

September, 2024

# GREEN FINANCING FRAMEWORK

**raízen**

## CONTENTS

<b>1.</b>	<b>FOREWORD</b>	<b>3</b>
1.1	ABOUT RAÍZEN	3
1.2	OUR STRATEGY FOR THE LOW-CARBON ECONOMY	4
1.3	SUGARCANE ETHANOL: AN EFFECTIVE RAW MATERIAL	7
1.4	OUR SUSTAINABLE PRODUCT PORTFOLIO	9
1.4.1	FIRST-GENERATION ETHANOL (1GE)	10
1.4.2	SECOND-GENERATION ETHANOL (2GE)	10
1.4.3	BIOGAS AND BIOMETHANE GENERATED FROM SUGARCANE BIOMASS	11
1.4.4	DISTRIBUTED GENERATION AND THE NON_REGULATED ELECTRICITY MARKET	12
1.4.5	ELECTRIC MOBILITY	12
1.4.6	NEW SOLUTIONS	12
<b>2.</b>	<b>RATIONALE FOR THE FRAMEWORK</b>	<b>13</b>
2.1.1	Use of Proceeds	14
2.1.2	Eligible Assets and Projects	15
2.1.3	Selection and evaluation of eligible assets and projects	5
2.1.4	Management of proceeds	5
2.1.5	Reporting	5

# 1. FOREWORD

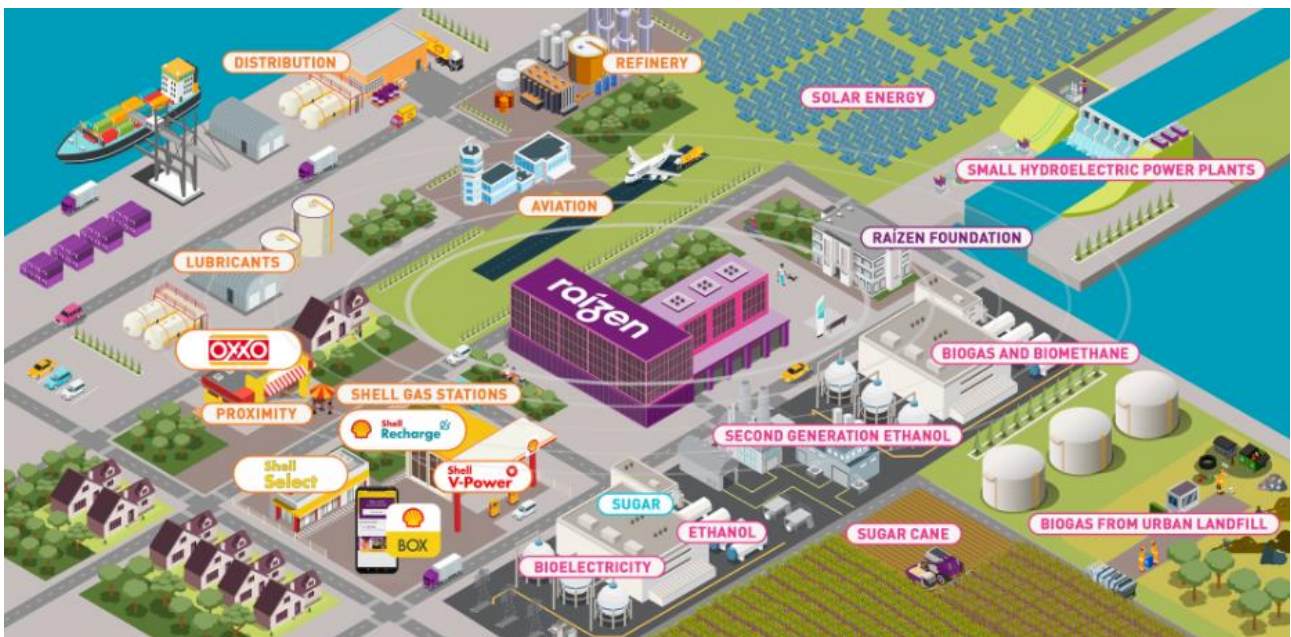
## 1.1 ABOUT RAÍZEN

We are Raízen, an integrated company and a global benchmark in bioenergy, with an extensive portfolio of renewable products and solutions for decarbonization. Operating as a key player in energy transition, we have operations in Brazil, Argentina and Paraguay, and cater to clients in more than 50 countries.

In a global scenario where the demand for sustainable energy solutions is constantly rising, we stand out as a driving force in the Biofuels and Sugar sectors, pushing towards a low-carbon economy. With a consolidated position in the main global markets, we have become the world's largest individual sugar producer and exporter and the main global player in the ethanol sector.

Our commitment to innovation and technology puts us at the leading edge in developing solutions for the segment, while establishing strong relationships with our clients and gaining a strong leadership position in the markets where we operate. We recognize the increasing global demand for biofuels, especially as part of the efforts to transition to a low-carbon economy and meet the objectives of the Paris Agreement, and as such have used this driver into our business strategy.

The starting point is our raw material, sugarcane. Sugarcane ethanol appears as a strategic energy alternative not only for the domestic market, but also as a global solution to the growing demands of sectors that struggle to decarbonize, such as the aviation, maritime, and chemical sectors. In the sugar segment, we play an important role, moving one out of every three units of molecules in the global flow, from which we produce sugar, ethanol, and bioelectricity.<sup>1</sup> We distribute and market our fuels directly (licensed under the Shell brand), supplying a network of service stations, airport bases, and B2B clients in Brazil and Argentina. We complement our downstream value proposition by operating Shell Select convenience stores and OXXO proximity stores owned by Grupo Nós. We are also continuously investing in solutions based on renewable energy sources, such as solar and biomass.



<sup>1</sup> (RAÍZEN, 2024 page 13). [Raízen Integrated Report Crop Year 23'24](#)

With a net operating revenue of R\$220.5 billion in 2023/2024<sup>2</sup>, we have more than 45,000 employees in Brazil, Argentina, and Paraguay<sup>3</sup>, as well as partnerships with sugarcane producers, haulers, and retailers, ensuring fair working conditions, strengthening the value chain, and boosting sustainable social and economic development.

These results stem from our public commitments and our active participation in the sustainability agenda. Among other local and global initiatives, we are signatories to the United Nations Global Compact, and our ESG Agenda incorporates the vision of the Sustainable Development Goals (SDGs) - which helps us to accelerate initiatives that generate shared value by addressing the main global challenges.

