GranBio Investimentos S.A.

Parent Company and Consolidated financial statements as of December 31, 2019, 2018 and 2017

Contents

Independent auditors' report on the Parent Company and Consolidated financial statements **3**

Statements of financial position **8**

Statements of profit or loss **9**

Statements of other comprehensive income **10**

Statements of changes in equity **11**

Statements of cash flows **12**

Statements of value added **13**

Notes to the Parent Company and Consolidated financial statements **14**

Independent auditors' report on the Parent Company and Consolidated financial statements

To the Board of Directors
Granbio Investimentos S.A.
São Paulo - SP

Opinion

We have audited the Parent Company and consolidated financial statements of GranBio Investimentos S.A. ("Company"), identified as Parent Company and Consolidated respectively, which comprise the statement of financial position as at December 31, 2019 and the related statements of profit or loss, other comprehensive income, changes in equity and cash flows for the year then ended, and notes, comprising significant accounting policies and other explanatory information.

Opinion on the parent company financial statements
In our opinion, the aforementioned Parent Company financial statements present fairly, in all material respects, the financial position of GranBio Investimentos S.A. as of December 31, 2019, and of its financial performance and its cash flows for the year then ended, in conformity with accounting practices adopted in Brazil.

Opinion on the consolidated financial statements
In our opinion, the aforementioned Consolidated financial statements present fairly, in all material respects, the consolidated financial position of GranBio Investimentos S.A. as of December 31, 2019, and the consolidated performance of its operations , and of its financial performance and its cash flows for the year then ended, in accordance with the accounting practices adopted in Brazil and International Financial Reporting Standards (IFRS) issued by the International Accounting Standards Board – IASB.

Basis for opinion

We conducted our audit in accordance with Brazilian and International Auditing Standards. Our responsibilities under those standards are further described in the section Auditors' Responsibilities for the Audit of the parent company and consolidated financial statements. We are independent of the Company in accordance with the ethical requirements that are relevant to our audit of the financial statements in Brazil, and we have fulfilled our ethical responsibilities in accordance with these requirements. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our audit opinion.

Emphasis of matter paragraph – Commercial capacity of the ethanol plant of the subsidiary Bioflex Agroindustrial S.A.

We draw your attention to note 17 to the Parent Company and Consolidated financial statements, which states that the ethanol plant of the subsidiary Bioflex Agroindustrial S.A. is receiving investments to achieve commercial capacity in an ongoing operation and that the realization of the assumptions made to carry out the impairment test is subject to commercial scale production starting up at the 2G ethanol plant. Our opinion does not make a qualification regarding this matter.

Key audit matters

Key audit matters are those matters that, in our professional judgment, were of most significance in our audit of the financial statements of the current period. These matters were addressed in the context of our audit of the parent company and consolidated financial statements as a whole, and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

Property, plant and equipment impairment testing

See Notes 3a, 3l.ii and 17 to the parent company and consolidated financial statements

Key audit matter	How the matter was addressed in our audit
By way of its indirect subsidiary Bioflex Agroindustrial S.A., in 2019 the Company's Consolidated financial statements present significant balances of property, plant and equipment needed to carry out its operations, essentially related to investments in equipment, assembly services, facilities and civil construction works to build the cellulose ethanol production plant. Because of the existence of impairment loss indicators, the Company evaluated the possible impairment of these assets, which involved premises including (i) the growth rate and discount rate for cash flows estimated for the cash generating unit; (ii) the plant's production capacity; (iii) second generation ethanol prices in the international market, among other factors. A change to these assumptions and judgments could have material impacts on the recoverable value of these assets in the Parent Company and Consolidated financial statements. Because of this and the importance of the amounts involved, we consider this to be a key audit matter.	Our audit procedures in this area included, among others: • With the assistance of our corporate finance experts, we evaluated the key assumptions made in the future cash flow projections and compared them against data obtained from external sources and we evaluated the sensitivity analysis of the key assumptions used and the impacts of any changes in those assumptions; • Reconciliation between the recoverable value determined and the carrying amount of the assets; • Comparison of the budgets approved for the previous year against the actual amounts determined, in order to assess the Company’s capacity to realize the projections; • Assessment of whether the disclosures in the parent company and consolidated financial statements regarding the matter took the material information into account. Based on the evidence obtained through the procedures summarized above, we consider acceptable the balance of property, plant and equipment regarding the measurement of its recoverable value and the disclosures related to the context of the parent company and consolidated financial statements taken as a whole for the fiscal year ended December 31, 2019.

Business combination – Recognition and measurement of control acquisition made by the subsidiary GranBio LLC

See Notes 4a.v and 6 to the parent company and consolidated financial statements

Key audit matter	How the matter was addressed in our audit

In 2019, the Company's direct subsidiary GranBio LLC acquired the entire control of the companies GranAPI LLC, API-Intellectual Property Holdings LLC, American Process Conversion Technologies LLC, and American Process Conversion Technologies Holdco LLC. This transaction was recorded by the business acquisition method. The use of the acquisition method requires, among other procedures, that the Company determine the fair value of the consideration transferred, the fair value of the assets acquired and the liabilities assumed, and goodwill for expected future profits. These procedures typically involve a high degree of judgment and require fair-value estimates to be made based on calculations and assumptions related to the future performance of the acquired business, which are subject to a high degree of uncertainty like the discount rate, growth rate, projected revenue and operating margins. Due to the substantial degree of uncertainty involved in determining the underlying assumptions for calculating estimated fair values and the impact that any changes in these assumptions could have on the parent company and consolidated financial statements, we consider this to be a key audit matter.	Our audit procedures in this area included, among others: • With the assistance of our corporate finance experts, we evaluated the key assumptions used by the Company to determine and recognize the fair value of assets and liabilities acquired, based on our knowledge of the acquired entity and the industry it operates in; and comparing the independent calculations made against external and historic data to analyze the reasonableness of the fair values determined; • Reviewing the documents formalizing the transaction; • Evaluating possible tax effects on the business combination with the assistance of our tax specialists; • Assessing whether the disclosures in the parent company and consolidated financial statements regarding the matter took the material information into account. In the course of our audit we identified adjustments that affected the recognition and measurement of the control acquisitions made which were recorded by the Company. As a result of the evidence obtained through the aforesaid procedures, we consider acceptable the recognition and measurement of the control acquisitions made within the context of the parent company and consolidated financial statements for the financial year ended December 31, 2019 taken as a whole.

Other matters - Statements of value added

The Parent Company and Consolidated statements of value added (DVA) for the year ended December 31, 2019, which are the responsibility of Company´s Management and presented as supplementary information under IFRS, were subject to audit procedures conducted in conjunction with the audit of the Company's financial statements. To form our opinion, we evaluated whether the statements have been reconciled against the financial statements and accounting records, as applicable, and whether their form and content comply with the criteria set out in CPC Technical Pronouncement 09 - Statements of Value Added. In our opinion, these statements of value added have been adequately prepared, in all material respects, in accordance with this Technical Pronouncement and are consistent with the parent company and consolidated financial statements taken as a whole.

Responsibilities of management for the parent company and consolidated financial statements

Management is responsible for the preparation and fair presentation of the parent company financial statements in accordance with the accounting practices adopted in Brazil and the consolidated financial statements in accordance with the accounting practices adopted in Brazil and International Financial Reporting Standards (IFRS) issued by the International Accounting Standards Board (IASB), and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the parent company and consolidated financial statements, management is responsible for assessing the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Company and its subsidiaries or to cease operations, or has no realistic alternative but to do so.

Auditors' responsibilities for the audit of the parent company and consolidated financial statements

Our objectives are to obtain reasonable assurance about whether the parent company and consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Brazilian auditing standards and ISAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements.

As part of an audit in accordance with Brazilian auditing standards and ISAs, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the parent company and consolidated financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company and its subsidiaries' internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.
- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Company and its subsidiaries' ability to continue as a going concern. If we conclude that a material uncertainty exists, then we are required to draw attention in our auditors' report to the related disclosures in the parent company and consolidated financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditors' report. However, future events or conditions may cause the Company and its subsidiaries to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the parent company and consolidated financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient appropriate audit evidence regarding the financial information of the entities or business activities within the Company to express an opinion on the parent company and consolidated financial statements. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our audit opinion.

We communicate with management regarding, among other matters, the planned scope and timing of the

audit and significant audit findings, including significant deficiencies in internal control that we possibly identify during our audit.

From the matters communicated with management, we determine those matters that were of most significance in the audit of the consolidated financial statements of the current period and are therefore the key audit matters. We describe these matters in our auditors' report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in our report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

São Paulo, August 31, 2020

KPMG Auditores Independentes

CRC 2SP014428/O-6

Yukie de Andrade Kato

Accountant CRC PR-052608/O-4 T-CE

GranBio Investmentos S.A.

Statements of financial position as of December 31

(In thousands of Brazilian Reais)

		Parent Company			Consolidated		
Assets	**Note**	**2019**	**2018**	**2017**	**2019**	**2018**	**2017**
Current assets							
Cash and cash equivalents	7	2	30.201	69	1.289	51.159	965
Accounts receivable	8	-	5	6	2.940	904	881
Loans - related parties	11	140.521	65.290	279.979	12.378	6.343	14.313
Other accounts receivable - related parties	11	14.068	19.646	10.506	-	60.055	25.717
Advances to suppliers		136	186	12	4.620	12.303	6.439
Inventories	9	-	-	-	9.670	14.366	6.570
Biological assets	12	-	-	-	-	3.228	1.236
Recoverable taxes		2.513	2.407	2.342	2.373	2.046	8.942
Prepayments		46	33	7	1.574	1.255	918
Total current assets		157.286	117.768	292.921	34.844	151.659	65.981
Non-current assets							
Other investments	10	-	-	-	-	21.402	24.634
Recoverable taxes		-	-	-	6.689	6.689	6.689
Judicial deposits		109	117	62	1.394	1.474	957
Other receivables	13	23.123	22.537	22.087	83.459	22.537	22.087
Other accounts receivable - related parties	11	-	-	-	61.776	-	-
Investments	14	761.041	676.090	467.066	-	138.021	131.545
Property, plant and equipment	15	2.013	157	218	973.786	939.393	996.451
Intangible assets	16	1	142	468	505.322	27.940	26.060
Total non-current assets		786.287	699.043	489.901	1.632.426	1.157.456	1.208.423
Total assets		**943.573**	**816.811**	**782.822**	**1.667.270**	**1.309.115**	**1.274.404**

		Parent Company			Consolidated		
Liabilities	**Nota**	**2019**	**2018**	**2017**	**2019**	**2018**	**2017**
Current liabilities							
Loans, financing and debentures	18	29.324	917	1.500	245.648	147.458	96.109
Lease		872	-	-	873	-	-
Trade payables	19	1.446	1.325	1.794	42.154	23.727	21.708
Loans - related parties	11	131.583	79.153	16.459	104.859	56.686	18.757
Other accounts payable - related parties	11	817	-	-	-	-	-
Tax and labor obligations		96	832	740	10.413	4.954	3.348
Accounts payables	20	60	344	-	29.880	5.185	1
Government grants	21	-	-	-	4.797	3.471	1.543
Total current liabilities		164.198	82.571	20.493	438.624	241.481	141.466
Non-current liabilities							
Loans, financing and debentures	18	88.448	113.511	112.231	376.937	446.211	482.172
Trade payables	19	-	-	-	-	-	668
Deferred income and social contribution taxes		-	-	-	48.752	-	-
Lease		959	-	-	959	-	-
Accounts payables	22	-	434	-	106.631	1.128	-
Total non-current liabilities		89.407	113.945	112.231	533.279	447.339	482.840
Equity							
Share capital	22	900.000	900.000	900.000	900.000	900.000	900.000
Capital reserves		108.175	107.589	107.139	108.175	107.589	107.139
Asset and liability valuation adjustments	22	81.778	83.091	54.649	81.778	83.091	54.649
Accumulated losses		(399.985)	(470.385)	(411.690)	(399.985)	(470.385)	(411.690)
Equity attributable to owners of the Company		689.968	620.295	650.098	689.968	620.295	650.098
Non-controlling interests		-	-	-	5.399	-	-
Total equity		689.968	620.295	650.098	695.367	620.295	650.098
Total equity and liabilities		**943.573**	**816.811**	**782.822**	**1.667.270**	**1.309.115**	**1.274.404**

The notes are an integral part of these parent company and consolidated financial statements.

GranBio Investimentos S.A.

Statements of profit or loss

Years ended December 31

(In thousands of Brazilian Reais)

	Note	Parent Company			Consolidated		
		2019	**2018**	**2017**	**2019**	**2018**	**2017**
Net revenues from goods sold and services	23	-	-	-	33.537	24.254	25.637
Cost of goods sold and services	24	-	-	-	(61.692)	(19.280)	(35.810)
Gross profit (loss)		-	-	-	(28.155)	4.974	(10.173)
Operating income (expenses)							
Administrative and general expenses	25	(4.917)	(3.155)	(472)	(63.461)	(36.521)	(20.159)
Other operating income (expenses)	26	4	-	(7.822)	213.470	37.901	(7.266)
Impairment losses on trade receivables	27	-	(1.273)	(1.515)	-	(1.273)	(50.474)
Share of profit of equity accounted investees, net of tax	14	86.290	(39.238)	(63.192)	12.815	(16.781)	(2.145)
Net income (loss) before net finance costs		81.377	(43.666)	(73.001)	134.669	(11.700)	(90.217)
Finance income	28	206	230	262	2.126	6.788	18.752
Finance costs	28	(11.183)	(15.259)	(11.285)	(59.786)	(53.783)	(12.559)
Net financial costs		(10.977)	(15.029)	(11.023)	(57.660)	(46.995)	6.193
Income before income tax and social contribution		70.400	(58.695)	(84.024)	77.009	(58.695)	(84.024)
Deferred income and social contribution taxes	29	-	-	-	1.556	-	-
Profit (loss) for the year		**70.400**	**(58.695)**	**(84.024)**	**78.565**	**(58.695)**	**(84.024)**
Owners of the Company		70.400	(58.695)	(84.024)	70.400	(58.695)	(84.024)
Non-controlling interests		-	-	-	8.165	-	-
Profit (loss) for the year		**70.400**	**(58.695)**	**(84.024)**	**78.565**	**(58.695)**	**(84.024)**
Weighted average number of common shares (thousand)		100.221	100.221	100.221	100.221	100.221	100.221
Earnings (loss) per share – basic and diluted	32	**0,70**	**(0,59)**	**(0,84)**	**0,78**	**(0,59)**	**(0,84)**

The notes are an integral part of these parent company and consolidated financial statements.

GranBio Investimentos S.A.

Statements of other comprehensive income

Years ended December 31

(In thousands of Brazilian Reais)

	Parent Company			Consolidated		
	2019	**2018**	**2017**	**2019**	**2018**	**2017**
Profit (loss) for the year	70.400	(58.695)	(84.024)	78.565	(58.695)	(84.024)
Other comprehensive income to be reclassified to profit or loss in subsequent periods:						
Sale of available for sale investment (note 14.d)	-	-	(36.908)	-	-	(36.908)
Foreign operations – foreign currency translation differences (note 14.d)	(1.313)	28.442	(1.132)	(1.313)	28.442	(1.132)
Comprehensive income (loss) for the year	**69.087**	**(30.253)**	**(122.064)**	**77.252**	**(30.253)**	**(122.064)**
Total other comprehensive income attributable to:						
Owners of the Company				69.087	(30.253)	(122.064)
Non-controlling interests				8.165	-	-
Total other comprehensive income				**77.252**	**(30.253)**	**(122.064)**

The notes are an integral part of these parent company and consolidated financial statements.

GranBio Investimentos S.A.

Consolidated statements of changes in equity

Years ended December 31, 2019, 2018 and 2017

(In thousands of Brazilian Reais)

		Attributable to owners of the Company							
	Note	**Share capital**	**Capital to be paid in**	**Capital reserve**	**Asset and liability valuation adjustments**	**Accumulated losses**	**Equity attributable to owners of the Company**	**Non-controlling interests**	**Total Equity**
Balance at January 1, 2017	14.d	900.000	-	105.598	92.689	(327.666)	770.621	-	770.621
Foreign operations – foreign currency translation differences	14.d	-	-	-	(1.132)	-	(1.132)	-	(1.132)
Equity disposal write-off	14.d	-	-	-	(36.908)	-	(36.908)	-	(36.908)
Monetary updating of shares		-	-	1.541	-	-	1.541	-	1.541
Loss for the year		-	-	-	-	(84.024)	(84.024)	-	(84.024)
Balance at December 31, 2017		900.000	-	107.139	54.649	(411.690)	650.098	-	650.098
Foreign operations – foreign currency translation differences	14.d	-	-	-	28.442	-	28.442	-	28.442
Monetary updating of shares		-	-	450	-	-	450		450
Loss for the year		-	-	-	-	(58.695)	(58.695)	-	(58.695)
Balance at December 31, 2018		900.000	-	107.589	83.091	(470.385)	620.295	-	620.295
Foreign operations – foreign currency translation differences	14.d	-	-	-	(1.313)	-	(1.313)	(472)	(1.785)
Capital to be paid in	20.a	249.869	(249.869)	-	-	-	-	-	-
Monetary updating of shares		-	-	586	-	-	586	-	586
Non-controlling interests - initial operation	6	-	-	-	-	-	-	(2.294)	(2.294)
Profit for the year		-	-	-	-	70.400	70.400	8.165	78.565
Balance at December 31, 2019		1.149.869	(249.869)	108.175	81.778	(399.985)	689.968	5.399	695.367

The notes are an integral part of these parent company and consolidated financial statements.

GranBio Investimentos S.A.

Statements of cash flows

Years ended December 31

(In thousands of Brazilian Reais)

	Parent Company			Consolidated		
	2019	2018	2017	2019	2018	2017
Cash flows from operating activities						
Profit (loss) for the year	70.400	(58.695)	(84.024)	78.565	(58.695)	(84.024)
Adjustments for:						
Depreciation (Note 15)	913	75	583	25.901	15.140	16.696
Amortization (Note 16)	141	326	326	11.783	629	630
Write-off of PP&E (Note 15)	6	-	10.951	1.059	58.658	11.400
Write-off biological assets	-	-	-	3.228	-	8.049
Gain n of business combination (note 26)	-	-	-	(218.128)	-	-
Share of profit of equity accounted investees, net of tax (note 14)	(86.290)	39.238	63.192	(12.815)	16.781	2.145
Interest on lease	216	-	-	216	-	-
Interest expenses for loans, financing and debentures (Note 18 b)	10.902	6.769	6.658	58.820	35.714	7.998
Allowance for doubtful accounts	-	1.273	1.515	-	1.273	50.474
Deferred income and social contribution taxes	-			(1.556)		
NRV adjustment on inventory	-	-	-	3.856	8.985	698
Profit (loss) for the year adjustments	(3.712)	(11.014)	(799)	(49.071)	78.485	14.066
Change in:						
Accounts receivable	5	1	(6)	(10)	(23)	(478)
Advance to suppliers	50	(174)	45	7.683	(5.561)	311
Inventories	-	-	-	931	(16.781)	13.049
Recoverable taxes	(106)	(65)	(115)	(327)	6.896	(6.853)
Other receivables	-	-	-	(6.289)	-	-
Related Parties (loans and other receivables)	(16.406)	46.970	(61.634)	34.017	13.599	(13.402)
Other assets	(12)	(26)	50	3.152	(337)	797
Judicial deposits	8	(55)	(4)	80	(517)	(259)
Trade payables	121	(386)	304	7.395	2.906	12.131
Tax and labor obligations	(736)	92	(66)	5.459	1.606	(4.475)
Other accounts payable	(720)	875	-	2.108	6.312	(1)
Government grants	-	-	-	1.326	1.928	(430)
Cash from (used in) operating activities	(17.796)	47.232	(61.426)	55.525	10.028	390
Payment of interest on loans, financing and debentures (Note 18 b)	(6.984)	(5.752)	(5.503)	(20.188)	(15.175)	(6.535)
Net cash from (used in) operating activities	(28.492)	30.466	(67.728)	(13.734)	73.338	7.921
Cash flows from investing activities						
Capital increase in joint ventures	-	-	16.633	-	-	1.367
Acquisition of subsidiary, net of cash acquired (note 6)	26	-	-	(11.215)	-	-
Other investments	-	-	-	21.402	3.232	16.059
Acquisition of biological assets	-	-	-	-	(1.992)	-
Acquisition of PP&E (Note 15)	(150)	(14)	(3.094)	(22.073)	(16.740)	(65.806)
Acquisition of intangible (Note 16)	-	-	-	(2.102)	(2.509)	(3.297)
Cash used in investment activities	(124)	(14)	13.539	(13.988)	(18.009)	(51.677)
Cash flows from financing activities						
Capital increase	-	-	49.061	-	-	49.061
New loans and financing	-	-	-	-	-	1.656
Payment of loans, financing and debentures - principal (Note 18 b)	(574)	(320)	(14.504)	(9.716)	(5.151)	(28.554)
Lease payments	(1.009)	-	-	(1.009)	-	-
Cash from (used in) financing activities	(1.583)	(320)	34.557	(10.725)	(5.151)	22.163
Effect of exchange variation on cash and cash equivalents	-	-	-	(11.423)	16	-
Increase (decrease) in cash and cash equivalents	(30.199)	30.132	(19.632)	(49.870)	50.194	(21.593)
Cash and cash equivalents at January 1	30.201	69	19.701	51.159	965	22.558
Cash and cash equivalents at December 31	2	30.201	69	1.289	51.159	965
Increase (decrease) in cash and cash equivalents	(30.199)	30.132	(19.632)	(49.870)	50.194	(21.593)

The notes are an integral part of these parent company and consolidated financial statements.

