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FLEXIBLE SOLUTIONS INTERNATIONAL INC  
Form 10QSB/A  
December 06, 2005

UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
WASHINGTON, D.C. 20549

FORM 10-QSB/A  
(AMENDMENT NO. 2)

(Mark one)

Quarterly Report Pursuant to Section 13 or 15(d) of the Securities Exchange Act of 1934

FOR THE QUARTERLY PERIOD ENDED JUNE 30, 2005.

Transition Report Under Section 13 or 15(d) of the Securities Exchange Act of 1934

For the transition period from \_\_\_\_\_ to \_\_\_\_\_.

Commission File Number 000-29649

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FLEXIBLE SOLUTIONS INTERNATIONAL, INC.

(Name of Small Business Issuer as Specified in Its Charter)

NEVADA  
(State of Incorporation)

91-1922863  
(IRS Employer Identification No.)

615 DISCOVERY STREET  
VICTORIA, BRITISH COLUMBIA, CANADA  
(Address of Principal Executive Offices)

V8T 5G4  
(Zip Code)

(250) 477-9969  
(Issuer's Telephone Number, Including Area Code)

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Check whether the issuer (1) filed all reports required to be filed by Section 13 or 15(d) of the Exchange Act during the past 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes  No

Indicate by check mark whether the registrant is a shell company (as defined in Rule 12b-2 of the Exchange Act). Yes  No

APPLICABLE ONLY TO CORPORATE ISSUERS

State the number of shares outstanding of each of the issuer's classes of common equity, as of the latest practicable date: The Company had 12,831,316 shares of Common Stock, par value \$0.001 per share, outstanding as of July 29, 2005.

Transitional Small Business Disclosure Format (check one): Yes  No

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### EXPLANATORY NOTE

Flexible Solutions International, Inc. ("we," "us," and "our") is filing this Quarterly Report on Form 10-QSB/A to amend and restate in its entirety its Quarterly Report on Form 10-QSB for the fiscal quarter ended June 30, 2005, which was previously filed with the Securities and Exchange Commission on August 12, 2005.

In October 2005, while completing a registration statement for securities issued in the second quarter of 2005, we determined that certain disclosures made in connection with our stock-based compensation expense required adjustment. As such, on October 5, 2005, upon the recommendation of our management, our board of directors and its audit committee, and our independent accountants, we determined to restate our consolidated financial statements for each of the periods ended since September 30, 2002, including each of the years ended December 31, 2002 through 2004, and for both of the quarters in the six months ended June 30, 2005 (the "Restated Periods").

In accordance with this determination to restate the Restated Periods, we revised the disclosures for stock-based compensation expense as required under Emerging Issues Task Force ("EITF") No. 96-18, Accounting for Equity Instruments That are Issued to Other Than Employees for Acquiring, or in Conjunction with Selling Goods or Services; EITF No. 00-18, Accounting Recognition for Certain Transactions Involving Equity Instruments Granted to Other Than Employees; and EITF No. 01-9, Accounting for Consideration Given by a Vendor to a Customer. In particular, we adjusted the stock-based compensation expense in our financial statements and notes thereto recorded in connection with our grant of an option to purchase 2,000,000 shares of our common stock in September 2002 pursuant to the terms of a product distribution agreement. Additional information on this restatement and its effects on our financial condition and results of operations can be found in our Notes to Unaudited Consolidated Financial Statements contained herein.

This Form 10-QSB/A does not reflect events occurring after the filing of our Form 10-QSB on August 12, 2005 or modify any of the disclosures contained therein, or in the accompanying financial statements and notes thereto, in any way other than by the amendments identified above and as set forth herein. Notwithstanding the above, and for the convenience of the reader, this entire report has been amended as a result of, and to reflect, the restatement, as well as to revise the disclosure of our management's discussion and analysis, unregistered sales of equity securities, and legal proceedings, as well as to generally reflect the current disclosure requirements of Form 10-QSB.

This Form 10-QSB/A should be read in conjunction with our periodic filings made with the Securities and Exchange Commission subsequent to the date of their original filings, including any amendments to those filings. In addition, in accordance with Rule 12b-15 under the Securities Exchange Act of 1934, as amended, and certain other rules, this Form 10-QSB/A includes updated certifications from our Chief Executive Officer and Chief Financial Officer.

We are presently unaware of any evidence that the restatements described above are due to any material noncompliance by us, as a result of misconduct, with any financial reporting requirement under the federal securities laws. Our audit committee of the board of directors is working with our management and our accountants to assure that we are taking the appropriate approach to resolving the issues related to the restatements, as well as any further issues that may be identified during the course of its review. The filing of this Form 10-QSB/A shall not be deemed an admission that the original filing, when made, included any untrue statement of a material fact or omitted to state a material fact necessary to make a statement not misleading.

CAUTIONARY NOTE REGARDING FORWARD-LOOKING STATEMENTS

This Quarterly Report on Form 10-QSB/A for the quarter ended June 30, 2005 ("Quarterly Report"), including the Notes to Unaudited Consolidated Financial Statements, contains forward-looking statements within the meaning of the Private Securities Litigation Reform Act of 1995. Forward-looking statements include, without limitation, those statements relating to development of new products, our financial condition, our ability to increase distribution of our products, integration of businesses we acquire, and disposition of any of our current business. Forward-looking statements can be identified by the use of forward-looking terminology, such as "may," "will," "should," "expect," "anticipate," "estimate," "continue," "plans," "intends," or other similar terminology. These forward-looking statements are not guarantees of future performance and involve risks, uncertainties and assumptions that are difficult to predict. Therefore, actual outcomes and results may differ materially from what is anticipated or forecasted in these forward-looking statements due to numerous factors, including, but not limited to, our ability to generate or obtain sufficient working capital to continue our operations, changes in demand for our products, the timing of customer orders and deliveries, and the impact of competitive products and pricing. In addition, such statements could be affected by general industry and market conditions and growth rates, and general domestic and international economic conditions.

Although we believe that the expectations reflected in these forward-looking statements are reasonable and achievable, such statements involve risks and uncertainties and no assurance can be given that the actual results will be consistent with these forward-looking statements. Except as otherwise required by Federal securities laws, we undertake no obligation to publicly update or revise any forward-looking statements, whether as a result of new information, future events, changed circumstances or any other reason, after the date of this Quarterly Report.

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Item 1. Financial Statements.

FLEXIBLE SOLUTIONS INTERNATIONAL, INC.  
CONSOLIDATED BALANCE SHEETS  
AT JUNE 30, 2005  
(U.S. DOLLARS)

	JUNE 30, 2005 AS RESTATED (NOTE 3) (UNAUDITED)	
	-----	-----
ASSETS		
CURRENT		
Cash and cash equivalents	\$ 752,130	\$
Short-term investments	--	
Accounts receivable	1,028,236	
Income tax	27,033	
Loan receivable	38,286	
Inventory	1,912,912	
Prepaid expenses	117,979	
	-----	-----
	3,876,576	
PROPERTY, EQUIPMENT AND LEASEHOLDS INVESTMENT	4,984,801 347,000	
	-----	-----
	\$ 9,208,377	\$
	-----	-----
LIABILITIES		
CURRENT		
Accounts payable and accrued liabilities	\$ 286,066	\$
Short-term loan	--	
	-----	-----
	286,066	
STOCKHOLDERS' EQUITY		
CAPITAL STOCK		
Authorized		
50,000,000 Common shares with a par value of \$0.001 each		
1,000,000 Preferred shares with a par value of \$0.01 each		
Issued and outstanding		
12,821,316 (2004: 11,831,916) common shares	11,832	
CAPITAL IN EXCESS OF PAR VALUE	11,392,821	
OTHER COMPREHENSIVE INCOME (LOSS)	73,184	
DEFICIT	(2,555,526)	
	-----	-----
TOTAL STOCKHOLDERS' EQUITY	8,922,311	
	-----	-----
TOTAL LIABILITIES AND STOCKHOLDERS' EQUITY	\$ 9,208,377	\$
	-----	-----
COMMITMENTS AND CONTINGENCIES (NOTES 11 & 12)		

- See Notes to Unaudited Consolidated Financial Statements -

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FLEXIBLE SOLUTIONS INTERNATIONAL, INC.  
CONSOLIDATED STATEMENTS OF OPERATIONS  
FOR THE SIX MONTHS ENDED JUNE 30, 2005 AND 2004  
(U.S. DOLLARS -- UNAUDITED)

	SIX MONTHS ENDED JUNE	
	2005 AS RESTATED (NOTE 3)	AS (N (N
SALES	\$ 3,887,714	\$
COST OF SALES	2,131,945	
GROSS PROFIT	1,755,769	
OPERATING EXPENSES		
Wages	436,825	
Administrative salaries and benefits	109,076	
Advertising and promotion	44,685	
Investor relations and transfer agent fee	509,588	
Office and miscellaneous	69,531	
Insurance	62,787	
Interest expense	62,189	
Rent	103,672	
Consulting	91,787	
Professional fees	126,449	
Travel	78,866	
Telecommunications	22,890	
Shipping	23,036	
Research	18,404	
Commissions	87,998	
Bad debt expense (recovery)	--	
Currency exchange	(6,867)	
Utilities	11,502	
Depreciation	331,086	
	2,183,504	
INCOME (LOSS) BEFORE OTHER ITEMS AND INCOME TAX	(427,735)	
INTEREST INCOME	3,616	
INCOME (LOSS) BEFORE INCOME TAX	(424,119)	
INCOME TAX (RECOVERY)	--	
NET INCOME (LOSS)	(424,119)	
DEFICIT, BEGINNING	(2,131,407)	
DEFICIT, ENDING	\$ (2,555,526)	\$
NET INCOME (LOSS) PER SHARE	\$ (0.03)	\$
WEIGHTED AVERAGE NUMBER OF SHARES	12,256,208	

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- See Notes to Unaudited Consolidated Financial Statements -

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FLEXIBLE SOLUTIONS INTERNATIONAL, INC.  
CONSOLIDATED STATEMENTS OF OPERATIONS  
FOR THE THREE MONTHS ENDED JUNE 30, 2005 AND 2004  
(U.S. DOLLARS -- UNAUDITED)

	THREE MONTHS ENDED JUNE	
	2005	2004
	AS RESTATED	AS RESTATED
	(NOTE 3)	(NOTE 3)
SALES	\$ 1,868,133	\$ 1,868,133
COST OF SALES	1,053,644	1,053,644
GROSS PROFIT	\$ 814,489	\$ 814,489
OPERATING EXPENSES		
Wages	202,388	202,388
Administrative salaries and benefits	71,071	71,071
Advertising and promotion	13,414	13,414
Investor relations and transfer agent fee	484,950	484,950
Office and miscellaneous	28,076	28,076
Insurance	34,468	34,468
Interest expense	24,514	24,514
Rent	47,866	47,866
Consulting	47,535	47,535
Professional fees	65,607	65,607
Travel	41,101	41,101
Telecommunications	12,602	12,602
Shipping	10,397	10,397
Research	2,896	2,896
Commissions	47,073	47,073
Bad debt expense (recovery)	--	--
Currency exchange	(7,585)	(7,585)
Utilities	4,336	4,336
Depreciation	162,983	162,983
	1,293,692	1,293,692
INCOME (LOSS) BEFORE OTHER ITEMS AND INCOME TAX	\$ (479,203)	\$ (479,203)
INTEREST INCOME	886	886
INCOME (LOSS) BEFORE INCOME TAX	\$ (478,317)	\$ (478,317)
INCOME TAX (RECOVERY)	--	--
NET INCOME (LOSS)	\$ (478,317)	\$ (478,317)
DEFICIT, BEGINNING	(2,077,209)	(2,077,209)

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DEFICIT, ENDING	\$	(2,555,526)	\$
NET INCOME (LOSS) PER SHARE	\$	(0.04)	\$
WEIGHTED AVERAGE NUMBER OF SHARES		12,675,837	

- See Notes to Unaudited Consolidated Financial Statements -

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FLEXIBLE SOLUTIONS INTERNATIONAL, INC.  
CONSOLIDATED STATEMENTS OF CASH FLOWS  
FOR THE SIX MONTHS ENDED JUNE 30, 2005 AND 2004  
(U.S. DOLLARS -- UNAUDITED)

	SIX MONTHS ENDED JUNE	
	2005 AS RESTATED (NOTE 3)	AS (N
OPERATING ACTIVITIES		
Net income (loss)	\$	(424,119)
Stock compensation expense		503,650
Depreciation		331,086
		410,617
Changes in non-cash working capital items:		
(Increase) Decrease in accounts receivable		(526,864)
(Increase) Decrease in inventory		(496,324)
(Increase) Decrease in prepaid expenses		13,301
Increase (Decrease) in accounts payable		35,937
Increase (Decrease) in income taxes		65,930
		--
CASH (USED IN) OPERATING ACTIVITIES		(497,405)
INVESTING ACTIVITIES		
Short-term investments		559,440
Investments		(76,000)
Loan receivable		284
Acquisition of property and equipment		(65,541)
CASH PROVIDED BY (USED IN) INVESTING ACTIVITIES		418,183
FINANCING ACTIVITIES		
Short-term loan		(3,150,000)
Proceeds from issuance of common stock		3,449,550
CASH PROVIDED BY FINANCING ACTIVITIES		299,550



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Effect of exchange rate changes on cash	(26,993)	
INFLOW (OUTFLOW) OF CASH	193,335	
Cash and cash equivalents, beginning	558,795	
CASH AND CASH EQUIVALENTS, ENDING	\$ 752,130	\$
SUPPLEMENTAL DISCLOSURE OF CASH FLOW INFORMATION		
Interest received	\$ 2,730	\$

- See Notes to Unaudited Consolidated Financial Statements -

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FLEXIBLE SOLUTIONS INTERNATIONAL, INC.  
NOTES TO UNAUDITED CONSOLIDATED FINANCIAL STATEMENTS  
FOR THE PERIOD ENDED JUNE 30, 2005  
(U.S. DOLLARS)

1. BASIS OF PRESENTATION.

These unaudited consolidated financial statements of Flexible Solutions International, Inc (the "Company") have been prepared in accordance with accounting principles generally accepted in the United States for interim financial information. These financial statements are condensed and do not include all disclosures required for annual financial statements. The organization and business of the Company, accounting policies followed by the Company and other information are contained in the notes to the Company's audited consolidated financial statements filed as part of the Company's December 31, 2004 Annual Report on Form 10-KSB. This quarterly report should be read in conjunction with such annual report.

