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## **ANP RESOLUTION NO. 758 OF NOVEMBER 23, 2018**

*Regulates the certification of efficient production or import of biofuels referred to in art. 18 of Law No. 13,576 of December 26, 2017, and the accreditation of verification bodies.*

THE COLLEGIATE BOARD OF THE NATIONAL AGENCY OF PETROLEUM, NATURAL GAS, AND BIOFUELS – ANP, in the exercise of the duties assigned by art. 6 of the Internal Regulations and by art. 7 of Decree No. 2,455 of January 14, 1998, based on the provisions of Law No. 9,478 of August 6, 1997, considering Proceeding No. 48610.003318/2108 and the resolutions taken in the 955th Meeting of the Collegiate Board held on November 23, 2018,

### **RESOLVES TO:**

#### Chapter I

#### **PRELIMINARY PROVISIONS**

Article 1. The criteria, procedures, and responsibilities for granting, renewal, suspension, and cancellation of the Certificate of Efficient Production of Biofuels are hereby established, and the requirements for accreditation of verification bodies responsible for Biofuel Certification are hereby defined.

Paragraph 1. The participation in the Brazilian Biofuel Policy (RenovaBio) is voluntary for producers and importers of biofuels.

Paragraph 2. The Certificate of Efficient Production of Biofuels is granted specifically to each biofuel producing unit.

Article 2. The producer and the importer of biofuel, participants in RenovaBio, are hereby required to provide all information necessary for the calculation of the Energy-Environmental Efficiency Rating, and the eligible fraction of the biofuel volume, included in the phases of generation, treatment, and conversion of biomass into biofuel.

#### Chapter II

#### **DEFINITIONS**

Article 3. For purposes of this Resolution, the following definitions are hereby established:

I – energetic biomass: raw material that may be converted into biofuel, even if it is intended for another purpose;

II – Biofuel Certification: set of procedures and criteria in a process through which the verification body assesses compliance of the measurement of aspects related to the production or import of biofuels, in relation to energy efficiency and emissions of greenhouse gases, based on the life-cycle assessment;

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III– Certificate of Efficient Production of Biofuels: document issued exclusively by an verification body as a result of the Biofuel Certification process and that expressly includes the Energy-Environmental Efficiency Rating of the primary issuer;

IV– life cycle: consecutive and interlinked stages of a product system, from acquisition of raw material or its generation from natural resources, to the final disposal, as defined in this Resolution;

V – accreditation: process through which an entity is accredited by ANP to certify biofuels and issue the Certificate of Efficient Production of Biofuels, observing the procedures defined in this Resolution and the technical reports available on the ANP website;

VI – Decarbonization Credit (CBIO): a book-entry instrument for purposes of evidencing the individual target of the fuel distributor referred to in art. 7 of Law No. 13,576 of December 26, 2017;

VII – primary issuer: producer or importer of biofuel authorized to operate by ANP, holding a Certificate of Efficient Production of Biofuels, and qualified to request the issuance of Decarbonization Credits in a number proportional to the volume of biofuel produced or imported and traded, with regard to its Energy-Environmental Efficiency Rating, as defined in this Resolution;

VIII – first-generation ethanol: process for production of ethanol from saccharides or starch;

IX – second-generation ethanol: process for production of ethanol from lignocellulose, via biochemical pathway;

X – isolated tree specimen: the one located away from primary or secondary phytophysiognomies, whose aerial part is not in contact with others, characterized as an isolated individual in the landscape without a continuous canopy;

IX – verification body: an organization accredited to make the Biofuel Certification and issue the Certificate of Efficient Production of Biofuels and the Energy-Environmental Efficiency Rating;

XII – eligible fraction of the biofuel volume: the certified fraction of the biofuel volume, that can receive the Energy-Environmental Efficiency Rating;

XIII – rural property: when located in the national territory, it refers to the area in a registered perimeter identified in the Environmental Rural Registry (CAR), pursuant to Law No. 12,651 of May 25, 2012; when located abroad, it refers to the georeferenced perimeter recognized by an official authority of the country;

X – importer of biofuel: economic agent authorized by ANP to import biofuel, pursuant to current regulations for each product related to the pathways of art. 4 of this Resolution;

XV – technical report: a document prepared by ANP containing clarification and operational details, supplementary to the procedures established in this Resolution to be used in the process of Biofuel Certification;

XI – carbon intensity: rate of greenhouse gas emission, based on a life-cycle assessment, in the fuel production process, per unit of energy;

XIII – Energy-Environmental Efficiency Rating: individual classification in the Certificate of Efficient Production of Biofuels, by a primary issuer, which represents the difference between the carbon

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intensity of its alternative fossil fuel and the fuel carbon intensity established in the certification process;

XVIII – Greenhouse Gas Inventory Verification Body (OVV): an agency accredited pursuant to the requirements established in ABNT standard NBR ISO 14065;

XIX – specific profile: option to be chosen in RenovaCalc, to be used by the producer or importer of biofuel, in which the technical parameters required are filled out with data obtained from their respective production processes and from the processes of the producers of energetic biomass;

XX – standard profile: option to be chosen in RenovaCalc, to be used by the producer or importer of biofuel, in which the technical parameters required regarding the production of energetic biomass are filled out with data provided in advance, corresponding to the average production profile in Brazil plus any penalties;

XIV – producer of biofuel: economic agent authorized by ANP to produce biofuel;

XXII – producer of biomass: an agent responsible for the production of biomass in a rural property; it may be the biofuel producing unit itself or a third party that only supplies biomass;

XXIII – RenovaCalc: a calculation tool for the carbon intensity of biofuels, developed based on methodological assumptions provided for in Schedule I, available on ANP's website; and

XXIV – producing unit: domestic or foreign facility used to produce biofuel, which, in addition to the industrial area intended for biofuel production, may include areas intended for agricultural production, manufacturing of agricultural and food products, electric power generation, and sanitary landfills.

### Chapter III

## **PATHWAYS OF PRODUCTION**

### Section I

#### Eligible Pathways of Production

Article 4. The pathways of production of the following biofuels are eligible for the Certificate of Efficient Production of Biofuels:

I – biodiesel;

II – biomethane;

III – alternative fuel synthesized from hydroprocessed esters and fatty acids (HEFA);

IV – first-generation ethanol fuel produced from sugarcane;

V – first- and second-generation ethanol fuel produced in an integrated plant;

VI – second-generation ethanol fuel;

VII – first-generation ethanol fuel produced from sugarcane and corn in an integrated plant;

VIII – first-generation ethanol fuel produced from corn; and

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IX – imported first-generation ethanol fuel produced from corn.

## Section II

Inclusion of New Pathways of Production and Adequacy of the Calculation Parameters for Carbon Intensity of Biofuels

Article 5. Economic agents interested in obtaining the Certificate of Efficient Production of Biofuels for biofuels or pathways of production, other than those listed in art. 4, shall forward to ANP documents confirming the following information:

I – apparent market for biofuels;

II – potential production volume;

III – potential market;

IV – technical and economic performance;

V – maturity of the production technology;

VI – degree of organization of the production chain;

VII – difference in relation to the pathways provided for in art. 4;

VIII – open data about the production processes of raw materials, biofuels, co-products, and supplies, when applicable;

IX – life-cycle assessment study according to the methodological requirements described in Schedule I, showing the sources of information, the assumptions, restrictions, dataset of agricultural and industrial production processes, and the calculation chart; and

X – critical review by third parties of the study referred to in item IX, in compliance with ABNT standard NBR ISO 14.044.

Article 6. The economic agents interested in modifying the calculation parameters for carbon intensity used in RenovaCalc shall send a request for change, accompanied by documentation containing relevant technical reasons therefor.

Article 7. The requests provided for in arts. 5 and 6 shall be evaluated by the RenovaBio Technical Group, created by ANP Ordinance No. 303 of August 2, 2018.

Sole paragraph. ANP may request additional information in order to support the decision of the RenovaBio Technical Group.

## CHAPTER IV

### **ACCREDITATION OF THE VERIFICATION BODY**

Article 8. The accreditation of the verification body shall follow the rules established in this Resolution, becoming valid as of its publication in the Official Gazette of the Federal Government.

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Sole paragraph. The list of verification bodies accredited under this Resolution shall be published and kept updated on the ANP website (<http://www.anp.gov.br>).

Article 9. The verification body's exclusive activities may only be performed by persons enrolled in the National Register of Legal Entities (CNPJ) or by a foreign company authorized to operate in the country, under articles 1,134 to 1,141 of the Brazilian Civil Code, and that meet the requirements established in this Resolution.

Article 10. The verification body shall be independent of the agents undergoing the certification process and its personnel cannot engage in any type of activity that conflicts with their independence of judgment and integrity regarding their certification activities.

Paragraph 1. The verification body cannot become directly involved in the project, production, supply, installation, purchase, ownership, use, maintenance, or any other activities related to the items verified in the certification process.

Paragraph 2. The independence referred to in the main section shall be maintained throughout the time during which the verification body remains accredited with ANP, under penalty of cancellation of the respective accreditation.

Article 11. The interested party may apply, at any time, for new accreditation as long as it meets the requirements of this Resolution.

Sole paragraph. New accreditation shall not be granted to verification bodies on which the sanction of cancellation was imposed, pursuant to art. 18, item III, during the period of three years of the date on which the administrative decision imposing the penalty became final and unappealable.

## Section I

### Technical Requirement for Accreditation of an Verification body

Article 12. The interested company shall submit a request for accreditation, according to the form available on the ANP website, together with the following documents:

I – copy of the charter (bylaws or articles of association), including all amendments or the last one, if consolidated, and, in case of a joint-stock company, a copy of the minutes of the meeting in which the managers were elected;

II – power of attorney appointing its legal representative before ANP, according to the form available on the ANP website; in case of a foreign company authorized to operate in the country, a copy of the power of attorney provided for in Article 1,138 of the Brazilian Civil Code is enough;

III – copy of the identification card of the legal representative referred to in item II;

IV – declaration describing its activities related to the subject matter of this Resolution;

V – document defining its responsibilities and hierarchical structure; and

VI – copy of the certificate evidencing the accreditation as a Greenhouse Gas Inventory Verification Body (OVV).

Article 13. ANP shall keep available, on its website, technical reports detailing the procedures to be followed for request and maintenance of the accreditation.

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## Section II

### **Verification body**

Article 14. The verification body's duties are:

I – ensure that the activities are carried out in compliance with ABNT standard NBR ISO 14065;

II – ensure infrastructure suitable for all biofuel certification activities;

III – carry out the Biofuel Certification process with a team of, at least, two professionals that jointly have the following competences:

a) higher education degree related to agricultural, environmental, engineering or chemical sciences, duly registered with the respective profession association;

b) training certificate containing in its scope ABNT standard NBR ISO 19011 – guidelines for audit of management systems, including proof of approval in the exam as a leading auditor provided by an accredited institution; and

c) experience in audit practices for Greenhouse Gas Emission or Carbon Footprint Inventories of at least, two years, duly verified; and

IV – have the audit team declaration of confidentiality for all information obtained or generated during performance of the certification activities.

Article 15. The hiring of natural persons or legal entities who have provided consulting services related to the implementation of the biofuel certification process, or have been part of the staff, ownership structure, or acted as a director of the company being certified during a period of two years prior to the beginning of the certification process is hereby prohibited.

Article 16. ANP may, at any time, request evidence that the requirements referred to in art. 14 are met, and the verification body shall submit the documents within five business days.

Article 17. Failure by the verification body to comply with the provisions in arts. 14 and 15 causes ANP to revoke the certificate and the obligation to redo the Biofuel Certification process.

Sole paragraph. The process referred to in main section shall not imply any expenses to the producer or importer of biofuels.