GranBio Investimentos S.A.
Statements of value added
Years ended December 31
(In thousands of Brazilian Reais)

	Parent Company			Consolidated		
	2019	**2018**	**2017**	**2019**	**2018**	**2017**
Revenue						
Sales of goods and services	-	-	-	35.677	26.816	28.570
Other income (loss)	4	-	(7.822)	213.470	37.901	(7.266)
Impairment losses on accounts receivable	-	(1.273)	(1.515)	-	(1.273)	(50.474)
	4	**(1.273)**	**(9.337)**	**249.147**	**63.444**	**(29.170)**
Inputs acquired from third parties						
Costs	-	-	-	(57.474)	(16.406)	(33.665)
Materials, energy, third-party services and other operating expenses	(2.420)	1.949	6.441	(35.522)	(17.397)	(6.699)
	(2.420)	**1.949**	**6.441**	**(92.996)**	**(33.803)**	**(40.364)**
Gross value added	**(2.416)**	**676**	**(2.896)**	**156.151**	**29.641**	**(69.534)**
Depreciation and amortization	(1.058)	(401)	(909)	(19.084)	(9.638)	(3.969)
	(1.058)	**(401)**	**(909)**	**(19.084)**	**(9.638)**	**(3.969)**
Net value added produced by the Company	**(3.474)**	**275**	**(3.805)**	**137.067**	**20.003**	**(73.503)**
Added value received as transfer						
Share of profit (loss) of equity-accounted investees	86.290	(39.238)	(63.192)	12.815	(16.781)	(2.145)
Finance income	206	230	262	2.126	6.788	18.752
	86.496	**(39.008)**	**(62.930)**	**14.941**	**(9.993)**	**16.607**
Total value added to distribute	**83.022**	**(38.733)**	**(66.735)**	**152.008**	**10.010**	**(56.896)**
Distribution of value added						
Payroll and social charges						
Direct compensation	1.112	3.760	4.497	9.530	10.168	8.716
Benefits	293	782	1.250	2.712	1.687	2.422
Severance Fund (F.G.T.S)	34	161	257	831	505	498
	1.439	**4.703**	**6.004**	**13.073**	**12.360**	**11.636**
Taxes, duties and contributions						
Federal	-	-	-	542	2.480	2.625
State	-	-	-	41	82	308
	-	**-**	**-**	**583**	**2.562**	**2.933**
Return on debt capital						
Interest	11.183	15.259	11.285	59.786	53.783	12.559
	11.183	**15.259**	**11.285**	**59.786**	**53.783**	**12.559**
Retained earnings/(loss)						
Retained earnings/(loss) for the year	70.400	(58.695)	(84.024)	70.400	(58.695)	(84.024)
Non-controlling interests	-	-	-	8.165	-	-
	70.400	**(58.695)**	**(84.024)**	**78.565**	**(58.695)**	**(84.024)**
Total	**83.022**	**(38.733)**	**(66.735)**	**152.008**	**10.010**	**(56.896)**

The notes are an integral part of these parent company and consolidated financial statements.

Notes to the Parent Company and Consolidated financial statements

(Amounts in thousands of Brazilian Reais)

1 Operations

GranBio Investimentos S.A. ("GranBio" or "Company") is a privately held company having its registered office address at Av. Brigadeiro Faria Lima, 2277 - Conjs. 1503 and 1504, São Paulo, São Paulo State. It was founded on June 13, 2011. Its ultimate parent company is Graninvestimentos S.A which has its registered office address at Av. Faria Lima, 2277- Conjs. 1503 and 1504, São Paulo, São Paulo State.

GranBio is a holding company and its subsidiaries are mainly engaged in: (a) creating viable flexible biorefineries that can be rolled out on an industrial scale to convert biomass into cellulose sugar, biofuels, biochemicals, nanocellulose and other ligno-cellulosic materials, in addition to electricity; (b) developing and trading competitive varieties of biomass, especially sugar cane Energy Cane Vertix ("Energy Cane Vertix"); (c) developing and licensing patents and intellectual property in the renewable sector using biomass and (d) generating and cogenerating electricity from biomass.

Energy Cane Vertix is a proprietary brand of GranBio, used to commercialize varieties of biomass developed by the Company. It is considered a lower cost biomass source compared to wood and sugar cane straw biomass. The Company holds 11 Protected Cultivars (Vertix 1 to Vertix 11), already licensed to the market, until December 31, 2019 a total of 17 licensing contracts were already celebrated by the subsidiary BioVertis.

The Company, through its subsidiaries in the United States of América (USA) also sells technology to extract nanocellulose, to processes the separation of lignin and to produce biochemicals. GranBio, LLC located in USA has applied for several patents for various proprietary technologies it has developed. Its research center is located in the city of Thomaston, GA, USA, and is used to develop and provide services to third parties for other branches of technology based on biomass carbon. GranBio LLC has a demonstration unit on a semi-commercial scale for the production of cellulose ethanol in Michigan.

Based on that assumption, the Company recently restructured its business model to license its knowledge and offers technological assistance to clients and partners in Joint-Ventures in the production and processing of biomass in cellulose sugar, 2G (second-generation) Ethanol, 2G biochemicals and nanocellulose.

The Company's financial statements include the Company and its subsidiaries (jointly referred to as the 'Group').

Liquidity

In the year ended December 31, 2019, the Company made a profit of R$ 78.6 million (compared to a loss of R$ 58.7 million in 2018 and R$ 84.0 million in 2017), totaling R$ 400.0 million in retained losses, (compared to R$ 470.4 million in 2018 and R$ 411.7 million in 2017). The 2019 profit of the subsidiary GranBio LLC was substantially related to the positive non-cash and non-recurring gain recognized on GranBio LLC's prior investment in GranAPI LLC on the acquisition of the remaining shares, which triggered business combination accounting.

In the year ended December 31, 2019 the Company had a consolidated negative net working capital of R$ 403.8 million and net cash from operating activities of R$ 47.8 million.

This situation requires that Management assesses the ability of the Company and its subsidiaries to keep

generating sufficient cash flows, to assure that they continue as a going concern for the foreseeable future by either generating operating cash flows, obtaining funds from third parties, or receiving financial support from its shareholders.

Management’s assessment considered the business plan of the Company, which was prepared based on the current status of assets and liabilities and the planned future actions, as well as certain significant macroeconomic assumptions and estimates of interest and inflation rates, as well as in the assessment of the financial capacity of shareholders to honor the capital commitment assumed in case of failure in the action plan prepared by the Company.

The planned actions that impact the future cash flow estimates include the following actions by the management of the Company:

- A standstill agreement with Banco do Nordeste do Brasil S.A. - BNB to temporally suspend the amortization of its debts until January 2021. The total amount on December 31, 2019 was R$ 123,542 – signed on May 05, 2020;
- A standstill agreement with Banco Nacional de Desenvolvimento Econômico e Social – BNDES to temporally suspend the amortization of its debt payments during a period of six months. The agreement signed on July 15,2020 applies to the loan between BNDES and the subsidiary Bioflex, for which the total amount on December 31, 2019 was R$ 270,466 – signed on July 15, 2020;
- On August 20, 2020, refinanced its debts with Financiadora de Estudos e Projetos - FINEP - in the total amount of R$ 117,772 on December 31, 2019, extending the maturity to 2029;
- A new working capital facility of R$ 15,000 was signed on August 17,2020;
- An agreement was negotiated between Itaú Unibanco S.A. (Itaú) and the Company´s shareholder GranInvestimentos S.A. related to the nonconvertible debentures issued by BioFlex (amounting R$ 101,654 on December 31, 2019). Under this agreement GranInvestimentos consent to acquire a substantial number of units owned by Itaú to reduce their total position to R$ 30,000. Considering the outstanding position of December 31. 2019, this means that GranInvestimentos S.A. would acquire R$ 71,654 from Itaú. In accordance with the signed agreement the transaction must take place until December 4, 2020;
- Finally, the Company is pursuing (i) alternatives to fund its existing obligations and its growth strategy with financial institutions and the capital markets both in Brazil and in the United States, pursuing additional finance transaction of approximately R$ 100,000; (ii) a further extension of its credit facilities with Banco Nacional de Desenvolvimento Econômico e Social – BNDES and Banco do Nordeste do Brasil S.A. - BNB to extend the maturity of the contracts; (iii) the Company is pursuing a public offering expected to be executed in the fourth quarter of 2020.

Management has recently restructured its business model to focus on licensing its knowledge and offering technological assistance to clients and partners. In August 2020, GranBio established a strategic alliance with NextChem, a subsidiary of the Italian engineering group Maire Tecnimont with a worldwide presence in renewable energy. The strategic alliance seeks to expand the Company's position in licensing its technology for the production of 2G (second generation) ethanol through the conversion of lignocellulosic biomass into renewable fuel with low carbon intensity, as also described in note of Subsequent Events.

The partnership combines the Company's technology and experience in second-generation biomass and biofuels with NextChem's engineering intelligence, project execution capacity and global presence to offer integrated services, feasibility studies, integrated projects, complete engineering and construction of manufacturing plants in different regions of the world. The partnership involved the sale of the first GreenPower+ license. The first tranche of this sale was received in 31st of August.

Management is also evaluating the Intellectual Property Portfolio to define non-core packages of patents that might be sold to generate cash. The eligible assets are certain non-utilized butanol technology and

certain non-core deicer technology. Those activities are still under negotiation and are expected to take place by the fourth quarter of 2020 and involve transaction of approximately R$ 100.000.

Considering the business plan, Management believes that the payment of obligations will be made as planned, and that the cash flow generation will be appropriate to meet its obligations in the foreseeable future.

However, in case the business plan is unsuccessful, the Company's shareholders have formally committed to support the Company in all actions required for continuing as a going concern, with the commitment to invest additional funds in an amount considered by management as sufficient to enable the Company to realize its business plans for the next 12 months.

Based on its evaluation, Management has concluded that there is no significant uncertainty as to the Company's ability to continue as a going concern in the foreseeable future. Therefore, the Parent Company and consolidated financial statements of the Company have been prepared on a going concern basis

2 List of subsidiaries and joint ventures

Direct subsidiaries

- **BioVertis Produção Agrícola Ltda. ("BioVertis"):** Company engaged in the experimentation, development, plantation, production and collection of biomass, i.e. energy cane and sugarcane straw. The Company has Energy Cane Vertix licensing agreements with ethanol producers. Currently under this program a semi-commercial nursery is being created, which is expected to be ramped up to commercial plantation in the coming years.

- **BioEdge Agroindustrial Ltda.:** Company that invests in commercial second-generation ethanol and biochemical plants.

- **BioCelere Agroindustrial Ltda:** Company dedicated to scientific research in order to enhance laboratory processes that convert biomass into sugar and creating genetically modified microorganisms. The main achievement of this Company was the patenting and acceptance for commercial use of proprietary genetically modified yeast used in the production of second-generation ethanol.

- **BioPlant Agroindustrial Ltda.:** Company engaged in the implementation and study of industrial solutions for the production of biochemicals and biofuels. The Company's operations are currently on hold.

- **GranBio LLC:** A US-based company engaged in investing in companies strategically related to the Company's business plan, which comprise creating technologies for converting biomass into cellulosic sugar for biochemicals and second-generation ethanol, in addition to developing nanocellulose for myriad industries. As stated in note 6, on March 13, 2019 the direct subsidiary GranBio LLC completed the acquisition of the entire capital of API Intellectual Properties Holdings LLC, GranBio Process Conversion Technologies Holdco LLC, GranBio Process Conversion Technologies LLC, GranAPI LLC and their affiliated companies: GranBio Services Inc., AVAPCO LLC, America Green+ LLC, Alternative Bioprod Inv. LLC, Alpena Protoype Bioref LLC and Alpena Biorefinery Inc. As a result of the business combination the Group now owns the Alpena Biorefinery Inc. in Alpena, Michigan, the Thomaston Biorefinery and R&D (Research and Development) Center in Thomaston, Georgia, operations teams, business research and an extensive intellectual property profile related to converting

biomass into biofuels, biochemicals and nanocellulose, with around 200 patents awarded and pending. The companies previously classified as joint ventures are now indirect subsidiaries.

Indirect subsidiaries

- **BioFlex Agroindustrial S.A.:** Company engaged in the production of biomass, processing biomass for the production and sale of biofuel, electricity, biochemicals and pharmachemicals, technological research and development, sale of sugarcane straw, bagasse and biomass.

- **GranBio - Intellectual Property Holdings LLC (formerly API - Intellectual Property Holdings LLC):** It holds all the patents and trade and technological secrets developed by GranAPI LLC and its subsidiaries.

- **GranBio Conversion Technologies LLC:** Company holds the assets of Thomaston, a demonstration plant for existing biomass conversion technologies. This company has a lease agreement for its assets with AVAPCO LLC.

- **GranBio Conversion Technologies Holdco LLC:** Nonoperational holding company with an interest of 10% in GranBio Process Conversion Technologies LLC.

- **GranApi LLC:** US-based non-operating holding company, controlling companies engaged in developing technologies to convert biomass into cellulosic ethanol, biochemicals and nanocellulose. GranApi LLC controls the following companies:

- **American Green + LLC:** Company holding the sublicensing rights for technology owned by GranBio Intellectual Property Holdings LLC for converting biomass into cellulosic ethanol.

- **AVAPCO LLC:** Company owns the sublicensing rights for technology owned by GranBio Intellectual Property Holdings LLC for converting biomass into cellulosic ethanol. This company leases Thomaston Biorefinery from GranBio Process Conversion Technologies LLC to develop new technologies and provide client services. Thomaston is a demonstration plant.

- **GranBio Services Inc**.: A US-based company engaged in investing in companies strategically related to the Company’s business plan. Holding of the three Companies below:

    - **Alpena Biorefinery Inc. (formerly American Process Energy Recovery Inc):** Company providing water treatment services to the paper and pulp company Decorative Panels International, located in Alpena, MI, and the production and sale of molasses to other clients;

    - **Alpena Prototype Bioref LLC:** Nonoperating company owner of the Alpena Biorefinery land;

    - **Alternative Bioprod Inv. LLC:** Nonoperating company set up to meet requirements of the New Market Tax Credit (NMTC) which transaction was finalized on January 2, 2019.

Joint ventures

- **Companhia Energética de São Miguel dos Campos:** Company dedicated to developing an integrated electricity and steam generation system running on biomass - cogeneration, electricity and steam supply and provision of services related to energy efficiency enhancement and generation. Most of the energy

generated is to meet the demands of its shareholders and the surplus generation is fed into the electrical grid system.

- **SGBio Renováveis S.A.:** Company engaged in technological research, development and innovation for processing biomass and making producing chemicals from biomass. The Company ceased operating in August 2019, returning capital of R$ 26 to its shareholders.

Note 4 shows the percentage ownership interests in the direct subsidiaries, indirect subsidiaries and joint ventures.

3 Basis of preparation and presentation of the Parent Company and Consolidated financial statements

The Executive Board approved the issuance of the Parent Company and consolidated financial statements on August 31, 2020.

The Parent Company and consolidated financial statements for years ended December 31, 2019, 2018 and 2017 comprise the Parent Company and Consolidated financial statements of the Company, its subsidiaries and the Group´s share of the profits and losses and net assets of a joint venture accounted for the by equity method.

Statement of Compliance

The Parent Company financial statements have been prepared in accordance with accounting practices adopted in Brazil. (BR GAAP). The consolidated financial statements (“Financial Statements”) have been prepared in accordance with accounting practices adopted in Brazil (BR GAAP) and in accordance with the International Financial Reporting Standards (“IFRS”), as issued by the International Accounting Standards Boards (“IASB”).

Accounting practices adopted in Brazil comprise the policies set out in Brazilian Corporate Law and the pronouncements, guidance, and interpretations issued by the Accounting Pronouncements Committee (CPC), approved by the Brazilian Securities and Exchange Commission (CVM) and the Federal Accounting Council (CFC).

International Financial Reporting Standards (IFRSs), comprise the International Accounting Standards (IASs), International Financial Reporting Standards Interpretation Committee (IFRIC) and Standing Interpretations Committee (SIC).

This is the first set of annual financial statements of the Group in which CPC 06 (R2) / IFRS 16 – Leases was applied. The related changes in the main accounting policies are described in note 5.

Details about the Group’s accounting policies are included in note 4.

Functional and presentation currency

The Parent Company and consolidated financial statements are being presented in Brazilian reais, which is the Company and its subsidiaries' functional currency, except the subsidiary GranBio LLC and its direct and indirect subsidiaries, whose functional currency is the US Dollar. All amounts have been rounded to the nearest thousand, unless otherwise indicated.

Use of estimates and judgments

In preparing the parent Company and consolidated financial statements, Management has made judgments and used estimates that affect the application of the accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to estimates are recognized prospectively.

a. Judgments

Information about judgments in applying accounting policies that have the most significant effect on the amounts recognized in the Parent Company and consolidated financial statements is included in the following notes:

- **Note 1 - Liquidity**: management´s assessment as how the Group will generate and/ or obtain capital to fund its operations in the next 12 months;
- **Note 4.a – Consolidation basis:** determines whether the Company actually holds control of an investee;
- **Note 6** – **Business combination**: fair value of consideration transferred, and fair value of assets acquired and liabilities assumed and the assumptions used in identifying and calculating the fair value of the assets acquired and liabilities assumed;
- **Note 14 - Equity method in investees:** determination of whether the Company has influence over an investee;
- **Note 15** - **Property, plant and equipment and Note - 16 Intangible assets** - impairment test, key assumptions underlying recoverable amounts. For further information see note 17;
- **Note 23 – Net revenues from goods sold and services:** the Group recognizes revenue when it transfers control over a good or service to a customer.

b. Assumptions and estimates uncertainties

Information about assumptions and estimation uncertainties as of December 31, 2019 that have a significant risk of resulting in a material adjustment to the carrying amounts of assets and liabilities in the next financial year are included in the following notes:

- **Note 6** – Business combination: fair value of assets acquired and liabilities assumed;
- **Note 9** - Inventory - analysis of the net realizable value, key assumption is products with slow turnover, expired products or products nearing the expiration date and products that do not meet quality standards, recorded as "Cost of products sold" and replacement cost in the market;
- **Note 15** - Property, plant and equipment - impairment test, key assumptions underlying recoverable amounts. For further information see note 17;
- **Note 16** – Intangible assets - main assumptions underlying the recoverable amounts, including the recoverability of development costs, licenses, intellectual property and goodwill deriving from the business combination.

Measurement of fair values

A number of the Company's accounting policies and disclosures require the measurement of fair values, for both financial and non-financial assets and liabilities, and are shown in note 30.

When measuring the fair value of an asset or a liability, the Group used observable market data as far as possible. Fair values are categorized into different levels of a fair value hierarchy based on the inputs used in the valuation techniques as follows.

- **Level 1**: quoted prices (unadjusted) in active markets for identical assets or liabilities.
- **Level 2:** *inputs* other than quoted prices included within Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices).
- **Level 3:** inputs for the asset or liability that are not based on observable market data (unobservable inputs).

Further information about the assumptions made in measuring fair values is included in notes 6 and 17.

Basis of measurement

The parent company and consolidated financial statements have been measured based on historical cost basis, except for certain financial instruments measured at fair value (note 3.b).

4 Significant accounting policies

The accounting policies set out below have been applied consistently to all periods presented in these Parent Company and consolidated financial statements, unless stated otherwise.

a. Basis of consolidation

Percentage interest in investees

See below the percentage interest in the direct and indirect subsidiaries and joint ventures:

		Ownership interest - (%)		
Direct subsidiaries	**Country**	**2019**	**2018**	**2017**
GranBio LLC	United States of America	100.00%	100.00%	100.00%
BioCelere Agroindustrial Ltda.	Brazil	99.99%	99.99%	99.99%
BioVertis Produção Agrícola Ltda.	Brazil	99.99%	99.99%	99.99%
BioEdge Agroindustrial Ltda.	Brazil	99.99%	99.99%	99.99%
BioPlant Agroindustrial Ltda.	Brazil	99.99%	99.99%	99.99%
Indirect subsidiaries				
Bioflex Agroindustrial S.A.	Brazil	99.99%	99.99%	99.99%
GranAPI LLC (*)	United States of America	100.00%	50.00%	50.00%
GranBio - Intellectual Property Holdings LLC (formerly API - Intellectual Property Holdings – LLC) (*)	United States of America	97.00%	50.00%	50.00%
GranBio Process Conversion Technologies LLC (*)	United States of America	100.00%	50.00%	50.00%
American Green + LLC (**)	United States of America	100.00%	50.00%	50.00%
AVAPCO LLC (**)	United States of America	100.00%	50.00%	50.00%
GranBio Services Inc. (formerly API – Intellectual Property Holdings – LLC.) (*)		96.10%	50.00%	50.00%
American Process Energy Recovery INC (**)	United States of America	100.00%	50.00%	50.00%
Alpena Prototype Bioref LLC (**)	United States of America	100.00%	50.00%	50.00%
Alternative Bioprod Inv. LLC (**)	United States of America	100.00%	50.00%	50.00%
Joint ventures				
Companhia Energética de São Miguel dos Campos – CESM	Brazil	50.00%	50.00%	50.00%
SGBio Renováveis S.A.(***)	Brazil	-	50.00%	50.00%

(*) The companies GranAPI LLC, GranBio Intellectual Property Holdings LLC, American Process Conversion Technologies LLC and GranBio Services Inc. were classified as joint ventures on December 31, 2018 and December 31, 2017 and were subsequently reclassified as indirect subsidiaries on March 13, 2019.

