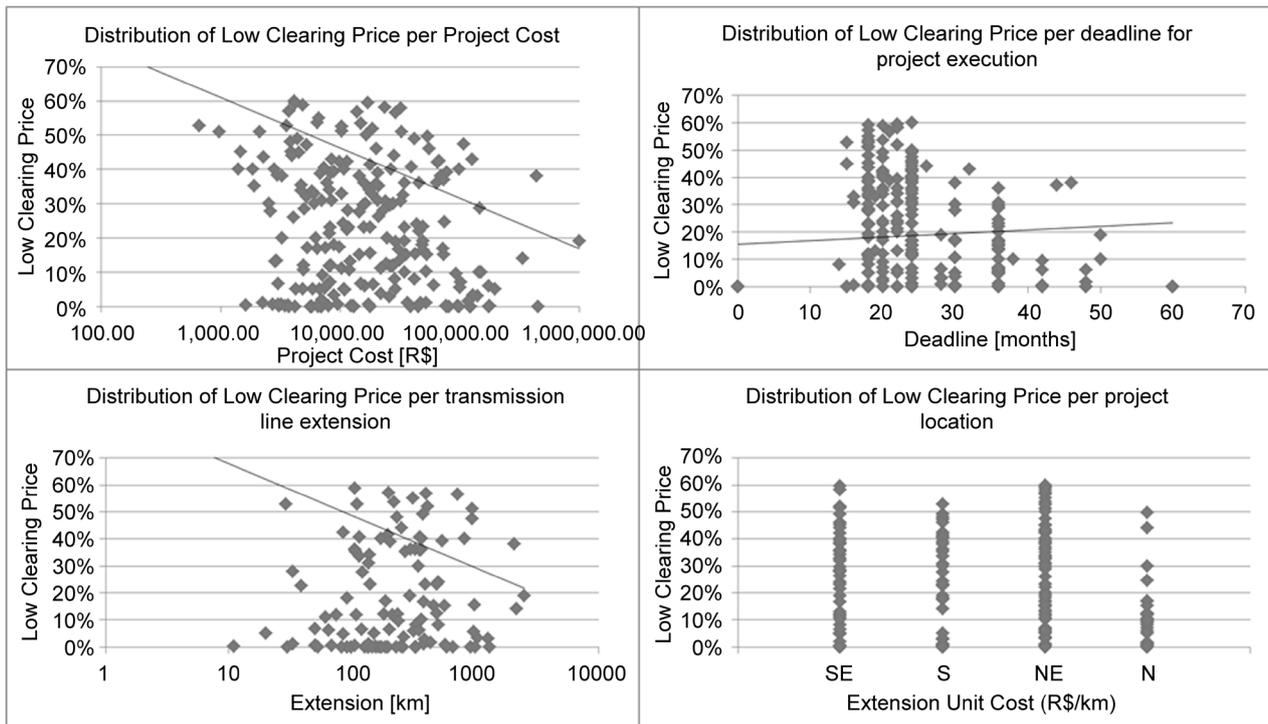
The low variation in the percentages of components (ME, MC and AC) for all verified range of low clearing prices may indicate that these do not influence the low clearing prices values between the YARs proposed by ANEEL (local regulator) and those offered by the winning bidder. Moreover, the analysis assesses the correlation of low clearing prices and empty auctions considering the variables: i) project cost; ii) project location; iii) deadline for project execution; iv) transmission line extension. As it can be observed in **Figure 3**, there is not a clear tendency for any variable. However, it can be noticed a smooth tendency of lower low clearing prices for projects in the north region.

Multivariable regression techniques were used to verify the correlation of low clearing prices with the parameters combined and there is no significant result either.

In addition to the analysis of the values produced by the initial investments valuation methodology, the data related to the investments that were effectively carried out by the winning bidder are also systematically analyzed.

#### **4. Investments Effectively Carried out by the Companies vs. Calculated by ANEEL**

With the demonstrations of the last item, which stem from a known method, there is evidence of the necessity of analyzing cost items that would be unpredictable



**Figure 3.** Distribution of low clearing price per projects parameters.

if they were based on the initial investment valuation methodology of ANEEL.

Therefore, an evaluation of the investments that have effectively been carried out by auction winning entrepreneurs has also been produced.