We integrate environmental, social, economic, and governance aspects to build a solid foundation of sustainability, which ensures the perpetuity, competitiveness, and accountability of our business and helps us fulfill our purpose of reshaping the future of energy. Our management of sustainability is based on the materiality process, which is reviewed every two years to identify the actual and potential impacts of our operations on the economy, society, and the environment. This ensures that we are consistently updating the priority topics for our sustainability management, allowing us to be clear about our actual and potential impacts, both positive and negative, and to understand the expectations of our stakeholders in relation to our administration.

In 2023, a total of eight material topics were identified:

- |   |                              |
|---|------------------------------|
| 1. Climate Change & Management of Emissions | 5. Community Relations       |
| 2. Agricultural Management & Biodiversity   | 6. Sustainable Procurement   |
| 3. Diversity & Inclusion                    | 7. Human Rights & Well-Being |
| 4. Ethics & Governance                      | 8. Water Management          |

Based on the material topics, since the 2018/2019 crop year we have been developing and keeping our Strategic Sustainability Plan up to date, which contains long-term goals and actions directly involving the vice-president and CEO. This work has enabled us to take a significant step forward in terms of the management and governance of Raízen's Sustainability Agenda.

Our goals and commitments can be seen at: [Sustainability Raízen | Targets and Performance \(raizen.com.br\)](https://www.raizen.com.br/sustainability)

## 1.2 OUR STRATEGY FOR THE LOW-CARBON ECONOMY

For decades, fossil fuels have been the main source of energy for economic development. With the worsening of climate change and the search for a more sustainable and resilient economy, energy transition has become a global imperative. Biofuels are playing a key role in energy transition, helping to decarbonize not only road transportation, but also sectors that have difficulty reducing emissions, such as aviation, and maritime transportation. New international regulations, such as the Renewable Energy Directive (RED EU), the Green Deal, and the US Inflation Reduction Act (IRA), should boost demand for low-carbon fuels, causing global consumption of biofuels and alternative liquids to more than double by 2050.<sup>4</sup>

These projections justify our need to invest in the expansion of bioenergy production. According to the International Energy Agency (IEA), global biofuel consumption needs to triple if the world is to remain on the path

<sup>2</sup> (RAÍZEN, 2024, page 9). [Raízen Integrated Report Crop Year 23'24](#)

<sup>3</sup> (RAÍZEN, 2024, page 6). [Raízen Integrated Report Crop Year 23'24](#)

<sup>4</sup> (S&P Global). [Fueling the future: Biofuels drive progress in carbon neutrality.](#)

Av. Brigadeiro Faria Lima, 4.100

11º andar Itaim Bibi CEP 04538-132

São Paulo SP Brazil

Phone +55 11 2344-6200

to become carbon neutral by 2050<sup>5</sup>. However, most of the important markets have projections that are below what is needed to achieve this goal. In Brazil, for instance, according to the Ten-Year Energy Expansion Plan - PDE 2032, demand for ethanol is expected to grow by 6.6% per year between 2022 and 2032, while total supply is expected to grow by 4.1%<sup>6</sup> per year over the same period. Likewise, in the aviation sector, the demand projected by SAF mandates is already much higher than the current production capacity. According to IATA (International Air Transport Association), the expected production of 1.9 billion liters of SAF in 2024 represents only 0.53% of the aviation fuel requirement<sup>7</sup>. In this context, we took the lead as the first ethanol player in the world to obtain ISCC CORSIA Plus certification, a widely recognized standard that attests to the sustainability of biofuels and allows our ethanol to be used in the production of Sustainable Aviation Fuel (SAF).

Raízen sees its importance in this scenario, as an integrated energy company with a significant renewable portfolio and a major supplier of clean energy to the market. Our value proposition stems not only from our certified production of sustainable sugarcane, but also from the GHG emissions avoided by our business. Each renewable product replaces a fossil equivalent of greater carbon footprint, so Raízen plays a key role in decarbonizing the production chains in which it participates.

Aware of its role in energy transition, Raízen launched its new climate commitments in 2022, as set out by the United Nations for the global climate goals. These commitments are:

1. **Increase renewable energy production by 80%**<sup>8</sup> through second-generation ethanol plants, biogas, and solar energy, as well as productivity and efficiency.
2. **Reduce the carbon footprint of our ethanol and sugar by 20%**<sup>9</sup> through innovation in agricultural practices, circularity, and greater productivity.
3. **Obtain a minimum of 80% of our adjusted EBITDA from renewable businesses**, limiting the share of fossil businesses in our overall results.
4. **Reduce Scope 3 emissions intensity by 10% before 2030**<sup>10</sup>, measured in gCO<sub>2</sub> per MJ of energy sold and focusing on "use of product," which accounts for more than 94% of Raízen's Scope 3 emissions.

Over the next decade, our main objective is to expand our renewable generation capacity, through second-generation ethanol, biomethane, for example, among other renewable products. The new facilities will contribute to the decarbonization and diversification potential of our portfolio, which will have additional capacity to avoid nearly 10 million tons of CO<sub>2</sub>e per year<sup>11</sup>. This will require investments focused on technology and innovation.

Furthermore, we are working to expand our solar energy generation, which reduces emissions by more than 90% compared to traditional sources such as thermal power plants, and fossil fuels.<sup>12</sup> In the 23'24 crop year, Raízen launched the Raízen Power brand, focused on renewable electricity solutions for every type of consumer. Since its launch in May 2023, the brand has stood out for its proximity to end consumers and our commitment to the energy transition, with a portfolio for small, medium, and large consumers. Currently, Raízen Power is among the top three electricity traders in Brazil, operating centralized and distributed power generation plants using renewable

<sup>5</sup> (IEA). [Net Zero by 2050 A Roadmap for the Global Energy Sector.](#)

<sup>6</sup> (EPE). [Studies for the 2032 Ten-Year Energy Expansion Plan.](#)

<sup>7</sup> (AVIATION NEWS, 2023). [SAF production doubled this year, projections for 2024 fall short of rising demands.](#)

<sup>8</sup> [In relation to the 21'22 baseline harvest: 63,640 million MJ](#)

[9 In relation to the 18'19 baseline harvest: 20.4 gCO<sub>2</sub>/MJ](#)

[10 In relation to the 21'22 baseline harvest: 55.32 gCO<sub>2</sub>e/MJ](#)

<sup>11</sup> (RAÍZEN, 2023). [With the growth and diversification of its business, Raízen launches a new brand dedicated to energy.](#)

<sup>12</sup> (NREL, 2021). [Life Cycle Assessment Harmonization.](#)

Av. Brigadeiro Faria Lima, 4.100

11º andar Itaim Bibi CEP 04538-132

São Paulo SP Brasil

T +55 11 2344 6200

sources such as solar, biomass from sugarcane bagasse, small hydroelectric plants, and biogas from urban landfills. In addition, we seek a market leadership position in electric mobility, with 25% of the market, reach 6 million customers in all consumption classes, increase our footprint in renewable energies, and achieve 10% share in the free energy market by 2030.<sup>13</sup>

Our bioenergy parks are self-sufficient in energy, since they reuse their own biomass waste to supply their internal energy demand. This dynamic is reflected in Raízen's emissions profile, with low Scope 1 and 2 emissions.