In the opinion of the Company's management, these consolidated financial statements reflect all adjustments necessary to present fairly the Company's consolidated financial position at June 30, 2005 and the consolidated results of operations and the consolidated statements of cash flows for the six months ended June 30, 2005 and 2004. The results of operations for the three months ended June 30, 2005 are not necessarily indicative of the results to be expected for the entire fiscal year.

These consolidated financial statements include the accounts of the Company, and its wholly-owned subsidiaries Flexible Solutions, Ltd. ("Flexible Ltd."), NanoChem Solutions Inc. and WaterSavr Global Solutions Inc. All inter-company balances and transactions have been eliminated. The Company was incorporated May 12, 1998 in the State of Nevada and had no operations until June 30, 1998, as described below.

On June 30, 1998, the Company completed the acquisition of all of the shares of Flexible Ltd. The acquisition was effected through the issuance of 7,000,000 shares of common stock by the Company, with the former shareholders of Flexible Ltd. receiving all of the shares then issued and outstanding of the Company. The transaction has been accounted for as a reverse-takeover. Flexible Ltd. is accounted for as the acquiring party and the surviving entity. As Flexible Ltd. is the accounting survivor, the consolidated financial statements presented for all periods are those of Flexible Ltd. The shares issued by the Company pursuant to the acquisition have been accounted for as if those shares

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had been issued upon the organization of Flexible Ltd.

On May 2, 2002, the Company established WaterSavr Global Solutions Inc. through the issuance of 100 shares of its common stock.

Pursuant to a purchase agreement dated May 26, 2004, the Company acquired the assets of Donlar Corporation on June 9, 2004 and created a new company, NanoChem Solutions Inc. The purchase price of the transaction was \$6,150,000, with consideration being a combination of cash and debt. Under the purchase agreement and as part of the consideration, the Company issued a promissory note bearing interest at 4% to satisfy \$3,150,000 of the purchase price. This note was due June 2, 2005 and all of the former Donlar assets were pledged as security. On May 28, 2005, the Company retired the remaining debt owed under this promissory note by paying such amount to the holder. The remainder of the purchase price, or \$3,000,000, was paid directly in cash.

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The following table summarizes the estimated fair value of the Donlar assets acquired at the date of acquisition (June 9, 2004):

Current assets	\$ 1,126,805
Property and equipment	5,023,195
	6,150,000
Acquisition costs assigned to property and equipment	314,724
Total assets acquired	\$ 6,464,724

The acquisition costs assigned to property and equipment are all direct costs incurred by the Company to purchase the assets. These costs include due diligence fees paid to outside parties investigating and identifying the assets, legal costs directly attributable to the purchase of the assets, plus applicable transfer taxes. These costs have been assigned to the individual assets based on their proportional fair values and will be amortized based on the rates associated with the related assets.

On February 7, 2005 the Company incorporated two new subsidiaries in Nevada: (a) SeaHorse Systems Inc. was incorporated to research new applications for ECO\$AVR(R), our patented swimming pool dispensing mechanism; and (b) NanoDetect Technologies Inc. was incorporated to focus on ways to use our current technologies to detect pathogens.

### 2. SIGNIFICANT ACCOUNTING POLICIES.

These unaudited consolidated financial statements have been prepared in accordance with generally accepted accounting principles accepted in the United States applicable to a going concern and reflect the policies outlined below.

#### (a) Cash and Cash Equivalents.

The Company considers all highly liquid investments purchased with an original or remaining maturity of less than three months at the date of purchase to be cash equivalents. Cash and cash equivalents are maintained with several financial institutions.

#### (b) Inventory and Cost of Sales.

Inventory is valued at the lower of cost and net realizable value. Cost is determined on a first-in, first-out basis. Cost of sales includes all

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expenditures incurred in bringing the goods to the point of sale. Inventorial costs and costs of sales include direct costs of the raw material, inbound freight charges, warehousing costs, handling costs (receiving and purchasing) and utilities and overhead expenses related to the Company's manufacturing and processing facilities.

### (c) Property, Equipment and Leaseholds.

The following assets are recorded at cost and depreciated using the following methods and using the following annual rates:

Computer hardware	30% Declining balance
Furniture and fixtures	20% Declining balance
Manufacturing equipment	20% Declining balance
Office equipment	20% Declining balance
Building	10% Declining balance
Leasehold improvements	Straight-line over lease term

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Property and equipment are written down to net realizable value when management determines there has been a change in circumstances that indicates that their carrying amount may not be recoverable. No write-downs have been necessary to date.

### (d) Impairment of Long-Lived Assets.

The Company assesses the recoverability of long-lived assets by determining whether the carrying value of the long-lived assets can be recovered over their remaining lives through undiscounted future operating cash flows using a discount rate reflecting average cost of funds. The assessment of the recoverability will be impacted if estimated future operating cash flows are not achieved. For the quarter ended June 30, 2005, no impairment charges have been recognized.

### (e) Foreign Currency.

The functional currency of the Company is the Canadian Dollar. The translation of the Canadian Dollar to the reporting currency of the U.S. Dollar is performed for current assets and current liabilities using exchange rates in effect at the balance sheet date. Non-monetary assets and liabilities are translated using rates prevailing at the time of the acquisition of the assets or assumption of the liabilities. Revenue and expense transactions are translated using average exchange rates prevailing during the year. Translation adjustments arising on conversion of the financial statements from the Company's functional currency, Canadian Dollars, into the reporting currency, U.S. Dollars, are excluded from the determination of income and disclosed as other comprehensive income (loss) in stockholders' equity.

Foreign exchange gains and losses relating to transactions not denominated in the applicable local currency are included in income if realized during the year and in comprehensive income if they remain unrealized at the end of the year.

### (f) Revenue Recognition.

Revenue from product sales is recognized at the time the product is shipped since title and risk of loss is transferred to the purchaser upon delivery to the carrier. Shipments are made F.O.B. shipping point. The Company recognizes revenue when there is persuasive evidence of an arrangement, delivery

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has occurred, the fee is fixed or determinable, collectibility is reasonably assured, and there are no significant remaining performance obligations. When significant post-delivery obligations exist, revenue is deferred until such obligations are fulfilled.

Provisions are made at the time the related revenue is recognized for estimated product returns. Since the Company's inception, product returns have been insignificant; therefore no provision has been established for estimated product returns.

### (g) Stock Issued in Exchange for Services.

The valuation of the Company's common stock issued in exchange for services is valued at an estimated fair market value as determined by officers and directors of the Company based upon the trading prices of our common stock on the dates of the stock transactions.

### (h) Stock-based Compensation.

The Company applies the fair-value-based method of accounting prescribed by Financial Accounting Standard ("FAS") No. 123 in accounting for stock issued in exchange for services to consultants and non-employees.

FAS No. 123 encourages, but does not require, companies to record compensation cost for stock-based compensation plans to employees at fair value. The Company has chosen to account for stock-

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based compensation to employees and directors using Accounting Principles Board ("APB") Opinion No. 25, Accounting for Stock Issued to Employees. Accordingly, compensation cost for stock options for employees is measured as the excess, if any, of the quoted market price of the Company's common stock at the date of the grant over the amount an employee is required to pay for the stock.

The Company adopted the disclosure provisions of FAS No. 123 for stock options granted to employees and directors. The Company discloses on a supplemental basis, the pro-forma effect of accounting for stock options awarded to employees and directors, as if the fair value based method had been applied, using the Black-Scholes option-pricing model.

### (i) Comprehensive Income.

Other comprehensive income refers to revenues, expenses, gains and losses that under generally accepted accounting principles are included in comprehensive income, but are excluded from net income, as these amounts are recorded directly as an adjustment to stockholders' equity. The Company's other comprehensive income is primarily comprised of unrealized foreign exchange gains and losses.

### (j) Income (Loss) Per Share.

Income (loss) per share is calculated by dividing net income (loss) by the weighted average number of shares outstanding. Diluted income (loss) per share is computed by giving effect to all potential dilutive options that were outstanding during the year. For the years ending December 31, 2004, 2003 and 2002, all outstanding options were anti-dilutive.

### (k) Use of Estimates.

The preparation of consolidated financial statements in conformity with accounting principles generally accepted in the United States of America

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requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the consolidated financial statements and the reported amounts of revenues and expenses during the reporting period. Actual results could differ from those estimates and would impact the results of operations and cash flows.

### (l) Financial Instruments.

The fair market value of the Company's financial instruments comprising cash, short-term investment, accounts receivable, income tax recoverable, loan receivable, accounts payable and accrued liabilities and amounts due to shareholders were estimated to approximate their carrying values due to immediate or short-term maturity of these financial instruments.

The Company is exposed to foreign exchange and interest rate risk to the extent that market value rate fluctuations materially differ from financial assets and liabilities subject to fixed long-term rates.

### (m) Recent Accounting Pronouncements.

(i) In June 2001, the Financial Accounting Standards Board ("FASB") issued FAS No. 142, Goodwill and Other Intangible Assets. Under FAS No. 142, goodwill and intangible assets with indefinite lives are no longer amortized but are reviewed at least annually for impairment. The amortization provisions of FAS No. 142 apply to goodwill and intangible assets acquired after June 30, 2001. With respect to goodwill and intangible assets acquired prior to July 1, 2001, the Company adopted FAS No. 142 effective January 1, 2002. Application of the non-amortization provisions of FAS No. 142 for goodwill did not have any impact on the Company's financial reporting.

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(ii) In October 2001, the FASB issued FAS No. 144, Accounting for the Impairment or Disposal of Long-Lived Assets. FAS No. 144 addresses significant issues relating to the implementation of FAS No. 121, Accounting for the Impairment of Long-Lived Assets and for Long-Lived Assets to be Disposed Of, and develops a single accounting model, based on the framework established in FAS No. 121 for long-lived assets to be disposed of by sale, whether such assets are or are not deemed to be a business. FAS No. 144 also modifies the accounting and disclosure rules for discontinued operations. The standard was adopted on January 1, 2002 and did not have any impact on the Company's financial statements.

(iii) In November 2001, the FASB issued Emerging Issues Task Force ("EITF") Issue No. 01-14, Income Statement Characterization of Reimbursements Received for "Out of Pocket" Expenses Incurred. This guidance requires companies to recognize the recovery of reimbursable expenses such as travel costs on service contracts as revenue. These costs are not to be netted as a reduction of cost. This guidance was implemented January 1, 2002. The Company does not expect this guidance to have a material impact on its financial statements.

(iv) In November 2004, the FASB issued FAS No. 151, Inventory Costs - an Amendment of ARB No. 43, Chapter 4, which clarifies the accounting for abnormal amounts of idle facility expense, freight, handling costs, and wasted material (spoilage), and also requires that the allocation of fixed production overhead be based on the normal capacity of an entity's production facilities. FAS No. 151 is effective for inventory costs incurred during fiscal years beginning after June 15, 2005. The Company is currently evaluating the impact of adopting

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this statement.

(v) In December 2004, the FASB issued revised FAS No. 123(R), Share-Based Payment, which replaces FAS No. 123, Accounting for Stock-Based Compensation, which superseded APB Opinion No. 25, Accounting for Stock Issued to Employees. FAS No. 123(R) requires the cost of all share-based payment transactions to be recognized in an entity's financial statements, establishes fair value as the measurement objective and requires entities to apply a fair-value-based measurement method in accounting for share-based payment transactions. FAS No. 123(R) applies to all awards granted, modified, repurchased or cancelled after July 1, 2005, and unvested portions of previously issued and outstanding awards. The Company is currently evaluating the impact of adopting this statement.

### 3. RESTATEMENTS AS A RESULT OF CORRECTING STOCK COMPENSATION EXPENSE.

In October 2005, while completing a registration statement for securities issued in the second quarter of 2005, the Company determined that certain disclosures made in connection with its stock-based compensation expense required adjustment. In September 2002, the Company entered into a distribution agreement with Ondeo Nalco Company ("Ondeo") whereby Ondeo agreed to serve as the exclusive distributor of the Company's WATER\$AVR(R) products for so long as Ondeo maintained a certain threshold sales level as defined in the agreement. As consideration for signing the agreement, Ondeo was granted an option to purchase 2,000,000 shares of the Company's common stock. Half of the option for one million shares was exercisable immediately at an exercise price of \$4.25 for each common share. The remaining half of the option for 1,000,000 shares was exercisable after certain threshold sales targets were achieved at a price of \$5.50 for each common share.

In determining the stock-based compensation expense for the nine months ended September 30, 2002, the Company expensed the entire fair value of the stock option believing that the option fully vested upon the signing of the agreement. In its October 2005 review, however, the Company determined that: (i) first, as stated above, half of the option to purchase 1,000,000 shares of common stock did not vest and was not exercisable until the threshold sales target had been met, which would not be until five years after the signing of the distribution agreement; and (ii) second, the Company did not consider Emerging Issues

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Task Force ("EITF") No. 96-18, Accounting for Equity Instruments That are Issued to Other Than Employees for Acquiring, or in Conjunction with Selling Goods or Services; EITF No. 00-18, Accounting Recognition for Certain Transactions Involving Equity Instruments Granted to Other Than Employees; and EITF No. 01-9, Accounting for Consideration Given by a Vendor to a Customer.

To correctly account for the stock options granted to Ondeo, the stock-based compensation expense, included in consulting expenses, should have been measured at the date the performance obligation was complete and then recognized on a rational and systematic manner in relation to the sales achieved by Ondeo. Had the Company correctly accounted for these stock options, stock-based compensation expense for the quarter would have been nil as no sales had yet been achieved. Instead, the Company recorded a stock-based compensation expense of \$2,704,000 for the quarter.

During the three months ended March 31, 2003, Ondeo achieved the first threshold sales target, and, accordingly, the Company should have recorded a corresponding stock-based compensation expense of \$54,080. However, since the entire stock-based compensation expense had been recorded in the September 30,

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2002 interim financial statements and in the year ended December 31, 2002, the Company did not record any additional stock-based compensation expense as a result of the attained first threshold level.

In the fourth quarter of the year ended December 31, 2003, it was determined that Ondeo was not going to attain the minimum sales targets stipulated in the exclusive distributorship agreement. Consequently the exclusive distributorship agreement and corresponding stock options were cancelled. The Company accounted for the cancellation of the stock options in accordance with FAS No. 123 similar to a forfeiture of stock options and reversed \$2,480,200 of the stock compensation expense previously recorded in 2002. Had the Company accounted for the cancellation of the stock options correctly, it would have reversed the stock-based compensation expense of \$54,080 that was recorded in the first quarter ended March 31, 2003.

