

General Systematics of Brazilian Energy Auctions

Energy auctions are market mechanisms that seek to increase the efficiency of energy contracting. In Brazil, they are the most important method for contracting energy. Through this mechanism, concessionaires, permittees, and authorized companies in the electricity distribution public service who take part in the National Interconnected System (*Sistema Interligado Nacional*, or SIN) ensure that the entire Unregulated Market (*Ambiente de Contratação Regulada*, or ACR) is serviced.

Energy auctions are conducted by the Electrical Energy Trading Chamber (*Câmara de Comercialização de Energia Elétrica*, or CCEE), by a delegation of the National Agency of Electric Energy (*Agência Nacional de Energia Elétrica*, or ANEEL), and the criteria used to define the auction's winners is the lowest rate, in order to ensure efficiency in energy contracting.

Due to ANEEL's delegation, the CCEE currently holds the following auctions:

- **New Energy Auction (*Leilão de Energia Nova*, or LEN)** – The purpose of the new energy auction is to meet the distributors' voltage increase. In this case, energy from plants that are yet to be built is sold and contracted.
- **Renewable Energy Auction (*Leilão de Fontes Alternativas*, or LFA)** – The renewable energy auction was instituted with the goal of meeting the market growth in the regulated market and increasing the participation of renewable sources in Brazil's energy mix.
- **Reserve Energy Auction (*Leilão de Energia de Reserva*, or LER)** – The contracting of reserve energy was created to increase security in the SIN's electric power supply, with energy coming from plants contracted specifically for this purpose – whether from new generation ventures or already existing ones.
- **Existing Energy Auction (*Leilão de Energia Existente*, or LEE)** – The existing energy auction was created to contract energy generated by plants that have already been built, which are in operation, and whose investments have already been offset – hence, cost less.
- **Adjustment Auction (*Leilão de Ajuste*, or LA)** – Adjustment auctions seek to customize energy contracting by the distributors, dealing with eventual deviations arising from the difference between the predictions made by distributors in previous auctions and their market's behavior.

In order to participate in these auctions, interested parties should observe the respective guidelines presented in the public notice, its annexes, and addendums, as well as pay the financial bonds associated with the auctions, according to the phase and type of auction, classified as:

- **Bid Bond:** value paid by the buyer and selling proponents to the escrow agent, for the purpose of participating in the energy auction.
- **Performance Bond:** value to be paid by the selling proponent or contractor to the escrow agent in order to ensure compliance with the obligations incurred in the energy auction.

The payment of these bonds varies according to the participant's profile and the type of auction, as seen in the table below:

	LEN and LFA		LER		LEE		LAJ	
	Seller/ Winner	Buyer	Seller/ Winner	Buyer	Seller/ Winner	Buyer	Seller/ Winner	Buyer
Bid Bond	•	•	•		•	•	•	
Performance Bond	•		•					

After the publication of the auction's opening, ANEEL publishes an order with the basic guidelines for the parties who are interested in participating as sellers or buyers, presenting the information about registration and technical qualification, the auction's public notice (which will be published afterward), the agreements, the systematics – the set of rules that define the auction's mechanism – through which the auction shall happen, and the distributing agents' declaration of needs.

The published public notice will present the following items in detail:

- The auction's object
- Participation and deterrents
- Proposal conditions
- Auction stages
- Document presentation
- Requests for clarification
- Auction registration
- Bond to participate in the auction
- Sellers and buyers apt to participate in the auction
- Auction bidding phase
- Qualification
- Approval and adjudication
- Performance bond
- Awarding conditions
- CCEAR signing conditions
- Penalties, resources, and final considerations

The systematics adopted for the auctions (especially the new and existing energy auctions) provide an evaluation by the developer regarding the share that will be contracted – if, for instance, it will effectively cover their costs and if it will be advantageous to sign an agreement for that specific auction.

On average, auctions consist of three stages. On the first stage, called the **initial stage**, the selling proponents will make a single bid. During this stage, the network's dispatch capacity is being disputed.

On the second stage, called the **continuous stage**, the product is negotiated and the participants may, at any moment, make bids whose prices are equal to or lower than the current price minus the minimum decrement – or, in case the participant has a valid bid, their own price minus the minimum decrement, considering the quantity

lots submitted in the initial stage. This stage ends when no bids are submitted for a certain period of time, meaning, when the auction is no longer active.