Outside of the production process, the company's fuel distribution arm is the largest contributor to the company's total emissions. In this sense, Raízen remains committed to reducing emissions across its entire portfolio. In addition to the reduction target mentioned above for Scope 3 emissions intensity, we have other initiatives in place, such as advanced analytics and artificial intelligence tools, where we managed to avoid the emission of 47,000 tons of CO<sub>2</sub> in the year in our distribution operations in Brazil.

### 1.3 SUGARCANE ETHANOL: AN EFFECTIVE RAW MATERIAL

The beginning of the entire process lies in our raw material. Sugarcane is one of the most efficient and sustainable sources for generating electricity and producing fuel. As a versatile raw material, sugarcane plays a pivotal role in our production, offering a rate of conversion of solar energy into biomass that is twice as high as other sources. To illustrate: compared to photovoltaic panels, sugarcane has 10 to 30 times more potential to decarbonize energy production per hectare of land<sup>14</sup>. In this sense, a study published in the journal of the Massachusetts Institute of Technology (MIT) outlines the elements that could make it easier for tropical countries to increase their relevance in the transition to a net-zero emissions economy, among which sugarcane stands out as the main factor.

Furthermore, the production of ethanol from sugarcane is an example of a highly efficient and sustainable system, in line with the principles of the circular economy. The reuse of waste generated throughout the process (bagasse, filter cake, vinasse, and water) not only maximizes the use of each part of the plant, but also allows for the generation of new products and renewable energy sources using the same planted area.

The benefits of sugarcane include:

- **Agricultural productivity:** In Brazil, the average productivity of ethanol from sugarcane is approximately 80 tons per hectare (at Raízen, in crop year 23'24, production reached 86 tons per hectare), nearly 2.67 times more than corn—the most widely used raw material in global production. Through biotechnology and environmental optimization, we expect to reach 90 tons per hectare by 2030 and, by 2050, genetic advances could raise productivity to as much as 148 tons per hectare.<sup>15</sup>
- **Carbon capture from the atmosphere:** The carbon captured from the atmosphere by sugarcane crops is an important environmental benefit. A third-party study showed that, over the last 20 years, sugarcane has absorbed almost 200 million tons of CO<sub>2</sub> from the atmosphere—equivalent to planting 1.4 million trees.<sup>16</sup> It is therefore possible that, in the future, ethanol's life cycle will have net negative emissions—retaining more carbon than it produces during combustion.<sup>17</sup>
- **Reducing emissions from the transport sector:** First-generation ethanol can reduce GHG emissions by 78% compared to gasoline, while second-generation ethanol allows even greater reductions, of 86% compared

<sup>13</sup> (RAÍZEN, 2024 page 26). [Raízen Integrated Report Crop Year 23'24](#)

<sup>14</sup> (MIT, 2023). [How tropical countries can accelerate their protagonism in the net zero economy.](#)

<sup>15</sup> (RAÍZEN, 2023). [Sugarcane: understand the potential of sugarcane in the energy transition.](#)

<sup>16</sup> (AGROICONE, EMBRAPA, AND UNICAMP, 2023). [Land Use Change Net Removals Associated with Sugarcane in Brazil.](#)

<sup>17</sup> (BRASKEM, 2016). [PE I'm green™ bio-based ACV.](#)

to fossil fuel,<sup>18</sup> directly influencing the reduction of emissions from the transport sector, which accounts for nearly 16% of Brazilian emissions, making it the sector with the second highest GHG emissions in the country.<sup>19</sup>

- **Circularity in the production process:** In the last stage of the production chain, sugarcane by-products have a higher added value than those originating from corn, increasing the potential for reuse, recovery, and recycling of materials and energy—the basis of the circular economy. With approximately 99.5% of all solid waste being used to produce various by-products, with its innovative mindset, Raízen makes the most of this potential. One such example is the use of natural fertilizers in our fields, which come from the ethanol production process. In crop year 20'21, the use of vinasse on around 60% of our arable lands led to a reduction of 35,000 to 40,000 tons of chemical fertilizers. In crop year 22'23, the goal was to increase this use to 80% of our lands, allowing for a reduction of approximately 3% in our carbon footprint<sup>20</sup>.



It should also be noted that Brazil is the largest producer of sugarcane in the world, and the world's largest producer and exporter of sugar, with approximately 20% of all global production and a 40% share of the world's exports<sup>21</sup>. Its favorable geography and climate, the development of cultivation technologies, and more productive and resilient varieties are key factors behind this leadership position.<sup>22</sup> These characteristics allow for a significant increase in productivity—which can be further boosted by new technologies such as the second-generation ethanol (2GE) and biogas—with minimal to no variations in planted area.

As the world's largest sugar producer and exporter and a leader in the production of biofuels obtained from sugarcane, Raízen recognizes its responsibility in using natural resources in a rational and efficient manner. The

<sup>18</sup> (FGV, 2017). [Biofuels Booklet](#).

<sup>19</sup> (KPMG, 2,024) [NetZero Readiness Report 2023 Brasil.pdf \(kpmg.com\)](#)

<sup>20</sup> (RAÍZEN, 2022). [Raízen expands the use of organic waste in sugarcane fields and reduces the use of fertilizers and GHG emissions](#).

<sup>21</sup> (USDA, 2024). [Sugar annual report](#).