The following presents the effect on the company's previously issued financial statements for the three months ended June 30, 2005 and 2004, and the year ended December 31, 2004:

Balance sheet as at June 30, 2005:

	Previously Reported	Increase (Decrease)
Capital in excess of par value	11,616,621	(223,800)
Accumulated deficiency	(2,779,326)	223,800

Statement of operations for the six months ended June 30, 2005:

	Previously Reported	Increase (Decrease)
Deficit, beginning	(2,355,207)	223,800
Deficit, ending	(2,779,326)	223,800

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Statement of operations for the three months ended June 30, 2005:

	Previously Reported	Increase (Decrease)
Deficit, beginning	(2,301,009)	223,800
Deficit, ending	(2,779,326)	223,800

Statement of operations for the three months ended June 30, 2004:

	Previously	Increase
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	Reported	(Decrease)
Deficit, beginning	(1,348,523)	223,800
Deficit, ending	(1,675,812)	223,800

Balance sheet as at December 31, 2004:

	Previously Reported	Increase (Decrease)
Capital in excess of par value	\$ 7,663,421	\$ (223,800)
Accumulated deficiency	(2,355,207)	223,800

4. LOAN RECEIVABLE.

	2005	2004
5% loan receivable due on demand	\$ 38,286	\$ 38,570

5. PREPAID EXPENSES.

	2005	2004
Security deposit and prepaids	\$ 117,969	\$ 131,280

6. PROPERTY, EQUIPMENT AND LEASEHOLDS.

	Cost	Accumulated Amortization	2005 Net
Buildings	\$ 3,144,259	\$ 303,488	\$ 2,840,771
Computer hardware	44,302	18,068	26,234
Furniture and fixtures	15,265	4,674	10,591
Office equipment	28,322	12,233	16,089
Manufacturing equipment	2,141,071	491,376	1,649,695
Trailer	1,865	912	953
Leasehold improvements	30,560	13,786	16,774
Trade show booth	6,985	1,885	5,100
Patents	20,408	--	20,408
Land	398,186	--	398,186
	\$ 5,831,223	\$ 846,422	\$ 4,984,801

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7. INVESTMENT.



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	2005	2004
Tatko Inc.	\$ 271,000	\$ 271,000
Air Water Interface Delivery & Detection Inc.	\$ 76,000	--
	\$ 347,000	\$271,000

On May 31, 2003, the Company acquired an option to purchase a 20% interest in the outstanding shares of Tatko Inc. ("Tatko") in exchange for the issuance to Tatko of 100,000 shares of common stock. The option to purchase the shares of Tatko expires on May 31, 2008. The purchase of the option also included the right to use the bio-chemicals and patents of Tatko in the Company's products. As part of the agreement, Tatko was required to supply to the Company samples of specific technologies so that the Company could adapt its processes to incorporate the technologies of Tatko. Since then, the Company believes that Tatko breached the agreement and demanded the return of the Company's shares. Tatko refused and the Company filed a lawsuit against Tatko. For further information on the status of this lawsuit, please see Note 12(d) to these Notes to Consolidated Financial Statements (Contingencies).

The Company believes that the patents developed by Tatko are extremely beneficial to future operations. Once the litigation involving the return of the shares has been settled, the Company intends to negotiate with Tatko to either enter into a normal supplier/customer relationship to acquire Tatko's products or to negotiate to acquire Tatko.

The Company has accounted for the cost of the investment in Tatko based on the original fair market value of common stock on May 31, 2003. The Company relies on the accounting policies of FAS No. 115, Accounting for Certain Investments in Debt and Equity Securities, and the guidelines of EITF No. 30-01, The Meaning of Other-Than-Temporary Impairment of Certain Investments, for assessing the accounting treatment and carrying value of the Company's investment in Tatko. In accordance with these pronouncements, the investment is reviewed on a continuous basis by analyzing the technology and operations of Tatko to ensure that the carrying value is justified. The Company considers the investment to be impaired when the fair value is less than its carrying amount. Since the investment does not have a readily determinable fair value, the Company has taken the position that the fair value assessment will be measured when an impairment indicator is present.

In 2005, NanoDetect purchased 25.3 shares of equity in Air Water Interface Delivery and Detection Inc. ("AWD") for a total cost of \$76,000. This investment represents only 2.5% of the issued and outstanding shares of AWD, and accordingly will be accounted for under the cost method.

8. STOCK OPTIONS.

The Company may issue stock options and stock bonuses for common stock to provide incentives to directors, key employees and other persons who

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contribute to its success. The exercise price of all incentive options are issued for not less than fair market value.

The following table summarizes stock option activity for the years ended December 31, 2004 and 2003, and the six months ended June 30, 2005:

	Number of Shares	Exercise Price per Share	Weighted Average Exercise Price
Balance, December 31, 2002	3,686,800	\$0.25 - \$3.50	\$
Granted	256,000	\$3.60 - \$4.25	\$
Exercised	(124,000)	\$0.25 - \$2.28	\$
Expired	(2,107,800)	\$0.25 - \$5.50	\$
Balance, December 31, 2003	1,711,000	\$1.00 - \$4.25	\$
Granted	572,740	\$3.00 - \$4.60	\$
Exercised	(37,000)	\$1.00 - \$2.50	\$
Expired	(5,000)	\$4.25	\$
Cancelled	(1,000,000)	\$1.50 - \$3.50	\$
Balance, December 31, 2004	1,241,740	\$1.00 - \$4.60	\$
Granted	30,000	3.85	
Exercised	(2,000)	1.40	
Balance, June 30, 2005	1,269,740	\$1.00 - \$4.60	\$

The fair value of each option grant is calculated using the following weighted average assumptions:

	2004	2003
Expected life (years)	5.00%	5.00%
Interest rate	3.50%	2.87%
Volatility	49.00%	49.00%
Dividend yield	0.00%	0.00%

During the quarter ended June 30, 2005, the Company granted 255,000 stock options (June 30, 2004: 25,000 stock options) to consultants and has applied FAS No. 123 using the Black-Scholes option-pricing model, which resulted in additional consulting expense of \$503,650 for the quarter ended June 30, 2005 (June 30, 2004: \$135,230 additional consulting expense). During the year ended December 31, 2003, the Company cancelled 2,000,000 stock options to consultants pursuant to the terms of the underlying contract, resulting in a recovery of consulting expense of \$2,480,200.

### 9. CAPITAL STOCK.

During the six months ended June 30, 2005, the Company issued: (i) 2,000 shares of common stock with exercise prices per share equal to \$1.40; (ii) 900,000 shares of common stock, along with warrants to purchase up to 900,000

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shares of common stock at the exercise price of \$3.75 per share; and (iii) 87,400 shares of common stock, along with a warrant to purchase up to 87,400 shares of common stock at the exercise price of \$3.75 per share.

During the year ended December 31, 2004, the Company issued 37,000 shares of common stock at prices ranging from \$1.00 to \$2.50 per share upon the exercise of stock options.

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During the year ended December 31, 2003, the Company issued: (i) 100,000 shares of common stock valued at \$271,000 to acquire an option to purchase a 20% interest in Tatko (see Note 8 to these Notes to Unaudited Consolidated Financial Statements (Stock Options)); and (ii) 124,000 shares of common stock at prices ranging from \$0.25 to \$2.28 per share upon the exercise of stock options.

### 10. SEGMENTED, SIGNIFICANT CUSTOMER INFORMATION AND ECONOMIC DEPENDENCY.

The Company operates in two segments:

(a) Development and marketing of two lines of energy and water conservation products (as shown under the column heading "EWCP" below), which consists of a (i) liquid swimming pool blanket which saves energy and water by storing evaporation from the pool surface, and (ii) food-safe powdered form of the active ingredient within the liquid blanket and is designed to be used in still or slow moving drinking water sources.

(b) Manufacture of biodegradable polymers and chemical additives used within the petroleum, chemical, utility and mining industries to prevent corrosion and scaling in water piping (as shown under the column heading "BPCA" below). Chemical additives are manufactured for use in laundry and dish detergents, as well as in products to reduce levels of insecticides, herbicides and fungicides.

The accounting policies of the segments are the same as those described in Note 2 to these Consolidated Financial Statements (Significant Accounting Policies). The Company evaluates performance based on profit or loss from operations before income taxes, not including nonrecurring gains and losses and foreign exchange gains and losses.

The Company's reportable segments are strategic business units that offer different, but synergistic products and services. They are managed separately because each business requires different technology and marketing strategies.

	EWCP	BPCA	Total
Revenue	\$ 765,621	\$ 3,122,093	\$ 3,887,714
Interest revenue	3,616	--	3,616
Interest expense	6,611	55,578	62,189
Depreciation and amortization	28,197	302,889	331,086
Segment profit (loss)	(979,805)	555,686	(424,119)
Segment assets	273,130	4,711,671	4,984,801
Expenditures for segment assets	65,541	--	65,541

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There is no segment data for the quarter ended March 31, 2004 as our additional segment was added in June 2004.

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The sales generated in the United States of America and Canada are as follows:

	2005
Canada	126,254
United States and abroad	3,761,460
<b>Total</b>	<b>3,887,714</b>

The Company's long-lived assets are located in Canada and the United States as follows:

	2005	
Canada	\$ 273,130	\$
United States	4,711,671	
<b>Total</b>	<b>\$ 4,984,801</b>	<b>\$</b>

11. COMMITMENTS.

Property and Premises Leases. The Company is committed to minimum rental payments for property and premises aggregating approximately \$326,538 over the term of two leases, the last expiring on June 30, 2009.

Commitments in each of the next five years are approximately as follows:

2005	\$ 67,145
2006	114,752
2007	55,169
2008	55,654
2009	33,818

12. CONTINGENCIES.

(a) On November 13, 2003, Patrick Grant, an ex-employee, filed a lawsuit in the Circuit Court of Cook County, Illinois against the Company,

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WaterSavr Global Solutions Inc. ("WGS"), the wholly-owned subsidiary of the Company, and Daniel B. O'Brien, the Company's Chief Executive Officer. The plaintiff claims damages for breach of contract, tortious interference with an agreement and various wrongful discharge claims. The plaintiff seeks monetary damages in excess of \$1,020,000 for the breach of contract and tortious interference claims and unspecified compensatory and punitive damages in the wrongful discharge claims. The Company completed mandatory mediation ordered by the Circuit Court and will next appear in court for case management, at which time the court will set discovery deadlines. The Company considers the case without merit and is planning to dispute the matter vigorously. In addition, the Company intends to file counterclaims against the plaintiff for failure to repay financial obligations owed to the Company of almost \$40,000, as well as unspecified damages arising out of the plaintiff's disclosure of confidential information to a client during his employment at WGS. No amounts have been recorded as receivable and no accrual has been made for any loss in the Company's consolidated financial statements as the outcome of the claim filed by Mr. Grant is not determinable.

(b) On May 1, 2003, the Company filed a lawsuit in the Supreme Court of British Columbia, Canada, against John Wells and Equity Trust, S.A. seeking return of 100,000 shares of the Company's common stock and repayment of a \$25,000 loan, which were provided to defendants for investment banking services consisting of securing a \$5 million loan and a \$25 million stock offering. Such services were not performed and in the proceeding, the Company seeks return of such shares after defendant's

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failure to both return the shares voluntarily and repay the note. On May 7, 2003, the Company obtained an injunction freezing the transfer of the shares. The proceeding is still in a discovery phase. On the date of issuance, the share transaction was recorded as shares issued for services at fair market value, a value of \$0.80 per share. No amounts have been recorded as receivable in the Company's consolidated financial statements as the outcome of this claim is not determinable.

(c) On May 28, 2004, Sun Solar Energy Technologies, Inc. ("Sun Solar"), filed a lawsuit in the Federal Court of Canada, against the Company, Flexible Solutions, Ltd. ("Flexible Ltd."), the Company's wholly-owned subsidiary, and Mr. O'Brien. Sun Solar is seeking: (a) a declaration that the trademark "Tropical Fish" is available for use by Sun Solar; (b) injunctive relief against further use of the "Tropical Fish" trademark by the Company; and (c) monetary damages exceeding \$7,000,000 for the alleged infringement by the Company, Flexible Ltd. and Mr. O'Brien of the "Tropical Fish" trademark, as well as any other "confusingly similar trademarks" or proprietary trade dresses. On August 9, 2004, the Company, Flexible Ltd. and Mr. O'Brien filed their defense and filed a counterclaim against Sun Solar. The counterclaim seeks: (x) injunctive relief against further use of the "Tropical Fish" trademark by Sun Solar; (y) a declaration that the "Tropical Fish" trademark is owned by the Company, or, in the alternative, is not distinctive and should be struck from the trademark registry; and (z) monetary damages exceeding \$50,000. The parties have completed documentary discovery, and examinations for discovery of all parties have been scheduled for July 2005. No amounts have been recorded as receivable in the Company's consolidated financial statements and no amounts have been accrued as potential losses as the outcome of this claim is not determinable.

(d) On July 23, 2004, the Company filed a breach of contract suit in the Circuit Court of Cook County, Illinois against Tatko. The action arises out of a joint product development agreement entered into between the Company and Tatko in which the Company agreed to invest \$10,000 toward the product development venture and granted to Tatko 100,000 shares of the Company's restricted common stock. In return, Tatko granted the Company a five-year option

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to purchase 20% of Tatko's outstanding capital stock. Tatko has since refused to collaborate on the agreement and the Company seeks declaratory relief stating that Tatko is not entitled to the 100,000 shares of the Company's restricted common stock. The litigation is still pending at this time.

In addition, Tatko filed its own suit on September 24, 2004 in the Circuit Court of Cook County, Illinois seeking declaratory relief of its entitlement to the Company's restricted common stock. On May 23, 2005, the Tatko suit was dismissed with prejudice by the District Court.

No amounts have been recorded as receivable in the Company's consolidated financial statements and no amount has been accrued as a loss as the outcome of the claim against Tatko is not determinable.

(e) In fiscal 2005, the Company filed a lawsuit in the Court of the Queen's Bench of Alberta against Calgary Diecast Corp. ("CDC"), seeking indeterminate damages resulting from a breach of contract. The contract was never completed and the Company's raw materials remain in the possession of CDC. On April 25, 2005, the Court ordered a judgment for the Company in the amount of \$48,723.

