

Vale S.A.  
Form 6-K  
February 23, 2017  
[Table of Contents](#)

**United States  
Securities and Exchange Commission**

Washington, D.C. 20549

**FORM 6-K**

**Report of Foreign Private Issuer  
Pursuant to Rule 13a-16 or 15d-16  
of the  
Securities Exchange Act of 1934**

**For the month of**

**February, 2017**

**Vale S.A.**

**Avenida das Américas, No. 700  
22640-100 Rio de Janeiro, RJ, Brazil**

(Address of principal executive office)

Indicate by check mark whether the registrant files or will file annual reports under cover of Form 20-F or Form 40-F.

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(Check One) Form 20-F  Form 40-F

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(1)

(Check One) Yes  No

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(7)

(Check One) Yes  No

Indicate by check mark whether the registrant by furnishing the information contained in this Form is also thereby furnishing information to the Commission pursuant to Rule 12g3-2(b) under the Securities Exchange Act of 1934.

(Check One) Yes  No

If  Yes is marked, indicate below the file number assigned to the registrant in connection with Rule 12g3-2(b). 82- .

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Table of Contents

**Financial Statements**

**December 31, 2016**

BRGAAP in R\$ (English)

Table of Contents

**Vale S.A. Financial Statements**

**Contents**

	<b>Page</b>
<u>Report of independent registered public accounting firm</u>	3
<u>Consolidated and Parent Company Income Statement</u>	12
<u>Consolidated and Parent Company Statement of Comprehensive Income</u>	13
<u>Consolidated and Parent Company Statement of Cash Flows</u>	14
<u>Consolidated and Parent Company Statement of Financial Position</u>	15
<u>Statement of Changes in Equity</u>	16
<u>Consolidated and Parent Company Value Added Statement</u>	17
<u>Notes to the Financial Statements</u>	18
<u>1. Corporate information</u>	18
<u>2. Basis for preparation of the financial statements</u>	18
<u>3. Information by business segment and by geographic area</u>	21
<u>4. Special events occurred during the year</u>	26
<u>5. Costs and expenses by nature</u>	27
<u>6. Financial results</u>	28
<u>7. Deferred revenue - Gold stream transaction</u>	28
<u>8. Income taxes</u>	29
<u>9. Basic and diluted earnings (loss) per share</u>	31
<u>10. Accounts receivable</u>	32
<u>11. Inventories</u>	32
<u>12. Recoverable taxes</u>	33
<u>13. Other financial assets and liabilities</u>	33
<u>14. Non-current assets and liabilities held for sale and discontinued operations</u>	34
<u>15. Investments</u>	36
<u>16. Noncontrolling interest</u>	40
<u>17. Intangibles</u>	41
<u>18. Property, plant and equipment</u>	42
<u>19. Impairment and onerous contracts</u>	45
<u>20. Loans, borrowings and cash and cash equivalents</u>	47
<u>21. Liabilities related to associates and joint ventures</u>	50
<u>22. Risk management</u>	54
<u>23. Financial instruments classification</u>	56
<u>24. Fair value estimate</u>	59
<u>25. Derivative financial instruments</u>	61
<u>26. Provisions</u>	68
<u>27. Asset retirement obligations</u>	68
<u>28. Litigation</u>	69
<u>29. Employee benefits</u>	71
<u>30. Stockholders' equity</u>	79
<u>31. Related parties</u>	83
<u>32. Commitments</u>	86
<u>33. Additional information about derivatives financial instruments</u>	88
<u>Members of the Board of Directors, Fiscal Council, Advisory Committees and Executive Officers</u>	92



Table of Contents

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**Independent auditor's report on the financial statements**

(A free translation of the original report in Portuguese as published in Brazil containing financial statement prepared in accordance with accounting practices adopted in Brazil and rules of the International Financial Reporting Standards - IFRS)

To

The Stockholders, Counselors and Management of

Vale S.A.

Rio de Janeiro - RJ

**Opinion**

We have audited the individual and consolidated financial statements of Vale S.A. ( the Company ), identified as Parent Company and Consolidated, respectively, which comprise the individual and consolidated balance sheet as of December 31, 2016, the statements of income, comprehensive income, changes in equity and cash flows for the year then ended, and notes comprising significant accounting policies and other explanatory information.

In our opinion, the aforementioned financial statements present fairly, in all material respects, the individual and consolidated financial position of Vale S.A. as of December 31, 2016, and of its individual and consolidated financial performance and its individual and consolidated cash flows for the year then ended in accordance with accounting practices adopted in Brazil and in accordance with International Financial Reporting Standards (IFRS), as issued by the International Accounting Standards Board - IASB.

**Basis for Opinion**

We conducted our audit in accordance with Brazilian and International Standards on Auditing. Our responsibilities under those standards are further described in the *Auditors' Responsibilities for the Audit of the individual and consolidated Financial Statements* section of our report. We are independent of the Company and its subsidiaries in accordance with the ethical requirements of Ethics Standards Boards for Accountants and Professional Standard issued by Federal Accounting Council, and we have fulfilled our other 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 opinion.

**Key Audit Matters**

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

Table of Contents

**1 Impairment Individual and consolidated financial statements**

As per Notes 17,18 and 19 to the financial statements

**Matter**

The assessment with respect to the recoverability of property, plant and equipment ( PP&E ), intangible assets and goodwill, and definition of Cash-Generating Units (CGUs) encompasses significant judgments concerning factors related to the level of future production, commodities price, production cost and economic assumptions such as discount rates, inflation rates and exchange rates of the countries where the Company operates. Due to the materiality of PP&E, intangible assets and goodwill, and to the level of uncertainty for determining the related impairment, which may impact the value of those assets in the consolidated financial statements and the value of the investment recorded under the equity method pick-up in the parent company's financial statements, we considered this subject as a significant matter for the audit.

**Procedures Performed**

Our procedures included, among others, the following ones:

- Design, implementation and operating effectiveness testing of the internal control on the valuation of the Company's assets, including those aimed at identifying the need for recording or reversing impairment;
- Assessment of the Company's assumptions and estimates to determine the recoverable value of its assets, including the ones related to production, production cost, capital investments, discount rates and exchange rates;
- Assessment of the definition and identification criteria for Cash-Generating Units (CGUs);
- Assessment, with the support of our specialists in economic and financial assumptions, of the cash flow forecast, reasonableness and consistency of the assumptions used in the preparation of the cash flow forecasts and comparison of those assumptions with market information. Based on our knowledge of the Company and Industry, preparation of sensitivity analysis;
- Arithmetic checking of the economic models regarding future cash flows and forecast results, combining them with accounting information and management reports and approved business plans; and



- Appropriateness assessment of the disclosure in relation to the testing of the value in use and the comparison of the latter with the fair value, net of costs to sell, in the applicable cases.

Table of Contents

**2 Asset Retirement Obligation (ARO) Individual and consolidated financial statements**

As per Notes 26 and 27 to the financial statements

**Matter**

As a result of its operations, the Company incurs in obligations to restore and rehabilitate the environment on retiring the areas. The areas and environment rehabilitation is required by the combination of both the legislation in force and the Company's policies. Estimating costs related to those future activities requires considerable judgement in relation to factors such as how long a certain area will be used, the time required to rehabilitate and certain economic assumptions such as the discount rate and foreign currency exchange rates. Due to the relevance of the asset retirement obligation and the level of uncertainty for the determination of its estimate, which may impact the amount of this provision in the consolidated financial statements and the amount of the investment recorded under the equity method pick-up in the financial statements of the parent company, We consider this subject as a significant matter for the audit

***Procedures Performed***

Our procedures included, among others, the following ones:

- Design, implementation and operating effectiveness testing of the internal control related to the determination of estimates for the asset retirement obligation provision to restore and rehabilitate areas commercially exploited by the Company;
- Analysis of assumptions used, including the base cost of the areas to be left, inflation rates, discount rates and risk rates;
- Analysis of the provision movement for the year related to the retired, restored/rehabilitated areas, and the relevant environmental obligation, aiming at verifying the primary inputs such as costs, inflation and discount rates, as well as an approved retirement plan; and
- Appropriateness assessment of the disclosure in relation to the obligations to rehabilitate the environment on retiring the areas.

Table of Contents

**3 Income taxes Individual and consolidated financial statements**

As per Notes 8 to the financial statements.

**Matter**

The Company has operations in various countries, each one with its own taxation regime. The nature of the Company's activities triggers various tax liabilities, including tax on income, social contributions, royalties and taxes on revenue. The nature of the Company's commodities export operations also create complexities related to international transfer pricing issues. Applying tax legislation is a complex and highly specialized activity, which requires judgement for the assessment of tax exposure estimates and for quantification of contingent liabilities. Due to the level of uncertainty and judgment involved in determining this estimate that may impact the amount recorded in the consolidated financial statements and the amount of the investment recorded under the equity method pick-up in the parent company's financial statements, we consider this subject as a significant matter for the audit.

***Procedures Performed***

Our procedures included, among others, the following ones:

- Design, implementation and operating effectiveness testing of the internal control related to the determination of estimates for recording the amounts of provisions for taxes payable and taxes to offset by the Company;
- With the help of our specialists from the tax department, we assess the criteria used for determining and paying taxes, and the assumptions used by the Company to determine the provisions and amounts disclosed as tax exposure and contingencies;
- We compare the assumptions used by the Company with the tax legislation applicable to each jurisdiction, and in relation to market practices and assessments performed by ourselves, based on our knowledge of and experience in the Company's operations in the use of the aforementioned legislation and on applicable precedents and sentences; and
- Assessment of the appropriateness of the Company's disclosures, particularly disclosures regarding current and deferred taxes and possible tax exposure.

Table of Contents

**4 Provision for litigation and disclosure of contingent liabilities - Individual and consolidated financial statements**

As per Note 28 to the financial statements

**Matter**

The Company is a party (as defendant) to various litigation of tax, civil and labor nature deriving from the ordinary course of its activities. The measurement, accounting recognition of a provision, and the disclosure of Provisions and Contingent Liabilities, related to the aforementioned litigation, require judgement from the Company's professionals and from its legal advisors with respect to the integrity of the existing cases, the appropriateness of the provisions recorded and their corresponding disclosures. Due to the materiality, complexity and judgement involved in the assessment and measurement of the Provisions and Contingent Liabilities, which may impact the amount recorded in the consolidated financial statements and the amount of the investment recorded under the equity method pick-up in the financial statements of the parent company, we consider this subject as a significant matter for the audit.

***Performed Procedures***

Our procedures included, among others, the following ones:

- Design, implementation and operating effectiveness testing of the internal control related to the determination of estimates for recording the amounts in accordance with the loss prognosis for the lawsuits;
- Assessment of the sufficiency of provisions recognized and contingency amounts disclosed, by means of analysis of criteria and assumptions used for measuring amounts recorded as provision and/or amounts disclosed, and took into account the assessments prepared by the Company's internal and external legal advisors, and comparison with the existing precedents;
- Assess the analysis of chances of loss regarding existing documentation and information related to the principal proceedings and complaints involving the Company through external confirmation of balances with external legal advisors;
- Assessment of the appropriateness of the Company's disclosures in relation to lawsuits provided for and those lawsuits with a possible loss prognosis.

Table of Contents

**5 Financial Instruments Individual and consolidated financial statements**

As per Note 23, 24 and 25 to the financial statements.

**Matter**

The Company contracts financial instruments which much be measured and assessed at their fair value - including derivative financial instruments, forward operations, swap operations, futures operations and zero cost-collars - as a strategy to hedge equity. Estimating the fair value of financial instruments not traded on active markets requires considerable judgement from the Company when determining prices or parameters and assumptions such as the classification of fair value hierarchy, discount rates for calculating present value, taking the existing market conditions into account as of the reporting date. Due to the materiality, complexity and judgement involved in assessing and measuring the financial instruments, whether derivative financial instruments or not, which may impact the amount recorded in the consolidated financial statements and the amount of the investment recorded under the equity method pick-up in the financial statements of the parent company, we consider this subject as a significant matter for the audit.

***Performed Procedures***

Our procedures included, among others, the following ones:

- Design, implementation and operating effectiveness testing of the internal control related to the process of identifying and valuing financial instruments;
- We tested the models developed by the Company, with the help of our specialists in financial instruments, to determine fair values and reasonableness of data, parameters and information included in the pricing models used, recalculated the amount of operations, and compared the assumptions used to determine fair values with similar operations performed in the marketplace; and
- Assessment of the appropriateness of the Company's disclosures, regarding sensitivity analyses, interest rate risk and foreign exchange risk, and the classification of instruments, among others.

**Other Information Statement of Added Value**

The individual and consolidated statements of value added (DVA) for the year ended December 31, 2016, prepared under the responsibility of the Company's management, and presented as supplementary information for IFRS purposes, was submitted for the auditing procedures jointly with audit of the Company's financial statements. For the purposes of forming our opinion, we evaluate whether these statements are reconciled with the financial statements and accounting records, as applicable, and if their form and content are in accordance with the criteria as defined in Technical Pronouncement CPC 09 - Statement of Added Value. In our opinion, this statement of value added have been properly prepared, in all material respects, in accordance with the criteria defined in this Technical Pronouncement and is consistent with the individual and consolidated financial statements taken as a whole.



Table of Contents

**Other information accompanying the individual and consolidated financial statements and the auditor's report**

Management is responsible for the other information, which comprises the Management report.

Our opinion on the individual and consolidated financial statements does not cover the other information and we do not express any form of assurance conclusion thereon.

In connection with our audit of the individual and consolidated financial statements, our responsibility is to read the Management Report and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated. If, based on the work we have performed, we conclude that there is a material misstatement of this Management Report, we are required to report that fact. We have nothing to report regarding this matter.

**Responsibilities of management and those charged with governance for the individual and consolidated financial statements**

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

In preparing the individual 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 or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Company's financial reporting process.

**Auditors' responsibilities for the audit of the individual and consolidated financial statements**

Our objectives are to obtain reasonable assurance about whether the individual and consolidated financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's 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 and International Standards on Auditing will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these individual and consolidated financial statements.





Table of Contents

As part of an audit in accordance with Brazilian and International Standards on Auditing, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the individual 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's 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's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditors' report to the related disclosures in the individual 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 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 individual 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 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 those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.



Table of Contents

We also provide those charged with governance with a statement that we have complied with relevant ethical requirements regarding independence, and communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with those charged with governance, 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.

Rio de Janeiro, February 22, 2017

/s/ KPMG Auditores Independentes

KPMG Auditores Independentes

CRC SP-014428/O-6 F-RJ

/s/ Manuel Fernandes Rodrigues de Sousa

Manuel Fernandes Rodrigues de Sousa

Accountant CRC-RJ-052428/O-2

Table of Contents**Income Statement**

In millions of Brazilian Reais, except earnings per share data

	Notes	Year ended December 31				
		2016	Consolidated 2015	2014	Parent Company 2016	2015
<b>Continuing operations</b>						
Net operating revenue	3(d)	94,633	78,057	82,619	46,424	42,560
Cost of goods sold and services rendered	5(a)	(61,143)	(62,780)	(53,773)	(29,663)	(27,522)
<b>Gross profit</b>		<b>33,490</b>	<b>15,277</b>	<b>28,846</b>	<b>16,761</b>	<b>15,038</b>
<b>Operating (expenses) income</b>						
Selling and administrative expenses	5(b)	(1,755)	(2,009)	(2,452)	(1,021)	(1,141)
Research and evaluation expenses		(1,098)	(1,326)	(1,568)	(677)	(767)
Pre operating and operational stoppage		(1,570)	(3,127)	(2,299)	(684)	(618)
Equity results from subsidiaries	15				1,493	(35,338)
Other operating income (expenses), net	5(c)	(937)	(588)	(2,477)	(1,166)	72
		<b>(5,360)</b>	<b>(7,050)</b>	<b>(8,796)</b>	<b>(2,055)</b>	<b>(37,792)</b>
Impairment of non-current assets and onerous contracts	19	(3,940)	(33,945)	87	205	270
Results on measurement or sale of non-current assets	14	(228)	52	(441)		546
<b>Operating income (loss)</b>		<b>23,962</b>	<b>(25,666)</b>	<b>19,696</b>	<b>14,911</b>	<b>(21,938)</b>
Financial income	6	27,657	25,968	8,514	25,656	25,822
Financial expenses	6	(21,355)	(62,021)	(23,140)	(19,900)	(56,950)
Equity results in associates and joint ventures	15	1,111	(1,526)	1,131	1,111	(1,526)
Impairment and other results in associates and joint ventures	15, 19 and 21	(4,353)	(1,431)	(139)	(4,233)	(455)
<b>Net income (loss) before income taxes</b>		<b>27,022</b>	<b>(64,676)</b>	<b>6,062</b>	<b>17,545</b>	<b>(55,047)</b>
<b>Income taxes</b>						
	8					
Current tax		(3,307)	(1,148)	(2,376)	(2,186)	18
Deferred tax		(6,260)	20,487	(1,282)	(2,048)	10,816
		<b>(9,567)</b>	<b>19,339</b>	<b>(3,658)</b>	<b>(4,234)</b>	<b>10,834</b>
<b>Net income (loss) from continuing operations</b>		<b>17,455</b>	<b>(45,337)</b>	<b>2,404</b>	<b>13,311</b>	<b>(44,213)</b>
Loss attributable to noncontrolling interests		(6)	(1,815)	(749)		

<b>Net income (loss) from continuing operations attributable to Vale's stockholders</b>		<b>17,461</b>	<b>(43,522)</b>	<b>3,153</b>	<b>13,311</b>	<b>(44,213)</b>
<b>Discontinued operations</b>	14					
Loss from discontinued operations		(4,159)	(660)	(2,185)		
Income (loss) attributable to noncontrolling interests		(9)	31	14		
<b>Loss from discontinued operations attributable to Vale's stockholders</b>		<b>(4,150)</b>	<b>(691)</b>	<b>(2,199)</b>		
<b>Net income (loss)</b>		<b>13,296</b>	<b>(45,997)</b>	<b>219</b>	<b>13,311</b>	<b>(44,213)</b>
Loss attributable to noncontrolling interests		(15)	(1,784)	(735)		
<b>Net income (loss) attributable to Vale's stockholders</b>		<b>13,311</b>	<b>(44,213)</b>	<b>954</b>	<b>13,311</b>	<b>(44,213)</b>
<b>Earnings (loss) per share attributable to Vale's stockholders:</b>						
<b>Basic and diluted earnings (loss) per share:</b>	9					
Preferred share (R\$)		2.58	(8.58)	0.19	2.58	(8.58)
Common share (R\$)		2.58	(8.58)	0.19	2.58	(8.58)

The accompanying notes are an integral part of these financial statements.

Table of Contents

## Statement of Comprehensive Income

In millions of Brazilian Reais

	Year ended December 31				
	2016	Consolidated 2015	2014	Parent Company 2016	2015
<b>Net income (loss)</b>	<b>13,296</b>	<b>(45,997)</b>	<b>219</b>	<b>13,311</b>	<b>(44,213)</b>
<b>Other comprehensive income (loss):</b>					
<b>Items that will not be reclassified subsequently to the income statement</b>					
<b>Retirement benefit obligations</b>					
Gross balance for the year	(419)	261	(661)	(163)	(136)
Effect of taxes	153	(4)	204	55	46
Equity results in associates and joint ventures, net of taxes			4	(155)	350
	<b>(266)</b>	<b>257</b>	<b>(453)</b>	<b>(263)</b>	<b>260</b>
<b>Total items that will not be reclassified subsequently to the income statement</b>	<b>(266)</b>	<b>257</b>	<b>(453)</b>	<b>(263)</b>	<b>260</b>
<b>Items that may be reclassified subsequently to the income statement</b>					
<b>Cumulative translation adjustments</b>					
Gross balance for the year	(13,879)	32,444	8,771	(13,283)	34,409
Effect of taxes	(309)	3,500			
Transfer of realized results to net income	(266)			(266)	
	<b>(14,454)</b>	<b>35,944</b>	<b>8,771</b>	<b>(13,549)</b>	<b>34,409</b>
<b>Available-for-sale financial instruments</b>					
Gross balance for the year	4	2	(8)		
Equity results from associates and joint ventures, net taxes				4	2
Transfer of realized results to net income, net of taxes			8		
	<b>4</b>	<b>2</b>		<b>4</b>	<b>2</b>
<b>Cash flow hedge</b>					
Gross balance for the year	23	2,655	(731)		
Effect of taxes	(3)	(23)	(6)		
Equity results in associates and joint ventures	16	(17)	(4)	26	1,458
Transfer of realized results to net income, net of taxes	(10)	(1,157)	(303)		
	<b>26</b>	<b>1,458</b>	<b>(1,044)</b>	<b>26</b>	<b>1,458</b>
<b>Total of items that may be reclassified subsequently to the income statement</b>	<b>(14,424)</b>	<b>37,404</b>	<b>7,727</b>	<b>(13,519)</b>	<b>35,869</b>
<b>Total comprehensive income (loss)</b>	<b>(1,394)</b>	<b>(8,336)</b>	<b>7,493</b>	<b>(471)</b>	<b>(8,084)</b>

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Comprehensive income (loss) attributable to noncontrolling interests	(923)	(252)	(444)
<b>Comprehensive income (loss) attributable to Vale's stockholders</b>	<b>(471)</b>	<b>(8,084)</b>	<b>7,937</b>

The accompanying notes are an integral part of these financial statements.

Table of Contents**Statement of Cash Flows**

In millions of Brazilian Reais

	Year ended December 31				
	2016	Consolidated 2015	2014	Parent Company 2016      2015	
<b>Cash flow from operating activities:</b>					
Net income (loss) before income taxes from continuing operations	27,022	(64,676)	6,062	17,545	(55,047)
<b>Continuing operations adjustments for:</b>					
Equity results in associates and joint ventures	(1,111)	1,526	(1,131)	(2,604)	36,864
Results on measurement or sale of non-current assets	(253)	(479)	673		(546)
Impairment and others results in associates and joint ventures	4,353	1,431	139	4,233	455
Impairment of non-current assets and onerous contracts	3,940	33,945	(87)	(205)	(270)
Depreciation, amortization and depletion	12,107	12,450	9,128	5,209	4,578
Financial results, net	(6,302)	36,053	14,626	(5,756)	31,128
<b>Changes in assets and liabilities:</b>					
Accounts receivable	(9,863)	5,212	5,360	4,503	6,404
Inventories	616	(749)	(1,477)	(135)	228
Suppliers and contractors	768	2,143	2,289	243	1,550
Payroll and related charges	435	(1,713)	(293)	714	(1,317)
Other taxes assets and liabilities, net	(371)	(687)	(633)	(227)	(79)
Deferred revenue - Gold stream (note 7)	1,683	1,670			
Other assets and liabilities, net	2,706	(469)	(524)	(1,923)	(1,021)
<b>Cash provided from operations</b>	<b>35,730</b>	<b>25,657</b>	<b>34,132</b>	<b>21,597</b>	<b>22,927</b>
Interest on loans and borrowings paid	(5,894)	(4,812)	(3,515)	(5,905)	(4,756)
Derivatives received (paid), net (note 25)	(5,604)	(3,771)	(521)	(2,215)	(769)
Interest on participative stockholders debentures paid	(268)	(209)	(280)	(268)	(209)
Income taxes	(1,401)	(1,790)	(1,149)	(69)	(58)
Income taxes - Settlement program	(1,426)	(1,284)	(1,161)	(1,397)	(1,257)
<b>Net cash provided by operating activities from continuing operations</b>	<b>21,137</b>	<b>13,791</b>	<b>27,506</b>	<b>11,743</b>	<b>15,878</b>
Net cash provided by operating activities from discontinued operations	498	1,928	286		
<b>Net cash provided by operating activities</b>	<b>21,635</b>	<b>15,719</b>	<b>27,792</b>	<b>11,743</b>	<b>15,878</b>
<b>Cash flow from investing activities continuing:</b>					
Financial investments redeemed (invested)	45	932	(392)	15	373
	(698)	(34)	781	(286)	160



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Loans and advances - net receipts (payments)					
Guarantees and deposits - net receipts (payments)	(141)	(246)	199	(127)	(197)
Additions to investments	(875)	(332)	(632)	(1,918)	(5,330)
Additions to property, plant and equipment and intangible (note 3(b))	(17,343)	(26,931)	(26,254)	(11,494)	(16,094)
Dividends and interest on capital received from associates and joint ventures	669	1,064	1,302	1,591	881
Proceeds from disposal of assets and investments	1,785	5,211	2,597	169	4,366
Proceeds from gold stream transaction	885	1,156			
<b>Net cash used in investing activities from continuing operations</b>	<b>(15,673)</b>	<b>(19,180)</b>	<b>(22,399)</b>	<b>(12,050)</b>	<b>(15,841)</b>
Net cash used in investing activities from discontinued operations	(966)	(936)	39		
<b>Net cash used in investing activities</b>	<b>(16,639)</b>	<b>(20,116)</b>	<b>(22,360)</b>	<b>(12,050)</b>	<b>(15,841)</b>
<b>Cash flow from financing activities from continuing operations:</b>					
<b>Loans and borrowings (i)</b>					
Additions	25,667	16,603	5,947	18,094	19,571
Repayments	(26,630)	(9,949)	(4,515)	(16,264)	(14,749)
<b>Transactions with stockholders:</b>					
Dividends and interest on capital paid to Vale's stockholders	(857)	(5,026)	(9,739)	(857)	(5,026)
Dividends and interest on capital paid to noncontrolling interest	(972)	(46)	(164)		
Transactions with noncontrolling stockholders	(69)	3,875		19	
<b>Net cash provided by (used in) financing activities from continuing operations</b>	<b>(2,861)</b>	<b>5,457</b>	<b>(8,471)</b>	<b>992</b>	<b>(204)</b>
Net cash provided by (used in) financing activities from discontinuing operations	(59)	(207)	(163)		
<b>Net cash provided by (used in) financing activities</b>	<b>(2,920)</b>	<b>5,250</b>	<b>(8,634)</b>	<b>992</b>	<b>(204)</b>
<b>Increase (decrease) in cash and cash equivalents</b>					
<b>Cash and cash equivalents in the beginning of the year</b>	<b>14,022</b>	<b>10,555</b>	<b>12,465</b>	<b>518</b>	<b>685</b>
Effect of exchange rate changes on cash and cash equivalents	(2,207)	2,614	1,292		
<b>Cash and cash equivalents at end of the year</b>	<b>13,891</b>	<b>14,022</b>	<b>10,555</b>	<b>1,203</b>	<b>518</b>
<b>Non-cash transactions:</b>					
Additions to property, plant and equipment - capitalized loans and borrowing costs	2,291	2,531	1,387	1,679	1,258

(i) Includes transactions with related parties: Bradesco, Banco do Brasil and Banco Nacional do Desenvolvimento Econômico e Social - BNDES.

The accompanying notes are an integral part of these financial statements.



Table of Contents**Statement of Financial Position**

In millions of Brazilian Reais

	Notes	Consolidated December 31, 2016	Consolidated December 31, 2015	Parent Company December 31, 2016	Parent Company December 31, 2015
<b>Assets</b>					
<b>Current assets</b>					
Cash and cash equivalents	20	13,891	14,022	1,203	518
Accounts receivable	10	11,937	5,763	26,223	36,026
Other financial assets	13	1,184	856	1,231	1,048
Inventories	11	10,913	13,775	3,982	3,830
Prepaid income taxes		518	3,513	312	3,176
Recoverable taxes	12	5,296	5,482	3,962	3,352
Others		1,814	1,215	594	581
		<b>45,553</b>	<b>44,626</b>	<b>37,507</b>	<b>48,531</b>
Non-current assets held for sale	14	27,994	15,792	8,936	
		<b>73,547</b>	<b>60,418</b>	<b>46,443</b>	<b>48,531</b>
<b>Non-current assets</b>					
Judicial deposits	28(c)	3,135	3,445	2,681	2,707
Other financial assets	13	2,046	1,100	2,178	1,867
Prepaid income taxes		1,718	1,840		
Recoverable taxes	12	2,368	1,956	2,223	1,457
Deferred income taxes	8(a)	23,931	30,867	15,299	17,292
Others		894	2,392	618	765
		<b>34,092</b>	<b>41,600</b>	<b>22,999</b>	<b>24,088</b>
Investments	15	12,046	11,481	107,539	127,517
Intangibles	17	22,395	20,789	11,314	8,557
Property, plant and equipment	18	180,616	211,259	102,056	96,887
		<b>249,149</b>	<b>285,129</b>	<b>243,908</b>	<b>257,049</b>
<b>Total assets</b>		<b>322,696</b>	<b>345,547</b>	<b>290,351</b>	<b>305,580</b>
<b>Liabilities</b>					
<b>Current liabilities</b>					
Suppliers and contractors		11,830	13,140	6,743	7,084
Loans and borrowings	20	5,410	9,788	4,171	4,736
Other financial liabilities	13	3,539	9,963	10,845	10,333
Taxes payable		2,144	2,325	1,883	1,780
Provision for income taxes		556	943		
Liabilities related to associates and joint ventures	21	951		951	
Provisions	26	3,103	2,159	1,792	1,012
Dividends and interest on capital		2,602		2,602	
Others		2,921	2,448	914	774

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		<b>33,056</b>	<b>40,766</b>	<b>29,901</b>	<b>25,719</b>
Liabilities associated with non-current assets held for sale	14	3,554	416		
		<b>36,610</b>	<b>41,182</b>	<b>29,901</b>	<b>25,719</b>
<b>Non-current liabilities</b>					
Loans and borrowings	20	90,154	102,878	47,877	55,986
Other financial liabilities	13	6,932	8,298	59,681	70,469
Taxes payable		16,170	15,953	15,838	15,626
Deferred income taxes	8(a)	5,540	6,520		
Provisions	26	18,730	20,867	4,396	4,103
Liabilities related to associates and joint ventures	21	2,560		2,560	
Deferred revenue - Gold stream	7	6,811	6,830		
Others		5,487	3,600	2,857	2,517
		<b>152,384</b>	<b>164,946</b>	<b>133,209</b>	<b>148,701</b>
<b>Total liabilities</b>		<b>188,994</b>	<b>206,128</b>	<b>163,110</b>	<b>174,420</b>
<b>Stockholders equity</b>	30				
Equity attributable to Vale's stockholders		127,241	131,160	127,241	131,160
Equity attributable to noncontrolling interests		6,461	8,259		
<b>Total stockholders equity</b>		<b>133,702</b>	<b>139,419</b>	<b>127,241</b>	<b>131,160</b>
<b>Total liabilities and stockholders equity</b>		<b>322,696</b>	<b>345,547</b>	<b>290,351</b>	<b>305,580</b>

The accompanying notes are an integral part of these financial statements.

Table of Contents**Statement of Changes in Equity**

In millions of Brazilian Reais

	Share capital	Results on conversion of shares	Results from operation with noncontrolling interest	Profit reserves	Treasury stocks	Unrealized fair value gain (losses)	Cumulative translation adjustments	Retained earnings	Equity attributable to Vale s stockholders	Equity attributable to noncontrolling interests	Total stockholders equity
<b>Balance at December 31, 2013</b>	<b>75,000</b>	<b>50</b>	<b>(840)</b>	<b>69,262</b>	<b>(7,838)</b>	<b>(2,815)</b>	<b>15,527</b>		<b>148,346</b>	<b>3,775</b>	<b>152,121</b>
<b>Net income (loss)</b>								<b>954</b>	<b>954</b>	<b>(735)</b>	
<b>Other comprehensive income:</b>											
Retirement benefit obligations						(453)			(453)		(453)
Cash flow hedge Translation adjustments						(1,044)			(1,044)		(1,044)
						(241)	8,721		8,480	291	8,730
<b>Transactions with stockholders:</b>											
Dividends and interest on capital of Vale s stockholders								(9,739)	(9,739)		(9,739)
Dividends of noncontrolling interest										(18)	(18)
Acquisitions and disposal of participation of noncontrolling interest			(130)						(130)	(428)	(558)
Capitalization of noncontrolling interest advances										302	302
Capitalization of reserves	2,300			(2,300)							
Cancellation of treasury stock				(5,092)	5,092						
Realization of reserves				(8,994)				8,994			

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Appropriation to undistributed retained earnings			209			(209)					
<b>Balance at December 31, 2014</b>	<b>77,300</b>	<b>50</b>	<b>(970)</b>	<b>53,085</b>	<b>(2,746)</b>	<b>(4,553)</b>	<b>24,248</b>	<b>146,414</b>	<b>3,187</b>	<b>149,000</b>	<b>(45,000)</b>
<b>Loss</b>								<b>(44,213)</b>	<b>(44,213)</b>	<b>(1,784)</b>	<b>(45,000)</b>
<b>Other comprehensive income:</b>											
Retirement benefit obligations						260		260		(3)	(3)
Cash flow hedge Available-for-sale financial instruments						1,458		1,458			1,458
Translation adjustments						2		2			2
Transactions with stockholders:						(1,040)	35,449	34,409	1,535	35,449	35,449
Dividends and interest on capital of Vale's stockholders											(5,026)
Dividends of noncontrolling interest										(123)	(123)
Acquisitions and disposal of participation of noncontrolling interest						(911)	(1,233)	(2,144)	5,317	3,166	3,166
Capitalization of noncontrolling interest advances										130	130
Appropriation to undistributed retained earnings								44,213			44,213
<b>Balance at December 31, 2015</b>	<b>77,300</b>	<b>50</b>	<b>(1,881)</b>	<b>3,846</b>	<b>(2,746)</b>	<b>(3,873)</b>	<b>58,464</b>	<b>131,160</b>	<b>8,259</b>	<b>139,000</b>	<b>(13,000)</b>
<b>Net income (loss)</b>								<b>13,311</b>	<b>13,311</b>	<b>(15)</b>	<b>13,311</b>
<b>Other comprehensive income:</b>											
Retirement benefit obligations						(263)		(263)		(3)	(3)
Cash flow hedge Available-for-sale financial instruments						26		26			26
Translation adjustments						4		4			4
Transactions with stockholders:						367	(13,916)	(13,549)	(905)	(14,000)	(14,000)
Dividends and interest on capital								(3,459)	(3,459)		(3,459)

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of Vale's stockholders										
Acquisitions and disposal of participation of noncontrolling interest			11					11	(4)	
Dividends of noncontrolling interest									(961)	
Capitalization of noncontrolling interest advances									90	
Appropriation to undistributed retained earnings				9,852			(9,852)			
<b>Balance at December 31, 2016</b>	<b>77,300</b>	<b>50</b>	<b>(1,870)</b>	<b>13,698</b>	<b>(2,746)</b>	<b>(3,739)</b>	<b>44,548</b>	<b>127,241</b>	<b>6,461</b>	<b>133</b>

The accompanying notes are an integral part of these financial statements.