## Section III

### **Sanctions on the Verification body**

Article 18. The accreditation of the verification body may be cancelled at any time by ANP upon the following events:

I – court-ordered or out-of-court extinction of the verification body;

II – by request of the verification body;

III – due to application of any sanctions as established in Schedule II; or

IV – suspension or cancellation of the accreditation as a Greenhouse Gas Inventory Verification Body (OVV).

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Article 19. In applying administrative sanctions on the verification body, criteria related to relevance, extension, advantage obtained, and severity of the infraction shall be evaluated as established in Schedule II.

Article 20. The verification body is subject to the following sanctions, without prejudice to other applicable legal penalties, especially those provided for in Law No. 9,847 of October 26, 1999, as established in Schedule II:

I – warning;

II – temporary suspension for up to one hundred and eighty days;

III – suspension, for an indefinite time, until elimination of the nonconformity that gave rise to the sanction is evidenced; and

IV – cancellation of the accreditation.

Article 21. The administrative sanction shall be applied by means of an administrative proceeding initiated to investigate the infraction of this Resolution, being the right to legal defense and adversary proceeding ensured under Law No. 9,784 of January 29, 1999.

Article 22. A new infraction committed within five years of the final administrative conviction for the previous infraction shall be deemed recidivism.

Chapter V

## **ELIGIBILITY CRITERIA FOR THE PRODUCER OF BIOMASS UNDER RENOVABIO**

General criteria for producers

Article 23. The producer or importer of biofuel may not include a certain producer of energetic biomass in the certification process.

Sole paragraph. The eligible fraction of the biofuel volume shall be equivalent to the eligible fraction of energetic biomass used in its production process.

Article 24. To issue the Energy-Environmental Efficiency Rating, only the energetic biomass used by the producing unit, from an area where removal of native vegetation has not occurred, may be accounted for as of the effective date of this Resolution.

Paragraph 1. For purposes of verification of the compliance with the provisions in the main section, removal of an isolated tree specimen is not considered as removal of native vegetation pursuant to the specific laws and regulations.

Paragraph 2. For purposes of compliance with the provisions in the main section, only the area dedicated to production of energetic biomass inside the rural property participating in the certification process is considered.

Paragraph 3. The criterion established in the main section applies to energetic biomass produced in the national territory or abroad and does not apply to biomass arising from residues, as defined in item 3.2 of Schedule I.

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Paragraph 4. The certified producer or importer of biofuel shall verify the satisfaction of the criterion provided for in the main section annually, according to the requirements established in a technical report, available on ANP's website.

Paragraph 5. For purposes of compliance with the provisions in the main section, any removal of native vegetation carried out between the date of enactment of Law No. 13,576 of 2017 and the date of publication of this resolution shall have been carried out pursuant to the prevailing environmental laws and regulations.

#### Brazilian producer

Article 25. To issue the Energy-Environmental Efficiency Rating, the energetic biomass produced in national territory may only be accounted for if it comes from a rural property with an active or pending Environmental Rural Registry (CAR), according to the National Environmental Rural Registration System, provided for in Decree No. 7,830 of October 12, 2012.

Paragraph 1. The criterion established in the main section does not apply to biomass arising from residues, as defined in item 3.2 of Schedule I.

Paragraph 2. The verification of the CAR shall be carried out annually by the producer of biofuel, before acquisition of the energetic biomass, and if the CAR of one of the properties is not active or pending, the biomass from such property shall be removed from the calculation of the eligible fraction of the biofuel volume until its situation is rectified.

Paragraph 3. The criterion established in the main section does not apply in cases in which the acquisition of energetic biomass has occurred before the term established in art. 1 of Decree No. 9,395 of May 30, 2018, or any other that may replace it.

Article 26. The national producer of energetic biomass shall meet the following requirements, so that its production is included in the calculation of the eligible fraction of the biofuel volume:

I (Revoked by Resolution No. 802/2019)

II – for oil palm: the production shall be located in a city with an area proper for the expansion of oil palm, as provided for in Agroecological Zoning for Oil Palm Crops (ZAE for Oil Palm), pursuant to Decree No. 7,172 of May 7, 2010, and to other laws and regulations applicable to the subject.

Paragraph 1. The requirements provided for in items I and II of the main section do not apply, respectively, to the areas already occupied by sugar cane on September 17, 2009, or already occupied by oil palm on May 7, 2010.

Paragraph 2. For purposes of compliance with the provisions in this article, the entire area dedicated to production of energetic biomass inside the rural properties participating in the certification process shall be considered.

#### Foreign producer

Article 27. The energetic biomass produced outside the national territory may only be accounted for to issue the Energy-Environmental Efficiency Rating if it arises from a rural property that observes the prevailing environmental laws and regulations in the country of origin.

#### Chapter VI



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## **CERTIFICATION OF EFFICIENT PRODUCTION OR IMPORTATION OF BIOFUELS AND ISSUANCE OF THE CERTIFICATE OF EFFICIENT PRODUCTION OF BIOFUELS**

Article 28. To issue the Certificate of Efficient Production of Biofuels, the producer or importer of biofuel shall:

I – contract an verification body accredited with ANP to carry out the Biofuel Certification, the validation of the Energy-Environmental Efficiency Rating, and the calculation of the eligible fraction of the biofuel volume;

II – allow access of the verification body to all information required for carrying out and concluding the certification process contracted;

III – calculate its Energy-Environmental Efficiency Rating using RenovaCalc, in the format available on ANP's website;

IV – calculate the eligible fraction of the biofuel volume, based on a system of document records, considering the eligible energetic biomass, in compliance with the requirements of arts. 23 to 27;

V – file all documents supporting the information required for calculation of the Energy-Environmental Efficiency Rating and of the eligible fraction of the biofuel volume for the period of at least five years; and

VI – monitor and record annually the information inserted and the results that led to the Energy-Environmental Efficiency Rating and to the calculation of the eligible fraction of the biofuel volume.

Paragraph 1. For the agricultural phase, the producer or importer of biofuel may choose to complete the RenovaCalc using the specific profile or the standard profile for each producer of biomass.

Paragraph 2. Within the scope of the certification processes, the data of the preceding calendar year (n-1) shall be used, provided that the verification body sends the reports referred to in art. 31 to ANP on or before March 31 of the subsequent year (n+1).

Paragraph 3. As of the second Certification process of the Efficient Production of Biofuels, the moving average data of the three preceding years shall be used.

Paragraph 3-A. If the second Certification process of the Efficient Production or Importation of Biofuels begins in 2020, the average data of 2018 and 2019 shall be used.

Paragraph 4. The renewal of the Certificate of Efficient Production of Biofuels is mandatory when the monitoring and registration indicated in item VI identify a decrease larger than ten percent (10%) in relation to the results in the current Energy-Environmental Efficiency Rating or in the calculation of the eligible fraction of the biofuel volume indicated in item IV.

Paragraph 4-A. The renewal of the Certificate of Efficient Production of Biofuels is mandatory in case of a change in the production pathway in the process of the primary issuer.

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Paragraph 5. The biofuel producing units may only obtain the Certification of Efficient Production of Biofuels if they have operated for at least six months, and the data of this period shall be used in the first certification process.

Paragraph 6. In the event provided for in ¶ 5, the Certificate of Efficient Production of Biofuels shall be valid for one year of the date of its approval of ANP.

Article 29. A bonus of up to twenty percent (20%) shall apply to the Energy-Environmental Efficiency Rating in case of evidence of negative greenhouse gas emission of in the life cycle of the biofuel in comparison with its fossil alternative.

Sole paragraph. The request of the primary issuer shall be analyzed by the RenovaBio Technical Group, created by ANP Ordinance No. 303 of August 2, 2018.

Article 30. In order to carry out the Biofuel Certification and issue the Certificate of Efficient Production of Biofuels, the verification body shall:

I – verify and validate the documents required for evidencing the veracity of the information necessary to calculate the Energy-Environmental Efficiency Rating;

II – inspect the facility of the producer of biofuel;

III – carry out inspections through the analysis of accounting records, systems, and management controls of inventory or invoice;

IV – verify and validate the calculation of the eligible fraction of the biofuel volume made by the producer or importer of biofuel, as well as the satisfaction of the eligibility criteria;

V – promote extensive dissemination of the certification process on its website;

VI – carry out public consultation about the proposal for certification for a minimum of thirty days; and

VII – observe the certification procedures described in a technical report available on ANP's website.

Paragraph 1. For purposes of evidencing and verification of the provisions in item IV, ANP shall provide, on its website, technical reports containing the procedures to be carried out, the details about the calculation of the eligible fraction of the biofuel volume by production pathway, as well as the criteria for identification of native vegetation, in order to map the use of land.

Paragraph 2. ANP shall be informed prior to the carrying out of all public consultations about the certification of efficient production or importation of biofuels.

Paragraph 3. The public consultation referred to in item VI of the main section shall precede the issuance or renewal of the Certificate of Efficient Production of Biofuels.

Paragraph 4. The verification body shall provide the following documents during the public consultation referred to in item VI of the main section:

I – data filled out by the producer or importer of biofuel in the RenovaCalc and validated by the verification body;

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II – proposed Certificate of Efficient Production of Biofuels expressly indicating the Energy-Environmental Efficiency Rating and the eligible fraction of the biofuel volume, according to the template available on ANP's website; and

III – partial report about the certification process.

Paragraph 5. All suggestions and comments presented during the public consultation referred to in item VI of the main section shall be assessed by the verification body, and those applicable shall be incorporated to the process and the remaining shall be reasonably refused.

Paragraph 6. ANP may authorize the verification body to add black stripes to information included in item I of the main section to be provided for public consultation, when it is considered competitively strategic and critical by the producing unit, according to a procedure to be defined in a technical report.

Article 31. Once the validation of the Energy-Environmental Efficiency Rating is complete, the verification body shall send the following to ANP:

I – a report of the on-site audits carried out accompanied by the daily attendance list with signatures of the participants and minutes of the meetings signed by the audit team;

II – a report of the public consultation of validation of the Energy-Environmental Efficiency Rating and of the eligible fraction of the biofuel volume, including an indication of all suggestions and comments presented, and those applicable shall be incorporated to the process and the remaining shall be reasonably refused; and

III – a report of the Biofuel Certification process, as detailed in a technical report available on ANP's website.

Paragraph 1. ANP may request, at any time, from the verification bodies information, clarification, and additional documents used to validate the Energy-Environmental Efficiency Rating and the calculation of the eligible fraction of the biofuel volume.

Paragraph 2. The change of the Energy-Environmental Efficiency Rating is only allowed upon issuance of a new Certificate of Efficient Production of Biofuels.

Paragraph 3. In case of pending issues or deficiencies identified by ANP during the analysis of the certification process, the verification body shall make new efforts until the evidence is sufficient to prove the veracity of the information used to calculate the Energy-Environmental Efficiency Rating and the eligible fraction of the biofuel volume.

Article 32. The Certificate of Efficient Production of Biofuels shall be valid for three years of the date of its approval of ANP.

Sole paragraph

Sole paragraph. The verification body shall issue the Certificate of Efficient Production of Biofuels and send it to ANP in up to ten (10) days after approval of the process by ANP, pursuant to a template available on ANP's website".

Article 33. The renewal, suspension, and cancellation of the Certificate of Efficient Production of Biofuels shall occur upon the following events:

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I – renewal:

- a) at the request of the certified producer or importer of biofuel, at any time;
- b) at the request of the certified producer or importer of biofuel, when, in the annual monitoring referred to in item VI of art. 28, a decrease larger than ten percent (10%) in the Energy-Environmental Efficiency Rating or in the calculation of the eligible fraction of the biofuel volume is verified;
- c) at the request of the verification body, when a change in the parameters that generated the Energy-Environmental Efficiency Rating or in the calculation of the eligible fraction of the biofuel volume is verified; or
- c) by determination of ANP, when a change in the parameters that generated the Energy-Environmental Efficiency Rating or in the calculation of the eligible fraction of the biofuel volume is verified.