### 13. COMPARATIVE FIGURES.

Certain of the comparative figures have been reclassified to conform with the current year's presentation.

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## Item 2. Management's Discussion and Analysis or Plan of Operation.

### OVERVIEW

Flexible Solutions International, Inc. ("we," "us," and "our") develops, manufactures and markets specialty chemicals which slow down the evaporation of water. Our initial product, HEAT\$AVR(R), is marketed for use in swimming pools and spas where its use, by slowing the evaporation of water, allows the water to retain a higher temperature for a longer period of time and thereby reduces the energy required to maintain the desired temperature of the water in the pool. Our newest product, WATER\$AVR(R), is marketed for water conservation in irrigation canals, aquaculture, and reservoirs where its use slows down water loss due to evaporation. We also make and sell dispensers which automate the deployment of our chemical products.

### RESULTS OF OPERATIONS

The following analysis and discussion pertains to our results of operations for the three-month and six-month periods ended June 30, 2005, compared to the results of operations for the three-month and six-month periods ended June 30, 2004, and to changes in our financial condition from December 31, 2004 to June 30, 2005.

Separate financial data for each of our operating segments is provided below. We evaluate the performance of our operating segments based on the following:

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	JUNE 30			% CHANGE
	2005	2004	2003	2005-2004

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Sales							
Energy Segment	\$	765,621	\$	759,744	\$	1,942,562	1
Polymer Segment		3,122,093		276,127		--*	1031
Consolidated		3,887,714		1,035,871		1,942,562	275
Gross Profit Margin							
Energy Segment		310,557		357,327		846,660	(13
Polymer Segment		1,445,212		267,537		--*	440
Consolidated		1,755,769		624,864		846,660	181
SG&A							
Energy Segment		1,293,921		994,893		974,108	30
Polymer Segment		889,583		238,591		--*	273
Consolidated		2,183,504		1,233,484		974,108	77
Interest Income							
Energy Segment		3,616		30,470		102,246	(88
Polymer Segment		--		--		--*	0
Consolidated		3,616		30,470		102,246	(88
Write Down of Investments							
Energy Segment		--		--		--	--
Polymer Segment		--		--		--*	--
Consolidated		--		--		--	--
Net Income (Loss							
	\$	(424,119 )	\$	(578,150)	\$	(49,297)	27

\* Polymer segment data is not available as indicated. The Company's polymer segment was formed after the acquisition of certain assets of the Donlar Corporation in June 2004.

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THREE MONTHS ENDED JUNE 30, 2005 AND 2004

Sales for the three months ended June 30, 2005 were \$1,868,133, as compared to \$547,761 for the three months ended June 30, 2004, an increase of \$1,320,372, or 241%. The increase in sales was primarily attributable to the new revenue provided by our wholly-owned subsidiary, NanoChem Solutions Inc. ("NanoChem"), which was formed as the corporate entity used to acquire certain assets from the bankruptcy estate of the Donlar Corporation ("Donlar").

Our Energy segment had sales of \$334,726 for the three months ended June 30, 2005, as compared to \$271,634 for the three months ended June 30, 2004, an increase of 23%. We expect revenue in this segment to increase in fiscal 2006 as brand recognition of our ECO\$AVR(TM) product line continues to grow and our marketing efforts for the WATER\$AVR(R) product line begin to produce increased sales. Our Polymer segment achieved sales of \$1,533,407 for the three months ended June 30, 2005, as compared to \$276,127 for the three months ended June 30, 2004. This increase is in part due to a full three months of sales from our new NanoChem subsidiary.

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We experienced a loss of \$478,317, or \$0.04 per share, for the three months ended June 30, 2005, as compared to a loss of \$327,289, or \$0.03 per share for the three months ended June 30, 2004. The three largest contributing factors to the loss were:

- o The brand building, marketing and extra staffing costs in ECO\$AVR(TM) sales incurred throughout the year that were not reflected in sales because dealers that had been sold product by our discontinued distributor, Sun Solar, still had substantial "Tropical Fish" product. We believe that very little old product is on the shelves and that costs and revenue for ECO\$AVR(TM) will be better balanced for the remainder of fiscal 2005.
- o All divisions maintained or increased sales and marketing costs in the quarter in order to increase the probability of sales increases in all of 2005. We considered the extra costs necessary to position us for growth.
- o Non-cash transactions such as stock option expense significantly increased as a result of two private placements of shares of our common stock in the quarter.

Gross profit margin represents sales less cost of sales and producing. The major categories of costs included in cost of sales and producing are cost of goods, distribution costs, and costs of our buying department. Distribution costs consist of all warehouse receiving and inspection costs, warehousing costs, all transportation costs associated with shipping goods from our facilities to our customers, and other costs of distribution. We do not exclude any portion of distribution costs from cost of sales. Our gross margins may not be comparable to those of other entities because some entities include all of the costs related to their overhead in cost of sales. However, we exclude a portion of cost of sales from gross profit and instead include such costs as a line item in operating expenses.

For the three months ended June 30, 2005, the largest increases were in the areas of wages (\$202,388 for the three months ended June 30, 2005, as compared to \$143,246 for the three months ended June 30, 2004), administrative salaries (\$71,071 for the three months ended June 30, 2005, as compared to \$32,697 for the three months ended June 30, 2004) and rent expense (\$47,886 for the three months ended June 30, 2005, as compared to \$30,867 for the three months ended June 30, 2004). The addition of commission expense (\$47,073 for the three months ended June 30, 2005, as compared to nil for the three months ended June 30, 2004) is a result of successfully using sales representatives for our swimming pool products and we feel the increase in sales justifies this added expense. These increases are wholly accounted for by the operating costs of the new divisions and represent a permanent increase in operating

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costs related to the new level of sales. The large increase in investor relations costs (\$484,950 for the three months ended June 30, 2005, as compared to \$57,947 for the three months ended June 30, 2004) is attributable to the stock options that vested in relation to the capital raising that closed on April 14, 2005. This resulted in a non-cash transaction of \$447,500 and, without this, we would have experienced a decrease in this expense. The decreases in advertising (\$13,414 for the three months ended June 30, 2005, a decrease from \$49,062 for the three months ended June 30, 2004) and consulting (\$47,535 for the three months ended June 30, 2005, a decrease from \$114,138 for the three months ended June 30, 2004) are the result of better cost control in these areas instituted by management over the past year and are expected to maintain at these levels.



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Our Energy segment generated \$883,544 in operating expenses in the three months ended June 30, 2005, an increase of 58% over the three months ended June 30, 2004. The increase is primarily attributable to our extraordinary stock option expense related to our raising of capital in the six months ended June 30, 2005. Our Polymer segment incurred \$410,148 in operating expenses for the three months ended June 30, 2005, an increase of 72% over the three months ended June 30, 2004. This is attributable to the fact that our NanoChem subsidiary operated for the full three months ended June 30, 2005, as compared to only twenty days during the same period ended June 30, 2004.

There was no income tax provision for the three months ended June 30, 2005, as no tax installment payments were made during the year, same as for the three months ended June 30, 2004.

Our Energy segment reported interest income of \$886 in the three months ended June 30, 2005, as compared to \$27,354 in the three months ended June 30, 2004, a decrease of approximately 97%. This decrease in interest income is due to our use of capital to purchase assets and develop our business.

### SIX MONTHS ENDED JUNE 30, 2005 AND 2004

Sales for the six months ended June 30, 2005 were \$3,887,714, as compared to \$1,035,871 for the six months ended June 30, 2004, an increase of \$2,851,843, or 275%. The increase in sales was primarily attributable to the new revenue provided by our NanoChem subsidiary, which was formed as the corporate entity used to acquire certain assets from the bankruptcy estate of Donlar.

Our Energy segment had sales of \$765,621 for the six months ended June 30, 2005, as compared to \$759,744 for the six months ended June 30, 2004, an increase of 1%. We expect revenue in this segment to increase in 2006 as brand recognition of our ECO\$AVR(TM) product line continues to grow and our marketing efforts for the WATER\$AVR(R) product line begin to produce increased sales. Our Polymer segment achieved sales of \$3,122,093 for the six months ended June 30, 2005, as compared to \$276,127 for the six months ended June 30, 2004. This increase is due to a full six months of sales from our new NanoChem subsidiary.

We experienced a loss of \$424,119, or \$0.03 per share, for the six months ended June 30, 2005, as compared to a loss of \$578,150, or \$0.05 per share, for the six months ended June 30, 2004. The three largest contributing factors to the loss were:

- o The brand building, marketing and extra staffing costs in ECO\$AVR(TM) sales incurred throughout the year that were not reflected in sales because dealers that had been sold product by our discontinued distributor, Sun Solar, still had substantial "Tropical Fish" product. We believe that very little old product is on the shelves and that costs and revenue for ECO\$AVR(TM) will be better balanced for the remainder of fiscal 2005.
- o All divisions maintained or increased sales and marketing costs in the period in order to increase the probability of sales increases in all of 2005. We considered the extra costs necessary to position us for growth.
- o Non-cash transactions such as stock option expense significantly increased as a result of two private placements of shares of our common stock in the period.

Our overall gross profit margin on product sales decreased to 45% for the six months ended June 30, 2005 from 60% for the six months ended June 30,

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2004. This decrease in gross margin was primarily due to the rise in oil and its affect on raw material pricing and shipping. There were also extra costs related to the labor and material inputs for our swimming pool products as a result of the significant rise of the Canadian Dollar versus the U.S. Dollar. For more information regarding this result, see Note 2(e) to the Company's Notes to Consolidated Financial Statements, Foreign Currency.

Gross profit margin represents sales less cost of sales and producing. The major categories of costs included in cost of sales and producing are cost of goods, distribution costs, and costs of our buying department. Distribution costs consist of all warehouse receiving and inspection costs, warehousing costs, all transportation costs associated with shipping goods from our facilities to our customers, and other costs of distribution. We do not exclude any portion of distribution costs from cost of sales. Our gross margins may not be comparable to those of other entities because some entities include all of the costs related to their overhead in cost of sales. However, we exclude a portion of cost of sales from gross profit and instead includes such costs as a line item in operating expenses.

For the six months ended June 30, 2005, there was an increase in sales and marketing costs in connection with our WATER\$AVR(R) product, which was reflected in increased wages, office, rent, telecommunications and travel-related expenses. We incurred higher professional fees in the six months ended June 30, 2005 primarily due to increased legal and accounting expenses and increased consultant expenses resulting from the cost of integrating the functions and sales of our NanoChem subsidiary as quickly as possible. Depreciation expense was \$331,086 for the six months ended June 30, 2005, as compared to \$185,547 for the six months ended June 30, 2004, reflecting depreciation for additional property and equipment added during fiscal 2004.

Our Energy segment generated \$1,293,291 in operating expenses for the six months ended June 30, 2005, an increase of 30% over the six months ended June 30, 2004. The increase is primarily attributable to our extraordinary stock option expense related to our raising of capital in the six months ended June 30, 2005. Our Polymer segment incurred \$889,583 in operating expenses for the six months ended June 30, 2005, an increase of 77% over the six months ended June 30, 2004. This is attributable to the fact that our NanoChem subsidiary operated for the entire six-month period ended June 30, 2005, as compared to only twenty days during the same period ended June 30, 2004.

There was no income tax provision for the six months ended June 30, 2005, as no tax installment payments were made during the year, same as for the six months ended June 30, 2004.

Our Energy segment reported interest income of \$3,616 for the six months ended June 30, 2005, as compared to \$30,470 for the six months ended June 30, 2004, a decrease of approximately 88%. This decrease in interest income is due to our use of capital to purchase assets and develop our business.

With the addition of the assets acquired from Donlar, we became a much larger company with commensurate increases in most expense segments. However, we were able to reduce certain expenses such as advertising (\$44,685 for the six months ended June 30, 2005, a decrease from \$56,792 for the six months ended June 30, 2004) and consulting (\$91,787 for the six months ended June 30, 2005, a decrease

from \$188,816 for the six months ended June 30, 2004) as a direct result of better cost control in these areas instituted by management over the past year and these costs are expected to maintain at these levels. The large increase in investor relations (\$509,588 for the six months ended June 30, 2005, as compared

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to \$122,625 for the six months ended June 30, 2004) is a result of stock options that vested in relation to the capital raising that closed on April 14, 2005. This resulted in a non-cash transaction of \$447,500, without which, we would have seen a decrease in this expense.

### LIQUIDITY AND CAPITAL RESOURCES

The following section discusses the effects of changes in our balance sheet and cash flow on our liquidity and capital resources. The following table summarizes our cash, cash equivalents and working capital that directly have an impact on our immediate and future cash needs and sources.

	JUNE 30, 2005	DECEMBER 31, 2004	INCREASE (DECREASE)
Cash and cash equivalents	\$ 752,130	\$ 558,795	\$ 193,335
Short-term investments	--	559,440	(559,440)
Working capital	3,590,510	(101,121)	3,691,631
Short-term loan	--	3,150,000	(3,150,000)

We had cash on hand of \$752,130 as of the quarter ended June 30, 2005, as compared to \$558,795 for the period ended December 31, 2004. As of June 30, 2005, we had working capital of \$3,590,510, as compared to a working capital deficit of \$101,121 for the period ended December 31, 2004. The increases in cash on hand and working capital primarily results from the cash raised in our private placement transactions that closed during the quarter ended June 30, 2005, as well as from our increase in sales. The cash raised from the private placement transactions was used to pay off the loan taken out for the purchase of the Donlar assets.

Historically, prior to fiscal 2004, our operations have been cash flow positive after considering the add back to net income of the stock compensation expense and depreciation. In fiscal 2004, our operations generated negative cash flow as we acquired a large amount of inventory and we financed the purchase of the Donlar assets through the redemption of short-term investments. In order to build our business, develop and research our products and sustain our start-up operations, we have relied mainly on external equity financing.

We expect that cash provided by operating activities may fluctuate in future periods as a result of a number of factors, including the fluctuations in our operating results, shipments, accounts receivable collections, and inventory management. As our sales continue to build, our accounts receivable will increase and our overall inventory levels will also increase.

Because we repaid the short-term loan due in June 2005 (incurred in connection with our purchase of the Donlar assets), we have no other commitments or guarantees in the next 12 months that will materially affect our cash position or needs. We believe we have sufficient capital to support our business and operations for at least the next 12 months. We anticipate utilizing approximately \$500,000 in the next twelve months attempting to close sales in California, Spain and Australia and to extend certain core U.S. patents to select other countries. Approximately 80% of such expenditures are related to expanding sales for our WATER\$AVR(R) product.

