FS Indústria de Biocombustíveis Ltda.

PROGRAMMATIC POST-ISSUANCE VERIFICATION LETTER

BIOENERGY CRITERIA OF THE CLIMATE BONDS STANDARD

Type of engagement: Assurance Engagement
Period engagement was carried out: July 2025
Approved verifier: Sustainalytics
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Scope and Objectives

Between September 2021 and January 2024, FS Indústria de Biocombustíveis Ltda. ("FS", "FS Bioenergia" or the "Company") issued six certified Climate Bond debt instruments (collectively the "Green Debt Instruments") to finance or refinance projects related to the production of biofuels. In July 2025, FS engaged Sustainalytics to review the projects financed between April 2024 and March 2025 with proceeds from the Green Debt Instruments (the "Nominated Projects") and provide an assessment as to whether the Nominated Projects meet the Post-Issuance Requirements of the Climate Bonds Standard Version 3.0.[1]

The Nominated Projects include:

- Capex and Opex related to the production of hydrous and anhydrous corn-ethanol biofuel

Schedule 1 provides details of the Nominated Projects and disbursement of proceeds.

Post-Issuance Evaluation Criteria

Post-Issuance Requirements of the Climate Bonds Standard Version 3.0:

- Use of Proceeds
- Evaluation and Selection of Projects, including conformance with the relevant Sector Criteria[2]
  - Bioenergy
  - Agriculture[3,4]
- Management of Proceeds
- Reporting

[1] Climate Bonds Initiative, "Climate Bonds Standard Version 3.0", (2019), at: https://www.climatebonds.net/files/documents/Climate-Bonds_Climate-Bonds-Standard_V3_Dec-2019.pdf
[2] Climate Bonds Initiative, "Bioenergy Criteria under the Climate Bonds Standard", (2022), at: https://www.climatebonds.net/files/documents/Climate-Bonds_Sector-Criteria-Bioenergy_Criteria-document_August-2022.pdf
[3] Climate Bonds Initiative, "Agriculture Criteria: Climate Bonds Standard & Certification Scheme", (2021), at: https://www.climatebonds.net/files/documents/Climate-Bonds_Agriculture-sector-critieria_Jun-2021.pdf
[4] Sustainalytics notes that FS has used the Climate Bonds Standard's Agriculture Criteria as a proxy to meet the feedstock certification requirements outlined under the Bioenergy Criteria.

Issuing Entity's Responsibility

FS is responsible for providing accurate information and documentation relating to the details of projects, including description, total development cost of each project and disbursed amounts.

Independence and Quality Control

Sustainalytics, a leading provider of ESG and corporate governance research and ratings to investors, conducted the verification of the Green Debt Instruments to provide an independent opinion on its conformance with the Post-Issuance Requirements of the Climate Bonds Standard.

Sustainalytics has relied on the information and the facts presented by FS with respect to the Nominated Projects. Sustainalytics is not responsible, nor shall be held liable, for any inaccuracies in the opinions, findings or conclusions herein due to incorrect or incomplete data provided by FS.

Sustainalytics makes all efforts to ensure the highest quality and rigor during its assessment process and enlisted its Sustainability Bonds Review Committee to provide oversight over this assessment.

Verifier's Responsibility

Sustainalytics conducted the verification in accordance with the Climate Bonds Standard Version 3.0 and with International Standard on Assurance Engagements 3000 (ISAE 3000).

The work undertaken as part of this engagement included conversations with relevant FS employees and review of relevant documentation to assess conformance of the Green Debt Instruments with the Post-Issuance Requirements of the Climate Bonds Standard Version 3.0.

Exceptions

No exceptions were identified. All projects meet the Post-Issuance Requirements of the Climate Bonds Standard Version 3.0 and the Bioenergy and Agriculture criteria.

Conclusion

Based on the limited assurance procedures conducted and evidence obtained, nothing has come to Sustainalytics' attention that causes us to believe that, in all material respects, the Green Debt Instruments are not in conformance with the Post-Issuance Requirements of the Climate Bonds Standard.

Detailed Findings

Eligibility Criteria	Procedure Performed	Factual Findings	Error or Exceptions Identified
Compliance with Mitigation Criteria	Verification of the Nominated Projects to determine whether the Mitigation criteria were met.	Confirmation that the Nominated Projects complied with the Mitigation requirements mentioned in the Bioenergy and Agriculture Criteria of the Climate Bond Standards, as detailed in Appendices 1 and 3.	None
Compliance with Adaptation and Resilience Criteria	Verification of the Nominated Projects to determine whether the Adaptation and Resilience criteria were met. Verification of FS' compliance with the Adaptation and Resilience requirements of the Bioenergy and Agriculture Criteria.	Confirmation that all the Nominated Projects complied with the Adaptation and Resilience requirements mentioned in the Bioenergy and Agriculture Criteria of the Climate Bond Standards, as detailed in Appendices 2, 4 and 5.	None
Compliance with Post-Issuance Requirements of the Climate Bonds Standard Version 3.0	Verification of the Green Debt Instruments to determine whether the Post-Issuance Requirements of the Climate Bonds Standard Version 3.0 were met.	All the Green Debt Instruments complied with the Post-Issuance Requirements of the Climate Bonds Standard Version 3.0.	None