II – suspension:

- a) at the request of the certified producer or importer of biofuel, at any time;
- c) by determination of ANP, in case of signs of a change in the parameters that generated the Energy-Environmental Efficiency Rating or in the calculation of the eligible fraction of the biofuel volume; or
- c) in case of signs of fraud in the process for obtaining the Certificate of Efficient Production of Biofuels.

III – cancellation:

- a) at the request of the certified producer or importer of biofuel, at any time;
- b) in cases in which the authorization for the exercise of the activity developed by the producer or importer of biofuel is cancelled or revoked by ANP; or
- c) in case fraud in the process for obtaining the Certificate of Efficient Production of Biofuels is evidenced.

Sole paragraph. During the suspension period or after cancellation of the Certificate of Efficient Production of Biofuels, the amount of biofuel produced, imported, traded, negotiated, shipped, or delivered may not be taken into account for issuance of Decarbonization Credits.

Chapter VII

## **SUPPORTING DOCUMENTS**

Article 34. To ensure traceability, transparency, and evidence that the Biofuel Certification is in compliance with the provisions in this Resolution, the documents forming part of the scope of work of the certification shall:

I – be filed by the verification body and by the primary issuer in a physical, magnetic, optical, or electronic mean; and

II – include all information and data used to calculate the Energy-Environmental Efficiency Rating and the eligible fraction of the biofuel volume.

Sole paragraph. The documents referred to in the main section shall be kept at the disposal of ANP for a period of five years of the date of issuance of the certificate.

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## Chapter IX **FINAL PROVISIONS**

Article 35. ANP may, directly or with the support of a contracted entity or competent authority, at any time, carry out inspections of the certified producer or importer of biofuel, of the verification body, and of other economic agents participating in the certification process about the procedures referred to in this Resolution.

Article 36. ANP may publish additional information, clarification, and operational details supplementary to the procedures provided for in this Resolution to be observed in the certification process, through technical reports that shall be available on its website.

Article 37. Failure to comply with the provisions in this Resolution shall subject the offender to the penalties provided for hereby, as well as those contemplated by Law No. 9,847 of October 26, 1999.

Article 38. This Resolution becomes effective as of the date of its publication.

## **SCHEDULE I**

(referred to in art. 3, item XXIII, art. 5, item IX, art. 24, ¶ 3, and art. 25, ¶ 1, of Resolution No. 758 of November 23, 2018) **TECHNICAL REGULATION OF RENOVACALC**

### 1. Purpose

The purpose of this Technical Regulation is to introduce the methodological requirements used in RenovaCalc to calculate the Energy-Environmental Efficiency Rating.

### 2. Scope of the Life-Cycle Assessment

The attributional life-cycle assessment is adopted, considered as technical-descriptive or accounting, aimed at attributing to a product, manufactured at a certain time, a portion of the total emissions of pollutants and of the consumption of resources in the economy (WEIDEMA & EKVALL, 2009).

The “well-to-wheel” (or “cradle-to-grave”) scope was adopted, which accounts for all flows of material and energy consumed by the production process and emitted to the environment, from the extraction of natural resources, acquisition or production and treatment of biomass, its conversion into biofuel, to its combustion in engines, including all transportation stages.

The methodological option and the main assumptions adopted for the life-cycle assessment are summarized in Table 1.

Table 1. Methodological options and assumptions of the life-cycle assessment

<b>Approach</b>	<b>Attributional</b>
Scope	“well-to-wheel”
Functional unit	fuel consumed, in MJ
Treatment of by-	Energy-based allocation

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products	
Data source for processes upstream of the agricultural process	The inventory data of the processes upstream of the agricultural process is obtained from the database ecoinvent v.3.1 (WERNET, et al., 2016). The adoption of production and processing inventories for Brazil (BR), global (GLO2) was prioritized and, in the absence thereof, the 'RoW3' inventories were used.
Calculation tool	RenovaCalc

### 3. Scope

#### 3.1. Biofuels and pathways

The following biofuels have pathways defined for calculation of carbon intensity:

- a) Biodiesel;
- b) Biomethane;
- c) Alternative fuel synthesized from soybean fatty acids and hydroprocessed esters (HEFA); and
- d) Fuel ethanol.

For fuel ethanol, there are distinguishing parameters for calculating carbon intensity for the following pathways of production:

- a) first generation of sugar cane;
- b) first and second generation in an integrated plant;
- c) second generation;
- d) first generation of sugar cane and corn in an integrated plant (flex);
- e) first generation of corn; and
- f) first generation of imported corn.

#### 3.2 Waste

The biomasses listed below are considered waste, and no greenhouse gases (GHG) are emitted from their generation, accounting only the emissions that occur from their collection and transport to the processing unit.

##### 3.2.1 Waste from agricultural and forestry crops

- a) Sugarcane, corn, sorghum, and wheat straws;
- b) Barks of rice, walnut, coffee, and the like;
- c) Corn cob; and
- d) Bark, stumps, branches, leaves, needles, treetops, forest shavings, and sawdust from planted forests or native forests, the latter provided that exploited under the Sustainable Forest Management regime duly authorized by the competent bodies, as established by Law No. 11,284 of March 2, 2006, Decree No. 5,975 of November 30, 2006 and Normative Instruction of the Ministry of the Environment No. 5 of December 11, 2006, or others that may appear.

##### 3.2.2 Processing waste

- a) Vinasse and other agro-industrial effluents;
- b) Sugarcane bagasse and sorghum;
- c) Filter cake, ashes, and soot;
- d) Animal fat;
- e) Other animal waste;

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- f) Lees; and
- g) Used cooking oil.

### 3.2.3 Other

- a) Animal waste;
- b) Poultry manure;
- c) Food waste in general;
- d) Organic solid waste from industrial biological processes;
- e) Sanitary sewage and sludge from wastewater treatment station; and
- f) Sanitary landfill biogas.

## 4. Calculation of the Energy-Environmental Efficiency Rating

### 4.1 Agricultural production phase

4.1.1 For the agricultural production phase, the producer or importer of biofuel can choose to calculate the Energy-Environmental Efficiency Rating using the specific profile or the standard profile.

4.1.2 For both own and supplier data, it is always necessary to provide primary data of all producers of biomass eligible for the parameters: total area, total production, agricultural waste collected. Such information is not subject to representation as “standard profile”.

4.1.3 It is used for calculation of each parameter, the weighted average of the data of own production and of suppliers, adopting the volume of biomass production as a weighting factor.

4.1.4 Tables 2 a 5 present the typical values and the penalized values, the latter adopted for composition of the standard production profile, the production of biomasses considered in the pathways defined in RenovaCalc.

4.1.5 For the pathway of ethanol produced from corn and imported, the standard profile can only be used if produced in the United States. In other situations, specific profile data must always be filled out.

Table 2. Typical values and penalized values for production of sugar cane.

Typical values seek to represent the average quantity of inputs contributed to Brazilian agricultural production systems. For the production of sugarcane, corn, and soybeans, Embrapa Meio Ambiente project entitled “Life Cycle Inventories of Brazilian agricultural products: a contribution to theecoinvent database” was used as data source (Folegatti-Matsuura & Picoli, 2018). The penalized values assume the highest inputs of the Brazilian agricultural production systems.

Parameter	Typical Value	Penalized Value
Burnt area	18%	100%
Calcitic or Dolomitic Limestone	5,79 kg/t sugar cane	12,00 kg/t sugar cane
Agricultural Plaster	2,79 kg/t sugar cane	5,00 kg/t sugar cane
Synthetic Nitrogen Fertilizers	1,11 kg N/t sugar cane	2,00 kg N/t sugar cane
Synthetic Phosphate Fertilizers	0,44 kg P2O5/t sugar cane	1,00kg P2O5/t sugar cane

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Synthetic Potassium Fertilizers	1,35 kg K <sub>2</sub> O/t sugar cane	2,00kg K <sub>2</sub> O/t sugar cane
Organic Nitrogen Fertilizers – Vinasse	440,2 L/t sugar cane	1000,0L/t sugar cane
Nitrogen concentration in vinasse	0,38 g N/L	0,38 g N/L
Organic Nitrogen Fertilizers – Filter Cake	30,6 kg /t sugar cane	42,8 kg /t sugar cane
Nitrogen concentration in filter cake	2,80 g N/kg	2,80 g N/kg
Organic Nitrogen Fertilizers – Ashes	7,2 kg /t sugar cane	10,1 kg /t sugar cane
Fuel (Diesel B10)	3,18 L/t sugar cane	6,00 L/t sugar cane

Table 3. Typical values and penalized values for production of corn.

Parameter	Typical Value	Penalized Value
Calcitic or Dolomitic Limestone	42,3 kg/t corn	105,8 kg/t corn
Seeds	4,6 kg/t corn	11,6 kg/t corn
Synthetic Nitrogen Fertilizers	12,6 kg N/t corn	31,4 kg N/t corn
Synthetic Phosphate Fertilizers	10,9 kg P <sub>2</sub> O <sub>5</sub> /t corn	27,3 kg P <sub>2</sub> O <sub>5</sub> /t corn
Synthetic Potassium Fertilizers	11,2 kg K <sub>2</sub> O/t corn	28,0 kg K <sub>2</sub> O/t corn
Fuel (Diesel B10)	4,8 L/t corn	12,0 L/t corn

Table 4. Typical values and penalized values for production of corn in the United States

Parameter	Typical Value	Penalized Value
Calcitic or Dolomitic Limestone	45,3 kg/t corn	113,3 kg/t corn
Synthetic Nitrogen Fertilizers	16,7 kg/t corn	41,8 kg/t corn
Synthetic Phosphate Fertilizers	11,0 kg P <sub>2</sub> O <sub>5</sub> /t corn	27,5 kg P <sub>2</sub> O <sub>5</sub> /t corn
Synthetic Potassium Fertilizers	8,0 kg K <sub>2</sub> O/t corn	20,0 kg K <sub>2</sub> O/t corn
Diesel	4,2 L/t corn	10,5 L/t corn
LPG	2,0 L/t corn	4,0 L/t corn
Electricity	5 kWh/t corn	12 kWh/t corn

Table 5. Typical values and penalized values for production of soybeans

Parameter	Typical Value	Penalized Value
Calcitic or Dolomitic Limestone	249,0 kg/t soy	546,6 kg/t soy



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Agricultural Plaster	53,3 kg/t soy	90,6 kg/t soy
Seeds	17,39 kg/t soy	39,16kg/t soy
Synthetic Nitrogen Fertilizers	2,8 kg N/t soy	5,55 kg N/t soy
Synthetic Phosphate Fertilizers	27,2 kg P <sub>2</sub> O <sub>5</sub> /t soy	58,77kg P <sub>2</sub> O <sub>5</sub> /t soy
Synthetic Potassium Fertilizers	32,7 kg K <sub>2</sub> O/t soy	51,80 kg K <sub>2</sub> O/t soy
Fuel and electricity (Diesel B10)	10,7 L/t soy	17,36 L/t soy

4.1.6 For chemical fertilizers, the nitrogen, phosphorus, and potassium content used for calculation of the carbon intensity is that determined in Table 6.

Table 6. Nitrogen, phosphorus, and potassium content in chemical fertilizers.