There can be no assurance that any of the expenditures will result in additional sales revenues. In

the event that our capital resources are not sufficient for the continued expansion of the Company, new capital will be needed or marketing expenses will have to be curtailed until capital is available. There is no guarantee that capital will be available on terms acceptable to the Company or at all. We have no investment banking agreements in place at this time.

#### RESTATEMENT OF FINANCIAL STATEMENTS

The accompanying financial statements have been restated to revise certain stock-based compensation expense. In October 2005, while completing a registration statement for securities issued in the second quarter of 2005, we determined that certain disclosures made in connection with our stock-based compensation expense required adjustment. In September 2002, we entered into a distribution agreement with Ondeo Nalco Company ("Ondeo") whereby Ondeo agreed to serve as the exclusive distributor of our WATER\$AVR(R) products for so long as Ondeo maintained a certain threshold sales level as defined in the agreement. As consideration for signing the agreement, Ondeo was granted an option to purchase 2,000,000 shares of our common stock. Half of the option for one million shares was exercisable immediately at an exercise price of \$4.25 for each common share. The remaining half of the option for 1,000,000 shares was exercisable after certain threshold sales targets were achieved at a price of \$5.50 for each common share.

In determining the stock-based compensation expense for the nine months ended September 30, 2002, we expensed the entire fair value of the stock option believing that the option fully vested upon the signing of the agreement. In our October 2005 review, however, we determined that: (i) first, as stated above, half of the option to purchase 1,000,000 shares of common stock did not vest and was not exercisable until the threshold sales target had been met, which would not be until five years after the signing of the distribution agreement; and (ii) second, we did not consider Emerging Issues Task Force ("EITF") No. 96-18, Accounting for Equity Instruments That are Issued to Other Than Employees for Acquiring, or in Conjunction with Selling Goods or Services; EITF No. 00-18, Accounting Recognition for Certain Transactions Involving Equity Instruments Granted to Other Than Employees; and EITF No. 01-9, Accounting for Consideration Given by a Vendor to a Customer.

During the three months ended March 31, 2003, Ondeo achieved the first threshold sales target, and accordingly, we should have recorded a corresponding stock-based compensation expense of \$54,080. However, since the entire stock-based compensation expense had been recorded in the September 30, 2002 interim financial statements and in the year ended December 31, 2002, we did not record any additional stock-based compensation expense as a result of the attained first threshold level.

In the fourth quarter of the year ended December 31, 2003, we determined that Ondeo was not going to attain the minimum sales targets stipulated in the agreement. Consequently, the agreement and corresponding stock option was cancelled. We accounted for the cancellation of the stock option in accordance with Statement of Financial Accounting Standard No. 123 similar to a forfeiture of stock options and reversed \$2,480,200 of the stock compensation expense previously recorded in fiscal 2002. Had we accounted for the cancellation of the stock option correctly, we would have reversed the amended stock-based compensation expense of \$54,080 that was recorded in the first quarter ended March 31, 2003.

In light of the above, the net effect of the adjustments to the financial statements is as follows:

1. Approximately \$2,704,000 in stock compensation expense recorded in

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September 2002 has been reversed;

2. Approximately \$54,080 in stock-based compensation expense has been recorded in the

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quarter ended March 31, 2003, as Ondeo met the first sales threshold under the agreement;

3. Approximately \$54,080 in stock-based compensation expense has been reversed in the year ended December 31, 2003, as Ondeo failed to meet subsequent sales thresholds under the agreement, resulting in the cancellation of the stock option;

4. As stated above, we recorded a stock-based compensation expense of \$2,704,000 in December 2002. As a result of canceling the stock option, we previously recorded a recovery of \$2,480,000 of stock compensation expense at December 31, 2003. This \$2,480,000 recovery has been reversed, in conjunction with the reversal of \$2,704,000 in stock compensation expense originally recorded; and

5. For the periods ended March 31, 2004 to June 30, 2005, the net effect of these adjustments is to decrease capital in excess of par value by approximately \$223,800 and increase retained earnings by approximately \$223,800.

We are presently unaware of any evidence that the restatements described above are due to any material noncompliance by us, as a result of misconduct, with any financial reporting requirement under the federal securities laws. Our audit committee of the board of directors is working with our management and our accountants to assure that we are taking the appropriate approach to resolving the issues related to the restatements, as well as any further issues that may be identified during the course of its review.

Item 3. Controls and Procedures.

### Disclosure Controls and Procedures

We maintain disclosure controls and procedures that are designed to ensure that information required to be disclosed in our periodic reports to the Securities and Exchange Commission ("SEC") is recorded, processed, summarized and reported within the time periods specified in the SEC's rules and regulations, and that such information is accumulated and communicated to our management, including our principal executive officer and principal financial officer, as appropriate, to allow timely decisions regarding required disclosure. Our disclosure controls and procedures are designed to provide a reasonable level of assurance of reaching our desired disclosure control objectives.

As of the end of the period covered by this Quarterly Report, we carried out an evaluation, under the supervision and with the participation of management, including our principal executive officer and principal financial officer, of the effectiveness of the design and operation of our disclosure controls and procedures (as defined under Rules 13a-15(e) and 15d-15(e) under the Securities Exchange Act of 1934, as amended). Based upon that evaluation, our principal executive officer and principal financial officer concluded that our disclosure controls and procedures are effective in timely alerting them to material information relating to us (including our consolidated subsidiaries) that is required to be included in our periodic reports.

The prior accounting treatment of our stock-based compensation expense was done in consultation and in accordance with the advice of our independent

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accountants. Accordingly, management does not believe that this restatement of our Quarterly Report indicates or results from a material weakness with respect to our disclosure controls and procedures or our internal controls over financial reporting.

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### Changes in Internal Control Over Financial Reporting

There was no change in our internal control over financial reporting that occurred during the period covered by this report that has materially affected, or is reasonably likely to materially affect, our internal control over financial reporting.

## PART II OTHER INFORMATION

### Item 1. Legal Proceedings.

On May 1, 2003, we filed a lawsuit in the Supreme Court of British Columbia, Canada, against John Wells and Equity Trust, S.A. seeking return of 100,000 shares of our common stock and repayment of a \$25,000 loan, which were provided to defendants for investment banking services consisting of securing a \$5 million loan and a \$25 million stock offering. Such services were not performed and in the proceeding, we seek return of such shares after defendant's failure to both return the shares voluntarily and repay the note. On May 7, 2003, we obtained an injunction freezing the transfer of the shares. The proceeding is still in a discovery phase. On the date of issuance, the share transaction was recorded as shares issued for services at fair market value, a value of \$0.80 per share. No amounts have been recorded as receivable in the Company's consolidated financial statements as the outcome of this claim is not yet determinable.

On November 13, 2003, an ex-employee, Patrick Grant, filed a lawsuit in the Circuit Court of Cook County, Illinois against us, WaterSavr, and our Chief Executive Officer, Daniel B. O'Brien. The plaintiff claims damages for breach of contract, tortious interference with an agreement and various wrongful discharge claims. Mr. Grant seeks monetary damages in excess of \$1,020,000 for the breach of contract and tortious interference claims and unspecified compensatory and punitive damages in the wrongful discharge claims. We completed mandatory mediation ordered by the Circuit Court and will next appear in court for case management, at which time the court will set discovery deadlines. We consider the case to be without merit and are planning to dispute the matter vigorously. In addition, we intend to file counterclaims against the plaintiff for failure to repay financial obligations owed to us of almost \$40,000, as well as unspecified damages arising out of plaintiff's disclosure of confidential information to a client during his employment at WaterSavr. No amounts have been recorded as receivable and no accrual has been made for any loss in our consolidated financial statements as the outcome of the claim filed by Mr. Grant is not yet determinable.

On May 28, 2004, Sun Solar filed a lawsuit in the Federal Court of Canada, against us, Flexible Ltd., and our Chief Executive Officer, Daniel B. O'Brien. Sun Solar is seeking: (a) a declaration that the trademark "Tropical Fish" is available for use by Sun Solar; (b) injunctive relief against our further use of the "Tropical Fish" trademark; and (c) monetary damages exceeding \$7,000,000 for the alleged infringement by us, Flexible Ltd. and Mr. O'Brien of the "Tropical Fish" trademark, as well as any other "confusingly similar trademarks" or proprietary trade dresses. On August 9, 2004, we, Flexible Ltd. and Mr. O'Brien filed our defense and a counterclaim against Sun Solar. The counterclaim seeks: (x) injunctive relief against further use of the "Tropical Fish" trademark by Sun Solar; (y) a declaration that we own the "Tropical Fish" trademark, or, in the alternative, the trademark is not distinctive and should

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be struck from the trademark registry; and (z) monetary damages exceeding \$50,000. The parties have completed documentary discovery, and examinations for discovery of all parties have been scheduled for July 2005. No amounts have been recorded as receivable in our consolidated financial statements and no amounts have been accrued as potential losses as the outcome of this claim is not determinable.

On July 23, 2004, we filed a breach of contract suit in the Circuit Court of Cook County, Illinois against Tatko Biotech Inc. ("Tatko"). The action arises out of our joint product development agreement

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with Tatko in which the we agreed to invest \$10,000 toward the product development venture and granted to Tatko 100,000 shares of our restricted common stock. In return, Tatko granted us a five-year option to purchase 20% of Tatko's outstanding capital stock. Tatko has since refused to collaborate on the agreement and we have sought declaratory relief stating that Tatko is not entitled to the 100,000 shares of our restricted common stock. The litigation is still pending at this time. In addition, Tatko filed its own suit on September 24, 2004 in the Circuit Court of Cook County, Illinois seeking declaratory relief of its entitlement to our restricted common stock. On May 23, 2005, the Tatko suit was dismissed with prejudice by the District Court. No amounts have been recorded as receivable in our consolidated financial statements and no amount has been accrued as a loss as the outcome of the claim against Tatko is not determinable.

In fiscal 2005, we filed a lawsuit in the Court of the Queen's Bench of Alberta against Calgary Diecast Corp ("CDC") seeking indeterminate damages resulting from a breach of contract. The contract was never completed and our raw materials remain in the possession of CDC. On April 25, 2005, the Court ordered a judgment in our favor in the amount of \$48,723.

### Item 2. Unregistered Sales of Equity Securities and Use of Proceeds.

On April 8, 2005, we sold 900,000 shares of our common stock at a per share price of \$3.75 to several accredited investors in a private placement transaction exempt from the federal securities laws under Section 4(2) of the Securities Act of 1933, as amended, and Rule 506 promulgated thereunder. In connection with the private placement, we also issued warrants to the purchasers to purchase up to an additional 900,000 shares of our common stock, at exercise prices of \$4.50 per share. When issued, the warrants were immediately exercisable through April 8, 2009.

On June 8, 2005, we sold 84,700 shares of our common stock at a per share price of \$3.75 to an accredited investor in a private placement transaction exempt from the federal securities laws under Section 4(2) of the Securities Act of 1933, as amended, and Rule 506 promulgated thereunder. In connection with the private placement, we also issued a warrant to the purchaser to purchase up to an additional 84,700 shares of our common stock, at an exercise price of \$4.50 per share. When issued, the warrant was immediately exercisable through June 8, 2009.

### Item 3. Defaults Upon Senior Securities.

None.

### Item 4. Submission of Matters to a Vote of Security Holders.

For the voting results of our 2005 Annual Shareholders Meeting held on June 10, 2005, please refer to our Current Report on Form 8-K filed with the Securities and Exchange Commission on June 29, 2005.

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Item 5. Other Information.

None.

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Item 6. Exhibits.

The following exhibits are attached hereto and filed herewith:

EXHIBIT NUMBER	DESCRIPTION OF EXHIBIT
10.1	Securities Purchase Agreement, dated as of April 8, 2005, by and between the Registrant and the parties set forth therein. (1)
10.2	Form of Warrant, issued as of April 8, 2005. (1)
10.3	Registration Rights Agreement, dated as of April 8, 2005, by and between the Registrant and the parties set forth therein. (2)
10.4	Securities Purchase Agreement, dated as of June 8, 2005, by and between the Registrant and the investor set forth therein. (2)
10.5	Form of Warrant, issued as of June 8, 2005. (2)
10.6	Registration Rights Agreement, dated as of June 8, 2005, by and between the Registrant and the party set forth therein. (2)
31.1	Certification of Principal Executive Officer Pursuant to ss.302 of the Sarbanes-Oxley Act of 2002. *
31.2	Certification of Principal Financial Officer Pursuant to ss.302 of the Sarbanes-Oxley Act of 2002. *
32.1	Certification of Principal Executive Officer Pursuant to 18 U.S.C. ss.1350 and ss.906 of the Sarbanes-Oxley Act of 2002. *
32.2	Certification of Principal Financial Officer Pursuant to 18 U.S.C. ss.1350 and ss.906 of the Sarbanes-Oxley Act of 2002. *

\* Filed herewith.

(1) Incorporated herein by reference to the Registrant's Registration Statement on Form S-3/A (Amendment No. 1), filed with the Securities and Exchange Commission on June 27, 2005.

(2) Incorporated herein by reference to the Registrant's Quarterly Report on Form 10-QSB/A (Amendment No. 1), filed with the Securities and Exchange Commission on September 21, 2005.



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SIGNATURES

In accordance with the requirements of Section 13 or 15(d) of the Exchange Act, the registrant caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

Dated: December 5, 2005.

FLEXIBLE SOLUTIONS INTERNATIONAL, INC.

