BIOELECTRICITY

BOOKLET

SUCRE PROJECT

APRIL 2020

Overcoming regulatory barriers for supplying electricity from the sugarcane industry

excelência energética

UNICA

UNDP

gef
GLOBAL ENVIRONMENT FACILITY
INVESTING IN OUR PLANET

SUCRE

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brazilian biorenewables national laboratory

ABOUT SUCRE PROJECT

The SUCRE (Sugarcane Renewable Electricity) Project is primarily designed to **increase the production of electricity with low greenhouse gases (GHG) emission using the sugarcane straw** made available during the crop harvest. SUCRE team has been working on identifying and solving issues that hinder partner mills from fully and systematically generating electricity. Beginning in June 2015, it is a total five years of Project, with funding of around US$ 7.5 million from Global Environment Facility (GEF) and a counterpart from the Brazilian Center for Research in Energy and Materials (CNPEM) of over US$ 3 million. The recovery and use of straw for electricity production in the private sector triggered an investment of approximately US$ 160 million by partner plants (a major part of which has already been done through the installation of dry cleaning systems, refurbishment or purchase of boilers, turbogenerators, balers and other pieces of equipment). The initiative is managed through a partnership with the United Nations Development Programme (UNDP) and is carried out by the Brazilian Biorenewables National Laboratory (LNBR), which is part of CNPEM.

ABOUT LNBR

The Brazilian Biorenewables National Laboratory (LNBR) is part of the Brazilian Center for Research in Energy and Materials (CNPEM), a non-profit private organization that operates under Contract Management with the Brazilian Ministry of Science, Technology, Innovations and Communications (MCTIC). LNBR uses Brazilian biomass and biodiversity to solve key scientific and technological challenges by employing high-performance biological platforms of industrial relevance for the sustainable development of advanced biofuels, biochemicals and biomaterials. The Laboratory has a history of technology development in partnership with companies, including start-ups. Among LNBR open-access facilities one finds a Pilot Plant for Process Development, a unique facility for scaling up of technologies.

ABOUT CNPEM

The Brazilian Center for Research in Energy and Materials (CNPEM) is a non-profit private organization under supervision of the Brazilian Ministry of Science, Technology, Innovation and Communications (MCTIC). Located in Campinas, São Paulo, the Center is comprised of four laboratories, worldwide references in their fields, which are open to the scientific and business communities. The Brazilian Synchrotron Light Laboratory (LNLS) is currently assembling Sirius, the new Brazilian electron accelerator. The Brazilian Biosciences National Laboratory (LNBio) is dedicated to solving challenges in the areas of health. The Brazilian Biorenewables National Laboratory (LNBR) is focused on biotechnological solutions for the sustainable development of advanced biofuels, biochemicals and biomaterials, using biomass and the Brazilian biodiversity. Finally, the Brazilian Nanotechnology National Laboratory (LNNano) conducts scientific research and technologic development into solutions based on nanotechnology. The four Laboratories also have their own research projects and participate in the transversal research agenda coordinated by CNPEM, which articulates scientific facilities and capabilities around strategic themes.

INTRODUCTION

This publication examines the Regulatory Framework for the Brazilian electricity sector concerning the sugarcane biomass energy trade by mills in the sugar-energy sector, with an emphasis on the use of straw to generate additional electricity. This document was prepared in order to: clearly and explicitly explain the regulatory model of the national electricity system; show how biomass energy is positioned in this system; point out the main barriers to expanding generation with biomass; and propose alternatives to overcome these barriers.

This booklet was created by the SUCRE (Sugarcane Renewable Electricity) Project in association with the electric energy consultancy company Excelência Energética (Energy Excellence) and with the Brazilian Sugarcane Industry Association (UNICA).

The SUCRE Project collaborated with partner mills that use or are interested in using straw to generate electricity, coming up with solutions that enhance this generation to the complete extent of available technology. It is an initiative implemented by the National Laboratory of Biorenewables (LNBR), one of the four National Laboratories that comprise the National Center for Research in Energy and Materials (CNPEM), a social organization supervised by the Ministry of Science, Technology, Innovation and Communications (MCTIC). The Project was financed by the Global Environment Facility and managed in partnership with the United Nations Development Program (UNDP).

The project was executed during five years beginning in June 2015, with funding of around US$ 7.5 million from the GEF (Global Environment Facility) and a co-funding from the National Center for Research in Energy and Materials (CNPEM) of over US$ 3 million. The collection and use of straw for electricity production in the private sector triggered an investment of approximately US$ 160 million by partner plants (a major part of which has already been done through the installation of dry cleaning stations, retrofitting of existing industrial facilities or purchase of new boilers, turbogenerators, balers and other industrial equipment).

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SUCRE PROJECT

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ELECTRICITY FROM STAW

A revolution in the field

MECHANICAL HARVESTING WITHOUT BURNING

In addition to improvements in working conditions and increasing yields, mechanizing the harvesting process makes it possible to harvest sugarcane without burning, with significant benefits to the environment through a reduction in emissions. Harvesting without sugarcane burning has also resulted in benefits for soil conservation, because the straw left in the field allows the erosion control and maintenance of soil moisture in hot and dry areas, contributes to an increase in organic matter and nutrients in the soil, and assists in controlling weeds.