Fertilizers	Content (%)		
	N	P	K
Nitric Acid, diluted	12	0	0
Anhydrous Ammonia	82	0	0
Ammonium Bicarbonate	18	0	0
Ammonium Chloride	25	0	0
Potassium Chloride	0	0	59
Monoammonium Phosphate (MAP)	10	51	0
Diammonium Phosphate (DAP)	17	46	0
Ammonium Nitrate	34	0	0
Calcium Ammonium Nitrate	25	0	0
Calcium Nitrate	15	0	0
Sodium Nitrate	15	0	0
Ammonium Sulfate Nitrate	26	0	0

<b>Potassium Nitrate</b>	<b>13,5</b>	<b>0</b>	<b>44</b>
Ammonium Phosphate Nitrate	8	52	0
"Phosphate Rock"	0	25	0
Urea-Ammonium Nitrate Solution	32	0	0
Ammonium Sulfate	20,5	0	0
Potassium Sulfate	0	0	49

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Simple Superphosphate	0	20	0
Triple Superphosphate	0	46	0
Urea	45	0	0

#### 4.2 Industrial phase of production

4.2.1 For the industrial phase of production, the producer or importer of biofuel must always provide primary data regarding the production process of biofuels, and there is not the standard profile option.

4.2.2 In the industrial phase, information regarding the total amount of biomass processed at the producing unit shall be provided, regardless of meeting the eligibility criteria.

4.2.3 RenovaCalc shall provide results for the carbon intensity of the biofuel eligible to generate Decarbonization Credits.]

4.2.4 The producer or importer of biofuel may use electricity trading data from a different legal entity when the electric power generation occurs using co-products or residues from the production process of the biofuel to be certified, as long as:

- a) the electric power plant is operated by the producer of biofuel; or
- b) the electricity producing unit and the biofuel producing unit are controlled by the same legal entity.

#### 4.3 Distribution phase

4.3.1 For the distribution phase, the producer or importer of biofuel must inform each fraction of its biofuels traded to the logistic distribution system.

4.3.2 The available logistic systems are:

- a) road; b) pipeline; c) rail; d) sea (for imported corn-based fuel ethanol only); and e) river.

4.3.3 Greenhouse gas emissions are calculated considering, for each biofuel, the average distribution distance from the producing unit to the end consumer, for each logistic system.

4.3.4 Table 7 shows the composition and average distances used for each logistic system, for the pathways defined using RenovaCalc.

4.3.5 In case the producer or importer of biofuel does not have information that may be confirmed about the logistic system used for distribution of the biofuel, road logistics shall be used, except for the pathway for imported corn-based ethanol, for which sea logistics shall be adopted.

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Table 7. Composition and average distances (km) of the logistic systems

Biofuel	Logistic systems									
	Road	Pipeline		Rail		Sea			River	
		Pipeline	Road	Rail	Road	Road	Rail	Sea	Road	River
First-generation fuel ethanol from sugar cane	700	500	200	300	400	-	-	-	-	-
First- and second-generation fuel ethanol produced in an integrated plant	700	500	200	300	400	-	-	-	-	-
Second-generation fuel ethanol	700	500	200	300	400	-	-	-	-	-
First-generation fuel ethanol from sugar cane and corn produced in an integrated plant (flex)	700	500	200	300	400	-	-	-	-	-

Sugar cane and corn in an integrated plant (flex)											
First-generation fuel ethanol from corn	700	-	-	-	-	-	-	-	-	1300	1240
First-generation fuel ethanol from imported corn	-	-	-	-	-	600	1400	1300	-	-	-
Biodiesel	700	-	-	1200	300	-	-	-	-	1300	1240
Alternative synthesized fuel from hydroprocessed esters and fatty acids (HEFA) from soybeans	1500	900	600	900	600	-	-	-	-	-	-

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Biomethane*	43	24	-	-	-	-	-	-	-	-
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\* For the share of biomethane transported to gas stations, the distribution exclusively by road was considered; and, for the share of biomethane injected directly into the network, the distribution exclusively by pipeline was considered.

#### 5. Information for calculation of the Energy-Environmental Efficiency Rating

5.1 Tables 8 to 16 show the information provided by the producers and importers of biofuels necessary for the calculation of the Energy-Environmental Efficiency Rating. Each parameter to be informed is described in the corresponding table.

Table 8. Information for calculation of the carbon intensity of first-generation ethanol fuel from sugar cane.

	Parameter	Description	Unit	Requirement
Agricultural Phase				
1	Planting system	Conventional – It involves the first stage of soil preparation, which consists of deeper operations, usually carried out with a plow, aiming at breaking compacted soil layers and eliminating or burying the vegetation cover. In the second stage of preparation, operations are more superficial, using mulch tillers or land planers to level, break clods, destroy superficial crusts, incorporate agrochemicals, and eliminate weeds. Sowing is done by broadcasting or in row. No-tillage, with crop rotation – No-tillage planting is the sowing system in which the seed is placed directly in the unturned soil. A small furrow (or pit) is opened, sufficiently deep and wide to ensure good coverage of the seed with soil. Crop rotation is the organized and regular alternation in the cultivation of different plant species, sequentially, in a given area.	N/A	Information included in the “standard profile”.

		<p><b>No-tillage, with crop rotation – No-tillage planting is the sowing system in which the seed is placed directly in the unturned soil. A small furrow (or pit) is opened, sufficiently deep and wide to ensure good coverage of the seed with soil. The succession of crops consists in alternating crops without any order and regularity of the species used.</b></p> <p><b>Minimum/Reduced Tillage – system in which there is less tillage when compared to the conventional system. Sowing is done directly over vegetation previously dried out with herbicide, without revolving the soil.</b></p>		
2	Total area	Total area of the producing facility, i.e., the sum of the harvested area, the seedling area, the renewal	ha	Mandatory information for

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		area, and the areas for cane harvested after eighteen months (“ <i>cana de ano e meio</i> ”) and for cane not harvested within the expected period and left out to be harvested in the following year (“ <i>bisada</i> ” cane).		all eligible producers of biomass.
3	Total burnt area	Sum of the areas (requirement 2) that were burned: with authorization for harvest; for elimination of crop residues; by accidental and/or criminal burning.	ha	Information included in the “standard profile”.
4	Total production of sugar cane	Total amount of product from the total production area (requirement 2).	tons of cane, on a wet basis.	Mandatory information for all eligible producers of biomass.

		<b>It refers to the total annual sugar cane harvested for crushing (sum of stalks, culms, vegetable and mineral impurities). This parameter shall be reported on a wet basis.</b>		
5	Average content of vegetable impurities	of It refers to the average content of vegetable impurities in sugar cane (requirement 4). It shall be reported on a wet basis and the moisture content of these impurities shall be informed.	kg/tons of cane, on a wet basis. Moisture content: %	Mandatory information for all eligible producers of biomass.
6	Average content of mineral impurities	of It refers to the average content of mineral impurities in sugar cane (requirement 4).	kg/tons of cane, on a wet basis	Mandatory information for all eligible producers of biomass.
7	Total collected straw	It refers to the total amount of straw collected annually in the total area of production (requirement 2). This parameter refers to straw collected separately from the sugar cane (for example, baled straw, straw collected by a forage harvester, among others).	tons of straw, on a dry basis	Mandatory information for all eligible producers of biomass.
8	Consumption of agricultural lime	Amount consumed of each type of agricultural lime (calcitic limestone, dolomitic limestone, and agricultural plaster), divided by the amount of sugar cane (requirement 4).	kg/tons of cane	Information included in the “standard profile”.
9	Consumption of synthetic fertilizers	Amount consumed of each element (N, P <sub>2</sub> O <sub>5</sub> , and K <sub>2</sub> O by source), applied to the total area (requirement 2), divided by the amount of sugar	kg of element/tons of cane	Information included in the “standard profile”.

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	cane (requirement 4).		
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10	Consumption of organic/organomineral fertilizers	<b>Amount of industrial waste and other organomineral fertilizers used as fertilizers by source (vinasse, filter cake, ashes and soot, etc.) applied to the total area (requirement 2), divided by the amount of sugar cane (requirement 4). Inform the Nitrogen content in each source.</b>	<b>kg or l / tons of sugar cane Nitrogen content: g N/kg or g N/L</b>	<b>Information included in the “standard profile”.</b>
11	Consumption of fuel and electricity by the network	It refers to fuel consumption (sum of agricultural operations, irrigation, sugarcane transport, straw, vinasse, filter cake, ashes, people transportation, etc.), in the total area (requirement 2), divided by the total amount of sugar cane (requirement 4). Own and third-party fuels must be accounted for (for example, if the harvesting of sugar cane is outsourced, the fuel used for this operation must be accounted for by the plant or supplier that contracted this service). Diesel B8, B10, BX, B20, B30. Biodiesel Gasoline C. Hydrous Ethanol	l/tons of sugar cane Nm <sup>3</sup> /tons of sugar cane kWh/tons of sugar cane	Information included in the “standard profile”.

		<b>Biomethane Electricity by source (Biomass; SHP; Wind; Solar), or BR Mix</b>		
Industrial phase				
1	Amount of sugar cane processed	Total annual amount of sugarcane arriving at the plant (sum of culms, vegetable and mineral impurities). This parameter shall be reported on a wet basis.	tons of sugar cane/year on a wet basis	Mandatory information. The total amount processed shall be informed, regardless of satisfaction of the eligibility criteria.
2	Amount of straw processed	Total annual amount of straw processed in the plant. This parameter refers to straw collected separately from the sugar cane (for example, baled straw, straw	tons of straw/year, on a dry basis	Mandatory information. The total amount processed shall be informed, regardless of satisfaction of the

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		collected by a forage harvester, among others).		eligibility criteria.
3	Yield of anhydrous ethanol	Total volume (adjusted for a temperature of 20°C) of anhydrous ethanol produced annually divided by the amount of sugar cane processed (requirement 1).	l/tons of sugar cane	Mandatory information. The total average yield shall be informed, regardless of satisfaction of the eligibility criteria.
4	Yield of hydrous ethanol	Total volume (adjusted for a temperature of 20°C) of anhydrous ethanol produced annually divided by the amount of sugar cane processed (requirement 1).	l/tons of sugar cane	Mandatory information. The total average yield shall be informed, regardless of satisfaction of the eligibility criteria.
5	Yield of sugar	Total mass of sugar produced annually divided by the amount of sugar cane processed (requirement 1).	kg/tons of sugar cane	Mandatory information.

				<b>The total average yield shall be informed, regardless of satisfaction of the eligibility criteria.</b>
6	Electrical power traded	It refers to the total amount of electricity traded, on an annual basis, divided by the amount of processed sugar cane (requirement 1), regardless of whether the co-products or residues used to generate this energy come from its production process or are purchased from third parties.	kWh/tons of sugar cane	Mandatory information. The total amount traded shall be informed, regardless of satisfaction of the eligibility criteria.
7	Bagasse traded	It refers to the total amount of bagasse traded, on an annual basis, divided by the amount of processed sugar cane (requirement 1). It shall be reported on a wet basis and the respective moisture content shall also be reported.	kg/tons of sugar cane, on a wet basis Moisture content: %	Mandatory information. The total amount traded shall be informed, regardless of satisfaction of the eligibility criteria.
8	Biofuel consumption	Consumption of biofuels used in the processing of sugar cane to convert it into ethanol.	kg/tons of sugar cane	Mandatory information. The total amount

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				consumed shall be informed.
8.1	Own biofuels	Amount of bagasse and straw consumed, on a wet basis, divided by the amount of processed sugar cane (requirement 1). Please also inform the moisture of these biofuels.	kg/tons of sugar cane, on a wet basis Moisture content: %	Mandatory information. The total amount consumed shall be informed.
8.2	Biofuels purchased from third parties	Amount consumed of bagasse, straw, wood chips, wood, and forest waste, on a wet basis, divided by the amount of sugar cane processed (requirement 1). Inform the moisture content of these biofuels. Additionally, the transportation distance of these biofuels from the supplier to the plant shall be informed.	kg/tons of sugar cane, on a wet basis Moisture content: % Transportation distance: km	Mandatory information.
				<b>The total amount consumed shall be informed.</b>
9	Consumption of fuel and electricity by the network	Consumption of fuel and electricity divided by the amount of sugar cane processed (requirement 1). Fuel Oil Hydrous ethanol Anhydrous ethanol Biomethane Electricity by source (Biomass; SHP; Wind; Solar), or BR Mix	l/tons of sugar cane Nm <sup>3</sup> /tons of sugar cane kWh/tons of sugar cane	Mandatory information. The total amount consumed shall be informed.