This way, the evolution of the percentage composition throughout time of the following components inside the total values of each project is analyzed:

1. Machines and Equipment;
2. Civil Works;
3. Lands;
4. Environmental Costs; and
5. Others.

Next, the investments composition carried out by auction winning companies are presented, according with the relative composition of these components in the total costs. **Table 1** presents the annual averages for each one of the components, as well as the global average of the period between 2009 and 2012.

Machines and Equipment presents a global average of 56.71%, highlighted for being the component which takes the largest parcel of the investments carried out by the concessionaires.

It is possible to observe a small variation in the annual values of this components average, in comparison to all the analyzed years' global averages (approximately 5%).

Civil Works is characterized as being the second component with the largest participation in the composition of the investments, with an average of 22.50%.

The same way as it occurs with Machines and Equipment, when the annual Civil Works averages are compared with the global average it is possible to find

**Table 1.** Annual global average for each one of the components.

Average Values	2009	2010	2011	2012	2009 to 2012
Machines and Equipment	62%	61%	52%	53%	57%
Civil Works	18%	22%	27%	23%	23%
Lands	3%	6%	7%	5%	5%
Environmental Costs	1%	1%	3%	2%	2%
Others	16%	9%	11%	17%	13%

that the variation between them is small. If the Civil Works and the Machines and Equipment components were added, they would correspond to about 78% of the total average of investments carried out by the concessionaires.

The remaining 22% of the global average are distributed between the other components as follows: Others with 13.49%, Lands with 5.46% (with wide annual variation) and Environmental Costs with 1.85%.

**Figure 4** presents a comparison between the annual averages of each component, along with its respective global averages for each one of the analysed years.

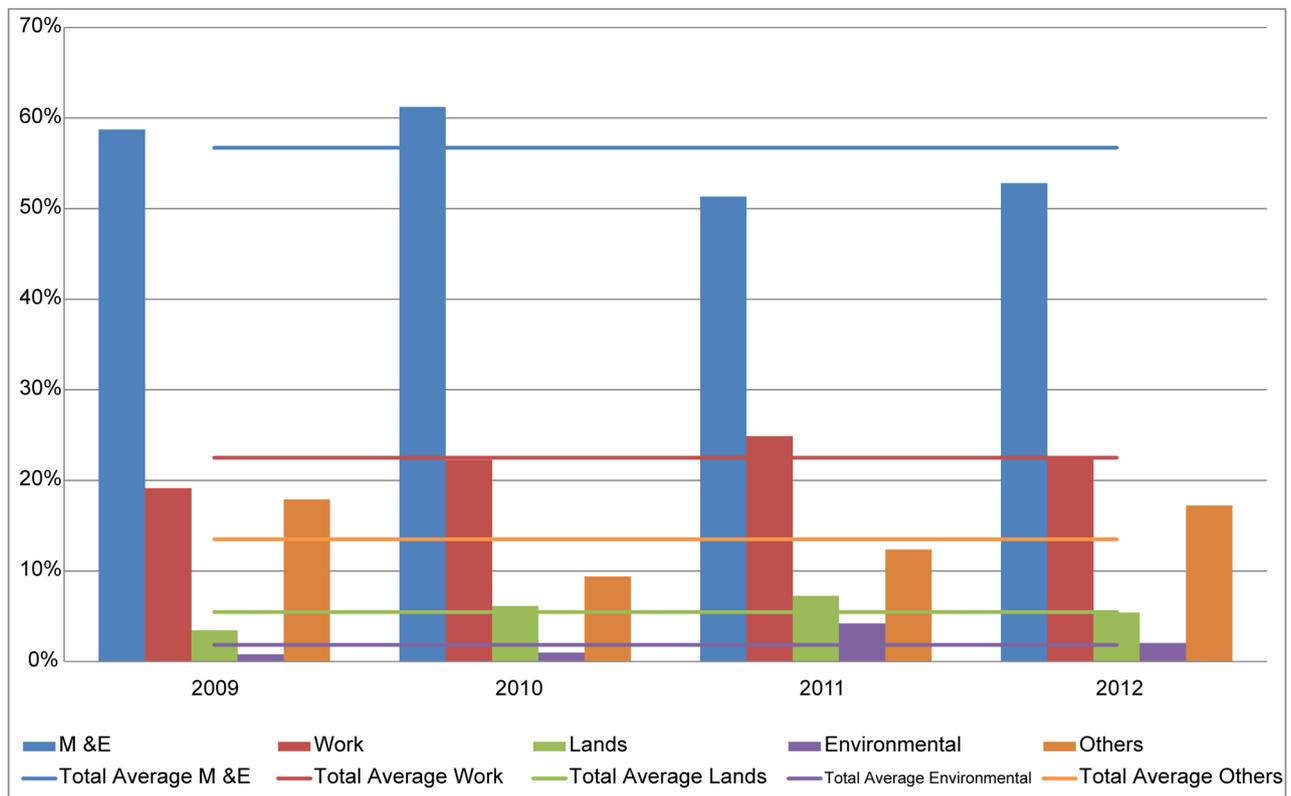
The Lands component represents an average of only 5.46% of the investments, being in some cases inferior to 0.5%. The highest value found has been 41.32%. Expressively low values indicate the possibility that the winning bidder is already the owner of part of the lands needed to some of the projects.