A NEW FUEL SOURCE

The total amount of straw produced by the sugarcane is similar to the amount of bagasse (fibrous residue) produced in the cane processing. In a sugarcane field producing 100 metric tons per hectare (t/ha) of sugarcane, there is around 14 t/ha of dry straw. The benefits for the soil and for the cultivation of sugarcane are achieved by leaving around 7 t/ha of straw (reference value, considering that there may be variations depending on local soil conditions and climate), which opens the opportunity to use the rest of the straw as fuel in energy production.

STRAW: COMPLEMENT TO BAGASSE

Using efficient power generation systems that have boilers and turbogenerators operating at steam pressures above 65 bar, the sugar-energy sector has the potential to export up to 70% more electricity to the consumer grid, using 50% of the available straw in the field in addition to the bagasse.

STRAW COLLECTION: BALING

Thanks to its compactness and standardization of form, baling has proven to be an appealing alternative for collecting straw. The system involves a combination of operations: windrowing, baling, collecting bales, transporting, off-loading at the mill, debaling, removal of soil and shredding the straw.

STRAW COLLECTION: INTEGRAL HARVEST

Integral or partial harvesting is another alternative for collecting straw. It involves reducing the ventilation of the harvester extractors, thus removing less straw during the sugarcane harvest. A certain amount of straw is transported with the cane to the mill, where it is separated through a Dry Cleaning System. Once separated, the straw has to be shredded in order to be burned in the boilers.

SUCRE PROJECT

Sugarcane Renewable Electricity

Despite the energy advantages, the use of straw is subject to significant technical and cost challenges, given its low density, geographical dispersion and high mineral impurity content.

Implemented by the Brazilian Biorenewables National Laboratory (LNBR) from the Brazilian Center for Research in Energy and Materials (CNPEM), the SUCRE (Sugarcane Renewable Electricity) Project appeare in this context in order to evaluate and offer solutions that create conditions to increase the export of renewable electric energy by the mills, with low emission of greenhouse gases, using straw as a complement to the sugarcane bagasse. As such, SUCRE acts on the technological, economic, agronomic, environmental, regulatory challenges and promoting the use of straw.

COMMERCIALIZATION

Energy auctions and the regulated market

REGULATED CONTRACTING ENVIRONMENT (ACR) REGULATED MARKET (ENERGY AUCTIONS)

LOWER PRICE VOLATILITY

The ACR was created with rules that provide greater protection for small-scale consumers, with regulated tariffs and tariff moderateness (minimum cost) that are achieved through the purchase of energy by distributors in auctions regulated by the Federal Government. This is done so that these consumers are not exposed to unpredictable energy prices, due to the inability to control the rules and properly manage their contractual relations with the distributors.

NEW AND OLD ENERGY

ACR features two types of energy purchase contracts depending on the development stage of the projects: electric energy auctions from existing generation plants – old energy auctions – and electric energy auctions from new generation projects – new energy auctions. Purchase and sale contracts for electricity in the regulated environment (Electric Energy Trading Contracts in the Regulated Environment- CCEAR) from existing energy can be signed with duration ranging from 1 to 15 years, while the duration varies between 15 and 35 years for energy from new power plants. For the biomass source, contracts stemming from new energy auctions are usually signed for 20 or 25-year periods.

CONTRACTING IN ADVANCE

In order to secure a future supply of energy, new energy auctions are held 3 to 7 years in advance of the start of supply at the auction so that there is enough time to implement the project. For instance, A-4 and A-6 auctions are held 4 and 6 years before the start date for electricity supply, as per the auction contract.

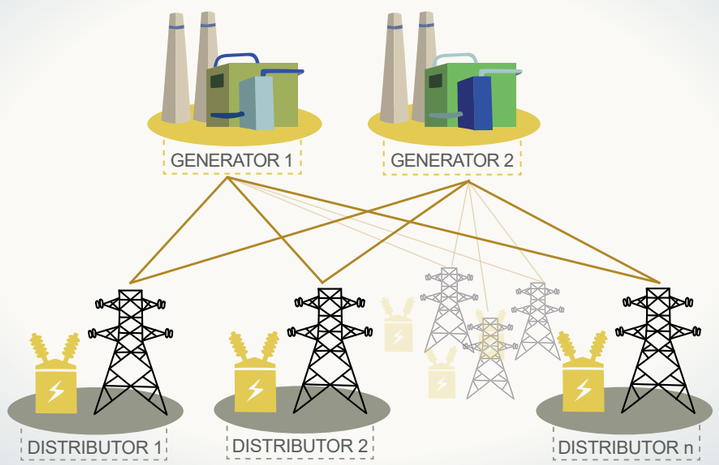
FREE CONTRACTING ENVIRONMENT (ACL) | FREE MARKET

GREATER OPPORTUNITIES AND RISKS

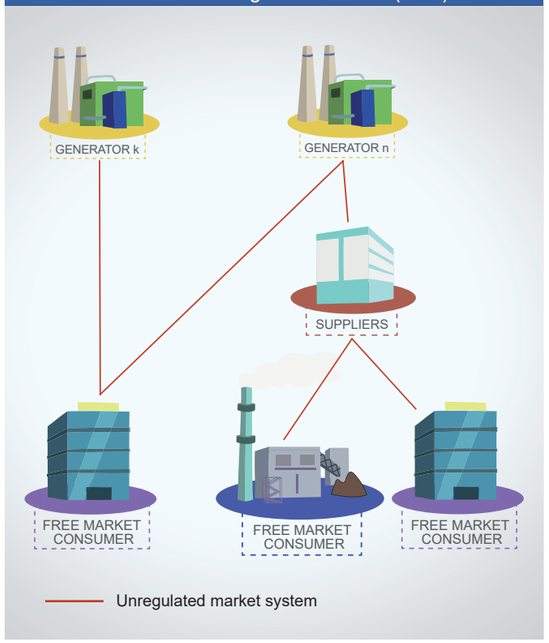
The Free Market or ACL – Free Contracting Environment, is one in which electricity purchase and sale transactions are freely negotiated through bilateral contracts within the rules and trade procedures established for this environment. Consumers whose energy demand is equal to or greater than 2,500 kW are able to participate. On January 1st, 2020, the limit was reduced to a load of 2,000 kW. From January 2023 the limit will be equal or greater than 500 kW.