Table of Contents**Value Added Statement**

In millions of Brazilian Reais

	Year ended December 31			
	Consolidated		Parent Company	
Generation of value added from continuing operations	2016	2015	2016	2015
<b>Gross revenue</b>				
Revenue from products and services	95,915	79,422	47,173	43,296
Results on measurement or sale of non-current assets	(1,074)	348	(597)	601
Revenue from the construction of own assets	12,721	30,314	10,185	17,948
Allowance for doubtful accounts	(9)	46	(3)	(9)
Other revenues	1,459	1,894	387	569
<b>Less:</b>				
Acquisition of products	(1,758)	(2,527)	(821)	(684)
Material, service and maintenance	(29,819)	(43,128)	(19,328)	(25,850)
Oil and gas	(4,284)	(4,104)	(2,720)	(2,629)
Energy	(2,414)	(1,643)	(1,040)	(941)
Freight	(8,641)	(11,877)	(71)	
Impairment of non-current assets and others results	(7,447)	(35,672)	(3,431)	(240)
Other costs and expenses	(12,118)	(10,347)	(1,390)	(1,087)
<b>Gross value added</b>	<b>42,531</b>	<b>2,726</b>	<b>28,344</b>	<b>30,974</b>
Depreciation, amortization and depletion	(12,107)	(12,450)	(5,209)	(4,578)
<b>Net value added</b>	<b>30,424</b>	<b>(9,724)</b>	<b>23,135</b>	<b>26,396</b>
<b>Received from third parties</b>				
Equity results from entities	1,111	(1,526)	2,604	(36,864)
Financial income	606	4,730	345	3,377
Monetary and exchange variation of assets	(6,791)	11,988	(6,398)	12,828
<b>Total value added from continuing operations to be distributed</b>	<b>25,350</b>	<b>5,468</b>	<b>19,686</b>	<b>5,737</b>
Value added from discontinued operations to be distributed	2,439	3,930		
<b>Total value added to be distributed</b>	<b>27,789</b>	<b>9,398</b>	<b>19,686</b>	<b>5,737</b>
Personnel	7,699	9,004	3,082	4,573
Taxes and contributions	4,835	6,221	7,124	6,383
Current income tax	3,307	1,148	2,186	(18)
Deferred income tax	6,260	(20,487)	2,048	(10,816)
Financial expense (excludes capitalized interest)	10,169	16,796	9,987	11,050
Monetary and exchange variation of liabilities	(17,610)	37,097	(17,807)	36,282
Other remunerations of third party funds	(2,606)	1,686	(245)	2,496
Reinvested net income (absorbed loss)	13,311	(44,213)	13,311	(44,213)
Net income (loss) attributable to noncontrolling interest	(15)	(1,784)		
<b>Distributed value added from continuing operations</b>	<b>25,350</b>	<b>5,468</b>	<b>19,686</b>	<b>5,737</b>
Distributed value added from discontinued operations	2,439	3,930		
<b>Distributed value added</b>	<b>27,789</b>	<b>9,398</b>	<b>19,686</b>	<b>5,737</b>



The accompanying notes are an integral part of these financial statements.

Table of Contents

**Notes to the Financial Statements**

**Expressed in millions of Brazilian Reais, unless otherwise stated**

**1. Corporate information**

Vale S.A. (the Parent Company) is a public company headquartered at 700, Avenida das Américas, Rio de Janeiro, Brazil with securities traded on the stock exchanges of São Paulo - BM&F BOVESPA (Vale3 and Vale5), New York - NYSE (VALE and VALE.P), Paris - NYSE Euronext (Vale3 and Vale5) and Madrid - LATIBEX (XVALO and XVALP).

Vale and its direct and indirect subsidiaries (Vale, Group or Company) are global producers of iron ore and iron ore pellets, key raw materials for steelmaking, and producers of nickel, which is used to produce stainless steel and metal alloys employed in the production of several products. The Group also produces copper, metallurgical and thermal coal, potash, phosphates and other fertilizer nutrients, manganese ore, ferroalloys, platinum group metals, gold, silver and cobalt. The information by segment is presented in note 3.

**2. Basis for preparation of the financial statements**

**a) Statement of compliance**

The consolidated and individual financial statements of the Company (financial statements) have been prepared in accordance with the International Financial Reporting Standards (IFRS) as implemented in Brazil by the Brazilian Accountant Pronouncements Committee (CPC), approved by the Brazilian Securities Exchange Commission (CVM) and by the Brazilian Federal Accounting Council (CFC). All relevant information from its own financial statements, and only this information, are being presented and correspond to those used by the Company's Management. The consolidated financial statements present the accounts of the Group.

**b) Basis of presentation**

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The financial statements have been prepared under the historical cost convention as adjusted to reflect: (i) the fair value of financial instruments measured at fair value through income statement or available-for-sale financial instruments measured at fair value through the statement of comprehensive income; and (ii) impairment of assets.

The comparative information for the years ended December 31, 2015 and 2014 was re-presented for the purposes of applying IFRS 5

Non-current assets held for sale and discontinued operations after approval by the Board of Directors of the sale of the fertilizers assets, as presented in Note 14.

Subsequent events were evaluated through February 22, 2017, which is the date the financial statements were approved by the Board of Directors.

### c) **Consolidation and investments**

The financial statements reflect the assets, liabilities and transactions of the Parent Company and its direct and indirect controlled entities ( subsidiaries ). Intercompany balances and transactions, which include unrealized profits, are eliminated. Subsidiaries over which control is achieved through other means, such as stockholders agreement, are also consolidated even if the Company does not own a majority of the voting capital.

The entities over which the Company has joint control ( joint ventures ) or significant influence, but not control ( associates ) are presented in note 15. Those investments are accounted for using the equity method. For interests in joint arrangements not classified as joint ventures ( joint operations ), the Company recognizes its share of assets, liabilities and net income.

Unrealized gains on downstream or upstream transactions between the Company and its associates and joint ventures are eliminated fully or proportionately to the Company's interest.

Table of Contents

The material consolidated entities in each business segment of are as follows:

	Location	Principal activity/Business	% ownership	% Voting capital	% Noncontrolling interest or other investors
<b>Direct and indirect subsidiaries</b>					
Companhia Portuária da Baía de Sepetiba	Brazil	Iron ore	100.0%	100.0%	0.0%
Mineração Corumbaense Reunida S.A.	Brazil	Iron ore and manganese	100.0%	100.0%	0.0%
Minerações Brasileiras Reunidas S.A. ( MBR )	Brazil	Iron ore	62.5%	98.3%	37.5%
Salobo Metais S.A.	Brazil	Copper	100.0%	100.0%	0.0%
Nacala Corridor Holding Netherlands B.V.	Netherlands	Coal	100.0%	100.0%	0.0%
PT Vale Indonesia	Indonesia	Nickel	59.2%	59.2%	40.8%
Vale International Holdings GmbH	Austria	Holding and research	100.0%	100.0%	0.0%
Vale Canada Limited	Canada	Nickel	100.0%	100.0%	0.0%
Vale International S.A.	Switzerland	Trading and holding	100.0%	100.0%	0.0%
Vale Malaysia Minerals Sdn. Bhd.	Malaysia	Iron ore	100.0%	100.0%	0.0%
Vale Manganês S.A.	Brazil	Manganese and ferroalloys	100.0%	100.0%	0.0%
Vale Moçambique S.A.	Mozambique	Coal	95.0%	95.0%	5.0%
Vale Nouvelle Calédonie S.A.S.	New Caledonia	Nickel	95.0%	95.0%	5.0%
Vale Oman Distribution Center LLC	Oman	Iron ore and pelletizing	100.0%	100.0%	0.0%
Vale Oman Pelletizing Company LLC	Oman	Pelletizing	70.0%	70.0%	30.0%

Investments held by investors in Vale's subsidiaries are classified as noncontrolling interests. The Company treats transactions with noncontrolling interests as transactions with equity owners of the Group and as described in note 16.

For purchases of noncontrolling interests, the difference between any amount paid and the portion acquired of the carrying value of net assets of the subsidiary is recorded in stockholders' equity. Gains or losses on disposals of noncontrolling interest are also recorded in stockholders' equity.

As explained in note 14, the Fertilizer Segment is presented as discontinued operations, which includes the following subsidiaries:

Location	Principal activity	% ownership	% Voting capital	% Noncontrolling interest or other investors
----------	--------------------	-------------	------------------	--

<b>Direct and indirect subsidiaries</b>					
Compañia Minera Miski Mayo S.A.C.	Peru	Fertilizers	40.0%	51.0%	60.0%
Vale Fertilizantes S.A.	Brazil	Fertilizers	100.0%	100.0%	0.0%

#### d) **Functional currency and presentation currency**

The financial statements of the Group and its associates and joint ventures are measured using the currency of the primary economic environment in which the entity operates ( functional currency ), which in the case of the Parent Company is the Brazilian real ( BRL or R\$ ). For presentation purposes, these financial statements are presented in Brazilian Reais.

Operations in other currencies are translated into the functional currency using the actual exchange rates in force on the respective transactions dates. The foreign exchange gains and losses resulting from the translation at the exchange rates in force at the end of the year are recognized in the income statement as financial expense or income. The exceptions are transactions for which gains and losses are recognized in the statement of comprehensive income.

The income statement and balance sheet of the Group's entities which functional currency is different from the presentation currency are translated into the presentation currency as follows: (i) assets, liabilities and stockholders' equity (except components described in item (iii)) are translated at the closing rate at the balance sheet date; (ii) income and expenses are translated at the average exchange rates, except for specific transactions that, considering their significance, are translated at the rate at the transaction date and; (iii) capital, capital reserves and treasury stock are translated at the rate at the date of each transaction. All resulting exchange differences are recognized in the comprehensive income as cumulative translation adjustment, and transferred to the income statement when the operations are realized.

The exchange rates used by the Group for major currencies to translate its operations are as follows:

	Closing rate			Average rate for the year ended		
	2016	2015	2014	2016	2015	2014
US dollar ( US\$ )	3.2591	3.9048	2.6562	3.4833	3.3387	2.3547
Canadian dollar ( CAD )	2.4258	2.8171	2.2920	2.6280	2.6020	2.1308
Australian dollar ( AUD )	2.3560	2.8532	2.1765	2.5876	2.4979	2.1205
Euro ( EUR or )	3.4384	4.2504	3.2270	3.8543	3.6999	3.1205

Table of Contents

**e) Significant accounting policies**

The accounting policies applied in financial statements are consistent with those adopted and disclosed in the financial statements of prior years. The Company has not early adopted any standards and interpretations that have been issued or amended but which are not yet in force. The accounting policies of subsidiaries, affiliates and joint ventures are adjusted to ensure consistency with the policies adopted by Vale.

Significant and relevant accounting policies for the understanding of the financial statements were included in the respective notes, with a summary of the recognition and measurement basis used by the Company.

The brief description of the recent accounting pronouncements issued by the IASB, which are not yet in force, and the current assessment did by the Company of the impacts on its financial statements, subject to changes due to the more analyzes in progress, are detailed below:

**IFRS 9 Financial instrument** In July 2014, the IASB issued the final version of IFRS 9 Financial Instruments that replaces IAS 39 Financial Instruments: Recognition and Measurement. This standard brings new approaches about: (i) classification and measurement of financial assets and liabilities, (ii) impairment and (iii) hedge accounting. This standard shall apply for annual periods beginning on or after January 1, 2018.

The Company does not plan the early adoption of this new standard. Based on the history of financial instruments traded by the Company, it is not expected significant impacts on financial statements by applying the IFRS 9 requirements.

**IFRS 15 Revenue from Contracts with Customers** In May 2014, the IASB issued IFRS 15, which replaces IAS 18 Revenues and the related interpretations. IFRS 15 introduces the five-step model for revenue recognition from contract with a customer. The new standard is based on the principle that revenue is recognized when the control of a good or service to be transferred to a customer in an amount that reflects the consideration to which the entity expects to be entitled in exchange for those goods or services. This standard shall apply for annual periods beginning on or after January 1, 2018.

The Company plans to adopt the new standard on the required effective date using the full retrospective method with the practical expedients approach for concluded contracts. During 2016, the Company performed a preliminary assessment of IFRS 15, which is subject to changes

arising from a more detailed analysis of the contracts that are in process. Based on these preliminary analyzes, management is evaluating whether the freight service should be considered a separate performance obligation or not.

The Company expects to disclose quantitative information, if any, prior to the adoption of the standard.

**IFRS 16 Lease** In January 2016, the IASB issued IFRS 16, which replaces IAS 17 Leases and related interpretations. The IFRS 16 set forth that in all leases with a maturity of more than 12 months, with limited exceptions, the lessee must recognize the lease liability in the balance sheet at the present value of the payments, plus costs directly allocated and at the same time that it recognizes a right of use corresponding to the asset. During the term of the lease, the lease liability is adjusted to reflect interest and payment made and the right to use is amortized, similar to the financial lease settled up in accordance with IAS 17. This standard shall apply for annual periods beginning on or after January 1, 2019.

The Company has not yet quantified the impact of adopting IFRS 16 on its assets and liabilities. The quantitative effect of the adoption of IFRS 16 will depend specifically on the Company's decision related to the method of transition, the use of practical expedients approach and exemptions for recognition, and any additional leases that Company will hold. The Company expects to disclose its transition approach and quantitative information prior to adoption, planned for January 1, 2019.

**IAS 7 Amendments (Disclosure Initiative)** The amendments to IAS 7 Statement of Cash Flows are part of the IASB's Disclosure Initiative and require an entity to provide disclosures that enable users of financial statements to evaluate cash flows and non-cash changes in liabilities arising from financing activities. On initial application of the amendment, entities are not required to provide comparative information for preceding periods. These amendments are effective for annual periods beginning on or after 1 January 2017, with early application permitted. Application of the amendments will result in additional disclosures provided by the Group. The Company did not early adopt this amendment.

Table of Contents**f) Critical accounting estimates and judgments**

The preparation of financial statements requires the use of certain critical accounting estimates, assumptions and judgments by the management of the Company. These estimates are based on the best knowledge and information existing at the balance sheet date. Changes in facts and circumstances may lead to the revision of these estimates. Actual future results may differ from the estimates.

The significant estimates, assumptions and judgments used by Company in these financial statements are as follows:

Note	Significant estimates, assumptions and judgments
<b>3(c)</b>	Consolidation
<b>7</b>	Deferred revenue - Gold stream
<b>8</b>	Deferred income taxes
<b>18</b>	Mineral reserves and mine useful life
<b>19</b>	Impairment of non-current assets
<b>21</b>	Liabilities related to associates and joint ventures
<b>24</b>	Fair values of derivatives and others financial instruments
<b>27</b>	Asset retirement obligation
<b>28</b>	Litigation
<b>29</b>	Post-retirement benefits for employees

**3. Information by business segment and by geographic area**

The Company divided its operations into five reportable segments: Ferrous Minerals, Coal, Base Metals, Fertilizers (presented as discontinued operations) and Others. The segments are aligned with products and reflect the structure used by Management to evaluate group performance. The responsible bodies for making operational decisions, allocating resources and evaluating performance include the Executive Boards and the Board of Directors, which use adjusted EBITDA as a measure of performance.

The information presented to the Executive Board on the performance of each segment is derived from the accounting records, adjusted for reallocations between segments.

The main activities of the operating segments are as follows:



**Ferrous minerals** - Ferrous minerals comprises the production and extraction of ferrous minerals, as iron ore fines, iron ore pellets and its logistic services (railroads, ports and terminals), manganese and ferroalloys and others ferrous products and services.

**Coal** - Coal comprises the extraction of metallurgical and thermal coal and its logistic services (railroads, ports and terminals).

**Base metals** - Base metals include the production and extraction of non-ferrous minerals, and are presented as nickel and its by-products (ferro-nickel, copper, gold, precious metals and others) and copper (copper concentrated).

**Fertilizers (Discontinued operations)** - Fertilizers include the production of the three major groups of nutrients (potash, phosphate and nitrogen) and other fertilizers products. The group of assets related to this segment is classified as Non-current assets and liabilities held for sale (note 14).

**Others** - The segments of others comprise sales and expenses of other products, services and investments in joint ventures and associate in other business.

Table of Contents**a) Adjusted EBITDA**

The definition of adjusted EBITDA for the Company is the operating income or loss excluding (i) the depreciation, depletion and amortization, (ii) results on measurement or sales of non-current assets, (iii) impairment, (iv) onerous contracts and plus (v) dividends received from associates and joint ventures.

	Year ended December 31, 2016						
	Net operating revenue	Cost of goods sold and services rendered	Sales, administrative and other operating expenses	Research and evaluation expenses	Pre operating and operational stoppage	Dividends received from associates and joint ventures	Adjusted EBITDA
<b>Ferrous minerals</b>							
Iron ore	54,187	(22,817)	(1,712)	(308)	(521)	35	28,864
Pellets	13,198	(6,932)	(251)	(45)	(77)	359	6,252
Ferroalloys and manganese	1,031	(793)	(11)	(1)	(39)		187
Other ferrous products and services	1,513	(933)	(26)	(5)	(12)		537
	<b>69,929</b>	<b>(31,475)</b>	<b>(2,000)</b>	<b>(359)</b>	<b>(649)</b>	<b>394</b>	<b>35,840</b>
<b>Coal</b>	<b>2,882</b>	<b>(3,090)</b>	<b>150</b>	<b>(50)</b>	<b>(137)</b>		<b>(245)</b>
<b>Base metals</b>							
Nickel and other products	15,504	(11,145)	(331)	(268)	(399)	13	3,374
Copper	5,770	(3,198)	(82)	(17)			2,473
Other base metals products			480				480
	<b>21,274</b>	<b>(14,343)</b>	<b>67</b>	<b>(285)</b>	<b>(399)</b>	<b>13</b>	<b>6,327</b>
<b>Others</b>	<b>548</b>	<b>(889)</b>	<b>(529)</b>	<b>(404)</b>	<b>(4)</b>	<b>262</b>	<b>(1,016)</b>
<b>Total of continuing operations</b>	<b>94,633</b>	<b>(49,797)</b>	<b>(2,312)</b>	<b>(1,098)</b>	<b>(1,189)</b>	<b>669</b>	<b>40,906</b>
<b>Discontinued operations</b>							
(Fertilizers)	6,470	(5,315)	(298)	(75)	(58)	12	736
<b>Total</b>	<b>101,103</b>	<b>(55,112)</b>	<b>(2,610)</b>	<b>(1,173)</b>	<b>(1,247)</b>	<b>681</b>	<b>41,642</b>



Table of Contents

	Year ended December 31, 2015						
	Net operating revenue	Cost of goods sold and services rendered	Sales, administrative and other operating expenses	Research and evaluation expenses	Pre operating and operational stoppage	Dividends received from associates and joint ventures	Adjusted EBITDA
<b>Ferrous minerals</b>							
Iron ore	41,427	(25,505)	(1,140)	(395)	(417)	87	14,057
Pellets	11,916	(7,008)	34	(13)	(81)	708	5,556
Ferroalloys and manganese	518	(583)	1	(1)	(61)		(126)
Other ferrous products and services	1,552	(1,115)	22	(9)	(6)	25	469
	<b>55,413</b>	<b>(34,211)</b>	<b>(1,083)</b>	<b>(418)</b>	<b>(565)</b>	<b>820</b>	<b>19,956</b>
<b>Coal</b>	<b>1,739</b>	<b>(2,857)</b>	<b>(435)</b>	<b>(73)</b>	<b>(208)</b>	<b>109</b>	<b>(1,725)</b>
<b>Base metals</b>							
Nickel and other products	15,534	(11,378)	(506)	(348)	(1,359)		1,943
Copper	4,957	(3,049)	(114)	(31)	(2)		1,761
Other base metals products			722				722
	<b>20,491</b>	<b>(14,427)</b>	<b>102</b>	<b>(379)</b>	<b>(1,361)</b>		<b>4,426</b>
<b>Others</b>	<b>414</b>	<b>(464)</b>	<b>(543)</b>	<b>(456)</b>	<b>(2)</b>	<b>135</b>	<b>(916)</b>
<b>Total of continuing operations</b>	<b>78,057</b>	<b>(51,959)</b>	<b>(1,959)</b>	<b>(1,326)</b>	<b>(2,136)</b>	<b>1,064</b>	<b>21,741</b>
<b>Discontinued operations (Fertilizers)</b>	<b>7,442</b>	<b>(4,896)</b>	<b>(124)</b>	<b>(277)</b>	<b>(232)</b>		<b>1,913</b>
<b>Total</b>	<b>85,499</b>	<b>(56,855)</b>	<b>(2,083)</b>	<b>(1,603)</b>	<b>(2,368)</b>	<b>1,064</b>	<b>23,654</b>

	Year ended December 31, 2014						
	Net operating revenue	Cost of goods sold and services rendered	Sales, administrative and other operating expenses	Research and evaluation expenses	Pre operating and operational stoppage	Dividends received from associates and joint ventures	Adjusted EBITDA
<b>Ferrous minerals</b>							
Iron ore	45,341	(22,515)	(3,037)	(758)	(376)	108	18,763
Pellets	12,397	(6,397)	(42)	(2)	(88)	1,097	6,965
Ferroalloys and	933	(618)	(27)	(1)	(54)		233

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manganese							
Other ferrous products and services	1,724	(1,310)	7	(21)		1	401
	<b>60,395</b>	<b>(30,840)</b>	<b>(3,099)</b>	<b>(782)</b>	<b>(518)</b>	<b>1,206</b>	<b>26,362</b>
<b>Coal</b>	<b>1,740</b>	<b>(2,514)</b>	<b>(764)</b>	<b>(43)</b>	<b>(89)</b>	<b>75</b>	<b>(1,595)</b>
<b>Base metals</b>							
Nickel and other products	14,703	(8,756)	249	(330)	(1,209)		4,657
Copper	3,434	(2,079)	(35)	(10)	(38)		1,272
	<b>18,137</b>	<b>(10,835)</b>	<b>214</b>	<b>(340)</b>	<b>(1,247)</b>		<b>5,929</b>
<b>Others</b>	<b>2,347</b>	<b>(1,408)</b>	<b>(759)</b>	<b>(403)</b>	<b>(14)</b>	<b>21</b>	<b>(216)</b>
<b>Total of continuing operations</b>	<b>82,619</b>	<b>(45,597)</b>	<b>(4,408)</b>	<b>(1,568)</b>	<b>(1,868)</b>	<b>1,302</b>	<b>30,480</b>
<b>Discontinued operations</b>							
(Fertilizers)	5,656	(4,406)	(226)	(170)	(200)		654
<b>Total</b>	<b>88,275</b>	<b>(50,003)</b>	<b>(4,634)</b>	<b>(1,738)</b>	<b>(2,068)</b>	<b>1,302</b>	<b>31,134</b>

Table of Contents

Adjusted EBITDA is reconciled to net income (loss) as follows:

	Year ended December 31		
	2016	2015	2014
<b>Adjusted EBITDA from continuing operations</b>	<b>40,906</b>	<b>21,741</b>	<b>30,480</b>
Depreciation, depletion and amortization	(12,107)	(12,450)	(9,128)
Dividends received from associates and joint ventures	(669)	(1,064)	(1,302)
Results on measurement or sale of non-current assets	(228)	52	(441)
Impairment of non-current assets and onerous contracts	(3,940)	(33,945)	87
<b>Operating income (loss)</b>	<b>23,962</b>	<b>(25,666)</b>	<b>19,696</b>
Financial results, net	6,302	(36,053)	(14,626)
Equity results in associates and joint ventures	1,111	(1,526)	1,131
Impairment and others results in associates and joint ventures	(4,353)	(1,431)	(139)
Income taxes	(9,567)	19,339	(3,658)
<b>Income (loss) from continuing operations</b>	<b>17,455</b>	<b>(45,337)</b>	<b>2,404</b>
Loss attributable to noncontrolling interests	(6)	(1,815)	(749)
<b>Income (loss) attributable to Vale's stockholders</b>	<b>17,461</b>	<b>(43,522)</b>	<b>3,153</b>

	Year ended December 31		
	2016	2015	2014
<b>Adjusted EBITDA from discontinued operations</b>	<b>736</b>	<b>1,913</b>	<b>654</b>
Depreciation, depletion and amortization	(1,197)	(1,039)	(980)
Dividends received from associates and joint ventures	(12)		
Results on measurement or sale of non-current assets	(5,899)	(608)	(2,800)
<b>Operating income (loss)</b>	<b>(6,372)</b>	<b>266</b>	<b>(3,126)</b>
Financial results, net	69	(485)	(127)
Equity results in associates and joint ventures	10	19	10
Income taxes	2,134	(460)	1,058
<b>Loss from discontinued operations</b>	<b>(4,159)</b>	<b>(660)</b>	<b>(2,185)</b>
Income (loss) attributable to noncontrolling interests	(9)	31	14
<b>Loss attributable to Vale's stockholders</b>	<b>(4,150)</b>	<b>(691)</b>	<b>(2,199)</b>

## b) Assets by segment

	Year ended December 31, 2016				
	Product inventory	Investments	Property, plant and equipment and intangible assets (i)	Additions to property, plant and equipment and intangible (ii)	Depreciation, depletion and amortization (iii)

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Ferrous minerals	3,697	5,894	113,526	11,384	5,593
Coal	412	929	6,216	2,136	652
Base metals	3,617	40	76,173	3,673	5,791
Others	7	5,183	7,096	150	71
<b>Total</b>	<b>7,733</b>	<b>12,046</b>	<b>203,011</b>	<b>17,343</b>	<b>12,107</b>

	Year ended December 31, 2015				
	Product inventory	Investments	Property, plant and equipment and intangible assets (i)	Additions to property, plant and equipment and intangible (ii)	Depreciation, depletion and amortization (iii)
Ferrous minerals	4,044	5,775	110,123	16,399	5,562
Coal	206	1,195	7,075	5,108	670
Base metals	4,552	66	91,849	5,162	6,161
Others	10	4,153	7,905	262	57
Discontinued operations (Fertilizers)	1,156	292	15,096	853	1,039
<b>Total</b>	<b>9,968</b>	<b>11,481</b>	<b>232,048</b>	<b>27,784</b>	<b>13,489</b>

(i) Goodwill is allocated mainly in iron ore and nickel segments in the amount of R\$4,060 e R\$5,981, respectively.

(ii) Includes only cash effect.

(iii) Refers to amounts recognized in the income statement.

Table of Contents

**c) Investment, intangible and property, plant and equipment by geographic area**

	December 31, 2016				December 31, 2015			
	Investments	Intangible	Property, plant and equipment	Total	Investments	Intangible	Property, plant and equipment	Total
Brazil	10,338	15,387	112,468	138,193	9,403	12,825	125,697	147,925
Canada		6,524	33,460	39,984	8	7,964	41,346	49,318
Americas, except Brazil and Canada	604		98	702	613		1,781	2,394
Europe			2,084	2,084			2,375	2,375
Asia	1,104		13,599	14,703	1,433		20,378	21,811
Australia			139	139			290	290
New Caledonia			10,062	10,062			13,749	13,749
Mozambique		484	5,589	6,073			1,727	1,727
Oman			3,117	3,117			3,916	3,916
Other regions					24			24
<b>Total</b>	<b>12,046</b>	<b>22,395</b>	<b>180,616</b>	<b>215,057</b>	<b>11,481</b>	<b>20,789</b>	<b>211,259</b>	<b>243,529</b>

**d) Revenues by geographic area**

	Year ended December 31, 2016				
	Ferrous minerals	Coal	Base metals	Others	Total
Americas, except United States and Brazil	1,167	72	4,079		5,318
United States of America	792		2,602	81	3,475
Europe	8,826	723	6,434	59	16,042
Middle East/Africa/Oceania	4,266	329	72	1	4,668
Japan	4,464	432	1,123		6,019
China	41,135	223	2,420		43,778
Asia, except Japan and China	3,125	1,052	4,053		8,230
Brazil	6,154	51	491	407	7,103
<b>Net operating revenue</b>	<b>69,929</b>	<b>2,882</b>	<b>21,274</b>	<b>548</b>	<b>94,633</b>

	Year ended December 31, 2015				
	Ferrous minerals	Coal	Base metals	Others	Total
Americas, except United States and Brazil	1,185	64	3,697		4,946
United States of America	95		2,640	69	2,804
Europe	8,293	347	6,464		15,104
Middle East/Africa/Oceania	3,323	314	273		3,910



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Japan	5,038	237	1,223		6,498
China	28,477	149	2,186		30,812
Asia, except Japan and China	3,545	553	3,325		7,423
Brazil	5,457	75	683	345	6,560
<b>Net operating revenue</b>	<b>55,413</b>	<b>1,739</b>	<b>20,491</b>	<b>414</b>	<b>78,057</b>

	Year ended December 31, 2014				Total
	Ferrous minerals	Coal	Base metals	Others	
Americas, except United States and Brazil	1,529	7	3,230	45	4,811
United States of America	55		2,590	565	3,210
Europe	9,115	275	6,105	30	15,525
Middle East/Africa/Oceania	3,794	259	350		4,403
Japan	6,031	453	2,030	16	8,530
China	28,077	178	1,507		29,762
Asia, except Japan and China	5,170	550	1,934	1	7,655
Brazil	6,624	18	391	1,690	8,723
<b>Net operating revenue</b>	<b>60,395</b>	<b>1,740</b>	<b>18,137</b>	<b>2,347</b>	<b>82,619</b>

Table of Contents

**Accounting policy**

Revenue is recognized when Vale transfers to its customers all of the significant risks and rewards of ownership of the product sold or when the services are rendered. Net revenue excludes any applicable sales taxes and is recognized at the fair value of the consideration received or receivable to the extent that it is probable that economic benefits will flow to Vale and the revenues can be reliably measured.

Depending on the contract, sales can be recognized when the product is available at the loading port, loaded on the ship, at the port of discharge or on the customer warehouse. Service revenues are recognized in the amount by which the services are rendered and accepted by the customer.

In some cases, the sale price is determined on a provisional basis at the date of sale and adjustments to the sales price subsequently occur based on movements in quoted market or contractual prices up to the date of final pricing. Revenue is recognized based on the estimated fair value of the total consideration receivable, and the provisionally priced sales mechanism embedded within these sale arrangements is characterized as a derivative. Therefore, the fair value of the final sales price adjustment is re-estimated continuously and changes in fair value are recognized as operational revenue in the income statement. As of December 31, 2016, R\$1,344 of revenues (2015: R\$(1,070)) were still not settled and were provisionally measured based on iron ore fines and copper forward prices.

Amounts billed to customers for shipping related to products sold by the Company are recognized as revenue when the Company is responsible for shipping. Shipping costs are recognized as operating costs.

**4. Special events occurred during the year**

The special events occurred during the year are those that, in the Company's judgment, significantly impacted the income statement due to their size and nature. To determine whether an event or transaction is non-recurring, the Company considers quantitative and qualitative factors, such as frequency and impact on the result of the year.

The special events identified by the Company are as follows:

	Year ended December 31	
	Consolidated	Parent Company

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	2016	2015	2014	2016	2015
Samarco Provision	(3,967)				
Results on measurement of non-current assets - Fertilizers business	(5,899)				
Impairment of non-current assets and onerous contracts	(3,940)	(33,945)	87	205	270
Gold stream transaction	480	722			
Deferred income tax in foreign jurisdiction		11,729			
<b>Total</b>	<b>(13,326)</b>	<b>(21,494)</b>	<b>87</b>	<b>205</b>	<b>270</b>

2016

**Samarco** In June 2016, the Company recognized in the income statement the amount of R\$3,733 which represented its best estimate of the obligation to comply with the reparation and compensation programs under the Agreement related to the dam failure of Samarco Mineração S.A. The Company also expensed an amount of R\$234 applied by Samarco to Fund its working capital requirements. For more details, see note 21.

**Fertilizers assets** - In December 2016, the Company approved the sale of fertilizers assets and the acquisition of a minority interest in The Mosaic Company ( Mosaic ). Vale assessed the net assets of the fertilizer business segment for impairment purposes and a loss in the amount of R\$5,899 was recognized. The fertilizers segment is presented as discontinued operations see note 14.

**Impairment of non-current assets and onerous contracts** In 2016, the Company recognized an impairment loss of R\$3,940 mainly by the reduction in the nickel price projections, see note 19.

**Gold stream transaction** In 2016, the Company recognized a gain of the result on sale of mineral rights in the amount of R\$480, see note 7.

Table of Contents**2015**

**Impairment of non-current assets and onerous contracts** In 2015, the Company recognized an impairment loss of R\$33,945 mainly by: (i) the reduction in estimated future coal prices combined with the increase of logistics costs and (ii) the reduction the recoverable values of the VNL and VNC CGUs, see note 19.

**Gold stream transaction** In 2015, the Company recognized a gain of the result on sale of mineral rights in the amount of R\$722, see note 7.

**Deferred income tax** - In 2015, in the first adoption of the Law 12.973, the Company recognized assets deferred income tax related to accumulated losses of subsidiaries abroad in the amount of R\$11,729, see note 8.

## 5. Costs and expenses by nature

### a) Cost of goods sold and services rendered

	Year ended December 31				
	2016	Consolidated 2015	2014	Parent Company 2016	2015
Personnel	7,222	7,030	6,582	3,445	3,597
Materials and services	10,808	9,827	10,246	5,438	5,619
Fuel oil and gas	4,280	4,037	3,426	2,714	2,590
Maintenance	9,487	8,520	5,464	6,068	5,397
Energy	2,406	1,602	1,170	1,028	926
Acquisition of products	1,762	2,531	3,780	821	684
Depreciation and depletion	11,346	10,821	8,176	4,808	4,147
Freight	8,641	11,877	8,514	71	
Others	5,191	6,535	6,415	5,270	4,562
<b>Total</b>	<b>61,143</b>	<b>62,780</b>	<b>53,773</b>	<b>29,663</b>	<b>27,522</b>
Cost of goods sold	59,409	61,072	51,579	28,601	26,467
Cost of services rendered	1,734	1,708	2,194	1,062	1,055

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<b>Total of continuing operations</b>	<b>61,143</b>	<b>62,780</b>	<b>53,773</b>	<b>29,663</b>	<b>27,522</b>
Discontinued operations (Fertilizers)	6,495	5,878	5,314		
<b>Total</b>	<b>67,638</b>	<b>68,658</b>	<b>59,087</b>	<b>29,663</b>	<b>27,522</b>

**b) Selling and administrative expenses**

	Year ended December 31				
	2016	Consolidated 2015	2014	Parent Company 2016	2015
Personnel	727	822	981	473	509
Services	248	354	441	148	194
Advertising and publicity	26	38	96	21	30
Depreciation and amortization	414	437	514	300	321
Travel expenses	29	36	55	17	19
Taxes and rents	46	52	66	18	22
Others	265	270	299	44	46
<b>Total of continuing operations</b>	<b>1,755</b>	<b>2,009</b>	<b>2,452</b>	<b>1,021</b>	<b>1,141</b>
Discontinued operations (Fertilizers)	195	134	151		
<b>Total</b>	<b>1,950</b>	<b>2,143</b>	<b>2,603</b>	<b>1,021</b>	<b>1,141</b>

**c) Others operational expenses (incomes), net**

	Year ended December 31				
	2016	Consolidated 2015	2014	Parent Company 2016	2015
Provision for litigation	487	46	406	524	(53)
Provision for loss with VAT credits (ICMS)	143	728	335	143	767
Profit sharing program	252	52	278	137	41
Disposal of materials and inventories	(349)	501	476	(56)	74
Gold stream transaction (nota 7)	(480)	(722)			
Others	884	(17)	982	418	(901)
<b>Total of continuing operations</b>	<b>937</b>	<b>588</b>	<b>2,477</b>	<b>1,166</b>	<b>(72)</b>
Discontinued operations (Fertilizers)	113	(2)	83		
<b>Total</b>	<b>1,050</b>	<b>586</b>	<b>2,560</b>	<b>1,166</b>	<b>(72)</b>

Table of Contents**6. Financial result**

	Year ended December 31				
	2016	Consolidated 2015	2014	Parent Company 2016	2015
<b>Financial expenses</b>					
Loans and borrowings gross interest	(6,152)	(5,503)	(4,059)	(6,330)	(5,295)
Capitalized loans and borrowing costs	2,291	2,531	1,387	1,679	1,258
Labor, tax and civil lawsuits	(45)	(193)	(218)	(21)	(127)
Derivative financial instruments	(1,655)	(11,969)	(4,885)	(957)	(7,471)
Indexation and exchange rate variation (a)	(10,405)	(46,346)	(11,521)	(9,612)	(45,899)
Participative stockholders debentures	(1,456)	3,039	(665)	(1,456)	3,039
Expenses of REFIS	(1,787)	(1,795)	(1,603)	(1,751)	(1,758)
Others	(2,146)	(1,785)	(1,576)	(1,452)	(697)
	<b>(21,355)</b>	<b>(62,021)</b>	<b>(23,140)</b>	<b>(19,900)</b>	<b>(56,950)</b>
<b>Financial income</b>					
Short-term investments	336	492	423	209	276
Derivative financial instruments	5,827	3,885	1,461	4,290	2,994
Indexation and exchange rate variation (b)	21,224	21,237	6,144	21,021	22,445
Others	270	354	486	136	107
	<b>27,657</b>	<b>25,968</b>	<b>8,514</b>	<b>25,656</b>	<b>25,822</b>
<b>Financial results, net</b>	<b>6,302</b>	<b>(36,053)</b>	<b>(14,626)</b>	<b>5,756</b>	<b>(31,128)</b>
<b>Summary of indexation and exchange rate variation</b>					
Loans and borrowings	17,885	(34,625)	(8,128)	17,715	(33,710)
Others	(7,066)	9,516	2,751	(6,306)	10,256
<b>Net (a) + (b)</b>	<b>10,819</b>	<b>(25,109)</b>	<b>(5,377)</b>	<b>11,409</b>	<b>(23,454)</b>

As from January 1, 2017 (subsequent event), the Company starts to apply net investment hedge accounting in foreign operation considering Vale International S.A. and Vale International Holding GmbH investments as the hedging objects and designated as hedging instruments the Parent Company third party loans and borrowings (excluding interest) in different currencies denominated in US dollar and euro, amounting to US\$8,067 (R\$26,291) and EUR1,500 (R\$5,159) as the hedging instrument, respectively.