Table 9. Information declared to calculate the carbon intensity of second-generation fuel ethanol

	Parameter	Description	Unit	Requirement
Agricultural Phase				
The greenhouse gas emissions are not accounted for, so the RenovaCalc does not have information to be declared for the agricultural phase.				
Industrial Phase				
1	Amount of lignocellulosic material (LCM) processed	Total amount of LCM, on a dry basis, processed annually to produce second-generation ethanol, detailed by source.	tons of LCM (on a dry basis)	Mandatory information. The total amount processed shall be informed, regardless of satisfaction of the eligibility criteria.

2	Yield of anhydrous ethanol	Total volume (adjusted for a temperature of 20°C) of anhydrous ethanol produced annually divided by the amount of LCM processed	l/tons of LCM	Mandatory information. The total average yield shall be informed,
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		(requirement 1).		regardless of satisfaction of the eligibility criteria.
3	Yield of hydrous ethanol	Total volume (adjusted for a temperature of 20°C) of anhydrous ethanol produced annually divided by the amount of LCM processed (requirement 1).	l/tons of LCM	Mandatory information. The total average yield shall be informed, regardless of satisfaction of the eligibility criteria.
4	Electrical power traded	Total amount of electricity traded annually divided by the amount of LCM processed (requirement 1), regardless of whether the co-products or residues used in the generation of that energy arise from its production process or are acquired from third parties.	kWh/tons of LCM	Mandatory information. The total amount traded shall be informed, regardless of satisfaction of the eligibility criteria.
5	Consumption of enzymes	Total amount of enzymes consumed divided by the amount of LCM processed (requirement 1).	kg/tons of LCM	Mandatory information. The total amount consumed shall be informed.
6	Consumption of industrial inputs for pre-treatment of LCM Sulfuric Acid Ammonia Sodium Hydroxide	Amount of inputs consumed divided by the amount of LCM processed (requirement 1).	kg/tons of LCM	Mandatory information. The total amount consumed shall be informed.

7	<b>Biofuel consumption</b>	<b>Amount consumed of bagasse, straw, wood chips, wood, forest waste, and waste cellulignin from the 2G process, on a wet basis, divided by the amount of LCM processed (requirement 1). Inform the moisture content of these biofuels. Additionally, the transportation distance of these biofuels from the supplier to the plant shall be informed.</b>	<b>kg/tons of LCM (on a wet basis) Moisture content: % Transportation distance: km</b>	<b>Mandatory information. The total amount consumed shall be informed.</b>
8	Consumption of fuel and electricity by the network	Consumption of fuel and electricity divided by the amount of sugar cane processed (requirement 1). Fuel Oil Hydrous ethanol Anhydrous ethanol Biomethane Electricity by source (Biomass; SHP; Wind; Solar), or BR Mix	l/tons of LCM Nm <sup>3</sup> /tons of LCM kWh/tons of LCM	Mandatory information. The total amount consumed shall be informed.

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Table 10. Information declared to calculate the carbon intensity of first- and second-generation fuel ethanol produced in an integrated plant

	Parameter	Description	Unit	Requirement
Agricultural Phase The requirements are identical to those of the agricultural phase of the pathway of first-generation fuel ethanol produced from sugar cane (Table 8).				
Industrial Phase				
1	Amount of sugar cane processed	Total annual amount of sugarcane arriving at the plant (sum of culms, vegetable and mineral impurities). This parameter shall be reported on a wet basis.	tons of sugar cane/year	Mandatory information. The total amount processed shall be informed, regardless of satisfaction of the eligibility criteria.

2	Amount of own straw processed	Total annual amount of straw processed in the plant. This parameter refers to straw collected separately from the sugar cane (for example, baled straw, straw collected by a forage harvester, among others).	tons of straw/year (on a dry basis)	Mandatory information. The total amount processed shall be informed, regardless of satisfaction of the eligibility criteria.
3	Amount of own bagasse processed	Total annual amount of own bagasse processed in the plant. It shall be reported on a wet basis and the respective moisture content shall also be reported.	tons/year (on a wet basis) Moisture content: %	Mandatory information. The total amount processed shall be informed, regardless of satisfaction of the eligibility criteria.
4	Amount of third-party bagasse processed	Total amount of third-party bagasse processed annually. It shall be reported on a wet basis and the respective moisture content shall also be reported. The transportation distance of this bagasse to the plant shall be informed.	tons/year (on a wet basis) Moisture content: % Transportation distance: km	Mandatory information. The total amount processed shall be informed, regardless of satisfaction of the eligibility criteria.
5	Amount of third-party straw processed	Total annual amount of third-party straw processed in the plant. The transportation distance of this straw to the plant shall be informed.	tons of straw/year (on a dry basis) Transportation distance: km	Mandatory information. The total amount processed shall be informed, regardless of satisfaction of the eligibility criteria.
6	Yield of anhydrous	Total volume (adjusted for a temperature of 20°C) of	l/tons of sugar cane	Mandatory information. The total

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	ethanol	anhydrous ethanol produced annually divided by the amount of <b>sugar cane processed (requirement 1)</b> .		average yield shall be informed, regardless of satisfaction of the eligibility criteria.
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7	Yield of hydrous ethanol	Total volume (adjusted for a temperature of 20°C) of hydrous ethanol produced annually divided by the amount of sugar cane processed (requirement 1).	l/tons of sugar cane	Mandatory information. The total average yield shall be informed, regardless of satisfaction of the eligibility criteria.
8	Yield of sugar produced	Total mass of sugar produced annually divided by the amount of sugar cane processed (requirement 1).	kg/tons of sugar cane	Mandatory information. The total average yield shall be informed, regardless of satisfaction of the eligibility criteria.
9	Electrical power traded	Total amount of electricity traded annually divided by the amount of sugar cane processed (requirement 1), regardless of whether the co-products or residues used in the generation of that energy arise from its production process or are acquired from third parties.	kWh/tons of sugar cane	Mandatory information. The total amount traded shall be informed, regardless of satisfaction of the eligibility criteria.
10	Bagasse traded	Total amount of bagasse traded annually divided by the amount of sugar cane processed (requirement 1). It shall be reported on a wet basis and the respective moisture content shall also be reported.	kg/tons of sugar cane (on a wet basis) Moisture content: %	Mandatory information. The total amount traded shall be informed, regardless of satisfaction of the eligibility criteria.
11	Consumption of enzymes	Total amount of enzymes consumed divided by the amount of sugar cane processed (requirement 1).	kg/tons of sugar cane	Mandatory information. The total amount consumed shall be informed.
12	Consumption of industrial inputs for pre-treatment of LCM Sulfuric Acid Ammonia Sodium Hydroxide	Amount of inputs consumed divided by the <b>amount of sugar cane processed (requirement 1)</b> .	kg/tons of sugar cane	Mandatory information. The total amount consumed shall be informed.

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13	Biofuel consumption	Amount consumed of biofuels divided by the amount of sugar cane processed (requirement 1).	kg/tons of sugar cane	Mandatory information. The total amount consumed shall be informed.
13.1	Own biofuels	Amount of bagasse and straw consumed, on a wet basis, divided by the amount of processed sugar cane (requirement 1). Also inform the moisture content of these biofuels.	kg/tons of sugar cane (on a wet basis) Moisture content: %	Mandatory information. The total amount consumed shall be informed.
13.2	Biofuels acquired from third parties	Amount consumed of bagasse, straw, wood chips, wood, and forest waste, on a wet basis, divided by the amount of sugar cane processed (requirement 1). Inform the moisture content of these biofuels. Additionally, the transportation distance of these biofuels from the supplier to the plant shall be informed.	kg/tons of sugar cane (on a wet basis) Moisture content: % Transportation distance: km	Mandatory information. The total amount consumed shall be informed.
14	Consumption of fuel and electricity by the network	Consumption of fuel and electricity divided by the amount of sugar cane processed (requirement 1). Fuel Oil Hydrous ethanol Anhydrous Ethanol	l/tons of sugar cane Nm <sup>3</sup> /tons of sugar cane kWh/tons of sugar cane	Mandatory information. The total amount consumed shall be informed.

	<b>Biomethane Electricity by source (Biomass; SHP; Wind; Solar), or BR Mix</b>	
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Table 11. Information declared to calculate the carbon intensity of first-generation, corn-based fuel ethanol.

Parameter	Description	Unit	Requirement
Agricultural Phase – Corn			
1	Planting system	Conventional – It involves the first stage of soil preparation, which consists of deeper operations, usually carried out with a plow, aiming at breaking compacted soil layers and eliminating or burying the vegetation cover. In the second stage of preparation, operations	N/A
			Information included in the “standard profile”.

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		are more superficial, using mulch tillers or land planers to level, break clods, destroy superficial crusts, incorporate agrochemicals, and eliminate weeds. Sowing is done by broadcasting or in row. No-tillage, with crop rotation – No-tillage planting is the sowing system in which the seed is placed directly on the unturned soil. A small furrow (or pit) is opened, sufficiently deep and wide to ensure good coverage of the seed with soil. Crop rotation is the organized and regular alternation in the cultivation of different plant species, sequentially, in a given area. No-tillage, with crop rotation – No-tillage planting is the sowing system in which the seed is placed directly in the unturned soil. A small furrow (or pit) is opened, sufficiently deep and wide to ensure good coverage of the seed with soil. The succession of crops consists in alternating crops without any order and regularity of the species used. Minimum/Reduced Tillage - system in which there is less tillage when compared to the conventional system. Sowing is done directly over vegetation previously dried out with herbicide, without revolving the soil.		
2	Total area	Total area of the unit dedicated to production of corn.	ha	Mandatory information for all eligible producers of biomass.
3	Total production	Total amount of product produced in the total area of production (requirement 2). This parameter shall be reported on a wet basis and the respective moisture content shall also be reported.	tons of corn (on a wet basis) Moisture content: %	Mandatory information for all eligible producers of biomass.

4	<b>Collected straw</b>	<b>Total amount of straw collected annually in the total area of production (requirement 2).</b>	<b>tons of straw (on a dry basis)</b>	<b>Mandatory information for all eligible producers of biomass.</b>
5	Seeds	Total annual amount of seeds used in the total area of production (requirement 2) divided by the total production of grains (requirement 3).	kg/tons of corn	Information included in the "standard profile".
6	Consumption of agricultural lime	Amount consumed of each type of agricultural lime (calcitic	kg/tons of corn	Information included in the

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		limestone, dolomitic limestone, and agricultural plaster), divided by the total production of grains (requirement 3).		"standard profile".
7	Consumption of synthetic fertilizers	Amount consumed of each element (N, P <sub>2</sub> O <sub>5</sub> , and K <sub>2</sub> O by source), applied to the total area (requirement 2), divided by the total production of grains (requirement 3).	kg element/tons of corn	Information included in the "standard profile".
8	Consumption of organic/organomineral fertilizers	Total annual amount of the specified fertilizer used in the total area (requirement 2) divided by the total production of grains (requirement 3). It shall be reported on a wet basis. Inform the Nitrogen content in each source.	kg element/tons of corn Nitrogen content: g N/kg	Information included in the "standard profile".
9	Consumption of fuel and electricity by the network	Consumption of fuels (sum of the agricultural operations, irrigation, fuel transportation, people transportation, etc.), in the total area (requirement 2), divided by <b>the total production of grains (requirement 3). Diesel B8, B10, BX, B20, B30. Biodiesel Gasoline C Hydrous ethanol Biomethane Electricity by source (Biomass; SHP; Wind; Solar), or BR Mix</b>	l/tons of corn Nm <sup>3</sup> /tons of corn kWh/tons of corn	Information included in the "standard profile".