By: /s/ DANIEL B. O'BRIEN

-----  
Name: Daniel B. O'Brien  
Title: President and Chief Executive Officer

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nt size="2" face="Times New Roman" style="font-size:1.0pt;">

7,984

(17,679

)

2,794

**Income taxes**

8

34

Current tax

(943

)

(332

)

(1,060

)

Deferred tax

(1,838

)

5,581

(543

)

	(2,781
)	
	5,249
	(1,603
)	

**Net income (loss) from continuing operations**

	5,203
	(12,430
)	
	1,191

Loss attributable to noncontrolling interests

)	(8
)	(501
)	(308
<b>Net income (loss) from continuing operations attributable to Vale's stockholders</b>	
	<b>5,211</b>
)	<b>(11,929</b>
	<b>1,499</b>

**Discontinued operations**

14

Loss from discontinued operations

(1,227

)

(190

)

(838

)

Income attributable to noncontrolling interests

2

10

38

**Loss from discontinued operations attributable to Vale's stockholders**

)	(1,229
)	(200
)	(842

**Net income (loss)**

**3,976**

) (12,620

353

Loss attributable to noncontrolling interests

(6

) (491

) (304

)  
**Net income (loss) attributable to Vale's stockholders**

**3,982**

(12,129

)  
**657**



**Earnings (loss) per share attributable to Vale's stockholders:**

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

Preferred share (US\$)

	0.77
	(2.35)
)	
	0.13
Common share (US\$)	
	0.77
	(2.35)
)	
	0.13

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

Table of Contents**Consolidated Statement of Comprehensive Income**

In millions of United States dollars

	Year ended December 31		
	2016	2015	2014
<b>Net income (loss)</b>	<b>3,976</b>	<b>(12,620)</b>	<b>353</b>
<b>Other comprehensive income (loss):</b>			
<b>Items that will not be reclassified subsequently to the income statement</b>			
<b>Cumulative translation adjustments</b>	<b>6,460</b>	<b>(18,128)</b>	<b>(7,436)</b>
<b>Retirement benefit obligations</b>			
Gross balance for the year	(112)	66	(279)
Effect of taxes	42	3	85
Equity results in associates and joint ventures, net of taxes	(70)	69	(192)
<b>Total items that will not be reclassified subsequently to the income statement</b>	<b>6,390</b>	<b>(18,059)</b>	<b>(7,628)</b>
<b>Items that may be reclassified subsequently to the income statement</b>			
<b>Cumulative translation adjustments</b>			
Gross balance for the year	(3,603)	9,340	3,407
Effect of taxes	(74)	904	
Transfer of realized results to net income	(75)		
	<b>(3,752)</b>	<b>10,244</b>	<b>3,407</b>
<b>Available-for-sale financial instruments</b>			
Gross balance for the year	1	1	(4)
Transfer of realized results to net income, net of taxes	1	1	4
<b>Cash flow hedge</b>			
Gross balance for the year	6	828	(290)
Effect of taxes	(1)	(7)	(3)
Equity results in associates and joint ventures, net of taxes	5	(5)	(1)
Transfer of realized results to net income, net of taxes	(3)	(369)	(122)
	<b>7</b>	<b>447</b>	<b>(416)</b>
<b>Total of items that may be reclassified subsequently to the income statement</b>	<b>(3,744)</b>	<b>10,692</b>	<b>2,991</b>
<b>Total comprehensive income (loss)</b>	<b>6,622</b>	<b>(19,987)</b>	<b>(4,284)</b>
Comprehensive income (loss) attributable to noncontrolling interests	111	(543)	(330)
<b>Comprehensive income (loss) attributable to Vale's stockholders</b>	<b>6,511</b>	<b>(19,444)</b>	<b>(3,954)</b>

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



Table of Contents**Consolidated Statement of Cash Flows**

In millions of United States dollars

	Year ended December 31		
	2016	2015	2014
<b>Cash flow from operating activities:</b>			
Net income (loss) before income taxes from continuing operations	7,984	(17,679)	2,794
<b>Continuing operations adjustments for:</b>			
Equity results in associates and joint ventures	(309)	445	(501)
Results on measurement or sale of non-current assets	(84)	(213)	258
Impairment and others results in associates and joint ventures	1,220	349	61
Impairment of non-current assets and onerous contracts	1,174	8,769	99
Depreciation, amortization and depletion	3,487	3,719	3,869
Financial results, net	(1,843)	10,654	6,018
<b>Changes in assets and liabilities:</b>			
Accounts receivable	(2,744)	1,671	2,567
Inventories	288	(217)	(467)
Suppliers and contractors	243	658	1,014
Payroll and related charges	133	(578)	(106)
Other taxes assets and liabilities, net	(109)	(222)	(252)
Deferred revenue - Gold stream (note 7)	524	532	
Other assets and liabilities, net	591	(304)	256
<b>Cash provided from operations</b>	<b>10,555</b>	<b>7,584</b>	<b>15,610</b>
Interest on loans and borrowings paid	(1,663)	(1,457)	(1,539)
Derivatives received (paid), net (note 25)	(1,602)	(1,202)	(179)
Interest on participative stockholders debentures paid	(84)	(65)	(112)
Income taxes	(388)	(544)	(491)
Income taxes - Settlement program	(417)	(384)	(494)
<b>Net cash provided by operating activities from continuing operations</b>	<b>6,401</b>	<b>3,932</b>	<b>12,795</b>
Net cash provided by operating activities from discontinued operations	180	559	309
<b>Net cash provided by operating activities</b>	<b>6,581</b>	<b>4,491</b>	<b>13,104</b>
<b>Cash flow from investing activities continuing:</b>			
Financial investments redeemed (invested)	12	308	(148)
Loans and advances - net receipts (payments)	(210)	(17)	364
Guarantees and deposits - net receipts (payments)	(41)	(67)	78
Additions to investments	(239)	(65)	(271)
Additions to property, plant and equipment and intangible (note 3(b))	(4,951)	(8,114)	(11,777)
Dividends and interest on capital received from associates and joint ventures	193	318	568
Proceeds from disposal of assets and investments	543	1,456	1,199
Proceeds from gold stream transaction	276	368	
<b>Net cash used in investing activities from continuing operations</b>	<b>(4,417)</b>	<b>(5,813)</b>	<b>(9,987)</b>
Net cash used in investing activities from discontinued operations	(281)	(346)	(278)
<b>Net cash used in investing activities</b>	<b>(4,698)</b>	<b>(6,159)</b>	<b>(10,265)</b>

<b>Cash flow from financing activities from continuing operations:</b>			
<b>Loans and borrowings (i)</b>			
Additions	6,994	4,995	2,341
Repayments	(7,717)	(2,753)	(1,864)
<b>Transactions with stockholders:</b>			
Dividends and interest on capital paid to Vale's stockholders	(250)	(1,500)	(4,200)
Dividends and interest on capital paid to noncontrolling interest	(291)	(15)	(66)
Transactions with noncontrolling stockholders	(17)	1,049	
<b>Net cash provided by (used in) financing activities from continuing operations</b>	<b>(1,281)</b>	<b>1,776</b>	<b>(3,789)</b>
Net cash provided by (used in) financing activities from discontinuing operations	(17)	(73)	(72)
<b>Net cash provided by (used in) financing activities</b>	<b>(1,298)</b>	<b>1,703</b>	<b>(3,861)</b>
<b>Increase (decrease) in cash and cash equivalents</b>			
	<b>585</b>	<b>35</b>	<b>(1,022)</b>
Cash and cash equivalents in the beginning of the year	3,591	3,974	5,321
Effect of exchange rate changes on cash and cash equivalents	86	(418)	(325)
<b>Cash and cash equivalents at end of the year</b>	<b>4,262</b>	<b>3,591</b>	<b>3,974</b>
<b>Non-cash transactions:</b>			
Additions to property, plant and equipment - capitalized loans and borrowing costs	653	761	588

(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**Consolidated Statement of Financial Position**

In millions of United States dollars

	Notes	December 31, 2016	December 31, 2015
<b>Assets</b>			
<b>Current assets</b>			
Cash and cash equivalents	20	4,262	3,591
Accounts receivable	10	3,663	1,476
Other financial assets	13	363	219
Inventories	11	3,349	3,528
Prepaid income taxes		159	900
Recoverable taxes	12	1,625	1,404
Others		557	311
		<b>13,978</b>	<b>11,429</b>
Non-current assets held for sale	14	8,589	4,044
		<b>22,567</b>	<b>15,473</b>
<b>Non-current assets</b>			
Judicial deposits	28(c)	962	882
Other financial assets	13	628	282
Prepaid income taxes		527	471
Recoverable taxes	12	727	501
Deferred income taxes	8(a)	7,343	7,904
Others		274	613
		<b>10,461</b>	<b>10,653</b>
Investments in associates and joint ventures	15	3,696	2,940
Intangibles	17	6,871	5,324
Property, plant and equipment	18	55,419	54,102
		<b>76,447</b>	<b>73,019</b>
<b>Total assets</b>		<b>99,014</b>	<b>88,492</b>
<b>Liabilities</b>			
<b>Current liabilities</b>			
Suppliers and contractors		3,630	3,365
Loans and borrowings	20	1,660	2,506
Other financial liabilities	13	1,086	2,551
Taxes payable		657	595
Provision for income taxes		171	241
Liabilities related to associates and joint ventures	21	292	
Provisions	26	952	540
Dividends and interest on capital		798	
Others		896	640
		<b>10,142</b>	<b>10,438</b>
Liabilities associated with non-current assets held for sale	14	1,090	107

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		<b>11,232</b>	<b>10,545</b>
<b>Non-current liabilities</b>			
Loans and borrowings	20	27,662	26,347
Other financial liabilities	13	2,127	2,125
Taxes payable		4,961	4,085
Deferred income taxes	8(a)	1,700	1,670
Provisions	26	5,748	5,309
Liabilities related to associates and joint ventures	21	785	
Deferred revenue - Gold stream	7	2,090	1,749
Others		1,685	958
		<b>46,758</b>	<b>42,243</b>
<b>Total liabilities</b>		<b>57,990</b>	<b>52,788</b>
<b>Stockholders equity</b>	<b>30</b>		
Equity attributable to Vale's stockholders		39,042	33,589
Equity attributable to noncontrolling interests		1,982	2,115
<b>Total stockholders equity</b>		<b>41,024</b>	<b>35,704</b>
<b>Total liabilities and stockholders equity</b>		<b>99,014</b>	<b>88,492</b>

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



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

In millions of United States dollars

	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 noncontro lling interest
<b>Balance at December 31, 2013</b>	60,578	(152)	(400)	29,566	(4,477)	(1,202)	(20,588)		63,325	1
<b>Net income (loss)</b>								657	657	
<b>Other comprehensive income:</b>										
Retirement benefit obligations						(192)			(192)	
Cash flow hedge						(416)			(416)	
Translation adjustments				(2,237)		97	(2,098)	235	(4,003)	
<b>Transactions with stockholders:</b>										
Dividends and interest on capital of Vale s stockholders								(4,200)	(4,200)	
Dividends of noncontrolling interest										
Acquisitions and disposal of participation of noncontrolling interest			(49)						(49)	
Capitalization of noncontrolling interest advances										
Capitalization of reserves	1,036			(1,036)						
Cancellation of treasury stock				(3,000)	3,000					
Realization of reserves				(3,387)				3,387		
Appropriation to undistributed retained earnings				79				(79)		
<b>Balance at December 31, 2014</b>	61,614	(152)	(449)	19,985	(1,477)	(1,713)	(22,686)		55,122	1
<b>Loss</b>								(12,129)	(12,129)	
<b>Other comprehensive income:</b>										
Retirement benefit obligations						70			70	
Cash flow hedge						447			447	
Available-for-sale financial instruments						1			1	
Translation adjustments				(5,371)		203	(2,665)		(7,833)	
<b>Transactions with stockholders:</b>										
Dividends and interest on capital of Vale s stockholders				(1,500)					(1,500)	
Dividends of noncontrolling interest										
Acquisitions and disposal of participation of noncontrolling interest			(253)				(336)		(589)	1

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Capitalization of noncontrolling interest advances										
Appropriation to undistributed retained earnings				(12,129)				12,129		
<b>Balance at December 31, 2015</b>	<b>61,614</b>	<b>(152)</b>	<b>(702)</b>	<b>985</b>	<b>(1,477)</b>	<b>(992)</b>	<b>(25,687)</b>		<b>33,589</b>	<b>2</b>
<b>Net income (loss)</b>								<b>3,982</b>	<b>3,982</b>	
<b>Other comprehensive income:</b>										
Retirement benefit obligations						(70)			(70)	
Cash flow hedge						7			7	
Available-for-sale financial instruments						1			1	
Translation adjustments				195		(93)	2,387	102	2,591	
<b>Transactions with stockholders:</b>										
Dividends and interest on capital of Vale's stockholders								(1,061)	(1,061)	
Dividends of noncontrolling interest										
Acquisitions and disposal of participation of noncontrolling interest				3					3	
Capitalization of noncontrolling interest advances										
Appropriation to undistributed retained earnings				3,023				(3,023)		
<b>Balance at December 31, 2016</b>	<b>61,614</b>	<b>(152)</b>	<b>(699)</b>	<b>4,203</b>	<b>(1,477)</b>	<b>(1,147)</b>	<b>(23,300)</b>		<b>39,042</b>	<b>1</b>

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

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**Notes to the Financial Statements**

**Expressed in millions of United States dollar, 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 financial statements of the Company (financial statements) present the accounts of the Group and have been prepared in accordance with the International Financial Reporting Standards (IFRS) as issued by the *International Accounting Standards Board* (IASB).

**b) Basis of presentation**

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 in associates and joint ventures**

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.

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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 Caledonie 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>					
Compañía 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 United States dollar ( USD or US\$ ) as the Company believes that this is how international investors analyze the financial statements.