Accordingly, the Company plans to mitigate part of its foreign exchange risk, since foreign exchange gains or losses on the hedging instrument (effective portion) will be recognized in other comprehensive income, thus offsetting some of the gains and losses generated from translating of the net investments in the aforementioned controlled companies. If the hedge relationship is not considered effective, the hedging instrument's exchange variations will be allocated to income statement for the year.

**7. Deferred revenue - Gold stream transaction**

In 2013, the Company entered into a gold transaction with Silver Wheaton Corp. ( SLW ) to sell 25% of the gold extracted as a by-product over the life of the Salobo copper mine and 70% of the gold extracted as a by-product of Sudbury nickel mines over the next 17 years. The Company received an up-front cash proceeds of R\$4,060 (US\$1,900).

The original transaction was amended in March 2015 and August 2016 to include in each contract an additional 25% of the gold extracted as by-product over a lifetime of the Salobo copper mine. In the first additive, the Company received up-front proceeds of R\$2,826 (US\$900) and in the second additive, (i) an initial cash payment of R\$2,568 (US\$800) and (ii) an option value resulting from the reduction of the exercise price from R\$211.00 (US\$65.00) to R\$142.00 (US\$43.75) on 10 million warrants from SLW held by the Company since 2013 and maturing in 2023.

Hence, in December 31, 2016 SLW holds the rights to 75% of the contained gold in the copper concentrated from the Salobo mine and 70% of the gold extracted as a by-product of the Sudbury nickel mines.

As the gold is delivered to SLW, Vale receives payment equal to the lesser of: (i) US\$400 per ounce of refined gold delivered (which payments are subject to an annual increase of 1% per year commencing on January 1, 2017 for the original and additional transactions and each subsequent year and (ii) the market reference price on the delivery date.

Vale may also receive an additional cash payment contingent on its decision to expand its capacity to process Salobo copper ores to more than 28 Mtpy before 2036. Salobo that were still in ramp-up until September 2016 will have a total capacity to process 24 Mtpy of run-of-mine (ROM). The contingent additional cash payment could range from US\$113 to US\$953 depending on ore grade, timing and size of the expansion.

The transactions were bifurcated into two identifiable components (i) the sale of the mineral rights and, (ii) the services for gold extraction on the portion in which Vale operates as an agent for SLW gold extraction.

Table of Contents

The deferred revenue is recognized based on the units of gold mined compared to the total proven and probable reserves of gold traded with SLW. During the year ended December 31, 2016, 2015 and 2014, the Company recognized R\$717, R\$361 and R\$151, respectively, in the statement of income relating to services rendered in the original and additional transactions.

The result on sale of mineral rights from the additional transactions of R\$480 and R\$722 was recognized in the year ended December 31, 2016 and 2015, respectively, under Other operating expenses, net .

**Critical accounting estimates and judgments**

Defining the gain on sale of mineral interest and the deferred revenue portion of the transaction requires the use of critical accounting estimates as follows:

- Discount rates used to measure the present value of future inflows and outflows;
- Allocation of costs between nickel or copper and gold based on relative prices;
- Expected margin for the independent elements (sale of mineral rights and service for gold extraction) based on Company's best estimate.

**8. Income taxes****a) Deferred income tax assets and liabilities**

	Consolidated		Parent Company	
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
<b>Taxes losses carryforward</b>	<b>20,188</b>	<b>25,171</b>	<b>10,310</b>	<b>12,294</b>
<b>Temporary differences:</b>				
Employee post retirement obligations	2,022	2,291	483	365
Provision for litigation	702	892	661	745



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Provision for assets losses	4,119	2,701	3,264	1,479
Fair value of financial instruments	546	3,215	1,921	3,215
Allocated goodwill	(7,325)	(8,871)		
Others	(1,861)	(1,052)	(1,340)	(806)
	<b>(1,797)</b>	<b>(824)</b>	<b>4,989</b>	<b>4,998</b>
<b>Total</b>	<b>18,391</b>	<b>24,347</b>	<b>15,299</b>	<b>17,292</b>
Assets	23,931	30,867	15,299	17,292
Liabilities	(5,540)	(6,520)		
	<b>18,391</b>	<b>24,347</b>	<b>15,299</b>	<b>17,292</b>

Changes in deferred tax are as follows:

	Assets	Consolidated Liabilities	Total	Parent Company Assets
<b>Balance at December 31, 2014</b>	<b>10,560</b>	<b>8,874</b>	<b>1,686</b>	<b>6,430</b>
Taxes losses carryforward	16,800	(141)	16,941	11,919
Provision for assets losses	(331)	(99)	(232)	(33)
Fair value of financial instruments	(398)		(398)	156
Allocated goodwill		(4,853)	4,853	
Others	(584)	93	(677)	(1,226)
<b>Effect in income statement</b>	<b>15,487</b>	<b>(5,000)</b>	<b>20,487</b>	<b>10,816</b>
Transfers between asset and liabilities	548	548		
Translation adjustment	1,042	2,049	(1,007)	
Other comprehensive income	3,522	49	3,473	46
Acquisition of subsidiary	(31)		(31)	
<b>Effect of discontinued operations</b>				
Income tax	(261)		(261)	
<b>Balance at December 31, 2015</b>	<b>30,867</b>	<b>6,520</b>	<b>24,347</b>	<b>17,292</b>
Taxes losses carryforward	(4,505)	295	(4,800)	(1,983)
Provision for assets losses	1,182	157	1,025	1,785
Fair value of financial instruments	(2,722)		(2,722)	(1,294)
Allocated goodwill		(1,206)	1,206	
Others	(880)	89	(969)	(556)
<b>Effect in income statement</b>	<b>(6,925)</b>	<b>(665)</b>	<b>(6,260)</b>	<b>(2,048)</b>
Transfers between asset and liabilities	546	546		
Translation adjustment	(1,876)	(899)	(977)	
Other comprehensive income	(121)	38	(159)	55
<b>Effect of discontinued operations</b>				
Income tax	2,127		2,127	
Transfer to net assets held for sale	(687)		(687)	
<b>Balance at December 31, 2016</b>	<b>23,931</b>	<b>5,540</b>	<b>18,391</b>	<b>15,299</b>

Table of Contents

**Law 12.973** - The Brazilian corporate tax law was amended at the end of 2014 and became effective as from fiscal year 2015. The change provided that profits from foreign subsidiaries are taxable in Brazil, on an accrual basis, applying the differential between the nominal local tax rate and the Brazilian tax rates (34%) considering the profit before tax in local GAAP (Generally Accepted Accounting Principles) and local currency. Accordingly, from January 1st, 2015 the results from foreign subsidiaries are recognized on that basis.

In accordance with article 77 of law 12.973, the losses generated by the foreign subsidiaries, before income taxes and the equity results, may be offset against their future profits, subject to certain conditions.

In 2015, in the first adoption, the Company recognized deferred income tax assets related to accumulated losses of subsidiaries abroad in the amount of R\$11,729.

The Company projections shows deferred tax assets substantially being realized in the next five years.

The tax loss carryforward do not expire and in the Brazilian jurisdiction the compensation is limited to 30% of the taxable income for the year. For local results there is no restriction to compensated profits from foreign subsidiaries against previously recorded deferred tax assets.

## b) **Income tax reconciliation**    **Income statement**

The total amount presented as income taxes in the income statement is reconciled to the rate established by law, as follows:

	Year ended December 31			Parent Company	
	2016	Consolidated 2015	2014	2016	2015
<b>Net income (loss) before income taxes</b>	<b>27,022</b>	<b>(64,676)</b>	<b>6,062</b>	<b>17,545</b>	<b>(55,047)</b>
<b>Income taxes at statutory rates - 34%</b>	<b>(9,187)</b>	<b>21,990</b>	<b>(2,061)</b>	<b>(5,965)</b>	<b>18,716</b>
<b>Adjustments that affect the basis of taxes:</b>					
Income tax benefit from interest on stockholders' equity	291	1,054	2,634	291	1,033
Tax incentives	1,130	204	209	953	
Results of overseas companies taxed by different rates which differs from the parent company rate			(2,827)		

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Equity results	378	(518)	385	886	(12,713)
Additions (reversals) of tax loss carryforward	(952)	5,911	(410)	(1,336)	4,651
Unrecognized tax losses of the year	(2,465)	(3,021)			
Nondeductible effect of impairment	(325)	(7,222)	(1,119)		
Others	1,563	941	(469)	937	(853)
<b>Income taxes</b>	<b>(9,567)</b>	<b>19,339</b>	<b>(3,658)</b>	<b>(4,234)</b>	<b>10,834</b>

**c) Tax incentives**

In Brazil, Vale has tax incentives to partially reduce the income tax generated by the operations conducted in the North and Northeast regions which includes iron ore, copper, and nickel. The incentive is calculated based on the taxable income of the incentive activity (tax operating income) and takes into account the allocation of tax operating income into different incentives applicable to different tranches of production during the periods specified for each product, generally 10 years. Most of our incentives are expected to expire up to 2024. An amount equal to that obtained with the tax saving must be appropriated in retained earnings reserve account in stockholders' equity, and cannot be distributed as dividends to stockholders.

In addition to those incentives, 30% of the income tax due based on the tax operating income can be reinvested on the purchase of machinery and equipment, subject to subsequent approval by the regulatory agency responsible, Superintendência do Desenvolvimento da Amazonia (SUDAM) and the Superintendência do Desenvolvimento do Nordeste (SUDENE). The reinvestment is accounted in retained earnings reserve account, which restricts the distribution as dividends to stockholders.

Vale is subject to the revision of income tax by local tax authorities in a range up to 10 years depending on jurisdiction where we operate.

**d) Income taxes - Settlement program ( REFIS )**

In 2013, the Company elected to participate in the REFIS, a federal tax settlement program, to settle most of the claims related to the collection of income tax and social contribution on equity gains of foreign subsidiaries and affiliates from 2003 to 2012.

At December 31, 2016, the balance of R\$17,662 (R\$1,492 as current and R\$16,170 as non-current) is due in 142 remaining monthly installments, bearing interest at the SELIC rate (Special System for Settlement and Custody) and at December 31, 2015, the balance of R\$17,301 (R\$1,348 as current and R\$15,953 as non-current) was due in 154 remaining monthly installments.

Table of Contents

**Accounting policy**

The recognition of income taxes as deferred taxes is based on temporary differences between carrying value and the tax basis of assets and liabilities as well as taxes losses carryforwards. The deferred income taxes assets and liabilities are offset when there is a legally enforceable right on the same taxable entity.

The deferred taxes assets arising from taxes losses and temporary differences are not recognized when their recovery amount are not probable.

Income taxes are recognized in the income statement, except for items recognized directly in stockholders' equity. The provision for income tax is calculated individually for each entity in the Group based on Brazilian tax rates, on an accrual basis, by applying the differential between the nominal local tax rates (based on rules in force in the location of the entity) and the Brazilian tax rate.

**Critical accounting estimates and judgments**

Deferred tax assets arising from tax losses, negative social contribution basis and temporary differences are registered taking into account the analysis of future performance, considering economic and financial projections, prepared based on internal assumptions and macroeconomic, trade and tax scenarios that may be subject to changes in the future. The assumptions of future profits are based on production and sales planning, commodity prices, operational costs, restructuring plans, reclamation and planned capital costs.

**9. Basic and diluted earnings (loss) per share**

The value of basic earnings (loss) per shares and diluted were calculated as follows:

	Year ended December 31		
	2016	2015	2014
<b>Basic and diluted earnings (loss) per share from continuing operations:</b>			
Income (loss) available to preferred stockholders	6,667	(16,618)	1,204
Income (loss) available to common stockholders	10,794	(26,904)	1,949
<b>Total</b>	<b>17,461</b>	<b>(43,522)</b>	<b>3,153</b>

**Basic and diluted loss per share from discontinued operations:**

Loss available to preferred stockholders	(1,585)	(264)	(840)
Loss available to common stockholders	(2,565)	(427)	(1,359)
<b>Total</b>	<b>(4,150)</b>	<b>(691)</b>	<b>(2,199)</b>

**Basic and diluted earnings per share:**

Income (loss) available to preferred stockholders	5,082	(16,882)	364
Income (loss) available to common stockholders	8,229	(27,331)	590
<b>Total</b>	<b>13,311</b>	<b>(44,213)</b>	<b>954</b>

**Thousands of shares**

Weighted average number of shares outstanding - preferred shares	1,967,722	1,967,722	1,967,722
Weighted average number of shares outstanding - common shares	3,185,653	3,185,653	3,185,653
<b>Total</b>	<b>5,153,375</b>	<b>5,153,375</b>	<b>5,153,375</b>

**Basic and diluted earnings (loss) per share from continuing operations**

Preferred share (R\$)	3.39	(8.45)	0.61
Common share (R\$)	3.39	(8.45)	0.61

**Basic and diluted loss per share from discontinued operations**

Preferred share (R\$)	(0.81)	(0.13)	(0.43)
Common share (R\$)	(0.81)	(0.13)	(0.43)

**Basic and diluted earnings (loss) per share**

Preferred share (R\$)	2.58	(8.58)	0.19
Common share (R\$)	2.58	(8.58)	0.19

The Company does not hold dilutive potential ordinary shares outstanding that could result in dilution of earnings per share.

Table of Contents**10. Accounts receivable**

	Consolidated		Parent Company	
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
Trade receivables	12,131	5,988	26,305	36,107
Impairment of trade receivables	(194)	(225)	(82)	(81)
	<b>11,937</b>	<b>5,763</b>	<b>26,223</b>	<b>36,026</b>
Trade receivables related to the steel sector - %	83.44%	75.32%	90.55%	88.83%

	Year ended December 31				
	2016	Consolidated 2015	2014	Parent Company 2016	2015
Impairment of trade receivables recorded in the income statement	(16)	44	(34)	3	(14)

No individual customer represents over 10% of receivables or revenues.

**Accounting policy**

Account receivables are financial instruments classified in the category loan and receivables and represent the total amount due from sale of products and services rendered by the Company. The receivables are initially recognized at fair value and subsequently measured at amortized cost, net of impairment losses, when applicable.

**Commercial credit risk management** - For the commercial credit exposure, which arises from sales to final customers, the risk management area, in accordance with the current delegation level, approves or request the approval of credit risk limits for each counterparty.

Vale attributes an internal credit risk rating for each counterparty using its own quantitative methodology for credit risk analysis, which is based on market prices, external credit ratings and financial information of the counterparty, as well as qualitative information regarding the counterparty's strategic position and history of commercial relations.

Based on the counterparty's credit risk, risk mitigation strategies may be used to manage the Company's credit risk. The main credit risk mitigation strategies include non-recourse discount of receivables, insurance instruments, letters of credit, corporate and bank guarantees, mortgages, among others.

Vale has a diversified accounts receivable portfolio from a geographical standpoint, with Asia, Europe and Brazil the regions with more significant exposures. According to each region, different guarantees can be used to enhance the credit quality of the receivables.

## 11. Inventories

	Consolidated		Parent Company	
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
Product inventory	8,382	11,994	2,923	2,655
Impairment of product inventory	(649)	(2,026)	(208)	
	<b>7,733</b>	<b>9,968</b>	<b>2,715</b>	<b>2,655</b>
Consumable inventory	3,180	3,807	1,267	1,175
<b>Total</b>	<b>10,913</b>	<b>13,775</b>	<b>3,982</b>	<b>3,830</b>

Product inventories by segments are presented in note 3(b).

### Accounting policy

Inventories are stated at the lower of cost or the net realizable value. The inventory production cost is determined on the basis of variable and fixed costs, direct and indirect costs of production, using the average cost method. An allowance for losses on obsolete or slow-moving inventory is recognized.

Table of Contents**12. Recoverable taxes**

Recoverable taxes are presented net of provisions for losses on tax credits.

	Consolidated		Parent Company	
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
Value-added tax	2,361	2,949	1,293	1,291
Brazilian federal contributions	5,212	4,392	4,825	3,480
Others	91	97	67	38
<b>Total</b>	<b>7,664</b>	<b>7,438</b>	<b>6,185</b>	<b>4,809</b>
Current	5,296	5,482	3,962	3,352
Non-current	2,368	1,956	2,223	1,457
<b>Total</b>	<b>7,664</b>	<b>7,438</b>	<b>6,185</b>	<b>4,809</b>

**13. Other financial assets and liabilities**

	Consolidated			
	Current		Non-Current	
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
<b>Others financial assets</b>				
Financial investments	59	109		
Loans			587	732
Derivative financial instruments (note 25)	892	474	1,454	363
Related parties (note 31)	233	273	5	5
	<b>1,184</b>	<b>856</b>	<b>2,046</b>	<b>1,100</b>
<b>Others financial liabilities</b>				
Derivative financial instruments (note 25)	1,349	8,107	3,991	6,132
Related parties (note 31)	2,190	1,856	415	830
Participative stockholders' debentures (note 32(b))			2,526	1,336
	<b>3,539</b>	<b>9,963</b>	<b>6,932</b>	<b>8,298</b>

	Parent Company			
	Current		Non-Current	
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
<b>Others financial assets</b>				
Financial investments	4	18		
Loans			114	106



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Derivative financial instruments (note 25)	338	196	1,304	293
Related parties (note 31)	889	834	760	1,468
	<b>1,231</b>	<b>1,048</b>	<b>2,178</b>	<b>1,867</b>
<b>Others financial liabilities</b>				
Derivative financial instruments (note 25)	1,033	3,559	3,427	5,296
Related parties (note 31)	9,812	6,774	53,728	63,837
Participative stockholders' debentures (note 32(b))			2,526	1,336
	<b>10,845</b>	<b>10,333</b>	<b>59,681</b>	<b>70,469</b>

Table of Contents**14. Non-current assets and liabilities held for sale and discontinued operations**

	Fertilizers assets (Discontinued operations) (i)	Consolidated December 31, 2016			December 31, 2015
		Nacala	Shipping assets	Total	Nacala
<b>Assets</b>					
Accounts receivable	279	21		300	13
Inventories	1,261	7		1,268	
Other current assets	348	370		718	522
Investments in associates and joint ventures	295			295	
Property, plant and equipment and Intangible, net	8,779	13,246	1,164	23,189	15,257
Other non-current assets	2,216	8		2,224	
<b>Total assets</b>	<b>13,178</b>	<b>13,652</b>	<b>1,164</b>	<b>27,994</b>	<b>15,792</b>
<b>Liabilities</b>					
Suppliers and contractors	913	134		1,047	365
Other current liabilities	626	44		670	23
Other non-current liabilities	1,821	16		1,837	28
<b>Total liabilities</b>	<b>3,360</b>	<b>194</b>		<b>3,554</b>	<b>416</b>
<b>Net non-current assets held for sale</b>	<b>9,818</b>	<b>13,458</b>	<b>1,164</b>	<b>24,440</b>	<b>15,376</b>

(i) Include the nitrogen assets (R\$1,265) and not include the noncontrolling interest (R\$765 - note 16).

**a) Discontinued operations (Fertilizers assets)**

In December 2016, the Company entered into an agreement with The Mosaic Company ( Mosaic ) to sell (i) the phosphate assets located in Brazil, except those mainly related to nitrogen assets located in Cubatão (Brazil); (ii) the control of Companhia Minerá Miski Mayo S.A.C., in Peru; (iii) the potassium assets located in Brazil; and (iv) the potash projects in Canada.

The agreed transaction price is R\$8,148 (US\$2.5 billion), of which R\$4,074 (US\$1.25 billion) will be paid in cash and R\$4,074 (US\$1.25 billion) with 42.3 million common shares to be issued by Mosaic, which at the transaction date represents around 11% of Mosaic's total outstanding common shares. Completion of the transaction is expected for the end of 2017 and is subject to the spin-off of the nitrogen assets from Vale Fertilizantes S.A.; the fulfillment of usual precedent conditions, including the approval of the Administrative Council of Economic Defense (CADE) and other antitrust authorities; and other operational and regulatory matters.

Vale may receive additional earn-out of the transaction up to R\$847 (US\$260) in circumstances where the phosphate price (MAP Monoammonium Phosphate) and the Real exchange rate exceed certain levels during each of the twelve months periods after the completion of the transaction during two years.

The assets located in Cubatão, which are mostly dedicated to the operation with nitrogen, will be transferred from Vale Fertilizantes S.A. to an independent legal entity, for which the Company is actively seeking to identify potential buyers.

Therefore, the fertilizer segment, including Cubatão, is presented as a discontinued operation and the related assets and liabilities were classified as assets and liabilities held for sale, as established by IFRS 5.

As consequence, the net assets of the fertilizers segment was adjusted to reflect the fair value less cost to sell and a loss of R\$5,899 (R\$3,893 net of tax) was recognized in the income statement from discontinued operations for the year ended December 31, 2016.

At the completion of the transaction, the Company will recycle R\$245 of the Cumulative translation adjustments to the income statement. For the years ended December 31, 2016, 2015 and 2014 the comprehensive income attributable to Vale's stockholders regarding discontinued operations was a loss of R\$458, a gain of R\$355 and a loss of R\$22, respectively.

Table of Contents

The results for the years and the cash flows of discontinued operations of the Fertilizer segment are presented as follows:

	Consolidated		
	Year ended December 31		
	2016	2015	2014
<b>Net income of discontinued operations</b>			
Net operating revenue	6,470	7,442	5,656
Cost of goods sold and services rendered	(6,495)	(5,878)	(5,314)
Operating expenses	(448)	(690)	(668)
Results on measurement or sale of non-current assets	(5,899)	(608)	(2,800)
<b>Operating income (loss)</b>	<b>(6,372)</b>	<b>266</b>	<b>(3,126)</b>
Financial Results, net	69	(485)	(127)
Equity results in associates and joint ventures	10	19	10
<b>Income (loss) before income taxes</b>	<b>(6,293)</b>	<b>(200)</b>	<b>(3,243)</b>
Income tax	2,134	(460)	1,058
<b>Income (loss) from discontinued operations</b>	<b>(4,159)</b>	<b>(660)</b>	<b>(2,185)</b>
Income (loss) attributable to noncontrolling interests	(9)	31	14
<b>Income (loss) attributable to Vale's stockholders</b>	<b>(4,150)</b>	<b>(691)</b>	<b>(2,199)</b>

	Year ended December 31		
	2016	2015	2014
<b>Cash flow from discontinued operations</b>			
<b>Operating activities</b>			
Loss before income taxes	(6,293)	(200)	(3,243)
Adjustments:			
Equity results in associates and joint ventures	(10)	(19)	(10)
Depreciation, amortization and depletion	1,197	1,039	980
Results on measurement or sale of non-current assets	5,899	608	2,800
Others	(69)	485	125
Increase (decrease) in assets and liabilities	(226)	15	(366)
<b>Net cash provided by operating activities</b>	<b>498</b>	<b>1,928</b>	<b>286</b>
<b>Investing activities</b>			
Additions to property, plant and equipment	(995)	(853)	(92)
Others	29	(83)	131
<b>Net cash provided (used) in investing activities</b>	<b>(966)</b>	<b>(936)</b>	<b>39</b>
<b>Financing activities</b>			
Repayments	(59)	(207)	(163)
<b>Net cash used in financing activities</b>	<b>(59)</b>	<b>(207)</b>	<b>(163)</b>
<b>Net cash provided (used) by discontinued operations</b>	<b>(527)</b>	<b>785</b>	<b>162</b>

b) **Coal - Nacala logistic corridor ( Nacala )**

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In December 2014, the Company signed an agreement with Mitsui & Co., Ltd. ( Mitsui ) to sell 50% of its stake in the Nacala corridor and 15% of Vale's stake in Vale Moçambique which holds the coal assets. After completion of the transaction, Vale will indirectly own 81% of the Moatize mine (Vale Moçambique) and approximately 50% of Nacala Corridor. Since Nacala will be jointly controlled by Vale and Mitsui the related assets and liabilities were classified as non-current assets held for sale with no impact in the income statement.

In September 2016, the Company reviewed the terms related to this transaction, in which Mitsui agreed to contribute up to R\$1,467 (US\$450), being: (i) R\$831 (US\$255) for a 15% of Vale's stake in the Moatize coal mine; and (ii) an additional contribution of up to R\$636 (US\$195) based on meeting certain conditions, including mine performance. Mitsui will also contribute R\$1,134 (US\$348) for a 50% stake in the equity and *quasi-equity* instruments of the Nacala and extend a long-term facility of R\$538 (US\$165).

As at December 2016, completion of the transaction remains subject to successful completion of the Project Finance and certain government approvals which are expected to occur in 2017.

### c) Shipping assets

In June 2016, Vale approved a plan to dispose of its fleet of eleven ships. As a consequence, the referenced assets were reclassified to non-current assets held for sale and a loss of R\$228 was recorded in the income statement as Results on measurement or sale of non-current assets .

In the year ended December 31, 2016, the Company concluded the sale of three Very Large Ore Carriers ( VLOC s ) for R\$863 and four Capesize vessels for R\$470. There are four vessels that are still held for sale as at December 31, 2016.

Table of Contents

**Accounting policy**

A non-current asset is classified as held for sale if its carrying amount will be recovered principally through a sale transaction rather than through continuing use.

The criteria for recognition the non-current assets as held for sale are only considered satisfied when the sale is highly probable and the asset (or disposal group of assets) is available for immediate sale in its present condition. The Company measures the assets held for sale (or group of assets) at the lower of its carrying amount and fair value less costs to sell. If the carrying amount exceeds the fair value less costs to sell an impairment loss is recognized against income. Any subsequent reversal of impairment is recognized only to the extent of the loss previously recognized.

The assets and liabilities of a disposal group classified as held for sale are presented separately in the statement of financial position.

The classification as a discontinued operation occurs through disposal, or when the operation meets the criteria to be classified as held for sale if this occurs earlier. A discontinued operation is a component of a Group business comprising cash flows and operations that may be clearly distinct from the rest of the Group and that represents an important separate line of business or geographical area of operations.

The result of discontinued operations is presented in a single amount in the income statement, including the results after income tax of these operations less any impairment loss. Cash flows attributable to operating, investing and financing activities of discontinued operations are described in a separate note.

When an operation is classified as a discontinued operation, the income statements of the prior periods are re-presented as if the operation had been discontinued since the beginning of the comparative period.

Any non-controlling interest relating to disposal group will be presented in the stockholders equity not being reclassified as a held for sale.

**15. Investments**

The material non-consolidated entities for the Group are as follows:

	Location	Principal activity	% ownership	% Voting capital	% Other investors
<b>Joint ventures</b>					
Aliança Geração de Energia S.A. (i)	Brazil	Energy	55.0%	55.0%	45.0%
Companhia Coreano-Brasileira de Pelotização	Brazil	Pellets	50.0%	50.0%	50.0%
Companhia Hispano-Brasileira de Pelotização (i)	Brazil	Pellets	50.9%	51.0%	49.1%
Companhia Ítalo-Brasileira de Pelotização (i)	Brazil	Pellets	50.9%	51.0%	49.1%
Companhia Nipo-Brasileira de Pelotização (i)	Brazil	Pellets	51.0%	51.1%	49.0%
Companhia Siderúrgica do Pecém ( CSP )	Brazil	Steel	50.0%	50.0%	50.0%
MRS Logística S.A.	Brazil	Logistics	48.16%	46.75%	51.84%
Samarco Mineração S.A.	Brazil	Pellets	50.0%	50.0%	50.0%
<b>Direct and indirect associates</b>					
Henan Longyu Energy Resources Co., Ltd.	China	Coal	25.0%	25.0%	75.0%
VLI S.A.	Brazil	Logistics	37.6%	37.6%	62.4%

The composition of the relevant entities is presented in note 2(c).

The associates and joint ventures are accounted for using the equity method.

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(i) Although the Company held majority of the voting capital, the entities are accounted under equity method due to shareholders' agreements where relevant decisions are shared with other parties.

Table of Contents**a) Changes during the year**

Changes in investments as follows:

	Consolidated						Parent Company	
	Associates	2016 Joint ventures	Total	Associates	2015 Joint ventures	Total	2016 Total	2015 Total
<b>Balance at January 1st,</b>	<b>5,166</b>	<b>6,315</b>	<b>11,481</b>	<b>5,469</b>	<b>5,509</b>	<b>10,978</b>	<b>127,517</b>	<b>128,615</b>
Acquisitions				17	1,819	1,836		1,818
Additions	2	889	891		90	90	1,918	5,265
Capitalizations				965		965	7	
Disposals	(23)		(23)	241		241		(4,000)
Translation adjustment	(283)	(101)	(384)	423	219	642	(13,791)	34,229
Equity results in income statement	237	874	1,111	(506)	(1,020)	(1,526)	2,604	(36,864)
Equity results from discontinued operations	10		10	19		19		
Equity results in statement of comprehensive income				(17)		(17)	(140)	(460)
Dividends declared	(131)	(576)	(707)	(224)	(47)	(271)	(1,672)	(835)
Impairment (note 19)				(1,217)	(510)	(1,727)		(510)
Transfer to held for sale	(295)		(295)				(8,936)	(30)
Others		(38)	(38)	(4)	255	251	32	289
<b>Balance at December 31,</b>	<b>4,683</b>	<b>7,363</b>	<b>12,046</b>	<b>5,166</b>	<b>6,315</b>	<b>11,481</b>	<b>107,539</b>	<b>127,517</b>

The investments by segments are presented in note 3(b).

**b) Acquisitions and divestiture****2016**

**Thyssenkrupp Companhia Siderúrgica do Atlântico Ltd ( CSA )** In April 2016, the Company sold 100% of its interest at CSA (26.87%) for a non-significant amount. The transaction resulted in R\$266 loss on recycling the Cumulative translation adjustments recognized in the income statement as Impairment and others results in associates and joint ventures .



**Minas da Serra Geral S.A. ( MSG )** In March 2016, the Company completed the purchase option on additional 50% participation at MSG which was owned by JFE Steel Corporation ( JFE ) in the amount of R\$65. Vale now holds 100% of MSG s shares.

**2015**

**Energy generation assets** - In December 2013, the Company signed agreements with CEMIG Geração e Transmissão S.A. ( CEMIG GT ) to incorporate two joint ventures, Aliança Norte Participações S.A. and Aliança Geração de Energia S.A and exchange of assets and shares. The transaction was completed in the first quarter of 2015, in which Vale received cash proceeds of R\$306 and recognized a gain of R\$55 as Impairment and others results in associates and joint ventures and a gain of R\$546 as Results on measurement or sales of non-current assets .

**Divestiture of Shandong Yankuang International Coking Co., Ltd. ( Yankuang )** - The Company completed the sale of its participation in Yankuang, a producer of coking coal, methanol and other products. In this transaction, Vale recognized a gain of R\$241 as Impairment and others results in associates and joint ventures .

The Impairment and others results in associates and joint ventures are as follows:

	Year ended December 31				
	2016	Consolidated 2015	2014	Parent Company 2016	2015
Samarco provision (note 21)	(3,967)			(3,967)	
Divestiture - Thyssenkrupp Companhia Siderúrgica do Atlântico Ltd	(266)			(266)	
Divestiture - Paragominas (i)	(120)				
Divestiture - Shandong Yankuang International Coking Co., Ltd.		241			
Energy generation assets		55			55
Divestiture - Vale Florestar Fundo de Investimento em Participações			(68)		
Impairment of investments (note 19)		(1,727)	(71)		(510)
<b>Total</b>	<b>(4,353)</b>	<b>(1,431)</b>	<b>(139)</b>	<b>(4,233)</b>	<b>(455)</b>

(i) Mineração Paragominas shares were sold in 2011 and an accounts receivable of R\$498 were outstanding. In December, 2016, the Company received R\$378 and a loss of R\$120 was recognized.