Industrial Phase				
1	Amount of corn processed	Total annual amount of corn processed. This parameter shall be reported on a wet basis. The moisture content shall be reported. Inform the transportation distance covered by the raw material until the producing facility.	tons of corn/year (on a wet basis) Moisture content: % Transportation distance: km	Mandatory information. The total amount processed shall be informed, regardless of satisfaction of the eligibility criteria.
2	Yield of anhydrous ethanol	Total volume (adjusted for a temperature of 20°C) of anhydrous ethanol produced annually divided by the amount of corn processed (requirement 1).	L/tons of corn	Mandatory information. The total amount produced shall be informed, regardless of satisfaction of the eligibility criteria.

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3	Yield of hydrous ethanol	Total volume (adjusted for a temperature of 20°C) of anhydrous ethanol produced annually divided by the amount of corn processed (requirement 1).	l/tons of corn	Mandatory information. The total amount produced shall be informed, regardless of satisfaction of the eligibility criteria.
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4	Electrical power traded	Total amount of electricity traded annually divided by the amount of corn processed (requirement 1), regardless of whether the co-products or residues used in the generation of that energy arise from its production process or are acquired from third parties.	kWh/tons of corn	Mandatory information. The total amount traded shall be informed, regardless of satisfaction of the eligibility criteria.
5	Yield of Distillers Dried Grains (DDG)	Total mass of DDG produced annually divided by the total annual amount of corn processed (requirement 1). The moisture content shall be reported.	kg/tons of corn Moisture content: %	Mandatory information. The total amount produced shall be informed, regardless of satisfaction of the eligibility criteria.
6	Yield of Distillers Dried Grains with Solubles (DDGS)	Total mass of DDGS produced annually divided by the total annual amount of corn processed (requirement 1). The moisture content shall be reported.	kg/tons of corn Moisture content: %	Mandatory information. The total amount produced shall be informed, regardless of satisfaction of the eligibility criteria.
7	Corn bran yield of Corn Gluten Meal (CGM)	Total mass of CGM produced annually divided by the total annual amount of corn processed (requirement 1). The moisture content shall be reported.	kg/tons of corn Moisture content: %	Mandatory information. The total amount produced shall be informed, regardless of satisfaction of the eligibility criteria.

8	<b>Corn protein yield of Corn Gluten Feed (CGF)</b>	<b>Total mass of CGF produced annually divided by the total annual amount of corn processed (requirement 1). The moisture content shall be reported.</b>	<b>kg/tons of corn Moisture content: %</b>	<b>Mandatory information. The total amount produced shall be informed, regardless of satisfaction of the eligibility criteria.</b>
9	Corn oil yield	Total mass of corn oil produced annually divided by the total annual amount of corn	kg/tons of corn	Mandatory information. The total amount

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		processed (requirement 1).		produced shall be informed, regardless of satisfaction of the eligibility criteria.
10	Consumption of fuel and electricity by the network	Consumption of fuel and electricity divided by the amount of corn processed (requirement 1). Wood chips, wood, forest waste, sugarcane bagasse, and sugarcane straw shall be reported on a wet basis, and their respective moisture content shall be informed. Additionally, the transportation distance of these fuels from the supplier to the plant shall be informed. Diesel B8, B10, BX, B20, B30 Biodiesel Fuel Oil	kg/tons of corn (on a wet basis) Moisture content: % l/tons of corn Nm <sup>3</sup> /tons of corn kWh/tons of corn Transportation distance: km	Mandatory information. The total amount consumed shall be informed.

	<b>Hydrous ethanol Anhydrous Ethanol Biomethane Natural Gas Electricity by source (Biomass; SHP; Wind; Solar), or BR Mix</b>	
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Table 12. Information declared to calculate the carbon intensity of first-generation, sugarcane- and corn-based ethanol fuel produced in an integrated plant (flex)

	Parameter	Description	Unit	Requirement
Agricultural Phase – Sugar cane The requirements are identical to those of the Agricultural Phase of the pathway of first-generation sugar cane-based fuel ethanol (Table 8).				
Agricultural Phase - Corn  The requirements are identical to those of the Agricultural Phase of the pathway of first-generation corn-based fuel ethanol (Table 11).				
Industrial Phase				
1	Amount of sugar cane processed	Total annual amount of sugarcane arriving at the plant (sum of culms, vegetable and mineral impurities). This parameter shall be reported on a wet basis.	tons of sugar cane/year	Mandatory information. The total amount processed shall be informed, regardless of satisfaction of the eligibility criteria.
2	Amount of own straw processed	Total annual amount of straw processed in the plant. This parameter refers to straw collected	tons of straw/year (on a dry	Mandatory information. The total amount processed shall be



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	separately from the sugar cane (for example, baled straw, straw collected by a forage harvester, among others).	basis)	informed, regardless of satisfaction of the eligibility criteria.
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3	<b>Amount of corn processed</b>	<b>Total annual amount of corn processed. This parameter shall be reported on a wet basis. The moisture content shall be reported. Inform the transportation distance covered by the raw material until the producing facility.</b>	<b>tons of corn/year (on a wet basis) Moisture content: % Transportation distance: km</b>	<b>Mandatory information. The total amount processed shall be informed, regardless of satisfaction of the eligibility criteria.</b>
4	Production of anhydrous ethanol	Total volume (adjusted for a temperature of 20°C) of anhydrous ethanol produced annually.	l/year	Mandatory information. The total amount produced shall be informed, regardless of satisfaction of the eligibility criteria.
5	Production of hydrous ethanol	Total volume (adjusted for a temperature of 20°C) of anhydrous ethanol produced annually.	l/year	Mandatory information. The total amount produced shall be informed, regardless of satisfaction of the eligibility criteria.
6	Production of sugar	Total mass of sugar produced annually.	kg/year	Mandatory information. The total amount produced shall be informed, regardless of satisfaction of the eligibility criteria.
7	Bagasse traded	Total amount of bagasse traded annually. It shall be reported on a wet basis and the respective moisture content shall be informed.	kg/year (on a wet basis) Moisture content: %	Mandatory information. The total amount traded shall be informed, regardless of satisfaction of the eligibility criteria.

8	<b>Electrical power traded</b>	<b>Total amount of electricity traded annually, regardless of whether the co-products</b>	<b>kWh/year</b>	<b>Mandatory information. The total amount</b>
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		<b>or residues used in the generation of that energy arise from its production process or are acquired from third parties.</b>		<b>traded shall be informed, regardless of satisfaction of the eligibility criteria.</b>
9	Production of Distillers Dried Grains (DDG)	Total mass of DDG produced annually. The moisture content shall be reported.	kg/year Moisture content: %	Mandatory information. The total amount produced shall be informed.
10	Production of Distillers Dried Grains with Solubles (DDGS)	Total mass of DDGS produced annually. The moisture content shall be reported.	kg/year Moisture content: %	Mandatory information. The total amount produced shall be informed.
11	Corn bran production of Corn Gluten Meal (CGM)	Total mass of CGM produced annually. The moisture content shall be reported.	kg/year Moisture content: %	Mandatory information. The total amount produced shall be informed.
12	Corn protein production of Corn Gluten Feed (CGF)	Total mass of CGF produced annually. The moisture content shall be reported.	kg/year Moisture content: %	Mandatory information. The total amount produced shall be informed.
13	Production of corn oil	Total mass of corn oil produced annually.	kg/year	Mandatory information. The total amount produced shall be informed.
14	Consumption of fuel and electricity by the network	Total annual consumption of fuel and electricity. Bagasse, straw, wood chips, wood, and forest waste shall be reported on a wet basis, and their respective moisture content shall be informed. Additionally, the transportation distance of these <b>fuels from the supplier to the plant shall be informed. Fuel Oil Hydrous ethanol Anhydrous ethanol Biomethane Electricity by source (Biomass; SHP; Wind; Solar), or BR Mix</b>	kg/year (on a wet basis) Moisture content: % l/year Nm <sup>3</sup> /year kWh/year <b>Transportation distance: km</b>	Mandatory information. The total amount consumed shall be informed.

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Table 13. Information declared to calculate the carbon intensity of imported first-generation, corn-based fuel ethanol

	Parameter	Description	Unit	Requirement
Agricultural Phase – Corn				
1	Planting system	Conventional – It involves the first stage of soil preparation, which consists of deeper operations, usually carried out with a plow, aiming at breaking compacted soil layers and eliminating or burying the vegetation cover. In the second stage of preparation, operations are more superficial, using mulch tillers or land planers to level, break clods, destroy superficial crusts, incorporate agrochemicals, and eliminate weeds. Sowing is done by broadcasting or in row. No-tillage, with crop rotation – No-tillage planting is the sowing system in which the seed is placed directly on the unturned soil. A small furrow (or pit) is opened, sufficiently deep and wide to ensure good coverage of the seed with soil. Crop rotation is the organized and regular alternation in the cultivation of different plant species, sequentially, in a given area. No-tillage, with crop rotation – No-tillage planting is the sowing system in which the seed is placed directly in the unturned soil. A small furrow (or pit) is opened, sufficiently deep and wide to ensure good coverage of the seed with soil. The succession of crops consists in alternating crops without any order and regularity of the species used. Minimum/Reduced Tillage - system in which there is less tillage when compared to the conventional system. Sowing is done directly over vegetation previously dried out with herbicide, without revolving the soil.	N/A	Information included in the “standard profile”.
2	Total area	Total area of the unit dedicated to production of corn.	ha	Mandatory information for all eligible producers of biomass.

3	<b>Total production</b>	<b>Total amount of product produced in the total area of production (requirement 2). This parameter shall be reported on a wet basis and the respective moisture content shall also be reported.</b>	<b>tons of corn (on a wet basis) Moisture content: %</b>	<b>Mandatory information for all eligible producers of biomass.</b>
4	Collected straw	Total amount of product produced in the total area of	tons of straw (on a dry	Mandatory information for

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		production (requirement 2).	basis)	all eligible producers of biomass.
5	Seeds	Total annual amount of seeds used in the total area of production (requirement 2) divided by the total production of grains (requirement 3).	kg/tons of corn	Information included in the "standard profile".
6	Consumption of agricultural lime	Amount consumed of each type of agricultural lime (calcitic limestone, dolomitic limestone, and agricultural plaster), divided by the total production of grains (requirement 3).	kg/tons of corn	Information included in the "standard profile".
7	Consumption of synthetic fertilizers	Amount consumed of each element (N, P2O5, and K2O by source), applied to the total area (requirement 2), divided by the total production of grains (requirement 3).	kg of element/tons of corn	Information included in the "standard profile".
8	Consumption of organic/organomineral fertilizers	Amount consumed of each element (N, P2O5, and K2O by source), applied to the total area (requirement 2), divided by the total production of grains (requirement 3).	kg of element/tons of corn	Information included in the "standard profile".
9	Consumption of fuel and electricity by the network	Consumption of fuels (sum of the agricultural operations, irrigation, fuel transportation, <b>people transportation, etc.</b> ), <b>in the total area (requirement 2), divided by the total production of grains (requirement 3). Diesel B8, B10, BX, B20, B30 Biodiesel Gasoline C Hydrous ethanol Biomethane Natural Gas LPG Electricity by the network – USA Mix</b>	LI/tons of corn Nm <sup>3</sup> /tons of corn kWh/tons of corn	Information included in the "standard profile".