Only the seller whose marginal venture has completed the required amount for the product will participate in the third and final stage, called the **bid confirmation stage**. This seller must confirm their bid so that the number of lots that complete the product's amount is equal to the product's required amount minus the sum of the other lots met.

In case the seller does not confirm their bids during this stage, all the bid's lots associated with the marginal venture that has completed the product's required amount will not be considered.

It is also required that the venture interested in the auction follows a schedule, which generally brings the following items:

For wind power ventures (EOL)

MILESTONE DESCRIPTION
Obtaining the Environmental License for Installation – LI
Confirming the payment of capital or acquisition of financing regarding at least 20% (twenty percent) of the amount needed for implementing the venture
Confirming the acceptance of a contractual instrument for supplying wind turbines or engineering, procurement, and construction
Starting implementation of the work site
Starting construction of structures
Starting concreting the generating units' bases
Starting assembling the generating units' towers
Starting the substation and/or the restricted interest transmission line works
Completing the assembly of generating units' towers
Obtaining the Environmental License for Operation – LO
Starting the test operation (inserting a line for each generating unit or group of generating units)
Starting the commercial operation (inserting a line for each generating unit or group of generating units)

For solar photovoltaic ventures (SOL)

MILESTONE DESCRIPTION
Obtaining the Environmental License for Installation – LI
Confirming the payment of capital or acquisition of financing regarding at least 20% (twenty percent) of the amount needed for implementing the venture
Confirming the acceptance of a contractual instrument for supplying photovoltaic panels or engineering, procurement, and construction
Starting construction of structures
Starting assembling the photovoltaic panels
Starting the substation and/or the restricted interest transmission line works
Completing the assembly of photovoltaic panels
Obtaining the Environmental License for Operation – LO
Starting the test operation (inserting a line for each generating unit or group of generating units)
Starting the commercial operation (inserting a line for each generating unit or group of generating units)

The lots met by the end of the auction imply an unconditional obligation to accept the Agreements of Electrical Energy Trading in the Regulated Market (*Contratos de Comercialização de Energia Elétrica no Ambiente Regulado*, or CCEAR) at trading prices (quantity product) or fixed revenue (availability product) associated to the lots met.

In addition to the CCEAR, the venture that wins the auction must sign other agreements, listed below, depending on the connection point.

To access the basic network:

- Agreement for Using the Transmission System (*Contrato de Uso do Sistema de Transmissão*, or **CUST**) and
- Agreement for Connecting to the Transmission Installations (*Contrato de Conexão às Instalações de Transmissão*, or **CCT**)

To access the distribution systems:

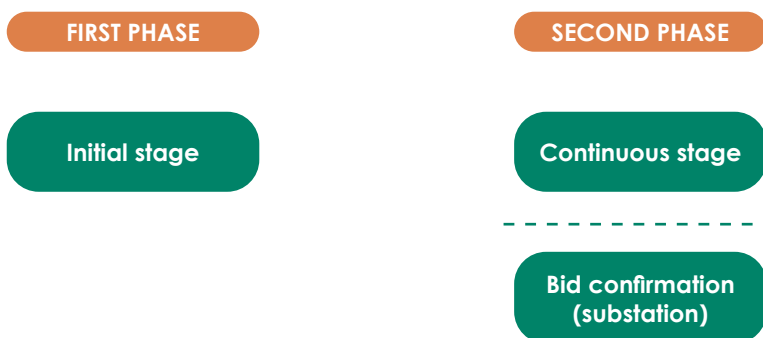
- Agreement for Using the Distribution System (*Contrato de Uso do Sistema de Distribuição*, or **CUSD**) and
- Agreement for Connecting to the Distribution System (*Contrato de Conexão ao Sistema de Distribuição*, or **CCD**) or
- Agreement for Connecting to the Transmission Installations (*Contrato de Conexão às Instalações de Transmissão*, or **CCT**)

Systematics

Every energy auction follows systematics, meaning, a step-by-step process for the auction to happen irreproachably and not allowing the favoring of any particular venture. All participants must follow the systematics, which will be defined in the specific public notice. The step-by-step process applied for the latest new energy auctions is explained in better detail below.

The auction is to be held through a system¹, by employing information technology resources and communication through the World Wide Web – or the Internet.

The auction is comprised of two phases, which are subdivided as such:



¹ Place where the forms for registering in the auction will be made available and where the other stages happen. The link to access the system is presented along with the auction's public notice.