<sup>22</sup> (ANTUNES, et. al.). [Biofuel Production from Sugarcane in Brazil](#).

optimization and legal compliance in using these resources, together with the traceability of raw materials, are key to guaranteeing sustainability in sugarcane cultivation and to avoid any discussion regarding an eventual competition with food sources.<sup>23</sup>

In this sense, another advantage of our raw material is that sugarcane is easier to trace than grains<sup>24</sup>. This traceability is made easier due to the proximity between the mills<sup>25</sup> and the areas planted with sugarcane, which requires immediate crushing compared to other raw materials, which can be stored. This contributes to greater accountability for sustainable production, capable of meeting stricter sustainability criteria and compliance with international certification standards.

Raízen guarantees the traceability of raw materials and the highest standards of sustainability in production. We are the company in the sugar-energy sector with the largest number of sugarcane processing units operating in compliance with the Bonsucro Standard, the main sustainability standard for sugarcane. This certification guarantees not only legal compliance, but also the fulfillment of important requirements such as continuous improvement, management and conservation of biodiversity and ecosystem services, respect for human rights, deforestation-free areas in our own operations and those of our suppliers, among other parameters.

In 2024, we account for around 30% of all the sugarcane worldwide certified under the Bonsucro Standard<sup>26</sup>, and in crop year 23'24, the number of Raízen units with Bonsucro certification increased to 25, of the 30 bioparks in operation, aiming to reach 100% of the units by 2030. In this same vein, Raízen has made a public commitment, also by 2030, to guarantee the traceability of 100% of the sugarcane crushed (own and third-party sugarcane) and to maintain zero illegal deforestation after 2008.

In addition to its own fields, Raízen seeks to promote excellence throughout its value chain. Through the Elos Raízen Program, an innovation in the sugar and ethanol industry, we aim to guarantee best practices in the supply chain. This is a voluntary sustainability initiative for our sugarcane suppliers, geared toward continuous improvement, combining planning, diagnosis, individual guidance, and engagement to ensure both the achievement of specific goals and the strengthening of a culture of social and environmental responsibility and respect for human rights across our chain.

Recognized by the Sustainable Agriculture Initiative Platform (SAI) and by Bonsucro, the initiative meets criteria aligned with the highest international sustainability standards<sup>27</sup> and currently involves 98.6% of all our sugarcane suppliers.

In addition, focusing on best practices in its production process, 99% of Raízen's harvest is mechanized<sup>28</sup>, avoiding slash-and-burn agriculture as a production method. This increases agricultural productivity and the sustainability of the process. Meanwhile, the implementation of precision agriculture technologies reduces the need for pesticides and promotes a more sustainable use of resources.

## 1.4 OUR SUSTAINABLE PRODUCT PORTFOLIO

Throughout our history, we have made strategic decisions to contribute to our goal of leading the energy transition. With a focus on diversifying solutions from sugarcane and its waste in the energy mix, we believe that a significant

---

<sup>23</sup> (RAÍZEN, 2024). [Big Numbers](#).

<sup>24</sup> (ANP, 2022). [Procedures for Implementing and Verifying the Chain of Custody of Grains and Vegetable Oils](#).

<sup>25</sup> (CONAB, 2,022). [Historical Series of the Harvests](#).

<sup>26</sup> (RAÍZEN, 2024 page 18). [Raízen's Integrated Report - Crop Year 23'24](#).

<sup>27</sup> (RAÍZEN, 2024 page 44). [Raízen's Integrated Report - Crop Year 23'24](#).

<sup>28</sup> (RAÍZEN, 2020). [New program in the sugarcane chain promotes sustainability among producers](#).



increase in the renewable energy portfolio is one of the main paths to reducing GHG emissions and achieving the Paris Agreement's goal of capping global temperature rise to 2°C by 2030.

We have therefore planned our presence in each energy sector and mapped potential new markets that can guide our growth strategies outside of our existing park.

#### 1.4.1 FIRST-GENERATION ETHANOL (1GE)

By investing in clean and renewable energy, we have become the leading global player in the ethanol sector.<sup>29</sup> We sell different types of ethanol (industrial, anhydrous, and hydrous<sup>30</sup>) to various markets, both domestic and global. This diversification is important to mitigate the risk of international price fluctuations and to establish the best trading strategy, i.e., to sell more to the markets (and at times of) with the best price premiums.

We sell our ethanol as a raw material to small and large industries, with the largest companies in Brazil and the world as our clients in different segments such as transport, pharmaceuticals, chemicals, cosmetics, beverages, contributing to the decarbonization of various sectors.

Brazilian first-generation ethanol (1GE) from sugarcane has one of the smallest carbon footprints in the world among the technologies currently available, with reductions of around 80% compared to gasoline.<sup>31</sup>

Raízen's good production practices are recognized by the market. For instance, we are the first ethanol player in the world to receive certification that qualifies the product for the production of SAF (Sustainable Aviation Fuel), which is one of the alternatives for reducing carbon emissions in aviation and which can be produced from ethanol. In addition to the other two bioparks that hold the ISCC EU and ISCC Plus certifications, we received the ISCC CORSIA Plus (Carbon Offsetting and Reduction Scheme for International Aviation) certification, which proves that the ethanol produced at the Costa Pinto bioenergy park in the city of Piracicaba, SP, meets the international requirements for the production of Sustainable Aviation Fuel (SAF)<sup>32</sup>.

ISCC (International Sustainability & Carbon Certification) is a global certification system that covers the entire biofuel value chain, from the cultivation of biomass to final consumption. The goal is to ensure that biofuels are produced in a sustainable way, respecting social, environmental, and economic criteria.

#### 1.4.2 SECOND-GENERATION ETHANOL (2GE)

With an investigative approach, we began to consider sugarcane trash and bagasse, previously treated as waste, as a raw material for our second-generation ethanol (2GE), an advanced biofuel with the same physical and chemical properties as 1GE. Given that the 2GE comes from an innovative circular economy process, with the use of waste and differentiated sustainability attributes, it is considered a clean option, with environmental benefits over other traditional production processes, like the 1GE. By reintroducing waste into the production process, we increase our production capacity by up to 50% using the same planted area, with a 30% lower rate of greenhouse gas

<sup>29</sup> (RAÍZEN, 2024). [Big Numbers](#).

<sup>30</sup> Currently, in 2024, Raízen produces and sells ethanol in the following proportions: industrial - 40%, anhydrous - 40%, and hydrous - 20%. (Source: [RAIZ4: diverse portfolio and the future of energy on the stock exchange](#))

<sup>31</sup> (PEREIRA, et al., 2019). [Comparison of biofuel life-cycle GHG emissions assessment tools: the case studies of ethanol produced from sugarcane, corn, and wheat](#).