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
Brazilian Reais ( R\$ )	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

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**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
3(c)	Consolidation
7	Deferred revenue - Gold stream
8	Deferred income taxes
18	Mineral reserves and mine useful life
19	Impairment of non-current assets
21	Liabilities related to associates and joint ventures
24	Fair values of derivatives and others financial instruments
27	Asset retirement obligation
28	Litigation
29	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	15,784	(6,622)	(486)	(91)	(150)	10	8,445
Pellets	3,827	(2,002)	(73)	(13)	(22)	103	1,820
Ferroalloys and manganese	302	(231)	(4)		(11)		56
Other ferrous products and services	438	(269)	(8)	(2)	(4)		155
	<b>20,351</b>	<b>(9,124)</b>	<b>(571)</b>	<b>(106)</b>	<b>(187)</b>	<b>113</b>	<b>10,476</b>
<b>Coal</b>	<b>839</b>	<b>(872)</b>	<b>35</b>	<b>(15)</b>	<b>(41)</b>		<b>(54)</b>
<b>Base metals</b>							
Nickel and other products	4,472	(3,204)	(95)	(78)	(114)	4	985
Copper	1,667	(924)	(25)	(5)			713
Other base metals products			150				150
	<b>6,139</b>	<b>(4,128)</b>	<b>30</b>	<b>(83)</b>	<b>(114)</b>	<b>4</b>	<b>1,848</b>
<b>Others</b>	<b>159</b>	<b>(259)</b>	<b>(157)</b>	<b>(116)</b>	<b>(1)</b>	<b>76</b>	<b>(298)</b>
<b>Total of continuing operations</b>	<b>27,488</b>	<b>(14,383)</b>	<b>(663)</b>	<b>(320)</b>	<b>(343)</b>	<b>193</b>	<b>11,972</b>
<b>Discontinued operations (Fertilizers)</b>	<b>1,875</b>	<b>(1,545)</b>	<b>(87)</b>	<b>(22)</b>	<b>(16)</b>	<b>4</b>	<b>209</b>
<b>Total</b>	<b>29,363</b>	<b>(15,928)</b>	<b>(750)</b>	<b>(342)</b>	<b>(359)</b>	<b>197</b>	<b>12,181</b>



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	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	12,330	(7,604)	(398)	(121)	(124)	22	4,105
Pellets	3,600	(2,121)	9	(4)	(24)	225	1,685
Ferroalloys and manganese	162	(175)	1		(19)		(31)
Other ferrous products and services	470	(341)	8	(3)	(2)	8	140
	<b>16,562</b>	<b>(10,241)</b>	<b>(380)</b>	<b>(128)</b>	<b>(169)</b>	<b>255</b>	<b>5,899</b>
<b>Coal</b>	<b>526</b>	<b>(839)</b>	<b>(140)</b>	<b>(22)</b>	<b>(61)</b>	<b>28</b>	<b>(508)</b>
<b>Base metals</b>							
Nickel and other products	4,693	(3,393)	(154)	(103)	(411)		632
Copper	1,470	(903)	(32)	(8)	(1)		526
Other base metals products			230				230
	<b>6,163</b>	<b>(4,296)</b>	<b>44</b>	<b>(111)</b>	<b>(412)</b>		<b>1,388</b>
<b>Others</b>	<b>133</b>	<b>(139)</b>	<b>(160)</b>	<b>(134)</b>		<b>35</b>	<b>(265)</b>
<b>Total of continuing operations</b>	<b>23,384</b>	<b>(15,515)</b>	<b>(636)</b>	<b>(395)</b>	<b>(642)</b>	<b>318</b>	<b>6,514</b>
<b>Discontinued operations (Fertilizers)</b>	<b>2,225</b>	<b>(1,469)</b>	<b>(37)</b>	<b>(82)</b>	<b>(70)</b>		<b>567</b>
<b>Total</b>	<b>25,609</b>	<b>(16,984)</b>	<b>(673)</b>	<b>(477)</b>	<b>(712)</b>	<b>318</b>	<b>7,081</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	19,301	(9,532)	(1,258)	(319)	(160)	44	8,076
Pellets	5,263	(2,705)	(21)		(38)	482	2,981
Ferroalloys and	392	(261)	(13)		(23)		95

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manganese							
Other ferrous							
products and							
services	741	(565)	3	(10)			169
	<b>25,697</b>	<b>(13,063)</b>	<b>(1,289)</b>	<b>(329)</b>	<b>(221)</b>	<b>526</b>	<b>11,321</b>
<b>Coal</b>	<b>739</b>	<b>(1,071)</b>	<b>(309)</b>	<b>(18)</b>	<b>(38)</b>	<b>28</b>	<b>(669)</b>
<b>Base metals</b>							
Nickel and							
other							
products	6,241	(3,710)	101	(138)	(514)		1,980
Copper	1,451	(877)	(12)	(5)	(16)		541
	<b>7,692</b>	<b>(4,587)</b>	<b>89</b>	<b>(143)</b>	<b>(530)</b>		<b>2,521</b>
<b>Others</b>	<b>996</b>	<b>(601)</b>	<b>(329)</b>	<b>(172)</b>	<b>(6)</b>	<b>14</b>	<b>(98)</b>
<b>Total of</b>							
<b>continuing</b>							
<b>operations</b>	<b>35,124</b>	<b>(19,322)</b>	<b>(1,838)</b>	<b>(662)</b>	<b>(795)</b>	<b>568</b>	<b>13,075</b>
<b>Discontinued</b>							
<b>operations</b>							
<b>(Fertilizers)</b>	<b>2,415</b>	<b>(1,885)</b>	<b>(95)</b>	<b>(72)</b>	<b>(85)</b>		<b>278</b>
<b>Total</b>	<b>37,539</b>	<b>(21,207)</b>	<b>(1,933)</b>	<b>(734)</b>	<b>(880)</b>	<b>568</b>	<b>13,353</b>

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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>11,972</b>	<b>6,514</b>	<b>13,075</b>
Depreciation, depletion and amortization	(3,487)	(3,719)	(3,869)
Dividends received from associates and joint ventures	(193)	(318)	(568)
Results on measurement or sale of non-current assets	(66)	61	(167)
Impairment of non-current assets and onerous contracts	(1,174)	(8,769)	(99)
<b>Operating income (loss)</b>	<b>7,052</b>	<b>(6,231)</b>	<b>8,372</b>
Financial results, net	1,843	(10,654)	(6,018)
Equity results in associates and joint ventures	309	(445)	501
Impairment and others results in associates and joint ventures	(1,220)	(349)	(61)
Income taxes	(2,781)	5,249	(1,603)
<b>Income (loss) from continuing operations</b>	<b>5,203</b>	<b>(12,430)</b>	<b>1,191</b>
Loss attributable to noncontrolling interests	(8)	(501)	(308)
<b>Income (loss) attributable to Vale's stockholders</b>	<b>5,211</b>	<b>(11,929)</b>	<b>1,499</b>

	Year ended December 31		
	2016	2015	2014
<b>Adjusted EBITDA from discontinued operations</b>	<b>209</b>	<b>567</b>	<b>278</b>
Depreciation, depletion and amortization	(347)	(310)	(418)
Dividends received from associates and joint ventures	(4)		
Results on measurement or sale of non-current assets	(1,738)	(157)	(1,054)
<b>Operating income (loss)</b>	<b>(1,880)</b>	<b>100</b>	<b>(1,194)</b>
Financial results, net	20	(147)	(51)
Equity results in associates and joint ventures	3	6	4
Income taxes	630	(149)	403
<b>Loss from discontinued operations</b>	<b>(1,227)</b>	<b>(190)</b>	<b>(838)</b>
Income attributable to noncontrolling interests	2	10	4
<b>Loss attributable to Vale's stockholders</b>	<b>(1,229)</b>	<b>(200)</b>	<b>(842)</b>

## b) Assets by segment

	Year ended December 31, 2016				
	Product inventory	Investments in associates and joint ventures	Property, plant and equipment and intangible assets (i)	Additions to property, plant and equipment and intangible (ii)	Depreciation, depletion and amortization (iii)
Ferrous minerals	1,134	1,808	34,834	3,246	1,618
Coal	126	285	1,907	612	191

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Base metals	1,110	12	23,372	1,057	1,658
Others	3	1,591	2,177	36	20
<b>Total</b>	<b>2,373</b>	<b>3,696</b>	<b>62,290</b>	<b>4,951</b>	<b>3,487</b>

Year ended December 31, 2015

	Product inventory	Investments in associates and joint ventures	Property, plant and equipment and intangible assets (i)	Additions to property, plant and equipment and intangible (ii)	Depreciation, depletion and amortization (iii)
Ferrous minerals	1,036	1,479	28,202	4,941	1,669
Coal	53	306	1,812	1,539	192
Base metals	1,166	17	23,522	1,555	1,841
Others	3	1,063	2,024	79	17
Discontinued operations (Fertilizers)	295	75	3,866	257	310
<b>Total</b>	<b>2,553</b>	<b>2,940</b>	<b>59,426</b>	<b>8,371</b>	<b>4,029</b>

(i) Goodwill is allocated mainly in iron ore and nickel segments in the amount of US\$1,246 e US\$1,835, respectively.

(ii) Includes only cash effect.

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



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**c) Investment in associates and joint ventures, intangible and property, plant and equipment by geographic area**

	December 31, 2016				December 31, 2015			
	Investments in associates and joint ventures	Intangible	Property, plant and equipment	Total	Investments in associates and joint ventures	Intangible	Property, plant and equipment	Total
Brazil	3,172	4,720	34,509	42,401	2,408	3,285	32,190	37,883
Canada		2,002	10,267	12,269	2	2,039	10,589	12,630
Americas, except Brazil and Canada	185		30	215	157		456	613
Europe			639	639			608	608
Asia	339		4,173	4,512	367		5,219	5,586
Australia			43	43			74	74
New Caledonia			3,087	3,087			3,521	3,521
Mozambique		149	1,715	1,864			442	442
Oman			956	956			1,003	1,003
Other regions					6			6
<b>Total</b>	<b>3,696</b>	<b>6,871</b>	<b>55,419</b>	<b>65,986</b>	<b>2,940</b>	<b>5,324</b>	<b>54,102</b>	<b>62,366</b>

**d) Revenues by geographic area**

	Year ended December 31, 2016				
	Ferrous minerals	Coal	Base metals	Others	Total
Americas, except United States and Brazil	334	20	1,172		1,526
United States of America	232		749	24	1,005
Europe	2,559	218	1,854	17	4,648
Middle East/Africa/Oceania	1,252	95	20		1,367
Japan	1,292	121	328		1,741
China	11,985	63	699		12,747
Asia, except Japan and China	912	305	1,173		2,390
Brazil	1,785	17	144	118	2,064
<b>Net operating revenue</b>	<b>20,351</b>	<b>839</b>	<b>6,139</b>	<b>159</b>	<b>27,488</b>

	Year ended December 31, 2015				
	Ferrous minerals	Coal	Base metals	Others	Total
Americas, except United States and Brazil	359	18	1,122		1,499

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United States of America	30		804	21	855
Europe	2,506	102	1,921		4,529
Middle East/Africa/Oceania	1,009	97	84		1,190
Japan	1,512	74	373		1,959
China	8,400	44	651		9,095
Asia, except Japan and China	1,081	169	990		2,240
Brazil	1,665	22	218	112	2,017
<b>Net operating revenue</b>	<b>16,562</b>	<b>526</b>	<b>6,163</b>	<b>133</b>	<b>23,384</b>

	Year ended December 31, 2014				Total
	Ferrous minerals	Coal	Base metals	Others	
Americas, except United States and Brazil	652	3	1,373	21	2,049
United States of America	24		1,099	245	1,368
Europe	3,894	115	2,586	13	6,608
Middle East/Africa/Oceania	1,608	110	149		1,867
Japan	2,566	192	863	6	3,627
China	11,939	76	642		12,657
Asia, except Japan and China	2,189	235	828		3,252
Brazil	2,825	8	152	711	3,696
<b>Net operating revenue</b>	<b>25,697</b>	<b>739</b>	<b>7,692</b>	<b>996</b>	<b>35,124</b>

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**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, US\$412 of revenues (2015: US\$(274)) 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		
	2016	2015	2014

Samarco Provision	(1,109)		
Results on measurement of non-current assets - Fertilizers business	(1,738)		
Impairment of non-current assets and onerous contracts	(1,174)	(8,769)	(99)
Gold stream transaction	150	230	
Deferred income tax in foreign jurisdiction		2,952	
<b>Total</b>	<b>(3,871)</b>	<b>(5,587)</b>	<b>(99)</b>

**2016**

**Samarco** In June 2016, the Company recognized in the income statement the amount of US\$1,038 (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 US\$71 (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 US\$1,738 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 US\$1,174 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 US\$150, see note 7.

**2015**

**Impairment of non-current assets and onerous contracts** In 2015, the Company recognized an impairment loss of US\$8,769 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.

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**Gold stream transaction** In 2015, the Company recognized a gain of the result on sale of mineral rights in the amount of US\$230, 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 US\$2,952, see note 8.

## 5. Costs and expenses by nature

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

	2016	Year ended December 31 2015	2014
Personnel	2,087	2,092	2,756
Materials and services	3,108	2,954	4,306
Fuel oil and gas	1,233	1,207	1,461
Maintenance	2,747	2,518	2,353
Energy	694	482	497
Acquisition of products	511	829	1,607
Depreciation and depletion	3,267	3,236	3,468
Freight	2,509	3,496	3,592
Others	1,494	1,937	2,750
<b>Total</b>	<b>17,650</b>	<b>18,751</b>	<b>22,790</b>
Cost of goods sold	17,148	18,233	21,839
Cost of services rendered	502	518	951
<b>Total of continuing operations</b>	<b>17,650</b>	<b>18,751</b>	<b>22,790</b>
Discontinued operations (Fertilizers)	1,887	1,762	2,274
<b>Total</b>	<b>19,537</b>	<b>20,513</b>	<b>25,064</b>

### b) Selling and administrative expenses

Year ended December 31

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	2016	2015	2014
Personnel	209	253	415
Services	72	106	187
Advertising and publicity	8	11	40
Depreciation and amortization	120	131	220
Travel expenses	8	11	23
Taxes and rents	13	16	27
Others	77	84	124
<b>Total of continuing operations</b>	<b>507</b>	<b>612</b>	<b>1,036</b>
Discontinued operations (Fertilizers)	56	40	63
<b>Total</b>	<b>563</b>	<b>652</b>	<b>1,099</b>

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

	Year ended December 31		
	2016	2015	2014
Provision for litigation	137	11	169
Provision for loss with VAT credits (ICMS)	41	194	116
Profit sharing program	76	15	121
Disposal of materials and inventories	(91)	193	187
Gold stream transaction (note 7)	(150)	(230)	
Others	254	24	430
<b>Total of continuing operations</b>	<b>267</b>	<b>207</b>	<b>1,023</b>
Discontinued operations (Fertilizers)	34	(1)	34
<b>Total</b>	<b>301</b>	<b>206</b>	<b>1,057</b>

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	Year ended December 31		
<b>Financial expenses</b>			
Loans and borrowings gross interest	(1,768)	(1,647)	(1,727)
Capitalized loans and borrowing costs	653	761	588
Labor, tax and civil lawsuits	(10)	(59)	(91)
Derivative financial instruments	(484)	(3,553)	(1,974)
Indexation and exchange rate variation (a)	(2,964)	(13,825)	(4,848)
Participative stockholders debentures	(417)	965	(315)
Expenses of REFIS	(514)	(547)	(683)
Others	(621)	(541)	(672)
	<b>(6,125)</b>	<b>(18,446)</b>	<b>(9,722)</b>
<b>Financial income</b>			
Short-term investments	92	140	181
Derivative financial instruments	1,740	1,076	640
Indexation and exchange rate variation (b)	6,058	6,465	2,675
Others	78	111	208
	<b>7,968</b>	<b>7,792</b>	<b>3,704</b>
<b>Financial results, net</b>	<b>1,843</b>	<b>(10,654)</b>	<b>(6,018)</b>
<b>Summary of indexation and exchange rate variation</b>			
Loans and borrowings	5,099	(10,460)	(3,250)
Others	(2,005)	3,100	1,077
<b>Net (a) + (b)</b>	<b>3,094</b>	<b>(7,360)</b>	<b>(2,173)</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 and EUR1,500 (US\$1,583) 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 same 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**

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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 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 US\$900 and in the second additive, (i) an initial cash payment of US\$800 and (ii) an option value resulting from the reduction of the exercise price from US\$65.00 to 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.