The effective environmental costs average participation was only 1.85%, the largest impact case being represented by 10.48%. Unlike the initial expectations, it has become evident that, even with the fact that ANEELs initial investments valuation methodology does not precisely foresee such land and environmental costs, its impact in the auctions expected YAR is small for both.

Nevertheless, the environmental costs are systematically pointed out by investors as a factor that reduces interest in new auctions [9]. Because of its low real participation in the costs of the projects, it may be inferred that its largest impact refers mainly to the delays in the licensing process, as well as to the impacts of this additional period of time in the financial performance of the projects.

The analysis of these investment data highlights the importance of the others parcel, whose average participation in the investments was of 13.49%. Such costs have been discriminated only by a small part of the companies. They represent a superior parcel when related to costs such as Lands and Environmental Costs summed up. It is noteworthy that, when detailed, the costs which are part of the component "Others" have not included financing interest.

In a general way, numerous cases of great discrepancy are verified in the composition of the investments in relation to the obtained average for all the investments. As a reminder, this is a process which is difficult to standardize because it reflects idiosyncrasies that result from the projects and their respective entrepreneurs.



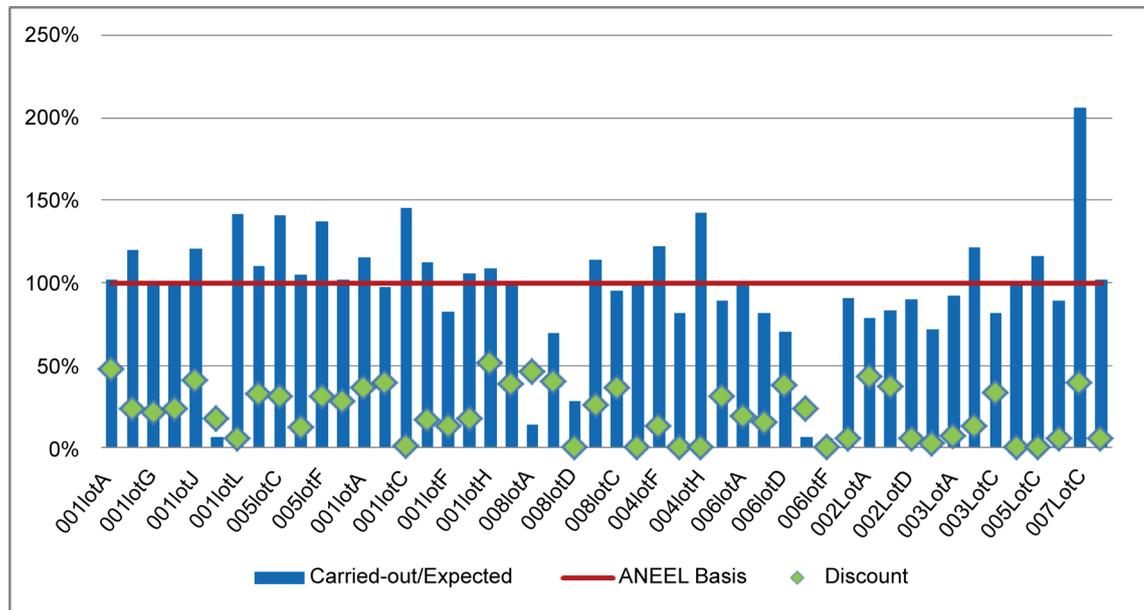
**Figure 4.** Comparison of annual and global averages between 2009-2012 (Source: [8]).