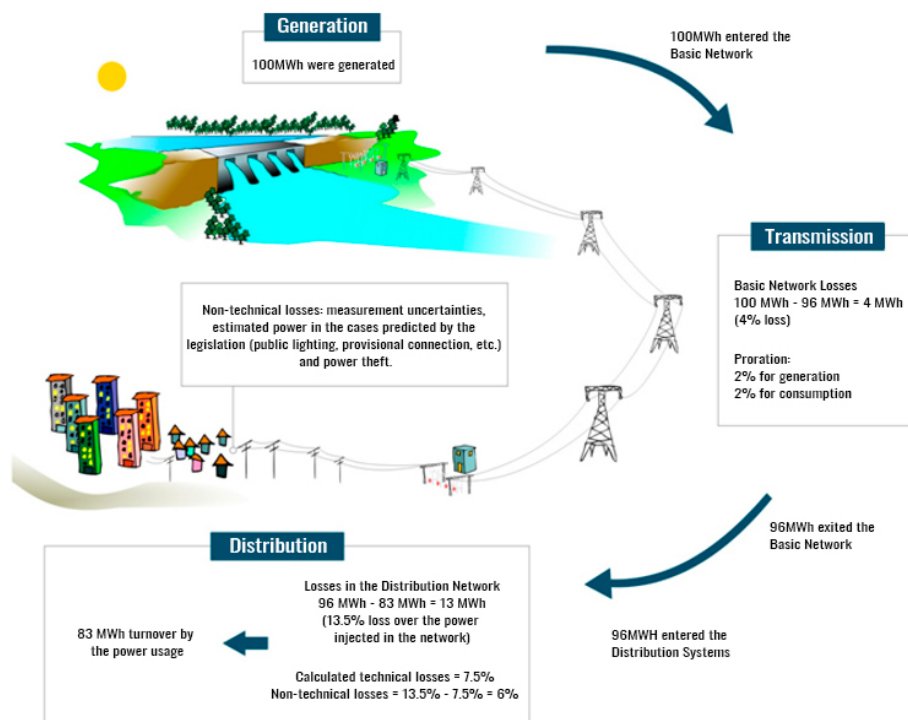
I – FIRST PHASE

Initial Stage

The auction's first phase is comprised of the initial stage, where the selling proponents can submit a single bid for each one of the ventures qualified in the public notice. The system will accept bids for each product simultaneously.

On the first phase, the selling proponents will define the amount that will be sold in the auction in lots. The sellers must submit a single bid of bidding price or fixed revenue, considering the reference price and the number of lots for each venture, as well as inform the internal consumption and the basic network losses, in lots.

Example:



Source: ANEEL

The purpose of deducing the declared losses² is to avoid problems in the verification of penalties. In the initial stage, the bid will correspond to the offer of:

- Number of lots: lower than or equal to the selling coverage and the highest value between 30% of qualified energy and 0.5 MWavg.
- Bidding price for ventures with NO awarding: with a bidding price lower than or equal to the product's initial price.
- Bidding price for ventures WITH awarding AND agreement: with a bidding price lower than or equal to the reference price.

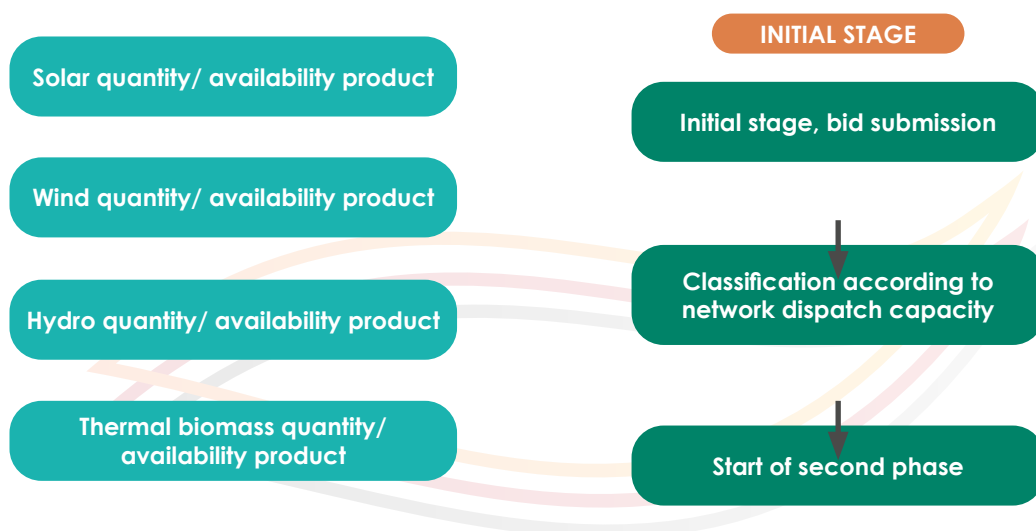
When the deadline for making a bid during the initial stage is over, the system will classify the bids of ventures that dispute access to the SIN, in ascending order of bidding price, considering the network's dispatch capacity.