Table of Contents**Investments (continued)**

	% ownership	% voting capital	Investments		Equity results in Income statement			Dividends received (i)		
			December 31, 2016	December 31, 2015	Year ended December 31 2016	Year ended December 31 2015	Year ended December 31 2014	Year ended December 31 2016	Year ended December 31 2015	Year ended December 31 2014
<b>Subsidiaries</b>										
Aços Laminados do Pará S.A.	100.00	100.00	344	339						
Biopalma da Amazônia S.A.	97.61	97.61	857	436	59	(593)	(267)			
Companhia Portuária da Baía de Sepetiba	100.00	100.00	430	531	318	456	349	455	188	341
Mineração Corumbaense Reunida S.A.	100.00	100.00		46	(117)	(1,184)	394		147	456
Minerações Brasileiras Reunidas S.A.	58.93	98.32	6,262	6,549	716	557	225	1,329	324	
Minerações Brasileiras Reunidas S.A. - Goodwill			4,060	4,060						
Salobo Metais S.A.	100.00	100.00	8,557	8,166	598	696	142	258		
Tecnored Desenvolvimento Tecnológico S.A.	100.00	100.00	39		(38)					
Vale International Holdings GmbH	100.00	100.00	8,345	13,359	(2,694)	2,069	(4,238)			
Vale Canada Limited	100.00	100.00	17,460	23,000	(4,889)	(18,210)	(586)			
Vale Fertilizantes S.A.				15,563	(6,166)	(736)	(2,100)			
Vale International S.A.	100.00	100.00	34,172	27,290	13,854	(16,998)	(8,626)			
Vale Malaysia Minerals Sdn. Bhd.	100.00	100.00	3,904	4,201	394	(467)	(100)			
Vale Manganês S.A.	100.00	100.00	595	676	(81)	(45)	57			
Vale Shipping Holding Pte. Ltd.	100.00	100.00	9,161	10,945	32	(99)	528			
Others			1,307	875	(493)	(784)	65	71	621	112
			<b>95,493</b>	<b>116,036</b>	<b>1,493</b>	<b>(35,338)</b>	<b>(14,157)</b>	<b>2,113</b>	<b>1,280</b>	<b>909</b>
<b>Joint ventures</b>										
Aliança Geração de Energia S.A.	55.00	55.00	1,896	1,876	157	173		137	115	
Aliança Norte Energia Participações S.A.	51.00	51.00	483	316	(21)	2				
California Steel Industries, Inc.	50.00	50.00	604	613	107	(90)	27	13		

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Companhia Coreano-Brasileira de Pelotização	50.00	50.00	221	242	61	85	72	90	67	39
Companhia Hispano-Brasileira de Pelotização	50.89	51.00	191	222	50	50	60	95	44	25
Companhia Ítalo-Brasileira de Pelotização	50.90	51.00	223	194	56	69	60	33	36	13
Companhia Nipo-Brasileira de Pelotização	51.00	51.11	353	406	101	152	152	141	102	114
Companhia Siderúrgica do Pecém	50.00	50.00	1,716	879	135	(1,047)	(101)			
MRS Logística S.A.	48.16	46.75	1,592	1,436	201	143	179	34	87	108
Samarco Mineração S.A. (ii)	50.00	50.00				(533)	884		459	906
Others			86	142	27	(11)	(15)	1	2	1
			<b>7,365</b>	<b>6,326</b>	<b>874</b>	<b>(1,007)</b>	<b>1,318</b>	<b>544</b>	<b>912</b>	<b>1,206</b>
<b>Associates</b>										
Henan Longyu Energy Resources Co., Ltd.	25.00	25.00	929	1,194	(18)	(13)	76		109	75
Mineração Rio Grande do Norte S.A.	40.00	40.00	421	364	172	144	17	111	12	21
Teal Minerals Inc.	50.00	50.00			(11)	(482)	(81)			
Thyssenkrupp Companhia Siderúrgica do Atlântico Ltd.						(274)	(142)			
VLI S.A.	37.60	37.60	3,158	3,038	120	156	114		25	
Zhuhai YPM Pellet Co.	25.00	25.00	70	92		1	1			
Others			103	467	(26)	(51)	(172)	14	6	
			<b>4,681</b>	<b>5,155</b>	<b>237</b>	<b>(519)</b>	<b>(187)</b>	<b>125</b>	<b>152</b>	<b>96</b>
<b>Total of joint ventures and associates</b>			<b>12,046</b>	<b>11,481</b>	<b>1,111</b>	<b>(1,526)</b>	<b>1,131</b>	<b>669</b>	<b>1,064</b>	<b>1,302</b>
<b>Total</b>			<b>107,539</b>	<b>127,517</b>	<b>2,604</b>	<b>(36,864)</b>	<b>(13,026)</b>	<b>2,782</b>	<b>2,344</b>	<b>2,211</b>

(i) Dividends received by the Parent Company during the year ended at December 31, 2016 were R\$1,591.

(ii) Note 21.

Table of Contents**c) Summarized financial information**

The summarized financial information about relevant associates and joint-ventures are as follows:

	December 31, 2016					
	Aliança Geração de Energia	Joint ventures			Associates	
		CSP	Pelletizing (i)	MRS Logística	Henan Longyu	VLI S.A.
Current assets	376	2,422	1,278	759	2,942	1,269
Non-current assets	3,935	12,415	1,036	6,814	1,486	13,587
<b>Total assets</b>	<b>4,311</b>	<b>14,837</b>	<b>2,314</b>	<b>7,573</b>	<b>4,428</b>	<b>14,856</b>
Current liabilities	537	2,166	355	1,410	652	2,206
Non-current liabilities	326	9,240	11	2,858	62	4,251
<b>Total liabilities</b>	<b>863</b>	<b>11,406</b>	<b>366</b>	<b>4,268</b>	<b>714</b>	<b>6,457</b>
<b>Stockholders equity</b>	<b>3,448</b>	<b>3,431</b>	<b>1,948</b>	<b>3,305</b>	<b>3,714</b>	<b>8,399</b>
<b>Net income (loss)</b>	<b>285</b>	<b>270</b>	<b>531</b>	<b>417</b>	<b>(72)</b>	<b>318</b>

  

	December 31, 2015					
	Aliança Geração de Energia	Joint ventures			Associates	
		CSP	Pelletizing (i)	MRS Logística	Henan Longyu	VLI S.A.
Current assets	255	1,036	1,369	1,263	3,447	1,963
Non-current assets	3,572	11,937	1,222	6,674	2,065	11,597
<b>Total assets</b>	<b>3,827</b>	<b>12,973</b>	<b>2,591</b>	<b>7,937</b>	<b>5,512</b>	<b>13,560</b>
Current liabilities	138	2,060	462	1,529	421	1,994
Non-current liabilities	277	9,156	34	3,426	311	3,486
<b>Total liabilities</b>	<b>415</b>	<b>11,216</b>	<b>496</b>	<b>4,955</b>	<b>732</b>	<b>5,480</b>
<b>Stockholders equity</b>	<b>3,412</b>	<b>1,757</b>	<b>2,095</b>	<b>2,982</b>	<b>4,780</b>	<b>8,080</b>
<b>Net income (loss)</b>	<b>314</b>	<b>(2,094)</b>	<b>703</b>	<b>297</b>	<b>(51)</b>	<b>414</b>

(i) Aggregate entity information: Companhia Coreano-Brasileira de Pelotização, Companhia Hispano-Brasileira de Pelotização, Companhia Ítalo-Brasileira de Pelotização, Companhia Nipo-Brasileira de Pelotização.

Stand alone number may differ from number reported herein, since they may be adjusted, when necessary to Vale's accounting policies including eventual goodwill, provisional price adjustment, etc.

**Accounting policy**

**Joint arrangements investments** - Joint arrangements are all entities over which the Group has shared control with one or more parties. Joint arrangement investments are classified as either joint operations or joint ventures depending on the contractual rights and obligations of each investor.

The joint operations are recorded in the financial statements to represent the Group's contractual rights and obligations. Accordingly, any jointly held assets, liabilities, revenues and expenses are accounted for individually in the financial statements. The Company does not have material joint operations.

Interests in joint ventures are accounted for using the equity method, after initially being recognized at cost in the consolidated balance sheet. The Group's investment in joint ventures includes the goodwill identified in the acquisition, net of any accumulated impairment loss.

The Group's interest in the profits or losses of its joint ventures is recognized in the income statement and participation in the changes in reserves is recognized in the Group's reserves. When the Group's interest in the losses of an associate or joint venture is equal to or greater than the carrying amount of the investment, including any other receivables, the Group does not recognize additional losses, unless it has incurred obligations or made payments on behalf of the joint venture.

**d) Commitments and guarantees**

The commitments and guarantees issued the affiliates and joint ventures are presented in note 32.

Table of Contents**16. Noncontrolling interest****a) Summarized financial information**

The summarized financial information, prior to the eliminations of the intercompany balances and transactions, about subsidiaries with material noncontrolling interest are as follows:

	December 31, 2016					
	MBR	PTVI	VNC	Compañía Mineradora Miski Mayo S.A.C. (i)	Others	Total
Current assets	1,900	1,879	1,505	348		
Non-current assets	10,370	5,435	6,848	1,400		
<b>Total assets</b>	<b>12,270</b>	<b>7,314</b>	<b>8,353</b>	<b>1,748</b>		
Current liabilities	464	473	921	151		
Non-current liabilities	647	851	3,497	322		
<b>Total liabilities</b>	<b>1,111</b>	<b>1,324</b>	<b>4,418</b>	<b>473</b>		
Stockholders equity	11,159	5,990	3,935	1,275		
<b>Equity attributable to noncontrolling interests</b>	<b>4,853</b>	<b>2,416</b>	<b>130</b>	<b>765</b>	<b>(1,703)</b>	<b>6,461</b>
Net income (loss)	1,393	6	(2,627)	16		
<b>Income (loss) attributable to noncontrolling interests</b>	<b>572</b>	<b>3</b>	<b>(131)</b>	<b>9</b>	<b>(468)</b>	<b>(15)</b>
<b>Dividends paid</b>	<b>2,215</b>			<b>177</b>		

	December 31, 2015					
	MBR	PTVI	VNC	Compañía Mineradora Miski Mayo S.A.C. (i)	Others	Total
Current assets	2,901	2,214	970	535		
Non-current assets	11,372	6,758	9,325	1,880		
<b>Total assets</b>	<b>14,273</b>	<b>8,972</b>	<b>10,295</b>	<b>2,415</b>		
Current liabilities	733	588	2,024	323		
Non-current liabilities	608	1,208	10,603	395		

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<b>Total liabilities</b>	<b>1,341</b>	<b>1,796</b>	<b>12,627</b>	<b>718</b>		
Stockholders' equity	12,932	7,176	(2,332)	1,697		
<b>Equity attributable to noncontrolling interests</b>	<b>5,311</b>	<b>2,894</b>	<b>215</b>	<b>1,018</b>	<b>(1,179)</b>	<b>8,259</b>
Net income (loss)	911	141	(7,480)	51		
<b>Income (loss) attributable to noncontrolling interests</b>	<b>255</b>	<b>57</b>	<b>(1,458)</b>	<b>31</b>	<b>(669)</b>	<b>(1,784)</b>
<b>Dividends paid</b>	<b>324</b>			<b>208</b>		

	December 31, 2014					
	Compañía Mineradora Miski Mayo S.A.C. (i)					
	MBR	PTVI	VNC		Others	Total
Net income (loss)	350	537	(2,609)		24	
<b>Income (loss) attributable to noncontrolling interests</b>	<b>6</b>	<b>219</b>	<b>(509)</b>		<b>14</b>	<b>(735)</b>
<b>Dividends paid</b>		109				

(i) Discontinued operation

Stand alone number may differ from number reported herein, since they may be adjusted, when necessary to Vale's accounting policies including eventual goodwill, provisional price adjustment, etc.

Table of Contents**b) Acquisitions and divestments****2016**

There were no significant changes in equity interest in subsidiaries in 2016.

**2015**

Sale of minority interest in Minerações Brasileiras Reunidas S.A. - In September 2015, the Company sold 36.4% of the total capital of subsidiary Minerações Brasileiras Reunidas S.A. ( MBR ) to an affiliate of Banco Bradesco S.A. (related party) for R\$4,000. After the sale, Vale holds 62.5% of the total capital. Vale has an option to repurchase the shares after an initial period.

**17. Intangibles**

Changes in intangibles are as follows:

	Goodwill	Concessions	Consolidated Right of use	Software	Total
<b>Balance at December 31, 2014</b>	<b>9,987</b>	<b>5,876</b>	<b>789</b>	<b>1,462</b>	<b>18,114</b>
Additions		1,770		397	2,167
Disposals		(64)		(1)	(65)
Amortization		(498)	(141)	(508)	(1,147)
Impairment (note 19)	(314)				(314)
Translation adjustment	1,769		163		1,932
Acquisition of subsidiary	102				102
<b>Balance at December 31, 2015</b>	<b>11,544</b>	<b>7,084</b>	<b>811</b>	<b>1,350</b>	<b>20,789</b>
Cost	11,544	10,109	1,814	3,997	27,464
Accumulated amortization		(3,025)	(1,003)	(2,647)	(6,675)
<b>Balance at December 31, 2015</b>	<b>11,544</b>	<b>7,084</b>	<b>811</b>	<b>1,350</b>	<b>20,789</b>
Additions		3,926	3	46	3,975
Disposals		(39)		(1)	(40)
Amortization		(842)	(8)	(534)	(1,384)



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Impairment of discontinued operations (note 14)	(102)				(102)
Translation adjustment	(1,295)	361	(63)	(33)	(1,030)
Transfers		269	(263)	289	295
<b>Effect of discontinued operations</b>					
Transfer to net assets held for sale	(106)			(2)	(108)
<b>Balance at December 31, 2016</b>	<b>10,041</b>	<b>10,759</b>	<b>480</b>	<b>1,115</b>	<b>22,395</b>
Cost	10,041	14,559	723	5,116	30,439
Accumulated amortization		(3,800)	(243)	(4,001)	(8,044)
<b>Balance at December 31, 2016</b>	<b>10,041</b>	<b>10,759</b>	<b>480</b>	<b>1,115</b>	<b>22,395</b>

	Parent Company			Total
	Concessions	Right of use	Software	
<b>Balance at December 31, 2014</b>	<b>5,876</b>	<b>129</b>	<b>1,462</b>	<b>7,467</b>
Additions	1,770		397	2,167
Disposals	(64)		(1)	(65)
Amortization	(498)	(6)	(508)	(1,012)
<b>Balance at December 31, 2015</b>	<b>7,084</b>	<b>123</b>	<b>1,350</b>	<b>8,557</b>
Cost	10,109	224	3,997	14,330
Accumulated amortization	(3,025)	(101)	(2,647)	(5,773)
<b>Balance at December 31, 2015</b>	<b>7,084</b>	<b>123</b>	<b>1,350</b>	<b>8,557</b>
Additions	3,578		44	3,622
Disposals	(39)			(39)
Amortization	(345)	(5)	(476)	(826)
<b>Balance at December 31, 2016</b>	<b>10,278</b>	<b>118</b>	<b>918</b>	<b>11,314</b>
Cost	13,670	224	4,041	17,935
Accumulated amortization	(3,392)	(106)	(3,123)	(6,621)
<b>Balance at December 31, 2016</b>	<b>10,278</b>	<b>118</b>	<b>918</b>	<b>11,314</b>

a) **Goodwill** - The goodwill arose from the acquisition of iron ore and nickel business.

b) **Concessions** - The concessions refer to the agreements with governments, for the exploration and the development of ports and railways. The Company holds railway concessions which are valid over a certain period of time. Those assets are classified as intangible assets and amortized over the shorter of their useful lives and the concession term at the end of which they will be returned to the government.

Table of Contents

c) **Right of use** - Refers to the usufruct contract between the Company and noncontrolling stockholders to use the shares of Empreendimentos Brasileiros de Mineração S.A. (owner of Minerações Brasileiras Reunidas S.A. shares) and intangible assets identified in the business combination of Vale Canada Limited ( Vale Canada ). The amortization of the right of use will expire in 2037 and Vale Canada s intangible assets will end in September of 2046.

**Accounting policy**

Intangibles are carried at the acquisition cost, net of amortization and impairment.

The estimated useful lives are as follows:

	<b>Useful life</b>
Concessions	3 to 50 years
Right of use	22 to 31 years
Software	5 years

**18. Property, plant and equipment**

Changes in property, plant and equipment are as follows:

	<b>Land</b>	<b>Building</b>	<b>Facilities</b>	<b>Equipment</b>	<b>Consolidated Mineral properties</b>	<b>Others</b>	<b>Constructions in progress</b>	<b>Total</b>
<b>Balance at December 31, 2014</b>	<b>2,839</b>	<b>30,955</b>	<b>28,721</b>	<b>24,669</b>	<b>39,654</b>	<b>29,095</b>	<b>51,574</b>	<b>207,507</b>
Additions (i)							32,370	32,370
Disposals	(11)	(27)	(141)	(290)	(438)	(5,395)	(83)	(6,385)
Assets retirement obligations					(1,294)			(1,294)
Depreciation, amortization and depletion		(1,823)	(2,349)	(3,519)	(2,869)	(2,557)		(13,117)
Transfers to non-current assets					(504)			(504)

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held for sale								
Impairment (note 19)	(49)	(7,028)	(3,221)	(4,228)	(3,074)	(7,895)	(6,754)	(32,249)
Impairment of discontinued operations (note 14)					(701)	23	70	(608)
Translation adjustment	222	3,258	1,947	5,207	8,492	4,711	1,385	25,222
Transfers	(12)	10,203	7,421	6,692	968	9,837	(35,109)	
Acquisition of subsidiary				1		316		317
<b>Balance at</b>								
<b>December 31, 2015</b>	<b>2,989</b>	<b>35,538</b>	<b>32,378</b>	<b>28,532</b>	<b>40,234</b>	<b>28,135</b>	<b>43,453</b>	<b>211,259</b>
Cost	2,989	53,522	51,357	47,757	66,592	41,459	43,453	307,129
Accumulated depreciation		(17,984)	(18,979)	(19,225)	(26,358)	(13,324)		(95,870)
<b>Balance at</b>								
<b>December 31, 2015</b>	<b>2,989</b>	<b>35,538</b>	<b>32,378</b>	<b>28,532</b>	<b>40,234</b>	<b>28,135</b>	<b>43,453</b>	<b>211,259</b>
Additions (i)							17,628	17,628
Disposals	(2)	(27)	(29)	(65)	(406)	(1,338)	(63)	(1,930)
Assets retirement obligation					1,028			1,028
Depreciation, amortization and depletion		(1,789)	(2,432)	(3,156)	(2,766)	(2,195)		(12,338)
Transfers to non-current assets held for sale						(1,595)		(1,595)
Impairment (note 19)	(4)	(1,476)	(578)	(367)	(374)	(502)	222	(3,079)
Impairment of discontinued operations (note 14)	(174)		(214)		(5,409)			(5,797)
Translation adjustment	(130)	(3,724)	(2,158)	(2,626)	(4,080)	(1,423)	(1,454)	(15,595)
Transfers	85	7,351	4,160	3,392	840	3,613	(19,736)	(295)
Acquisition of subsidiary		1						1
<b>Effect of discontinued operations</b>								
Transfer to net assets held for sale	(404)	(1,084)	(261)	(3,569)	(1,755)	(201)	(1,397)	(8,671)
<b>Balance at</b>								
<b>December 31, 2016</b>	<b>2,360</b>	<b>34,790</b>	<b>30,866</b>	<b>22,141</b>	<b>27,312</b>	<b>24,494</b>	<b>38,653</b>	<b>180,616</b>
Cost	2,360	54,359	51,051	38,955	52,360	36,890	38,653	274,628
Accumulated depreciation		(19,569)	(20,185)	(16,814)	(25,048)	(12,396)		(94,012)
<b>Balance at</b>								
<b>December 31, 2016</b>	<b>2,360</b>	<b>34,790</b>	<b>30,866</b>	<b>22,141</b>	<b>27,312</b>	<b>24,494</b>	<b>38,653</b>	<b>180,616</b>

(i) Includes capitalized borrowing costs, see cash flow.

Table of Contents

	Land	Building	Facilities	Equipment	Parent Company Mineral properties	Others	Constructions in progress	Total
<b>Balance at</b>								
<b>December 31, 2014</b>	<b>1,452</b>	<b>13,364</b>	<b>17,337</b>	<b>7,097</b>	<b>4,396</b>	<b>9,820</b>	<b>33,855</b>	<b>87,321</b>
Additions (i)							14,328	14,328
Disposals	(11)	(10)	(19)	(138)	(4)	(5)		(187)
Assets retirement obligation					(937)			(937)
Depreciation, amortization and depletion		(511)	(924)	(972)	(341)	(1,160)		(3,908)
Impairment (note 19)		480	23	90	370	(30)	(663)	270
Transfers	231	6,223	2,962	2,294	731	5,578	(18,019)	
<b>Balance at</b>								
<b>December 31, 2015</b>	<b>1,672</b>	<b>19,546</b>	<b>19,379</b>	<b>8,371</b>	<b>4,215</b>	<b>14,203</b>	<b>29,501</b>	<b>96,887</b>
Cost	1,672	22,405	25,195	13,401	5,462	21,235	29,501	118,871
Accumulated depreciation		(2,859)	(5,816)	(5,030)	(1,247)	(7,032)		(21,984)
<b>Balance at</b>								
<b>December 31, 2015</b>	<b>1,672</b>	<b>19,546</b>	<b>19,379</b>	<b>8,371</b>	<b>4,215</b>	<b>14,203</b>	<b>29,501</b>	<b>96,887</b>
Additions (i)							9,551	9,551
Disposals		(1)	(17)	(4)		(27)	(46)	(95)
Asset retirement obligation					202			202
Depreciation, amortization and depletion		(675)	(1,059)	(1,102)	(207)	(1,352)		(4,395)
Impairment (note 19)			480	(86)		(16)	(173)	205
Transfers	12	2,075	1,633	1,300	(88)	3,691	(8,923)	(300)
<b>Balance at</b>								
<b>December 31, 2016</b>	<b>1,684</b>	<b>20,945</b>	<b>20,416</b>	<b>8,479</b>	<b>4,122</b>	<b>16,499</b>	<b>29,911</b>	<b>102,056</b>
Cost	1,684	24,250	27,293	14,219	5,576	24,558	29,911	127,491
Accumulated depreciation		(3,305)	(6,877)	(5,740)	(1,454)	(8,059)		(25,435)
<b>Balance at</b>								
<b>December 31, 2016</b>	<b>1,684</b>	<b>20,945</b>	<b>20,416</b>	<b>8,479</b>	<b>4,122</b>	<b>16,499</b>	<b>29,911</b>	<b>102,056</b>

(i) Includes capitalized borrowing costs, see cash flow.

The net book value of consolidated property, plant and equipment pledged to secure judicial claims on December 31, 2016 and 2015 were R\$113 and R\$174, respectively. For the parent company at December 31, 2016 and 2015 corresponds to R\$107 and R\$173, respectively.

**Accounting policy**

Property, plant and equipment are evaluated at the cost of acquisition or construction, net of amortization and impairment.

Mineral properties developed internally are determined by (i) direct and indirect costs attributed to build the mine site and plant, (ii) financial charges incurred during the construction period, (iii) depreciation of other fixed assets used during construction, (iv) estimated decommissioning and site restoration expenses, and (v) other capitalized expenditures occurred during the development phase (phase when the project demonstrates its economic benefit to the Company, and the Company has ability and intention to complete the project).

The depletion of mineral properties is determined based on the ratio between production and total proven and probable mineral reserves.

Property, plant and equipment, other than mineral properties are depreciated using the straight-line method based on the estimated useful lives, from the date on which the assets become available for their intended use and are capitalized, except for land which is not depreciated.

The estimated useful lives are as follows:

	<b>Useful life</b>
Buildings	15 to 50 years
Facilities	3 to 50 years
Equipment	3 to 40 years
<b>Others:</b>	
Locomotives	12 to 25 years
Wagon	30 to 44 years
Railway equipment	5 to 33 years
Ships	20 years
Others	2 to 50 years

The residual values and useful lives of assets are reviewed at the end of each fiscal year and adjusted if necessary.

Table of Contents

**a) Mineral reserves**

**Critical accounting estimates and judgments**

The estimates of proven and probable reserves are regularly evaluated and updated. These reserves are determined using generally accepted geological estimates. The calculation of reserves requires the Company to take positions on expected future conditions that are uncertain, including future ore prices, exchange rates, inflation rates, mining technology, availability of permits and production costs. Changes in some of these assumptions could have a significant impact on the proven and probable reserves of the Company.

The estimated volume of mineral reserves is used as basis for the calculation of depletion of the mineral properties, and also for the estimated useful life which is a major factor to quantify the provision for asset retirement obligation, environmental recovery of mines and impairment of long lived asset. Any changes to the estimates of the volume of mine reserves and the useful lives of assets may have a significant impact on the depreciation, depletion and amortization charges and assessments of impairment.

**b) Expenditures and stripping costs**

**(i) Exploration and evaluation expenditures** - Expenditures on mining research are accounted for as operating expenses until the effective proof of economic feasibility and commercial viability of a given field can be demonstrated. From then on, the expenditures incurred are capitalized as mineral properties.

**(ii) Expenditures on feasibility studies, new technologies and others research** - The Company also conducts feasibility studies for many businesses which it operates including researching new technologies to optimize the mining process. After these costs are proven to generate future benefits to the Company, the expenditures incurred are capitalized.

**(iii) Maintenance costs** - Significant industrial maintenance costs, including spare parts, assembly services, and others, are recorded in property, plant and equipment and depreciated through the next programmed maintenance overhaul.

**(iv) Stripping Costs** - The cost associated with the removal of overburden and other waste materials ( stripping costs ) incurred during the development of mines, before production takes place, are capitalized as part of the depreciable cost of the mineral properties. These costs are subsequently amortized over the useful life of the mine.

Post-production stripping costs are included in the cost of inventory, except when a new project is developed to permit access to a significant ore deposits. In such cases, the cost is capitalized as a non-current asset and is amortized during the extraction of the ore deposits, over the useful life of the ore deposits.

Stripping costs are measured at fixed and variable costs directly and indirectly attributable to its removal and, when applicable, net of any impairment losses measured in the same basis adopted for the cash generating unit of which it belongs.

Table of Contents**19. Impairment and onerous contracts**

The impairment losses (reversals) recognized in the year are presented below:

Segments by class of assets	Assets or cash-generating unit	Book value (after impairment) as of December 31, 2016	Income statement Impairment (reversals)		
			2016	2015	2014
<b>Property, plant and equipment and intangible</b>					
Iron ore	North system	536	(536)	213	
Coal	Australia	140	91	2.460	787
Base metals nickel	Newfoundland (VNL)	6,241	2,112	13.394	
Base metals nickel	Nouvelle Calédonie (VNC)	10,976	952	5.660	628
Base metals nickel	Onça Puma	6,766		(976)	(4.295)
Coal	Mozambique	5,772		9.302	
Iron ore	Midwest system			2.023	
Iron ore	Simandou Project				2.793
Several segments	Other assets		460	487	
<b>Impairment of non-current assets</b>			<b>3,079</b>	<b>32,563</b>	<b>(87)</b>
Onerous contracts			861	1.382	
<b>Impairment of non-current assets and onerous contracts</b>			<b>3,940</b>	<b>33,945</b>	<b>(87)</b>
<b>Investments in associates and joint ventures</b>					
Iron ore	Samarco Mineração S.A.			510	
Base metals - Copper	Teal Minerals Inc.			1.217	
Others	Vale Soluções em Energia S.A.				71
<b>Impairment of investments in associates and joint ventures</b>				<b>1,727</b>	<b>71</b>

**a) Impairment of non-financial assets**

The assets, where a trigger of impairment was identified, were tested using fair value less costs of disposal ( FVLCS ) model, except for the pelletizing plant that the value in use ( VIU ) model was applied. The FVLCS for each Cash Generating Units ( CGU ) was assessed considering Level 3 fair value measurements, as it is derived from valuation techniques that includes inputs that are not based on observable market data.

These cash flows were discounted using a post-tax discount rate ranging from 6% to 10%. The discount rate was based on the weighted average cost of capital ( WACC ) that reflected the risks specific to the CGU.



**Iron ore and pellets** During 2016, based on new market circumstances, the Company decided to resume Norte's system pelletizing plant, based on the studies carried out by management that demonstrates its economic feasibility. Accordingly, the Company reversed the full impairments of R\$536 recorded in 2013 and 2015.

Of the total goodwill (note 17), R\$4,060 is allocated to the group of ferrous mineral CGUs. The impairment analyses based on FVLCS model indicated that CGUs recoverable amount exceeds its carrying value; therefore, no impairment was recognized in the financial statements.

In 2015, the Company recognized an impairment loss of R\$2,023 due to lack of competitiveness in the Midwest system as a consequence of a complex logistic system associated with a consistent decline in iron ore prices. Accordingly, long-lived assets were fully impaired.

In 2014, for the Simandou project, Vale recognized an impairment of R\$2,793 related to the revocation of Vale's former 51%-owned subsidiary VBG-Vale BSGR Limited ( VBG ) mining concessions in Guinea. During the first quarter of 2015, the investment was sold.

**Coal** The Coal assets in Australia were impacted mainly by the revision of the future mining plans, which resulted in an impairment loss of R\$91 in 2016 (R\$2,460 in 2015). The impairment of R\$787 registered in 2014 relates to Integra and Isaac Plans operations which were sold during the fourth quarter of 2015.

In relation to the coal assets in Mozambique, Vale recognized an impairment loss of R\$9,302 in 2015 due to the reduction in estimated future coal prices combined with the increase of logistics costs, which decreased the estimated net recoverable amount of these assets. During 2016, no trigger event was identified for the purpose of impairment reassessing or any additional event or circumstance has changed that would indicate that the impairment recognized in 2015 is no longer applicable.

**Nickel** - The decrease in long term nickel price projections, that significantly reduced the recoverable values of the VNL and VNC CGUs, combined with significant capital investments in new processing facilities in recent years, resulted in an impairment loss in the amount of R\$2,112 and R\$952 (R\$13,394 and R\$5,660) in 2016 and 2015 year end, respectively.

Table of Contents

The assumption of nickel prices used in the FVLCS calculation for the nickel CGUs is in a range (US\$ per ton) from 10,500 to 20,000 (13,000 to 20,000 in 2015). Cash flows used are designed based on the life of each CGU and considering a discount rate ranging from 6% to 8% per year.

Of the total goodwill (note 17), R\$5,981 is allocated to the group of nickel CGUs. The impairment analyses based on FVLCS model demonstrates that nickel CGUs recoverable amount exceeds its carrying value; therefore no impairment was recognized in the financial statements.

In 2014, the Company identified that the indicators which caused an impairment to be recognized in previous years for Onça Puma were no longer applicable. This was mainly due to Onça Puma's production resuming to normal capacity after the furnace problems in 2012. The total impairment registered in 2012 was reversed in 2014 and 2015.

**b) Onerous contract**

The provision recognized in 2016, R\$611 is related to the contracts with minimum guaranteed volume for port structure in the Midwest system and R\$250 for supply of manganese ore.

In 2015, the Company recognized a provision related to the fluvial transportation contract with minimal guarantee volume in the amount of R\$1,382 also in the Midwest system.

**c) Impairment of investments in associates and joint ventures**

In 2015, the Company recognized an impairment of R\$510 in its investment in Samarco (note 21) and R\$1,217 in Teal Minerals Inc. ( Teal ). Teal recognized an impairment of property, plant and equipment due to the revision of future mining plans and the decrease of the copper price.

**Accounting policy**

**Impairment of non-Financial assets** - Non-financial assets are reviewed for impairment whenever events or changes in circumstances indicate that the carrying amount might not be recoverable. An impairment loss is recognized for the amount by which the asset's carrying value exceeds its recoverable amount. The recoverable amount is the higher of an asset's fair value less costs of disposal ( FVLCS ) and value in use ( VIU ).

FVLCS is generally determined as the present value of the estimated future cash flows expected to arise from the continued use of the asset, including any expansion prospects, and its eventual disposal. VIU model is determined as the present value of the estimated future cash flows expected to arise from the continued use of the asset in its present form. Value in use is determined by applying assumptions specific to the Group's continued use and cannot take into account future development. These assumptions are different to those used in calculating fair value and consequently the VIU calculation is likely to give a different result to a FVLCS calculation.

The future cash flows are based on the current life-of-mine plan or long-term production plan for the cash-generating unit.

Assets that have an indefinite useful life and are not subject to amortization, such as goodwill, are tested annually for impairment.

For the purposes of assessing impairment, assets are grouped at the lowest levels for which there are separately identifiable cash flows (Cash Generating Units (CGUs)). Goodwill is allocated to Cash Generating Units or Cash Generating Units groups that are expected to benefit from the business combinations in which the goodwill arose and are identified in accordance with the operating segment.

Non-current assets (excluding goodwill) in which the Company recognized impairment in the past are reviewed whenever events or changes in circumstances indicate that the impairment may no longer be applicable. In such cases, an impairment reversal will be recognized.

**Onerous Contracts** - For onerous contracts, provision is recognized for the present value of certain long-term contracts where the unavoidable cost of meeting the Company's obligations exceed the economic benefits to be received under it.

Table of Contents**Critical accounting estimates and judgments**

The Company determines its cash flows based on the budgets approved by management, which require the use of the following key assumptions: (i) mineral reserves and mineral resources measured by internal experts; (ii) costs and investments based on the best estimate of projects as supported by past performance; (iii) sale prices consistent with projections available in reports published by industry considering the market price when appropriate; (iv) the life of each cash-generating unit (ratio between production and mineral reserves); and (v) discount rates that reflect specific risks relating to the relevant assets in each cash-generating unit. These assumptions are subject to risk and uncertainty; hence there is a possibility that changes in circumstances will change these projections, which may impact the recoverable amount of the assets.

**20. Loans, borrowings and cash and cash equivalents****a) Net debt**

The Company evaluates the net debt with the objective of ensuring the continuity of its business in the long term, being able to generate value to its stockholders, through the payment of dividends and capital gain.

	Consolidated		Parent Company	
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
Debt contracts in the international markets	68,863	84,625	26,796	34,208
Debt contracts in Brazil	26,701	28,041	25,252	26,514
<b>Total of loans and borrowings</b>	<b>95,564</b>	<b>112,666</b>	<b>52,048</b>	<b>60,722</b>
(-) cash and cash equivalents	13,891	14,022	1,203	518
<b>Net debt</b>	<b>81,673</b>	<b>98,644</b>	<b>50,845</b>	<b>60,204</b>

**b) Cash and cash equivalents**

Cash and cash equivalents includes cash, immediately redeemable deposits and short-term investments with an insignificant risk of change in value. They are readily convertible to cash, being R\$3,132 denominated in R\$, indexed to the Brazilian Interbank Interest rate ( DI Rate or CDI ), R\$9,448 denominated in US\$, mainly time deposits and R\$1,311 denominated in other currencies.