<sup>32</sup> (RAÍZEN, 2023). [Raízen is the first ethanol player in the world to receive certification that qualifies the product for the production of SAF](#).

emissions compared to Raízen's 1GE ethanol. Furthermore, compared to regular gasoline, the reduction is even greater, at nearly 80%.<sup>33</sup>

We are the only company in the world that produces 2GE on a commercial scale on an ongoing and uninterrupted<sup>34</sup> basis, with the United States and Europe as our main export markets. In these countries, the growing demand for sustainability has been driven by clear emission reduction targets, including specific obligations for the use of advanced biofuels in various sectors. In both Europe and the US, sugarcane bagasse has been approved as a feedstock.

To date<sup>35</sup>, Raízen has two plants that, together, have a combined production capacity of 112 million liters of 2GE per year. Another four plants are being built and three others are in the project phase. Each plant is expected to produce 82 million liters of 2GE per year, with a CAPEX of approximately R\$1.2 billion.

### 1.4.3 BIOGAS AND BIOMETHANE GENERATED FROM SUGARCANE BIOMASS

Biogas is the result of a complex production process in which biodigesters convert organic components from sugarcane processing, such as filter cake and vinasse, into methane and CO<sub>2</sub>, known as biogas. Besides being used to produce bioelectricity, biogas can also be transformed into biomethane, which can replace fossil fuels (like diesel) in heavy vehicles such as trucks, buses, and tractors, therefore emitting 90% less CO<sub>2</sub>.<sup>36</sup>

Studies on the potential of biogas in Brazil show that 40.8 billion liters of diesel could be replaced by biomethane (representing three times the annual consumption of diesel in the state of São Paulo). In addition, Brazil's potential for generating electricity from biogas is 170,000 GWh/year, which is twice the production of the Itaipu Hydroelectric Power Plant.<sup>37</sup>

In October 2020, we started operations at our biogas plant in Guariba, SP, one of the largest in the world. This plant, which currently generates electricity and has an installed capacity of 21 MW, is adjacent to the Bonfim mill, where more than 5 million tons of sugarcane are processed per year, generating a high volume of vinasse and filter cake to meet the needs of a commercial-scale biogas project. The combined use of these two by-products produces around 138,000 MWh.

In 2022, we announced the construction of our second biogas plant to produce biomethane, located in the Costa Pinto Biopark in Piracicaba, SP. With an investment of R\$300 million, the plant has the capacity to produce 26 million m<sup>3</sup> of renewable natural gas (biomethane) per year<sup>38</sup>. Almost all of the production of the new plant was sold to Yara Brasil Fertilizantes and Volkswagen do Brasil, under long-term contracts.

Studies show that, in the future, technological advances will increase biomass and biomethane production, making it possible to replace the diesel used during the cultivation of sugarcane with biomethane, playing an important role in mitigating GHG emissions and reducing the carbon footprint of first-generation ethanol.<sup>39</sup>

<sup>33</sup>(RAÍZEN, 2024). [2GE is the fuel for the energy transition to move forward.](#)

<sup>34</sup> (RAÍZEN, 2023). [Sugarcane: understand the potential of sugarcane in the energy transition.](#)

<sup>35</sup> Baseline date: July/2024

<sup>36</sup> (RAÍZEN, 2023). [Sugarcane: understand the potential of sugarcane in the energy transition.](#)

<sup>37</sup> Abiogás (2022)

<sup>38</sup> (RAÍZEN, 2022). [Raízen announces the construction of its second biogas plant, the first dedicated to the production of renewable natural.](#)

<sup>39</sup> (JUNQUEIRA, et al., 2017). [Techno-economic analysis and climate change impacts of sugarcane biorefineries considering different time horizons.](#)

#### 1.4.4 DISTRIBUTED GENERATION AND THE NON-REGULATED ELECTRICITY MARKET

Within the scope of the Raízen Power brand, dedicated to renewable electricity solutions, we operate centralized and distributed power generation plants using renewable sources of energy, such as solar, biomass from sugarcane bagasse, small hydroelectric plants, and biogas from urban landfills.

The distributed generation of solar energy began in 2018, when we decided to complement our renewable energy mix by making use of the large availability of land and tax incentives from the Brazilian government. In 2019, we opened our first solar plant adjacent to the Costa Pinto unit, with an installed capacity of 1.3 MWp. Since then, we have expanded our presence in Brazil and currently have more than 50 distributed generation plants in operation, selling electricity on the non-regulated market and serving more than 90,000 customers across the country. With this expansion, we have become the largest distributed generation company in several states, with simultaneous operations in five Brazilian states.

Raízen is among the world's largest producers of bioelectricity, with an installed capacity of close to 1 GW, and having generated 3 TWh in crop year 22'23.<sup>40</sup> All of our bioparks in operation are self-sufficient in energy consumption, with the majority selling their surplus to the National Interconnected System (SIN). Together with the energy trading company WX Energy, in addition to selling energy on the free market, we provide integrated and customized solutions for different customer profiles, which generates a flow of contracts as we diversify the range of products and services in our portfolio.

#### 1.4.5 ELECTRIC MOBILITY

Within the scope of Raízen Power, we launched the *Shell Recharge* program, making us pioneers in fostering electric mobility in Brazil. This initiative is aimed to create one of the largest networks for charging electric vehicles in the world, with more than 30,000 charging locations in 35 countries. Since 2022, we have been expanding the network in Brazil, Argentina, and Paraguay, offering solutions for charging electric vehicles, thus contributing to reducing carbon emissions and building a more sustainable future. During crop year 23'24, a total of 53 direct current (DC) and alternating current (AC) charging locations were opened.<sup>41</sup>

#### 1.4.6 NEW SOLUTIONS

Investment in the research and development of new biofuel solutions is a fundamental pillar for advancing a more sustainable and resilient global economy. According to a study led by Oxford University, grant funding for carbon removal projects is continually increasing, growing at a rate of 14% per year<sup>42</sup>. In this context, sugarcane has emerged as an effective and versatile solution, since 99.5% of the waste from its production can be reused to generate a number of by-products. Thus, various research fronts have been created at Raízen to develop new solutions such as SAF, renewable hydrogen, bioplastics, lignin, biobunker (e-methanol), biomethanol, and green ammonia.