Schedule 1: Overview of Nominated Projects

Table 1: Details of allocation of proceeds and projects financed from the Green Debt Instruments[5]

Use of Proceeds Category	Asset	Amount Allocated (BRL million)
Bioenergy: production of hydrous and anhydrous corn-ethanol biofuel	Facilities producing biofuel for transport	**3,882.62**
Total Proceeds Allocated		**3,882.62**
Unallocated Proceeds		**347.30[6]**
Outstanding Proceeds from the Green Debt Instruments as of March 2025		**4,229.92**

[5] Sustainalytics notes that FS raised BRL 4,683.95 million from the Green Debt Instruments, of which BRL 454.03 million were repaid during 2023 and 2024, leaving an outstanding balance of BRL 4,229.92 million available for project financing as of March 2025.
[6] FS has communicated to Sustainalytics that the unallocated proceeds from the Green Debt Instruments will be fully allocated by March 2027.

Table 2: Reported Impact and Emissions Thresholds as per the CBI Bioenergy Criteria

Use of Proceeds Category	Asset Type as per CBI Criteria	Emissions Thresholds for Biofuel or Biomass Produced or Used (Primary Energy) as per CBI Criteria	Reported Emissions Data by FS
Bioenergy: production of hydrous and anhydrous corn-ethanol biofuel	Facilities producing biofuel for transport	18.8 gCO_2e/MJ	i. Carbon intensity of anhydrous ethanol produced between April 2024 and March 2025: 18.70 gCO_2e/MJ ii. Percentage of emissions reduction compared to fossil fuel (gasoline) from anhydrous ethanol: 78.60%
			iii. Carbon intensity of hydrous ethanol produced between April 2024 and March 2025: 18.50 gCO_2e/MJ iv. Percentage of emissions reduction compared to fossil fuel (gasoline) from anhydrous ethanol: 78.90%

Schedule 2A: Post-Issuance Requirements of the Climate Bonds Standard

Use of Proceeds	5.1 The Net Proceeds of the Bond shall be allocated to the Nominated Projects & Assets. 5.2 All nominated Projects & Assets shall meet the documented objectives of the Bond as stated under Clause 6.1.1 and shall be in conformance with the requirements of Part C of the Climate Bonds Standard. 5.3 The Issuer shall allocate the Net Proceeds to Nominated Projects & Assets within 24 months of issuance of the Bond, or the Issuer shall disclose in post-issuance reporting as per Clause 8.3 the estimated timeline for allocation of net proceeds to Nominated Projects & Assets. Net proceeds may be reallocated to other Nominated Projects & Assets at any time while the Bond remains outstanding. 5.4 Nominated Projects & Assets shall not be nominated to other Certified Climate Bonds, Certified Climate Loans, Certified Climate Debt Instruments, green bonds, green loans or other labelled instruments (such as social bonds or SDG bonds) unless it is demonstrated by the Issuer that: 5.4.1. distinct portions of the Nominated Projects & Assets are being funded by different Certified Climate Bonds, Certified Climate Loans, Certified Climate Debt Instruments, green bonds, green loans or other labelled instruments; or 5.4.2. the existing Certified Climate Bond, Certified Climate Loan or Certified Climate Debt Instrument is being refinanced via another Certified Climate Bond, Certified Climate Loan or Certified Climate Debt Instrument. 5.5 Where a proportion of the Net Proceeds of the Bond are used for refinancing, the Issuer shall track the share of the Net Proceeds used for financing and refinancing and identify which Nominated Projects & Assets may be refinanced. This may also include the expected look-back period for refinanced Nominated Projects & Assets. 5.6 The Net Proceeds of the Bond shall be tracked by the Issuer following a formal internal process which is documented in accordance with Clause 3.1. 5.7 The Net Proceeds of the Bond shall be no greater than the Issuer's total investment exposure or debt obligation to the Nominated Projects & Assets, or the relevant proportion of the total Market Value of the Nominated Projects & Assets which are owned or financed by the Issuer. 5.8 Additional Nominated Projects & Assets may be added to, or used to substitute or replenish, the portfolio of Nominated Project & Assets as long as the additional Nominated Project & Assets are eligible under Part C of the Climate Bonds Standard and are consistent with the Bond's objective as set out in Clause 6.1.1. 5.8.1. Where additional Nominated Projects & Assets are covered by Sector Eligibility Criteria which were not included in the scope of either the Pre-Issuance Verification or the Post-Issuance Verification engagements, the Issuer shall engage a Verifier to provide a Verifier's Report covering at least