## c) Loans and borrowings

## (i) Total debt

	Consolidated			
	Current liabilities		Non-current liabilities	
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
<b>Debt contracts in the international markets</b>				
<b>Floating rates in:</b>				
US\$	762	943	17,889	20,203
EUR			688	
<b>Fixed rates in:</b>				
US\$		4,651	42,643	50,463
EUR			5,157	6,376
Other currencies	55	56	679	659
<b>Accrued charges</b>	<b>990</b>	<b>1,274</b>		
	<b>1,807</b>	<b>6,924</b>	<b>67,056</b>	<b>77,701</b>
<b>Debt contracts in Brazil</b>				
<b>Floating rates in:</b>				
R\$, indexed to TJLP, TR, IPCA, IGP-M and CDI	1,313	827	18,326	18,388
Basket of currencies and US\$ indexed to LIBOR	1,117	1,133	3,962	5,239
<b>Fixed rates in:</b>	<b>214</b>		<b>703</b>	
R\$		246		1,047
<b>Accrued charges</b>	<b>959</b>	<b>658</b>	<b>107</b>	<b>503</b>
	<b>3,603</b>	<b>2,864</b>	<b>23,098</b>	<b>25,177</b>
	<b>5,410</b>	<b>9,788</b>	<b>90,154</b>	<b>102,878</b>

Table of Contents

	Parent Company		Parent Company	
	Current liabilities		Non-current liabilities	
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
<b>Debt contracts in the international markets</b>				
<b>Floating rates in:</b>				
US\$	448	567	15,876	16,829
<b>Fixed rates in:</b>				
US\$		937	4,889	9,020
EUR			5,158	6,376
<b>Accrued charges</b>	425	479		
	<b>873</b>	<b>1,983</b>	<b>25,923</b>	<b>32,225</b>
<b>Debt contracts in Brazil</b>				
<b>Floating rates in:</b>				
R\$, indexed to TJLP, TR, IPCA, IGP-M and CDI	1,059	780	17,307	17,658
Basket of currencies and US\$ indexed to LIBOR	1,117	1,125	3,962	5,227
<b>Fixed rates in:</b>				
R\$	190	190	685	876
<b>Accrued charges</b>	<b>932</b>	<b>658</b>		
	<b>3,298</b>	<b>2,753</b>	<b>21,954</b>	<b>23,761</b>
	<b>4,171</b>	<b>4,736</b>	<b>47,877</b>	<b>55,986</b>

The future flows of debt payments principal, per nature of funding and interest are as follows:

	Consolidated				Parent Company	
	Bank loans	Capital markets	Development agencies	Total	Estimated future interests payments (i)	Principal Total
2017	192		3,266	3,458	5,159	2,814
2018	6,065	2,578	3,820	12,463	4,462	11,832
2019	3,546	3,259	4,436	11,241	3,947	7,289
2020	5,192	4,361	3,018	12,571	3,292	7,780
2021	2,027	4,374	2,972	9,373	2,751	4,770
Between 2022 and 2025	4,279	10,729	3,950	18,958	7,493	10,691
2026 onwards	264	24,411	769	25,444	17,335	5,515
	<b>21,565</b>	<b>49,712</b>	<b>22,231</b>	<b>93,508</b>	<b>44,439</b>	<b>50,691</b>

(i) Estimated future payments of interest, calculated based on interest rate curves and foreign exchange rates applicable as at December 31, 2016 and considering that all amortization payments and payments at maturity on loans and borrowings will be made on their contracted payments dates. The amount includes the estimated values of future interest payments (not yet accrued), in addition to interest already recognized in the financial statements.

At December 31, 2016, the average annual interest rates by currency are as follows:

Loans and borrowings in	Consolidated		Parent Company	
	Average interest rate (i)	Total debt	Average interest rate (i)	Total debt
US\$	4.92%	67,187	3.60%	26,541
R\$ (ii)	10.94%	21,588	11.23%	20,142
EUR (iii)	3.82%	6,052	4.06%	5,365
Other currencies	3.35%	737		
		<b>95,564</b>		<b>52,048</b>

(i) In order to determine the average interest rate for debt contracts with floating rates, the Company used the last renegotiated rate at December 31, 2016.

(ii) R\$ denominated debt that bears interest at IPCA, CDI, TR or TJLP, plus spread. For a total of R\$15,213, the Company entered into derivative transactions to mitigate the exposure to the cash flow variations of the floating rate debt denominated in R\$, resulting in an average cost of 2.42% per year in US\$.

(iii) Eurobonds, for which the Company entered into derivatives to mitigate the exposure to the cash flow variations of the debt denominated in EUR, resulting in an average cost of 4.33% per year in US\$.

## ii) Credit and financing lines

Type	Contractual currency	Date of agreement	Period of the agreement	Total amount	Available amount December 31, 2016
<b>Credit lines</b>					
Revolving credit facilities	US\$	May 2015	5 years	9,777	9,777
Revolving credit facilities	US\$	July 2013	5 years	6,518	6,518
<b>Financing lines</b>					
BNDES (i)	R\$	April 2008	10 years	7,300	287
BNDES - CLN 150	R\$	September 2012	10 years	3,883	20
BNDES - S11D e S11D Logística	R\$	May 2014	10 years	6,163	2,050

(i) Memorandum of understanding signature date, however term is considered from the signature date of each contract amendment. This credit line supported or supports the pelletizing plant VIII, Onça Puma, Salobo I and II and capital expenditure of Itabira projects.

Table of Contents

**Liquidity risk** - To mitigate such risk, Vale has a revolving credit facilities to assist the short term liquidity management and to enable more efficiency in cash management, being consistent with the strategic focus on cost of capital reduction. The revolving credit facilities available today were acquired from a syndicate of several global commercial banks.

**iii) Funding**

In January 2016, the Company drew down part of its revolving credit facilities which were fully amortized in November 2016. There was no outstanding debt on this lines at December 31, 2016.

In June and August 2016, the Company issued through its wholly owned subsidiary Vale Overseas Limited the guaranteed notes due 2021 and 2026 totaling R\$7,333 (US\$2,250). These notes bear a coupon of 5.875% and 6.250% per year, respectively, payable semi-annually, and were sold at a price of 100.000% of the principal amount.

In February 2017 (subsequent event), the Company issued through Vale Overseas Limited guaranteed notes due August 2026 totaling R\$3,259 (US\$1,000). The notes bears 6.250% coupon per year, payable semi-annually, and were sold at a price of 107.793% of the principal amount. The notes will be consolidated with, and form a single series with, Vale Overseas' s R\$3,259 (US\$1,000) 6.250% notes due 2026 issued on August, 2016, mentioned above. Vale intends to apply the net proceeds from the offering on the earlier redemption of Vale' s EUR750 notes (due in March 2018), which is expected to occur during March 2017.

**iv) Guarantees**

As at December 31, 2016 and 2015, loans and borrowings are secured by property, plant and equipment and receivables in the amount of R\$1,538 and R\$1,937, respectively.

The securities issued through Vale' s 100%-owned finance subsidiary Vale Overseas Limited are fully and unconditionally guaranteed by Vale.

**v) Covenants**



Some of the Company's debt agreements with lenders contain financial covenants. The main covenants in those agreements require maintaining certain ratios, such as debt to EBITDA (Earnings before Interest Taxes, Depreciation and Amortization) and interest coverage. The Company has not identified any instances of noncompliance as at December 31, 2016 and 2015.

**Accounting policy**

Loans and borrowings are initially measured at fair value, net of transaction costs incurred and are subsequently carried at amortized cost and updated using the effective interest rate method. Any difference between the proceeds (net of transaction costs) and the redemption value is recognized in the Income statement over the period of the loan, using the effective interest rate method. The fees paid in obtaining the loan are recognized as transaction costs.

Loans and borrowing costs are capitalized as part of property, plants and equipment if those costs are directly related to a qualified asset. The capitalization occurs until the qualified asset is ready for its intended use. The average capitalization rate is 37%. Borrowing costs that are not capitalized are recognized in the income statement in the period in which they are incurred.

Table of Contents

**21. Liabilities related to associates and joint ventures**

Refers to the provision to comply with the obligations under the agreement related to the dam failure of Samarco Mineração S.A. ( Samarco ), which is a Brazilian joint venture between Vale S.A. and BHP Billiton Brasil Ltda. ( BHPB ), as follows:

**a) Framework agreement**

Samarco and its shareholders, Vale S.A. and BHPB, entered into an Agreement ( Framework Agreement ) in connection with the R\$20.2 billion lawsuit on March 2, 2016 with the Brazilian federal government, the two Brazilian states affected by the failure (Espírito Santo and Minas Gerais) and other governmental authorities in order to implement the programs for remediation and compensation of the areas and communities affected by Samarco's dam (Fundão) failure.

The Framework Agreement does not contemplate admission of civil, criminal or administrative liability for the Fundão dam failure.

The Framework Agreement has a 15-year term, renewable for successive one-year periods until all the obligations under the Framework Agreement have been performed.

Under the Framework Agreement, Samarco, Vale S.A. and BHPB have agreed to establish a foundation to develop and implement social and economic remediation and compensation, to be funded by Samarco as follows: R\$2.0 billion in 2016, R\$1.2 billion in 2017 and R\$1.2 billion in 2018. From 2019 to 2021, annual contributions to the foundation will range from R\$800 to R\$1.6 billion based on the projects approved for the relevant year. From 2022 onwards, the annual contributions will be determined on the basis of the amount of funding necessary to complete remaining programs approved for each relevant year. The foundation will allocate an annual amount of R\$240 over 15 years to the implementation of compensation programs, and these annual amounts are included in the annual contributions described above for the first six years. Through the end of 2018, Samarco is expected to provide R\$500 for sewage collection and treatment and solid waste disposal under the terms of the Framework Agreement.

To the extent that Samarco does not meet its funding obligations to the foundation, each of Vale S.A. and BHPB will provide, under the terms of the Framework Agreement, funds to the Foundation in proportion to its 50% equity interest in Samarco.

On June 24, 2016, the Renova Foundation ( Foundation ) was constituted, under the Framework Agreement, to develop and implement the socio-economic restoration and compensation programs. The Foundation began its operations in August of 2016.

As the consequence of the dam failure, governmental authorities ordered the suspension of Samarco's operations.

**b) Estimates used for the provision**

Samarco initially expected to resume its operations in the last quarter of 2016. Based on this assumption, Samarco's cash flow projections indicated that it would be able to generate all or a substantial part of the funding required under the Framework Agreement. This assumption was supported by studies of appropriate technical solutions for the resumption of operations, as well as the progress of the work on the remaining dam structures after the failure and the implementation of the socio-economic and socio-environmental programs contemplated in the Framework Agreement.

In light of the stage of procedures necessary to resume operations and the uncertainties related to the licensing approval by governmental authorities during 2016, Samarco revised its assumption and concluded that was unable to make a reliable estimate of how and when its operations will resume.

Due to the above, as well as additional uncertainties regarding Samarco's cash flow, Vale S.A. recognized a provision on its interim financial statements as of June 30, 2016, for estimated costs in the amount of R\$5,560 which was discounted at a risk-free rate, resulting in R\$3,733 provision, which represents Vale S.A.'s best estimate of the obligation to comply with the reparation and compensation programs under the Framework Agreement, equivalent to its 50% equity interest in Samarco.

In August, 2016, Samarco issued non-convertible private debentures which were subscribed equally by Vale S.A. and BHPB, and the resources contributed by Vale S.A. were allocated as follows: (i) R\$222 was used by Samarco in the reparation programs in accordance with the Framework Agreement, and therefore, applied against the provision of R\$3,733 mentioned above; and (ii) R\$234 was applied by Samarco's to fund its working capital, and recognized in Vale's income statement as Impairment and other results in associates and joint ventures. Vale S.A. intends to make available short-term facilities in the first half of 2017 of up to R\$375 to Samarco to support its operations, without undertaking an obligation to Samarco. Funds for working capital requirements will be released as needed by the shareholders subject to achieving certain milestones.

Table of Contents

As a result of constituting the Foundation, most of the reparation and compensation programs were transferred from Samarco.

Therefore, Vale S.A. made contributions to the Foundation totaling R\$ 239 to be used in the programs in accordance with the Framework Agreement.

As a result of the above mentioned, the movements of the provision during the year are as follows:

	<b>2016</b>
<b>Balance on January 1,</b>	
Provision recognized	3,733
Payments made	(461)
Discount rate accretion	239
<b>Balance on December 31,</b>	<b>3,511</b>
<b>Current liabilities</b>	<b>951</b>
<b>Non-current liabilities</b>	<b>2,560</b>
<b>Liabilities</b>	<b>3,511</b>

At each reporting period, Vale S.A. will reassess the key assumptions used by Samarco in the preparation of the projected future cash flows and will adjust the provision, if required.

**c) Relevant information of Samarco**

Samarco is a Brazilian entity jointly controlled by Vale S.A. and BHPB, in which each shareholder has a 50% ownership interest.

Samarco operates an integrated enterprise consisting of mining, beneficiation and concentration of low-grade iron ore in the municipality of Mariana, in the State of Minas Gerais, as well as the hauling of such concentrated ore through ore pipelines connecting the its two operating plants located in Minas Gerais and Espírito Santo.

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On November 5, 2015, Samarco experienced the failure of an iron ore tailings dam ( Fundão ) in the state of Minas Gerais, which affected communities and ecosystems, including the Rio Doce river. Following the dam failure, the state government of Minas Gerais ordered the suspension of Samarco's operations.

The summarized financial information about Samarco are as follows:

	<b>December 31, 2016</b>
<b>Current assets</b>	<b>536</b>
Non-current assets	21,213
<b>Total assets</b>	<b>21,749</b>
<b>Current liabilities</b>	<b>15,811</b>
Non-current liabilities	9,824
<b>Total liabilities</b>	<b>25,635</b>
<b>Stockholders' equity</b>	<b>(3,886)</b>
<b>Loss</b>	<b>(326)</b>

Under Brazilian legislation and the terms of the joint venture agreement, Vale does not have an obligation to provide funding to Samarco. As a result, Vale's investment in Samarco was reduced to zero.

Since the initial date of the accident, Samarco and its shareholders disbursed the total amount of R\$2.0 billion to comply with the obligations under the Framework Agreement.

Table of Contents

**d) Contingencies related to Samarco accident**

*(i) Public civil claim filed by the Federal Government and others*

The federal government, the two Brazilian states affected by the failure (Espírito Santo and Minas Gerais) and other governmental authorities have initiated a public civil lawsuit against Samarco and its shareholders, Vale S.A. and BHPB, with an estimated value indicated by the plaintiffs of R\$20.2 billion.

On May 5, 2016, the Framework Agreement, which was signed on March 2, 2016, was ratified by the Federal Regional Court ( TRF ), 1st Region. In June 2016 the Superior Court of Justice ( STJ ) in Brazil issued an interim order, suspending the decision of TRF, which ratified the Framework Agreement until the final judgments of the claim.

On August 17, 2016, the TRF of the 1st Region rejected the appeal presented by Samarco, Vale S.A. and BHPB against the interim order and overruled the judicial decision that ratified the Framework Agreement. This decision of the TRF of the 1st Region, among other measures, confirmed a prior injunction that prohibited the defendants from transferring or conveying any of their interest in its Brazilian iron ore concessions, without, however, limiting their production and commercial activities and ordered a deposit with the court of R\$1.2 billion by January 2017. This R\$1.2 billion cash deposit was provisionally replaced by the guarantees provided for under the agreements with MPF, as described below.

In January 2017 Samarco, Vale S.A. and BHPB entered into two preliminary agreements with the Federal Prosecutor's Office in Brazil (MPF).

The first agreement ( First Agreement ) aims to outline the process and timeline for negotiations of a Final Agreement ( Final Agreement ), expected to occur by June 30th, 2017. This First Agreement sets the ground for conciliation of two public civil actions which aim to establish socio-economic and socio-environmental remediation and compensation programs for the impacts of the Fundão dam failure, respectively: claim n° 023863-07.2016.4.01.3800, filed by the Federal Prosecutors (amounting to R\$155 billion), as mentioned in item (ii) below, and claim n° 0069758-61.2015.4.01.3400, filed by the Federal Government, the states of Minas Gerais and Espírito Santo and other governmental authorities (amounting to R\$20.2 billion). Both claims were filed with the 12th Judicial Federal Court of Belo Horizonte.

The First Agreement provides for: (i) the appointment of experts selected by the Federal Prosecutors and paid for by the companies to conduct a diagnosis and follow the progress of the 41 programs under the Framework Agreement signed on March 2nd, 2016 by the companies and the Federal Government and the states of Minas Gerais and Espírito Santo and other governmental authorities and (ii) holding at least eleven public hearings by April 15th, 2017, five of which are to be held in Minas Gerais, three in Espírito Santo and the remainder in the indigenous territories of the Krenak, Comboios and Caieiras Velhas, in order to allow these communities to take part in the definition of the content of the Final Agreement.

Under the First Agreement, Samarco, Vale S.A. and BHPB will provide the 12<sup>th</sup> Judicial Federal Court of Belo Horizonte with a guarantee for fulfillment of the obligations regarding the financing and payment of the socio-environmental and socio-economic remediation programs resulting from the Fundão dam failure, pursuant to the two public civil actions, until the signing of the Final Agreement, amounting to R\$2.2 billion, of which (i) R\$100 in financial investments; ii) R\$1.3 billion in insurance bonds; and (iii) R\$800 in assets of Samarco. The guarantee will remain in place until the completion of the negotiations for the Final Agreement or until June 30<sup>th</sup>, 2017, whichever comes first. In order to implement the First Agreement, it has been requested that the 12<sup>th</sup> Judicial Federal Court of Belo Horizonte accept such guarantees until the completion of the negotiations and the signing of the Final Agreement, or until the parties reach a new agreement regarding the guarantees. If, by June 30<sup>th</sup>, the negotiations have not been completed, the Federal Prosecutor's Office may require that the 12<sup>th</sup> Judicial Federal Court of Belo Horizonte re-institute the order for the deposit of R\$1.2 billion in relation to the R\$20.2 billion public civil action, which is currently suspended.

In addition, the Second Agreement (Second Agreement) was signed, which establishes a timetable to make funds available to remediate the social, economic and environmental damages caused by the Fundão dam failure in the municipalities of Barra Longa, Rio Doce, Santa Cruz do Escalvado and Ponte Nova, amounting to R\$200.

The terms of the two Agreements are subject to ratification by the courts.

Table of Contents

*(ii) Public civil action filed by Federal Prosecution Office*

On May 3, 2016, the Federal Prosecution Office (MPF) filed a public civil action against Samarco and its shareholders and presented several demands, including: (i) the adoption of measures for mitigating the social, economic and environmental impacts resulting from the Fundão dam failure and other emergency measures; (ii) the payment of compensation to the community; and (iii) payments for the collective moral damage. The initial action value claimed by the Federal Prosecution Office (MPF) is R\$155 billion. The first conciliatory hearing was held on September 13, 2016. On November 21, 2016, the court ordered that the defendants be served, and the defendants submitted their defense. Given the negotiations of a potential settlement, the parties jointly requested the suspension of the proceeding, in accordance with the First Agreement.

*(iii) U.S. Securities class action suits*

On May 2, 2016, Vale S.A. and certain of its officers were named as defendants in securities class action suits in the Federal Court in New York brought by holders of Vale's American Depositary Receipts under U.S. federal securities laws. The lawsuits allege that Vale S.A. made false and misleading statements or omitted to make disclosures concerning the risks and dangers of the operations of Samarco's Fundão dam and the adequacy of related programs and procedures. The plaintiffs have not specified an amount of alleged damages in these actions. Vale S.A. intends to vigorously and fully defend itself against the allegations. The litigation is at an early stage. On March 7, 2016, the judge overseeing the securities class actions issued an order consolidating these actions and designating lead plaintiffs and counsel. On April 29, 2016, lead plaintiffs filed a Consolidated Amended Complaint that will serve as the operative complaint in the litigation. In July 2016, Vale S.A. and the individual defendants filed a motion to dismiss the Amended Complaint. In August 2016, the plaintiffs submitted their opposition to the motion to dismiss, to which the defendants replied in September 2016. The decision on the motion to dismiss remains pending.

*(iv) Criminal lawsuit*

On October 20, 2016, the MPF brought a criminal lawsuit in the Brazilian Federal Justice Court against Vale S.A., BHPB, Samarco, VogBr Recursos Hídricos e Geotecnia Ltda. and 22 individuals for alleged crimes against the environment, urban planning and cultural heritage, flooding, landslide, as well as for alleged crimes against the victims of the Fundão dam failure.

On November 16, 2016, the judge received the Federal Prosecutors Office criminal lawsuit and determined the summons of all defendants, granting 30 days each to file their defenses, to count from the day they receive the summon. Vale has already been served and its deadline to present its defense is March 3, 2017.

*(v) Other lawsuits*



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In addition, Samarco and its shareholders were named as a defendant in several other lawsuits brought by individuals, corporations and governmental entities seeking personal and property damages.

These lawsuits and petitions are at early stages, so it is not possible to determine a range of outcomes or reliable estimates of the potential exposure at this time. No contingent liability has been quantified and no provision was recognized for lawsuits related to Samarco's dam failure.

### **Critical accounting estimates and judgments**

The provision requires the use of assumptions that may be mainly affected by: (i) changes in scope of work required under the Framework Agreement as result of further technical analysis, (ii) resolution of uncertainty in respect of the resume the Samarco's operation; (iii) updates in the discount rate; and (iv) resolution of existing and potential legal claims. As a result, future expenditures may differ from the amounts currently provided and changes to key assumptions could result in a material impact to the amount of the provision in future reporting periods.

Table of Contents

**22. Risk management**

Vale considers that an effective risk management is key to support the achievement of the company objectives and to ensure the financial strength and flexibility of the company and the business continuity.

Therefore, Vale has developed its risk management strategy in order to provide an integrated approach of the risks the company is exposed to, considering not only the risks generated by variables traded in financial markets (market risk) and those arising from liquidity risk, but also the risk from counterparties obligations (credit risk) and those relating to inadequate or failed internal processes, people, systems or external events (operational risk), among others.

**a) Risk management policy**

The Board of Directors established a corporate risk management policy defining principles and guidelines applicable to this process in the company and the corresponding governance structure.

This policy determines that corporate risks should be measured and monitored, regularly, in an integrated manner, in order to ensure that the company overall risk level remains aligned with its strategic guidelines.

The Executive Risk Management Committee, created by the Board of Directors, is responsible for supporting the Executive Board in the risk management decisions, issuing opinions and recommendations. It is also responsible for the supervision and revision of the principles and instruments of corporate risk management.

The Executive Board is responsible for the approval of the policy deployment into norms, rules and responsibilities and for reporting to the Board of Directors about such procedures.

The risk management norms and instructions complement the corporate risk management policy and define practices, processes, controls, roles and responsibilities.

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The Company may, when necessary, allocate specific risk limits to management activities, including but not limited to, market risk limit, corporate and sovereign credit limit, in accordance with the acceptable corporate risk limit.

### **b) Liquidity risk management**

The liquidity risk arises from the possibility that Vale might not perform its obligations on due dates, as well as face difficulties to meet its cash requirements due to market liquidity constraints.

See note 20 Loans, borrowing and cash and cash equivalents for details on the Group's liquidity risk.

### **c) Credit risk management**

Vale's exposure to credit risk arises from trade receivables, derivative transactions, guarantees, down payment for suppliers and cash investments. Our credit risk management process provides a framework for assessing and managing counterparties' credit risk and for maintaining our risk at an acceptable level.

#### **(i) Commercial credit risk management**

See note 10 Accounts receivables for details on commercial credit risk.

#### **(ii) Treasury credit risk management**

To manage the credit exposure arising from cash investments and derivative instruments, credit limits are approved to each counterparty with whom we have credit exposure.

Furthermore, we control the portfolio diversification and monitor different indicators of solvency and liquidity of the different counterparties that were approved for trading.

### **d) Market risk management**

Vale is exposed to the behavior of several market risk factors that can impact its cash flow. The assessment of this potential impact arising from the volatility of risk factors and their correlations is performed periodically to support the decision making process regarding the risk

management strategy, that may incorporate financial instruments, including derivatives.

Table of Contents

The portfolio of these financial instruments is monitored on a monthly basis, enabling financial results surveillance and its impact on cash flow.

Considering the nature of Vale's business and operations, the main market risk factors which the Company is exposed to are:

- Foreign exchange and interest rates;
- Product prices and input costs.

**e) Foreign exchange and interest rate risk**

The company's cash flow is subjected to volatility of several currencies, as its products are predominantly priced in US dollar, while most of the costs, disbursements and investments are denominated in other currencies, mainly Brazilian real and Canadian dollar.

In order to reduce the potential impact that arises from this currency mismatch, derivatives instruments may be used as a risk mitigation strategy.

Vale implements hedge transactions to protect its cash flow against the market risks that arise from its debt obligations - mainly currency volatility. The hedges cover most of the debts in Brazilian reals and euros. We use swap and forward transactions to convert debt linked to Brazilian real and Euros into US dollar, with volumes, flows and settlement dates similar to those of the debt instruments - or sometimes lower, subject to market liquidity conditions.

Hedging instruments with shorter settlement dates are renegotiated through time so that their final maturity matches - or becomes closer - to the debts' final maturity. At each settlement date, the results of the swap and forward transactions partially offset the impact of the foreign exchange rate in Vale's obligations, contributing to stabilize the cash disbursements in US dollar.

Vale has also exposure to interest rates risks over loans and financings. The US Dollar floating rate debt in the portfolio consists mainly of loans including export pre-payments, commercial banks and multilateral organizations loans. In general, such debt instruments are indexed to the LIBOR (London Interbank Offer Rate) in US dollar. We take advantage of the potential correlation between commodity prices and U.S. dollar floating interest rates as a partial natural hedge for our cash flow.

**f) Risk of product and input prices**

Vale is also exposed to market risks including commodities price and input price volatilities. In accordance with risk management policy, risk mitigation strategies involving commodities can be used to adjust the cash flow risk profile and reduce Vale's cash flow volatility. For this kind of risk mitigation strategy, Vale uses predominantly forwards, futures or zero-cost collars.

**g) Operational risk management**

The operational risk management is the structured approach that Vale uses to manage uncertainty related to possible inadequate or failure in internal processes, people, systems and external events, in accordance with the principles and guidelines of ISO 31000.

The main operational risks are periodically monitored, ensuring the effectiveness of preventive and mitigating key controls in place and the execution of the risk treatment strategy (implementation of new or improved controls, changes in the risk environment, risk sharing by contracting insurance, provisioning of resources, etc.).

Therefore, the Company seeks to have a clear view of its major risks, the best cost-benefit mitigation plans and the effectiveness of the controls in place, monitoring the potential impact of operational risk and allocating capital efficiently.

**h) Capital management**

The Company's policy aims at establishing a capital structure that will ensure the continuity of your business in the long term. Within this perspective, the Company has been able to deliver value to stockholders through dividend payments and capital gain, and at the same time maintain a debt profile suitable for its activities, with an amortization well distributed over the years, thus avoiding a concentration in one specific period.

Table of Contents**i) Insurance**

Vale contracts several types of insurance policies, such as operational risk policy, engineering risks insurance (projects), civil responsibility, life insurance policy for their employees, among others. The coverage of these policies is similar to the ones used in general by the mining industry and is issued in line with the objectives defined by the Company, with the corporate risk management policy and the limitation imposed by the insurance and reinsurance global market. In general, the company's assets directly related with its operations are included in the coverage of insurance policies.

Insurance management is performed with the support of existing insurance committees in the various operational areas of the Company. Among the management instruments, Vale uses captive reinsurance to balance the price on reinsurance contracts with the market, as well as, enable direct access to key international markets of insurance and reinsurance.

**23. Financial instruments classification**

The Company classifies its financial instruments in accordance with the purpose for which they were acquired, and determines the classification and initial recognition according to the following categories:

	December 31, 2016			Consolidated			Total
	Loans and receivables or amortized cost	At fair value through net income	Total	Loans and receivables or amortized cost	At fair value through net income	Derivatives designated as hedge accounting	
<b>Financial assets</b>							
<b>Current</b>							
Cash and cash equivalents	13,891		13,891	14,022			14,022
Financial investments	59		59	109			109
Derivative financial instruments		892	892		474		474
Accounts receivable	11,937		11,937	5,763			5,763
Related parties	233		233	273			273
	<b>26,120</b>	<b>892</b>	<b>27,012</b>	<b>20,167</b>	<b>474</b>		<b>20,641</b>
<b>Non-current</b>							
Derivative financial instruments		1,454	1,454		363		363
Loans	587		587	732			732

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Related parties	5		5	5		5
	<b>592</b>	<b>1,454</b>	<b>2,046</b>	<b>737</b>	<b>363</b>	<b>1,100</b>
<b>Total of financial assets</b>	26,712	2,346	29,058	20,904	837	21,741
<b>Financial liabilities</b>						
<b>Current</b>						
Suppliers and contractors	11,830		11,830	13,140		13,140
Derivative financial instruments		1,349	1,349		7,909	198
Loans and borrowings	5,410		5,410	9,788		9,788
Related parties	2,190		2,190	1,856		1,856
	<b>19,430</b>	<b>1,349</b>	<b>20,779</b>	<b>24,784</b>	<b>7,909</b>	<b>198</b>
<b>Non-current</b>						
Derivative financial instruments		3,991	3,991		6,132	6,132
Loans and borrowings	90,154		90,154	102,878		102,878
Related parties	415		415	830		830
Participative stockholders debentures		2,526	2,526		1,336	1,336
	<b>90,569</b>	<b>6,517</b>	<b>97,086</b>	<b>103,708</b>	<b>7,468</b>	<b>111,176</b>
<b>Total of financial liabilities</b>	<b>109,999</b>	<b>7,866</b>	<b>117,865</b>	<b>128,492</b>	<b>15,377</b>	<b>198</b>



Table of Contents

	Parent Company					
	December 31, 2016		December 31, 2015			
	Loans and receivables or amortized cost	At fair value through net income	Total	Loans and receivables or amortized cost	At fair value through net income	Total
<b>Financial assets</b>						
<b>Current</b>						
Cash and cash equivalents	1,203		1,203	518		518
Financial investments	4		4	18		18
Derivative financial instruments		338	338		196	196
Accounts receivable	26,223		26,223	36,026		36,026
Related parties	889		889	834		834
	<b>28,319</b>	<b>338</b>	<b>28,657</b>	<b>37,396</b>	<b>196</b>	<b>37,592</b>
<b>Non-current</b>						
Derivative financial instruments		1,304	1,304		293	293
Loans	114		114	106		106
Related parties	760		760	1,468		1,468
	<b>874</b>	<b>1,304</b>	<b>2,178</b>	<b>1,574</b>	<b>293</b>	<b>1,867</b>
<b>Total of financial assets</b>	<b>29,193</b>	<b>1,642</b>	<b>30,835</b>	<b>38,970</b>	<b>489</b>	<b>39,459</b>
<b>Financial liabilities</b>						
<b>Current</b>						
Suppliers and contractors	6,743		6,743	7,084		7,084
Derivative financial instruments		1,033	1,033		3,559	3,559
Loans and borrowings	4,171		4,171	4,736		4,736
Related parties	9,812		9,812	6,774		6,774
	<b>20,726</b>	<b>1,033</b>	<b>21,759</b>	<b>18,594</b>	<b>3,559</b>	<b>22,153</b>
<b>Non-current</b>						
Derivative financial instruments		3,427	3,427		5,296	5,296
Loans and borrowings	47,877		47,877	55,986		55,986
Related parties	53,728		53,728	63,837		63,837
Participative stockholders debentures		2,526	2,526		1,336	1,336
	<b>101,605</b>	<b>5,953</b>	<b>107,558</b>	<b>119,823</b>	<b>6,632</b>	<b>126,455</b>
<b>Total of financial liabilities</b>	<b>122,331</b>	<b>6,986</b>	<b>129,317</b>	<b>138,417</b>	<b>10,191</b>	<b>148,608</b>

The classification of financial assets and liabilities by currencies are as follows:

Financial assets	Consolidated						Total
	December 31, 2016						
	R\$	US\$	CAD	AUD	EUR	Others currencies	
<b>Current</b>							

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Cash and cash equivalents	3,132	9,448	147	81	183	900	13,891
Financial investments	4	55					59
Derivative financial instruments	339	553					892
Accounts receivable	1,098	10,787			3	49	11,937
Related parties	233						233
	<b>4,806</b>	<b>20,843</b>	<b>147</b>	<b>81</b>	<b>186</b>	<b>949</b>	<b>27,012</b>
<b>Non-current</b>							
Derivative financial instruments	1,304	150					1,454
Loans	114	313	160				587
Related parties	5						5
	<b>1,423</b>	<b>463</b>	<b>160</b>				<b>2,046</b>
<b>Total of assets</b>	<b>6,229</b>	<b>21,306</b>	<b>307</b>	<b>81</b>	<b>186</b>	<b>949</b>	<b>29,058</b>
<b>Financial liabilities</b>							
<b>Current</b>							
Suppliers and contractors	6,181	3,090	1,995	23	313	228	11,830
Derivative financial instruments	1,033	316					1,349
Loans and borrowings	2,450	2,696	55		209		5,410
Related parties	1,040	1,150					2,190
	<b>10,704</b>	<b>7,252</b>	<b>2,050</b>	<b>23</b>	<b>522</b>	<b>228</b>	<b>20,779</b>
<b>Non-current</b>							
Derivative financial instruments	3,427	564					3,991
Loans and borrowings	19,128	64,498	681		5,847		90,154
Related parties	415						415
Participative stockholders debentures	2,526						2,526
	<b>25,496</b>	<b>65,062</b>	<b>681</b>		<b>5,847</b>		<b>97,086</b>
<b>Total of liabilities</b>	<b>36,200</b>	<b>72,314</b>	<b>2,731</b>	<b>23</b>	<b>6,369</b>	<b>228</b>	<b>117,865</b>

Table of ContentsConsolidated  
December 31, 2015

Financial assets	R\$	US\$	CAD	AUD	EUR	Others currencies	Total
<b>Current</b>							
Cash and cash equivalents	3,186	9,871	47	211	43	664	14,022
Financial investments		109					109
Derivative financial instruments	196	278					474
Accounts receivable	980	4,232	488	39	16	8	5,763
Related parties	273						273
	<b>4,635</b>	<b>14,490</b>	<b>535</b>	<b>250</b>	<b>59</b>	<b>672</b>	<b>20,641</b>
<b>Non-current</b>							
Derivative financial instruments	293	70					363
Loans	105	401	226				732
Related parties	5						5
	<b>403</b>	<b>471</b>	<b>226</b>				<b>1,100</b>
<b>Total of assets</b>	<b>5,038</b>	<b>14,961</b>	<b>761</b>	<b>250</b>	<b>59</b>	<b>672</b>	<b>21,741</b>
<b>Financial liabilities</b>							
<b>Current</b>							
Suppliers and contractors	5,853	5,424	1,308	35	449	71	13,140
Derivative financial instruments	3,557	4,550					8,107
Loans and borrowings	1,696	7,779	55		258		9,788
Related parties	1,856						1,856
	<b>12,962</b>	<b>17,753</b>	<b>1,363</b>	<b>35</b>	<b>707</b>	<b>71</b>	<b>32,891</b>
<b>Non-current</b>							
Derivative financial instruments	5,296	836					6,132
Loans and borrowings	19,942	75,903	644	15	6,374		102,878
Related parties	811	19					830
Participative stockholders debentures	1,336						1,336
	<b>27,385</b>	<b>76,758</b>	<b>644</b>	<b>15</b>	<b>6,374</b>		<b>111,176</b>
<b>Total of liabilities</b>	<b>40,347</b>	<b>94,511</b>	<b>2,007</b>	<b>50</b>	<b>7,081</b>	<b>71</b>	<b>144,067</b>

Parent Company  
December 31, 2016

Financial assets	R\$	US\$	AUD	EUR	Total
<b>Current</b>					
Cash and cash equivalents	1,185	18			1,203
Financial investments	4				4
Derivative financial instruments	338				338
Accounts receivable	(1,355)	27,572		6	26,223

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Related parties	684	205		889
	<b>856</b>	<b>27,795</b>	<b>6</b>	<b>28,657</b>
<b>Non-current</b>				
Derivative financial instruments	1,304			1,304
Loans	114			114
Related parties		760		760
	<b>1,418</b>	<b>760</b>		<b>2,178</b>
<b>Total of assets</b>	<b>2,274</b>	<b>28,555</b>	<b>6</b>	<b>30,835</b>
<b>Financial liabilities</b>				
<b>Current</b>				
Suppliers and contractors	5,992	603	1	6,743
Derivative financial instruments	1,033			1,033
Loans and borrowings	2,149	1,815	207	4,171
Related parties	131	9,681		9,812
	<b>9,305</b>	<b>12,099</b>	<b>1</b>	<b>21,759</b>
<b>Non-current</b>				
Derivative financial instruments	3,427			3,427
Loans and borrowings	17,993	24,726	5,158	47,877
Related parties	3,694	50,034		53,728
Participative stockholders debentures	2,526			2,526
	<b>27,640</b>	<b>74,760</b>	<b>5,158</b>	<b>107,558</b>
<b>Total of liabilities</b>	<b>36,945</b>	<b>86,859</b>	<b>1</b>	<b>129,317</b>

Table of Contents

Financial assets	R\$	US\$	Parent Company		Total
			December 31, 2015		
			AUD	EUR	
<b>Current</b>					
Cash and cash equivalents	493	25			518
Financial investments	18				18
Derivative financial instruments	196				196
Accounts receivable	(609)	36,628		7	36,026
Related parties	606	228			834
	<b>704</b>	<b>36,881</b>		<b>7</b>	<b>37,592</b>
<b>Non-current</b>					
Derivative financial instruments	293				293
Loans	106				106
Related parties	337	1,131			1,468
	<b>736</b>	<b>1,131</b>			<b>1,867</b>
<b>Total of assets</b>	<b>1,440</b>	<b>38,012</b>		<b>7</b>	<b>39,459</b>
<b>Financial liabilities</b>					
<b>Current</b>					
Suppliers and contractors	6,148	806	6	124	7,084
Derivative financial instruments	3,559				3,559
Loans and borrowings	1,595	3,141			4,736
Related parties	1,168	5,601	4	1	6,774
	<b>12,470</b>	<b>9,548</b>	<b>10</b>	<b>125</b>	<b>22,153</b>
<b>Non-current</b>					
Derivative financial instruments	5,296				5,296
Loans and borrowings	18,534	30,820		6,632	55,986
Related parties	3,912	59,925			63,837
Participative stockholders debentures	1,336				1,336
	<b>29,078</b>	<b>90,745</b>		<b>6,632</b>	<b>126,455</b>
<b>Total of liabilities</b>	<b>41,548</b>	<b>100,293</b>	<b>10</b>	<b>6,757</b>	<b>148,608</b>

**24. Fair value estimate**

Due to the short-term cycle, it is assumed that the fair value of cash and cash equivalents balances, financial investments, accounts receivable and accounts payable approximate their book values. For the measurement and determination of fair value, the Company uses various methods including market, income or cost approaches, in order to estimate the value that market participants would use when pricing the asset or liability. The financial assets and liabilities recorded at fair value are classified and disclosed in accordance with the following levels:

**Level 1** unadjusted quoted prices on an active, liquid and visible market for identical assets or liabilities that are accessible at the measurement date;

**Level 2** - quoted prices (adjusted or unadjusted) for identical or similar assets or liabilities on active markets; and

**Level 3** - assets and liabilities, for which quoted prices, do not exist, or where prices or valuation techniques are supported by little or no market activity, unobservable or illiquid.

a) **Assets and liabilities measured and recognized at fair value:**

	December 31, 2016			Consolidated		December 31, 2015	
	Level 2	Level 3	Total	Level 2	Level 3	Total	
<b>Financial assets</b>							
Derivative financial instruments	1,319	1,027	2,346	837		837	
<b>Total</b>	<b>1,319</b>	<b>1,027</b>	<b>2,346</b>	<b>837</b>		<b>837</b>	
<b>Financial liabilities</b>							
Derivative financial instruments	3,877	1,463	5,340	13,688	551	14,239	
Participative stockholders debentures	2,526		2,526	1,336		1,336	
<b>Total</b>	<b>6,403</b>	<b>1,463</b>	<b>7,866</b>	<b>15,024</b>	<b>551</b>	<b>15,575</b>	

Table of Contents

	December 31, 2016			Parent Company		December 31, 2015	
	Level 2	Level 3	Total	Level 2	Level 3	Total	
<b>Financial assets</b>							
Derivative financial instruments	615	1,027	1,642	489		489	
<b>Total</b>	<b>615</b>	<b>1,027</b>	<b>1,642</b>	<b>489</b>		<b>489</b>	
<b>Financial liabilities</b>							
Derivative financial instruments	2,997	1,463	4,460	8,304	551	8,855	
Participative stockholders debentures	2,526		2,526	1,336		1,336	
<b>Total</b>	<b>5,523</b>	<b>1,463</b>	<b>6,986</b>	<b>9,640</b>	<b>551</b>	<b>10,191</b>	

**Methods and techniques of evaluation****i) Derivative financial instruments**

Financial instruments are evaluated by calculating their present value through yield curves at the closing dates. The curves and prices used in the calculation for each group of instruments are detailed in the market curves .