SAF, produced from sugarcane ethanol, can reduce CO<sub>2</sub> emissions by up to 80% compared to conventional aviation kerosene<sup>43</sup>, making it a crucial alternative for reducing CO<sub>2</sub> emissions in the air transport sector, which has historically emitted large amounts of greenhouse gases (GHG). According to new regulations from the European

<sup>40</sup> (RAÍZEN, 2023 page 11). [Raízen's 2022 - 2023 Integrated Report](#).

<sup>41</sup> (RAÍZEN, 2024 page 26). [Raízen's Integrated Report - Crop Year 23'24](#).

<sup>42</sup> (SMITH et al., 2023). [The State of Carbon Dioxide Removal](#).

<sup>43</sup> (IATA, s.d.). [What is SAF?](#)

Union (EU), starting in 2025, around 2% of the fuel supplied to EU airports must be SAF, with the target rising to 6% by 2030 and gradually to 70% by 2050.<sup>44</sup>

In this same vein, we have signed a decarbonization agreement with Wärtsilä to investigate the use of ethanol as a maritime fuel. Preliminary studies show that replacing fossil fuels with ethanol can reduce CO<sub>2</sub> emissions by up to 80% on maritime routes, significantly contributing to the decarbonization of this sector.<sup>45</sup>

In addition, under the new regulations, the European Union's Renewable Energy Directive (RED EU) also includes targets for advanced biofuels and renewable fuels of non-biological origin (RFNBO), such as hydrogen-based e-fuels. In 2023/2024, we laid the foundation stone for the world's first experimental station for the production of renewable hydrogen from ethanol, using biofuel steam reforming technology, in partnership with Shell Brasil, Hytron, Senai Cetiqt, RCGI, and the University of São Paulo (USP). To validate the supply, we signed a memorandum of understanding with Toyota, which will provide a Mirai vehicle for the studies. The experimental station is expected to be operational in the second half of 2024, using the hydrogen produced to fuel the buses that run exclusively within the university campus. Renewable hydrogen, produced from ethanol, can also be used as a raw material for SAF, with significant potential to facilitate its production on a large scale.

In addition, Raízen is looking into the possibility of producing beyond the primary route of biogas and biomethane, moving into more advanced products for export, such as biomethanol, e-methanol, and green ammonia. Biomethanol and e-methanol, two important products for decarbonization, can be obtained using different conversion technologies, while green ammonia is produced by reacting hydrogen with nitrogen. As these products are easily exportable, they will generate high demand to meet Europe's decarbonization targets.

Other alternatives aimed at carbon reduction are also on our radar. Solutions such as Carbon Capture and Storage (CCS) and Biomass Energy with Carbon Capture and Storage (BECCS) are being explored to further mitigate greenhouse gas emissions. CCS is a technology for capturing carbon from industrial process emissions and storage in underground geological formations. When CO<sub>2</sub> is captured from facilities that produce biofuels or bioenergy, the process is called BECCS.

According to a study led by the University of Oxford, there is great potential in these new carbon removal methods which, despite not yet having generated significant results overall, are growing faster than conventional methods such as reforestation<sup>46</sup>.

## 2. RATIONALE FOR THE FRAMEWORK

Society's demand for clean energy is growing as the transition to a low-carbon economy advances worldwide. As an integrated energy platform, with its strategy focused on the expansion of biofuels, Raízen is committed to leading the energy transition in the sector and ratifies this commitment through this sustainable financing framework ("Framework").

Raízen intends to use this Framework as a unified suite of Green Financing Instruments ("Green-FIs") to the market aiming to finance or refinance, in whole or in part, green financial debt instruments that align with the Company's sustainability priorities (including bonds, loans, and/or other debt securities.). It can be used both in the capital market and in the loan market. This framework was developed to ensure that funds raised through Green-FIs comply with the Green Bond Principles ("GBP") published by the International Capital Market Association ("ICMA")

<sup>44</sup> (S&P Global). [Fueling the future: Biofuels drive progress on carbon neutrality](#).

<sup>45</sup> (RAÍZEN, 2024, page 22). [Raízen's Integrated Report - Crop Year 23'24](#)

<sup>46</sup> (SMITH et al., 2023). [The State of Carbon Dioxide Removal](#).

in 2021. This framework also complies with the Green Loan Principles (“GLP”) published by the Loan Market Association (“LMA”), aiming to encompass bilateral or syndicated loans with financial institutions and/or multilateral agencies, (“Green Principles”).

Additionally, any Green-FIs issued by Raízen, its subsidiaries and/or any of its affiliates in the Brazilian debt capital market will also take into consideration the alignment with “Guia para Ofertas de Títulos ESG”, published by the Brazilian Financial and Capital Markets Association (“ANBIMA”) in December 2022, which provide best practices for ESG issuances for Brazilian companies (“Brazilian Best Practices”).

The Green Principles, and the Brazilian Best Practices (simply referred as “Principles”) are voluntary guidelines that were globally implemented and recommend transparency, disclosure and promote integrity for best practices when raising funds with Green-FIs.

### 2.1.1 USE OF PROCEEDS

The amount equivalent to the net proceeds obtained through Green-FIs will be used to partially or fully finance or re-finance existing and/or future investments that meet the eligibility criteria described below and that are directly associated with the assets and projects selected by Raízen in accordance with this Green Financing Framework (“Eligible Assets and Projects”).

The total amount raised by each Green-FI must not exceed the budget of the projects they intend to finance. Investments may be eligible for CAPEX and OPEX allocation disbursed within a maximum of 36 months prior to financing or after the issue date of the instruments, observing the maturity date of the instruments. The company will make every effort to allocate proceeds within 36 months.

Transactions related to Eligible Assets and Projects will be subject to compliance with applicable laws and regulations and Raízen’s policies. Additionally, the offering document for each Green-FI will specify which Eligible Asset and Project is included in the associated Green-FI. Each Eligible Asset and Project is intended to align with at least one of the Sustainable Development Goals (“SDGs”), as defined by the United Nations (“UN”) and described below.

The resources from the Green-FIs issued by Raízen will exclude irregular and/or illegal practices involving child labor or subjecting employees to degrading conditions or conditions analogous to slavery, as well as businesses that do not operate in compliance with Brazilian Federal Law 12.846/2013 (Anti-Corruption Law). Additionally, the resources will not be used to finance or refinance assets and/or projects that use fossil feedstocks or are associated with environmentally harmful resource extraction. Raízen has a clear stance against any actions that may cause deforestation and commits to allocating resources only to production based on raw materials from areas covered by internationally recognized standards.