(**) Investees of GranAPI LLC and GranBio Services Inc, which are consolidated indirectly into the Company, as a result of the acquisition on March 13, 2019.

(***) This company ceased its operation in August 2019, returning a capital of R$ 26 to its shareholders.

(i) Subsidiaries

The Group controls an entity when it is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date on which control commences until the date on which control ceases.

The subsidiaries' financial information is recognized in the Parent Company financial statements by the equity accounting method.

(ii) Investments in equity-accounted investees

The Group's investments in entities valued by the equity method consists of interests in associated companies and joint ventures.

Associates are those entities in which the Group has significant influence, but not control or joint control, over the financial and operating policies. A joint venture is an arrangement in which the Group has joint control, whereby the Group has rights to the net assets of the arrangement, rather than rights to its assets and obligations for its liabilities.

These investments are recognized initially at cost, which includes transaction costs. Subsequent to initial recognition, the financial statements include the Group’s share of the profit or loss and other comprehensive income (OCI) of equity-accounted investees, until the date on which significant influence or joint control ceases. Investments in subsidiaries are accounted for under the equity method in the Parent Company financial statements.

(iii) Transactions eliminated on consolidation

Intra-group balances and transactions, and any unrealized income and expenses arising from intra-group transactions, are eliminated in preparing the consolidated financial statements. Unrealized gains driving from transactions with investees recorded by the equity method are eliminated against the investment in proportion to the Group's interest in the investee. Unrealized losses are eliminated in the same way as unrealized gains, but only to the extent that there is no evidence of impairment.

(iv) Loss of control

When the Group loses control over a subsidiary, it derecognizes the assets and liabilities of the subsidiary, and any related NCI and other components of equity. Any resulting gain or loss is recognized in profit or loss. Any interest retained in the former subsidiary is measured at fair value when control is lost.

(v) Business combinations

The Group accounts for business combinations using the acquisition method when control is transferred to the Group. The acquisition date is the date on which the Group assumes control of the assets. The consideration transferred in the acquisition is generally measured at fair value, as are the identifiable net assets acquired. Any goodwill that arises in the transactions is tested annually for impairment. Transaction costs are recognized in profit or loss as incurred, except if related to the issue of debt or equity securities.

The consideration transferred does not include amounts related to the settlement of pre-existing relationships. Such amounts are generally recognized in profit or loss.

Any contingent consideration is measured at fair value at the date of acquisition. If an obligation to pay contingent consideration that meets the definition of a financial instrument is classified as equity, then it is not remeasured and settlement is accounted for within equity. Otherwise, other contingent consideration is remeasured at fair value at each reporting date and subsequent changes in the fair value of the contingent consideration are recognized in profit or loss.

(vi) Non-controlling interests ("NCI")

NCI are measured initially at their proportionate share of the acquiree's identifiable net assets at the date of acquisition. Changes in the Group's interest in a subsidiary that do not result in a loss of control are accounted for as equity transactions.

b. Foreign currency

(i) Foreign currency transactions

Transactions in foreign currencies are translated to the respective functional currencies of Company's entities at exchange rates at the dates of the transactions.

Monetary assets and liabilities denominated in foreign currencies are translated into the functional currency at the exchange rate at the reporting date. Non-monetary assets and liabilities that are measured at fair value in a foreign currency are translated to the functional currency at the exchange rate when the fair value was determined. Non-monetary items that are measured based on historical cost in a foreign currency are translated at the exchange rates at the date of the transaction. Foreign currency differences arising on re-translation are generally recognized in profit or loss.

(ii) Foreign operations

The assets and liabilities of foreign operations, including goodwill and fair value adjustments arising on acquisition, are translated into real at the exchange rates at the reporting date. The income and expenses of foreign operations are translated into real at the exchange rates at the dates of the transactions.

Foreign currency differences arising from the translation of items into the presentation currency are recognized in other comprehensive income and accumulated in the asset and liability valuation adjustments reserve in equity. If the foreign operation is a non-wholly owned subsidiary, then the relevant proportion of the translation difference is allocated to non-controlling interests.

c. Revenue

Revenue is measured based on the consideration specified in a contract with a customer. The Group recognizes revenue when it transfers control over a good or service to a customer.

The following topics provides information about the nature and timing of the satisfaction of performance obligations in contracts with customers, including significant payment terms, and the related revenue recognition policies.

- Service fee income: Revenue is recognized over time as the services are provided. The stage of completion for determining the amount of revenue to recognize is assessed based on surveys of work performed. If the services under a single arrangement are rendered in different reporting periods, then the consideration is allocated based on their relative standalone selling prices. The stand-alone selling price is determined based on the list prices at which the Group sells the services in separate transactions. Invoices services are issued on a monthly basis and are usually payable within 30 days.

- Resale of goods and Energy Cane Vertix: Revenue is recognized when the goods are delivered and have been accepted by customers at their premises. Customers obtain control of products when the goods are delivered to and have been accepted at their premises. This sales revenue is recognized when the performance obligation is fulfilled, i.e., when the promised product is physically transferred, and the consumer obtains control over this product.

- License revenue: the Group´s license revenue is recognized at the specific point in time of the sale or its concession, since, at that time, the customer can determine how and when to use that license without needing the Group´s performance, meaning, that the Group will no longer carry out any activities that significantly affect the intellectual property of this license to which the customer has rights. Therefore, the license provides the right to use the Group´s intellectual property as it exists when it is sold and granted and, for this reason, the revenue is recognized at that specific time of the sale and concession of the license, since its intellectual property does not change, and the customer obtains control at the time the license is granted.

d. Employee benefits

Short-term employee benefits

Short-term employee benefits are expensed as personnel expenses as the related service is provided. A liability is recognized for the amount expected to be paid if the Group has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee and the obligation can be estimated reliably.

e. Finance income and finance costs

The Company's finance income and finance costs include:

- Interest income and expenses;
- The net gain or loss on financial assets at fair value through profit or loss (FVTPL);
- The foreign currency gain or loss on financial assets and financial liabilities;

Interest income or expense is recognized using the effective interest method.

'Effective interest rate' means the rate that exactly discounts the estimated future cash payments or receipts through the expected life of the financial instrument at:

- gross carrying amount of the financial asset; or
- at amortized cost of the financial liability.

When calculating the interest revenue or expense, the effective interest rate is charged on the gross carrying amount of the asset (when the asset is not impaired) or at the amortized cost of the liability. However, interest revenue is calculated by applying the effective interest rate to the amortized cost of the financial asset suffering impairment after initial recognition. If the asset is no longer impaired, the interest revenue is once again calculated on the gross amount.

f. Biological assets

Biological assets are measured at cost less accumulated amortization and any accumulated impairment losses, when applicable. The assets are amortized according to their useful lives, with any change therein recognized in profit or loss. They are measured on a cost since it relates to the Energy Cane Vertix developed by the Group, for which there is no active market and the Company did not sell this cane so that it was not possible to establish a fair price. The plan was to use 2G ethanol in the production process.

g. Inventories

Carried at the lower of average cost of purchase or production and net realizable value. The Company considers the following when determining its provision for inventory losses: products with slow turnover, expired products or products nearing the expiration date and products that do not meet quality standards. Inventory losses are recorded as “Cost of products sold” and replacement cost in the market. The inventories are comprised of raw materials and consumables necessary for the production of 2G ethanol.

h. Property, plant and equipment

(i) Recognition and measurement

Items of property, plant and equipment are measured at the historic cost of acquisition or construction, which includes capitalized borrowing costs, less accumulated depreciation and any accumulated impairment losses.

If parts of an item of property, plant and equipment have different useful lives, then they are accounted for as separate items (major components) of property, plant and equipment. Any gain or loss on disposal of an item of property, plant and equipment (calculated as the difference between the net proceeds from disposal and the carrying amount of the property, plant and equipment) is recognized in profit or loss.

(ii) Subsequent expenditure

Subsequent expenses are capitalized to the extent it is probable that the future benefits associated with these expenses shall be transferred to the Group. Ongoing repairs and maintenance are expensed as incurred.

(iii) Depreciation

Depreciation is calculated to amortize the cost of items of property, plant and equipment net of their estimated residual values using the straight-line method over their estimated useful lives, except for

property, plant and equipment related to the operational plant that are depreciated based units-of-production method, being its outputs projected for the next 40 years. Depreciation is recognized in profit or loss. The right-of-use asset is subsequently amortized using the straight-line method from the commencement date to the end of the lease term, unless the lease transfers ownership of the underlying asset to the Group by the end of the lease term or the cost of the right-of-use asset reflects that the Group will exercise a purchase option. In that case the right-of-use asset will be amortized over the useful life of the underlying asset, which is determined on the same basis as those of property and equipment. Land is not depreciated.

Items of property, plant and equipment are depreciated from the date they are installed and are available for use, or in the case of internally constructed assets, on the date construction is completed and the asset is available for use.

The estimated useful lives are as follows (in years):

Property, plant and equipment	**2019**
IT equipment	3 - 5
Vehicles	5
Fixtures and fittings	3 - 10
Lab plant and equipment	2 - 10
Agricultural plant and equipment	4 - 12
Improvements to rented property	25
Industrial machinery, equipment and facilities	2 - 40
Right-of-use (*)	10
Buildings and constructions	2 - 60
Plantation	10

(*) There is a new asset as a result of the adoption of CPC 06 (R2)/IFRS 16 on January 1, 2019.

Depreciation methods, useful lives and residual values are reviewed at each reporting date and adjusted if appropriate.

i. Intangible assets and goodwill

(i) Goodwill

Goodwill arising on the acquisition of subsidiaries is measured at cost less accumulated impairment losses.

(ii) Research and development

Expenditure on research activities is recognized in profit or loss as incurred.

Development expenditure is capitalized only if the expenditure can be measured reliably, the product or process is technically and commercially feasible, future economic benefits are probable, and the Group intends to and has sufficient resources to complete development and to use or sell the asset. Subsequent to initial recognition, development expenditure is measured at cost less accumulated amortization and any accumulated impairment losses.

(iii) Other intangible assets

Other intangible assets that are acquired by the Group and have finite useful lives are measured at cost less accumulated amortization and any accumulated impairment losses. Subsequent expenditure is capitalized

only when it increases the future economic benefits embodied in the specific asset to which it relates. Amortization is calculated on the cost of an asset or other equivalent cost, minus the residual value.

(iv) Subsequent expenses

Subsequent expenses are capitalized only when they increase the future economic benefits incorporated into the specific asset to which they relate. All other expenses are recognized in the statement of profit or loss as incurred.

(v) Amortization

Intangible assets are amortized on a straight-line basis in profit or loss over their estimated useful lives, from the date that they are available for use.

The estimated useful lives are as follows:

Intangible assets	**2019**
Software	5
Development of Energy Cane Vertix and yeast	8 - 20
Technology licenses and intellectual property *(i)*	30

(i)

(vi) Technology licenses, intellectual property and goodwill deriving from business combinations

Intangible assets are recorded at acquisition cost or fair value of the intangible assets acquired in a business combination, less accumulated amortization by the straight-line method, when applicable. These intangibles are tested for impairment according to the accounting policy in note 4.m. Goodwill and intangibles with indefinite useful life are subject of annual impairment test.

j. Financial instruments

Accounting policy applicable after January 1st, 2018

(i) Recognition and initial measurement

Trade accounts receivable and issued debt securities are initially recognized on the date they originate.

All other financial assets and financial liabilities are initially recognized when the Group becomes a party to the contractual provisions of the instrument.

A financial asset (except for trade accounts receivable without a significant financing component) or financial liability is initially measured at fair value plus, for an item not measured at Fair Value Through Profit or Loss “FVTPL”, transaction costs directly attributable to its acquisition or issuance. A trade accounts receivable without a significant financing component is initially measured at the operation price.

(ii) Classification and subsequent measurement

Upon initial recognition a financial asset is classified as measured: at amortized cost; at Fair Value through Other Comprehensive Income "FVOCI" - debt instrument; at FVOCI - equity instrument; or at FVTPL.

Financial assets are not reclassified subsequently to initial recognition, unless the Group changes its business model to financial asset management. In this case all the affected financial assets are reclassified on the first day of the first period following the business model change.

A financial asset is measured at amortized cost if both of the following conditions are met and it is not stated as measured at FVTPL:

- it is maintained within a business model with the objective of maintaining financial assets in order to receive contractual cash flows; and
- its contractual terms generate cash flows on specified dates that constitute solely payments of principal and interest ("SPPI") on the outstanding principal.

A debt instrument is measured at FVOCI if both of the following conditions are met and it is not stated as measured at FVTPL:

- it is maintained within a business model whose objective is achieved by both the receipt of contractual cash flows and the sale of financial assets; and
- its contractual terms generate the cash flows on specified dates that constitute payments of principal and interest on the outstanding principal.

Upon initial recognition of an investment in an equity instrument that is not held for trading, the Group can elect to make irrevocable subsequent changes to the fair value of the investment in OCI. This choice is made for each investment.

All financial assets not classified as measured at amortized cost or FVOCI, as described above, are classified as FVTPL. Upon initial recognition, the Group irrevocably assigns a financial asset that would otherwise meet the requisites to be measured at amortized cost or FVOCI as FVTPL if this eliminates or significantly reduces an accounting mismatch that would otherwise arise.

The Group assesses the objective of the business model in which a financial asset is maintained in the portfolio which better reflects how the business is managed and the information is provided to Management. The information considered includes:

- The policies and objectives stipulated for the portfolio and the practical functioning of these policies. These include the question of ascertaining whether the Management strategy is focused on obtaining contractual interest revenue, maintaining a given interest rate profile, the correspondence between the duration of financial assets and the duration of related liabilities or expected cash flows, or the realization of cash flows through the sale of assets;
- How the portfolio's performance is assessed and reported to Company Management;
- The risks affecting the performance of the business model (and the financial asset maintained in said business model) and how such risks are managed;
- How business managers are compensated - for example, if the compensation is based on the fair value of the assets managed or the contractual cash loans obtained; and
- The frequency, volume and timing of the financial asset sales in previous periods, the reasons for these sales and expectations for future sales.

The transfers of financial assets to third parties in transactions that do not qualify for derecognition are not considered sales, in a way consistent with the ongoing recognition of the Company's assets.

Financial assets held-for-trading or managed with performance assessed based on fair value, are measured at fair value through profit or loss.

Financial assets - assessment as to whether the contractual cash flows are solely payments of principal and interest

For the purpose of this assessment, principal is defined as the fair value of the financial asset upon initial recognition. The interest is defined as a payment for the value of the money over time and the credit risk posed by the outstanding principal over a given period of time and the other underlying loan costs and risks (for example liquidity risk and administrative cost), in addition to a spread.

The Group examines the instrument's contractual terms to determine whether the contractual cash flows only entail payments of the principal and interest. This includes assessing whether the financial asset contains a contractual term that could change the timing or value of the contractual cash flows so that it would no longer meet this condition. When making this assessment the Group takes into account:

- Contingent events modifying the value or timing of the cash flows;
- Terms that could adjust the contractual rate, including variable fees;
- Prepayment and extending term extensions; and
- The terms limiting the Company's access to specific cash flows from specific assets (for example based on an asset's performance).

Prepayment is consistent with the criteria of paying the principal and interest if the prepayment mainly represents unpaid amounts of the principal and interest on the outstanding principal - which may include reasonable additional compensation for early termination of the contract. Furthermore, in relation to a financial asset acquired for an amount less than or greater than the nominal value of the contract, the permission or requirement for prepayment at an amount representing the nominal value of the contract plus the contractual interest (which may also include reasonable additional compensation for early termination of the contract) accumulated (but not paid) are treated as consistent with this criteria if the fair value of the prepayment is insignificant upon initial recognition.

Financial assets - Subsequent measurement and gains and losses

Financial assets at FVTPL

These assets are subsequently stated at fair value. The net income including interest or dividend revenue is recognized in profit or loss.

Financial assets at amortized cost

These assets are subsequently measured at the amortized cost using the effective interest rate method. The amortized cost is reduced for impairment. Revenue from interest, exchange variance gains and losses and impairment are recognized in profit or loss. Any gain or loss resulting from derecognition is recognized in profit or loss.

Debt instruments at FVOCI

These assets are subsequently stated at fair value. Interest revenue calculated by the effective interest rate, exchange variance gains and losses and impairment are recognized in profit and loss. Other net income is recognized in OCI. Upon derecognition, the gain or loss accumulated in OCI is reclassified to profit or loss.

Financial liabilities - classification, subsequent measurement and gains and losses

Financial liabilities were classified as measured at amortized cost or FVTPL. A financial liability is classified as at fair value through profit or loss if it is classified as held-for trading, is a derivative or is designated as such on initial recognition. Financial liabilities measured at FVTPL are measured at fair value and the net revenue, including interest, is recognized in profit or loss. Other financial liabilities are subsequently measured at the amortized cost using the effective interest rate method. Expenses on interest, exchange variance gains and losses are recognized in profit or loss. Any gain or loss resulting from derecognition is also recognized in profit or loss.

(iii) Derecognition

Financial assets

The Group derecognizes a financial asset when the contractual rights to the cash flows from the asset expire, or when the Group transfers the rights to receive the contractual cash flows of a financial asset in a transaction where essentially all the risks and rewards of ownership of financial assets are transferred or in which the Group neither transfers nor substantially retains all the risks and rewards of ownership of the financial asset nor retains control over the financial asset.

Financial liabilities

The Group derecognizes a financial liability when its contractual obligations are discharged, canceled, or expire. The Group also derecognizes a financial liability when its terms are modified and the cash flows of the modified liability are substantially different, in which case a new financial liability is recognized based on the modified terms and recognized at fair value.

Upon derecognizing a financial liability, the difference between the former carrying amount and the amount paid (including assets transferred that do not flow through cash or undertaken liabilities) is recognized in profit or loss.

(iv) Offsetting

Financial assets and financial liabilities are offset and the net amount presented in the statement of financial position when, and only when, the Group currently has a legally enforceable right to offset the amounts and intends either to settle them on a net basis or to realize the asset and settle the liability simultaneously.

Accounting policy applicable before January 1st, 2018

The Company and its subsidiaries classified financial assets in the following categories:

- Loans and receivables;

Financial assets - Subsequent measurement and profit and loss

Financial assets FVTPL - Measured at fair value and changes in fair value, including interest or dividend income, were recognized in income.

Financial assets held to maturity - Measured at amortized cost using the effective interest method.

Loans and receivables - Measured at amortized cost using the effective interest method.

Financial assets held for sale - Measured at fair value and changes in fair value, except for impairment, interest and exchange differences on debt instruments, were recognized in OCI and accumulated in the fair value reserve. When these assets were derecognized, the accumulated gains and losses in equity were reclassified to the result.

Financial liabilities - classification, subsequent measurement and profit and loss

Financial liabilities were classified as measured at fair value through profit or loss – FVTPL and other financial liabilities. A financial liability is classified as at FVTPL if it is classified as held-for-trading, is a derivative or is designated as such at initial recognition. Financial liabilities measured at FVTPL are measured at fair value and the net gains and losses, including any interest expense, are recognized in profit and loss. Other financial liabilities are subsequently measured at amortized cost using the effective interest method. Interest expense and foreign exchange gains and losses are recognized in income. Any gain or loss on derecognition is also recognized in the statement of profit and loss.

(i) Derecognition

Financial assets

The Company and its subsidiaries derecognize a financial asset when the contractual rights to the asset's cash flows expire, or when the Company and its subsidiaries transfer the contractual receipt rights to the contractual cash flows on a financial asset in a transaction in which substantially all the risks and benefits of ownership of the financial asset are transferred or in which the Company and its subsidiaries neither transfer nor substantially maintain all the risks and benefits of ownership of the financial asset and also do not retain control over the financial asset.

Financial liabilities

The Company and its subsidiaries derecognize a financial liability when their contractual obligation is withdrawn, canceled or expires. The Company and its subsidiaries also derecognize a financial liability when the terms are modified and the cash flows of the modified liability are substantially different, in which case a new financial liability based on the modified terms is recognized at fair value.