In addition to free consumers, we have special consumers. They are those with a load greater than or equal to 500 kW, provided they purchase energy through incentivized (renewable) sources, such as biomass power exported to the transmission or distribution systems less than or equal to 50 MW.

Regulated Contracting Environment (ACR)



Free Contracting Environment (ACL)

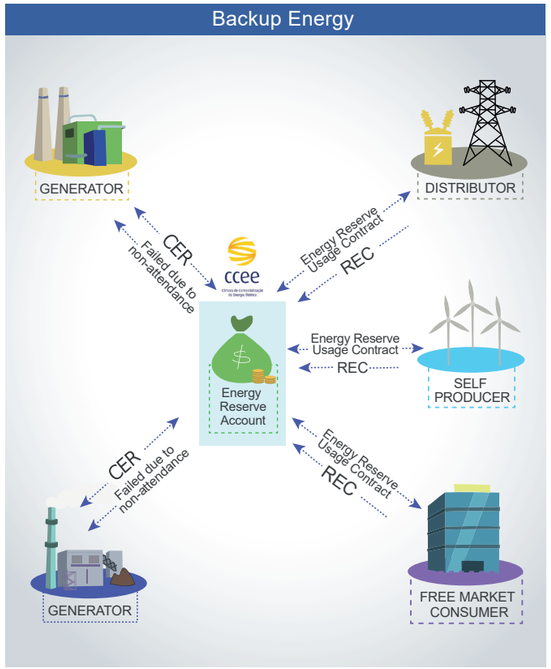


RESERVE POWER (ENERGY AUCTIONS)

This type of contracting is formalized by entering into Reserve Energy Contracts (CER) between the selling agents in the auctions and the Electric Energy Trading Chamber (CCEE), as a representative of the energy consumption agents, including free consumers, and the self-producers.

The reserve energy auction is intended to increase the security of energy supply to the National Interconnected System (SIN). This increase in supply can either replace a hydro generation, preserving the level of the water reservoirs, as well as avoiding the dispatch of fossil thermoelectric plants (activating thermal plants), reducing the operating costs of the system. Reserve energy is accounted for and settled exclusively on the short-term CCEE market. However, the seller of the energy always receives the fixed revenue defined in the auction.

Backup Energy



DISTRIBUTED GENERATION (DG) | REGULATED MARKET

Another kind of regulated contract is done directly between the distribution concessionary and the generators through public tenders for each concession area.

CONTRACTING THROUGH PUBLIC CALLS PROMOTED BY ENERGY DISTRIBUTORS

Distributed Generation Contracts are named after the principle of generating energy close to the load centers, thus optimizing the use of the electric grid between generation and consumption. As such, the energy stems from ventures connected directly to the electrical distribution system of the buyer. The contracts are preceded by a public tender promoted by the electricity distribution agent.

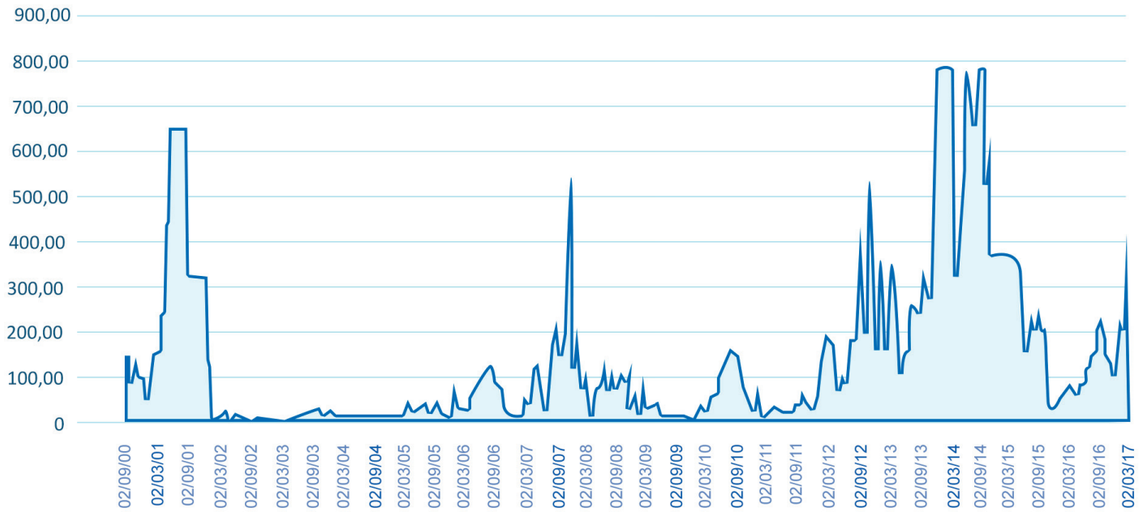
Distributors can – up to a limit of 10% of their load – enter into bilateral contracts with incentivized generators (renewable energy generators) located in their concession area. The energy acquired in this method is meant to supply the final consumer, and the transfer price is limited by electric sector rules (limited to the Reference Value - VR) or the Specific Reference Value of each source (VRES).