Green-FIs will be aligned with the four core components and recommendations of the Green Principles, namely:

- I) Use of Proceeds
- II) Process for Investment Evaluation and Selection
- III) Management of Proceeds
- IV) Reporting.



The issuances will also align with the recommendation of having a Framework and an independent pre-issuance verification of the components listed in items I-IV above.

This Framework may be updated from time to time and will be applied to Green-FIs issued by Raízen, its subsidiaries and any of its affiliates. In the event of an update to this Framework, any future investments will be in alignment with the categories recognized by the Green Principles. It is Raízen's intention to follow best market practice as standards develop.

### **2.1.2 ELIGIBLE ASSETS AND PROJECTS**

Eligible Assets and Projects fall into the following categories, with the aim of contributing to the transition to a low-carbon economy and climate change mitigation at a global level.



Table 1. Eligible Assets and Projects

Type of UoP	Project category	Eligibility criterion	Indicators	Alignment with the targets of the Sustainable Development Goals (SDGs) <sup>47 48</sup>
Green	GBP: Renewable energy	<p><b>Ethanol production:</b> Expenses related to biofuel production of all types of sugarcane ethanol, including:</p> <p>(i) capital expenditures for the development, construction, remodeling, operation, and maintenance of biofuel production facilities (including, but not limited to second-generation plants), including hiring labor and purchasing equipment and industrial inputs.</p>	<ul style="list-style-type: none"> <li>- Annual emissions avoided (tCO<sub>2</sub>e compared to fossil fuels)</li> <li>- Annual renewable energy generation (in MWh/GWh for electricity and GJ/TJ for other types of energy)</li> <li>- Carbon intensity factor (tCO<sub>2</sub>e/MJ)</li> </ul>	 <p>7.2 By 2030, increase substantially the share of renewable energy in the global energy mix. 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.</p>
Green	GBP: Renewable energy	<p><b>Production and purchase of certified raw materials:</b> Expenses related to the planting and purchase of sugarcane covered by a recognized sustainability standard, such as Bonsucro or equivalent<sup>49</sup>, to produce biofuel from all types of ethanol, including:</p> <p>(i) operating expenses for planting sugarcane to produce biofuels in line with the highest sustainability standards</p>	<ul style="list-style-type: none"> <li>- % of biofuel covered by Elos, Bonsucro, or equivalent certification.</li> <li>- Volume of sugarcane purchased from suppliers registered with the Elos program</li> </ul>	 <p>7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.</p>

<sup>47</sup> (United Nations Organization, UN). [Sustainable Development Goals](#).



<sup>48</sup> Correlations suggested by ICMA. [A High-Level Mapping to the Sustainable Development Goals](#).






<sup>49</sup> Certifications such as ISCC, Bonsucro, or any other relevant sustainability standard.

Type of UoP	Project category	Eligibility criterion	Indicators	Alignment with the targets of the Sustainable Development Goals (SDGs) <sup>47 48</sup>
		<p>(ii) operating expenses for the purchase of sugarcane raw materials.</p> <p>Non-waste feedstock will meet the following criteria<sup>50</sup>:</p> <p>i. Production of the feedstock will not take place on land with high biodiversity (at least within last 10 years) AND</p> <p>ii. Land with a high amount of carbon have not been converted for biofuel feedstock production AND</p> <p>iii. The feedstock produced will not compete with food and feed in the region.</p>		
Green	GBP: Renewable energy	<p><b>Cogeneration of energy from biomass:</b> Expenditures related to the cogeneration of energy from biomass, including:</p> <p>(i) capital for the development, construction, remodeling, operation, and maintenance of cogeneration facilities, including the purchase of labor power;</p>	<p>- Annual emissions avoided (tCO<sub>2</sub>e compared to fossil fuels)</p> <p>- Annual renewable energy generation (in MWh/GWh for electricity and GJ/TJ for other types of energy)</p>	  <p>7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.</p>

<sup>50</sup> The company ensures allocation of proceeds in compliance with criterias i and ii through full traceability and satellite imagery assessment that attest no deforestation took place in those respective properties, regardless of it being owned sugarcane or third party's. This attribute is a particularity of sugarcane, that led to the publication of an independent "[Land use change Study](#)", which not only confirmed that sugarcane production in Brazil is not associated with deforestation but also showed that the land occupation dynamics due to sugarcane cultivation over the past 20 years in Brazil, contrary to expectations, have been responsible for carbon removal from the atmosphere. Adherence to criteria iii, is met while sugarcane produces both food and fuel simultaneously with very low land occupation. Sugarcane occupies around 1% of the national territory, while contributing to 15 to 20% of Brazilian energy matrix through bioelectricity and ethanol (fuel) and, with the same 1%, placing Brazil as the world's largest sugar producer and exporter (food). The bioparks operate under an integrated sugar and ethanol production model, demonstrating the absence of food vs. fuel competition.



Type of UoP	Project category	Eligibility criterion	Indicators	Alignment with the targets of the Sustainable Development Goals (SDGs) <sup>47 48</sup>
		(ii) capital for implementing biomass optimization projects in the field for industrial purposes, including the purchase of equipment and inputs.		9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.
Green	<b>GBP:</b> Renewable energy	<b>Biogas and Biomethane:</b> Expenditures related to the biodigestion of industrial waste from sugarcane for the production of bioelectricity and/or biomethane through biogas, including: (i) construction, maintenance, remodeling, expansion of biogas and biomethane production plants, including purchase of equipment and inputs.	<ul style="list-style-type: none"> <li>- Annual emissions avoided (tCO<sub>2</sub>e compared to fossil fuels)</li> <li>- Annual renewable energy generation (in MWh/GWh for electricity and GJ/TJ for other energies)</li> </ul>	 <p>7.2 By 2030, increase substantially the share of renewable energy in the global energy mix. 8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programmes on Sustainable Consumption and Production. 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.</p>
Green	<b>GBP:</b> Renewable energy	<b>Solar energy:</b> Expenditures related to the production of solar energy, including: (i) capital for development, construction, renovation, including acquisition of labor power and purchase of equipment.	<ul style="list-style-type: none"> <li>- Annual emissions avoided (tCO<sub>2</sub>e compared to fossil fuels)</li> <li>- Annual renewable energy generation (in MWh/GWh for electricity and GJ/TJ for other types of energy)</li> </ul>	 <p>7.2 By 2030, increase substantially the share of renewable energy in the global energy mix. 9.1 Develop quality, reliable, sustainable and resilient infrastructure, including regional and transborder infrastructure, to support economic development and</p>