In the derecognition of a financial liability, the difference between the extinguished book value and the consideration paid (including transferred assets that do not pass through cash or assumed liabilities) is recognized in the result.

(ii) Offsetting

Financial assets and financial liabilities are offset and the net amount presented in the statement of financial position when, and only when the Group has a legally enforceable right to offset these amounts and intends either to settle them on a net basis or to realize the asset and settle the liability simultaneously.

k. Share capital

Common shares are classified as Shareholders' equity. The minimum mandatory dividends established in the bylaws are recognized as liabilities.

Incremental costs directly attributable to the issue of ordinary shares are recognized as a deduction from equity. Income tax relating to transaction costs of an equity transaction is accounted for in accordance with CPC 32/IAS 12.

l. Impairment

Accounting policy applicable after January 1, 2018

(i) Non-derivative financial assets

Financial instruments and contractual assets

The Group recognizes provisions for expected credit losses on:

- financial assets measured at amortized cost; and
- contract assets.

The Group measures the provision for loss at an amount equal to the expected credit loss for the entire life. The provisions for losses on trade accounts receivable and contract assets are measured at an amount equal to the expected credit loss for the instrument's entire life.

When determining whether the credit risk of a financial asset has increased significantly since initial recognition and when estimating the lifetime expected credit losses (ECL), the Group considers reasonable and supportable information that is material and available without excessive cost or effort. This includes quantitative and qualitative information and analyses based on the Company's historic experience in credit evaluation and forward-looking information.

The Group assumes a financial asset's credit risk has risen substantially if it is more than 30 days overdue.

The Group considers a financial asset to be in default when:

- It is highly unlikely that the debtor will pay all of its credit obligations without resorting to actions such as enforcing the guarantee (if applicable) or
- the financial asset is more than 90 days overdue.

The Group considers that a debt security has a low credit risk when its credit risk rating is equivalent to the globally accepted definition of "investment grade".

- Lifetime ECLs are ECLs that result from all possible default events over the expected life of a financial instrument.
- 12-month ECLs are ECLs that result from possible default events within the 12 months after the reporting date (or a shorter period, if the instrument's expected life is shorter than 12 months).

The maximum period considered to estimate the expected credit loss is the maximum contractual period during which the Group is subject to credit risks.

Measuring expected credit losses

Expected credit losses are estimates weighted by the credit loss probability. Expected losses are measured at present value based on all cash deficiencies (i.e. the difference between the cash flows owed to the Group according to the contract and the cash flows it expects to receive). Expected credit losses are discounted by the financial asset's effective interest rate, when applicable.

Impaired financial assets

At each reporting date, the Group evaluates whether the financial assets recorded at amortized cost are credit impaired. A financial asset is 'impaired' when one or more events that have a detrimental impact on the estimated future cash flows of the financial asset have occurred. Objective evidence that a financial asset is impaired includes the following observable data:

- significant financial difficulty of the issuer or borrower; violation of contractual clauses, such as default or being more than 90 days overdue;
- restructuring of an amount due to the Group on terms that the Group would not consider otherwise;
- the probability that the borrower will enter bankruptcy or other type of financial reorganization; or
- the disappearance of an active market for that financial asset because of financial difficulties.

Presenting the provision for expected credit losses in the statement of financial position

The provision for financial asset losses measured at amortized cost is deducted from the gross carrying amount of the assets, when applicable.

Write-off

The gross carrying amount of financial assets is written off when the Group does not have a reasonable expectation to recover the financial asset in its entirety or in part. The Group does not expect any substantial recovery of the written-off amount. However, written-off financial assets can still be subject to credit enforcement to perform the Company procedures to recover the amounts due.

Accounting policy applicable before January 1, 2018

Non-derivative financial assets

Financial assets not classified as financial assets at fair value through profit or loss were valued at each balance sheet date to determine whether there was objective evidence of impairment.

Objective evidence that financial assets had a loss in value included:

- debtor's default or delays;
- restructuring of an amount due to the Group under conditions that would not be accepted under normal conditions;
- indications that the debtor or issuer will enter bankruptcy / judicial recovery;
- negative changes in the payment situation of debtors or issuers;
- the disappearance of an active market for the security because of financial difficulties; or
- observable data indicating that there was a decline in the measurement of expected cash flows for a group of financial assets.

Financial assets measured at amortized cost

The Company and its subsidiaries considered evidence of impairment of assets measured at amortized cost, both individually and collectively. All individually significant assets were valued for impairment. Those who had not suffered loss of value individually were then valued collectively for any loss of value that could have occurred but had not yet been identified. Assets that were not individually significant were assessed collectively for impairment based on the grouping of assets with similar risk characteristics.

When assessing the impairment loss collectively, the Company and its subsidiaries used historical trends in the recovery period and the amounts of loss incurred, adjusted to reflect Management's judgment if the current economic and credit conditions were such that actual losses would likely be greater or less than those suggested by historical trends.

(ii) Non-financial assets

At each reporting date the Group reviews the carrying amounts of its non-financial assets (other than biological assets, inventories, contract assets and deferred tax assets) to determine whether there is any indication of impairment. If any such indication exists, then the asset’s recoverable amount is estimated. Goodwill is tested annually for impairment.

For impairment testing, assets are grouped together into the smallest group of assets that generates cash inflows from continuing use that are largely independent of the cash inflows of other assets or CGUs (cash generating units). Goodwill arising from a business combination is allocated to CGUs or groups of CGUs that are expected to benefit from the synergies of the combination.

The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell. Value in use is based on the estimated future cash flows, discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset or CGU.

An impairment loss is recognized if the carrying amount of an asset or CGU exceeds its recoverable amount.

Impairment losses are recognized in profit or loss. They are allocated first to reduce the carrying amount of any goodwill allocated to the CGU (or group of CGUs), and then to reduce the carrying amounts of the other assets in the CGU (or group of CGUs) on a pro rata basis.

An impairment loss in respect of goodwill is not reversed. For other assets, an impairment loss is reversed

only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortization, if no impairment loss had been recognized.

m. Provisions

A provision is recognized when the Group has a legal or unofficial obligation as a result of past events, and it is probable that an outflow of economic benefits will be required to settle the obligation, which can be reliably estimated. When the Group expects a provision to be reimbursed, in part or full, for example as a result of an insurance contract, the reimbursement is recognized as a separate asset, but only when the reimbursement is a virtual certainty. Expenses related to any provision are presented in the statement of profit or loss net of any reimbursement. Any increase in the obligation over the course of time is recognized as a financial expense.

n. Statements of value added

The Group prepared the statements of value added pursuant to technical pronouncement CPC 09 -Statement of value added. They are presented as an integral part of the financial statements in accordance with the BR GAAP required to public companies, while under IFRS they represent additional information.

o. Government grants

The Group participates in the Economic Subsidy Program promoted by the Financiadoras de Estudos e Projetos ("FINEP"). The main objective of this program is to promote a significant increase in innovation activities and an increase in the competitiveness of companies and Brazilian economy.

This type of financial support from FINEP consists of the application of public non-reimbursable resources (which do not need to be returned) directly to companies, to share with them the costs and risks inherent to such activities.

The Group is currently using FINEP resources in the following projects: (a) Development of an engineering project, using precision agriculture techniques, for the construction of agricultural equipment that presents planting efficiency; (b) Structuring a transgenics program for plants with a greater amount of biomass and resistance to abiotic and / or biotic stresses, with an emphasis on prospecting genes and obtaining transgenic sugarcane plants.

Upon receipt of funds from FINEP, the Group recognizes the liability corresponding to its obligation to invest funds for the purposes of projects supported by FINEP. This liability has no financial charges and is maintained at its original historical value.

After the use of resources in the projects financed by FINEP and documentary evidence of them, FINEP will give its approval regarding the resources applied and the fulfillment of the contractual objectives and obligations by the Group. Only after that moment, the Company will recognize the corresponding gain in Other operating income (expenses), by appropriating the balance of the liability with FINEP, a moment that will represent the fulfillment of the Group´s obligations, therefore, having no amount to pay or reimburse FINEP.

5 Changes in significant accounting policies

5.1 New standards, amendments and interpretations of standards adopted for the first time for the period starting on January 1, 2019

CPC 06 (R2) / IFRS 16 – Leases

The Group initially applied CPC 06 (R2)/IFRS 16 Leases from January 1, 2019. The Group, opted for the simplified modified retrospective transition approach, without the restatement of comparative periods. Accordingly, the comparative information presented for 2018 and 2017 were not restated – i.e. it is presented, as previously reported, under IAS 17 and related interpretations. The details of the changes in accounting policies are disclosed below. Additionally, the disclosure requirements in IFRS 16 have not generally been applied to comparative information.

Leases in which the Group is a lessee

The Group assesses whether a contract is, or contains, a lease if the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration. This assessment takes place in the beginning of the contract.

The cost of the right-of-use asset comprises: (i) the value of the initial measurement of the lease liability; (ii) any lease payments made to date; (iii) direct costs incurred; and (iv) estimated costs to be incurred to disassemble and remove the asset, when applicable.

As lessee, the Group identified contracts containing leases for the rental of its head office. These contracts have an average term of 60 months, and this was the estimated term used to estimate the initial recognition of the lease liability and right of use.

Upon determining the lease term, the Group takes into account all the facts and circumstances that create an economic incentive for a lessee to extend the lease or not to terminate a lease. The extension options (or periods after the termination options) are included in the lease term only if extension is reasonably certain (or not terminated). The assessment is reviewed where a significant event or change in circumstances occurs that is within the control of the lessee and that trigger re-assessment. Assessing the extension of the contract affects the value of the lease liabilities and the right-of-use assets recognized.

The Group recognizes new assets for its lease contracts for the rental of administrative and operational properties. The lease liability is measured at the present value of the lease payments, discounted for the implicit or incremental rate on the lessee's loans, the weighted average rate applied was 9.94% per year. The nature of the expenses related to these lease contracts have changed as the Group recorded an amortization cost on the right-of-use asset and interest expense on the lease obligations.

At the transition date to CPC 06 (R2) / IFRS 16, the Group recognized rights-of-use assets and lease liabilities, in the same amount, and without impact on retained earnings. The impact on the transition is summarized below:

Parent Company

Impacts of adoption	Balances as at 12/31/2018	CPC 06 (R2) / IFRS 16 First-time adoption	Balances as at 1/1/2019
Assets			
Current and non-current	**140,422**	-	**140,422**
Investment	**676,090**	-	**676,090**
PP&E	**157**	**2,625**	**2,782**
Right-of-use asset		2,625	2,625
Intangible assets	**142**	-	**142**
	816,811	**2,625**	**819,436**
Liabilities			
Current and non-current	**196,516**	**2,625**	**199,141**
Leases	-	2,625	2,625
Equity	**620,295**	-	**620,295**
	816,811	**2,625**	**819,436**

Consolidated

Impacts of adoption	Balances as at 12/31/2018	CPC 06 (R2) / IFRS 16 First-time adoption	Balances as at 1/1/2019
Assets			
Current and non-current	**203,761**	-	**203,761**
Investment	**138,021**	-	**138,021**
PP&E	**939,393**	**2,625**	**942,018**
Right-of-use asset		2,625	2,625
Intangible assets	**27,940**	-	**27,940**
	1,309,115	**2,625**	**1,311,740**
Liabilities			
Current and non-current	**688,820**	**2,625**	**691,445**
Leases	-	2,625	2,625
Equity	**620,295**	-	**620,295**
	1,309,115	**2,625**	**1,311,740**

In the year ended December 31, 2019, the movement of the right-to-use assets and liabilities of these leasing operations (Parent Company and Consolidated), can be shown as follows:

Assets	**2019**
First time adoption January 1º, 2019	2,625
(-) Amortization	(875)
Total as at December 31, 2019	1,750

Liabilities	**2019**
First time adoption January 1º, 2019	2,625
(-) Lease payments	(1,009)
(+) Financial expenses	216

Total as at December 31, 2019	1,832

Undiscounted contractual cash flows (liabilities gross of leasing) consists of annual cash disbursements, as shown below:

Parent Company

Estimated commitments	Future value	Annual interest	Present value
2020 – 2023	1,832	(187)	1,645
At December 31, 2019	**2,010**	**(187)**	**1,832**
Current	1,010	(137)	873
Noncurrent	1,009	(50)	959

Consolidated

Estimated commitments	Future value	Annual interest	Present value
2020 – 2023	1,832	(187)	1,645
At December 31, 2019	**2,019**	**(187)**	**1,832**
Current	1,010	(137)	873
Noncurrent	1,009	(50)	959

The right-of-use assets are recorded in “Property, plant and equipment”. The indirect subsidiary Bioflex Agroindustrial S.A. has a PP&E lease contract with its joint subsidiary Companhia Energética São Miguel dos Campos. The initial adoption of CPC-06 (R2) / IFRS 16 has no accounting impacts on lessors.

Leases representing recognition exemptions

The Group used a number of practical expedients when applying CPC 06 (R2)/IFRS 16 to leases previously classified as operating leases under IAS 17. In particular, the Group:

- did not recognize right-of-use assets and liabilities for leases for which the lease term ends within 12 months of the date of initial application;
- did not recognize right-of-use assets and liabilities for leases of low value assets (e.g. IT equipment);
- excluded initial direct costs from the measurement of the right-of-use asset at the date of initial application; and
- used hindsight when determining the lease term.

ICPC 22 - Uncertainty over Income Tax Treatments

ICPC 22 clarifies how to apply the recognition and measurement requisites of CPC 32 when there is uncertainty over income tax treatments.

After adopting the new standard in the period January 01, 2019, the Group concluded that the new standard did not generate impacts on the Parent Company and consolidated financial statements in the period.

Investment in a subsidiary, associate and joint venture (Alterations to CPC 18(R2))

There were no effects deriving from the adoption of the respective interpretation from January 1, 2019.

5.2 Standards issued but not yet effective

A number of new standards are effective for annual periods beginning after January 1, 2019 and earlier application is permitted; however, the Group has not early adopted the new or amended standards in preparing these financial statements.

The following amended standards and interpretations are not expected to have a significant impact on the Group's consolidated financial statements:

- Amendments to References to Conceptual Framework in IFRS Standards.
- Definition of a Business (Amendments to CPC 15/ IFRS 3).
- Definition of Material (Amendments to CPC 26/ IAS 1 and CPC 23/IAS 8).

6 Business combination

Granbio LLC (a direct subsidiary of the Company) is primarily engaged in investing in companies strategically related to the Company's business plan, by creating technologies for converting biomass into cellulose sugar for biochemicals and second-generation ethanol, in addition to developing nanocellulose for industries. GranBio LLC is in the Biotech segment reporting of the Company. In previous years it acquired equity interests in companies in the strategic segments the Company operates in. As at December 31, 2018 Granbio LLC had a 50% interest and joint control in GranAPI LLC, API-Intellectual Property Holdings LLC, American Process Conversion Technologies LLC and American Process Conversion Technologies Holdco LLC. In March 2019 GranBio LLC purchased all the remaining equity interests in these companies from TR LLC, with the exception of 3% of API – Intellectual Property Holdings LLC share capital, obtaining control of them all.

Consideration transferred

On March 13, 2019 the value of consideration paid to TR LLC in this business combination was USD 51,900 thousand (R$ 194,028 thousand), as follows:

(in thousands)

	Consideration transferred	
	US$	**R$**
Cash (i)	3,000	11,215
Future installments (i)	7,000	26,169
Right to use assets (ii)	3,400	12,711
Assignment of licenses (iii)	36,200	135,334
Other extra commercial services (iv)	2,300	8,599
	51,900	**194,028**

(i) Payment made on the date of the transaction of US$ 3,000 thousand (R$ 11,215), and 2 installments falling due in 2020 and 2021 which were recognized as accounts payable in the total amount of US$ 7,000 thousand (R$ 26,169 on transaction date and R$ 28,215 on December 31, 2019– see note 20).

(ii) TR LLC, the seller, has the right to use assets of the Thomaston plant for 225 days in the period beginning April 1, 2019 through June 30, 2021. GranBio has the right to acquire the days not used by TR LLC for US$ 15 thousand per day. For further information see note 20. The value assigned to this right was based on Granbio's costs to repurchase all the days of use granted.

(iii) Assignment of 2 non-exclusive, worldwide, non-transferable, non-sublicensable licenses to TR LLC to use in 2 industrial projects, being one plant site in United States and one plant site in Europe. TR LLC's granted licenses are related to the existing technology portfolio, of the companies being sold, including biomass conversion into biofuels, biochemicals and/or nanocellulose. The value assigned to the license fee was based on the Joint Development Agreement between the Group and third parties, which established the license fee equivalent to US$ 18,100 per license.

(iv) Commercial fee equivalent to 10% of futures licenses related revenues commercialized by TR LLC to the BioForever project in Europe (GranBio LLC will receive the remaining 90% of the revenue stream). The commercial fee is equivalent to US$ 1,800 thousand (10% of license fee) and US$ 500 thousand in value of other assets and contracts transferred to TR LLC.

Identifiable assets acquired and liabilities assumed

On the acquisition date the Company determined the fair value of the assets acquired and liabilities assumed. The purchase price allocation was completed on March 13, 2019.

In the table below, it is presented a summary of the assets acquired and liabilities assumed on a consolidated basis at their fair values on the acquisition date:

In thousands of real	Fair value
Cash and cash equivalent	1,387
Accounts receivable	2,026
Inventory	90
Notes receivable (i)	54,044
Prepaid expenses	1,828
Other assets	1,716
Property, plant and equipment	33,927
Intangible assets	368,086
Assets	**463,104**
Promissory notes	78,512
Deferred revenue	17,224
Other liabilities	7,185
Deferred income taxes	47,991
Accounts and trade Payable	11,058
Liabilities	**161,970**
Total identifiable net assets at fair value	**301,134**

(i) The US-based indirect subsidiaries, that were acquired, benefit from the "New Market Tax Credits" (NMTC) tax program to foment new markets and economic growth in low-income regions. As part of this structured transaction, the Group maintained the note receivable in the amount of USD 14,456 thousand (R$ 57,885 at December 31, 2019 - See Note 13 – Other receivables) formalized through promissory notes.

Measurement of fair value

The valuation techniques used for measuring the fair value of material assets acquired were as follows:

Assets acquired	Description	Valuation technique
Property, plant and equipment	American Process Conversion Technologies LLC controls Biorrefineria Thomaston located in Thomaston-GA. The Thomaston plant was designed to demonstrate the Green Power +, GreenBox and AVAP technologies. The plant is highly flexible for testing and able to convert from one to three tonnes of biomass a day, depending on density, into sugars and fermented products. The Thomaston biorefinery also has pre-commercial capacity for 150t/year of cellulose nanocrystals/cellulose nanofibers	Market comparison technique and cost technique: the valuation model considers market prices for similar items when they are available, and depreciated replacement cost when appropriate. Depreciated replacement cost reflects adjustments for physical deterioration as well as functional and economic obsolescence. The estimated useful lives are between 2 and 40 years.
Intangible assets	GranBio - Intellectual Property Holdings LLC (formerly API - Intellectual Property Holdings – LLC) holds 86 patents awarded/permitted globally (44 patents in the USA, 36 patents in Europe, 2 patents in Canada, 3 patents in South Africa, and 1 patent in China) and more than 100 patent applications submitted worldwide (USA, Europe, Brazil, Canada, China, Japan, India, Indonesia, Thailand, Malaysia, South Africa, Australia and Russia). The patents are related to the substantial biorefinery expertise and trade secrets, which combine front-end processes, specific processes and production technologies.	Multi-Period Excess Earnings Method or (MPEEM) of the Income Approach in estimating the Fair Value of the Technology of the acquired companies. The MPEEM isolates the earnings of the specified intangible asset and deducts portions of the total earnings that are attributable to contributory assets to estimate the excess earnings attributable to the subject intangible asset Useful life of 30 years
Notes receivable	On December 30, 2014, the US-based indirect subsidiaries (AVAPCO LLC and GranBio Conversion Technologies LLC) entered into the "New Market Tax Credits" (NMTC) transaction to increase the funds available for expansion. As part of this transaction, AVAPCO LLC loaned US$ 14,456 thousand (R$ 57,885) to COCRF Investor 35 LLC (the Investment Fund).	The fair market value was calculated based on Amortized Cost. The asset is measured at the amount recognized at initial recognition minus principal repayments, plus or minus the cumulative amortization of any difference between that initial amount and the maturity amount.

Goodwill

Goodwill was calculated based on the difference between the consideration transferred and the fair value of the assets acquired, and liabilities assumed. None of the goodwill recognized is expected to be deductible for income and social contribution tax purposes.

Goodwill from the acquisition was recognized in March 13, 2019 as follows:

(in thousands)	US$	R$
Consideration transferred	51,900	194,028
Participation of non-controlling shareholders*	1,500	5,607
Fair value of pre-existing interest	50,400	188,421
Total identifiable net assets at fair value	(80,553)	(301,134)
Goodwill	**23,247**	**86,922**

* 3% of API – Intellectual Property Holdings LLC held by non-controlling interest have been valued at Fair Market Values of US$ 1,500 thousand (R$ 5,607 on the acquisition date), based on discounted cash flow.