² Correspond to the transmission systems' losses.

It is worth pointing out that the National Electric System Operator (*Operador Nacional do Sistema Elétrico*, or ONS) and the Energy Research Company (*Empresa de Pesquisa Energética*, or EPE) are responsible for calculating the network's dispatch capacity and that the classification order will take into account the injected power, in the case of biomass plants, and power, for the other plants.

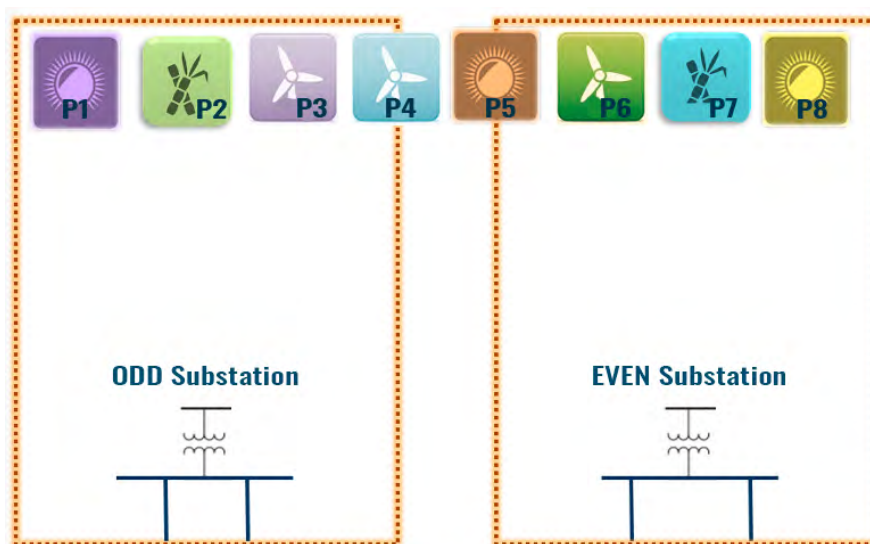
After classifying the ventures that will move on in the auction, the second phase can begin.

Another important point is that the bidding price for the quantity product is given in R\$/MWh, and the fixed revenue for the availability product is given in R\$/year, converted into R\$/MWh by the Cost Benefit Index (*Índice Custo Benefício*, or ICB).



Below, we see an example of how the initial stage unfolds. The values presented are for demonstration purposes only and should not be used as reference.

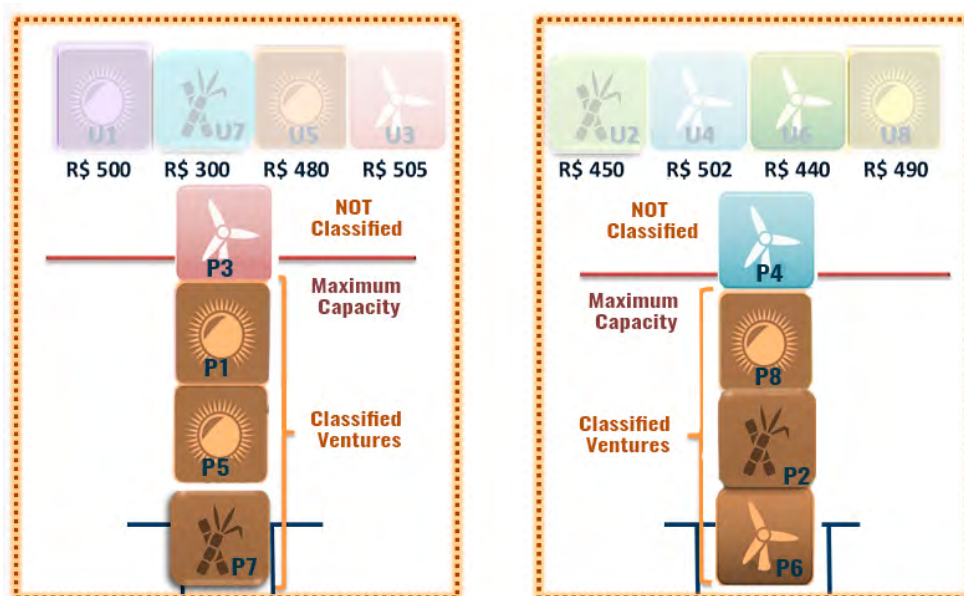
In the presented scenario, eight ventures were qualified for the first phase: three for solar source, two for biomass source, and three for wind source.