The practiced values informed by the winning bidders are corrected according with the respective dates in which the auctions have taken place. Since the values practiced by the companies are confidential, for the sake of the analysis presented next, the value produced by the initial investments valuation methodology used by ANEEL has been considered as reference. The values practiced by the companies have been compared, in percentage, to the reference value established by ANEEL. **Figure 5** presents the low clearing price in each auction, the value practiced by the winning bidder and the value calculated by ANEEL throughout the period between 2009 and 2012.

It is possible to observe that the behaviour of the real parameter (see **Figure 5**) does not distance much from the reference values calculated by ANEEL. This fact indicates that the calculation of investments obtained through the ANEEL methodology is in accordance with what is expected. Moreover, there is not a correlation between the low clearing prices and the real investments. Another highlight is that it is not possible to evidence tendencies invariable behaviour.

The analysis also relies on evaluations that consider the three types of auctioned projects, such as the comparison between Real investments and investments valued by ANEEL for: Transmission Lines TL, Substations SS and Mixed ones TL + SS.

The analysis of the three types of investments have presented similar results, the majority of the cases being close or surpassing the values expected by the initial investments valuation methodology of ANEEL.



**Figure 5.** Low clearing price, winning bidder real investment and the investment calculated by ANEEL between 2009 and 2012.

For the most part of the projects (56%), the values carried out by the companies are equal or superior to the ones produced by the initial investment valuation methodology used in Brazilian auctions.

In some cases, the real investments that are equal or superior to the ones predicted by ANEELs initial investment valuation methodology are followed by low clearing prices between 40% and 50% in relation to the YARs proposed by ANEEL. On the other hand, auctions with low clearing prices near to null present real investments of an order of 40% superior to the values predicted by the same methodology.

## 5. Conclusions

As can be verified by the analysis, it is not possible to establish a clear correlation among project cost; project location; deadline for project execution; transmission line extension; type of project and the low clearing prices or empty auctions.

Thus, systemic errors related to the technical aspects of the project and its location have not been observed in a manner that allows confirming a discrepancy between real investments and the value calculated by ANEEL.

The analysis of the Equipment and Additional Costs components segmented by types of projects (SS, TL and Mixed) shows that, for each type, the variation in the values of each component for the considered batches rarely surpasses 5%.

The simulations carried out by ANEEL do not have the means to capture the specific conditions of a possible investor, such as:

1. Internal strategies of resource allocation reduction of investments in moments of crisis, investments in moments of resource availability and aptitude for indebtedness;

2. Availability of equipment with costs that are below market value for numerous reasons such as: stock, own production or subsidy;
3. Opportunities derived from the availability of local infrastructure in the location of the project, which allows the implementation or the operation through costs that are inferior to the ones of a new bidder;
4. Vertical organization, which would allow the hiring of assembly, engineering and other services for costs that are inferior to the market value;
5. Unavailability of important players for reasons that do not concern the auctions/projects; and
6. Artificially low offers for the guarantee of a consolidated market, where the one who offers does not want the entrance of new agents.

The internal information of entrepreneurs is generally confidential and strategic, in a way that even if the Agency refined its procedures it would not have the conditions to model such nuances correctly.

In addition, as demonstrated in some studies, the prices of the projects of this nature are dynamic; therefore, a consolidation of the process is not expected. With time, new technologies and materials may cheapen the technical solutions, while land and environmental restrictions may grow.

At the end of the analysis, the values of the investments carried out by the companies have been evaluated considering the values calculated by the initial investment valuation methodology of ANEEL. Even though discrepant values have been identified in some of the informed investments, the analysis of the majority of the cases has allowed the verification that the practiced values approach satisfactorily the values expected by the regulator.

The predictions carried out are close to the reality of the projects and the low clearing prices/empty auctions do not derive from errors in the estimates of this YAR-composing variable. In this sense, the low clearing prices show themselves as a result of a highly competitive process in the auctions, which leads the investors to bid according with strategies that overcome the simple logic of a margin determined by the organizer of the auctions.