	the conformance of the additional Nominated Projects & Assets with the relevant Sector Eligibility Criteria under Part C of the Climate Bonds Standard.
Process for Evaluation and Section of Projects & Assets	6.1 The Issuer shall document and maintain a decision-making process which it uses to determine the continuing eligibility of the Nominated Projects & Assets. This includes, without limitation: 6.1.1. A statement on the climate-related objectives of the Bond; 6.1.2. How the climate-related objectives of the Bond are positioned within the context of the Issuer's overarching objectives, strategy, policy and/or processes relating to environmental sustainability; 6.1.3. The Issuer's rationale for issuing the Bond; 6.1.4. A process to determine whether the Nominated Projects & Assets meet the eligibility requirements specified in Part C of the Climate Bonds Standard; 6.1.5. Other information provided by the Issuer as described in Clause 2.2
Management of Proceeds	7.1 Net Proceeds of the Bond shall be credited to a sub account, moved to a sub-portfolio or otherwise identified by the Issuer in an appropriate manner, and documented. 7.2 All nominated Projects & Assets shall meet the documented objectives of the Bond as stated under Clause 6.1.1 and shall be in conformance with the requirements of Part C of the Climate Bonds Standard. 7.3 The Issuer shall allocate the Net Proceeds to Nominated Projects & Assets within 24 months of issuance of the Bond, or the Issuer shall disclose in post-issuance reporting as per Clause 8.3 the estimated timeline for allocation of net proceeds to Nominated Projects & Assets. Net proceeds may be reallocated to other Nominated Projects & Assets at any time while the Bond remains outstanding: 7.3.1. Held in temporary investment instruments that are cash, or cash equivalent instruments, within a Treasury function; 7.3.2. Held in temporary investment instruments that do not include greenhouse gas intensive projects which are inconsistent with the delivery of a low carbon and climate resilient economy; or 7.3.3. Applied to temporarily reduce indebtedness of a revolving nature before being redrawn for investments or disbursements to Nominated Projects & Assets.
Reporting – Post-issuance	8.1 The Issuer shall prepare an Update Report at least annually while the Bond remains outstanding. 8.1.2. The Update Report shall be made available to holders of the Bond and to the Climate Bonds Standard Board. 8.1.3. The Issuer should provide an Update Report to holders of the Bond on a timely basis in case of material developments.

Schedule 2B: Conformance to the Post-Issuance Requirements of the Climate Bonds Standard[7]

Evaluation Criteria	Factual Findings	Error or Exceptions Identified
Use of Proceeds	5.1 A list of Nominated Projects & Assets is provided in Schedule 1. 5.2 The Nominated Projects & Assets meet the documented objectives of the finance and are in conformance with the requirements of Part C of the Climate Bonds Standard. 5.3 A proportion of the Net Proceeds have been allocated to Nominated Projects & Assets upon the issuance of the Bonds. FS has communicated to Sustainalytics that the unallocated proceeds from the Green Debt Instruments will be fully allocated by March 2027. 5.4 FS has confirmed that the Nominated Projects & Assets have not been nominated to other Certified Climate Bonds, Certified Climate Loans, Certified Climate Debt Instruments, green bonds, green loans or other labelled instruments (such as social bonds or SDG bonds). 5.5 FS has confirmed that it has tracked the share of the Net Proceeds used for financing and refinancing. 5.6 FS' green bond framework documents that the Net Proceeds are tracked following a formal internal process. 5.7 FS has confirmed that the Net Proceeds raised are no greater than the total investment exposure or debt obligation to the Nominated Projects & Assets which are owned or financed by the Issuer. 5.8 N/A 5.8.1 N/A	None
Process for Evaluation and Selection of Projects & Assets	6.1 FS' Green Bond Framework documents a decision-making process which it uses to determine the continuing eligibility of the Nominated Projects & Assets. This includes, without limitation: 6.1.1 A statement on the climate-related objectives of the financing;	None

[7] Climate Bonds Initiative, "Climate Bonds Standard Version 3.0", (2019), at: https://www.climatebonds.net/files/documents/Climate-Bonds_Climate-Bonds-Standard_V3_Dec-2019.pdf