Source: ANEEL

Plants 1, 3, 5, and 7 will dispute access to the odd substation, and plants 2, 4, 6, and 8 will dispute access to the even substation.

The classification will be done according to substation and order of price (ascending); the red line corresponds to the network's maximum dispatch capacity:



Source: ANEEL

For the odd substation, ventures 7, 5, and 1 will be classified, and 3, which surpassed the maximum capacity, will not.

For the even substation, ventures 6, 2, and 8 will be classified, and 4 will not, since it surpassed the network's maximum dispatch capacity.

Ventures classified in the first phase may dispute the second phase. It is also worth remembering that the bids associated with ventures that were not classified in the initial stage will be considered as excluded lots and are not allowed to be submitted for bids in the next stage.

It is important to observe that bids associated to the ventures whose selling proponents have accepted and presented the CUST and CCT agreements to access the basic network, or the CUSD and CCD or CCT to access the transmission systems, will also be classified, regardless of the SIN's remaining capacity for generation dispatch.

However, even the ventures that fit these conditions must make a bid on the first phase in order to ensure their classification for the second phase.

II – SECOND PHASE

The auction's second phase predicts the dispute of the products simultaneously, and consists of the continuous stage and the bid confirmation.

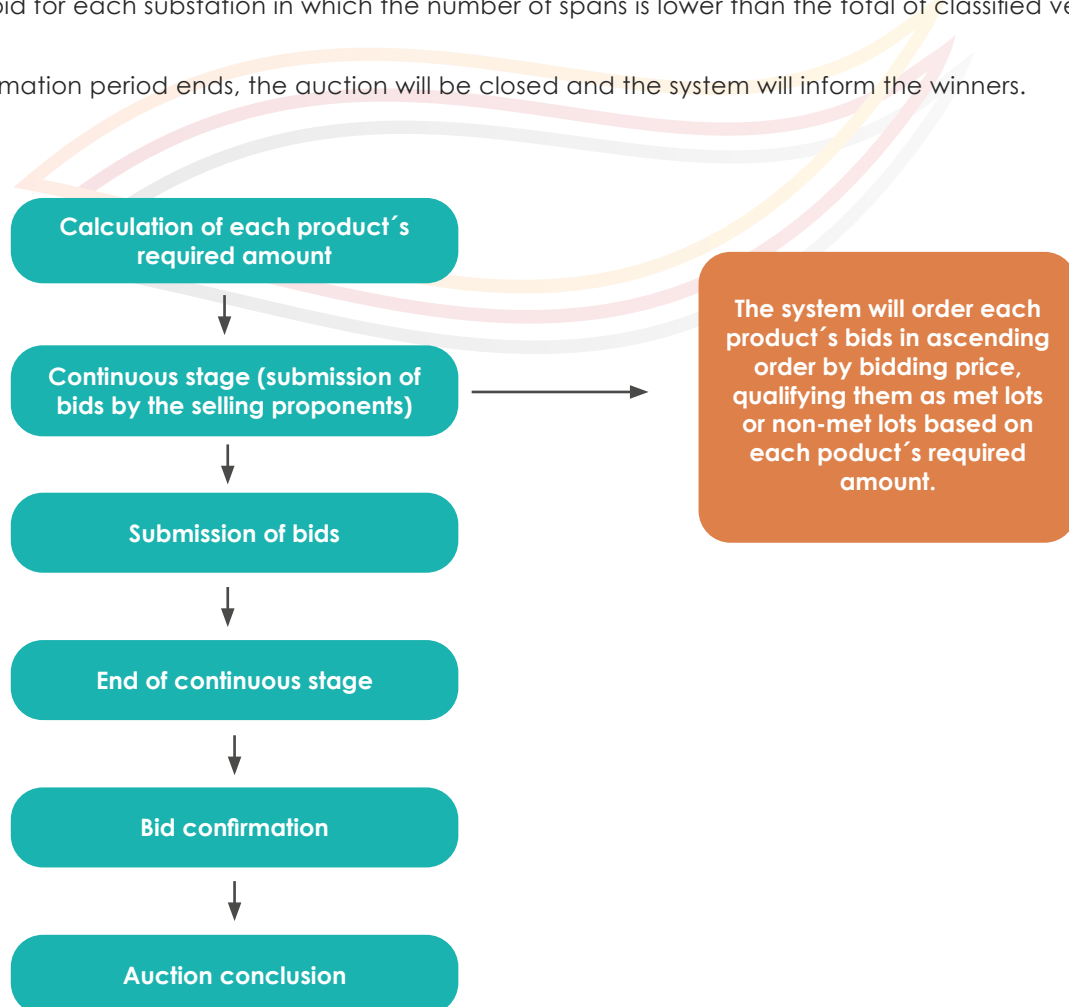
In the beginning of the second phase, the system will calculate each product's required amount. After that comes the continuous stage, where the selling proponents will submit bids associated to the number of lots offered during the initial stage.