In this sense, the transmission line auctions in Brazil have been considered distorted for presenting characteristics that should be avoided in processes of this nature [10], such as the objection to the entrance of interested agents, in this case derived from low YAR values and dumping practice in certain auctions.

The dumping practice stands out in the participation of Brazilian state companies. In a recent case, during an auction without occurrences, a State company offered a low clearing price of 14% for the YAR of a project [2].

Situations such as these create unfavourable conditions to the success of future auctions as well as to the financial sustainability of the projects auctioned for unrealistic values the largest Brazilian state owned company of the sector is going through serious financial difficulties at this moment.

While this type of low clearing price is not healthy, the empty auctions represent a great risk to the Brazilian electrical sector, where an expansion is of 7000 MW per year is necessary until 2013, according to the official data provided by the

Ministry of Mines and Energy [6]. In this context, the empty transmission auctions are part of the impediments to the expansion of the Interconnected Electrical System, making the power plants idle or making the system to operate with restrictions due to lack of transmission capacity.

Therefore, correcting the estimation methodology of YAR ceiling prices, in a manner that guarantees the participation of interested agents, seems to be a more important concern.

This is due, particularly, to the demonstrated fact that, in the occurred auctions, the low clearing prices take place independently from the YAR ceiling price being close or not to the values effectively carried out by the companies, which count on other mechanisms and internal strategies to set bounds for its offers. Since the capital cost calculated by ANEEL is defined based on historical averages, many times it becomes excessively risky for the investor to compromise with the investments, according with the context present in the capital markets.

Next, propositions and suggestions are pointed out, concerning possible improvements in the process of using the Price Reference Database (DB) based on the analysis carried out by this work.

**Finer Technical Detailing of the Bids Terms and Conditions:** Broadening the technical detailing of the terms and conditions of the bids in a way that the modelling of each auction lot does not demand interferences nor unavailable information in the respective terms and conditions.

**New Evaluation of the Market:** It is recommended, as part of the periodic actions, a new research of the market for updating the Price Reference DB. Considering that the last update has taken place in 2009, a new research may capture cost variations deriving from not only the market conditions but also from the technological evolution of the period. That can also enrich the options in terms of equipment or available configuration that cannot be obtained through the correction of values related to the elements that already exist in the DB, with the application of market indexes such as IGP-M or IPCA.

**Study of the Auctioned and the projects Carried-out Project.** The analysis of the values practiced by the companies has proven itself of fundamental importance to the evaluation of the results produced by ANEEL DB. As previously presented, the “Other” component has major importance in the composition of the real investments and it needs to be better known and detailed. Equally, the detailing of the other components would allow the proposing of corrections and adjustments in the modelling of the ME, MC, AC and IWP components as well as the validation of the modelling used in the DB.

**Application of Different Correction Indexes:** The creation of a model in DB, and in other derived alterations, is recommended for the application of different correction indexes due to the nature of the modelled quantities. In addition to the entrance for the charging (in the software) of numerous correction indexes, the composition of this tool involves anew modelling of the MC and the AC components requiring their detailing, which is currently unavailable. The study

and systematization of the projects carried-out project could contribute to this task.

Creation of a Database of Carried-Out Auctions: An interesting tool for the management of the TEs auctions process would be the creation of a database of carried-out auctions.

This would store and systematize the information that is pertinent to the bidding process from the valuation until the project execution, such as:

1. Data record and calculation record of the auction: Terms and conditions, Price Reference DB Tables, Investment Tables, YAR Tables and other used data;
2. Data of winning companies; and
3. Real investment data, which may be tackled by the aforementioned suggestion of study.

Creation of a Model Company: Establishment of a model company to serve as benchmark in a market that has not yet achieved the necessary maturity for the carrying out auctions, as they take place in the current format. The systematization of this set of data since the disclosure of auction terms and conditions and all the means for carrying-out the investment would allow, for instance, the creation of indexes to evaluate the process as a whole, considering the investment values predicted by the Price Reference DB, the low clearing prices, the empty auctions and the values effectively carried out. This systematized set of information and indexes would facilitate the answer to some questionings, the identification of necessary improvements and of discrepant cases, as well as the delimiting of future processes.

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