Gain on business combination

As a result of gaining control, the Company remeasured, at fair value, its pre-existing interest in the businesses acquired and the assets transferred from Granbio LLC to TR LL at fair value. A gain of R$ 218,128 was recognized in profit or loss as a result. These amounts have been recorded under other income (note 26):

	U$	R$
Fair value of pre-existing interest	51,900	194,028
Less carrying amount of JV	(35,711)	(133,498)
Non controlling Interests	(1,500)	(5,607)
Gain on the pre-existing interest	14,689	54,923
Income from licensing (*)	38,500	143,933
Translation adjustment	-	19,272
Total gain on business combination	**53,189**	**218,128**

(*) As a result of the transaction, the Company recognized income at the fair value of the 2 licenses assigned to TR LLC as part of the gain on the business combination.

If the acquisition had taken place on January 1, 2019, management estimates that GranBio LLC consolidated revenue would have been R$ 13,272 and consolidated loss would have been R$ 19,911. In the ten-months period ended December 31, 2019, the acquisition of equity interest in Granbio LLC direct invested companies contributed revenue of R$ 10,498 and loss of R$14,499 to the consolidated financial statements.

The impacts on consolidated financial statements are also shown in notes 15 - Property, plant and equipment, 16 - Intangible assets and 24 (Other income).

Deferred income tax – liability

Group has recorded a deferred tax liability amounting U$ 12,837 thousand (R$ 47,991) for temporary differences that arose in respect of the recognition identifiable assets and liabilities in the business combination. During the year of 2019, part of the balance was realized due to amortization, and as of December 31, 2019 the balance of deferred income tax liability is U$ 12,095 thousand (R$ 48,752). For further information see note 19c.

7 Cash and cash equivalents

	Parent			Consolidated		
	2019	**2018**	**2017**	**2019**	**2018**	**2017**
Banks	2	4	12	1,062	15,620	574
Short-term investments	-	30,197	57	227	35,539	391
Total	**2**	**30,201**	**69**	**1,289**	**51,159**	**965**

Cash and cash equivalents includes cash, bank deposits and short-term investments redeemable within up to 90 days from the investment date, highly liquid or convertible to a known cash amount and subject to immaterial change in value, which are recorded at cost plus income earned through the end of the reporting period and do not exceed their fair or realizable values. The investment yields are indexed to the interbank deposit rate (CDI) rate, and in 2019 the average yield was between 98.10% and 98.37% of the CDI rate. The weighted average CDI in 2018 was 98.10% and in 2017 was 100%.

8 Accounts receivable

	Parent			Consolidated		
	2019	**2018**	**2017**	**2019**	**2018**	**2017**
Trade and other receivables	-	5	6	2,940	904	881
Total	**-**	**5**	**6**	**2,940**	**904**	**881**

Amounts recorded in the item denote the accounts receivable of the subsidiary BioFlex Agroindustrustrial S.A., due to operational revenue from the sale of ethanol at December 31, 2019 and the leasing of electrical co-generation assets, resale of materials, chemical products and sugarcane straw in 2018 and 2017.

9 Inventories

	Consolidated		
	2019	**2018**	**2017**
Raw materials (i)	8,697	5,325	3,690
Consumables (ii)	973	9,041	2,880
Total	**9,670**	**14,366**	**6,570**

(i) The main raw materials are the enzymes and straw required for the production of 2G ethanol. The Company and its subsidiaries have insurance contracts due to the risks involved (note 33).

(ii) Denotes various consumables used to produce 2G ethanol.

The stock held by third parties amounts to R $ 3,561 referring to 292,600 kg of enzymes on December 31, 2019..The stock balance held by third parties on December 31, 2018, totaled R $ 11,242 and on December 31, 2017 the amount of R $ 1,155 .

Inventory risks:

- Inventories counts are carried out annually and when necessary, all differences between physical counts and accounting records are adjusted. However, in the last few years there have been no significant adjustments;
- The risk of loss of value was recorded for straw due to the average cost of the inventories being higher than the replacement cost in the market, mentioned below.

Management valued the inventory based on its recoverable value on December 31, 2019, 2018 and 2017. At December 31, 2019 and 2018, Management found necessary to record a provision for inventory impairment (recorded on the cost of products sold), due to the devaluation of the market prices of straw. As shown below:

Change	**Provision for inventory**
Balances at January 01, 2017	**-**
Provision for losses	(698)
Balances as of December 31, 2017	**698**
Provision for losses	(8,985)
Balances as of December 31, 2018	**(9,683)**
Provision for losses	(3,856)
Balances as of December 31, 2019	**(13,539)**

10 Other investments

	Consolidated		
	2019	**2018**	**2017**
Long-term investments	-	21,402	24,634
Total	**-**	**21,402**	**24,634**

As of December 31, 2018, and 2017 long-term investments were securing the loans and financing of the subsidiaries BioVertis Agroindustrial Ltda. and Bioflex Agroindustrial S.A. The balance of long-term investments included the balance of fixed investment funds and had an average annual yield of 102,49% of the CDI rate in 2018 and 100,10% in 2017. The long-term investment balance was redeemed in 2019, as the

Group renegotiated its guarantees and the long-term investment was given in exchange for these new guarantees. See note 18 for further details about loans, financing and debentures security.

11 Related-party transactions

The Company has transactions with its direct subsidiaries, indirect subsidiaries, joint ventures, parent companies and associated companies, in order to provide funds to maintain its operations. Such operations do not incur interest or have a maturity date, as agreed by the parties.

Transactions between related parties are divided between financial transactions that refer to intercompany loans for cash supply and commercial transactions that refer to amounts transacted from shared costs and other business transactions.

As of December 31, 2019, 2018 and 2017, the balances break down as follows:

- Parent Company

			2019		2018		2017	
	Relation		**Current assets**	**Current liabilities**	**Current assets**	**Current liabilities**	**Current assets**	**Current liabilities**
Loans								
BioVertis Produção Agrícola Ltda.	Subsidiary	(i)	21,637	-	12,663	-	20,260	-
BioCelere Agroindustrial Ltda.	Subsidiary	(i)	7,439	-	2,947	-	11,212	-
BioPlant Agroindustrial S.A.	Subsidiary	(i)	735	-	490	-	1,035	-
BioEdge Agroindustrial Ltda.	Subsidiary	(i)(vi)	109,815	-	49,190	-	247,472	-
API Brasil Engenharia e Serviços	Other		895	-	-	-	-	-
BioFlex Agroindustrial S.A.	Subsidiary			-		358		7
Granbio LLC	Subsidiary	(v)	-	11,089	-	24,840	-	-
GranInvestimentos S.A.	Shareholder	(ii)	-	120,494	-	53,955	-	16,439
GranEnergia Investimentos S.A.	Indirect parent company		-	-	-	-	-	13
Total			**140,521**	**131,583**	**65,290**	**79,153**	**279,979**	**16,459**
Accounts receivable/ payable								
BioVertis Produção Agrícola Ltda.	Subsidiary	(iii)	-	-	2,444	-	1,359	-
BioCelere Agroindustrial Ltda.	Subsidiary	(iii)	-	-	1,496	-	862	-
Companhia Energética São Miguel dos Campos	Joint Venture	(iii)	604	-	2,788	-		-
BioFlex Agroindustrial S.A.	Subsidiary	(iii)	5,594	-	5,455	-	2,555	-
Graal Participações S.A.	Indirect parent company	(iii)	6,575	-	6,351	-	5,717	-
GranInvestimentos S.A.	Subsidiary		-	-	-	-	-	-
GranBio LLC	Subsidiary	(v)	-		1,112	-		
GranEnergia Investimentos S.A.	Indirect parent company	(iii)	1,295	-	-	-	-	-
GranIHC S.A.	Indirect parent company		-	-	-	-	13	-
MRO Serviços Logístico Ltda.	Other		-	817	-	-	-	-
Total			**14,068**	**817**	**19,646**	**-**	**10,506**	**-**
Grand total			**154,589**	**132,400**	**84,936**	**79,153**	**290,485**	**16,459**

- Consolidated

	Relation		2019		2018		2017	
			Current assets	**Current liabilities**	**Current assets**	**Current liabilities**	**Current assets**	**Current liabilities**
Loans								
Companhia Energética São Miguel dos Campos	Joint Venture	(ii)	-	-	-	2,731	-	2,110
GranEnergia Investimentos S.A.	Indirect parent company	(iii)	5,692	817	-	-	-	-
GranInvestimentos S.A.	Shareholder	(i)	-	104,042	-	53,955	108	16,452
Graal Participações S.A.	Indirect parent company	(iii)	6,686	-	6,343	-	5,711	-
Avapco Ltda.	Subsidiary		-	-	-	-	8,454	195
			12,378	**104,859**	**6,343**	**56,686**	**14,313**	**18,757**
Accounts receivable								
Companhia Energética São Miguel dos Campos	Joint Venture	(iv)	61,776	-	60,055	-	25,717	-
			61,776	**-**	**60,055**	-	**25,717**	-
Total			**74,154**	**104,859**	**66,398**	**56,686**	**40,030**	**18,757**
Current			12,378	104,859	66,398	56,686	40,030	18,757
Non-current			61,776	-	-			

Transactions affecting net income for the year:

Net income	Relation		Parent Company 2019	2018	2017
Administrative expenses					
BioVertis Produção Agrícola Ltda.	Subsidiary	(iii)	690	794	961
BioCelere Agroindustrial Ltda.	Subsidiary	(iii)	144	467	1,078
BioFlex Agroindustrial S.A.	Subsidiary	(iii)	823	2,635	2,180
Companhia Energética São Miguel dos Campos	Joint Venture	(iii)	957	871	2,575
Graal Participações S.A.	Indirect parent company	(iii)	291	467	5,711
Total			**2,905**	**5,234**	**12,505**

	Relation		Consolidated 2019	2018	2017
Lease income					
Companhia Energética São Miguel dos Campos	Joint Venture	(iv)	21,190	21,360	16,564
Administrative Expenses					
Companhia Energética São Miguel dos Campos	Joint Venture	(iii)	592	871	2,575

(i) Denotes the amounts in the Company's loans with its subsidiaries that are expected to be settled in the short term. The operations have no interest or maturity.

(ii) Cash received from the subsidiary to supply cash for operating activities;

(iii) Amounts denote pass-through corporate expenses shared by the Company and its direct and indirect subsidiaries;

(iv) Amounts receivable and other operations for the commercial lease of the boiler between the indirect subsidiaries Bioflex Agroindustrial S.A. and Companhia Energética São Miguel dos Campos - CESM.

(v) Refers to amounts received from overseas for direct investment in the Company and funds sent overseas to meet operating cash requirements.

(vi) Between 2017 and 2018, the Parent Company GranBio Investimentos S.A. contributed R$ 175 million to BioEdge Agroindustrial Ltda., reducing the balance receivable from the investee. The complementary reduction of R$ 23,282 is due to the partial return (payment) of the current account loan from BioEdge to GranBio. From 2018 to 2019, GranBio made new loans via current account to meet Bioedge's operational demands.

Key management personnel compensation

	Parent Company			Consolidated		
	2019	2018	2017	2019	2018	2017
Key management personnel compensation	(737)	(1,588)	(1,486)	(1,606)	(3,174)	(3,526)
Total	**(737)**	**(1,588)**	**(1,486)**	**(1,606)**	**(3,174)**	**(3,526)**

The amount paid as key management personnel compensation has been included in the personal expenses balance disclosed in note 26.

12 Biological assets

	Consolidated		
	2019	2018	2017
Crop treatment	-	5,830	3,838
Depletion	-	(2,602)	(2,602)
Total	-	**3,228**	**1,236**

The biological assets belonged to the subsidiary BioVertis Produção Agricola Ltda., and consisted of the plantation and crop treatments of sugarcane and Energy Cane Vertix. 100% of the balance recorded in this item was sold in August 08, 2019. See note 26, item (v).

13 Other receivables

The other receivables account breaks down as follows:

	Parent			Consolidated		
	2019	2018	2017	2019	2018	2017
Accounts receivable on share issuance (a)	23,123	22,537	22,087	23,123	22,537	22,087
Promissory notes receivable (b)	-	-	-	57,885	-	-
Other accounts receivable	-	-	-	2,451	-	-
Total	**23,123**	**22,537**	**22,087**	**83,459**	**22,537**	**22,087**

(a) The Company approved its capital increase of R$ 820,000 on April 30, 2013, via the issuance of 20,628,931 (twenty million six hundred and twenty-eight thousand nine hundred and thirty-one) common registered shares with no par value issued at the price of R$ 39.75 by the Company, of which 5,534,591 (five million five hundred and thirty-four thousand five hundred and ninety-one) shares were subscribed by the Parent Company GranInvestimentos S.A. and 15,094,340 (fifteen million ninety-four thousand three hundred and forty) shares were subscribed by the shareholder BNDES Participações S.A.

- The Parent Company GranInvestimentos S.A. has subscribed 5,534,591 (five million five hundred and thirty-four thousand five hundred ninety-one) shares, in the amount of R$ 335,471.
- The shareholder BNDES Participações S.A paid in 14,686,109 (fourteen million six hundred

eighty-six thousand one hundred nine) shares, for R$ 649,591 between 2013 and 2017, leaving a receivable balance of 408,231 (four hundred and eight thousand two hundred and thirty-one) shares, in the amount of R$ 23,123. This amount was fully subrogated to GranInvestimentos and settled in 2020 (see Note 34 – Subsequent Events). The receivable balance is restated by the IPCA price index pursuant to the subscription commitment agreement. The amounts resulting from this update were recognized in the capital reserve. During 2017, the Company received the amount of R$ 49,061 from its shareholders. This amount is shown in the cash flow in the group of financing activities.

(b) On December 30, 2014, the US-based indirect subsidiaries (AVAPCO LLC and GranBio Conversion Technologies LLC) entered into the "New Market Tax Credits" (NMTC) transaction to increase the funds available for expansion. As part of this transaction, AVAPCO LLC loaned US$ 14,456 thousand (R$ 57,885) to COCRF Investor 35 LLC (the Investment Fund). The Investment Fund also received US$ 6,878 in equity investment from Capital One N.A. (the Financial Investor). All funds received by the Investment Fund have been invested into three community development entities (CDE's) in transactions that qualify as a qualified entity investment under Internal Revenue Code Section 45C. AMCREF Fund XXIX (AMCREF), COCRF sub-CDE 27, LLC (COCRF), and DVCI CDE XXV, LLC (DVCI) received investments totaling up to US$ 21,335 thousand. In exchange for its investment and in addition to expected return of capital and interest, the Financial Investor will receive NMTC totaling 39% of the total amount invested in AMCREF, COCRF, and DVCI over seven years.

AMCREF, COCRF, and DVCI loaned US$ 20,510 thousand (R$ 82,670) to GranBio Conversion Technologies LLC described in note 20 (iii) to fund expansion and purchase the Thomaston Biorefinery from AVAPCO LLC for USD 14,890 thousand in December 2014. AVAPCO LLC has subsequently entered into a lease agreement whereby it leases the Biorefinery from APCT under a lease arrangement expiring in December 2034.

As part of this structured operation transaction, the subsidiary AVAPCO LLC has a receivable in the amount of US$ 14,456 thousand, equivalent to R$ 57,885 on December 31, 2019 formalized through promissory notes issued by COCRF Investor 35, LLC in relation to ne New Market Tax Credit transaction. The terms of this note call for interest only payments on a quarterly basis beginning March 2015 at 1.5% for a period of seven years.

14 Investments

a. Breakdown of balances

	Parent Company			Consolidated		
	2019	**2018**	**2017**	**2019**	**2018**	**2017**
Direct and indirect subsidiaries	761,041	674,998	461,785	-	-	-
Joint ventures	-	1,092	5,281	-	138,021	131,545
Total	**761,041**	**676,090**	**467,066**	**-**	**138,021**	**131,545**

The joint ventures are as follows:

	Consolidated		
	2019	**2018**	**2017**
Direct investment			
SGBio Renováveis S.A.	-	1,092	5,281
Indirect investment			

GranApi LLC	-	138,264	124,602
Intellectual Property Holdings LLC	-	(1,335)	1,662
Total	**-**	**138,021**	**131,545**

Joint ventures disclosures are presented in notes 2, 3 and 4. The most relevant joint ventures became subsidiaries in the business combination as described in note 6.

b. Direct investments

	Shareholders' equity			Profit or (loss) for the year		
Investees	**2019**	**2018**	**2017**	**2019**	**2018**	**2017**
BioEdge Agroindustrial Ltda.	388,585	477,035	321,652	(88,450)	(21,772)	(58,707)
BioVertis Produção Agrícola Ltda.	(10,950)	7,214	(2,585)	(18,164)	(5,321)	(6,956)
BioCelere Agroindustrial Ltda.	1,496	2,950	1,084	(1,454)	(3,370)	(2,389)
BioPlant Agroindustrial Ltda.	(727)	(664)	(1,065)	(63)	(593)	(571)
Granbio LLC	382,637	188,463	142,699	195,487	(3,993)	5,851
SGBio Renováveis S.A.	-	1,092	5,281	(1,066)	(4,189)	(420)

c. Indirect investments

	Shareholders' equity			Profit or (loss) for the year		
Investees	**2019**	**2018**	**2017**	**2019**	**2018**	**2017**
Granapi LLC	-	138,264	124,602	13,134	(9,595)	(1,754)
API IP LLC	-	(1,335)	1,654	747	(2,989)	(24)

d. Changes in the investments

- Parent Company

	January 1, 2017	Capital contribution / return	Write-off (i)	Translation adjustment	Profit or (loss)	Balances at December 31, 2017	Capital contribution / return	Translation adjustment	Profit or (loss)	Balances at Decembe r 31, 20178	Capital contribution / return	Translation adjustment	Profit or (loss)	Balances at December 31, 2019
Direct subsidiaries														
BioEdge Agroindustrial Ltda.	380,359	-	-	-	(58,707)	321,652	177,155	-	(21,772)	477,035	-	-	(88,450)	388,585
BioVertis Produção Agrícola Ltda.	4,371	-	-	-	(6,956)	(2,585)	15,120	-	(5,321)	7,214	-	-	(18,164)	(10,950)
BioCelere Agroindustrial Ltda.	3,473	-	-	-	(2,389)	1,084	5,236	-	(3,370)	2,950	-	-	(1,454)	1,496
BioPlant Agroindustrial Ltda.	(494)	-	-	-	(571)	(1,065)	994	-	(593)	(664)	-	-	(63)	(727)
Granbio LLC	192,648	(17,760)	(36,908)	(1,132)	5,851	142,699	21,315	28,442	(3,993)	188,463	-	(1,313)	195,487	382,637
Subtotal	**580,357**	**(17,760)**	**(36,908)**	**(1,132)**	**(62,772)**	**461,785**	**219,820**	**28,442**	**(35,049)**	**674,998**	**-**	**(1,313)**	**87,356**	**761,041**
Joint ventures														
SGBio Renováveis S.A.	5,701	-	-	-	(420)	5,281	-	-	(4,189)	1,092	(26)	-	(1,066)	-
Subtotal	**5,701**	**-**	**-**	**-**	**(420)**	**5,281**	**-**	**-**	**(4,189)**	**1,092**	**(26)**	**-**	**(1,066)**	**-**
Total investments	**586,058**	**(17,760)**	**(36,908)**	**(1,132)**	**(63,192)**	**467,066**	**219,820**	**28,442**	**(39,238)**	**676,090**	**(26)**	**(1,313)**	**86,290**	**761,041**

- Consolidated

	Balances at January 1, 2017	Capital contribution / return	Write-off (i)	Profit or (loss)	Balances at December 31, 2017	Capital contribution / return	Profit or (loss)	Balances at December 31, 2018	Capital return to shareholders (ii)	Profit or (loss)	Write-off through business combination	Balances at December 31, 2019
Joint ventures												
SGBio Renováveis S.A.	5,704	-		(415)	5,289	-	(4,197)	1,092	(26)	(1,066)	-	-
Granapi LLC	165,763	(2,449)	(36,908)	(1,754)	124,602	23,257	(9,595)	138,264	-	13,134	(151,398)	-
API IP LLC	1,630	-		24	1,654	-	(2,989)	-1,335	-	747	588	-
Total investments	**173,097**	**(2,449)**	**(36,908)**	**(2,145)**	**131,545**	**23,257**	**(16,781)**	**138,021**	**(26)**	**12,815**	**(150,810)**	**-**

(i) In 2014 the Company bought shares from Zymergen Inc for USD 923 thousand, a US company that is engaged in enhancing and optimizing fermentation processes in order to cut costs and increase revenue. At inception date the investment was classified as held for sale. As of December 31, 2016, the investee's equity had a fair value of R$ 36,908, with the gain recognized in “other comprehensive income”. As a result of the sale of shares in August 2017 for US 6,060 thousand (R$ 19,338), this amount was reclassified to the profit and loss. And the gain from the operation in the amount of R$ 16,389 was reclassified to financial income . For further information see note 28.