For each bid submitted, in any of the products, the system will restart the time and order each product's bids, in ascending order by bidding price, qualifying them as met lots or non-met lots, based on each product's required amount.

If the time for inserting a bid ends with no bids submitted, the continuous stage is concluded.

After conclusion of the continuous stage, the system will verify the classified ventures as met lots and can begin confirming the bid for each substation in which the number of spans is lower than the total of classified ventures.

When the confirmation period ends, the auction will be closed and the system will inform the winners.



All data inserted must be trackable.

For each venture, the number of offered lots must respect, cumulatively, the limit corresponding to:

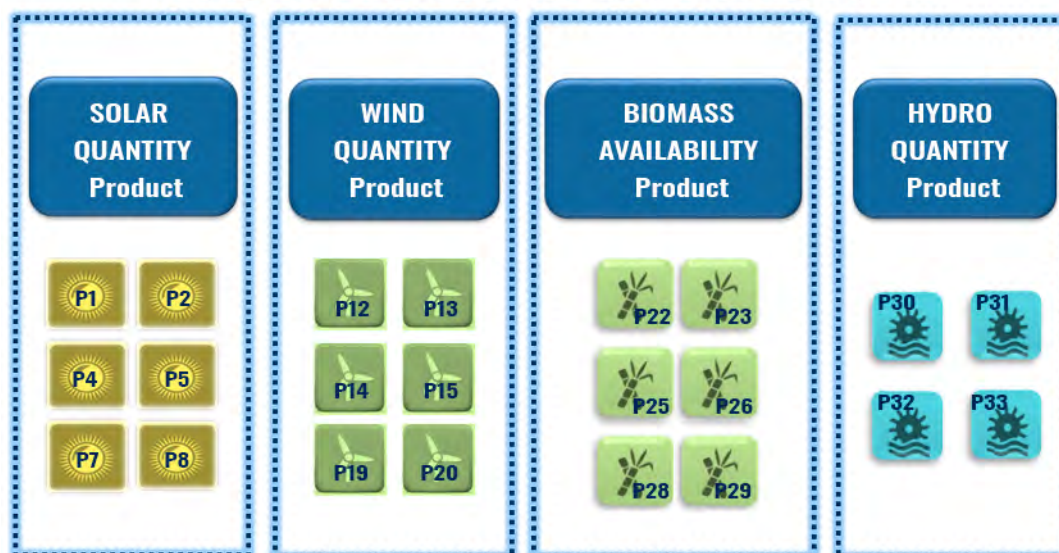
- I – The selling coverage; and
- II – The number of lots offered in the first phase's initial stage.

When calculating the selling coverage, the internal consumption amount and losses in the basic network will be discounted from the guaranteed power output.

The selling proponent is exclusively responsible for the bidding price and the fixed revenue, regardless of the number of lots offered.

Below, we present an example of how the second phase unfolds. The values presented are for demonstration purposes only and should not be used as reference.