	6.1.2 How the climate-related objectives of the financing are positioned within the context of the FS' overarching objectives, strategy, policy and/or processes relating to environmental sustainability; 6.1.3 FS' rationale for issuing the bond; 6.1.4 A process to determine whether the Nominated Projects & Assets meet the eligibility requirements specified in the Climate Bonds Standard; 6.1.5 Other information provided by FS as described in Clause 2.2	
Management of Proceeds	7.1 FS confirmed that Net Proceeds of the Bonds were credited to a sub-account, moved to a sub-portfolio or otherwise identified by FS in an appropriate manner, and documented. 7.2 FS has confirmed that it maintained an earmarking process to manage and account for allocation of Net Proceeds to the Nominated Projects & Assets. 7.3 While the Bonds remain outstanding, the balance of the tracked Net Proceeds shall be reduced by amounts allocated to Nominated Projects & Assets. Pending such allocations to Nominated Projects & Assets, the balance of unallocated Net Proceeds shall be: 7.3.1. Held in temporary investment instruments that are cash, or cash equivalent instruments, within a Treasury function; 7.3.2. Held in temporary investment instruments that do not include greenhouse gas intensive projects which are inconsistent with the delivery of a low carbon and climate resilient economy; or 7.3.3. Applied to temporarily reduce indebtedness of a revolving nature before being redrawn for investments or disbursements to Nominated Projects & Assets.	None
Reporting – Post-issuance	8.1. FS is committed to preparing an Update Report at least annually while the financing remains outstanding. 1.1.2. The Update Report will be made available to the lenders and to the Climate Bonds Standard Board. 1.1.3. FS will provide an Update Report to the bond holders on a timely basis in case of material developments.	None

Appendices

Appendix 1: Bioenergy Criteria – Mitigation Requirements

Item	Assessment
Meet the established GHG emissions threshold: • Facilities producing biofuel for transport (18.8 gCO_2e/MJ)	FS meets this threshold. Anhydrous bioethanol: 18.7 gCO_2e/MJ Hydrated bioethanol: 18.5 gCO_2e/MJ
Reducing the risk of indirect land-use impact	FS Bioenergia has not certified its feedstock using the RSB iLUC module. However, it has provided documentation to demonstrate that it meets and complies with low iLUC risk biomass criteria and compliance, based on yield increase. Grain used as feedstock for the eligible facilities will be sourced from second-crop corn produced in Brazil and the state of Mato Grosso in particular. There has been a rapid expansion of grain production in Mato Grosso between 2006-07 and 2016-17: Total maize production increased from 4 million tonnes to 29 million tonnes. Nearly all (99%) of this additional maize is produced as a double crop. Supplementary maize production can be largely attributed to yield increase due to the implementation of double-cropping techniques. Therefore, second crop corn ethanol from Mato Grosso has reduced the risk of indirect land-use impact.[8]

[8] Moreira et al. (2020), "Socio-environmental and land-use impacts of double-cropped maize ethanol in Brazil", Nature Sustainability, at: https://doi.org/10.1038/s41893-019-0456-2

Appendix 2: Bioenergy Criteria – Adaptation and Resilience Requirements

Item	Assessment
Processes are in place (as part of both the asset design and ongoing management) to assess key risks to the assets from a changing climate. These key risks should include the following, plus any others felt to be of concern for the operation of these assets. The risks should be identified and interpreted in terms of the impact on the asset and the related effects for the business – e.g. impact on operating feasibility and schedules and potential system outages, impact on maintenance requirements etc. N.B. This list taken from World Banks Climate and Disaster Risk Assessment Tool • Temperature changes, and extremes in temperature • Extreme precipitation and flooding • Drought • Sea level rise and storm surge • Strong winds How these affect the asset or site in question will be highly variable and will be for the issuer to identify and relate to their operations. These assessments should use climate information, modelling and scenarios from a peer reviewed source. This assessment should be done regularly. The frequency of the assessment will depend on the nature of the climate related risks and vulnerabilities, and should be specified by the issuer and reporting against in subsequent annual reporting.	FS conducted its first climate risk study in 2020 to evaluate the following risks: temperature changes, extreme precipitation and droughts. Several actions were suggested, and FS is working on an implementation and monitoring plan for these actions. FS intends to review the plan every five years.
Processes are in place (as part of both the asset design and ongoing management) to assess the impact of the bioenergy asset on the climate resilience of other stakeholders in the social, economic and environmental system in which it operates and how to mitigate or reduce any negative impacts. These assessments address: • Any ways in which bioenergy facilities might affect the climate resilience of other users/stakeholders? • Any ways in which bioenergy facilities improve the adaptation capacity of other users/stakeholders? For example, they may include: • Impact on water quality and quantity for other users in the basin • Waste and pollution emitted • Fire hazards	FS' Climate Risk Analysis and Climate Change Adaptation Plan includes an assessment of impacts on local and regional resiliency. FS is currently expanding the plan to include processes for how operational and asset management decisions can support such adaptation efforts. Sustainalytics recognizes FS' ongoing commitment to climate resilience and notes that the implementation of these processes is crucial to ensure systems' resiliency in the regions in which FS operates and ensure ongoing compliance with the CBI Criteria.
An adaptation plan has been designed and is being implemented to address the risks identified in assessments above.	The investment selection process was adjusted at the end of 2019 for direct suppliers of corn and biomass