Type of UoP	Project category	Eligibility criterion	Indicators	Alignment with the targets of the Sustainable Development Goals (SDGs) 47 48
				human well-being, with a focus on affordable and equitable access for all.
Green	<b>GBP: Energy efficiency</b>	<b>Energy efficiency</b> Energy efficiency: Expenses related to improving energy efficiency in sugarcane ethanol biofuel plants, cogeneration units, biogas facilities and/or solar plants, and the purchase of more efficient equipment.	<ul style="list-style-type: none"> <li>- GHG emissions ( tCO<sub>2</sub> ) per ton of sugarcane (Scope 2).</li> <li>- Energy consumption per ton of sugarcane (MWh/GWh for electricity and GJ/TJ) for other energies).</li> </ul>	   <p>7.2 By 2030, increase substantially the share of renewable energy in the global energy mix. 7.3 By 2030, double the global rate of improvement in energy efficiency. 8.4 Improve progressively, through 2030, global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation, in accordance with the 10-Year Framework of Programms on Sustainable Consumption and Production. 9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable, with increased resource-use efficiency and greater adoption of clean and environmentally sound technologies and industrial processes, with all countries taking action in accordance with their respective capabilities.</p>
Green	<b>GBP: Clean transportation</b>	<b>Infrastructure for clean energy vehicles:</b> Expenditures related to the installation of fast electric charging stations with certified 100% renewable energy	<ul style="list-style-type: none"> <li>- Number of electric vehicle charging stations installed</li> <li>- Total charged (KWh)</li> <li>- Annual emissions avoided (tCO<sub>2</sub>e compared to fossil fuels)</li> </ul>	  <p>7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.</p>

Type of UoP	Project category	Eligibility criterion	Indicators	Alignment with the targets of the Sustainable Development Goals (SDGs) <sup>47 48</sup>
				<p>11.2 By 2030, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons.</p>



### 2.1.3 SELECTION AND EVALUATION OF ELIGIBLE ASSETS AND PROJECTS

Raízen has a process in place to ensure that only assets and projects aligned with the criteria established above will be selected as eligible for the issuance of Green-FIs. To this end, senior management will annually discuss and establish which projects will use the proceeds in the following crop year.

The selection process for Eligible Assets and Projects includes the following steps:

1. An evaluation of the eligibility of proposals according to the eligibility criteria specified in the table above and disregarding assets and projects that do not meet the criteria.
2. All projects will be evaluated to ensure that they have been and are being developed, built, and operated in accordance with our Corporate and Regulatory Governance, Sustainability, and Compliance Policies, as well as with our Health, Safety, and Environment Policy, and with any and all applicable rules, legislation, and/or regulations. The evaluation of the eligibility of projects and assets will go beyond the legal aspects, taking into account the highest sustainability standards for the sector.
3. The leadership in charge will submit potential green or transitional assets and projects to senior management for final approval.

### 2.1.4 MANAGEMENT OF PROCEEDS

Raízen intends to allocate the proceeds of all Green-FIs issued under this Framework to assets and projects selected in accordance with the use of proceeds criteria and the evaluation and selection process presented herein. The portfolio consists of new and/or existing assets and projects.

Pending full allocation of the proceeds to eligible assets and projects, Raízen will hold and/or invest the balance of unallocated net proceeds, at its own discretion, in its treasury liquidity portfolio (in cash or cash equivalents, money market funds, etc.). Raízen's senior management will monitor the Eligible Green Portfolio and will exclude green assets or projects that cease to comply with the eligibility criteria or that may have been disposed of, replacing them as soon as reasonably practicable. The allocation of net proceeds from each Green-FI will be reviewed and approved by Raízen's senior management at least annually.

The Framework may be amended from time to time to reflect market developments and best practices. Any new issuance of Green-FI will be aligned with the latest version of the Framework. Assets and projects will only be considered eligible if they meet the eligibility criteria in force at the time.

### 2.1.5 REPORTING

Raízen will annually report on the allocation of proceeds from Green-FIs and the impact of these proceeds by project, over the maturity of each issuance, as required ("Annual Report").

The Annual Report will be published as part of, or concurrently along with, the company's annual disclosure, according to the maturity of each operation. Any relevant development, such as modification of the Framework or allocation of proceeds, will be reported in a timely manner, seeking to align the reports with the latest standards and market practices.

The Annual Report will contain financial indicators such as: the volume of labeled proceeds allocated to each project (R\$ and %); the volume of labeled proceeds earmarked for repayment, refinancing, and future expenditures per operation (R\$ and %). Additionally, the Annual Report will also include, to the extent possible, a methodology section, baselines, and assumptions used in the impact analysis and impact indicators selected (including, but not limited to avoided emissions, energy generated, energy savings, etc).



Raízen will provide consolidated reports for all its Green-FIs.

The reports will be available at: [www.raizen.com.br](http://www.raizen.com.br)

### 2.1.6 EXTERNAL REVIEW

Raízen has obtained and will make publicly available a Second-Party Opinion (“SPO”) from Sustainalytics, a leading ESG research, ratings, and data firm, to provide an opinion on this Framework as well as the alignment to the Principles. The SPO will be available on the SPO provider’s website.

#### DISCLAIMER

This document is intended to provide non-exhaustive, general information. This document may contain statements about future events and expectations that are forward looking statements. None of the future projections, expectations, estimates or prospects in this document should be taken as forecasts or promises nor should they be taken as implying any indication, assurance or guarantee that the assumptions on which such future projections, expectations, estimates or prospects have been prepared are correct or exhaustive or, in the case of the assumptions, fully stated in the document. Raízen has and undertakes no obligation to update, modify or amend this document, the statements contained herein to reflect actual changes in assumptions or changes in factors affecting these statements or to otherwise notify any addressee if any information, opinion, projection, forecast or estimate set forth herein changes or subsequently becomes inaccurate. This document is not intended to be and should not be construed as providing legal or financial advice. It does not constitute an offer or invitation to sell or any solicitation of any offer to subscribe for or purchase or a recommendation regarding any securities, nothing contained herein shall form the basis of any contract or commitment whatsoever and it has not been approved by any security regulatory authority. The distribution of this document and of the information it contains may be subject of legal restrictions in some countries. Persons who might come into possession of it must inquire as to the existence of such restrictions and comply with them. The addressee is solely liable for any use of the information contained herein and Raízen shall not be held responsible for any damages, direct, indirect or otherwise, arising from the use of this document by the addressee.