Ventures Classified for the Second Phase



The process for all the products will happen simultaneously

Source: CCEE

In order to make the understanding easier, we will only use the numeric example of one product – solar; however, the process happens simultaneously for all products.

For each product, the system will calculate the required amount. In our example, the required amount is 400 lots, with a total offer of 737 lots, considering the ventures classified for the second phase:

SOLAR PRODUCT	
Total Offer	737
Required Amount	400
Met Lots	467

↑

Source: CCEE

Lots relating to the bid that completes the product's required amount will be fully classified as met lots, even if this makes the number of lots higher than the product's required amount.

This happened with solar venture 07, which ended up with 67 met lots over the limit:

SOLAR PRODUCT		
BIDS		
Venture	Lots	Price
SOLAR 02	69	109.00
SOLAR 05	80	100.00
SOLAR 03	55	98.00
SOLAR 01	59	98.00
SOLAR 07	99	95.50
SOLAR 06	94	95.00
SOLAR 04	97	95.00
SOLAR 08	99	92.00
SOLAR 09	78	90.00

Source: CCEE

Classification will be made based on the bidding price by ascending order and the number of lots. In case there is a tie between bidding prices, the tiebreaker will be done by descending order of the number of offered lots and, in case the tie persists, by chronological order of bid submissions.

SOLAR PRODUCT		
BIDS		
Venture	Lots	Price
SOLAR 02	69	109.00
SOLAR 05	80	100.00
SOLAR 03	55	98.00
SOLAR 01	59	98.00
SOLAR 07	99	95.50
SOLAR 06	94	95.00
SOLAR 04	97	95.00
SOLAR 08	99	92.00
SOLAR 09	78	90.00

Source: CCEE

Solar venture 04 was classified first.

When the continuous stage starts, the selling proponents are able to make bids associated to the number of lots offered on the initial stage, observing the current price, the decrement, and the new current price.

Each product's current price will be updated at each bid and will be equal to the bidding price for the marginal venture that completes the product's required amount. In our example, the marginal venture is solar 07, and the current price at this moment is R\$ 95.50.

SOLAR PRODUCT		
BIDS		
Venture	Lots	Price
SOLAR 02	69	109.00
SOLAR 05	80	100.00
SOLAR 03	55	98.00
SOLAR 01	59	98,00
SOLAR 07	99	95.50
SOLAR 06	94	95.00
SOLAR 04	97	95.00
SOLAR 08	99	92.00
SOLAR 09	78	90.00

Source: CCEE

From the current price, the decrement will be subtracted – which, in the example, is 50 cents. Thus, for the ventures that did not have their lots met, this price is the indicator for new bids to be submitted (ventures 01, 03, 05, and 02), as long as they are lower than or equal to the new current price, which will be R\$ 95.00.

SOLAR PRODUCT	
Total Offer	737
Required Amount	400
Met Lots	467
Current Price (R\$/ MWh)	95.50
Decrement (R\$/ MWh)	0.50
New Current Price (R\$/ MWh)	95,00

Source: CCEE

If the ventures that had their lots met (solar ventures 09, 08, 04, 06, and 07) still choose to submit a new bid, this must be, at least, the result of their last valid bidding price minus the decrement.

Let us use solar venture 08, that had a bid of R\$ 92.00, as an example. If it chooses to submit a new bid, even as already being met, the bid must be lower than or equal to R\$ 91.50.

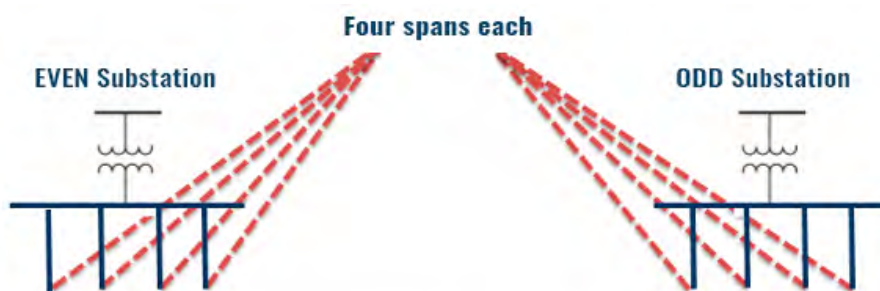
SOLAR PRODUCT		
BIDS		
Venture	Lots	Price
SOLAR 02	69	109.00
SOLAR 05	80	100.00
SOLAR 03	55	98.00
SOLAR 01	59	98.00
SOLAR 07	99	95.50
SOLAR 06	94	95.00
SOLAR 04	97	95.00
SOLAR 08	99	91.50
SOLAR 09	78	90.00

This data dynamics will continue until the end of the auction and the price is updated with each venture's bidding. Hence, the developer should pay close attention when submitting a bid, because the price might already have been altered even before they do so.