The issuer has designed or amended investment and maintenance plans for the assets or projects and the broader ecosystem and its stakeholders. This is to ensure that the asset and its scheduled maintenance is sufficient to cope with the ongoing impacts of climate change and a plan has been established to govern how they approach emergency maintenance needs arising from sudden climate change impacts (e.g. extreme storms). The issuer has training, capacity and governance arrangements in place for how the organization will deal with the impacts of exception events (e.g. droughts, floods, severe pollution events, extreme storms, winds etc.). The issuer has monitoring and reporting systems and processes to identify high risk scenarios. The issuer has contingency plans to address disruption to operations or loss of the asset and any resulting broader environmental or social damage. The issuer has processes for feeding risk assessment back into decision making. The issuer has a budget allocated to implementing the adaptation plan and has a named member of staff responsible for its implementation. The issuer complies with any existing broader or higher-level adaption plans, such as NAPAs.	(producers), including a summary of broad decision flow (see Framework) Once the contracts have deadlines (period) for the delivery of the products (corn) and after the purchase approval, a monitoring system is implemented using satellite images throughout the delivery period. In addition, a socio-environmental statement (with date and time) is generated each time new corn is received. In this way, FS maintains strict risk management and socio-environmental monitoring processes applied to the field's origination operations, using tools based on geoprocessing. FS also monitors all consultation and monitoring management through the Agrotools SAFE tool, which guarantees the quality of analysis and independent storage of evidence from consultations, necessary for a measurable, reportable and verifiable process. To ensure the safety of its employees and third parties working in FS' plants and to minimize the risk of accidents, FS has adopted several tools and controls. Since 2017, safety training has exceeded 20,000 hours and involved hundreds of employees and suppliers. In the last crop year, FS identified an increase of 18 percentage points in the Safe Practice Index, one of its key indicators to assess the teams' adherence to FS' safety culture. The specific budget for the implementation of the adaptation plan is still under construction. The FS employee responsible for overseeing this process is Sustainability Supervisor Rubiane Jacobowsky. FS conducts its work in accordance with Brazil's national plans. Overall, Sustainalytics considers the programmes and actions of FS to be in line with the intents of the Criteria in this area.

Feedstocks certified under approved best practice standards	Please see Appendices 3, 4 and 5.
Addressing food security risk	FS Bioenergia has confirmed that it sources feedstock solely from Brazil, which has been deemed to have low food insecurity based on the most recent publication of the Global Hunger Index.

Appendix 3: Agriculture Criteria – 3.3.1. Mitigation criteria for an agricultural production unit

Criteria	CBI Requirements	FS Bioenergia
M1: No conversion of high carbon stock lands	Please confirm that the production unit is not operating on land that has been converted from high carbon stock (HCS) lands spanning more than one hectare after Jan 1, 2010 or according to the cut-off date required in national law in the country of issuance or as defined by regional green financing initiatives if this is prior to 2010. This includes wetlands, peatlands, forested areas or other designated HCS areas, as defined by the threshold of 35 tC/ha. *Compliance can be demonstrated by submission of maps (see Global Forest Watch maps), georeferenced photographs or satellite imagery of land use change and burning for example. Forest inventory surveys or other formal government data can also be used.*	FS Bioenergia uses a digital platform (Agrotools) to ensure that its suppliers are not operating on land that has been converted from HCS lands. Agrotools specializes in socio-environmental analysis through satellite images and consultation of available public databases. FS Bioenergia has established specific criteria for the monitoring efforts of each type of supplier, according to the input, planting area and biomass, among other indicators. The Forest Code sets a cutoff date for deforestation at 22 July 2008, with different percentages across Brazil's biomes. The main data set is verified through PRODES – Brazil's deforestation monitoring system – which has been monitoring the Amazon biome since 2008 and the Cerrado biome since 2018. The monitoring helps generate an environmental report on the deforested areas throughout the years, as well as embargoed areas and blocks suppliers that are not compliant. FS Bioenergia assesses whether suppliers are included in the federal government's employment blacklist, which identifies locations of slave labour. In addition to this analysis, supply contracts have specific clauses that prohibit degrading work practices, including child labour. FS' Code of Conduct for Suppliers and Partners strictly rejects these types of employment conditions. All producers must comply with national legislation and FS' policy. Rural producers that are not in compliance with FS' policy are suspended from the supplier list. FS has confirmed in its Framework that no feedstock sourced from production units with deforestation after 1 January 2010 will be eligible for inclusion in certified activities.
M2: Land use status	Please confirm there is no clearing of woody vegetation over 3 metres in height after 2020 on the production unit in question. *Compliance can be demonstrated by submission of maps (see Global Forest Watch*	Satellite images enable FS Bioenergia to detect the occurrence of deforestation and possible overlap with Indigenous or Quilombolas lands, or conservation units. Compliance has been demonstrated through

	maps), georeferenced photographs or satellite imagery of land use change and burning for example. Forest inventory surveys or other formal government data can also be used.	the submission of sample satellite imagery and disclosures around the Issuer's processes in using this data.
M3.2: Evidence of following low-emission best practices for crop production	In order to demonstrate that the production unit is deploying low emission practices on an ongoing basis, the relevant table from the Sector Criteria document must be completed, and all core practices must be met.	Refer to Appendix 4, below.