SHORT-TERM MARKET (MCP)

PLD VOLATILITY (CHART BELOW)

Todos os contratos de comercialização de energia elétrica, sejam no âmbito do ACR ou do ACL, devem ser registrados na CCEE, que realiza a medição dos montantes efetivamente produzidos e consumidos por cada agente. As diferenças apuradas, tanto entre o consumo contratado versus realizado, e a energia gerada vs vendida, positivas ou negativas, são contabilizadas pela CCEE e liquidadas financeiramente no Mercado de Curto Prazo (MCP), ao Preço de Liquidação das Diferenças (PLD). O PLD é determinado semanalmente, para cada submercado (SE-CO / S/NE), e para três patamares (horários) de carga distintos. O PLD procura retratar o equilíbrio entre oferta e demanda de energia elétrica, com valores mínimo e máximo regulados pela Agência Nacional de Energia Elétrica (ANEEL).

Weekly PLD in Southeastern/Midwest Brazil (average baseline)



Fonte: CCEE, valores em R$/MWh

THE REGULATORY PROCESS FOR PARTICIPATING IN ACR AUCTIONS

1. Registration request with ANEEL;

2. Registration of the project with the Energy Research Company (EPE) by filling out the Monitoring System for Energy Generating Enterprises (AEGE) with the purpose of obtaining a technical qualification. For new projects, the entire structure must be registered: details of equipment, land, licenses, fuel etc.;

3. Presentation of the technical documentation with the EPE, such as: (i) data sheet (created by the AEGE); (ii) registration issued by ANEEL; (iii) complete specifications of the project containing the overall characteristics of the project, technical conception, description of socio-environmental impacts, expectations for monthly energy generation; technical design drawings, and others; (iv) ART; (v) Environmental License and respective studies; (vi) Water Use Grant; (vii) Electric Grid Access Report; (viii) proof of fuel availability, etc.;

4. Technical qualification issued by the EPE in order to participate in the bidding process;

5. Subscription: qualified projects register for the auction in the ANEEL system, when the bidders will inform if they will participate in the bidding alone or in a consortium;

6. Bid bond: the guarantee is executed if the winning bider of the auction does not sign the trading contract resulting from the auction;

7. Appointment of operational managers and receipt of login passwords;

8. Systematic training and simulation of the auction;

9. Holding the Auction;

10. Delivery of documentation for qualification, including: articles of incorporation, diagram of the economic group; consortium instrument of constitution (if applicable); bid ratification agreement; certificates proving tax and labor regularity; accounting statements that prove compliance with economic and financial requirements;

11. Submittal of the incorporation documents for a Special Purpose Enterprize (SPE);

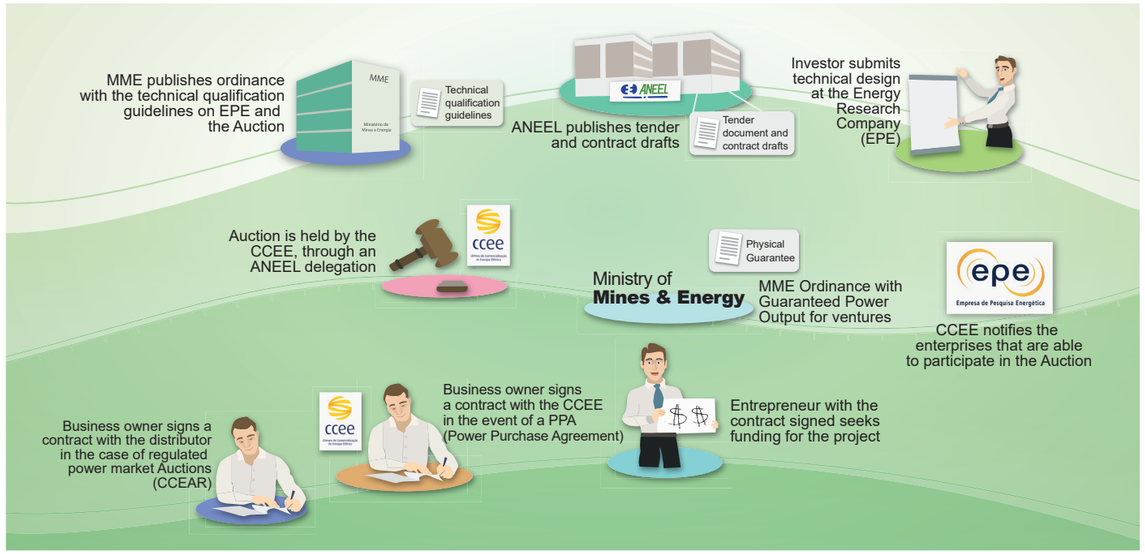
12. Registration in the CCEE;

13. Approval and awarding of the auction: document issued by ANEEL approving the outcome of the auction;

14. Collection of financial performance bond;

15. Granting the authorization issued by the Ministry of Mines and Energy (MME), which allows it to act as a power generator;