Industrial Phase				
1	Amount of corn processed	Total annual amount of corn processed. This parameter shall be reported on a wet basis. The moisture content shall be reported. Inform the transportation distance covered	tons of corn/year (on a wet basis) Moisture content: % Transportation distance: km	Mandatory information. The total amount processed shall be informed, regardless of satisfaction of the

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		by the raw material until the Producing facility.		eligibility criteria.
2	Yield of anhydrous ethanol	Total volume (adjusted for a temperature of 20°C) of anhydrous ethanol produced annually divided by the amount of corn processed (requirement 1).	L/tons of corn	Mandatory information. The total amount produced shall be informed.
3	Yield of hydrous ethanol	Total volume (adjusted for a temperature of 20°C) of anhydrous ethanol produced <b>annually divided by the amount of corn processed (requirement 1).</b>	l/tons of corn	Mandatory information. The total amount produced shall be informed.

4	Electrical power traded	Total amount of electricity traded annually divided by the amount of corn processed (requirement 1), regardless of whether the co-products or residues used in the generation of that energy arise from its production process or are acquired from third parties.	kWh/tons of corn	Mandatory information. The total amount traded shall be informed.
5	Yield of Distillers Dried Grains (DDG)	Total mass of DDG produced annually divided by the total annual amount of corn processed (requirement 1). The moisture content shall be reported.	kg/tons of corn Moisture content:	Mandatory information. The total amount produced shall be informed.
6	Yield of Distillers Dried Grains with Solubles (DDGS)	Total mass of DDGS produced annually divided by the total annual amount of corn processed (requirement 1). The moisture content shall be reported.	kg/tons of corn Moisture content:	Mandatory information. The total amount produced shall be informed.
7	Corn bran yield of Corn Gluten Meal (CGM)	Total mass of CGM produced annually divided by the total annual amount of corn processed (requirement 1). The moisture content shall be reported.	kg/tons of corn Moisture content:	Mandatory information. The total amount produced shall be informed.
8	Corn protein yield of Corn Gluten Feed (CGF)	Total mass of CGF produced annually divided by the total annual amount of <b>corn processed (requirement 1). The moisture content shall be reported.</b>	kg/tons of corn Moisture content:	Mandatory information. The total amount produced shall be informed.

9	Corn oil yield	Total mass of corn Oil produced annually divided by the total annual amount of corn processed	kg/tons of corn	Mandatory information. The total
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		(requirement 1).		amount produced shall be informed.
10	Consumption of fuel and electricity by the network	Consumption of fuel and electricity divided by the amount of corn processed (requirement 1). Wood chips, wood, forest waste, sugarcane bagasse, and sugarcane straw shall be reported on a wet basis, and their respective moisture content shall be informed. Additionally, the transportation distance of these fuels from the supplier to the plant shall be informed. Diesel B8, B10, BX, B20, B30 Biodiesel Fuel Oil Hydrous ethanol Anhydrous ethanol Biomethane Natural Gas Heat (coal)	kg/tons of corn (on a wet basis) Moisture content: % l/tons of corn Nm <sup>3</sup> /tons of corn kWh/tons of corn Transportation distance: km	Mandatory information. The total amount consumed shall be informed.

	<b>Electricity by the network – USA Mix</b>	
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Table 14. Information declared to calculate the carbon intensity of biodiesel

	Parameter	Description	Unit	Requirement
Agricultural Phase – Soybeans, Palm, Cotton, Others				
1	Planting system	Conventional – It involves the first stage of soil preparation, which consists of deeper operations, usually carried out with a plow, aiming at breaking compacted soil layers and eliminating or burying the vegetation cover. In the second stage of preparation, operations are more superficial, using mulch tillers or land planers to level, break clods, destroy superficial crusts, incorporate agrochemicals, and eliminate weeds. Sowing is done by broadcasting or in row. No-tillage, with crop rotation – No-tillage planting is the sowing system in which the	N.A.	Information included in the “standard profile”.

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		seed is placed directly on the unturned soil. A small furrow (or pit) is opened, sufficiently deep and wide to ensure good coverage of the seed with soil. Crop rotation is the organized and regular alternation in the cultivation of different plant species, sequentially, in a given area. No-tillage, with crop rotation – No-tillage planting is the sowing system in which the seed is placed directly in the unturned soil. A small furrow (or pit) is opened, sufficiently deep and wide to ensure good coverage of the seed with soil. The succession of crops consists in alternating crops without any order and regularity of the species used. Minimum/Reduced Tillage - system in which there is less tillage when compared to the conventional system. Sowing is done directly over vegetation previously dried out with herbicide, without revolving the soil.		
2	Total area	Total area intended for soybean production (when applicable) in the property.	ha	Mandatory information for all eligible producers of biomass.
3	Total production	Total amount of soybeans produced in the total area of production (requirement 2). This parameter shall be reported on a wet basis.	tons of soybeans (on a wet basis) Moisture content: %	Mandatory information for all eligible producers of biomass.
4	Seeds	Total annual amount of seeds used in the total area of soybean production (requirement 2) divided by the total soybean production (requirement 3).	kg/tons of soybeans	Information included in the “standard profile”.
5	Consumption of	Amount consumed of each	kg/tons of	Information

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	agricultural lime	type of agricultural lime (calcitic limestone, dolomitic limestone, and agricultural plaster), applied to the total area (requirement 2), divided by the total soybean production (requirement 3).	soybeans	included in the "standard profile".
6	Consumption of synthetic fertilizers	Amount consumed of each element (N, P <sub>2</sub> O <sub>5</sub> , and K <sub>2</sub> O by source), applied to the total area (requirement 2), divided by the total soybean production (requirement 3).	kg of element/tons of soybeans	Information included in the "standard profile".
7	Consumption of organic/organomineral fertilizers	Amount consumed of each element (N, P <sub>2</sub> O <sub>5</sub> , and K <sub>2</sub> O by source), applied to the total area (requirement 2), divided by the total production of soybeans (requirement 3).	kg of element/tons of soybeans	Information included in the "standard profile".
8	Consumption of fuel and electricity by the network	Consumption of fuels (sum of the agricultural operations, irrigation, material transportation, people transportation, etc.), in the total area (requirement 2), divided by the total soybean production (requirement 3). Diesel B8, B10, BX, B20, B30 Biodiesel Gasoline C Hydrous ethanol Biomethane Electricity by source (Biomass; SHP; Wind; Solar), or BR Mix	l/tons of soybeans Nm <sup>3</sup> /tons of soybeans kWh/tons of soybeans	Information included in the "standard profile".
Industrial phase – oil extraction				
1	Amount of soybeans processed	Total annual amount of soybeans processed. This parameter shall be reported on a wet basis and the moisture content shall be informed.	tons of soybeans/year (on a wet basis) Moisture content: % Transportation distance: km	Mandatory information. The total amount processed shall be informed, regardless of satisfaction of the eligibility criteria.
2	Oil yield	Total mass of oil produced annually divided by the total annual amount of soybeans	kg oil/tons of soybeans	Mandatory information. The total production



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		processed (requirement 1).		shall be informed, regardless of satisfaction of the eligibility criteria.
3	Co-product production	Total mass of each co-product (cake, bran, etc.) produced annually divided by the total annual amount of soybeans processed (requirement 1).	kg co-product/tons of soybeans	Mandatory information. The total production shall be informed, regardless of satisfaction of the eligibility criteria.
4	Consumption of fuel and electricity by the network	Total annual consumption of fuel and electricity. Bagasse, straw, wood chips, wood, and forest waste shall be reported on a wet basis, and their respective moisture content shall be informed. The transportation distance of these biofuels from the supplier to the plant shall be informed. Diesel B8, B10, BX, B20, B30. Biodiesel Fuel Oil Biomethane Natural gas Electricity by source (Biomass; SHP; Wind; Solar), or BR Mix	kg/tons of biomass (on a wet basis) Moisture content: % l/tons of soybeans Nm <sup>3</sup> /tons of soybeans kWh/tons of soybeans Transportation distance: km	Mandatory information. The total amount consumed shall be informed.
Industrial phase – transesterification				
1	Amount of raw material processed	Total annual amount of raw material processed, by source (soybean oil, palm oil, cottonseed oil, “other oils”). Inform the transportation distance covered by the raw material until the Producing facility. Inform the average carbon intensity of the soybean oil acquired.	tons of raw material/year Transportation distance: km Average carbon intensity of the soybean oil: gCO <sub>2</sub> eq/kg oil	Mandatory information. The total amount processed shall be informed, regardless of satisfaction of the eligibility criteria.
2	Total inflow (residues)	Total amount of waste biomass to be processed (used frying oil, animal fat, other waste oils). <b>This parameter shall be</b>	tons of waste biomass (on a wet basis) <b>Moisture content: %</b>	Mandatory information. The total amount processed shall be informed,

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		<b>reported on a wet basis.</b>		regardless of satisfaction of the eligibility criteria.
3	Production pathway	Specify the type of production pathway: ethylic or methylic.	Ethylic or Methylic	Mandatory information.
4	Production of biodiesel	Total volume (adjusted for a temperature of 20°C) of biodiesel produced annually.	m <sup>3</sup> biodiesel/year	Mandatory information. Total production shall be informed, regardless of satisfaction of the eligibility criteria.
5	Production of raw glycerin	Total mass of raw glycerin produced annually.	tons/year	Mandatory information. Total production shall be informed, regardless of satisfaction of the eligibility criteria.
6	Production of purified glycerin	Total mass of purified glycerin produced annually.	tons/year	Mandatory information. Total production shall be informed, regardless of satisfaction of the eligibility criteria.
7	Consumption of industrial inputs: Methanol, Sodium methoxide, Anhydrous ethanol, Sodium hydroxide	Total mass of each industrial input consumed annually.	tons of input/year	Mandatory information. The total amount consumed shall be informed.

8	<b>Consumption of fuel and electricity by the network</b>	<b>Total annual consumption of fuel and electricity. Bagasse, straw, wood chips, wood, and forest waste shall be reported on a wet basis, and their respective moisture content</b>	<b>kg fuel/year Moisture content: % m<sup>3</sup>/year Nm<sup>3</sup>/year MWh/year Transportation</b>	<b>Mandatory information. The total amount consumed shall be</b>
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		<b>shall be informed. The transportation distance of these biofuels from the supplier to the plant shall be informed. Diesel B8, B10, BX, B20, B30. Biodiesel Fuel oil Natural Gas Electricity by source (Biomass; SHP; Wind; Solar), or BR Mix</b>	<b>distance: km</b>	<b>informed.</b>
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Table 15. Information declared to calculate the carbon intensity of the alternative fuels synthesized from soybean hydroprocessed esters and fatty acids (HEFA)

	Parameter	Description	Unit	Requirement
Agricultural phase – Soybeans The requirements are identical to those of the agricultural phase of the biodiesel pathway (Table 14).				
Industrial Phase – Oil Extraction The requirements are identical to those of the oil extraction stage of the biodiesel pathway (Table 14).				
Industrial Phase				
1	Effective processing of own oil	Total annual amount of oil processed. Inform the transportation distance covered by the raw material until the Producing facility.	tons of oil/year Transportation distance: km	Mandatory information. The total amount processed shall be informed, regardless of satisfaction of the eligibility criteria.