Appendix 4: Agriculture Criteria – 3.9 Best practices for low emissions agriculture

Best practice requirements: Crop production

Category	Core Practices	Optional Practices	Exclusions	Disclosures provided	Sustainalytics' Assessment
Fertilizer use	• A nutrient management plan is in place that identifies the right rate of N fertilizer use for the production unit • Plus at least three optional practices	• The nutrient management plan also identifies the right source of fertilizer • The nutrient management plan also identifies the right timing of fertilizer • Right placement of fertilizer • Deep urea or other subsurface placement • Agronomic practices that produce yields in top 25% for the agroecosystem • Fertilizer produced with energy-efficient methods (e.g. steam methane reforming (SMR), green ammonia, or process using <36 gigajoules/t ammonia • Controlled release fertilizer • Biological N-fixation as the source of nitrogen inputs • Any practice that reduces or offsets N_2O emissions by 20%	None	FS does not own any areas for planting corn. It buys all corn for its production process from producers surrounding its plants. Currently there are more than 500 direct partner suppliers. Optional practices: • The nutrient management plan also identifies the right source of fertilizer: FS is part of the RenovaBio programme (Brazilian Biofuel Program), through which it can gain visibility into the use of fertilizers used by producers. FS undertakes the identification of the sources of the nutrients used by producers participating in the RenovaBio certification. • The nutrient management plan also	Compliant. While FS does not own any of the areas for planting its corn, it is a RenovaBio-certified company and aims to only purchase corn from producers certified to RenovaBio. Sustainalytics views the criteria of RenovaBio to be aligned with the Core Practices. From 2020, suppliers certified to RenovaBio have been monitored for their annual productivity (tonnes per hectare). They are required to present data on fertilizer consumption. In addition, the Mato Grosso Institute for Agricultural Economics monitors and measures the use and impacts of fertilizers in the region and carries out an analysis in different municipalities.

				identifies the right timing of fertilizer: There are several other regional institutions (Embrapa, Fundação MT) that carry out research and development tools to guide the best management of nutrients for the cultivation of corn and undertake research related to the right timing of fertilizer application. Also, there are precision agriculture companies (variable rate) to reach the right rate or correct dose of fertilizer at the indicated location.	In addition to the listed optional practices, Sustainalytics notes that the RenovaBio programme identifies the right placement of fertilizer use. Therefore, FS is compliant with the requirement.
Management of soil for net carbon sequestration	• Project length of at least five years • Reduced tillage • Avoided erosion • No open burning • Evidence that soil carbon sequestration is likely to be maintained for 20 years or more (secure land rights, low threat of conversion, contractual commitments) or demonstrate 50% higher level	• Increase in aboveground biomass (cover crops, agroforestry) and residue retention • Organic matter amendments to the soil (compost) • Any practice that increases soil organic carbon or above-ground or below-ground carbon by 20% over ten years	None	FS has confirmed: • The project length is at least five years long (the project has been running for 11 years). • The producers have all adopted no-tillage practices. • Erosion has been avoided. • There is a low threat of land conversion. Optional practices:	Compliant

	of sequestration. • Plus at least one optional practice			• The corn that FS purchases supports organic matter amendments to the soil. The direct planting of second-crop corn contributes organic matter to the soil through the retention of first-crop corn and organic matter residue (i.e. the addition of natural compostable matter). In addition to the two plants already installed in Mato Grasso, FS has plans to install four more plants by 2030, with the intention to promote second-crop corn over the long term.	
Management of biomass for net carbon sequestration	• Increase in aboveground biomass (grassland/pasture productivity, cover crops, agroforestry) by at least 20% • Evidence that aboveground biomass carbon sequestration is likely to be maintained for 20 years or more (secure land rights, low threat of conversion, contractual		None	FS achieved a 28% increase in second-crop productivity between 2005 and 2016. Specifically, the area cultivated with double-crop systems increased from 6.58 million ha to 8.43 million ha from 2005 to 2016. FS has confirmed that it meets the requirement of a 20% increase over 10 years.	Compliant Sustainalytics views this level of disclosure to be aligned with the criteria's requirements.

	commitments) or demonstrate 50% higher level of sequestration.				
Energy, including energy embedded in inputs	• Energy efficient traction, irrigation, and storage (falls in top 25% of energy efficiency rates for equipment available in country) OR • Use of only renewable energy		None	FS has confirmed that it only uses renewable biomass sources. Rural producers in the region where FS plants are installed have been following innovations and technology in relation to efficient machinery, with better performance and lower fuel consumption. Agriculture equipment companies frequently launch new equipment and implements. FS has confirmed that it does not use irrigation due to the favourable weather conditions in Mato Grosso.	Compliant Sustainalytics views this level of disclosure to be aligned with the criteria's requirements.
Residue Management	• Sustainable use of residues		None	FS has confirmed that it only purchases crops that adhere to Brazil's overarching legislation for chemical use. This includes Ordinance No. 84, which oversees environmental monitoring regarding pesticides.[9] Normative Instruction No. 4	Compliant. Sustainalytics views this level of disclosure to be aligned with the criteria's requirements.