16. Signing of sales contracts.



BENEFITS TO THE ELECTRICAL SYSTEM

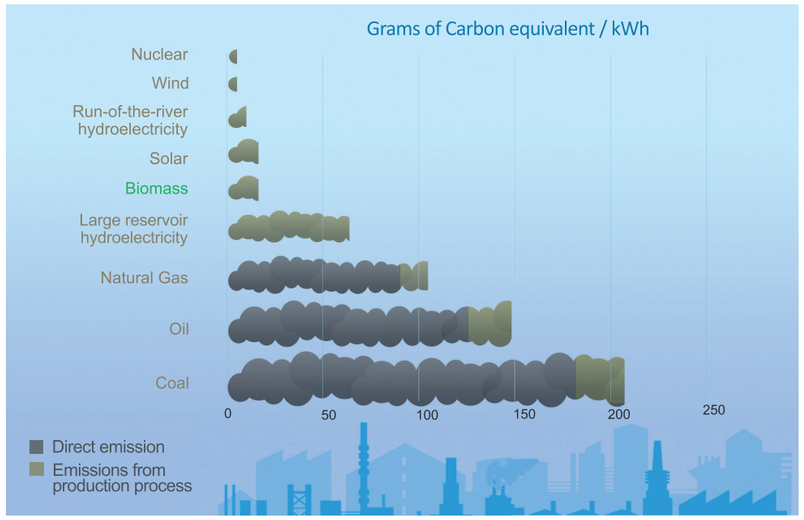
Environment, jobs, complementarity and infrastructure

REDUCED ENVIRONMENTAL IMPACT

LOW GREENHOUSE GAS EMISSIONS

Bioelectricity is the renewable thermal source with the lowest emissions in grams of carbon equivalent per kWh of energy generated, with emissions comparable to intermittent renewable solar and wind power. This stems from the fact that the carbon balance in the life cycle of sugarcane is nearly zero, given that the carbon dioxide emitted during burning in the boilers had already been previously absorbed by the growth of sugarcane that generated the biomass. In 2019, the electricity generated for the grid through sugarcane bagasse and straw was 22.4 TWh, accounting for 5% of national electricity consumption or equivalent to the annual consumption of near 12 million households. Estimates by UNICA (2020) reveal that renewable energy from sugarcane fields offered to the network in 2019 was

equivalent of having avoided the emission of approximately 8 million tons of CO_2. Such mark could only be achieved with the cultivation of 53 million native trees over the course of 20 years.



Source: International Atomic Energy Agency

JOB CREATION

Bioelectricity creates 15 times more direct jobs than coal-fired generation, 22 times more than natural gas and 72 times more direct jobs than nuclear energy (BNDES, 2005).

According to UNICA (2019), the total sugar-energy bioelectricity generation in 2018, including self-production, was 35.5 TWh. This amount of energy production provides an estimated 191,000 jobs through this source, reinforcing the capacity of job creation intrinsic to investments in sugar-energy bioelectricity.

COMPLEMENTARITY HYDRO-BIOMASS

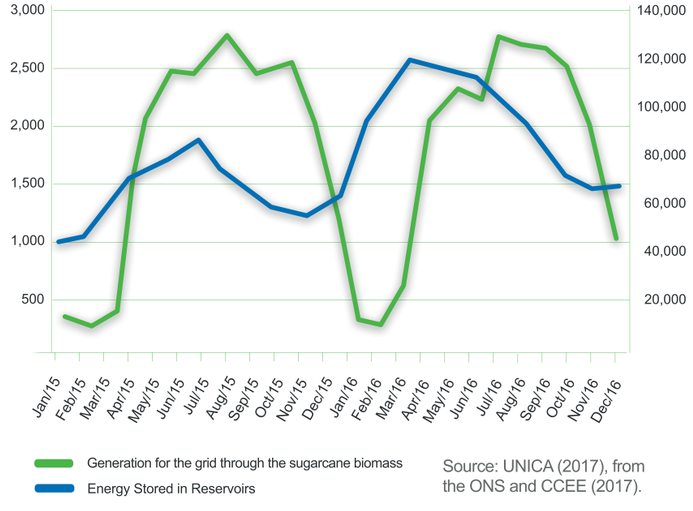
INCREASED SYSTEM SECURITY AND RESERVOIR SAVINGS

OThe profile of generation in the Southeast that is complementary to hydroelectric generation (see chart on the side (below?) boosts the reliability of the electric system and reduces the risks of power shortage and price increases during the dry season. In 2019, of the total bioelectricity of sugar-energy to the grid, 91% was supplied in the dry season, between April and November, with bioelectricity saving the equivalent of 15% of the total energy stored in the reservoirs of the hydroelectric plants of the Southeast/Center-West submarket (UNICA, 2020). The figure to the side (below?)shows the complementarity between the bioelectricity of sugarcane offered to the grid and the energy stored in the reservoir of the hydroelectric plants of SE-CO, the main submarket in the country.

In addition, 76% of the bioelectricity for the Brazilian Electricity Sector (SEB) in 2019 was concentrated on the months when the Tariff Flag System was in yellow or red (UNICA, 2020).

WITHOUT THE NEED FOR LARGE POWER TRANSMISSION LINES

The fact that the sugarcane plantation is primarily located in the SE-CO submarket means that the biomass generation plants are located close to the consumer centers, reducing the need to build large transmission lines and respective power transmission losses.