(ii) The Company ceased operating in August 2019, returning capital of R$ 26 to its shareholders.

e. Summary of direct subsidiaries' equity accounts

Direct subsidiaries at December 31, 2019	Assets	Liabilities	Equity	Net income (Loss)
BioEdge Agroindustrial Ltda.	1,178,841	790,256	388,585	(88,450)
BioVertis Produção Agrícola Ltda.	27,212	38,162	(10,950)	(18,164)
BioCelere Agroindustrial Ltda.	14,052	12,556	1,496	(1,454)
BioPlant Agroindustrial Ltda.	3	730	(727)	(63)
Granbio LLC	597,718	210,916	382,637	195,487

Direct subsidiaries at December 31, 2018	Assets	Liabilities	Equity	Net income (Loss)
BioEdge Agroindustrial Ltda.	1,079,478	602,443	477,035	(21,772)
BioVertis Produção Agrícola Ltda.	37,500	30,286	7,214	(5,321)
BioCelere Agroindustrial Ltda.	14,333	11,383	2,950	(3,370)
BioPlant Agroindustrial Ltda.	-	664	(664)	(593)
Granbio LLC	212,237	23,774	188,463	(3,993)

Direct subsidiaries at December 31, 2017	Assets	Liabilities	Equity	Net income (Loss)
BioEdge Agroindustrial Ltda.	1,038,580	716,928	321,652	(58,707)
BioVertis Produção Agrícola Ltda.	34,162	36,747	(2,585)	(6,956)
BioCelere Agroindustrial Ltda.	15,135	14,051	1,084	(2,389)
BioPlant Agroindustrial Ltda.	4	1,069	(1,065)	(571)
Granbio LLC	151,967	9,268	142,699	5,851

15 Property, plant and equipment

a. Breakdown of carrying amount

- Parent Company

	2019			2018	2017
	Cost	Depreciation	Net	Net	Net
IT equipment	808	(808)	-	-	37
Fixtures and fittings	912	(885)	27	56	92
Improvements to rented property	1,786	(1,719)	67	81	83
Property, plant and equipment in progress	169	-	169	20	6
Right of use assets (note 5)	2,625	(875)	1,750	-	-
Total	**6,300**	**(4,287)**	**2,013**	**157**	**218**

- Consolidated

	2019			2018	2017
	Cost	Depreciation	Net	Net	Net
IT equipment	2,395	(2,346)	49	55	294
Vehicles	145	(142)	3	6	81
Fixtures and fittings	2,009	(1,628)	381	347	473
Lab plant and equipment	5,216	(2,575)	2,641	1,585	2,038
Agricultural plant and equipment	53,763	(27,311)	26,452	28,168	32,944
Improvements to rented property	52,707	(5,438)	47,269	6,991	7,530
Industrial machinery, equipment and facilities	913,368	(41,455)	871,913	133,403	140,093
Property, plant and equipment in progress	18,702	-	18,702	760,265	802,507
Right of use assets (note 5)	2,625	(875)	1,750	-	-
Land	1,861	-	1,861	134	134
Buildings and constructions	3,388	(623)	2,765	1,858	1,953
Plantation	10,419	(10,419)	-	6,581	8,404
Total	**1,066,598**	**(92,812)**	**973,786**	**939,393**	**996,451**

b. Changes in property, plant and equipment

- Parent Company

	Balances at January 1, 2017	Additions	Write-offs	Balances at December 31, 2017	Additions	Write-offs	Balances at December 31, 2018	Additions	Write-offs	Balances at December 31, 2019
Cost										
Improvements to rented property	1,785	-	-	1.785	-	-	1,785	1	-	1,786
Property, plant and equipment under construction (i)	7,836	3,094	(10,924)	6	14	-	20	149	-	169
Fixtures and fittings	1,000	-	(82)	918	-	-	918	-	(6)	912
IT equipment - Hardware	908	-	(45)	863	-	-	863	-	(55)	808
Right of use assets – Note 5	-			-	-	-	-	2,625	-	2,625
Total	**11,529**	**3,094**	**(11,051)**	3.572	**14**	**-**	**3,586**	**2,775**	**(61)**	**6,300**
Depreciation										
Improvements to rented property	(1,366)	(336)	-	(1,702)	(2)	-	(1,704)	(15)	-	(1,719)
Fixtures and fittings	(768)	(113)	55	(826)	(36)	-	(862)	(23)	-	(885)
IT equipment - Hardware	(736)	(135)	45	(826)	(37)	-	(863)	-	55	(808)
Right of use assets – Note 5	-	-	-	-	-	-	-	(875)	-	(875)
Total	**(2,870)**	**(584)**	**100**	(3,354)	**(75)**	**-**	**(3,429)**	**(913)**	**55**	**(4,287)**
Total property, plant and equipment	**8,659**	**2,510**	**(10,951)**	**218**	**(61)**	**-**	**157**	**1,862**	**(6)**	**2,013**

(i) Fixed asset write-offs include fixed assets under construction that represent investments made in succinic acid production projects, an engineering project that will no longer continue according to the 2017 and 2018 business plan update.

- Consolidated

	Balances at January 1, 2017	Additions	Write-offs	Balances at December 31, 2017	Additions	Write-offs	Balances at December 31, 2018	Business combinations (note 6)	Additions	Write-offs	Exchange variation	Transfer	Balances at December 31, 2019
Cost													
IT equipment	2,533	-	(50)	2.484	-	(29)	2.455	-	-	(107)	-	47	2.395
Vehicles	508	-	-	508	68	(396)	180	-	-	(38)	-	3	145
Fixtures and fittings	2,602	43	(610)	2.035	-	(68)	1.967	-	-	(88)	-	130	2.009
Lab plant and equipment	3,958	247	(321)	3.884	9	(65)	3.828	1.215	163	(565)	98	477	5.216
Agricultural plant and equipment	49,694	727	-	50.421	303	-	50.724	-	-	-	-	3.039	53.763
Improvements to rented property	12,112	-	-	12.112	-	-	12.112	1.151	-	-	93	39.351	52.707
Industrial machinery, equipment and facilities	161,590	-	(18)	161.572	4	-	161.576	29.035	1.857	-	2.334	718.566	913.368
Property, plant and equipment under construction	759,553	53,876	(10,924)	802.505	16.356	(58.598)	760.263	-	20.052	-	-	(761.613)	18.702
Right-of-use assets	-	-	-	-	-	-	-	-	2.625	-	-	-	2.625
Land	134	-	-	134	-	-	134	1.598	-	-	129	-	1.861
Buildings and constructions	2,385	-	-	2.385	-	-	2.385	928	-	-	75	-	3.388
Plantation	-	10,913	-	10.913	-	-	10.913	-	-	(494)	-	-	10.419
Total	**995,070**	**65,806**	**(11,923)**	**1.048.953**	**16.740**	**(59.156)**	**1.006.537**	**33.927**	**24.697**	**(1.292)**	**2.729**	**-**	**1.066.598**
Depreciation													
IT equipment	(1,785)	(453)	48	(2.189)	(236)	26	(2.400)	-	(53)	107	-	-	(2.346)
Vehicles	(328)	(99)	-	(426)	(123)	376	(173)	-	(7)	38	-	-	(142)
Fixtures and fittings	(1,636)	(250)	324	(1.561)	(120)	62	(1.618)	-	(98)	88	-	-	(1.628)
Lab plant and equipment	(1,538)	(458)	150	(1.846)	(431)	34	(2.242)	-	(333)	-	-	-	(2.575)
Agricultural plant and equipment	(12,443)	(5,034)	-	(17.477)	(5.079)	-	(22.557)	-	(4.754)	-	-	-	(27.311)
Improvements to rented property	(3,477)	(1,105)	-	(4.583)	(539)	-	(5.122)	-	(316)	-	-	-	(5.438)
Industrial machinery, equipment and facilities	(14,786)	(6,693)	-	(21.479)	(6.694)	-	(28.172)	-	(13.283)	-	-	-	(41.455)
Right-of-use	-	-	-	-	-	-	-	-	(875)	-	-	-	(875)
Buildings and constructions	(336)	(95)	-	(432)	(95)	-	(528)	-	(95)	-	-	-	(623)
Plantation depletion	-	(2,509)	-	(2.509)	(1.823)	-	(4.332)	-	(6.087)	-	-	-	(10.419)
Total	**(36,329)**	**(16,696)**	**523**	**(52.502)**	**(15.140)**	**498**	**(67.144)**	**-**	**(25.901)**	**233**	**-**	**-**	**(92.812)**
Total property, plant and equipment	**958,741**	**49,110**	**(11,400)**	**996.451**	**1.600**	**(58.658)**	**939.393**	**33.927**	**(1.204)**	**(1.059)**	**2.729**	**-**	**973.786**

Property, plant and equipment under construction

Until the year ended December 31, 2018, property, plant and equipment under construction represented the investment made to build the cellulosic ethanol production plant in São Miguel dos Campos - AL. These investments included the acquisition of equipment, assembly and installation services, construction and expenses to make the operation continuous and stable.

In November 15, 2018, the Group received a total amount of USD 25 million , separated into USD 6 million received at Gran LLC and USD 19 million (in December 31, 2018 the amount was R$ 72,924) at Bioflex Agroindustrial, resulting from the case filed against the companies Beta Renewables S.P.A. and Biochemtex S.P.A on April 07, 2016. The reimbursement was due to losses suffered by the manufacturing plant, thus generating a write-off from property, plant and equipment under construction of R$ 58,436, which breaks down as follows: R$ 35,921 directly impacting the Company's profit or loss and R$ 22,515 creating an accounts receivable against Gran LLC. In the course of 2018 the others write-offs totalized the amount of R$ 162.

Following completion of the plant in 2019 and the operational start-up, the balance of property, plant and equipment under construction for this manufacturing plant was reclassified to machinery and equipment and industrial facilities in property, plant and equipment.

Guarantees

R$ 318,653 (R$ 306,822 as of December 31, 2018 and R$ 301,801 as of December 31, 2017) was submitted as security as of December 31, 2019 for bank loans. For further information please see note 18.c.

Capitalization of interest in property, plant and equipment under construction

The Company's indirect subsidiary BioFlex Agroindustrial S.A. capitalized debt interest of R$ 3,595 during the year ended December 31, 2019 (R$ 5,358 as of December 31, 2018 and R$ 32,007 as of December 31, 2017). See note 18 item (b).

16 Intangible assets - Consolidated

	Software	Develop-ment	Licenses and intellectual property	Goodwill	Total
Balances at January 01, 2017	**1,980**	**21,413**	**-**	**-**	**23,393**
Additions	-	3,297	-	-	3,297
Amortization (note 25) (a)	(630)	-	-	-	(630)
Balances as of December 31, 2017	**1,350**	**24,710**	**-**	**-**	**26,060**
Additions	-	2,509	-	-	2,509
Amortization (note 25)	(629)	-	-	-	(629)
Balances as of December 31, 2018	**721**	**27,219**	**-**	**-**	**27,940**
Additions through business combinations (note 6)	-	-	368,086	86,922	455,008
Additions	-	2,102	-	-	2,102
Amortization (a) (note 25)	(376)	-	(11,407)	-	(11,783)
Exchange variation			25,130	6,925	32,055
Balances as of December 31, 2019	**345**	**29,321**	**381,809**	**93,847**	**505,322**

(a) Amortization expenses were recognized in Administrative and general expenses.

Development - investments made by the Company through its direct subsidiaries:

- Biovertis: development of Energy Cane Vertix, the raw material to be used in the production of biofuels and biochemicals in the amount of R$ 16,936 as of December 31, 2019 (R$ 14,834 as of December 31, 2018 and R$ 12,468 as of December 31, 2017); and

- Biocelere: development of genetically modified yeast to ferment cellulosic sugar in the amount of R$ 12,385 as of December 31, 2019 and December 31, 2018. In December 31, 2017 the amount was R$ 12,242.

Licenses and intellectual property ownership - Amounts denoting the development of intellectual property and licensing related to nanocellulose and biorefinery technology and trade and industrial secrets. The business combination (note 6) also resulted in R$ 368,086 (US$ 97,220) being recognized as intangible assets identified by Management in the combination between Granbio LLC and the companies GranAPI LLC, API-Property Intellectual Holdings LLC, American Process Conversion Technologies LLC and American Process Conversion Technologies Holdco LLC. The number of technology and intellectual property licenses was calculated based on the expected revenue generated by selling licenses to third parties, the existing commercial pipeline and prospects for growth in the number of projects for converting biomass into cellulosic ethanol, biochemicals and nanocellulose. For further information see note 6.

Goodwill – denotes expected future earnings generated by the entities GranAPI LLC, API-Property Intellectual Holdings LLC, American Process Conversion Technologies LLC and American Process Conversion Technologies Holdco LLC, as a result of their technology. Management used the relief-from-royalty method to estimate the fair value of these companies' technology. This method assumes that instead of paying for property, a company is willing to pay to exploit the benefits related to this class of assets. This goodwill is not deductible for tax purposes. For further information see note 6.

17 Impairment analysis

Property, plant and equipment and intangible assets that are subject to depreciation and amortization are therefore tested for impairment whenever events or changes in circumstances indicate that the carrying amount may not be recoverable.

Due to the limited operating history , the Group annually conducts impairment tests for the BioFlex´s PPE and for GranBio LLC intangible assets and goodwill.

The recoverable amount was determined by using the discounted cash flows determined by Management based on budgets taking into account assumptions for each CGU using budget assumptions and historical performance previously demonstrated.

The average weighted capital cost for discounting consisted of the alternative market funding base debt cost and CAPM methodology base equity cost, reflecting a reference beta for the renewable industry.

a. Property, plant and equipment

Regarding the impairment test for the subsidiary BioFlex Agroindustrial S.A., the Group used a long-term cash flow, which reflects the expected use of the recently implemented asset and the investments being made to achieve commercial capacity in an ongoing operation. The 2G ethanol prices were determined based on evidence from target markets. The operational expenditure ("opex") projection was compiled based on the history of costs incurred adjusted to an industrial capacity level of use. As of December 31, 2019, the impairment tests performed by the Group are not indicative of an adjustment to the statement of financial position balances related to the aforementioned projects. The realization of the assumptions used to prepare this test is conditioned to the start of commercial scale production of the 2G ethanol plant.

The Group made this test through the value-in-use method (discounted cash flow) and did not identify any losses, as shown below:

		Value-in-use	**Book value**	**Value-in-use/book value**
Bioflex Agroindustrial	2019	1,007,655	935,453	1.08
Bioflex Agroindustrial	2018	1,117,246	911,010	1.23
Bioflex Agroindustrial	2017	1,009,111	967,089	1.04

The discount rate used was 7.28% p.a. (8.82% as of December 31, 2018 and 5.48 as of December 31, 2017) in real terms. The discount rate was based on the weighted average cost of capital. The inflation rate used for the projection was 3.45% (4.5% as of December 31, 2018 and 2017). Given the potential impact of the discount rate on the discounted cash flow, the Group conducted a sensitivity analysis as follows:

	Year	**+0.5% in the discount rate – Value-in-use**
Bioflex Agroindustrial	2019	951.955
Bioflex Agroindustrial	2018	1.070.026
Bioflex Agroindustrial	2017	966,461

Others key assumptions are cellulosic ethanol price, biochemical price and nanocellulose demand, but, the most important is the discount rate. The impairment tests conducted by the Group did not reveal the need for adjustments to the balances for the aforesaid project.

b. Intangible assets and Goodwill

Concerning the impairment test for the subsidiary GranBio LLC., the Group used a long-term cash flow, which reflects the expected use of the recently implemented asset and the investments being made to achieve commercial capacity in an ongoing operation. The 2G ethanol license prices were determined based on evidence from target markets. The opex projection was compiled based on the history of costs incurred adjusted to an industrial capacity level of use.

The Group made this test through the value-in-use method (discounted cash flow) and did not identify any losses, as shown below:

		Value-in- use	**Book value**	**Value-in-use/book value**
GranBio LLC	2019	489,396	439,960	1.11

The discount rate used was 13.24% p.a. in real terms. The inflation rate used for the projection was 1,7%. The variation between the rate used in the GranBio LLC test (13.24%) and the rate used in Bioflex (7.28%) is mainly due to the higher size premium (Duff and Phelps 2017 methodology) of the GranBio LLC business, as it is a new market to be explored.

Additionally, Duff and Phelps Valuation Handbook for 2017 identifies a size premium based on an analysis of historical returns in excess of CAPM (“Capital Asset Pricing Model) among stocks of various relative sizes. This premium recognizes that equity holders demand a higher return from companies that are smaller in total overall size. The Duff and Phelps study calculates a premium referred to as the equity size premium for ten groups of stocks, segregated by size using the capitalization rank deciles of the NYSE as a guideline for aggregation. Considering the deal size, a capitalization size premium of 5.37%, representing the 10th decile, was used to calculate the cost of equity for the GranBio LLC.

Given the potential impact on the discount cash flow rate, the Group conducted a sensitivity analysis changing this variable whose cash flow can be seen in the table below:

		+0.5% in the discount rate
GranBio LLC	2019	459,515

Others key assumptions are cellulosic ethanol price, biochemical price and nanocellulose demand., but., the most important is the discount rate. The impairment tests conducted by the Group did not reveal the need for adjustments to the balances for the aforesaid projects.

18 Loans, financing and debentures

				Parent Company			Consolidated		
Type	Index	Interest Per year	Due date	2019	2018	2017	2019	2018	2017
FINEP – Financing	Fixed	4.00%	May/24	6,924	7,904	8,225	6,924	7,904	8,225
FINEP – Financing	TJLP	-1.50%	Jun/25	110,848	106,524	105,506	110,849	106,524	105,506
BNDES – Financing	Fixed	3.31%	May/23	-	-	-	111,113	107,560	109,232
BNDES – Financing	TJLP	4.42%	Jun/25	-	-	-	166,953	147,703	135,142
BNDES – Loan	SELIC	7.78%	Mar/22	-	-	-	1,550	1,287	1,158
BNB – Financing	Fixed	6.28%	Sep/27	-	-	-	123,542	127,895	131,462
Debentures	CDI	1.00%	Mar/20	-	-	-	101,654	94,796	87,556
		Total		**117,772**	**114,428**	**113,731**	**622,585**	**593,669**	**578,281**
		Current		**29,324**	**917**	**1,500**	**245.648**	**147,458**	**96,109**
		Noncurrent		**88,448**	**113,511**	**112,231**	**376.937**	**446,211**	**482,172**

Loans and financing

BNDES and BNB financing were taken out in order to fund the construction of the industrial cellulosic ethanol production plant and to acquire agricultural machinery to harvest the raw material.

The FINEP financing consists of contracts funding the research and development projects for biomass (Energy Cane Vertix) and yeast, in addition to technologies for converting biomass into biochemicals and biofuel.

Debentures

In March 2015, the indirect subsidiary Bioflex Agroindustrial S.A. made its 1st Issuance of Ordinary Debentures through a private deed, entailing the issuance of 80 (eighty) secured registered ordinary nonconvertible debentures for a restricted public distribution, without the issuance of pledges or certificates, in a single series for a unit value of R$ 1,000, with the principal amount of R$ 80,000.

The debentures' yield rate is 100% of the accumulated variance of the average daily DI rates (interbank deposits or "CDI"), plus a surcharge, for the periods:

- The surcharge was 1.20% per annum from the issuance date until March 16, 2016;
- The surcharge was 2.00% per annum from March 17, 2016 until March 16, 2017;
- The surcharge was 2.70% per annum from March 17, 2017 until March 16, 2018;
- The surcharge was 1.50% per annum from March 17, 2018 until May 17, 2019;
- The rate is 1.00% per annum from May 18, 2019 onwards.

The debentures were issued by the indirect subsidiary BioFlex Agroindustrial S.A., with Banco Itaú as the debenture holder, in order to refinance debt and bolster cash.

The nominal value of the debentures had a maturity of 3 years from the date of distribution (March 17, 2018). The 5th Amendment to the Ordinary Debentures Issuance extended the maturity term to 4 years and 8 months, as from the issuance date, according maturing on August 19, 2020. As payment of principal and interest at maturity.