[9] Brazilian Pesticide Regulation Overview: https://agrochemical.chemlinked.com/agropedia/brazilian-pesticide-regulation-overview

				sets a requirement for environmental risk assessments for the use of any new pesticides. At the state level, the Mato Grosso Institute for Agricultural Economics monitors and measures the use and impacts of fertilizers in the region.	
Food loss	• No mycotoxins or other contaminated growing conditions that could result in reduced yields.		None	FS has confirmed that in the field, producers are instructed to carry out fungicide applications guided by institutions and suppliers. These fungicides protect the plant against pathogens (fungi), such as those that produce mycotoxins. In addition, FS performs analyses of quality classification in the receipt of grains. FS carries out quality control in storage (temperature and humidity) and monitors the final products with laboratory analyses that guarantee the quality of all products.	Compliant. Sustainalytics views this level of disclosure to be aligned with the criteria's requirements.
Flooded rice (if applicable)	• Days of flooding reduced by 10%		None	N/A	
Peatlands (if applicable)	• Peatland restoration		None	N/A	

Appendix 5: Adaptation and Resilience Criteria for a crop production unit

Adaptation and resilience checklist for assessment of the whole agricultural production unit

Adaptation and resilience checklist for the whole agricultural production unit		Submitted
1.	**Clear boundaries and critical interdependencies between the farm holding and the system it operates within are identified.**	
1.1	Boundaries of the production unit(s) are defined using (1) a listing of all farm holdings and associated assets and activities associated with the use of the bond proceeds, (2) a map of their location, and (3) identification of the expected operational life of the activity, asset or project.	Submitted – FS uses Agrotools to check and identify where suppliers are located in Mato Grosso. The platform includes a map of each supplier's location.
1.2	Critical interdependencies between the farm holding and the system within which it operates are identified. Identification of these interdependencies should consider the potential for adverse impacts arising from: (1) the effects of water use or pollution on other water users or erosion in the watershed; (2) relationships of the asset/project to nearby flood zones; (3) introduction of pests and diseases; S (4) reduction in pollinating insects and birds; (5) reduction in biodiversity or High Conservation Value habitat; (6) damage or reduction in value of neighbours' property due to boundary trees, other structures at risk of falling during storm events, agricultural pests and disease; (7) fire and other practices that affect air quality; (8) market influences, such as excess supply which drives down prices; (9) appropriation of land or economic assets from nearby vulnerable groups; and (10) overuse of inputs	Submitted – Climate Risk Analysis and Climate Change Adaptation Plan FS Bioenergia (Section 5.5 – page 40) FS conducted an analysis of the potential effects of the assets and other actors on climate risk. This analysis considered impacts that can arise from lack of vegetation, extreme and concentrated rainfall, and the loss of soil ecological functions. FS' collaboration with its suppliers (through courses and lectures on the potential effects of its assets on climate risk) is viewed to be essential and interdependent.
2.	**An assessment has been undertaken to identify the key physical climate hazards to which the production unit will be exposed and vulnerable to over its operating life.**	
	Key physical climate risks and indicators of these risks are identified in line with the following guidelines. • Risks are identified based on (a) a range of climate hazards, and (b) information about risks in the current local context, including reference to any previously identified relevant hazard zones, e.g., flood zones.	Submitted – Climate Risk Analysis and Climate Change Adaptation Plan FS Bioenergia (Section 4.1, page 8)