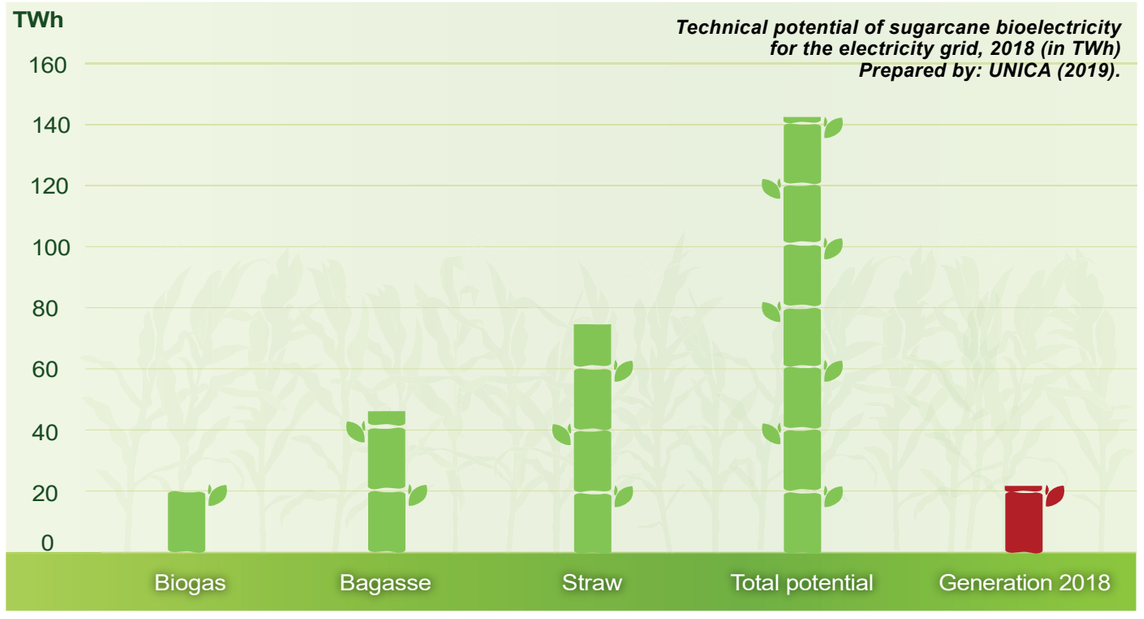
Source: UNICA (2017), from the ONS and CCEE (2017).

SUGAR-ENERGY BIOELECTRICITY POTENTIAL

Where can bioelectricity go

As of now, only 15% of the potential of sugar-energy bioelectricity is being used. If the biomass found in the sugarcane fields were fully used, bioelectricity would have the technical potential to reach 142 thousand GWh – almost seven times the volume that will be supplied this year – which would correspond to providing 30% of the energy consumption in the Brazilian market.

Combining the conditions of RenovaBio, a government program to spur the production of biofuels, and a positive business environment in the electricity sector, sugar-energy bioelectricity has the potential to grow by over 50% by 2027 – from the 21.5 thousand GWh produced in 2018 to 33 thousand GWh in 2027. Nevertheless, we would begin to take advantage of only 17% of the technical potential of this generation source in 2027, demonstrating the possibility of a positive response that bioelectricity can provide to the expected expansion of the free market.



REGULATORY BARRIERS

Legal constraints to full biomass use

Despite the promising potential for expanding the use of biomass for electricity generation, stakeholders currently face some regulatory barriers in the Brazilian electricity sector. These issues are outlined here, with proposals suggested to mitigate the barriers found.

INSTABILITY OF THE CEILING PRICE AT AUCTIONS

The ceiling price for the biomass source varies widely at each auction, with the lowest being R$ 148.00/MWh at Auction A-5/2012, where there was no winning bid, and the highest being R$ 316/MWh

in Auction A-5/2015, with only 37 MW contracted despite the more attractive price. The ceiling price of an auction should not fluctuate very much. However, there have been variations of up to 30% from one auction to another, which occurred at 3 auctions in 2015 when the ceiling prices exhibited the following variations: R$ 215 -> 281 -> 218/MWh. This lack of predictability drives investors away from executing projects for the auctions.

ECONOMIC INFEASIBILITY OF ADDING NEW FUELS

The current mechanism for participating in auctions already provides for the possibility of a thermoelectric plant using more than one fuel in the generation. The use of fuel additional to sugarcane bagasse, either through the addition of straw or sawdust, is primarily intended to increase the amount of energy generated or the stability of the energy supply. However, the rules for electricity supply auctions do not allow for different treatments between fuels. In other words, it does not consider specific situation of each fuel, and a distinct price cannot be linked to the generation with straw compared to the generation with bagasse, although these biomasses have different costs for the generator.

LACK OF LONG TERM PLANNING FOR THE GENERATION FROM BIOMASS

The lack of a long-term planning for contracting biomass energy, with annual targets, represents an impediment to stimulating the virtuous cycle in the bioenergy production chain, since there is no predictability for the sector's agents as to the amounts of energy contracting and the corresponding, thereby deterring investments throughout the chain.

DISTANCE TO CONSUMPTION CENTERS POORLY PRICED (WEAK LOCATION SIGNAL)

At the auctions for procuring electricity under the ACR, the costs for distribution and transmission systems are not properly priced. The location of the power generating plant is not effectively compared from an economic point of view, nor are the differences in price risks between submarkets.