The pricing method used for European options is the Black & Scholes model. In this model, the fair value of the derivative is a function of the volatility in the price of the underlying asset, the exercise price of the option, the interest rate and period to maturity. In the case of options which income is a function of the average price of the underlying asset over the period of the option, the Company uses Turnbull & Wakeman model. In this model, in addition to the factors that influence the option price in the Black-Scholes model, the formation period of the average price is also considered.

In the case of swaps, both the present value of the assets and liability are estimated by discounting the cash flow by the interest rate of the currency in which the swap is denominated. The difference between the present value of the assets and the liabilities generates its fair value.

For to the Long Term Interest Rate ( TJLP ) swaps, the calculation of the fair value assumes that TJLP is constant, and the projections of future cash flow in Brazilian Reais are made on the basis of the last TJLP disclosed.

Contracts for the purchase or sale of products, inputs and costs of selling with future settlement are priced using the forward yield curves for each product. Typically, these curves are obtained on the stock exchanges where the products are traded, such as the London Metals Exchange ( LME ), the Commodity Exchange ( COMEX ) or other providers of market prices. When there is no price for the desired maturity, Vale uses an interpolation between the available maturities.

The fair value for derivatives classified in level 3 are measured using discounted cash flows and option model valuation techniques with main unobservable inputs discount rates, stock prices and commodities prices.

ii) **Participative stockholders debentures** - Consist of the debentures issued during the privatization process (note 32(b)), which fair values are measured based on the market approach. Reference prices are available on the secondary market.

#### **Critical accounting estimates and judgments**

The fair values of financial instruments that are not traded in active markets are determined using valuation techniques. Vale uses its own judgment to choose between the various methods. Assumptions are based on the market conditions, at the end of the year.

An analysis of the impact if actual results are different from management's estimates is present on note 33 (sensitivity analysis).

#### **b) Fair value of financial instruments not measured at fair value**

The fair value estimate for level 1 is based on market approach considering the secondary market contracts. For loans allocated to level 2, the income approach is adopted and the fair value for both fixed-indexed rate debt and floating rate debt is determined on a discounted cash flows basis using LIBOR future values and Vale's bonds curve.



Table of Contents

The fair values and carrying amounts of non-current loans (net of interest) are as follows:

Financial liabilities	Balance	Consolidated			Balance	Parent Company		
		Fair value	Level 1	Level 2		Fair value	Level 1	Level 2
<b>December 31, 2016</b>								
Debt principal	93,508	89,218	45,216	44,002	50,691	50,658	12,166	38,492
<b>December 31, 2015</b>								
Debt principal	110,231	102,434	48,017	54,417	59,585	58,227	11,783	46,444

## 25. Derivative financial instruments

### a) Derivatives effects on statement of financial position

	Consolidated Assets			
	December 31, 2016		December 31, 2015	
	Current	Non-current	Current	Non-current
<b>Derivatives not designated as hedge accounting</b>				
<b>Foreign exchange and interest rate risk</b>				
CDI & TJLP vs. US\$ fixed and floating rate swap	429	3	269	
IPCA swap	22	199	7	64
Pré-dolar swap	3	75		
	<b>454</b>	<b>277</b>	<b>276</b>	<b>64</b>
<b>Commodities price risk</b>				
Nickel	13	7	198	41
Bunker oil	425			
	<b>438</b>	<b>7</b>	<b>198</b>	<b>41</b>
<b>Others</b>				
		1,170		258
		<b>1,170</b>		<b>258</b>
<b>Total</b>	<b>892</b>	<b>1,454</b>	<b>474</b>	<b>363</b>

	Consolidated Liabilities			
	December 31, 2016		December 31, 2015	
	Current	Non-current	Current	Non-current

<b>Derivatives not designated as hedge accounting</b>				
<b>Foreign exchange and interest rate risk</b>				
CDI & TJLP vs. US\$ fixed and floating rate swap	955	2,078	3,119	4,419
IPCA swap	65	186	82	393
Eurobonds swap	24	147	572	111
Euro Forward	149			
Pre dollar swap	16	104	364	280
	<b>1,209</b>	<b>2,515</b>	<b>4,137</b>	<b>5,203</b>
<b>Commodities price risk</b>				
Nickel	16	7	153	42
Bunker oil	124		3,609	
	<b>140</b>	<b>7</b>	<b>3,762</b>	<b>42</b>
<b>Others</b>				
		1,469		887
		<b>1,469</b>		<b>887</b>
<b>Derivatives designated as cash flow hedge accounting</b>				
Bunker oil			198	
Foreign exchange			10	
			<b>208</b>	
<b>Total</b>	<b>1,349</b>	<b>3,991</b>	<b>8,107</b>	<b>6,132</b>

Table of Contents

	Parent Company Assets			
	December 31, 2016		December 31, 2015	
	Current	Non-current	Current	Non-current
<b>Derivatives not designated as hedge accounting</b>				
<b>Foreign exchange and interest rate risk</b>				
CDI & TJLP vs. US\$ fixed and floating rate swap	322	3	193	
IPCA swap	13	199	3	64
Pré-dollar swap	3	75		
	<b>338</b>	<b>277</b>	<b>196</b>	<b>64</b>
<b>Others</b>		1,027		229
		<b>1,027</b>		<b>229</b>
<b>Total</b>	<b>338</b>	<b>1,304</b>	<b>196</b>	<b>293</b>

	Parent Company Liabilities			
	December 31, 2016		December 31, 2015	
	Current	Non-current	Current	Non-current
<b>Derivatives not designated as hedge accounting</b>				
<b>Foreign exchange and interest rate risk</b>				
CDI & TJLP vs. US\$ fixed and floating rate swap	952	1,777	3,112	3,943
IPCA swap	65	83	82	186
Pre dollar swap	16	104	365	280
	<b>1,033</b>	<b>1,964</b>	<b>3,559</b>	<b>4,409</b>
<b>Others</b>		1,463		887
		<b>1,463</b>		<b>887</b>
<b>Total</b>	<b>1,033</b>	<b>3,427</b>	<b>3,559</b>	<b>5,296</b>

b) **Effects of derivatives on the income statement, cash flow and other comprehensive income**

	Consolidated Year ended December 31								
	Gain (loss) recognized in the income statement			Financial settlement inflows(outflows)			Gain(loss) recognized in other comprehensive income		
	2016	2015	2014	2016	2015	2014	2016	2015	2014
<b>Derivatives not designated as hedge accounting</b>									
<b>Foreign exchange and interest rate risk</b>									

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CDI & TJLP vs. US\$ fixed and floating rate swap	2,897	(3,644)	(1,160)	(1,689)	(867)	(51)		
IPCA swap	257	(167)	(142)	(78)	20			
Eurobonds swap	(75)	(353)	(385)	(524)	(39)	24		
Euro forward	(152)							
Pre dollar swap	241	(462)	(73)	(361)	(158)	16		
	<b>3,168</b>	<b>(4,626)</b>	<b>(1,760)</b>	<b>(2,652)</b>	<b>(1,044)</b>	<b>(11)</b>		
<b>Commodities price risk</b>								
Nickel	(158)	(166)	21	(113)	(212)	29		
Bunker oil	911	(2,662)	(1,372)	(2,829)	(866)	(236)		
	<b>753</b>	<b>(2,828)</b>	<b>(1,351)</b>	<b>(2,942)</b>	<b>(1,078)</b>	<b>(207)</b>		
<b>Others</b>								
	<b>261</b>	<b>(494)</b>	<b>(10)</b>					
<b>Derivatives designated as cash flow hedge accounting</b>								
Bunker oil		(1,483)	(203)		(1,513)	(203)	1,409	(1,067)
Foreign exchange	(10)	(136)	(100)	(10)	(136)	(100)	10	66
	<b>(10)</b>	<b>(1,619)</b>	<b>(303)</b>	<b>(10)</b>	<b>(1,649)</b>	<b>(303)</b>	<b>10</b>	<b>1,475</b>
<b>Total</b>	<b>4,172</b>	<b>(9,567)</b>	<b>(3,424)</b>	<b>(5,604)</b>	<b>(3,771)</b>	<b>(521)</b>	<b>10</b>	<b>1,475</b>

Table of Contents

	Gain (loss) recognized in the income statement		Parent Company Year ended December 31 Financial settlement inflows(outflows)		Gain(loss) recognized in other comprehensive income	
	2016	2015	2016	2015	2016	2015
<b>Derivatives not designated as hedge accounting</b>						
<b>Foreign exchange and interest rate risk</b>						
CDI & TJLP vs. US\$ fixed and floating rate swap	2,685	(3,467)	(1,773)	(622)		
IPCA swap	185	(132)	(81)	11		
Pre dollar swap	241	(465)	(361)	(158)		
	<b>3,111</b>	<b>(4,064)</b>	<b>(2,215)</b>	<b>(769)</b>		
<b>Others</b>	<b>222</b>	<b>(413)</b>				
<b>Derivatives designated as cash flow hedge accounting</b>						
Bunker oil						1,409
Foreign exchange					10	66
<b>Total</b>	<b>3,333</b>	<b>(4,477)</b>	<b>(2,215)</b>	<b>(769)</b>	<b>10</b>	<b>1,475</b>

During 2015, the Company implemented bunker oil purchase cash flows protection program and recognized as cost of goods sold and services rendered and financial expense the amounts of R\$1,483 and R\$8,084, respectively. In 2016, all derivatives impacts were charged to financial results.

The maturity dates of the derivative financial instruments are as follows:

	Last maturity dates
Currencies and interest rates	July 2023
Bunker oil	December 2017
Nickel	December 2018
Others	December 2027

**Accounting policy**

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Derivatives transactions which are not qualified as hedge accounting are presented as economic hedge, as the Company uses derivative instruments to manage its financial risks as a way of hedging against these risks. Derivative financial instruments are recognized as assets or liabilities in the balance sheet and are measured at their fair values. Changes in the fair values of derivatives are recorded in income statement or in stockholders' equity when the transaction is eligible to be characterized as effective hedge accounting.

On the beginning of the hedge accounting operations, the Company documents the relationship between hedging instruments and hedged items with the objective of risk management and strategy for carrying out hedging operations. The Company also documents, both initially and on a continuously basis, that its assessment of whether the derivatives used in hedging transactions are highly effective.

The effective components of changes in the fair values of derivative financial instruments designated as cash flow hedges are recorded as unrealized fair value gain or losses and recognized in stockholders' equity; and their non-effective components recorded in income statement. The amounts recorded in the statement of comprehensive income, will only be transferred to income statement (costs, operating expenses or financial expenses) when the hedged item is actually realized.

Table of Contents

**Additional information about derivatives financial instruments**

**In millions of Brazilian reais, except as otherwise stated**

The risk of the derivatives portfolio is measured using the delta-Normal parametric approach, and considers that the future distribution of the risk factors and its correlations tends to present the same statistic properties verified in the historical data. The value at risk estimate considers a 95% confidence level for a one-business day time horizon.

There was no cash amount deposited as margin call regarding derivative positions on December 31, 2016. The derivative positions described in this document did not have initial costs associated.

The following tables detail the derivatives positions for Vale and its controlled companies as of December 31, 2016, with the following information: notional amount, fair value including credit risk, gains or losses in the period, value at risk and the fair value breakdown by year of maturity.

**a) Foreign exchange and interest rates derivative positions**

**(i) Protection programs for the R\$ denominated debt instruments**

In order to reduce cash flow volatility, swap transactions were implemented to convert into US\$ the cash flows from certain debt instruments denominated in R\$ with interest rates linked mainly to CDI, TJLP and IPCA. In those swaps, Vale pays fixed or floating rates in US\$ and receives payments in R\$ linked to the interest rates of the protected debt instruments.

The swap transactions were negotiated over-the-counter and the protected items are the cash flows from debt instruments linked to R\$. These programs transform into US\$ the obligations linked to R\$ to achieve a currency offset in the Company's cash flows, by matching its receivables - mainly linked to US\$ - with its payables.

**Financial settlement**

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Flow	Notional				Fair value		Inflows (Outflows) December 31, 2016	Value at Risk December 31, 2016	Fair value by year		
	December 31, 2015	December 31, 2016	Index	Average rate	December 31, 2016	December 31, 2015			2017	2018	2019+
<b>CDI vs. US\$ fixed rate swap</b>											
Receivable	R\$ 6.289	R\$ 5.239	CDI	106,78%	(396)	(3.059)	(973)	129	157	(553)	
Payable	US\$ 2.105	US\$ 2.288	Fix	3,78%							
<b>TJLP vs. US\$ fixed rate swap</b>											
Receivable			TJLP		(2.026)	(3.965)	(709)	203	(675)	(332) (1.019)	
Payable	R\$ 4.360	R\$ 5.484	+	1,32%							
	US\$ 2.030	US\$ 2.611	Fix	1,69%							
<b>TJLP vs. US\$ floating rate swap</b>											
Receivable			TJLP		(179)	(245)	(7)	15	(11)	(15) (153)	
Payable	R\$ 242	R\$ 267	+	0,86%							
	US\$ 140	US\$ 156	Libor	-1,23%							
<b>R\$ fixed rate vs. US\$ fixed rate swap</b>											
Receivable	R\$ 1.031	R\$ 1.356	Fix	7,69%	(42)	(644)	(361)	75	(12)	42 (73)	
Payable	US\$ 343	US\$ 528	Fix	-0,73%							
<b>IPCA vs. US\$ fixed rate swap</b>											
Receivable			IPCA		(167)	(411)	4	36	23	19 (208)	
Payable	R\$ 1.000	R\$ 1.000	+	6,55%							
	US\$ 434	US\$ 434	Fix	3,98%							
<b>IPCA vs. CDI swap</b>											
Receivable			IPCA		137	6	(82)	1	(64)	(27) 228	
Payable	R\$ 1.350	R\$ 1.350	+	6,62%							
	R\$ 1.350	R\$ 1.350	CDI	98,58%							

(ii) Protection program for EUR denominated debt instruments

In order to reduce the cash flow volatility, swap and forward transactions were implemented to convert into US\$ the cash flows from certain debt instruments issued in Euros by Vale. In those swaps, Vale receives fixed rates in EUR and pays fixed rates in US\$. And in those forwards only the principal amount of the debt is converted from EUR to US\$.

The swap and forward transactions were negotiated over-the-counter and the protected items are the cash flows from debt instruments linked to EUR. The financial settlement inflows/outflows are offset by the protected items losses/gains due to EUR/US\$ exchange rate.



Table of Contents

Flow	Notional				Average rate		Fair value		Financial settlement	Value at Risk		Fair value by year		
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2016	December 31, 2016	2017	2018	2019+
<b>EUR fixed rate vs. US\$ fixed rate swap</b>							(170)	(683)	(524)	32	(23)	(21)	(127)	
Receivable	500	1.000	Fix	3,75%										
Payable	US\$3	US\$302	Fix	4,29%										

Flow	Notional		Bought / Average rate		Fair value		Financial settlement	Value at Risk		Fair value
	December 31, 2016	December 31, 2015	Sold	(USD/EUR)	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2016	December 31, 2016	2017
Forward	500		B	1,143	(149)				19	(149)

**(iii) Foreign exchange hedging program for disbursements in CAD**

In order to reduce the cash flow volatility, forward transactions were implemented to mitigate the foreign exchange exposure that arises from the currency mismatch between revenues denominated in US\$ and disbursements denominated in CAD.

The forward transactions were negotiated over-the-counter and the protected item is part of the CAD denominated disbursements. The financial settlement inflows/outflows are offset by the protected items losses/gains due to CAD/US\$ exchange rate. This program is classified under the hedge accounting requirements, and it was settled in the first quarter of 2016.

Flow	Notional		Bought / Average rate		Fair value		Financial settlement	Value at Risk		Fair value
	December 31, 2016	December 31, 2015	Sold	(CAD / USD)	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2016	December 31, 2016	2017
Forward			CAD 10	B	1,028		(12)	(10)		

**b) Commodities derivative positions****(i) Bunker Oil purchase cash flows protection program**

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In order to reduce the impact of bunker oil price fluctuation on maritime freight hiring/supply and, consequently, reducing the company's cash flow volatility, bunker oil derivatives were implemented. These transactions are usually executed through forward purchases and zero cost-collars.

The derivative transactions were negotiated over-the-counter and the protected item is part of the Vale's costs linked to bunker oil prices. The financial settlement inflows/outflows are offset by the protected items' losses/gains due to bunker oil prices changes.

Flow	Notional (ton)		Bought / Sold	Average strike (US\$/ton)	Fair value		Financial Settlement	Value at Risk	Fair by
	December 31, 2016	December 31, 2015			December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2016	
<b>Bunker Oil protection</b>									
Forwards	0	1.867.500	B	0		(2.252)	(1.747)		
Call options	2.856.000	2.041.500	B	324	424	0			93
Put options	2.856.000	2.041.500	S	213	(45)	(1.158)	(603)		10
<b>Total</b>					<b>379</b>	<b>(3.410)</b>			

As at December 31, 2016 and 2015, excludes R\$78 and R\$397, respectively, of transactions in which the financial settlement occurs subsequently of the closing month.

### (ii) Protection programs for base metals raw materials and products

In the operational protection program for nickel sales at fixed prices, derivatives transactions were implemented to convert into floating prices the contracts with clients that required a fixed price, in order to keep nickel revenues exposed to nickel price fluctuations. Those operations are usually implemented through the purchase of nickel forwards.

In the operational protection program for the purchase of raw materials and products, derivatives transactions were implemented, usually through the sale of nickel and copper forward or futures, in order to reduce the mismatch between the pricing period of purchases (concentrate, cathode, sinter, scrap and others) and the pricing period of the final product sales to the clients.

The derivative transactions are negotiated at London Metal Exchange or over-the-counter and the protected item is part of Vale's revenues and costs linked to nickel and copper prices. The financial settlement inflows/outflows are offset by the protected items' losses/gains due to nickel and copper prices changes.

Table of Contents

Flow	Notional (ton)		Bought / Sold	Average strike (US\$/ton)	Fair value		Financial Settlement Inflows (Outflows) December 31, 2016	Value at Risk December 31, 2016	Fair value December 31, 2016
	December 31, 2016	December 31, 2015			December 31, 2016	December 31, 2015			
<b>Fixed prices sales protection</b>									
Nickel forwards	11.615	16.917	B	10.156	(2)	(180)	(98)	12	(1)
<b>Raw materials purchase protection</b>									
Nickel forwards	134	118	S	10.823	0,4	0,4	(0,6)	0,1	0
Copper forwards	441	385	S	5.207	(0,5)	0,4	0,1	0,2	(0)
<b>Total</b>					<b>(0,1)</b>	<b>0,7</b>			<b>(0)</b>

c) **Silver Wheaton Corp. warrants**

The company owns warrants of Silver Wheaton Corp. (SLW), a Canadian company with stocks negotiated in Toronto Stock Exchange and New York Stock Exchange. Such warrants configure American call options and were received as part of the payment regarding the sale of part of gold payable flows produced as a sub product from Salobo copper mine and some nickel mines in Sudbury.

Flow	Notional (quantity)		Bought / Sold	Average strike (US\$/share)	Fair value		Financial Settlement Inflows (Outflows) December 31, 2016	Value at Risk December 31, 2016	Fair value by year 2023
	December 31, 2016	December 31, 2015			December 31, 2016	December 31, 2015			
Call options	10.000.000	10.000.000	B	44	143	28		15	

d) **Call options from debentures**

The company has debentures in which lenders have call options of a specified quantity of Ferrovias Norte Sul ordinary shares, later changed to VLI SA shares. The call options strike price is given by the debentures remaining notional in each exercise date.

Notional (quantity)	Bought / Average strike	Fair value	Financial Settlement Inflows (Outflows)	Value at Risk	Fair value by year
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Flow	December 31, 2016	December 31, 2015	Sold	(R\$/share)	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2016	202
Call options	140.239	140.239	S	8.419	(236)	(152)		15	(

Table of Contentse) **Options related to Minerações Brasileiras Reunidas S.A. ( MBR ) shares**

The Company entered into a contract that has options related to MBR shares. Under certain restrict and contingent conditions, which are beyond the buyer's control, such as illegality due to changes in the law, the contract has a clause that gives the buyer the right to sell back its stake to the Company. In this case, the Company could settle through cash or shares. On the other hand, the Company has the right to buy back this non-controlling interest in the subsidiary.

Flow	Notional (quantity, in millions)		Bought / Sold	Average strike (R\$/ação)	Fair value		Financial Settlement Inflows (Outflows) December 31, 2016	Value at Risk December 31, 2016	Fair value by year 2017
	December 31, 2016	December 31, 2015			December 31, 2016	December 31, 2015			
Options	2.139	2.139	B/S	1,8	393	57		37	

f) **Embedded derivatives in contracts**

The Company has some nickel concentrate and raw materials purchase agreements in which there are provisions based on nickel and copper future prices behavior. These provisions are considered as embedded derivatives.

Flow	Notional (ton)		Bought / Sold	Average strike (US\$/ton)	Fair value		Financial Settlement Inflows (Outflows) December 31, 2016	Value at Risk December 31, 2016	Fair value by year 2017
	December 31, 2016	December 31, 2015			December 31, 2016	December 31, 2015			
Nickel Forward	5.626	3.877	S	10.950	1,1	11,7			
Copper Forward	3.684	5.939	S	5.249	5,0	7,7			
<b>Total</b>					<b>6,1</b>	<b>19,4</b>			<b>8,1</b>

The Company has also a natural gas purchase agreement in which there is a clause that defines that a premium can be charged if the Company's pellet sales prices trade above a pre-defined level. This clause is considered an embedded derivative.

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Flow	Notional (volume/month)		Bought / Sold	Average strike (US\$/ton)	Fair value		Financial Settlement	Value at Risk December 31, 2016	Fair value December 31, 2017
	December 31, 2016	December 31, 2015			December 31, 2016	December 31, 2015	Inflows (Outflows) December 31, 2016		
Call options	746.667	746.667	S	179	(6,5)			4,1	(0,1)

In August 2014 the Company sold part of its stake in VLI to an investment fund managed by Brookfield Asset Management ( Brookfield ). The sales contract includes a clause that establishes, under certain conditions, a minimum return guarantee on Brookfield 's investment. This clause is considered an embedded derivative, with payoff equivalent to that of a put option and estimated pricing based on our own model and assumptions.

Flow	Notional (quantity)		Bought / Sold	Average strike (R\$/share)	Fair value		Financial Settlement	Value at Risk December 31, 2016	Fair value by year 2018+
	December 31, 2016	December 31, 2015			December 31, 2016	December 31, 2015	Inflows (Outflows) December 31, 2016		
Put option	1.105.070.863	1.105.070.863	S	3,07	(593)	(551)		45	(5)

For sensitivity analysis of derivative financial instruments, Financial counterparties ratings and market curves please see note 33.

Table of Contents**26. Provisions**

	<b>Consolidated</b>			
	<b>Current liabilities</b>		<b>Non-current liabilities</b>	
	<b>December 31, 2016</b>	<b>December 31, 2015</b>	<b>December 31, 2016</b>	<b>December 31, 2015</b>
Payroll and related charges (i)	2,362	1,464		
Environment Restoration	33	83	362	318
Onerous contracts (note 19)	329		1,541	1,195
Asset retirement obligations (note 27)	154	346	8,055	9,313
Provisions for litigation (note 28)			2,734	3,210
Employee postretirement obligations (note 29)	225	266	6,038	6,831
<b>Provisions</b>	<b>3,103</b>	<b>2,159</b>	<b>18,730</b>	<b>20,867</b>

	<b>Parent Company</b>			
	<b>Current liabilities</b>		<b>Non-current liabilities</b>	
	<b>December 31, 2016</b>	<b>December 31, 2015</b>	<b>December 31, 2016</b>	<b>December 31, 2015</b>
Payroll and related charges (i)	1,649	806		
Environment Restoration	14	51	200	139
Asset retirement obligations (note 27)	71	83	1,571	1,291
Provisions for litigation (note 28)			1,944	2,190
Employee postretirement obligations (note 29)	58	72	681	483
<b>Provisions</b>	<b>1,792</b>	<b>1,012</b>	<b>4,396</b>	<b>4,103</b>

(i) Includes profit sharing provision R\$1,064 and R\$147 for the year ended December 31, 2016 and 2015, respectively. For the Parent Company, R\$638 and R\$106 for the year ended December 31, 2016 and 2015, respectively.

**27. Asset retirement obligations**

Refers to the costs for the closure of the mines and deactivation of the related mining assets. Changes in the provision of asset retirement obligations and long-term interest rates (per annum, used to discount these obligations to present value and to update the provisions) are as follows:

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	Consolidated		Parent Company	
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
<b>Balance at beginning of the year</b>	<b>9,659</b>	<b>8,949</b>	<b>1,374</b>	<b>3,195</b>
Interest expense	405	214	183	135
Settlements	(264)	(298)	(12)	(12)
Revisions on cash flows estimates	737	(524)	97	(1,944)
Translation adjustment	(1,160)	1,318		
<b>Effect of discontinued operations</b>				
Transfer to net assets held for sale	(1,168)			
<b>Balance at end of the year</b>	<b>8,209</b>	<b>9,659</b>	<b>1,642</b>	<b>1,374</b>
Current	154	346	71	83
Non-current	8,055	9,313	1,571	1,291
	<b>8,209</b>	<b>9,659</b>	<b>1,642</b>	<b>1,374</b>
<b>Long-term interest rates (per annum)</b>				
Brazil	5.73%	7.28%	5.73%	7.28%
Canada	0.55%	0.59%		
Other regions	1.07% - 8.02%	1.12% - 5.91%		

**Accounting policy**

The provision refers to costs related to mine closure and reclamation, with the completion of mining activities and decommissioning of assets related to mine. When the provision is recognized, the corresponding cost is capitalized as part of property plant and equipment and is depreciated on the same basis over the related asset and recorded in the income statement.

The long-term liability is subsequently measured using a long-term risk free discount rate applicable to the liability and recorded in the income statement as financial expenses until the Company makes payments related to mine closure and decommissioning of assets mining.

The accrued amounts of these obligations are not deducted from the potential costs covered by insurance or indemnities.



Table of Contents**Critical accounting estimates and judgments**

The Company applies judgment and assumptions when measuring its asset retirement obligation. The Company recognizes an obligation under the fair value for asset retirement obligations in the period in which they occur. The Company considers the accounting estimates related to closure costs of a mine as a critical accounting policy because they involve significant values for the provision and are estimated using several assumptions, such as interest rate, cost of closure useful life of the asset considering the current state of closure and the projected date of depletion of each mine. The estimates are reviewed annually.

**28. Litigation****a) Provision for litigation**

Vale is party to labor, civil, tax and other ongoing lawsuits, at administrative and court levels. Provisions for losses resulting from lawsuits are estimated and updated by the Company, based on analysis from the Company's legal consultants.

Changes in provision for litigation are as follows:

	<b>Consolidated</b>				<b>Total of litigation provision</b>
	<b>Tax litigation</b>	<b>Civil litigation</b>	<b>Labor litigation</b>	<b>Environmental litigation</b>	
<b>Balance at December 31, 2014</b>	<b>1,088</b>	<b>311</b>	<b>1,876</b>	<b>130</b>	<b>3,405</b>
Additions	511	193	534	2	1,240
Reversals	(582)	(143)	(454)	(15)	(1,194)
Payments	(151)	(129)	(225)	(215)	(720)
Indexation and interest	54	40	17	126	237
Translation adjustment	127	1		50	178
Additions and reversals of discontinued operations	5	36	23		64
<b>Balance at December 31, 2015</b>	<b>1,052</b>	<b>309</b>	<b>1,771</b>	<b>78</b>	<b>3,210</b>
Additions	86	347	830	7	1,270
Reversals	(127)	(224)	(412)	(20)	(783)
Payments	(410)	(212)	(363)	(11)	(996)
Indexation and interest	155	68	28	(10)	241
Translation adjustment	(2)		2	1	1

**Effect of discontinued operations**

Net movements of year	1	(5)	28	(1)	23
Transfers to net assets held for sale	(60)	(11)	(142)	(19)	(232)
<b>Balance at December 31, 2016</b>	<b>695</b>	<b>272</b>	<b>1,742</b>	<b>25</b>	<b>2,734</b>

	Parent Company				Total of litigation provision
	Tax litigation	Civil litigation	Labor litigation	Environmental litigation	
<b>Balance at December 31, 2014</b>	<b>436</b>	<b>186</b>	<b>1,732</b>	<b>94</b>	<b>2,448</b>
Additions	370	173	508	2	1,053
Reversals	(535)	(139)	(418)	(14)	(1,106)
Payments	(156)	(7)	(211)	(34)	(408)
Indexation and interest	217	28	(49)	7	203
<b>Balance at December 31, 2015</b>	<b>332</b>	<b>241</b>	<b>1,562</b>	<b>55</b>	<b>2,190</b>
Additions	44	346	804	8	1,202
Reversals	(50)	(202)	(407)	(19)	(678)
Payments	(275)	(206)	(337)	(11)	(829)
Indexation and interest	2	68	(1)	(10)	59
<b>Balance at December 31, 2016</b>	<b>53</b>	<b>247</b>	<b>1,621</b>	<b>23</b>	<b>1,944</b>

*i. Provisions for labor litigation* - Consist of lawsuits filed by employees and service suppliers, related to employment relationships mainly in Brazil. The most recurring claims are related to payment of overtime, hours in itinerary, and health and safety. Also the social security in Brazil ( INSS ) contingencies are related to legal and administrative disputes between INSS and Vale due to applicability of compulsory social security charges.

Table of Contents**b) Contingent liabilities**

Contingent liabilities of administrative and judicial claims, with expectation of loss classified as possible, and for which the recognition of a provision is not considered necessary by the Company, based on legal advice are as follows:

	Consolidated		Parent Company	
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
Tax litigation	26,995	20,796	22,970	15,839
Civil litigation	7,484	5,214	6,022	4,351
Labor litigation	7,933	7,288	7,521	6,383
Environmental litigation	6,134	5,393	5,944	5,224
<b>Total</b>	<b>48,546</b>	<b>38,691</b>	<b>42,457</b>	<b>31,797</b>

**i - Tax litigation** - Our most significant tax-related contingent liabilities result from disputes related to (i) the deductibility of our payments of social security contributions on the net income (CSLL) from our taxable income, (ii) challenges of certain tax credits we deducted from our PIS and COFINS payments, (iii) assessments of CFEM (royalties), and (iv) charges of value-added tax on services and circulation of goods (ICMS), especially relating to certain tax credits we claimed from the sale and transmission of energy, ICMS charges to anticipate the payment in the entrance of goods to Pará State, ICMS charges on our own transportation costs and challenges to other tax credits we claimed. The changes reported in the period resulted, mainly, from new proceedings related to PIS, COFINS, ICMS, CFEM; interest and inflation adjustments in the amounts in dispute.

**ii - Civil litigation** - Most of those claims have been filed by suppliers for indemnification under construction contracts, primarily relating to certain alleged damages, payments and contractual penalties. A number of other claims related to contractual disputes regarding inflation index.