	A full list of potential physical climate risks that may be considered is given in Table 6. At a minimum, risks in each of the following categories must be considered: 1. Temperature: High/low temperature, change in number of hot nights, heat spell duration, cold waves, frost. 2. Water 2.1 Precipitation: High precipitation, intense rainfall events; waterlogging, flood, drought, freezing rain (hail, freezing rain, ice). 2.2 Water stress: Crop water stress (reflecting combination of temperature, precipitation and wind), ratio of water withdrawals to availability. 2.3 Sea-level: inundation, flooding or storm surges, salinization due to salt water intrusion or changing water regimes. 2.4 Glacial melting and lake outbursts: flood, body of water contained by glacier overflows or glacial melts. 3. Wind: cyclones (hurricanes, tornadoes, typhoons), dust and sandstorms, blizzards, wind patterns. 4. Soil: erosion (including coastal erosion), landslides, avalanches, degradation. 5. Seasonality: Rain onset, change in seeding date, length of growing season, change in frost-free days in season, other phenological risks specific to crop-type. 6. Pests and disease: new pest and disease patterns, changes in pest and disease vectors. 7. Fire: increased incidence and extent of wildfires or control of agricultural fires. 8. CO2 concentrations: generally expected to create positive effect due to CO2 fertilization and stimulate growth and carbohydrate production, but risks changes in nutritional content and density, such as protein, sugars and essential minerals, for example in wheat, rice, and potatoes.33	
3.	**The measures that have or will be taken to address those risks mitigate them to a level so that the production unit(s) are suitable to climate change conditions over its operational life.**	
3.1	Risk reduction measures are implemented for all key risks to the production unit. These should enable the production unit to meet an average annual productivity threshold under a range of expected climate hazards for the duration of the investment period. The minimum productivity threshold is determined by the average level of yield loss, compared to average production over five years, for at least three comparable holdings with five years or more of production. Where comparable holdings are not available, the minimum productivity threshold will be calculated as 10% less than the mean annual productivity over five previous years where no extreme climate events occurred.	Submitted – Climate Risk Analysis and Climate Change Adaptation Plan FS Bioenergia (Table 12 – page 44). While FS has not specified a minimum productivity threshold, this level of disclosure is viewed to be satisfactory.

3.2	Risk reduction measures must be tolerant to a range of climate hazards and not lock-in conditions that could result in maladaptation.	Submitted – Climate Risk Analysis and Climate Change Adaptation Plan FS Bioenergia (Table 13 – page 46)
4.	**The measures that have or will be taken do no harm to the resilience of the defined system they operate within, as indicated by the boundaries of and critical interdependencies with that system as identified in item 1 in this checklist**	
4.1	An assessment is conducted to demonstrate that the production unit does not pose significant risk of harm to others' natural, social or financial assets according to the principle of best available evidence during the investment period taking into account the production unit's boundaries and critical interdependencies as defined in Criteria 1. Harm is defined as an adverse effect on any of the following: (1) the effects of water use or pollution on other water users or erosion in the watershed; (2) increased risk of flooding; (3) introduction of pests and diseases; (4) reduction in pollinating insects and birds; (5) reduction in biodiversity or High Conservation Value habitat (6) damage or reduction in value of neighbours' property due to boundary trees, other structures at risk of falling during storm events, agricultural pests and disease; (7) fire and other practices that affect air quality, (8) market influences, such as flooding a market with a commodity and driving down prices, (9) appropriation of land or economic assets from nearby vulnerable groups , (10) overuse of inputs, (11) decline in the productivity of an asset, or (12) decline in conditions below an applicable policy standard, (13) no use of chemicals listed in the Stockholm Convention or 1a or 1b in the WHO classification of pesticides by hazard or not in compliance with the Rotterdam Convention	Submitted – Climate Risk Analysis and Climate Change Adaptation Plan FS Bioenergia (Section 5.5 – page 40) FS conducted an analysis of the potential effects of its assets on the climate risks of other actors.
5.	**The issuer is required to demonstrate that there will be ongoing monitoring and evaluation of the relevance of the risks and resilience measures and related adjustments to those measures will be taken as needed.**	
5.1	Indicators for risks identified under item 2 in this checklist are provided.	Submitted – Climate Risk Analysis and Climate Change Adaptation Plan FS Bioenergia (Table 13 – page 46)
5.2	Indicators for resilience measures identified under item 3 in this checklist are provided.	Submitted – Climate Risk Analysis and Climate Change Adaptation Plan FS Bioenergia (Table 12 – page 44)

5.3	Indicators for “no harm” to relevant system assets identified under item 3 in this checklist are provided.	Submitted – Climate Risk Analysis and Climate Change Adaptation Plan FS Bioenergia (Section 5.5 – page 40)
5.4	Issuers have a viable plan to annually monitor (a) climate risks linked to the production unit, (b) climate resilience performance, (c) appropriateness of climate resilience intervention(s) and to adjust as necessary to address evolving climate risks.	Submitted – Climate Risk Analysis and Climate Change Adaptation Plan FS Bioenergia (Section 5.7 – page 43 and Table 12 – page 44) FS has established an internal climate-focused team to oversee this process and adjust as needed to evolving climate risks.
5.5	Issuers have a process for monitoring and evaluation and this is done annually.	Submitted – Climate Risk Analysis and Climate Change Adaptation Plan FS Bioenergia (Section 5.7 – page 43) FS currently aims to update its Climate Risk Analysis plan every five years with the help of an independent third party. FS is structuring itself to monitor the plan’s actions annually.
5.6	A grievance redress mechanism is in place to enable stakeholders to identify unanticipated adverse impacts, including biases of investments away from high risk locations and assets.	Submitted – Climate Risk Analysis and Climate Change Adaptation Plan FS Bioenergia (Section 4.1.2– page 10)

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