The short-term debt has exerted pressure on the Company's cash flow and led it to incur a negative net working capital. Management is engaged in renegotiations with the financial institutions to lengthen its debt profile in order to ease up its operating cash flow.

a. Long-term debt amortization schedule

See below the contractual maturities of financial liabilities:

	Parent Company			Consolidated		
	2019	**2018**	**2017**	**2019**	**2018**	**2017**
2020	29,324	917	1,500	245,648	147,458	96,109
2021	20,023	19,967	5,858	71,829	69,518	43,964
2022	20,023	19,967	19,593	71,875	70,047	68,948
2023 onwards	48,402	73,577	86,780	233,233	306,646	369,260
Total	**117,772**	**114,428**	**113,731**	**622,585**	**593,669**	**578,281**

b. Reconciliation of cash flows deriving from financing activities

	Parent Company	**Consolidated**
Balance at January 1, 2017	**127,080**	**603,716**
Proceeds from loans and financing	**-**	1,656
Amortization of loans and financing - principal	(14,504)	(28,554)
Provision for interest on loans, financing and debentures	6,658	7,998
Interest capitalized on PP&E	-	32,007
Amortization of loans and financing – interest	(5,503)	(38,542)
Balance at December 31, 2017	**113,731**	**578,281**
Amortization of loans and financing - principal	(320)	(5,151)
Provision for interest on loans, financing and debentures	6,769	35,714
Interest capitalized on PP&E	-	5,358
Amortization of loans and financing - interest	(5,752)	(20,533)
Balance at January 31, 2018	**114,428**	**593,669**
Amortization of loans and financing - principal	(573)	(9,716)
Provision for interest on loans, financing and debentures	10,902	58,820
Interest capitalized on PP&E	-	3,595
Amortization of loans and financing - interest	(6.985)	(23,783)
Balance at December 31, 2019	**117,772**	**622,585**

c. Guarantees

The Company's debts are secured by bank guarantee and corporate endorsement and the subsidiaries' debts by bank guarantees, corporate endorsements and real guarantees. The real guarantees are imposed on property, plant and equipment by BNDES and FINEP. Both institutions have level 1 and 2 mortgages on the industrial assets of the subsidiary BioFlex, and FINEP also has a guarantee over agricultural equipment.

d. Covenants

The Group has loans and borrowings of R$ 117,772 (R$ 114,428 as of December 31, 2018 and R$ 113,731 as of December 31, 2017) at the Parent Company and R$ 622,585 (R$ 593,669 as of December 31, 2018 and R$ 578,281 as of December 31, 2017) at the consolidated level, all due in instalments through September 2027.

The loans and financing contain non-financial operating covenants establishing a range of obligations, listed below:

- Compliance with environmental obligations and legislation, the biosafety quality certificate (CQB) and the Gene Pool Management Council (CGEN).
- Submit federal, state and municipal tax debt clearance certificates.
- Have not incurred protests for indisputable debts.
- Pausing of operating activities.
- Corporate and equity restructuring.

19 Trade payables

	Parent Company			Consolidated		
	2019	**2018**	**2017**	**2019**	**2018**	**2017**
Trade payable	1,446	1,325	1,794	42,154	23,727	22,376
Total	**1,446**	**1,325**	**1,794**	**42,154**	**23,727**	**22,376**
Short-term	1,446	1,325	1,794	42,154	23,727	21,708
Long-term	-	-	-	-	-	668

Trade payables mainly due to the purchase of raw materials for the 2G ethanol production process.

20 Accounts payables – Consolidated

	Consolidated		
	2019	2018	2017
Consideration payable – business combination (i)	28,215	-	-
Right of use (ii)	10,010	-	-
Promissory notes (iii)	82,670	-	-
Co-obligations payable	5,115	4,550	-
Other accounts payable	10,501	1,763	1
Total	**136,511**	**6,313**	**1**
Short-term	29,880	5,185	1
Long-term	106,631	1,128	-

(i) Denotes the acquisition of equity interests through the direct subsidiary Granbio LLC, as per note 6. The amount payable is USD 7,000, to be settled in two equal annual payments of USD 3,500, the first maturing in March 2020 (already paid) and the second in June 2021. The amount converted into Reais is R$ 28,215 on December 31, 2019.

(ii) This denotes the recognition of the right to use the Thomaston plant, awarded under the terms of the equity interest acquisition agreement for the direct subsidiary Granbio LLC and the business combination in March 2019. The initial amount was R$ 12,711 (U$ 3,400) and during the year was recognized R$ 2,701 in income, thereby the amount in December 31, 2019 is R$ 10,010. The recognized right to use is recorded based on the period embraced by this access agreement, as per note 6.

(iii) By way of the subsidiary Granbio LLC, the Company's indirect subsidiaries based in the US entered into structured “New Market Tax Credit” (note 13) to expand and purchase Thomaston Biorefinery, located in Georgia, in which the funds AMCREF, DVCI and COCRF loaned USD 20,510 thousand to the subsidiary GranBio Conversion Technologies LLC. These loans were made as long-term promissory notes. As mentioned in note 13, this structured transaction was realized between subsidiaries directly and indirectly held by Granbio LLC. The amount of USD 20,510 thousand (R$ 82,670), was still payable to the funds as of December 31, 2019. The debt is scheduled to be amortized over 13 repayments maturing from 2022 to 2034.

See below the schedule by year of maturity for accounts payable classified in non-current liabilities:

	2019	2018	2017
2021	14.505	1.128	-
2022	6.746	-	-
2023	6.746	-	-
2024 onwards	78.634	-	-
Total	**106.631**	**1.128**	**-**

21 Government grants

The Group participates in the Economic Subsidy Program promoted by the Financier of Studies and Projects ("FINEP"). The main objective of this program is to promote a significant increase in innovation activities and an increase in the competitiveness of companies and the country's economy.

This type of financial support from FINEP consists of the application of public non-reimbursable resources (which do not need to be returned) directly to companies, to share with them the costs and risks inherent to such activities.

The company is currently using FINEP resources in the following projects: (a) Development of an engineering project, using precision agriculture techniques, for the construction of agricultural equipment that presents planting efficiency; (b) Structuring a transgenics program for plants with a greater amount of biomass and resistance to abiotic and / or biotic stresses, with an emphasis on prospecting genes and obtaining transgenic sugarcane plants.

The amount is following:

	Consolidated		
	2019	**2018**	**2017**
Government grants	4,797	3,471	1,543
Total	**4,797**	**3,471**	**1,543**

All conditions and other contingencies attaching to government assistance are recognized, when applicable.

FINEP's financial support of non-reimbursable public resources granted to be used in innovation activities (nanotechnology, biotechnology, information and communication technologies, sustainable construction and industrial sanitation) and to increase the Group's competitiveness.

22 Equity

a. Share capital

The Company's share capital as of December 31, 2019, 2018 and 2017 is R$ 900,000 and consists of 100,628,931 (one hundred million six hundred and twenty-eight thousand nine hundred and thirty-one) common shares. Each common share entitles one vote to the resolutions of the General Meetings
The ownership structure is as follows:

Shareholder's Equity	**Value in R$**	**Number of shares**	**Percentage**
GranInvestimentos S/A	300,000	85,534,591	85%
BNDES Participações S/A	600,000	15,094,340	15%
Total	**900,000**	**100,628,931**	**100%**

During 2017, the shareholders contributed new capital in cash in the amount of R $ 49,061.

The extraordinary general meeting held December 30, 2019 approved a future capital increase of R$ 249,869 via the issuance of 24,141,935 common registered shares with no par value, for the unit issuance price of R$

10.35. The new shares can be paid in using credits held against the Company or payment in local currency.

b. Asset and liability valuation adjustments

Asset and liability valuation adjustments include accumulated adjustments for foreign-currency differences deriving from the translation of financial statements for foreign operations. In the fiscal year ended December 31, 2019 the translation loss of R$ 1,313 was recognized (translation gains recorded of R$ 28,442 at December 31, 2018 and R$ 1,132 at December 31, 2017). The balance of the item as of December 31, 2019 is R$ 81,778 (R$ 83,091 as of December 31, 2018 and R$ 54,649 as of December 31, 2017).

c. Capital reserve

In a Shareholders' Agreement signed on April 30, 2013 between BNDESPAR and GranInvestimentos S.A. (Shareholders), it was stipulated that the shares were initially issued at R$ 39.75 each. The capital contributions after the signing of this Agreement have the share price adjusted by the IPCA. The variation in the share price between the date of the Shareholders' Agreement until the date of the effective receipt of the capital contribution, is multiplied by the total number of paid-in shares, and this variation is recorded as a Capital Reserve.

BNDESPAR has 408,231 shares payable to the Group, and these shares are also adjusted by the IPCA. This monetary restatement was R$ 586 on December 31, 2019 (R$ 450 in December 31, 2018 and R$ 1,541 in December 31, 2017). As of December 31, 2019 the total amount in Capital reserve is R$ 108,175 (R$ 107,589 in December 31, 2018 and R$ 107,139 in December 31, 2017).

23 Net revenues from goods sold and services

	Consolidated		
	2019	**2018**	**2017**
Service fee income (i)	10,499	-	-
Resale of goods (iii)	3,988	5,456	9,796
Sugarcane and Energy Cane Vertix sales revenue (iv)	-	-	2,210
Revenues	**14,487**	**5,456**	**12,006**
Equipment leasing revenue (ii)	21,190	21,360	16,564
Other revenues	**21,190**	**21,360**	**16,564**
Total gross revenue	**35,677**	**26,816**	**28,570**
Taxes on sales	(2,140)	(2,562)	(2,933)
Net operating revenue	**33,537**	**24,254**	**25,637**

(i) Operational revenue of the indirect subsidiaries GranBio Process Energy Recovery, Inc. and Avapco resulting from the provision of waste elimination and water treatment services, by using proprietary technology;
(ii) Operating revenue of the indirect subsidiary BioFlex Agroindustrial S.A. due to leasing electricity cogeneration assets, as per the contract signed with CESM.
(iii) Operating revenue of the indirect subsidiary BioFlex Agroindustrial S.A. due to reselling sugarcane straw to CESM and domestic sales of cellulose ethanol.
(iv) Operating revenue from the subsidiary BioVertis due to the sale of sugarcane and Energy Cane Vertix.

Below is the presentation of net revenues by region and segment. See note 31 for more information.

		Consolidated		
Subsidiary	**Region**	**2019**	**2018**	**2017**
BioVertis	Northeast of Brazil	-	-	1,691
BioFlex	Northeast of Brazil	23,038	24,254	23,944
BioTech	United States of America	10,499	-	-
Total		**33,537**	**24,254**	**25,637**

24 Cost of goods sold and services

	Consolidated		
	2019	**2018**	**2017**
Cost of the services rendered (i)	(17,339)	-	
Cost of goods sold (ii)	(44,353)	(19,280)	(35,810)
Total	**(61,692)**	**(19,280)**	**(35,810)**

(i) Operational cost of the indirect subsidiaries American Process Energy Recovery, Inc. and AVAPCO resulting from the provision of waste elimination and water treatment services.

(ii) The amounts denote the production costs of the indirect subsidiary BioFlex Agroindustrial S.A. due to reselling sugarcane straw to CESM and domestic sales of cellulose ethanol. In December 31, 2019 the depreciation cost allocated in cost of goods sold was R$ 22,818 (R$ 9,005 in 2018 and R$ 15,502 in 2017).

The high cost of reselling products in 2017 is due to the operation being at its beginning, still having higher maintenance and implementation costs. The Bioflex Agroindustrial industry was completed in early 2019, also increasing initial costs until reaching its maximum production capacity.

25 Administrative and general expenses

	Parent Company			Consolidated		
	2019	2018	2017	2019	2018	2017
Personnel expenses	(1,439)	(4,703)	(6,004)	(13,073)	(12,360)	(11,636)
Services rendered (i)	(4,739)	(2,568)	(2,611)	(17,036)	(11,353)	(6,349)
Occupation expenses	(445)	(1,377)	(1,166)	(5,503)	(1,641)	(1,852)
Vehicle expenses	(5)	-	(8)	(599)	(168)	(142)
Insurance	(127)	(76)	(57)	(1,893)	(131)	(1,162)
Travel	(944)	(641)	(205)	(1,551)	(896)	(671)
Depreciation and amortization (ii)	(1,058)	(401)	(909)	(14,866)	(6,764)	(1,824)
Sales expenses	(66)	(109)	(68)	(148)	(288)	(262)
General expenses (iii)	(422)	(255)	(239)	(10,951)	(2,859)	(2,608)
Marine operations	-	-	-	(359)	-	-
Taxes and fees	(195)	(179)	(215)	(1,254)	(1,966)	(446)
Recovery of expenses (iv)	751	5,249	4,217	-	-	-
Other expenses (v)	3,772	1,905	6,793	3,772	1,905	6,793
Total	**(4,917)**	**(3,155)**	**(472)**	**(63,461)**	**(36,521)**	**(20,159)**

(i) Denotes expenses on third-party services provided such as audit, tax and legal.

(ii) In 2019, R$ 11,783 of amortization expenses was recorded (R$ 629 in 2018 and R$ 630 in 2017). The depreciation expenses in 2019 was R$ 3,083 (R$ 6,135 in 2018 and R$ 1,194 In 2017). Depreciation on other assets such as furniture, vehicles, IT equipment is recognized as an administrative and general expense.

(iii) General expenses with maintenance, mail, fuel, materials for use, consumption and security materials.

(iv) Subsidiary expenses recovered consisting of pass-through corporate expenses relating to Company management.

(v) Other cost sharing for indirect parent company, Joint Venture and other related parties that do not consolidate.

26 Other operating income (expenses)

	Parent			Consolidated		
	2019	**2018**	**2017**	**2019**	**2018**	**2017**
Gain on business combination (note 6) (i)	-	-	-	218,128	-	-
Recognition of right of use for access (ii)	-	-	-	4,487	-	-
Claim indemnification (iii)	-	-		-	72,924	
Biological assets sale revenue (iv)	-	-	-	550	-	-
Sale of equity interest	-	-	-	-	-	-
Other operating income	-	-	-	2,607	476	-
Total - Other income	**-**	**-**	**-**	**225,772**	**73,400**	**-**
Property, plant and equipment write-off (iii)	-	-	(7,822)	-	(35,257)	(7,860)
Write-off of biological assets and plantations (iv)	-	-	-	(12,302)	-	-
Other operating expenses	4	-	-	-	(242)	594
Total – Other expenses	**4**	**-**	**(7,822)**	**(12,302)**	**(35,499)**	**(7,266)**
Total	**4**	**-**	**(7,822)**	**213,470**	**37,901**	**(7,266)**

(i) Amount related to the gain on the business combination. See further information on note 6.

(ii) Amount denoting recognition of the right of use of the Thomaston plant due to the control acquisition. The recognized right to use is recorded based on the period embraced by this access agreement. See note 20.

(iii) The Group received the amount of USD 25 million , segregated into USD 6 million received at Gran LLC and USD 19, million at Bioflex Agroindustrial, equal to an amount in Reais of R$ 72,924, resulting from the case filed against the companies Beta Renewables S.P.A. and Biochemtex S.P.A (note 13) on April 07, 2016. This amount was to reimburse the Group due to the malfunction of part of the technology built to produce the 2G Ethanol . As a consequence, the Group wrote off R$ 35,257 from property, plant and equipment in progress. In 2017, write-offs were related to investments in the succinic acid production projects and engineering projects that will no longer be continued under the updated business plan.

(iv) Denotes earnings on the sale of biological assets in August 08, 2019. The value of the write-off of the cost of biological assets and sugarcane plantations due to this sale was R$ 12,302.

27 Impairment losses on trade receivables

	Parent Company			Consolidated		
	2019	**2018**	**2017**	**2019**	**2018**	**2017**
Impairment losses	**-**	(1,273)	(1,515)	**-**	(1,273)	(50,474)
Total	-	**(1,273)**	**(1,515)**	-	**(1,273)**	**(50,474)**

Amounts denote the impairment loss recorded for the accounts receivable from the joint-venture Companhia Energética de São Miguel dos Campos (CESMC). At December 31.2019 there are no expected credit losses, because this Joint Venture will start generating cash surplus for the next few years and will pay the debts.

28 Net financial costs

	Parent Company			Consolidated		
Finance costs	**2019**	**2018**	**2017**	**2019**	**2018**	**2017**
Bank expenses	(4)	(2)	(2)	(102)	-	(31)
IOF – Tax on financial operations	(49)	(109)	(91)	(49)	(388)	(104)
Other interests (i)	(216)	(8,375)	(4,533)	(793)	(17,596)	(4,284)
Interest on loans, financing and debentures	(10,902)	(6,769)	(6,658)	(58,820)	(35,714)	(7,998)
Exchange variance	(12)	(2)	(1)	(22)	(85)	(72)
Discounts to customers	-	(2)	-	-	-	(70)
	(11,183)	**(15,259)**	**(11,285)**	**(59,786)**	**(53,783)**	**(12,559)**
Finance income						
Sale of equity interest (ii)	-	-	-	-	-	16,389
Interest	-	-	1	6	-	2
Financial discounts obtained	47	18	-	1,814	5,196	22
Exchange variance	-	1	4	-	61	280
Earnings on investments	159	211	257	312	1,531	2,059
	206	**230**	**262**	**2,126**	**6,788**	**18,752**
Net finance costs	**(10,977)**	**(15,029)**	**(11,023)**	**(57,660)**	**(46,995)**	**6,193**

(i) Interest mainly due to financial cost on loan guarantees obtained from financial institutions and interest and fines on late payments to suppliers and taxes.

(ii) Profit on the sale of investment Zymergen Inc. in GranBio LLC. Shareholding acquired for USD 923 thousand in 2014 and resold to Zymergen Inc. for USD 6,060 thousand (R$ 19,338) in August 2017 (sale of 3,672,519 shares at USD 1.65). As a result, the Company recognized financial income in the period in the amount of R $ 16,389

29 Tax losses

a. Amounts recorded in profit and loss

	Consolidated 2019
Current social contribution and income tax expense	
Current expense	-
Total	-
Deferred social contribution and income tax expense	
Temporarily differences	
Amortization of intangible (note 6)	1,556
	1,556

b. Reconciliation of the total tax expense/ benefit

	2019	2018	2017
Income (loss) before income tax and social contribution	**77,009**	**(58,695)**	**(84,024)**
North American companies	195,487	-	-
Brazilian companies **[A]**	(118,478)	(58,695)	(84,024)
Tax using the Company´s domestic tax rate **[B]**	34%	34%	34%
Income tax and social contribution [A]*[B]=[C]	**(40,283)**	**(19,956)**	**(28,568)**
Inclusions: [D]	**1,311**	**9,193**	**18,128**
Share of profit of equity accounted investees	-	5,706	729
Inventories provision	1,311	3,055	237
Impairment losses on accounts receivable	-	432	17,162
Exclusions: [E]	**(4,357)**	**-**	**-**
Share of profit of equity accounted investees	(4,357)	-	-
Unrecorded deferred income tax and social contribution [C] + [D] + [E] = [F]	**(43,329)**	**(10,763)**	**(10,440)**
Effective rate [F] / [A]	-56.26%	18.34%	12.43%
Accumulated tax loss carryforwards (opening balance)	(393,163)	(361,507)	(330,800)
Unrecorded deferred income tax and social contribution – opening balance[G]	(133,675)	(122,912)	(112,472)
Unrecorded deferred income tax and social contribution – final balance [F] + [G]	**(177,004)**	**(133,675)**	**(122,912)**

The Group did not generate taxable profit in previous years and, therefore, there is increased doubt about whether future taxable profit will be available to realize deferred tax assets. As a result, deferred tax assets are not recognized as at December 31, 2019, 2018 and 2017.

For the Brazilian entities, the accumulated tax losses and the negative social contribution base do not expire. However, they can be compensated only up to the limit of 30% of the annual taxable profit.

For North American entities, tax losses accumulated before December 31, 2017 can be used in 20 years and there is no limit on taxable profit for the use of these losses. Tax losses generated after December 31, 2017 can be used indefinitely and can be used to offset only 80% of taxable income for the current year.

Tax returns for all companies are subject to tax inspections and reviews by the tax authorities for varying periods. As a result of these inspections and reviews, questions may arise about the methodologies, criteria and interpretations of the legislation by the authorities and, therefore, change the amounts recognized by the Group in the financial statements and / or result in judicial questions.

c. Movements in deferred tax balances

	Consolidated 2019
Balances as of December 31, 2018	-
Deferred tax liability – business combination (note 6)	47,991
Amortization of intangible	(3,136)
Exchange variation	3,897
Balances as of December 31, 2019	**48,752**

30 Financial instruments and risk management

Operations with financial instruments are fully recognized in the accounts and restricted to cash and cash equivalents, receivables due from related parties, loans and borrowings, trade and other accounts payable.

The Group and its direct and indirect subsidiaries do not invest in derivatives or any other risky assets on a speculative basis.

The Group and its direct and indirect subsidiaries assess such financial assets and liabilities with respect to market value was conducted on the basis of available information and appropriate assessment methods. However, the interpretation of market data and selection of assessment methods requires considerable judgment and estimates to calculate the most appropriate realizable value. As a result, the estimates do not necessarily indicate the values that could be realized in the current market.

The activities of the Company and its direct and indirect subsidiaries expose it to various financial risks: liquidity risk and market risk (including interest rate risk), as described below:

a. Liquidity risk

The management of liquidity risk implies keeping enough cash and securities and credit facilities to be able to settle market positions. Due to the dynamic nature of their businesses, the Group and its direct and indirect subsidiaries use flexible funding by maintaining bank credit facilities.

Management monitors the level of the Company and its direct and indirect subsidiaries' liquidity, considering the expected cash flow and cash and cash equivalents. Furthermore, the liquidity management policy of the Company and its direct and indirect subsidiaries entails projecting cash flows and considering the level of net assets required to achieve these projections and maintain the debt financing plans.

Management is continuing to look into alternatives to guarantee a balanced capital structure, see further information on notes 1 and 34.

The following are the contractual liabilities maturities, excluding the impact of currency trading agreements on a net basis.