INSUFFICIENT PRICING OF THE BENEFIT OF GENERATION CONCENTRATED IN THE DRY PERIOD

Simulations reveal that there is more freedom in operating the system with the use of sugarcane biomass in the energy matrix. That is, the bioenergy generation profile allows greater efficiency in leveraging resources, reallocating energy dispatching throughout the period and resulting in a reduction of the risk of deficit without aggravating water reservoir conditions. In short, the operation of the system becomes "more streamlined" with bioenergy. This benefit of biomass to the National Interconnected System seeks to be portrayed by Short-Term Economic Cost (CEC) variable of the Cost Benefit Index (ICB). However, the methodology for calculating the Marginal Operating Cost (CMO) used by EPE, which ultimately determines the variables COP and CEC, does not properly quantify the benefit of energy production from bagasse and straw during the dry season, distorting the ICB principle. This is because the simulations carried out by EPE, up to then, did not include the actual procedures used by the ONS in operating the system.

PROPOSALS FOR THE ENERGY AUCTIONS

Alternatives to improve the process

BIOFUEL DISTINCTION

For adding another biofuel to bagasse (like straw, for example) at ACR auctions, the suggestion is that any extra fuel intended for use will be treated with an expansion and, in this case, generation may be flexible. Analogous to what happens with the Thermal Power Plants (UTEs) powered by Liquefied Natural Gas (LNG), the plant would have a Unit Variable Cost (CVU) for bagasse and a CVU for straw. As such, for calculating the Cost Benefit Index (ICB) in order to participate in auctions, each addition would represent an expansion with specific guaranteed power output and CVU. They would also have specific ICBs (one ICB for each fuel, representing specific bids in auctions).

For example, a hypothetical generating plant would register for the 20 MW average auction using bagasse as the primary fuel, following the harvest period, and a 5 MW average could be available to the System using an additional biomass (e.g. straw), provided that a monthly dispatch order is planned in advance.

LONG-TERM CONTRACTING PLAN

Biomass demands correct long-term economic indicators. As such, a target of 500 average MW of biomass energy per year is proposed to be contracted until 2030, a period of time that is enough to create a virtuous cycle in the production chain of sugar-energy bioenergy.

INTERNALIZATION OF EXTERNALITIES

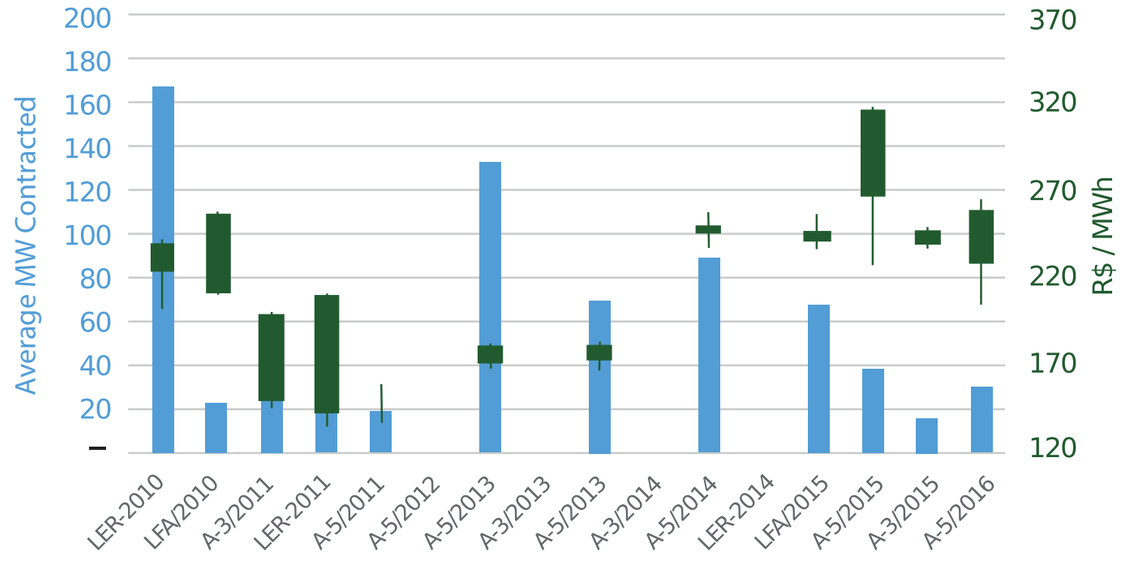
It is suggested that auctions allow the combination of part or all of the products, with those who offer the best proposals for viable combinations be declared winners. Also, energy may be allowed to be marketed from the combination of bagasse + straw and/or bagasse + straw + biogas and/or any other combination, even with other sources, such as SHP, PV or Wind. This way, the generator can assemble its own portfolio.

COMBINING AUCTIONS

Propõe-se que leilões permitam a combinação de partes ou todo dos produtos, sendo declarados vencedores aqueles que oferecessem as melhores propostas para as combinações viáveis, podendo ser permitido comercializar, por exemplo, energia a partir da combinação de bagaço+palha e/ou bagaço+palha+biogás e/ou qualquer outra combinação, até mesmo com outras fontes, como PCH, PV ou Eólica. Assim, o gerador pode montar seu próprio portfólio.

PREDICTABILITY OF PRICES AT AUCTIONS

The graph below illustrates the biomass energy contracted at auctions in the blue columns, and, in dark green, the price variations from the ceiling to the minimum negotiated. There is a clear need to guarantee the predictability of the price ceiling well in advance for the investor. Consequently, a possible auction price ceiling proposal of (1+x) times the average marketing price of the previous auction from the same source with variable x can vary from 0.5 to 1.0. It should be noted that the value of "x" should be set for all auctions and not specified in a regulation (?) for each new tender in order to ensure the assumptions of long-term planning.