**iii - Labor litigation** - Represents individual claims by employees and service providers, primarily involving demands for additional compensation for overtime work, time spent commuting or health and safety conditions; and the Brazilian federal social security administration ( INSS ) regarding contributions on compensation programs based on profits.

**iv - Environmental litigation** - The most significant claims concern alleged procedural deficiencies in licensing processes, non-compliance with existing environmental licenses or damage to the environment.

**c) Judicial deposits**

In addition to the provisions and contingent liabilities, the Company is required by law to make judicial deposits to secure a potential adverse outcome of certain lawsuits. These court-ordered deposits are monetarily adjusted and reported as non-current assets until a judicial decision to draw the deposit occurs.

	Consolidated		Parent Company	
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
Tax litigation	630	822	499	531
Civil litigation	202	399	53	135
Labor litigation	2,251	2,163	2,078	1,984
Environmental litigation	52	61	51	57
<b>Total</b>	<b>3,135</b>	<b>3,445</b>	<b>2,681</b>	<b>2,707</b>

**d) Others**

For contingencies related to Samarco Mineração S.A., see note 21.

Table of Contents

**Accounting policy**

A provision is recognized when the obligation is considered probable and can be measured. The accounting counterpart for the obligation is an expense in income statement. This obligation is updated according to the evolution of the judicial process or interest incurred and can be reversed if the estimate of loss is not considered probable or settled when the obligation is paid.

**Critical accounting estimates and judgments**

By their nature, litigations will be resolved when one or more future event occurs or fails to occur. Typically, the occurrence or not of such events is outside the Company's control. Legal uncertainties involve the exercise of significant estimates and judgments by management regarding the results of future events.

**29. Employee benefits**

**a) Employee postretirements obligations**

In Brazil, the management of the pension plans is responsibility of Fundação Vale do Rio Doce de Seguridade Social ( Valia ) a nonprofit entity with administrative and financial autonomy. The Brazilian plans are as follows:

**Benefit plan Vale Mais ( Vale Mais ) and benefit plan Valiaprev ( Valiaprev )** - Certain of the Company's employees are participants of plans Vale Mais and Valiaprev with components of defined benefit (specific coverage for death, pensions and disability allowances) and components of defined contributions (for programmable benefits). The defined benefits plan is subject to actuarial evaluations. The defined contribution plan represents a fixed amount held on behalf of the participants. Both Vale Mais and Valiaprev were overfunded as at December 31, 2016 and 2015.

**Defined benefit plan ( Plano BD )** - The Plano BD has been closed to new entrants since the year 2000, when the Vale Mais plan was implemented. It is a plan that has defined benefit characteristics, covering almost exclusively retirees and

their beneficiaries. It was overfunded as of December 31, 2016 and 2015 and the contributions made by the Company are not relevant.

**Abono complementação benefit plan** - The Company sponsors a specific group of former employees entitled to receive additional benefits from Valia normal payments plus post-retirement benefit that covers medical, dental and pharmaceutical assistance. The contributions made by the Company finished in 2014. The abono complementação benefit was overfunded as at December 31, 2016 and 2015.

**Other benefits** - The Company sponsors medical plans for employees that meet specific criteria and for employees who use the abono complementação benefit. Although those benefits are not specific retirement plans, actuarial calculations are used to calculate future commitments. As those benefits are related to health care plans they have the nature of underfunded benefits, and are presented as underfunded plans as at December 31, 2016 and 2015.

The Foreign plans are managed in accordance with their region. They are divided between plans in Canada, United States of America, United Kingdom, Indonesia, New Caledonia, Japan and Taiwan. Pension plans in Canada are composed of a defined benefit and defined contribution component. Currently the defined benefit plans do not allow new entrants. The foreign defined benefit plans are underfunded as at December 31, 2016 and 2015.

Employers disclosure about pensions and other post-retirement benefits on the status of the defined benefit elements of all plans is provided as follows.

Table of Contents**i. Change in benefit obligation**

	Overfunded pension plans	Consolidated Underfunded pension plans	Other benefits	Parent Company Overfunded pension plans	Other benefits
<b>Benefit obligation as at December 31, 2014</b>	<b>9,902</b>	<b>12,009</b>	<b>3,981</b>	<b>9,902</b>	<b>532</b>
Service costs	65	308	92	62	
Interest costs	1,181	591	219	1,177	63
Benefits paid	(814)	(874)	(216)	(814)	(70)
Participant contributions	4	1		4	
Transfers	31	(31)			
Effect of changes in the actuarial assumptions	(710)	(267)	(119)	(691)	30
Translation adjustment		2,670	815		
<b>Benefit obligation as at December 31, 2015</b>	<b>9,659</b>	<b>14,407</b>	<b>4,772</b>	<b>9,640</b>	<b>555</b>
Service costs	36	267	(44)	34	103
Interest costs	1,256	608	231	1,253	72
Benefits paid	(970)	(900)	(212)	(969)	(66)
Participant contributions	2	2		2	
Effect of changes in the actuarial assumptions	942	371	244	936	76
Translation adjustment		(1,906)	(574)		
Transfer to held for sale	(29)		(193)		
Others		334			
<b>Benefit obligation as at December 31, 2016</b>	<b>10,896</b>	<b>13,183</b>	<b>4,224</b>	<b>10,896</b>	<b>740</b>

**ii. Evolution of assets fair value**

	Overfunded pension plans	Consolidated Underfunded pension plans	Other benefits	Parent Company Overfunded pension plans	Other benefits
<b>Fair value of plan assets as at December 31, 2014</b>	<b>13,357</b>	<b>9,872</b>		<b>13,357</b>	
Interest income	1,616	498		1,615	
Employer contributions	208	446	216	201	70
Participant contributions	4	1		4	
Benefits paid	(814)	(874)	(216)	(814)	(70)
Return on plan assets (excluding interest income)	(977)	(36)		(980)	
Transfers	19	(19)			

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Translation adjustment		2,195		
<b>Fair value of plan assets as at December 31, 2015</b>	<b>13,413</b>	<b>12,083</b>	<b>13,383</b>	
Interest income	1,777	525	1,772	
Employer contributions	143	342	212	66
Participant contributions	2	2		2
Benefits paid	(970)	(900)	(212)	(66)
Return on plan assets (excluding interest income)	976	192		970
Transfer to held for sale	(43)			
Translation adjustment		(1,530)		
Others		430		
<b>Fair value of plan assets as at December 31, 2016</b>	<b>15,298</b>	<b>11,144</b>	<b>15,298</b>	

iii. Reconciliation of assets and liabilities recognized in the statement of financial position

	Consolidated Plans in Brazil					
	December 31, 2016		December 31, 2015			
	Overfunded pension plans	Underfunded pension plans	Other benefits	Overfunded pension plans	Underfunded pension plans	Other benefits
<b>Balance at beginning of the year</b>	<b>3,754</b>			<b>3,455</b>		
Interest income	539			427		
Changes on asset ceiling and onerous liability	120			(128)		
Transfer to held for sale	(11)					
<b>Balance at end of the year</b>	<b>4,402</b>			<b>3,754</b>		
<b>Amount recognized in the statement of financial position</b>						
Present value of actuarial liabilities	(10,896)	(1,260)	(740)	(9,659)	(970)	(624)
Fair value of assets	15,298	839		13,413	837	
Effect of the asset ceiling	(4,402)			(3,754)		
<b>Liabilities at end of the year</b>		<b>(421)</b>	<b>(740)</b>		<b>(133)</b>	<b>(624)</b>
Current liabilities			(58)			(72)
Non-current liabilities		(421)	(682)		(133)	(552)
<b>Liabilities at end of the year</b>		<b>(421)</b>	<b>(740)</b>		<b>(133)</b>	<b>(624)</b>



Table of Contents

	Consolidated Foreign plan					
	Overfunded pension plans	December 31, 2016 Underfunded pension plans	Other benefits	Overfunded pension plans	December 31, 2015 Underfunded pension plans	Other benefits
<b>Amount recognized in the statement of financial position</b>						
Present value of actuarial liabilities		(11,923)	(3,484)		(13,437)	(4,149)
Fair value of assets		10,305			11,246	
<b>Liabilities at end of the year</b>		<b>(1,618)</b>	<b>(3,484)</b>		<b>(2,191)</b>	<b>(4,149)</b>
Current liabilities		(53)	(114)		(67)	(127)
Non-current liabilities		(1,565)	(3,370)		(2,124)	(4,022)
<b>Liabilities at end of the year</b>		<b>(1,618)</b>	<b>(3,484)</b>		<b>(2,191)</b>	<b>(4,149)</b>
<b>Consolidated Total</b>						
	Overfunded pension plans	December 31, 2016 Underfunded pension plans	Other benefits	Overfunded pension plans	December 31, 2015 Underfunded pension plans	Other benefits
<b>Balance at beginning of the year</b>	<b>3,754</b>			<b>3,455</b>		
Interest income	539			427		
Changes in asset ceiling/onerous liability	120			(128)		
Transfer to held for sale	(11)					
<b>Balance at end of the year</b>	<b>4,402</b>			<b>3,754</b>		
<b>Amount recognized in the statement of financial position</b>						
Present value of actuarial liabilities	(10,896)	(13,183)	(4,224)	(9,659)	(14,407)	(4,773)
Fair value of assets	15,298	11,144		13,413	12,083	
Effect of the asset ceiling	(4,402)			(3,754)		
<b>Liabilities at end of the year</b>		<b>(2,039)</b>	<b>(4,224)</b>		<b>(2,324)</b>	<b>(4,773)</b>
Current liabilities		(53)	(172)		(67)	(199)
Non-current liabilities		(1,986)	(4,052)		(2,257)	(4,574)
<b>Liabilities at end of the year</b>		<b>(2,039)</b>	<b>(4,224)</b>		<b>(2,324)</b>	<b>(4,773)</b>

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Parent Company  
Plans in Brazil

	December 31, 2016		December 31, 2015	
	Overfunded pension plans	Underfunded pension plans	Overfunded pension plans	Underfunded pension plans
			Other benefits	Other benefits
<b>Balance at beginning of the year</b>	<b>3,743</b>			<b>3,455</b>
Interest income	539			427
Changes on asset ceiling and onerous liability	120			(139)
<b>Balance at end of the year</b>	<b>4,402</b>			<b>3,743</b>
<b>Amount recognized in the statement of financial position</b>				
Present value of actuarial liabilities	(10,896)		(740)	(9,640)
Fair value of assets	15,298			13,383
Effect of the asset ceiling	(4,402)			(3,743)
<b>Liabilities at end of the year</b>			<b>(740)</b>	<b>(555)</b>
Current liabilities			(58)	(72)
Non-current liabilities			(682)	(483)
<b>Liabilities at end of the year</b>			<b>(740)</b>	<b>(555)</b>

Table of Contents

## iv. Costs recognized in the income statement

	Consolidated Year ended December 31					
	Overfunded pension plans	2016 Underfunded pension plans	Other benefits	Overfunded pension plans	2015 Underfunded pension plans	Other benefits
Service cost	36	267	(44)	65	308	92
Interest on expense on liabilities	1,256	608	231	1,181	591	219
Interest income on plan assets	(1,777)	(525)		(1,616)	(498)	
Interest expense on effect of (asset ceiling)/ onerous liability	541			437		
<b>Total of cost, net</b>	<b>56</b>	<b>350</b>	<b>187</b>	<b>67</b>	<b>401</b>	<b>311</b>

	Parent Company Year ended December 31					
	Overfunded pension plans	2016 Underfunded pension plans	Other benefits	Overfunded pension plans	2015 Underfunded pension plans	Other benefits
Service cost	34		103	62		
Interest on expense on liabilities	1,253		72	1,177		63
Interest income on plan assets	(1,772)			(1,615)		
Interest expense on effect of (asset ceiling)/ onerous liability	540			428		
<b>Total of cost, net</b>	<b>55</b>		<b>175</b>	<b>52</b>		<b>63</b>

## v. Costs recognized in the statement of comprehensive income

	Consolidated Year ended December 31					
	Overfunded pension plans	2016 Underfunded pension plans	Other benefits	Overfunded pension plans	2015 Underfunded pension plans	Other benefits
<b>Balance at beginning of the year</b>	<b>(440)</b>	<b>(1,934)</b>	<b>(369)</b>	<b>(380)</b>	<b>(1,515)</b>	<b>(350)</b>
Effect of changes actuarial assumptions	(942)	(371)	(244)	710	267	119

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Return on plan assets (excluding interest income)	976	192		(977)	(36)	
Change of asset ceiling / costly liabilities (excluding interest income)	(125)			170		
Others		95			8	
	(91)	(84)	(244)	(97)	239	119
Deferred income tax	31	62	60	33	(4)	(33)
<b>Others comprehensive income</b>	<b>(60)</b>	<b>(22)</b>	<b>(184)</b>	<b>(64)</b>	<b>235</b>	<b>86</b>
Translation adjustments		340	30		(650)	(105)
Transfers/ disposal				4	(4)	
<b>Accumulated other comprehensive income</b>	<b>(500)</b>	<b>(1,616)</b>	<b>(523)</b>	<b>(440)</b>	<b>(1,934)</b>	<b>(369)</b>

Parent Company  
Year ended December 31

	Overfunded pension plans	2016 Underfunded pension plans	Other benefits	Overfunded pension plans	2015 Underfunded pension plans	Other benefits
<b>Balance at beginning of the year</b>	<b>(444)</b>		<b>(140)</b>	<b>(381)</b>	<b>7</b>	<b>(120)</b>
Effect of changes actuarial assumptions	(936)		(76)	691		(30)
Return on plan assets (excluding interest income)	970			(980)		
Change of asset ceiling / costly liabilities (excluding interest income)	(121)			183		
	(87)		(76)	(106)		(30)
Deferred income tax	30		26	36		10
<b>Others comprehensive income</b>	<b>(57)</b>		<b>(50)</b>	<b>(70)</b>		<b>(20)</b>
Transfers/ disposal				7	(7)	
<b>Accumulated other comprehensive income</b>	<b>(501)</b>		<b>(190)</b>	<b>(444)</b>		<b>(140)</b>

Table of Contents

**vi. Risks related to plans**

The Administrators of the plans have committed to strategic planning to strengthen internal controls and risk management. This commitment is archived by conducting audits including of internal controls, which aim to mitigate operational market and credit risks. Risks are presented as follow:

**Legal** - lawsuits: issuing periodic reports to internal audit and directors contemplating the analysis of lawyers about the possibility of loss (remote, probable or possible), aiming to support the administrative decision regarding provisions. Analysis and ongoing monitoring of developments in the legal scenario and its dissemination within the institution in order to subsidize the administrative plans, considering the impact of regulatory changes.

**Actuarial** - the annual actuarial valuation of the benefit plans comprises the assessment of costs, revenues and adequacy of plan funding. It also considers the monitoring of biometric, economic and financial assumptions (asset volatility, changes in interest rates, inflation, life expectancy, salaries and other).

**Market** - profitability projections are performed for the various plans and profiles of investments for 10 years in the management study of assets and liabilities. These projections include the risks of investments in various market segments. Furthermore, the risks for short-term market of the plans are monitored monthly through metrics of VaR (Value at Risk) and stress testing. For exclusive investment funds of Valia, the market risk is measured daily by the custodian asset bank.

**Credit** - assessment of the credit quality of issuers by hiring expert consultants to evaluate financial institutions and internal assessment of payment ability of non-financial companies. For assets of non-financial companies the assessment is conducted a monitoring of the company until the maturity of the security.

**vii. Actuarial and economic assumptions and sensitivity analysis**

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All calculations involve future actuarial projections about some parameters, such as: salaries, interest, inflation, the trend of INSS benefits, mortality and disability.

The economic and actuarial assumptions adopted have been formulated considering the long-term period for maturity and should therefore be examined accordingly. In the short term they may not necessarily be realized.

In the evaluations were adopted the following assumptions:

	<b>Brazil</b>					
	<b>Overfunded pension plans</b>	<b>December 31, 2016 Underfunded pension plans</b>	<b>Other benefits</b>	<b>Overfunded pension plans</b>	<b>December 31, 2015 Underfunded pension plans</b>	<b>Other benefits</b>
Discount rate to determine benefit obligation	10.98% - 11.14%	10.98%	10.98% - 11.09%	13.63%	13.71%	13.63%
Nominal average rate to determine expense/income	10.98% - 11.14%	10.98%	N/A	12.36%	13.71%	N/A
Nominal average rate of salary increase	4.85% - 5.95%	6.95%	N/A	8.12%	8.12%	N/A
Nominal average rate of benefit increase	6.00%	6.00%	N/A	6.00%	6.00%	N/A
Immediate health care cost trend rate	N/A	N/A	8.00%	N/A	N/A	9.18%
Ultimate health care cost trend rate	N/A	N/A	8.00%	N/A	N/A	9.18%
Nominal average rate of price inflation	4.85%	4.85%	4.85%	6.00%	6.00%	6.00%

	<b>Foreign</b>			
	<b>December 31, 2016</b>		<b>December 31, 2015</b>	
	<b>Underfunded pension plans</b>	<b>Other benefits</b>	<b>Underfunded pension plans</b>	<b>Other benefits</b>
Discount rate to determine benefit obligation	3.84%	3.90%	4.00%	3.90%
Nominal average rate to determine expense/ income	4.01%	N/A	4.80%	N/A
Nominal average rate of salary increase	4.05%	N/A	3.90%	N/A
Nominal average rate of benefit increase	N/A	3.00%	N/A	3.00%
Immediate health care cost trend rate	N/A	6.30%	N/A	6.30%
Ultimate health care cost trend rate	N/A	4.50%	N/A	4.50%
Nominal average rate of price inflation	2.00%	2.00%	2.00%	2.00%

Table of Contents

For the sensitivity analysis, the Company considers the effect of 1% in nominal discount rate to determine the actuarial liability. The effects of this change in actuarial liabilities in premise and adopted the average duration of the plan are as follows:

	Overfunded pension plans	Consolidated December 31, 2016 Underfunded pension plans	Other benefits	Overfunded pension plans	Parent Company December 31, 2016 Underfunded pension plans	Other benefits
<b>Nominal discount rate - 1% increase</b>						
Actuarial liability balance	10,002	11,632	3,816	10,002		805
Assumptions made	11.29%	5.55%	6.33%	11.29%		11.48%
<b>Nominal discount rate - 1% reduction</b>						
Actuarial liability balance	11,946	14,936	4,788	11,946		682
Assumptions made	9.56%	3.50%	4.02%	9.56%		10.48%

**viii. Assets of pension plans**

Brazilian plan assets as at December 31, 2016 and 2015 includes respectively (i) investments in a portfolio of Vale's stock in the amount of R\$60 and R\$15 and (ii) Brazilian Federal Government securities in the amount of R\$13,623 and R\$11,622.

Foreign plan assets as at December 31, 2016 and 2015 includes Canadian Government securities in the amount of R\$2,395 and R\$2,636, respectively.

**ix. Overfunded pension plans**

Assets by category are as follows:

	Consolidated							
	Level 1	December 31, 2016			Total	Level 1	December 31, 2015	
		Level 2	Level 3			Level 2	Level 3	
Cash and cash equivalents	1			1	2	1		3
Accounts Receivable					1			1

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Equity securities				1		1
Debt securities - Corporate bonds	380		380		367	367
Debt securities - Government bonds	8,512		8,512	6,478		6,478
Investments funds - Fixed Income	7,857		7,857	7,023		7,023
Investments funds - Equity	549		549	170		170
International investments	38		38	112		112
Structured investments - Private Equity funds	708	456	1,164	540	532	1,072
Structured investments - Real estate funds		32	32		25	25
Real estate		1,205	1,205		1,246	1,246
Loans to participants		850	850		968	968
<b>Total</b>	<b>17,665</b>	<b>380</b>	<b>2,543</b>	<b>20,588</b>	<b>14,327</b>	<b>17,466</b>
Funds not related to risk plans				(5,290)		(4,053)
<b>Fair value of plan assets at end of year</b>				<b>15,298</b>		<b>13,413</b>

	Parent Company							
	December 31, 2016				December 31, 2015			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Cash and cash equivalents	1			1	2	1		3
Accounts Receivable					1			1
Debt securities - Corporate bonds		380		380		367		367
Debt securities - Government bonds	8,512			8,512	6,478			6,478
Investments funds - Fixed Income	7,857			7,857	7,018			7,018
Investments funds - Equity	549			549	170			170
International investments	38			38	112			112
Structured investments - Private Equity funds	708		456	1,164	540		511	1,051
Structured investments - Real estate funds			32	32			25	25
Real estate			1,205	1,205			1,245	1,245
Loans to participants			850	850			966	966
<b>Total</b>	<b>17,665</b>	<b>380</b>	<b>2,543</b>	<b>20,588</b>	<b>14,321</b>	<b>368</b>	<b>2,747</b>	<b>17,436</b>
Funds not related to risk plans				(5,290)				(4,053)
<b>Fair value of plan assets at end of year</b>				<b>15,298</b>				<b>13,383</b>



Table of Contents

Measurement of overfunded plan assets at fair value with no observable market variables (level 3) are as follows:

	Consolidated				Total
	Private equity funds	Real estate funds	Real estate	Loans to participants	
<b>Balance as at December 31, 2014</b>	<b>671</b>	<b>19</b>	<b>1,322</b>	<b>1,070</b>	<b>3,082</b>
Return on plan assets	(281)	3	15	157	(106)
Assets purchases	162	3	4	133	302
Assets sold during the year	(25)		(95)	(393)	(513)
Transfers in and/ out of Level 3	5			1	6
<b>Balance as at December 31, 2015</b>	<b>532</b>	<b>25</b>	<b>1,246</b>	<b>968</b>	<b>2,771</b>
Return on plan assets	(67)		10	115	58
Assets purchases	103	7	8	193	311
Assets sold during the year	(79)		(58)	(423)	(560)
Transfer to held for sale	(33)		(1)	(3)	(37)
<b>Balance as at December 31, 2016</b>	<b>456</b>	<b>32</b>	<b>1,205</b>	<b>850</b>	<b>2,543</b>

	Parent Company				Total
	Private equity funds	Real estate funds	Real estate	Loans to participants	
<b>Balance as at December 31, 2014</b>	<b>671</b>	<b>19</b>	<b>1,322</b>	<b>1,070</b>	<b>3,082</b>
Return on plan assets	(281)	3	14	156	(108)
Assets purchases	146	3	4	133	286
Assets sold during the year	(25)		(95)	(393)	(513)
<b>Balance as at December 31, 2015</b>	<b>511</b>	<b>25</b>	<b>1,245</b>	<b>966</b>	<b>2,747</b>
Return on plan assets	(79)		10	114	45
Assets purchases	103	7	8	193	311
Assets sold during the year	(79)		(58)	(423)	(560)
<b>Balance as at December 31, 2016</b>	<b>456</b>	<b>32</b>	<b>1,205</b>	<b>850</b>	<b>2,543</b>

#### x. Underfunded pension plans

Assets by category are as follows:

	Consolidated				Total		
	December 31, 2016		December 31, 2015				
	Level 1	Level 2	Level 3	Level 1	Level 2	Level 3	Total
Cash and cash equivalents		78		78	191		191
Equity securities	4,045			4,045	4,320		4,320

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Debt securities - Corporate bonds	34		34		47		47
Debt securities - Government bonds	271	2,395	2,666	219	2,671		2,890
Investments funds - Fixed Income	464	1,001	1,465	584	1,097		1,681
Investments funds - Equity	301	1,199	1,500	335	1,394		1,729
International investments		88	88	8	117		125
Structured investments - Private Equity funds			608	608		384	384
Structured investments - Real estate funds						1	1
Real estate			78	78		77	77
Loans to participants			18	18		17	17
Others			564	564		621	621
<b>Total</b>	<b>5,081</b>	<b>4,795</b>	<b>1,268</b>	<b>11,144</b>	<b>5,466</b>	<b>5,517</b>	<b>1,100</b>
							<b>12,083</b>

Table of Contents

Measurement of underfunded plan assets at fair value with no observable market variables (level 3) are as follows:

	Private equity funds	Real estate funds	Real estate	Loans to participants	Others	Total
<b>Balance as at December 31, 2014</b>	<b>48</b>	<b>1</b>	<b>65</b>	<b>15</b>		<b>129</b>
Return on plan assets			16	3		19
Assets purchases	340	(1)			621	960
Assets sold during the year	(3)					(3)
Transfers in and/ out of Level 3	(1)	1	(4)	(1)		(5)
<b>Balance as at December 31, 2015</b>	<b>384</b>	<b>1</b>	<b>77</b>	<b>17</b>	<b>621</b>	<b>1,100</b>
Return on plan assets	52		1	1	31	85
Assets purchases	613	(1)				612
Assets sold during the year	(386)					(386)
Translation adjustment	(55)				(88)	(143)
<b>Balance as at December 31, 2016</b>	<b>608</b>		<b>78</b>	<b>18</b>	<b>564</b>	<b>1,268</b>

**xi. Disbursement of future cash flow**

Vale expects to disburse R\$536 in 2017 in relation to pension plans and other benefits.

**xii. Expected benefit payments**

The expected benefit payments, which reflect future services, are as follows:

	Overfunded pension plans	December 31, 2016 Underfunded pension plans	Other benefits
2017	301	775	212
2018	320	773	219
2019	339	772	226
2020	360	773	234
2021	380	776	240
2022 and thereafter	1,961	3,937	1,309

**b) Profit sharing program ( PLR )**

The Company recorded as cost of goods sold and services rendered and other operating expenses related to the PLR R\$1,064 and R\$147 for the year ended on December 31, 2016 and 2015, respectively. For the Parent Company, R\$638 and R\$106 for the year ended on December 31, 2016 and 2015, respectively.

**c) Long-term compensation plan**

For the long-term awarding of eligible executives, the Company compensation plans includes Matching Program and Performance Share Unit Program - PSU, with three to four years-vesting cycles, respectively, with the aim of encouraging employee's retention and stimulating their performance.

For the Matching program, the participants can acquire Vale's preferred shares in the market without any benefits being provided by Vale. If the shares acquired are held for a period of three years and the participants keep it employment relationship with Vale, the participant is entitled to receive from Vale an award in shares, equivalent to the number of shares originally acquired by the executive. It should be noted that, although a specific custodian of the shares is defined by Vale, the share initially purchased by the executives have no restriction and can be sold at any time. However, if it's done before the end of the three-year-vesting period they lose the entitlement of receiving the related award paid by Vale.

For PSU program, the eligible executives have the opportunity to receive during a four year-vesting cycle, an award equivalent to the market value of a determined number of common shares and conditioned to Vale's performance factor measured as an indicator of total return to the shareholders (TSR). This award is paid in cash and can occur in cumulative installments of 20% (at the end of 2nd year), 30% (at the end of 3rd year) and 50% (at the end of 4th year), conditioned to the performance factor of each year.

Liabilities of the plans are measured at fair value at every reporting period, based on market rates. Compensation costs incurred are recognized by the defined vesting period of three or four years. At December 31, 2016, 2015 and 2014 the Company recognized in the income statement the amounts of R\$120, R\$113 and R\$163, respectively, related to long term compensation plan.

Table of Contents

**Accounting policy**

**Employee benefits**

**i. Current benefits – wages, vacations and related taxes**

Payments of benefits such as wages or accrued vacation, as well the related social security taxes over those benefits are recognized monthly in income, on an accruals basis.

**ii. Current benefits – profit sharing program**

The Company has the Annual Incentive Program (AIP) based on Team and business units contribution and Company-wide performance through operational cash generation. The Company makes an accrual based on evaluation periodic of goals achieved and Company result, using the accrual basis and recognition of present obligation arising from past events in the estimated outflow of resources in the future. The accrual is recorded as cost of goods sold and services rendered or operating expenses in accordance with the activity of each employee.

**iii. Non-current benefits – long-term incentive programs**

The Company has established a procedure for awarding certain eligible executives (Matching and Virtual Shares Programs) with the goal of encouraging employee retention and optimum performance. Plan liabilities are measured at each reporting date, at their fair values, based on market prices. Obligations are measured at each reporting date, at fair values based on market prices. The compensation costs incurred are recognized in income during the vesting period as defined.

**iv. Non-current benefits – pension costs and other post-retirement benefits**

The Company has several retirement plans for its employees.

For defined contribution plans, the Company's obligations are limited to a monthly contribution linked to a pre-defined percentage of the remuneration of employees enrolled in to these plans.

For defined benefit plans, actuarial calculations are periodically obtained for liabilities determined in accordance with the Projected Unit Credit Method in order to estimate the Company's obligation. The liability recognized in the balance sheet represents the present value of the defined benefit obligation as at that date, less the fair value of plan assets. The Company recognized in the income statement the costs of services, the interest expense of the obligations and the interest income of the plan assets. The remeasurement of gains and losses, return on plan assets (excluding the amount of interest on return of assets, which is recognized in income for the year) and changes in the effect of the ceiling of the active and onerous liabilities are recognized in comprehensive income for the year.

For overfunded plans, the Company does not recognize any assets or benefits in the balance sheet or income statement until such time as the use of the surplus is clearly defined. For underfunded plans, the Company recognizes actuarial liabilities and results arising from the actuarial valuation.

### **Critical accounting estimates and judgments**

#### **Post-retirement benefits for employees**

The amount recognized and disclosed depend on a number of factors that are determined based on actuarial calculations using various assumptions in order to determine costs and liabilities. One of these assumptions is selection and use of the discount rate. Any changes to these assumptions will affect the amount recognized.

At the end of each year the Company and external actuaries review the assumptions that will be used for the following year. These assumptions are used in determining the fair values of assets and liabilities, costs and expenses and the future values of estimated cash outflows, which are recorded in the plan obligations.

### **30. Stockholders' equity**

#### **a) Share capital**

Stockholders' equity is represented by common shares ( ON ) and preferred non-redeemable shares ( PNA ) without par value. Preferred shares have the same rights as common shares, with the exception of voting rights to elect members of the Board of Directors. The Board of Directors may, regardless of changes to bylaws, issue new shares (authorized capital), including the capitalization of profits and reserves to the extent authorized.



Table of Contents

The Company repurchases its shares to hold in treasury for future sale or cancellation. These shares are recorded in a specific account as a reduction of stockholders' equity at their acquisition value and carried at cost. These programs are approved by the Board of Directors with a determined terms and numbers of type of shares.

Incremental costs directly attributable to the issue of new shares or options are recognized in stockholders' equity as a deduction from the amount raised, net of taxes

At December 31, 2016 and 2015, share capital was R\$77,300 corresponding to 5,244,316,120 shares issued and fully paid without par value.

Stockholders	December 31, 2016		Total
	ON	PNA	
Valepar S.A.	1,716,435,045	20,340,000	1,736,775,045
Brazilian Government (Golden Share)		12	12
Foreign investors - ADRs	786,067,634	610,880,671	1,396,948,305
FMP - FGTS	70,662,746		70,662,746
PIBB - BNDES	741,730	1,171,101	1,912,831
BNDESPar	206,378,882	66,185,272	272,564,154
Foreign institutional investors in local market	262,868,264	825,753,408	1,088,621,672
Institutional investors	104,510,549	133,496,260	238,006,809
Retail investors in Brazil	37,988,150	309,895,202	347,883,352
<b>Shares outstanding</b>	<b>3,185,653,000</b>	<b>1,967,721,926</b>	<b>5,153,374,926</b>
Shares in treasury	31,535,402	59,405,792	90,941,194
<b>Total issued shares</b>	<b>3,217,188,402</b>	<b>2,027,127,718</b>	<b>5,244,316,120</b>
<b>Amounts per class of shares (in millions)</b>	<b>47,421</b>	<b>29,879</b>	<b>77,300</b>
<b>Total authorized shares</b>	<b>3,600,000,000</b>	<b>7,200,000,000</b>	<b>10,800,000,000</b>

b) **Profit reserves**

The amount of profit reserves are distributed as follows:

	Investments reserve	Legal reserve	Tax incentive reserve	Additional Remuneration reserve	Total of profit reserves
<b>Balance as at December 31, 2014</b>	<b>44,611</b>	<b>8,131</b>	<b>343</b>		<b>53,085</b>



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Dividends and interest on capital of Vale's stockholders	(5,026)				(5,026)
Allocation of loss	(39,585)	(4,285)	(343)		(44,213)
<b>Balance as at December 31, 2015</b>		<b>3,846</b>			<b>3,846</b>
Allocation of income	5,894	665	1,228	2,065	9,852
<b>Balance as at December 31, 2016</b>	<b>5,894</b>	<b>4,511</b>	<b>1,228</b>	<b>2,065</b>	<b>13,698</b>

**Investment reserve** - aims to ensure the maintenance and development of activities that comprise the Company's operations in an amount not exceeding 50% of distributable annual net income, limited to the share capital amount.

**Legal reserve** - is a legal requirement for Brazilian public companies to retain 5% of the annual net income up to 20% of the capital. The reserve can only be used to compensate losses or to increase capital.

**Tax incentive reserve** - results from the option to designate a portion of the income tax for investments in projects approved by the Brazilian Government as well as tax incentives.

**Additional remuneration reserve** - Results from the portion of management proposed remuneration that exceeds the mandatory minimum remuneration of 25% of the adjusted net income as presented below established in the Company's by-laws.

c) **Unrealized fair value gain (losses)**

	Retirement benefit obligations	Cash flow hedge	Available-for-sale financial instruments	Conversion shares	Total gain (losses)
<b>Balance as at December 31, 2014</b>	<b>(2,245)</b>	<b>(1,204)</b>	<b>(4)</b>	<b>(1,100)</b>	<b>(4,553)</b>
Other comprehensive income	260	1,458	2		1,720
Translation adjustment	(758)	(279)	(2)	(1)	(1,040)
<b>Balance as at December 31, 2015</b>	<b>(2,743)</b>	<b>(25)</b>	<b>(4)</b>	<b>(1,101)</b>	<b>(3,873)</b>
Other comprehensive income	(263)	26	4		(233)
Translation adjustment	368	(1)			367
<b>Balance as at December 31, 2016</b>	<b>(2,638)</b>			<b>(1,101)</b>	<b>(3,739)</b>

Table of Contents**d) Remuneration to the Company's stockholders**

Vale's by-laws determine the minimum remuneration to stockholders of 25% of net income, after adjustments from Brazil's legal requirements which based on our adjusted net income as shown below resulted in R\$3,459. In December, 2016 R\$857 was anticipated and the remaining balance of R\$2,602 was accounted for in short term liability as Dividends and interest on capital. Additionally, in our by-laws preferred shares class A are entitled to receive priority dividends corresponding to (i) at least 3% (three percent) of the shareholders' equity share value, calculated based on the financial statements used as reference for the payment of dividends or (ii) 6% (six percent) calculated over the part of capital represented by this class of shares, whichever is the higher among them. Accordingly, management proposed and the Board of Directors approved the proposal for additional dividends payments of R\$2,065 to equalize preferred and common share remuneration. The amount was classified as Additional Remuneration reserve until it is approved in the annual general meeting. All remuneration paid and proposed during the year was based on interest on equity.