2	Effective processing of oil from suppliers	Total annual amount of processed oil acquired by the producing unit. Inform the transportation distance covered by the raw material until the Producing facility. Inform the average carbon intensity of the oil acquired.	tons of oil/year Transportation distance: km Average carbon intensity of the oil: gCO <sub>2</sub> eq/kg oil	Mandatory information. The total amount processed shall be informed, regardless of satisfaction of the eligibility criteria.
3	Biokerosene yield	Total volume (adjusted for a temperature of 20°C) of biokerosene produced annually divided by the total annual amount of oil processed (requirement 2).	kg/tons of oil	Mandatory information. Total production shall be informed.
4	Alternative gasoline yield	Total volume (adjusted for a temperature of 20°C) of alternative gasoline produced annually divided by the total annual amount of oil processed (requirement 2).	l/tons of oil	Mandatory information. Total production shall be informed.
5	Alternative	Total volume (adjusted for a	l/tons of oil	Mandatory

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	diesel yield <sup>1</sup>	temperature of 20°C) of alternative diesel produced annually divided by the total annual amount of oil processed (requirement 2).		information. Total production shall be informed.
6	Alternative liquefied gas yield <sup>1</sup>	Total volume (calculated by reference to the standard pressure and temperature conditions) of alternative liquefied gas produced annually divided by the total annual amount of oil processed (requirement 2).	kg/tons of oil	Mandatory information. Total production shall be informed, regardless of satisfaction of the eligibility criteria.
7	Electrical power traded	Total amount of electricity traded annually divided by the total annual amount of oil processed, regardless of whether the co-products or residues <b>used in the generation of that energy arise from its production process or are acquired from third parties.</b>	kWh/tons of oil	Mandatory information. The total amount traded shall be informed, regardless of satisfaction of the eligibility criteria.

8	Consumption of industrial inputs: Hydrogen	Total mass of hydrogen consumed annually.	kg/tons of oil	Mandatory information. Total consumption shall be informed.
9	Consumption of fuel and electricity by the network	The total annual consumption of fuels and electricity divided by the total annual amount of oil processed (requirement 2). Bagasse, straw, wood chips, wood, and forest waste shall be reported on a wet basis, and their respective moisture content shall be informed. Additionally, the transportation distance of these fuels from the supplier to the plant shall be informed. Diesel B8, B10, BX, B20, B30. Biodiesel Fuel oil Hydrous ethanol Biomethane Alternative fuel gas Natural gas Electricity by source (Biomass; SHP; Wind; Solar), or BR Mix	kg/tons of oil (on a wet basis) Moisture content: % l/tons of oil Nm <sup>3</sup> /tons of oil kWh/tons of oil Transportation distance: km	Mandatory information. Total consumption shall be informed.

Table 16. Information declared to calculate the carbon intensity of biomethane

Parameter	Description	Unit	Requirement
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Agricultural Phase

The greenhouse gas emissions are not accounted for, so the RenovaCalc does not have information to be declared for the agricultural phase.				
Industrial Phase				
1	Production of biomethane	Total annual volume of biomethane produced, calculated by reference to the standard pressure and temperature conditions (101.325 kPa and 273.15 K, respectively). Inform the Lower Heating Value (PCI) of biomethane and its respective methane content, measured before any enrichment with natural gas, propane, or LPG.	Nm <sup>3</sup> /year PCI: MJ/Nm <sup>3</sup> Methane content: molar %	Mandatory information. The total amount produced shall be informed.
2	Electricity traded	Total annual amount of electricity traded.	kWh/year	Mandatory information. The total amount traded shall be informed.
3	Processed biomass(es)	Total amount of each biomass processed annually for conversion into biomethane. Also inform the transportation distance of the raw material to the plant.	tons of biomass/year Transportation distance: km	Mandatory information. The amount processed shall be informed.
4	Consumption of fuels and electricity during processing	Consumption of fuels and electricity during processing. Bagasse, straw, wood chips, wood, and Forest waste shall be reported on a wet basis, and their respective moisture content shall be informed. Additionally, the transportation distance of these fuels from the supplier to the plant shall be informed. Diesel B8, B10, BX, B20, B30	tons/year (on a wet basis) Moisture content: % l/year m <sup>3</sup> /year Nm <sup>3</sup> /year MWh/year Transportation distance in km	Mandatory information. Total consumption shall be informed.

	<b>Biodiesel Fuel Oil Biomethane Natural gas Electricity by source (Biomass; SHP; Wind; Solar), or BR Mix</b>	
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## 6. Calculation of the Carbon Intensity of Biofuels

6.1 The carbon intensity of a biofuel is determined automatically by the system after the producer

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or importer of biofuel informs all input parameters for calculation, generating a ratio in g CO<sub>2</sub>eq./MJ.

6.2 The system calculates the carbon intensity of the biofuel automatically in five main steps:

- i) Adjustment of the input parameters based on a reference flow and insertion as “input flows” in the life-cycle inventory of each production pathway;
- ii) Association of such inventory “input flows” with the greenhouse gas emission data upstream of the agro-industrial process, related to the production of agricultural and industrial inputs and to power generation, and downstream, related to distribution and use of the biofuel;

III – Consolidation of an inventory of the greenhouse gas emissions generated in the following stages: agricultural, industrial, of distribution and use of the biofuel;

- iv) Conversion of the greenhouse gas emissions into the “g CO<sub>2</sub>eq” unit, based on characterization factors for each gas: CO<sub>2</sub> = 1; CH<sub>4</sub>fossil = 30; CH<sub>4</sub>biogenic = 28; and N<sub>2</sub>O = 265; and
- v) Adjustment of the ratio based on the functional unit.

6.3 The ratios used in the measurement unit conversions can be found in Tables 17 and 18.

6.4 The Energy-Environmental Efficiency Rating is determined by subtracting the carbon intensity of each biofuel (in g CO<sub>2</sub>eq./MJ) from the carbon intensity of its alternative fossil fuel, according to Table 19, using the amounts of Table 20.

6.5. A bonus of up to twenty percent (20%) applies to the Energy-Environmental Efficiency Rating in case of negative greenhouse gas emission in the life cycle of the biofuel in comparison with its fossil alternative.

Table 17. Specific mass and lower heating value of fuels.

<b>Product</b>	<b>Specific mass [ton/m<sup>3</sup>]</b>	<b>Lower Heating Value [MJ/kg]</b>
Anhydrous ethanol <sup>1</sup>	0,791	28,26
Hydrous ethanol <sup>1</sup>	0,809	26,38
Biodiesel <sup>1</sup>	0,880	37,68
Biomethane <sup>2</sup>	0,00076	48,25
Alternative fuel gas	0,00080	45,42
Paraffinic kerosene synthesized from hydroprocessed esters and fatty acids (SPK – HEFA) <sup>1</sup>	0,735	43,54
Alternative diesel synthesized from hydroprocessed esters and fatty acids (HEFA) <sup>1</sup>	0,782	43,98
Alternative gasoline synthesized from hydroprocessed esters and fatty acids (HEFA) <sup>1</sup>	0,690	44,94
Alternative liquefied gas synthesized from hydroprocessed esters and fatty acids (HEFA) <sup>3</sup>	0,550	46,60
Gasoline A <sup>1</sup>	0,742	43,54

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Diesel A <sup>1</sup>	0,840	42,29
Natural gas <sup>1</sup>	0,00074	36,84
Aviation kerosene <sup>1</sup>	0,799	43,54
LPG <sup>3</sup>	0,552	46,47
Fuel oil	1,013	40,15

<sup>1</sup> Mass specific to the temperature of 273.15 K (0°C) and 101.325 kPa (1 atm).

<sup>2</sup> Biomethane with 96.5% methane, at 273.15 K (0°C) and 101.325 kPa (1 atm).

<sup>3</sup> Mass specific to the temperature of 273.15 K (0°C) and pressurized.

Table 18. Lower heating value of co-products of the production processes of oil and biofuels

Product	Lower Heating Value [MJ/kg]
Sugar	16,19
DDG – "Dried Distillers Grains"	20,24
DDGS – "Dried Distillers Grains with Solubles"	20,24
CGM – "Corn Gluten Meal"	18,61
CGF – "Corn Gluten Feed"	18,61
Corn oil	37,22
Soybean oil	34,04
Soy bran	34,04

<b>Purified glycerin*</b>	<b>16,20</b>
Raw glycerin**	14,62

\*Purified glycerin: glycerin derived from the biodiesel production process going through one or more purification stages, such as distillation, evaporation, extraction, filtration, or centrifugation, in order to obtain a product with a higher degree of purity

\*\*Raw glycerin: glycerin derived from the biodiesel production process which does not go through purification stages in the plant for production of biodiesel, and is traded in its raw form.

Table 19. Biofuels and their alternative fossil fuels.

Biofuel	Fossil Fuel
Fuel ethanol	Gasoline
Biodiesel	Diesel

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Biomethane	Weighted average, considering the domestic sales of Diesel, Gasoline, and Compressed Natural Gas in unit of energy
Paraffinic kerosene synthesized from hydroprocessed esters and fatty acids (SPK – HEFA)	Aviation kerosene
Alternative diesel synthesized from hydroprocessed esters and fatty acids (HEFA)	Diesel
Alternative gasoline synthesized from hydroprocessed esters and fatty acids (HEFA)	Gasoline

Table 20. Carbon intensity of fossil fuels.

Fossil Fuel	Carbon Intensity [g CO <sub>2</sub> eq./MJ]
Gasoline	87,4
Diesel	86,5
Average of Gasoline, Diesel, and Compressed Natural Gas	86,7
Aviation kerosene	87,5

## SCHEDULE II

(referred to in art. 18, item III, art. 19, and art. 20 of Resolution No. 758 of November 23, 2018)

Table of Sanctions

	SITUATIONS SUBJECT TO IMPOSITION OF SANCTIONS	INITIAL SANCTION	1 <sup>st</sup> RECURRENCE OF THE SANCTION	2 <sup>nd</sup> RECURRENCE OF THE SANCTION
1	Use of fraudulent accreditation – issuance of reports and certificates when the certification services have not been provided; when results have been tampered with; issuance of certificates or reports by an unqualified professional; counterfeit of records or other information in the certification process.	Cancellation of the accreditation.	-	-
2	Granting, permission, or authorization for any other	Suspension until satisfaction of the	Cancellation of the accreditation.	-



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	organization related to the verification body (through ownership structure, administrative control, contractual relationship, cooperation agreements), compensated or otherwise, to use its status of accredited by ANP in any way.	conditions established by ANP, including evidence of invalidation of services provided.		
3	Provision of biofuel certification services making reference to the status of verification body accredited during the suspension period.	Cancellation of the accreditation.	-	-
4	Development of activities that compromise the impartiality or secrecy of information.	Warning.	Suspension until satisfaction of the conditions established by ANP.	Cancellation of the accreditation.
5	Failure to comply with the notices issued by ANP arising from the Supervision activity.	Warning.	Suspension until satisfaction of the conditions established by ANP.	Cancellation of the accreditation.
6	Failure to comply with the nonconformity management verified by ANP.	Warning.	Suspension until satisfaction of the conditions established by ANP.	Cancellation of the accreditation.
7	Failure to meet the deadlines established by ANP.	Warning.	Suspension until satisfaction of the conditions established by ANP.	Cancellation of the accreditation.
8	Failure to provide the documents requested by ANP, delaying or hindering its work, from any aspects.	Suspension until satisfaction of the conditions established by ANP.	Cancellation of the accreditation.	-
9	Lack of grounds in the certification process for issuance of the Certificate of Efficient Production of Biofuels.	Suspension until satisfaction of the conditions established by ANP.	Cancellation of the accreditation.	-
10	Occurrence of nonconformities that, due to their relevance, extent, or amount, cause a lack of trust in the activities	Suspension until satisfaction of the conditions established by	Cancellation of the accreditation.	-

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	developed by the verification body.	ANP.		
11	Failure to satisfy the conditions established by ANP after the suspension period determined as a result of the imposition of a sanction.	Cancellation of the accreditation.	-	-