ANTICIPATED DISPATCH

The dispatch of the Physical Guarantee associated with the use of additional biomass (for example, straw) as fuel would be done in advance, as is already the case with LNG, for the purpose defined by the cane milling season or offseason periods with enough advanced time for the generating plant's programming (a proposal that the harvest period dispatch be defined in March of each year). And, in order to better depict the operational characteristics of burning straw (or sawdust), the term of the contracts must be in multiples of 5 years for straw, maintaining 20-25 years for bagasse.

AUCTION A-6: BIOMASS IS DIFFERENT FROM NON-RENEWABLE SOURCES

Bioelectricity has competed directly with coal and gas in the A-6 new energy auctions. A product must be guaranteed for the biomass/biogas source at the A-6 Auctions. In last year's A-6 auction, wind energy accounted for most of the procured volume of ener-

gy (50.3%), followed by natural gas thermal power plants (40.3%), small hydroelectric plants (SHP and CGH) with 9.4%, and finally, biomass with a mere 1%. At the A-6/2018, biomass competed in the so-called Product Availability, where a single natural gas thermal plant took more than 97% of the demand allocated to that product, displacing bioelectricity projects. Essentially, a regular and growing contracting needs to be sought for bioelectricity, with reasonable prices in regulated auctions and reinforcing the free market environment. 2018 was the 3rd worst year for contracting new projects in regulated auctions promoted by the Federal Government since it was implemented in 2005. We need to promote auctions in the regulated contracting environment for biomass (and continuity of contracting), with prices that reflect the externalities of bioelectricity and the characteristics of each project (retrofit; greenfield; use of straw and bagasse; generation of biogas, etc.). Concurrently, the Free Contracting Environment (ACL) has to be strengthened so that it is also capable of facilitating a growing number of bioelectricity projects.

PROPOSALS FOR PROMOTING BIOMASS BEYOND THE AUCTIONS

Other incentive measures

ALLOW THE SALE OF ENERGY EFFICIENCY PROJECTS IN THE FREE CONTRACTING ENVIRONMENT

Biomass power plants may have their Physical Guarantee of Energy (GFE) amounts revised based on the increased availability of fuel and/or energy efficiency, as stipulated in Ordinance 564/MME. However, this GFE gain is required to be sold at specific regulated auctions and selling in the free contracting environment be prohibited.

The legislation needs to be updated and article 7 of Ordinance no. 564/MME (which requires the sales of the Physical Guarantee of Energy (UTEs with null CVU) arising from investments in energy efficiency and/or fuel increases only in the regulated contracting environment (ACR) has to be revoked, thereby making it impossible to invest through direct sales to consumers, traders or other agents, when the investor deems it is more appropriate.

IMPROVEMENTS IN THE SALES OF DISTRIBUTED GENERATION (DG) BY DISTRIBUTORS

In order to promote this type of contracting DGs by the distributors, the Ministry of Mines and Energy (MME) issued Ordinance no. 65 on February 27th, 2018, which defined the Specific Reference Value for each source (VREs) of Distributed Generation, including bioelectricity and biogas, in addition to establishing a range of guidelines.

However, in § 4 of Art. 2 of the aforementioned Ordinance, the MME determined that contracting through Distributed Generation must use contract models drafted by the National Electric Energy Agency (ANEEL), an activity that has not yet been completed by ANEEL and which is essential to unlocking this type of contract.

Another guideline to be also considered could be that the distributor has a mandatory minimum quota for contracting DG, and ANEEL would be responsible for organizing and promoting public tenders with specific products and with one being for biomass sources. The distributor could also contract a source located in its submarket and no longer be limited to its concession area.

RENOVABIO, MODERNIZATION OF THE ELECTRICITY SECTOR AND A STRATEGIC VISION FOR BIOELECTRICITY

The improvement in the business environment for bioelectricity over the next few years, encouraging investments could lead to accelerating the development of this source of strategic generation, closing the gap between the effective production of bioelectricity and its technical generation potential for the National Interconnected System.

Can RenovaBio and a more beneficial environment in the electricity sector spur on a sizable increase in the volume of sugarcane bioelectricity over the upcoming years? Yes, there is a technical potential for this. However, it is important to establish industry planning policies and instruments with a structured and integrated vision for the various sugarcane products in the country's energy matrix (ethanol, bioelectricity and biogas), given that bioelectricity has experienced an unfavorable business environment and regulatory framework over the last few years in the Brazilian electricity sector.

The Brazilian – and even the global – electric energy sector faces pressure for changes in its regulatory, commercial and operational framework, requiring a modernization of its institutional environment, because there has been a lot of friction in today's demanding business models, often leading to sector judicialization.

Along these lines, according to the MME, the Brazilian electric power sector is expected to go through a comprehensive process of modernization by 2020 and 2021, with the opening of the market becoming one of the key guidelines for this sector-related reform. The expected growth for the free market, combined with better pricing for the features of the sources in regulated auctions, is also expected to stimulate the marketing of new bioelectricity projects, particularly due to the "dormant" potential of this source in the Brazilian sugarcane fields.

The challenge is posed for both public and private entities: to stimulate (and accelerate) the inclusion of bioelectricity in the electric matrix, a fact that will undoubtedly also assist in creating the conditions needed for expanding ethanol in the fuel matrix and the effectiveness of RenovaBio.

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