	Parent Company				
Non-derivative financial liabilities	**Carrying amount**	**6 months or less**	**6 to 12 months**	**1 to 3 years**	**Over 3 years**
Loans, financing and debentures	117,772	14,925	15,192	54,492	47,043
Trade payables	1,446	1,446	-	-	-
Loans - related parties and Other accounts receivable - related parties	132,400	132,400	-	-	-
	251,618	**148,771**	**15,192**	**54,492**	**47,043**

	Consolidated				
Non-derivative financial liabilities	**Carrying amount**	**6 months or less**	**6 to 12 months**	**1 to 3 Years**	**Over 3 years**
Loans, financing and debentures	622,585	177,560	74,432	242,369	203,162
Trade payables	42,154	42,154	-	-	-
Loans - related parties and Other accounts receivable - related parties	104,859	104,859	-	-	-
Trade and other payables	136,511	14,636	15,244	27,998	78,634
	906,109	**339,209**	**89,676**	**270,367**	**281,796**

The maturity analyses of the Company do not project cash flows that could occur significantly earlier or at significantly different amounts.

b. Market Risk

The Group is exposed to interest-rate changes, charged on its loans and borrowings and exchange variance on the assets and liabilities of the overseas-based direct and indirect subsidiaries. To minimize possible impacts triggered by these changes, the Group adopt the policy of diversification of these contracts.

The Group is primarily exposed to changes in Interbank Deposit Rate (CDI), basic interest tax (SELIC) and Long-Term Interest Rate (TJLP) interest rates, which are applied to its loans and borrowings.

At the reporting date the profile of the Company's financial instruments yielding interest was:

	Gross amount					
	Parent Company			Consolidated		
Variable-rate instruments	**2019**	**2018**	**2017**	**2019**	**2018**	**2017**
Assets						
Short-term investments and other investments	-	30,197	57	227	56,941	25,025
Liabilities						
Loans and borrowings (CDI)	-	-	-	(101,654)	(94,796)	(87,556)
Loans and borrowings (TJLP)	(110,848)	(106,524)	(105,506)	(277,802)	(254,227)	(240,648)
Loans and borrowings (SELIC)	-	-	-	(1,550)	(1,287)	(1,158)
Total	**(111,848)**	**(76,327)**	**(105,449)**	**(380,779)**	**(293,369)**	**(304,347)**

At the Parent Company and consolidated reporting date the profile of the assets and liabilities resulting from the consolidation of the direct and indirect subsidiaries in USD as the functional currency has been summarized below, and is exposed to exchange variance:

	Consolidated		
Instruments exposed to exchange variance	**2019**	**2018**	**2017**
Assets			
Cash and cash equivalents	1,073	-	-
Receivables	1,557	-	-
Promissory notes receivable	60,252	-	-
Other financial assets	31,251	-	-
Total	**94,133**	**-**	**-**
Liabilities			
Trade accounts payable	(11,664)	-	-
Promissory notes payable	(106,163)	-	-
Trade and other payables	(44,338)	-	-
Total	**(162,165)**	-	-

Sensitivity analysis for variable-rate instruments and exchange variance

The sensitivity analysis took into account loans and financing which are restated by the CDI, TJLP and SELIC rates.

The sensitivity analysis on the interest rates of loans, borrowings and debentures and the short-term investments considers an increase and decrease in interest rates of 25% and 50% and how this would have increase equity and profit or loss. This analysis take into account the amounts presented on the financial statements of December 31, 2019. Except for the 25% and 50% increase and decrease, no other changes were projected:

(Projections for one year)

		31-Dec-19				
Interest rate exposure	**Balances**	**Probable**	**25%**	**50%**	**-25%**	**-50%**
Short-term investments (CDI)	227	10	12	15	7	5
Loans and borrowings						
TJLP	(278,338)	(14,140)	(17,765)	(21,210)	(10,605)	(7,070)
SELIC	(1,550)	(68)	(85)	(102)	(51)	(34)
CDI	(101,627)	(5,174)	(6,468)	(7,761)	(3,881)	(2,587)
Profit or loss for the period		**(19,373)**	**(24,216)**	**(29,059)**	**(14,529)**	**(9,686)**

The interest rates to which the Company is subject, considering the projections of these rates in a probable scenario and sensitivity analysis are as follows:

		31-Dec-2019			
	Probable	**25%**	**50%**	**-25%**	**-50%**
SELIC (i)	4.40%	5.50%	6.60%	3.30%	2.20%
CDI (ii)	4.40%	5.50%	6.60%	3.30%	2.20%
TJLP (iii)	5.09%	6.36%	7.64%	3.82%	2.55%

(i) Interest rates were based on information available at the Banco Central do Brasil.
(ii) Interest rates were based on information available at the CETIP
(iii) Interest rates were based on information available at the BNDES

The sensitivity analysis into the exchange rates with 25% and 50% increase and decrease in the consolidated figures is as follows, including the most likely dollar variance used for translation at December 31, 2019 (there are no impacts on the 2017 and 2018 consolidation to be disclosed). As of December 31, 2019, the USD exchange rate was R$ 4.0307 to the dollar:

Foreign exchange exposure	**Carrying amounts**	**USD thousand**	**25%**	**50%**	**-25%**	**-50%**
Assets	94,133	23,354	23,534	47,068	(23,534)	(47,068)
Liabilities	(162,164)	(40,232)	(40,542)	(81,084)	40,452	81,084
Asset and liability valuation adjustments			**(17,008)**	**(34,016)**	**17,008**	**34,016**

For the effects of the investments in overseas subsidiaries, see below the sensitivity analysis with the probable scenario for the future exchange rate:

		2019			
	Probable	**25%**	**50%**	**-25%**	**-50%**
In thousands of USD	4.0307	5.0384	6.0461	3.0230	2.0154

Capital management

The objective of the Company´s capital management is to ensure that it maintains its strong credit rating with the financial institutions and its capital ratio, in order to support the Company´s business and maximize value for its shareholders. The Group and its direct and indirect subsidiaries control their capital structures by making adjustments and adapting to the existing economic conditions. In its net debt structure, the Group includes loans and financing less cash and cash equivalents.

	Parent Company			**Consolidated**		
	2019	**2018**	**2017**	**2019**	**2018**	**2017**
Cash and cash equivalents	2	30,201	69	1,062	51,159	965
Short-term investments	-	-	-	227	21,402	24,634
(-) Loans	(117,772)	(114,428)	(113,731)	(622,585)	(593,669)	(578,281)
Net debt	**(117,770)**	**(84,227)**	**(113,662)**	**(621,296)**	**(521,108)**	**(552,682)**
Equity	689,968	620,295	650,098	695,367	620,295	650,098
Equity and net debt	**572,198**	**536,068**	**536,436**	**74,071**	**99,187**	**97,416**

Classification of financial instruments

The table below shows the main financial instruments by category:

- Parent Company

	Amortized cost		
Financial assets	**2019**	**2018**	**2017**
Cash and cash equivalents	2	4	574
Short-term investments	-	30,197	25,025
Receivables	-	5	6
Related parties	154,589	84,936	290,485
Total	**154,591**	**115,142**	**316,090**
Liabilities			
Trade accounts payable	1,446	1,325	1,794
Related parties	132,400	79,153	16,459
Loans and borrowings	117,772	114,428	113,731
Total	**251,618**	**194,906**	**131,984**

- Consolidated

	Amortized cost		
Financial assets	**2019**	**2018**	**2017**
Cash and cash equivalents	1,062	15,620	574
Short-term investments	227	56,941	25,025
Related parties	74,154	66,389	40,030
Other receivables	83,459	22,537	22,087
Trade and other receivables	2,940	904	881
Total	**161,842**	**162,391**	**88,597**
Liabilities			
Trade accounts payable	42,154	23,727	22,376
Loans and borrowings	622,585	593,669	578,281
Related parties	104,859	56,686	18,757
Trade and other payables	136,511	6,313	1
Total	**906,109**	**680,395**	**620,415**

The fair values of the financial instruments presented do not significantly vary from the balances presented in the statement of financial position.

31 Segment reporting

Basis for segmentation

The Group has the following 3 strategic divisions, which are its reportable segments. These divisions offer different products and services and are managed separately because they require different technologies.

The operations of each of the Company's reportable segments are summarized below:

Reportable segments	**Operational Area**	**Operations**
BioVertis	Northeast of Brazil	Engaged in the experimentation, development, plantation, production and collection of biomass, i.e. Energy Cane Vertix and sugarcane straw.
BioFlex	Northeast of Brazil	Production of biomass, processing biomass for the production and sale of biofuel, electricity, biochemicals and pharmachemicals, technological research and development, sale of sugarcane straw, bagasse and biomass.
Biotech	United States of America	Development of technology to convert biomass into cellulosic ethanol, biochemicals and nanocellulose.

Information about reportable segments

Information related to each reportable segment is set out below. The performance is assessed based on final net income, as Management believes that this information is the most important for assessing the results of the respective segments.

			2019		
	BioVertis	**BioFlex**	**Biotech**	**Others**	**Total**
Revenue from goods sold and services rendered	-	23,038	10,499	-	33,537
Cost of goods sold and services rendered		(44,457)	(17,235)	-	(61,692)
Gross profit	**-**	**(21,419)**	**(6,736)**	**-**	**(28,155)**
Operating income and (expenses)					
Administrative expenses	(6,298)	(13,646)	(23,523)	(5,128)	(48.594)
Depreciation	(1,954)	(4,468)	(7,094)	(1,351)	(14,867)
Gain on remeasurement of investment due to business combination	-	-	218.128	-	218.128
Other income / (expenses)	(8,694)	(4,373)	8,394	15	(4,658)
Share of profit (loss) of equity-accounted investees	-	-	13,882	(1,067)	12.815
	(16,946)	(22,486)	209,788	(7,532)	162,824
Net income before financial income/expenses	**(16,946)**	**(43,905)**	**197,020**	**(7,532)**	**134,669**
Finance income	-	578	1.342	206	2,126
Finance costs	(1,035)	(45,357)	(2,191)	(11,203)	(59.786)
Net finance expenses	**(1,035)**	**(44,779)**	**(849)**	**(10.997)**	**(57.660)**
Income before income tax and social contribution	**(17,981)**	**(88,684)**	**202,202**	**(18,529)**	**77,009**
Deferred income and social contribution taxes	-	-	1,556	-	1,556
Net income (loss) for the period	**(17,981)**	**(88,684)**	**203,758**	**(18,529)**	**78,565**
Reportable segment assets					
Inventories	18	9,536	116	-	9,670
Property, plant and equipment	7,730	935,453	27,930	2,673	973,786
Intangible assets	16,975	156	475,656	12,535	505,322
Reportable segment liabilities					
Loans and borrowings	9,176	495,636	-	117,773	622,585
Trade and other payables	2,049	8,095	126,307	60	136,511
Lease	-	-	-	1,832	1,832

	2018				
	BioVertis	**BioFlex**	**Biotech**	**Other**	**Total**
Revenue from goods sold and services rendered	-	24,254	-	-	24,254
Cost of goods sold and services rendered	-	(19,280)	-	-	(19,280)
Gross profit	**-**	**4,974**	**-**	**-**	**4,974**
Operating income and (expenses)					
Administrative expenses	(2,291)	(18,964)	-	(8,502)	(29,757)
Depreciation	(2,021)	(3,179)	-	(1,564)	(6,764)
Other income	40	41,308	-	(4,720)	36,628
Share of profit (loss) of equity-accounted investees	-	-	-	(16,781)	(16,781)
	(4,272)	**19,165**	**-**	**(31,567)**	**(16,674)**
Net income before financial income/expenses	**(4,272)**	**24,139**	**-**	**(31,567)**	**(11,700)**
Finance income	21	828	-	5,939	6,788
Finance expenses	(1,092)	(37,370)	-	(15,321)	(53,783)
Net finance expenses	**(1,071)**	**(36,542)**	**-**	**(9,381)**	**(46,995)**
Net income (loss) for the period	**(5,343)**	**(12,403)**	**-**	**(40,949)**	**(58,695)**
Reportable segment assets					
Inventories	32	14,334	-	-	14,366
Biological Assets	3,228	-	-	-	3,228
Property, plant and equipment	14,943	907,335	-	17,115	939,393
Intangible assets	15,025	232	-	12,683	27,940
Reportable segment liabilities					
Loans and borrowings	10,716	468,525	-	114,428	593,669
Trade and other payables	122	4,696	-	1,495	6,313

	2017				
	BioVertis	**BioFlex**	**Biotech**	**Other**	**Total**
Revenue from goods sold	1,693	23,944	-	-	25,637
Cost of goods sold	(3,640)	(32,170)	-	-	(35,810)
Gross profit	**(1,947)**	**(8,226)**	**-**	**-**	**(10,173)**
Operating income and (expenses)					
Administrative expenses	(5,541)	(9,947)	-	(2,847)	(18,335)
Depreciation	(202)	(393)	-	(1,229)	(1,824)
Other income	(21)	(52,230)	-	(5,489)	(57,740)
Share of profit (loss) of equity-accounted investees	-	-	-	(2,145)	(2,145)
	(5,764)	(62,570)	-	(11,710)	(80,044)
Net income before financial income/expenses	**(7,711)**	**(70,796)**	**-**	**(11,710)**	**(90,217)**
Finance income	627	1,298	-	16,826	18,751
Finance expenses	(1,008)	(237)	-	(11,314)	(12,559)
Net finance expenses	**(381)**	**1,061**	**-**	**5,512**	**6,192**
Net income (loss) for the period	**(8,091)**	**(69,735)**	**-**	**(6,198)**	**(84,024)**
Reportable segment assets					
Inventories	45	6,526	-	185	6,571
Biological assets	1,236	-	-	-	1,236
Property, plant and equipment	16,986	973,994	-	27,873	996,451
Intangible assets	12,830	345	-	12,886	26,061
Reportable segment liabilities					
Loans and borrowings	12,457	452,095	-	113,729	578,281
Trade and other payables	-	-	-	-	-

Main clients

In 2019, the main revenues were for these clients: CESM referring to the BioFlex segment, representing 57% of net revenue and DPI LLC in the United States referring to the Biotech segment, representing 27% of net revenue. In 2018, revenues were 100% for CESM (93% for this same Joint Venture in 2017).

32 Earnings per share

Basic: the basic calculation of earnings per share is done by dividing the profit or loss for the year, attributed to the holders of the parent company's common shares, by the weighted average number of common shares available during the years.

Diluted: diluted earnings per share is calculated by adjusting the weighted average number of common shares outstanding for all potential common shares with dilutive effects. The Company does not currently have any potential common shares,

The table below provides data on earnings and the shares used in calculating basic and diluted earnings per share, which are identical:

	2019	2018	2017
Profit (loss) for the year	**78,565**	**(58,695)**	**(84,024)**
Weighted average number of common shares (thousand)	100,221	100,221	100,221
Basic and diluted earnings per lot of thousand shares, (in Reais)	**0.7839**	**(0.5857)**	**(0.8384)**

33 Insurance

As of December 31, 2019, the Company and its subsidiaries have the following insurance contracts and amounts considered compatible by management with the risks involved:

Plant and inventory (approximate coverage - R$ 445.000)

- **Civil liability:** coverage for material and personal damages caused involuntarily to third parties as a result of the production, facilities and assemblies taking place on the insured site;

Administrative (approximate coverage - R$ 41,000)

- **Administrative head office**: fire, lightning strike, explosion, theft, qualified theft, civil liability and others.

Given their nature and specific features, the risk assumptions made and the respective coverage are not covered by a financial statements review, and were not therefore reviewed by our independent auditors.

34 Subsequent events

Corporate Acts

A subrogated payment receipt was issued on February 17, 2020, in which the Company represents that had received R$ 23,123 from the shareholder GranInvestimentos S.A. debited from the funds already advanced by the shareholder and not returned by the Company, as payment of the balance of common shares issued by the Company and subscribed on April 30, 2013 by BNDES Participações S.A. and not paid in by it, thus fully operating the conventional subrogation of GranInvestimentos S.A. As of December 31, 2019, this R$ 23,123 is presented in Other credits receivable in non-current assets.

A subscription bulletin was issued on February 18, 2020 by which the Company represents it had received R$ 77,662 from the shareholder GranInvestimentos S.A. debited from the funds already advanced by the shareholder and not returned by the Company, as payment of the balance of 7,503,574 common shares at the issuance price of R$ 10.35, as resolved by the Company's Extraordinary General Meeting held on December 30, 2019.

By the Extraordinary General Meeting, held on February 18, 2020, the shareholders approved the cancellation of the future subscription of share capital that had been resolved in the Extraordinary General Meeting on December 30, 2019. Only the amount of R $ 77,662 commented on in the previous paragraph was approved.

The Impacts of COVID 19 (Coronavirus) on Company business

On January 31, 2020 the World Health Organization (WHO) announced that the novel coronavirus (COVID-19) pandemic had become a global health emergency. On March 11, 2020, WHO declared that the outbreak was a global pandemic. The outbreak has led governments and private sector entities to make impactful decisions, which coupled with the outbreak's potential have escalated uncertainty amongst economic agents and could have material impacts on our financial statements.

As disclosed in note 28 about market risks, we are exposed to US dollar exchange variance because of the investments in overseas subsidiaries of USD 23 million as of December 31, 2019. The possible impacts of our exposure to US dollar variance will be reflected in the item asset and liability valuation adjustments in Other comprehensive income and Investments.

Management is continuously monitoring the outbreak's impacts on our operations and the Company's equity and financial position, in order to take appropriate measures to mitigate the impacts and financial statements. The following measures had been taken by the date the issuance of these financial statements was authorized:

- Renegotiations of contracts with suppliers in order to align the acquisition of consumables with production based on the expected demand for the Company's products in light of the current post COVID-19 reality.
- Implementation of temporary staff adjustment measures, in order to preserve cash, such as suspending recruitments and implementing an unremunerated leave program; and
- Rescheduling the maturities of the Group's loans and financing with financial institutions and supplier payments in order to mitigate any liquidity risks.

New Chief Executive Officer

In December 2019 Paulo Eduardo Nigro was invited to take a seat on the Company's Board of Directors. In February 2020, Paulo was invited by the Board of Directors to assume the position of Chief Executive Officer, in a process of planned succession in which the founding family ceased to have participation in the Company's management. The executive will have the task of accelerating the business plan defined for the Company, seeking to consolidate it as a technology supplier for biomass conversion processes and producer of high value-added chemical specialties.

Renegotiated loans and borrowings

On April 06, 2020 the Company and its subsidiary BioFlex Agroindustrial S.A. entered the Memorandum of Understanding with Itaú Unibanco S.A. and its shareholder GranInvestimentos S.A. Under the memorandum the Company and BioFlex consent to (i) the partial assumption of nonconvertible debentures issued by BioFlex Agroindustrial S.A. by the Company's indirect controlling shareholders; (ii) cancellation of certain surety contracts, by which Itaú Unibanco S.A. secures the payment of certain loan contracts of the Company; and (iii) inclusion of new guarantees in the bank guarantee contracts provided by Itaú Unibanco to the Company and its subsidiaries.

On May 05, 2020, Banco do Nordeste do Brasil S.A unilaterally awarded the subsidiary BioFlex Agroindustrial S.A. a temporary suspension on the payment of principal and interest of the financing amounting R$ 123,531 until January 2021.

On July 15, 2020 the Company and its subsidiary BioFlex Agroindustrial S.A. entered the 5th amendment to the financing contract consisting of credit facility 13.2.0418.1 with the National Bank for Economic and Social Development - BNDES. This amendment was made to (i) change the interest charged on Subcredits “A”, “B”, “C” and “D”; (ii) temporarily suspend the payment of principal and interest for sub- credits “A” to “J” for the period of 6 months as from signing the amendment and (iii) ratifying the guarantees established in the credit instrument.

On August 07, 2020 the Company signed a financing contract with a group of individual investors worth R$15 million, in order to finance activities involved in the process of structuring the public share offering to be made by the company. This contract involved submitting security via a statutory lien for the production of cellulose ethanol in the 2020/2021 harvest up to the limit of 120% of the loan amount

On August 20, 2020 the GranBio signed the refinancing with FINEP in the total amount of R$ 116,200, extending the maturity to 2029 (102 months).

Strategic partnership for licensing cellulose ethanol technology

The Company recently restructured its business model to license its knowledge and offers technological assistance to customers and partners in joint ventures in the production and processing of biomass in cellulose sugar, second generation ethanol, 2G biochemicals and nanocellulose.

By way of its indirect subsidiary American Green+ LLC, on July 31, 2020 the Company entered into a strategic partnership with NextChem, a subsidiary of Italian conglomerate Maire Tecnimont, to license this technology worldwide.

The partnership combines the Company's technology and know-how in transforming biomass into second-generation biofuels with NextChem's engineering expertise to offer integrated services, feasibility studies, integration projects, and the engineering and construction of industrial plants worldwide.

The partnership involves selling a license to produce cellulose ethanol, to be partly paid for in cash and partly in the form of engineering services.

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Members of the Executive Board

Paulo Eduardo Nigro
CEO

Guilherme Mottin Refinetti
CFO

Carlos Arruti Rey Legal
Officer

Erli Lopes de Camargo Junior
Accountant
CRC:1SP-289.324/O-8