The proposal of stockholders' remuneration was calculated as follows:

	<b>2016</b>
<b>Net income of the year</b>	<b>13,311</b>
Legal reserve	(665)
Tax incentive reserve	(885)
<b>Adjusted net income</b>	<b>11,761</b>
Allocation of net income	(6,237)
	<b>5,524</b>
<b>Remuneration:</b>	
Mandatory minimum	3,459
Additional remuneration	2,065
	<b>5,524</b>
<b>Remuneration by nature:</b>	
Interest on capital	5,524
	<b>5,524</b>
<b>Total remuneration per share</b>	<b>1.071865625</b>

The amounts paid to stockholders, by nature of remuneration, are as follows:

	<b>Dividends</b>	<b>Interest on capital</b>	<b>Total</b>	<b>Amount per share</b>
<b>Amounts paid in 2014</b>				
First installment - April		4,632	4,632	0.898904129
Second installment - October	1,752	3,355	5,107	0.990876867

<b>Total</b>	<b>1,752</b>	<b>7,987</b>	<b>9,739</b>	
<b>Amounts paid in 2015</b>				
First installment - April		3,101	3,101	0.601760991
Second installment - October	1,925		1,925	0.373609533
<b>Total</b>	<b>1,925</b>	<b>3,101</b>	<b>5,026</b>	
<b>Amounts paid in 2016</b>				
First installment - December		857	857	0.166293936
<b>Total</b>		<b>857</b>	<b>857</b>	

**e) New shareholders agreement Subsequent event.**

On February 20, 2017 the Company announced that a new shareholders agreement was filed at the Company's headquarters, executed by Litel Participações S.A., Litela Participações S.A., Bradespar S.A., Mitsui & Co., Ltd. and BNDES Participações S.A. BNDESPAR ( Valepar Agreement ), as shareholders of Valepar S.A. ( Valepar ), jointly referred to as Shareholders , which shall enter into force after the expiration of Valepar's current Shareholders Agreement on May 10, 2017.

The Valepar Agreement, along with the standard provisions in connection with voting rights and right of first refusal for the acquisition of the Shareholders' shares, provides for the submission to the Company of a proposal for the purpose of enabling the listing of Vale on BM&FBOVESPA's Novo Mercado special segment (Brazil) and making Vale a company without defined control ( Proposal ). The Proposal is binding on the Shareholders, and it is subject to approval by the Company's corporate bodies. The Valepar Agreement will have a term of 6 months, counting from the date it takes effect.

The transaction envisaged by the Proposal is composed of a series of indivisible and interdependent steps, whose effectiveness is subject to the successful performance of the other steps. The Proposal comprises, beyond the performance of all acts and procedures imposed by the applicable legal provisions and rules:

Table of Contents

(i) Voluntary conversion of Vale class A preferred shares into common shares, based on the conversion rate of 0.9342 common shares for each Vale class A preferred share, based on the average closing price of the common shares and preferred shares over the last 30 trading sessions on the BM&FBOVESPA prior to February 17, 2017 (inclusive), weighted by the volume of shares traded in such trading sessions;

(ii) Amendment of Vale's bylaws, so as to adjust it, as much as possible, to BM&FBOVESPA's Novo Mercado special segment rules so Vale may be effectively listed on such special segment;

(iii) The merger of Valepar into Vale at an exchange ratio that contemplates a 10% increase in the number of shares held by the shareholders of Valepar compared to Valepar's current shareholding interest, and represents a dilution of approximately 3% of the shareholding interest held by the other shareholders in Vale.

In line with the provisions of item (iii) above, Valepar's shareholders will receive 1.2065 Vale common shares for each Valepar share held by them. As a result, Vale will issue 173,543,667 new common shares, all registered and without par value, in favor of Valepar's shareholders. Consequently, Valepar's shareholders will own a total of 1,908,980,340 Vale common shares after the merger of Valepar.

The goodwill balance carried on Valepar's financial statements and its potential tax benefit use by Vale will not be subject to capitalization in favor of Valepar's shareholders, but will be for the benefit of all Vale's shareholders. Valepar will hold at the time of the merger enough cash and cash equivalents to fully settle its liabilities.

The implementation of the Proposal is subject to (i) the approval of the Proposal, including the merger of Valepar into Vale, by Valepar's and Vale's corporate bodies; and (ii) the acceptance by at least 54.09% of class A preferred shares of the voluntary conversion, as mentioned in item (i) above, within the maximum term of 45 days from the shareholders' meeting decision on the matter, resulting in a combined shareholding interest held by the Shareholders of less than 50% of Vale's total common shares. Valepar and the Shareholders will not exercise their voting right at Vale's shareholders' meetings that consider the voluntary conversion of the Vale class A preferred shares into common shares and the merger of Valepar.

The holders of American Depositary Shares representing class A preferred shares of Vale will be able to elect voluntary conversion into American Depositary Shares representing common shares of Vale, on the same terms available to holders of class A preferred shares. Class A preferred shares, and preferred ADSs, that do not elect voluntary conversion will remain outstanding.

On the date of effectiveness of the merger of Valepar into Vale, if the merger is approved, the Shareholders will execute a new shareholders agreement ( "Vale Agreement" ) that will bind only 20% of the totality of Vale's common shares, and will be in force until November 9, 2020, with no provision for renewal.

For 6 months from the date of entry into force of the Vale Agreement, the Shareholders will be obligated not to transfer, by any means, either directly or indirectly, Vale shares they receive as a result of the implementation of the Proposal ( "Lock-Up" ), except for (i) the transfer of Vale's shares by the Shareholders to their affiliates and their current shareholders, provided that such transferred shares shall remain subject to the

Lock-Up, and (ii) the transfer of shares held by the Shareholders prior to the merger of Valepar.

**Accounting policy**

The stockholder's remuneration is paid on dividends and interest on capital. This remuneration is recognized as a liability in the financial statements of the Company based on bylaws. Any amount above the minimum compulsory remuneration approved by the bylaws shall only be recognized in current liabilities on the date that is approved by stockholders.

The Company is permitted to distribute interest attributable to stockholders' equity. The calculation is based on the stockholders' equity amounts as stated in the statutory accounting records and the interest rate applied may not exceed the Brazilian Government Long-term Interest Rate ( TJLP ) determined by the Central Bank of Brazil. Also, such interest may not exceed 50% of the net income for the year or 50% of retained earnings plus profit reserves as determined by Brazilian corporate law.

Table of Contents

The benefit to the Company, as opposed to making a dividend payment, is a reduction in the income tax burden because this interest charge is tax deductible in Brazil. Income tax of 15% is withheld on behalf of the stockholders relative to the interest distribution. Under Brazilian law, interest attributed to stockholders' equity is considered as part of the annual minimum mandatory dividend. This notional interest distribution is treated for accounting purposes as a deduction from stockholders' equity in a manner similar to a dividend and the tax deductibility recorded in the income statement.

**31. Related parties**

Transactions with related parties are made by the Company at arm's-length, observing the price and usual market conditions and therefore do not generate any undue benefit to their counterparties or loss to the Company.

In the normal course of operations, Vale enters into contracts with related parties (associates, joint ventures and stockholders), related to the sale and purchase of products and services, loans, derivatives, leasing of assets, sale of raw material and railway transportation services.

The balances of these related party transactions and their effects on the financial statements are as follows:

	Assets Consolidated							
	December 31, 2016				December 31, 2015			
	Cash and cash equivalents	Derivative financial instruments	Accounts receivable	Related parties	Cash and cash equivalents	Derivative financial instruments	Accounts receivable	Related parties
Banco Bradesco S.A.	1,701	1,056			144	258		
Banco do Brasil S.A.	186	111			1,544	62		
Companhia Coreano-Brasileira de Pelotização				15				22
Companhia Hispano-Brasileira de Pelotização			2				3	14
Companhia Ítalo-Brasileira de Pelotização				27				33
Companhia Nipo-Brasileira de Pelotização				48				35
Companhia Siderúrgica do Pecem			122					
Consórcio de Rebocadores da Baía de São Marcos			32				60	

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Mitsui & Co., Ltd.			11				5	
MRS Logística S.A.				78				65
VLI			27	38			135	39
Others			155	32			103	70
<b>Total</b>	<b>1,887</b>	<b>1,167</b>	<b>349</b>	<b>238</b>	<b>1,688</b>	<b>320</b>	<b>306</b>	<b>278</b>

	<b>Liabilities Consolidated</b>							
	<b>December 31, 2016</b>				<b>December 31, 2015</b>			
	<b>Derivative financial instruments</b>	<b>Others liabilities</b>	<b>Related parties</b>	<b>Loans and borrowings</b>	<b>Derivative financial instruments</b>	<b>Others liabilities</b>	<b>Related parties</b>	<b>Loans and borrowings</b>
Aliança Geração de Energia S.A.		51	125			43		
Banco Bradesco S.A.	815			20	800			1,445
Banco do Brasil S.A.	147			8,369	976			10,250
BNDES	236			14,444	152			15,877
BNDES Participações S.A. Companhia				1,348				1,449
Coreano-Brasileira de Pelotização Companhia		10	192			15	273	
Hispano-Brasileira de Pelotização Companhia		126	47			143	26	
Companhia Ítalo-Brasileira de Pelotização			323			12	252	
Companhia Nipo-Brasileira de Pelotização		10	477			34	436	
Consórcio de Rebocadores da Baía de São Marcos						30		
Ferrovia Centro-Atlântica S.A.			270				266	
Mitsui & Co., Ltd.		56				41		
MRS Logística S.A.		82				91		
Sumic Nickel Netherland B.V			1,149				1,374	
VLI		8						
Others		130	22			122	59	
<b>Total</b>	<b>1,198</b>	<b>473</b>	<b>2,605</b>	<b>24,181</b>	<b>1,928</b>	<b>531</b>	<b>2,686</b>	<b>29,021</b>

Table of Contents

	Assets Parent Company							
	December 31, 2016				December 31, 2015			
	Cash and cash equivalents	Derivative financial instruments	Accounts receivable	Related parties	Cash and cash equivalents	Derivative financial instruments	Accounts receivable	Related parties
Banco Bradesco S.A.	67	1,056			44	258		
Banco do Brasil S.A.	8	111			217	62		
Biopalma da Amazônia S.A.			1	965				1,360
Companhia Coreano-Brasileira de Pelotização				15				22
Companhia Hispano-Brasileira de Pelotização			2					14
Companhia Ítalo-Brasileira de Pelotização				27				33
Companhia Nipo-Brasileira de Pelotização				48				35
Companhia Portuária Baía de Sepetiva			1	80				119
Companhia Siderúrgica do Pecem			115					
Consórcio Rebocadores da Baía de São Marcos Empreendimentos Brasileiros de Mineração S.A.			32					
Mineração Brasileiras Reunidas S.A.				292				
Mineração Corumbaense Reunidas S.A.			1	14				161
MRS Logística S.A.			52				51	
MRS Logística S.A.				30				27
Salobo Metais S.A.			16	104			22	155
Vale International S.A.			27,387				36,518	331
VLI			27	38			135	39
Others			172	36			230	6
<b>Total</b>	<b>75</b>	<b>1,167</b>	<b>27,806</b>	<b>1,649</b>	<b>261</b>	<b>320</b>	<b>36,956</b>	<b>2,302</b>

	Liabilities Parent Company							
	December 31, 2016				December 31, 2015			
	Derivative financial instruments	Others liabilities	Related parties	Loans and borrowings	Derivative financial instruments	Others liabilities	Related parties	Loans and borrowings
Aliança Geração de Energia S.A.		51	125			43		
Banco Bradesco S.A.	815			20	800			1,445
Banco do Brasil S.A.	147			8,369	976			10,250
BNDES	236			13,039	152			14,405
BNDES Participações S.A.				1,348				1,449
		10				15		



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Companhia Coreano-Brasileira de Pelotização								
Companhia Hispano-Brasileira de Pelotização	126					143		
Companhia Ítalo-Brasileira de Pelotização						12		
Companhia Nipo-Brasileira de Pelotização	10					34		
Companhia Portuária Baía de Sepetiba	285					484		
Consórcio Rebocadores da Baía de São Marcos						30		
Empreendimentos Brasileiros de Mineração S.A.		7						
Ferrovias Centro-Atlântica S.A.		270				266		
Mineração Brasileiras Reunidas S.A.	505	3,131				510	3,172	
MRS Logística S.A.	82					91		
Vale Internacional S.A.	4	59,715				5	66,814	
VLI	8							
Others	163	292				256	359	
<b>Total</b>	<b>1,198</b>	<b>1,244</b>	<b>63,540</b>	<b>22,776</b>	<b>1,928</b>	<b>1,623</b>	<b>70,611</b>	<b>27,549</b>

Table of Contents

	Year ended December 31								
	2016			2015			2014		
	Net operating revenue	Costs and expenses	Financial result	Net operating revenue	Costs and expenses	Financial result	Net operating revenue	Costs and expenses	Financial result
Aliança Geração de Energia S.A.		(422)		44					
Banco Bradesco S.A. (i)			659			(218)			(55)
Banco do Brasil S.A. (i)			(1,537)			(1,390)			(155)
Baovale Mineração S.A.		(57)			(78)			(47)	
BNDES (i)			(1,871)			(1,331)			(470)
BNDES Participações S.A. (i)			(244)			(178)			(95)
California Steel Industries, Inc.	38						420		
Companhia Coreano-Brasileira de Pelotização		(220)	(20)		(270)			(230)	
Companhia Hispano-Brasileira de Pelotização		(150)	(14)		(168)			(108)	
Companhia Ítalo-Brasileira de Pelotização		(170)	(25)		(224)			(115)	
Companhia Nipo-Brasileira de Pelotização		(400)	(36)		(365)			(369)	
Companhia Siderúrgica do Atlântico		(21)						(495)	
Companhia Siderúrgica do Pecem	445	(96)							
Consórcio Rebocadores Baía de São Marcos	14								
Ferrovias Centro Atlântica S.A.	125	(97)	(7)	156	(128)	(5)	140		
Ferrovias Norte Sul S.A.	55								
Mitsui & Co., Ltd.	482	(120)		612			260	(93)	
MRS Logística S.A.		(1,586)			(1,620)			(1,407)	
Samarco Mineração S.A.	74		3	407			491		
VLI	953	(72)		835			825		18
Others	52	(12)	2	183	(149)	30	246	(209)	46
<b>Total</b>	<b>2,238</b>	<b>(3,423)</b>	<b>(3,090)</b>	<b>2,237</b>	<b>(3,002)</b>	<b>(3,092)</b>	<b>2,382</b>	<b>(3,073)</b>	<b>(711)</b>

	Year ended December 31					
	2016			2015		
	Net operating revenue	Costs and expenses	Financial result	Net operating revenue	Costs and expenses	Financial result
Aliança Geração de Energia S.A.		(422)				
Banco Bradesco S.A. (i)			645			(219)
Banco do Brasil S.A. (i)			(1,543)			(1,390)
Baovale Mineração S.A.		(57)			(78)	
BNDES (i)			(1,860)			(1,295)

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BNDES Participações S.A. (i)			(244)			(178)
Biopalma do Amazônia S.A.	1		(161)			517
Companhia Coreano-Brasileira de Pelotização		(220)			(270)	
Companhia Hispano-Brasileira de Pelotização		(150)			(168)	
Companhia Ítalo-Brasileira de Pelotização		(170)			(234)	
Companhia Nipo-Brasileira de Pelotização		(400)				
Companhia Portuária Baía de Sepetiba		(663)			(892)	
Companhia Siderúrgica do Atlântico		(21)			(365)	
Companhia Siderúrgica do Pecem	420					
Consórcio Rebocadores Baía de São Marcos	14					
Ferrovia Centro Atlântica S.A.	125	(97)	(7)	156	(128)	
Ferrovia Norte Sul S.A.	55					
Mineração Brasileiras Reunidas S.A.		(1,540)	(404)		(1,133)	(172)
MRS Logística S.A.		(1,586)			(1,620)	
Samarco Mineração S.A.	74		3	408		
Vale International S.A.	40,601		2,535	37,251		(15,021)
Vale Energia S.A.		(14)			(242)	
VLI	953	(72)		959		
Others	94	(1)	(355)	146	(21)	(14)
<b>Total</b>	<b>42,337</b>	<b>(5,413)</b>	<b>(1,391)</b>	<b>38,920</b>	<b>(5,151)</b>	<b>(17,772)</b>

(i) Does not include exchange rate variation.

Table of Contents

The key management personnel remuneration is as follows:

	Year ended December 31		
	2016	2015	2014
<b>Short-term benefits</b>			
Wages or pro-labor	29	25	25
Direct and indirect benefits	15	19	17
Bonus		24	28
	<b>44</b>	<b>68</b>	<b>70</b>
<b>Long-term benefits</b>			
Shares based	3	2	2
<b>Termination of position</b>	<b>15</b>	<b>19</b>	
	<b>62</b>	<b>89</b>	<b>72</b>

## 32. Commitments

### a) Base metals operations

#### i) Nickel Operations New Caledonia

In regards to the construction and installation of the nickel plant in New Caledonia, Vale Canada Limited ( Vale Canada ) provided guarantees in respect of a special financing arrangement, structured under French tax law, to BNP Paribas (agent for the benefit of certain French institutional tax investors). The guarantees relate to lease finance payments due from Vale Nouvelle-Calédonie S.A.S. ( VNC ) to a special purpose company held by the French tax investors in respect of certain assets of the plant. Consistent with VNC's commitments under the financing structure, these assets were substantially complete as at December 31, 2012. Vale Canada has committed that these assets will operate for a five year period following substantial completion. Vale Canada believes the likelihood of the guarantees being called upon is remote.

#### ii) Nickel Operations Indonesia

In October 2014, Vale subsidiary PT Vale Indonesia Tbk ( PTVI ), a public company in Indonesia, renegotiated its agreement with the Government to operate (known as the Contract of Work ( CoW )). The renegotiation included an undertaking by PTVI to further divest 20% of its

shares to Indonesian participants (approximately 20% of PTVI's shares already being registered on the Indonesian stock exchange) within five years. This undertaking will be fulfilled by PTVI's existing major shareholders, being Vale Canada and Sumitomo Metal Mining, Co., Ltd., on a pro rata basis.

### iii) Nickel Operations – Canada

The subsidiaries Vale Canada, Vale Newfoundland & Labrador Limited ( VNLL ) and the Province of Newfoundland and Labrador (the Province ) signed a Development Agreement with respect to the development and operation of the Voisey's Bay mine along with certain other obligations with respect to processing in the Province and the export of nickel and copper concentrate. On December 19, 2014, the Sixth Amendment to the Development Agreement was executed. The Sixth Amendment includes operational and other key commitments in the Development Agreement. As such, under the Development Agreement, as amended, VNLL has a potential obligation secured by letters of credit and other security, which may become due and payable in the event that certain commitments in relation to the construction of the underground mine are delayed or not met.

### iv) Other

In the course of the operations the Company has provided other letters of credit, guarantees and surety bonds in the amount of R\$3.6 billion (US\$1.1 billion) that are associated with items such as environment reclamation, asset retirement obligation commitments, insurance, electricity commitments, post-retirement benefits, community service commitments and import and export duties.

### b) Participative stockholders' debentures

At the time of its privatization in 1997, Vale issued debentures to then-existing stockholders, including the Brazilian Government. The debentures' terms were set to ensure that pre-privatization stockholders would participate in potential future benefits that might be obtained from exploiting mineral resources.

A total of 388,559,056 debentures were issued with a par value of R\$0.01 (one cent of Brazilian Real), whose value will be inflation-indexed the General Market Price Index ( IGP-M ), as set out in the Issue Deed. The Company paid as semiannual remuneration the amount of R\$268 and R\$209, respectively, for the year ended December 31, 2016 and 2015.

Table of Contents**c) Others commitments**

The table below sets forth the annual minimum, required and non-cancelable, future payments related to the contractual obligations assumed by the Company as of December 31.

	2017	2018	2019	2020	2021 and thereafter
Operating lease	517	465	457	455	1,689
Purchase obligations	8,959	1,266	647	487	3,927
<b>Total minimum payments required</b>	<b>9,476</b>	<b>1,731</b>	<b>1,104</b>	<b>942</b>	<b>5,616</b>

**Operating lease** - Vale has operating lease agreements with its joint ventures Companhia Coreano-Brasileira de Pelotização, Companhia Hispano-Brasileira de Pelotização, Companhia Ítalo-Brasileira de Pelotização and Companhia Nipo-Brasileira de Pelotização (together pelletizing companies), in which Vale leases their pelletizing plants. These renewable operating lease agreements have last between 3 and 10 years. The minimum future payments have been calculated considering that all contracts will be renewed automatically.

The Company also has operating leases for the exploration and processing of iron ore with joint ventures, port operations with third parties, and property leases for its operational facilities with third parties.

The total amount of operational leasing expenses for the year ended on December 31, 2016, 2015 and 2014 were R\$940, R\$1,033 and R\$822, respectively.

**Purchase obligations** - The purchase obligations derive mainly from take or pay contracts, contracts for the acquisition of fuel and the acquisition of raw materials and services.

**d) Guarantees provided**

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As of December 31, 2016, corporate guarantees provided by Vale (within the limit of its direct or indirect interest) for the companies Norte Energia S.A. and Companhia Siderúrgica do Pecém S.A. totaled R\$1,176 and R\$4,725 respectively.

Table of Contents**33. Additional information about derivatives financial instruments****a) Sensitivity analysis of derivative financial instruments**

The following tables present the potential value of the instruments given hypothetical stress scenarios for the main market risk factors that impact the derivatives positions. The scenarios were defined as follows:

- *Scenario I*: fair value calculation considering market prices as of December 31, 2016
- *Scenario II*: fair value estimated considering a 25% deterioration in the associated risk variables
- *Scenario III*: fair value estimated considering a 50% deterioration in the associated risk variables

<b>Instrument</b>	<b>Instrument s main risk events</b>	<b>Scenario I</b>	<b>Scenario II</b>	<b>ScenarioIII</b>
CDI vs.US\$ fixed rate swap	R\$ depreciation	(396)	(2.145)	(3.893)
	US\$ interest rate inside Brazil decrease	(396)	(436)	(477)
	Brazilian interest rate increase	(396)	(405)	(414)
Protected item: R\$ denominated debt	R\$ depreciation	n.a.		
TJLP vs. US\$ fixed rate swap	R\$ depreciation	(2.027)	(3.635)	(5.243)
	US\$ interest rate inside Brazil decrease	(2.027)	(2.113)	(2.203)
	Brazilian interest rate increase	(2.027)	(2.199)	(2.357)
	TJLP interest rate decrease	(2.027)	(2.152)	(2.281)
Protected item: R\$ denominated debt	R\$ depreciation	n.a.		
TJLP vs. US\$ floating rate swap	R\$ depreciation	(179)	(285)	(392)
	US\$ interest rate inside Brazil decrease	(179)	(187)	(196)
	Brazilian interest rate increase	(179)	(191)	(203)
	TJLP interest rate decrease	(179)	(188)	(197)
Protected item: R\$ denominated debt	R\$ depreciation	n.a.		
R\$ fixed rate vs. US\$ fixed rate swap	R\$ depreciation	(42)	(331)	(620)
	US\$ interest rate inside Brazil decrease	(42)	(81)	(124)
	Brazilian interest rate increase	(42)	(134)	(214)
Protected item: R\$ denominated debt	R\$ depreciation	n.a.		
IPCA vs.US\$ fixed rate swap	R\$ depreciation	(167)	(547)	(928)



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	US\$ interest rate inside Brazil decrease	(167)	(190)	(216)
	Brazilian interest rate increase	(167)	(254)	(333)
	IPCA index decrease	(167)	(210)	(252)
Protected item: R\$ denominated debt	R\$ depreciation	n.a.		
IPCA vs. CDI swap	Brazilian interest rate increase	136	(8)	(134)
	IPCA index decrease	136	63	(6)
Protected item: R\$ denominated debt linked to IPCA	IPCA index decrease	n.a.	(63)	6
EUR fixed rate vs. US\$ fixed rate swap	EUR depreciation	(170)	(704)	(1.237)
	Euribor increase	(170)	(190)	(210)
	US\$ Libor decrease	(170)	(232)	(298)
Protected item: EUR denominated debt	EUR depreciation	n.a.	704	1.237
EUR Forward	EUR depreciation	(149)	(576)	(1.003)
	Euribor increase	(149)	(150)	(151)
	US\$ Libor decrease	(149)	(150)	(151)
Protected item: EUR denominated debt	EUR depreciation	n.a.	576	1.003

Table of Contents

Instrument	Instrument's main risk events	Scenario I	Scenario II	Scenario III
<b>Bunker Oil protection</b>				
Forwards and options	Bunker Oil price decrease	379	(36)	(503)
Protected item: Part of costs linked to bunker oil prices	Bunker Oil price decrease	n.a.	36	503
<b>Nickel sales fixed price protection</b>				
Forwards	Nickel price decrease	(2)	(96)	(191)
Protected item: Part of nickel revenues with fixed prices	Nickel price fluctuation	n.a.	96	191
<b>Purchase protection program</b>				
Nickel forwards	Nickel price increase	0,4	(0,7)	(1,8)
Protected item: Part of costs linked to nickel prices	Nickel price increase	n.a.	0,7	1,8
Copper forwards	Copper price increase	(0,5)	(2,4)	(4,4)
Protected item: Part of costs linked to copper prices	Copper price increase	n.a.	2,4	4,4
<b>SLW warrants</b>	SLW stock price decrease	144	76	24
<b>VLI call options</b>	VLI stock value increase	(236)	(354)	(491)
<b>Options regarding non-controlling interest in subsidiary</b>	Subsidiary stock value decrease	393	110	(68)
<b>Instrument</b>	<b>Main risks</b>	<b>Scenario I</b>	<b>Scenario II</b>	<b>Scenario III</b>
Embedded derivatives - Raw material purchase (nickel)	Nickel price increase	1	(49)	(100)
Embedded derivatives - Raw material purchase (copper)	Copper price increase	5	(12)	(29)
Embedded derivatives - Gas purchase	Pellet price increase	(7)	(13)	(23)
Embedded derivatives - Guaranteed minimum return (VLI)	VLI stock value decrease	(593)	(987)	(1.541)

**b) Financial counterparties ratings**

The transactions of derivative instruments, cash and cash equivalents as well as investments are held with financial institutions whose exposure limits are periodically reviewed and approved by the delegated authority. The financial institutions credit risk is performed through a methodology that considers, among other information, ratings provided by international rating agencies.

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The table below presents the ratings in foreign currency published by agencies Moody's and S&P regarding the main financial institutions that we had outstanding positions as of December 31, 2016.

Long term ratings by counterparty	Moody's	S&P
ANZ Australia and New Zealand Banking	Aa2	AA-
Banco Bradesco	Ba3	BB
Banco de Credito del Peru	Baa1	BBB
Banco do Brasil	Ba3	BB
Banco do Nordeste	Ba3	BB
Banco Safra	Ba3	BB
Banco Santarider	Ba3	BB
Banco Votorantim	Ba3	BB
Bank of America	Baa1	BBB+
Bank of Nova Scotia	Aa3	A+
Bank of Tokyo Mitsubishi UFJ	A1	A
Banpara	Ba3	BB-
Barclays	Baa3	BBB
BBVA	A3	BBB+
BNP Paribas	A1	A
BTG Pactual	Ba3	B+
Caixa Economica Federal	Ba3	BB
Citigroup	Baa1	BBB+
Credit Agricole	A2	A
Deutsche Bank	A2	BBB+
Goldman Sachs	A3	BBB+
HSBC	A1	A
Intesa SanpaoloSpa	A3	BBB-
Itau Unibanco	Ba3	BB
JP Morgan Chase & Co	A3	A-
Macquarie Group Ltd	A3	BBB
Morgan Stanley	A3	BBB+
National Australia Bank NAB	Aa2	AA-
Royal Bank of Canada	Aa3	AA-
Societe Generale	A2	A
Standard Bank Group	Baa3	
Standard Chartered	A1	BBB+

Table of Contents**c) Market curves**

The curves used on the pricing of derivatives instruments were developed based on data from BM&F, Central Bank of Brazil, London Metals Exchange and Bloomberg.

**(i) Products****Nickel**

Maturity	Price (US\$/ton)	Maturity	Price (US\$/ton)	Maturity	Price (US\$/ton)
SPOT	10.010	JUN17	10.064	DEC17	10.155
JAN17	9.984	JUL17	10.080	DEC18	10.316
FEB17	10.002	AUG17	10.096	DEC19	10.452
MAR17	10.022	SEP17	10.110	DEC20	10.591
APR17	10.036	OCT17	10.128		
MAY17	10.052	NOV17	10.143		

**Copper**

Maturity	Price (US\$/lb)	Maturity	Price (US\$/lb)	Maturity	Price (US\$/lb)
SPOT	2,51	JUN17	2,51	DEC17	2,51
JAN17	2,51	JUL17	2,51	DEC18	2,50
FEB17	2,51	AUG17	2,51	DEC19	2,50
MAR17	2,51	SEP17	2,52	DEC20	2,49
APR17	2,51	OCT17	2,51		
MAY17	2,51	NOV17	2,51		

**Bunker Oil**

Maturity	Price (US\$/ton)	Maturity	Price (US\$/ton)	Maturity	Price (US\$/ton)
SPOT	332	JUN17	318	DEC17	312

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JAN17	328	JUL17	317	DEC18	304
FEB17	324	AUG17	316	DEC19	291
MAR17	322	SEP17	315	DEC20	280
APR17	321	OCT17	314		
MAY17	320	NOV17	313		

(ii) Foreign exchange and interest rates

US\$-Brazil Interest Rate

Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)
02/01/17	9,28	12/01/17	2,96	04/01/20	3,47
03/01/17	5,93	01/02/18	3,04	07/01/20	3,60
04/03/17	4,54	04/02/18	2,94	10/01/20	3,57
05/02/17	3,98	07/02/18	2,93	01/04/21	3,75
06/01/17	3,63	10/01/18	2,95	04/01/21	3,85
07/03/17	3,32	01/02/19	3,03	07/01/21	3,92
08/01/17	3,22	04/01/19	3,03	10/01/21	4,00
09/01/17	3,11	07/01/19	3,17	01/03/22	4,16
10/02/17	3,04	10/01/19	3,27	01/02/23	4,55
11/01/17	3,01	01/02/20	3,41	01/02/24	5,18

US\$ Interest Rate

Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)
1M	0,77	6M	1,13	11M	1,19
2M	0,82	7M	1,15	12M	1,19
3M	1,00	8M	1,16	2Y	1,47
4M	1,06	9M	1,17	3Y	1,73
5M	1,10	10M	1,18	4Y	1,92

TJLP

Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)
02/01/17	7,50	12/01/17	7,50	04/01/20	7,50
03/01/17	7,50	01/02/18	7,50	07/01/20	7,50
04/03/17	7,50	04/02/18	7,50	10/01/20	7,50
05/02/17	7,50	07/02/18	7,50	01/04/21	7,50
06/01/17	7,50	10/01/18	7,50	04/01/21	7,50
07/03/17	7,50	01/02/19	7,50	07/01/21	7,50
08/01/17	7,50	04/01/19	7,50	10/01/21	7,50
09/01/17	7,50	07/01/19	7,50	01/03/22	7,50
10/02/17	7,50	10/01/19	7,50	01/02/23	7,50
11/01/17	7,50	01/02/20	7,50	01/02/24	7,50

Table of Contents

## BRL Interest Rate

<b>Maturity</b>	<b>Rate (% p.a.)</b>	<b>Maturity</b>	<b>Rate (% p.a.)</b>	<b>Maturity</b>	<b>Rate (% p.a.)</b>
02/01/17	13,92	12/01/17	11,70	04/01/20	11,27
03/01/17	13,51	01/02/18	11,59	07/01/20	11,32
04/03/17	13,13	04/02/18	11,37	10/01/20	11,34
05/02/17	12,92	07/02/18	11,21	01/04/21	11,35
06/01/17	12,70	10/01/18	11,15	04/01/21	11,40
07/03/17	12,53	01/02/19	11,07	07/01/21	11,45
08/01/17	12,28	04/01/19	11,10	10/01/21	11,48
09/01/17	12,10	07/01/19	11,12	01/03/22	11,50
10/02/17	11,94	10/01/19	11,17	01/02/23	11,62
11/01/17	11,81	01/02/20	11,22	01/02/24	11,59

## Implicit Inflation (IPCA)

<b>Maturity</b>	<b>Rate (% p.a.)</b>	<b>Maturity</b>	<b>Rate (% p.a.)</b>	<b>Maturity</b>	<b>Rate (% p.a.)</b>
02/01/17	7,53	12/01/17	5,44	04/01/20	5,04
03/01/17	7,15	01/02/18	5,33	07/01/20	5,09
04/03/17	6,79	04/02/18	5,16	10/01/20	5,10
05/02/17	6,59	07/02/18	5,04	01/04/21	5,10
06/01/17	6,38	10/01/18	4,98	04/01/21	5,15
07/03/17	6,21	01/02/19	4,91	07/01/21	5,19
08/01/17	5,98	04/01/19	4,93	10/01/21	5,22
09/01/17	5,81	07/01/19	4,94	01/03/22	5,24
10/02/17	5,66	10/01/19	4,97	01/02/23	5,37
11/01/17	5,54	01/02/20	5,00	01/02/24	5,37

## EUR Interest Rate

<b>Maturity</b>	<b>Rate (% p.a.)</b>	<b>Maturity</b>	<b>Rate (% p.a.)</b>	<b>Maturity</b>	<b>Rate (% p.a.)</b>
1M	-0,38	6M	-0,25	11M	-0,21
2M	-0,35	7M	-0,23	12M	-0,20
3M	-0,33	8M	-0,22	2Y	-0,16
4M	-0,29	9M	-0,22	3Y	-0,10
5M	-0,26	10M	-0,21	4Y	-0,02

## CAD Interest Rate

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Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)
1M	0,94	6M	1,10	11M	0,54
2M	0,94	7M	0,92	12M	0,49
3M	0,95	8M	0,79	2Y	1,11
4M	1,02	9M	0,69	3Y	1,26
5M	1,07	10M	0,61	4Y	1,41

Currencies - Ending rates

CAD/US\$	0,7443	US\$/BRL	3,2591	EUR/US\$	1,0472
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Table of Contents

**Members of the Board of Directors, Fiscal Council, Advisory Committees and Executive Officers**

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**Vice-President**

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Motomu Takahashi  
Oscar Augusto de Camargo Filho  
Eduardo de Salles Bartolomeo  
Lucio Azevedo  
Alberto Guth

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Francisco Ferreira Alexandre  
Robson Rocha  
Luiz Mauricio Leuzinger  
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Moacir Nachbar Junior  
Oswaldo Mário Pego de Amorim Azevedo

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Fernando Santos do Nascimento  
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Priscila Valle Costa de Oliveira  
Ricardo Simonsen

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**Chairman**

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**Chief Executive Officer**

Clovis Torres Junior  
**Executive Officer (Human Resources, Health & Safety, Sustainability, Energy, Mergers and Acquisitions, Governance, Corporate Integrity, Legal and Tax)**

Luciano Siani Pires  
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**Executive Officer (Fertilizers, Coal and Strategy)**



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**Investors Relations and Controller Director**

Murilo Muller  
**Controllershship Executive Manager**

Dioni Brasil  
**Accounting Manager**  
**TC-CRC-RJ 083305/O-8**

Table of Contents

**Signatures**

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

		Vale S.A. (Registrant)
Date: February 23, 2017	By:	/s/ Andre Figueiredo Andre Figueiredo Director of Investor Relations

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