Source: CCEE

When the continuous stage ends, the confirmation stage begins (if needed, because it will only take place if the number of spans, or accesses, in the substation is lower than the total number of classified ventures).

Here's an example for better visualization:



SUBSTATIONS	
EVEN Substation	ODD Substation
SOLAR 06	SOLAR 01
SOLAR 08	SOLAR 05
WIND 12	SOLAR 09
WIND 14	WIND 17
WIND 20	---

Source: CCEE

In the example, only the ventures in the even substation will have to confirm the bid. When doing so, the selling proponents will express their agreement to use, at their own risk, a shared connection, in the terms and guidelines specified in the auction's public notice.

The selling proponents who don't confirm their bid will have their lots considered as non-met.

With confirmation finished, the system will end the auction and disclose results for all phases.

SYSTEM CONFIGURATION

- The following items will be validated in the system before the auction begins:
- Each product's initial price;
- Reference prices for:
 - a) Hydropower venture, when appropriate; and
 - b) Venture with awarding with agreement;
 - Each venture's minimum percentage;
 - The values corresponding to each venture's qualified energy, in lots;
 - The auction's duration time;
 - The time for making a bid;
 - The final time for making a bid;
 - The percentage decrement;
 - The requirement parameter;
 - The sources' parameters;
 - The declared amount;
 - The value corresponding to the guaranteed power output, expressed in average megawatt (MWavg), for each venture;
 - The value corresponding to the voltage, expressed in megawatts (MW), for each venture;
 - The value corresponding to the injected power, expressed in megawatts (MW), for each thermoelectric biomass venture;
 - The value corresponding to the installed power, in direct current, expressed in megawatt-peak (MWp), for each solar photovoltaic venture;
 - The short-term economic cost for each venture whose energy is negotiated through the availability product;
 - The variable cost of operation for each venture whose energy is negotiated through the availability product;
 - Information about contracting the distribution or transmission system for use;
 - Distribution substation of each venture's connection to the SIN;
 - Each distribution substation's capacity, expressed in MW;
 - The eligible busbar of each venture's connection to the SIN;
 - Each eligible busbar's capacity, expressed in MW;
 - The number of spans of each eligible busbar and each distribution substation, expressed in a positive natural number;

- The SIN's subarea where each eligible busbar and each distribution substation are located;
- The capacity of each of the SIN's subareas, expressed in MW;
- The SIN's area where each of the SIN's subarea is located; and
- The capacity of each of the SIN's areas, expressed in MW.

Among the information entered in the system, the following will be made available for the selling proponents:

- The selling coverage for their respective ventures;
- The product's initial price;
- The reference price for their respective hydropower ventures, when appropriate;
- The reference price for their respective ventures with awarding with agreement;
- The minimum percentage of their respective ventures;
- The current price;
- The minimum decrement;
- The distribution substation and the eligible busbar in which the venture will dispute capacity on the first phase and their respective subarea and area of the SIN.

CONCLUSION, DISCLOSURE OF RESULTS, AND ACCEPTING THE CCEAR

Observing the qualification conditions established by ANEEL, the lots met by the end of the auction have an unconditional obligation to accept the respective CCEAR, based on the lots met, between each one of the buyers and sellers. Each CCEAR must contain:

- Final selling price, for ventures whose energy is negotiated in the quantity products; or
- Fixed revenue, for ventures whose energy is negotiated in the availability products.

The final selling price of other ventures will be the winning bid's price. After the auction is concluded, the system will, according to the systematics' details:

- Assess the negotiated lots by product for the purpose of accepting the respective CCEARs between each winner and all buyers, proportionately to the amounts negotiated and the required amounts, respectively; and
- Assess the fixed income for the purpose of accepting the respective CCEARs between buyers, proportionately to the required amounts, for ventures whose energy is negotiated in the availability product.

The results, disclosed immediately after the auction is concluded, can be altered according to the qualification process promoted by ANEEL, as predicted in the public notice.