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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 US\$209, US\$106 and US\$64, 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 US\$150 and US\$230 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**

	December 31, 2016	December 31, 2015
<b>Taxes losses carryforward</b>	<b>6,194</b>	<b>6,446</b>
<b>Temporary differences:</b>		
Employee post retirement obligations	620	587
Provision for litigation	215	228
Provision for assets losses	1,264	692
Fair value of financial instruments	167	823
Allocated goodwill	(2,247)	(2,272)
Others	(570)	(270)

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	(551)	(212)
<b>Total</b>	<b>5,643</b>	<b>6,234</b>
Assets	7,343	7,904
Liabilities	(1,700)	(1,670)
	<b>5,643</b>	<b>6,234</b>

Changes in deferred tax are as follows:

	Assets	Liabilities	Total
<b>Balance at December 31, 2014</b>	<b>3,976</b>	<b>3,341</b>	<b>635</b>
Taxes losses carryforward	4,631	(36)	4,667
Provision for assets losses	(82)	(25)	(57)
Fair value of financial instruments	(96)		(96)
Allocated goodwill		(1,271)	1,271
Others	(181)	23	(204)
<b>Effect in income statement</b>	<b>4,272</b>	<b>(1,309)</b>	<b>5,581</b>
Transfers between asset and liabilities	142	142	
Translation adjustment	(1,297)	(518)	(779)
Other comprehensive income	914	14	900
Acquisition of subsidiary	(11)		(11)
<b>Effect of discontinued operations</b>			
Income tax	(92)		(92)
<b>Balance at December 31, 2015</b>	<b>7,904</b>	<b>1,670</b>	<b>6,234</b>
Taxes losses carryforward	(1,307)	84	(1,391)
Provision for assets losses	342	44	298
Fair value of financial instruments	(802)		(802)
Allocated goodwill		(342)	342
Others	(258)	27	(285)
<b>Effect in income statement</b>	<b>(2,025)</b>	<b>(187)</b>	<b>(1,838)</b>
Transfers between asset and liabilities	167	167	
Translation adjustment	900	36	864
Other comprehensive income	(19)	14	(33)
<b>Effect of discontinued operations</b>			
Income tax	627		627
Transfer to net assets held for sale	(211)		(211)
<b>Balance at December 31, 2016</b>	<b>7,343</b>	<b>1,700</b>	<b>5,643</b>

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**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 US\$2,952.

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		
	2016	2015	2014
<b>Net income (loss) before income taxes</b>	<b>7,984</b>	<b>(17,679)</b>	<b>2,794</b>
<b>Income taxes at statutory rates - 34%</b>	<b>(2,715)</b>	<b>6,011</b>	<b>(950)</b>
<b>Adjustments that affect the basis of taxes:</b>			
Income tax benefit from interest on stockholders' equity	87	356	1,123
Tax incentives	344	61	95
Results of overseas companies taxed by different rates which differs from the parent company rate			(1,184)
Equity results	108	(151)	171
Additions (reversals) of tax loss carryforward	(273)	1,498	(178)

Unrecognized tax losses of the year	(708)	(901)	
Nondeductible effect of impairment	(97)	(1,865)	(450)
Others	473	240	(230)
<b>Income taxes</b>	<b>(2,781)</b>	<b>5,249</b>	<b>(1,603)</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 US\$5,419 (US\$458 as current and US\$4,961 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 US\$4,430 (US\$345 as current and US\$4,085 as non-current) was due in 154 remaining monthly installments.

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**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	1,990	(4,555)	572
Income (loss) available to common stockholders	3,221	(7,374)	927
<b>Total</b>	<b>5,211</b>	<b>(11,929)</b>	<b>1,499</b>

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

Loss available to preferred stockholders	(469)	(76)	(322)
Loss available to common stockholders	(760)	(124)	(520)
<b>Total</b>	<b>(1,229)</b>	<b>(200)</b>	<b>(842)</b>

**Basic and diluted earnings per share:**

Income (loss) available to preferred stockholders	1,521	(4,631)	250
Income (loss) available to common stockholders	2,461	(7,498)	407
<b>Total</b>	<b>3,982</b>	<b>(12,129)</b>	<b>657</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 (US\$)	1.01	(2.31)	0.29
Common share (US\$)	1.01	(2.31)	0.29

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

Preferred share (US\$)	(0.24)	(0.04)	(0.16)
Common share (US\$)	(0.24)	(0.04)	(0.16)

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

Preferred share (US\$)	0.77	(2.35)	0.13
Common share (US\$)	0.77	(2.35)	0.13

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**

	December 31, 2016	December 31, 2015
Trade receivables	3,723	1,534
Impairment of trade receivables	(60)	(58)
	<b>3,663</b>	<b>1,476</b>
Trade receivables related to the steel sector - %	83.44%	75.32%

	Year ended December 31		
	2016	2015	2014
Impairment of trade receivables recorded in the income statement	(5)	11	(13)

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**

	December 31, 2016	December 31, 2015
Product inventory	2,572	3,071
Impairment of product inventory	(199)	(518)
	<b>2,373</b>	<b>2,553</b>
Consumable inventory	976	975
<b>Total</b>	<b>3,349</b>	<b>3,528</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.

	December 31, 2016	December 31, 2015
Value-added tax	724	755
Brazilian federal contributions	1,599	1,125
Others	29	25
<b>Total</b>	<b>2,352</b>	<b>1,905</b>
Current	1,625	1,404
Non-current	727	501
<b>Total</b>	<b>2,352</b>	<b>1,905</b>

**13. Other financial assets and liabilities**

	December 31, 2016	Current December 31, 2015	December 31, 2016	Non-Current December 31, 2015
<b>Others financial assets</b>				
Financial investments	18	28		
Loans			180	188
Derivative financial instruments (note 25)	274	121	446	93
Related parties (note 31)	71	70	2	1
	<b>363</b>	<b>219</b>	<b>628</b>	<b>282</b>
<b>Others financial liabilities</b>				
Derivative financial instruments (note 25)	414	2,076	1,225	1,570
Related parties (note 31)	672	475	127	213
Participative stockholders debentures (note 32(b))			775	342
	<b>1,086</b>	<b>2,551</b>	<b>2,127</b>	<b>2,125</b>

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

	December 31, 2016			December 31, 2015	
Fertilizers assets (Discontinued operations) (i)	Nacala	Shipping assets	Total	Nacala	

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<b>Assets</b>					
Accounts receivable	86	6		92	3
Inventories	387	2		389	
Other current assets	107	114		221	134
Investments in associates and joint ventures	90			90	
Property, plant and equipment and Intangible, net	2,694	4,064	357	7,115	3,907
Other non-current assets	679	3		682	
<b>Total assets</b>	<b>4,043</b>	<b>4,189</b>	<b>357</b>	<b>8,589</b>	<b>4,044</b>
<b>Liabilities</b>					
Suppliers and contractors	280	41		321	93
Other current liabilities	192	13		205	6
Other non-current liabilities	559	5		564	8
<b>Total liabilities</b>	<b>1,031</b>	<b>59</b>		<b>1,090</b>	<b>107</b>
<b>Net non-current assets held for sale</b>	<b>3,012</b>	<b>4,130</b>	<b>357</b>	<b>7,499</b>	<b>3,937</b>

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(i) Include the nitrogen assets (US\$382) and not include the noncontrolling interest (US\$234 note 16).

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**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 Compañia Minera 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 US\$2.5 billion, of which US\$1.25 billion will be paid in cash and 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 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 US\$1,738 (US\$1,147 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 US\$75 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 US\$131, a gain of US\$106 and a loss of US\$9, respectively.

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

	Year ended December 31		
	2016	2015	2014
<b>Net income of discontinued operations</b>			
Net operating revenue	1,875	2,225	2,415
Cost of goods sold and services rendered	(1,887)	(1,762)	(2,274)
Operating expenses	(130)	(206)	(282)
Results on measurement or sale of non-current assets	(1,738)	(157)	(1,053)
<b>Operating income (loss)</b>	<b>(1,880)</b>	<b>100</b>	<b>(1,194)</b>
Financial Results, net	20	(147)	(51)
Equity results in associates and joint ventures	3	6	4
<b>Loss before income taxes</b>	<b>(1,857)</b>	<b>(41)</b>	<b>(1,241)</b>
Income taxes	630	(149)	403
<b>Loss from discontinued operations</b>	<b>(1,227)</b>	<b>(190)</b>	<b>(838)</b>
Income attributable to noncontrolling interests	2	10	4
<b>Loss attributable to Vale's stockholders</b>	<b>(1,229)</b>	<b>(200)</b>	<b>(842)</b>

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	Year ended December 31		
	2016	2015	2014
<b>Cash flow from discontinued operations</b>			
<b>Operating activities</b>			
Loss before income taxes	(1,857)	(41)	(1,241)
Adjustments:			
Equity results in associates and joint ventures	(3)	(6)	(4)
Depreciation, amortization and depletion	347	310	419
Results on measurement or sale of non-current assets	1,738	157	1,053
Others	(20)	148	51
Decrease in assets and liabilities	(25)	(9)	(266)
<b>Net cash provided by operating activities</b>	<b>180</b>	<b>559</b>	<b>12</b>
<b>Investing activities</b>			
Additions to property, plant and equipment	(292)	(257)	(36)
Others	11	(89)	55
<b>Net cash provided (used) in investing activities</b>	<b>(281)</b>	<b>(346)</b>	<b>19</b>
<b>Financing activities</b>			
Repayments	(17)	(73)	(72)
<b>Net cash used in financing activities</b>	<b>(17)</b>	<b>(73)</b>	<b>(72)</b>
<b>Net cash provided (used) by discontinued operations</b>	<b>(118)</b>	<b>140</b>	<b>(41)</b>

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

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 US\$450, being: (i) US\$255 for a 15% of Vale's stake in the Moatize coal mine; and (ii) an additional contribution of up to US\$195 based on meeting certain conditions, including mine performance. Mitsui will also contribute US\$348 for a 50% stake in the equity and *quasi-equity* instruments of the Nacala and extend a long-term facility of 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 US\$66 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 US\$269 and four Capesize vessels for US\$140. There are four vessels that are still held for sale as at December 31, 2016.

**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.

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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 in associates and joint ventures

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

(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.

a) Changes during the year

Changes in investments in associates and joint ventures as follows:

	Associates	2016 Joint ventures	Total	Associates	2015 Joint ventures	Total
<b>Balance at January 1st,</b>	<b>1,323</b>	<b>1,617</b>	<b>2,940</b>	<b>2,059</b>	<b>2,074</b>	<b>4,133</b>
Acquisitions				4	580	584
Additions	1	238	239		30	30
Capitalizations				249		249
Disposals	(7)		(7)	79		79
Translation adjustment	175	338	513	(558)	(653)	(1,211)
Equity results in income statement	69	240	309	(137)	(308)	(445)
Equity results from discontinued operations	3		3	6		6
Equity results in statement of comprehensive income				(6)		(6)
Dividends declared	(37)	(165)	(202)	(59)	(36)	(95)
Impairment (note 19)				(314)	(132)	(446)
Transfer to held for sale	(90)		(90)			
Others		(9)	(9)		62	62
<b>Balance at December 31,</b>	<b>1,437</b>	<b>2,259</b>	<b>3,696</b>	<b>1,323</b>	<b>1,617</b>	<b>2,940</b>

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



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**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 US\$75 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 US\$17. 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 US\$97 and recognized a gain of US\$18 as Impairment and others results in associates and joint ventures and a gain of US\$193 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 US\$79 as Impairment and others results in associates and joint ventures .

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

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	Year ended December 31		
	2016	2015	2014
Samarco provision (note 21)	(1,109)		
Divestiture - Thyssenkrupp Companhia Siderúrgica do Atlântico Ltd	(75)		
Divestiture - Paragominas (i)	(36)		
Divestiture - Shandong Yankuang International Coking Co., Ltd.		79	
Energy generation assets		18	
Divestiture - Vale Florestar Fundo de Investimento em Participações			(30)
Impairment of investments (note 19)		(446)	(31)
<b>Total</b>	<b>(1,220)</b>	<b>(349)</b>	<b>(61)</b>

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(i) Mineração Paragominas shares were sold in 2011 and an accounts receivable of US\$149 were outstanding. In December, 2016, the Company received US\$113 and a loss of US\$36 was recognized.

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Associates and joint ventures	% ownership	% voting capital	Investments in associates and joint ventures		Equity results in the income statement			Dividends received		
			December 31, 2016	December 31, 2015	Year ended December 31 2016	Year ended December 31 2015	Year ended December 31 2016	Year ended December 31 2015	Year ended December 31 2014	
<b>Ferrous minerals</b>										
Baovale Mineração S.A.	50.00	50.00	26	24	9		4			
Companhia Coreano-Brasileira de Pelotização	50.00	50.00	68	62	17	25	30	26	19	16
Companhia Hispano-Brasileira de Pelotização										
	50.89	51.00	59	57	15	14	24	27	16	11
Companhia Ítalo-Brasileira de Pelotização	50.90	51.00	69	50	16	21	25	9	14	5
Companhia Nipo-Brasileira de Pelotização	51.00	51.11	108	104	29	46	66	41	30	48
MRS Logística S.A.	48.16	46.75	488	368	57	43	76	10	22	44
Samarco Mineração S.A. (i)	50.00	50.00				(167)	392		146	401
VLI S.A.	37.60	37.60	969	778	36	46	48		8	
Zhuhai YPM Pellet Co.	25.00	25.00	21	23						
Others				13		(2)				1
			<b>1,808</b>	<b>1,479</b>	<b>179</b>	<b>26</b>	<b>665</b>	<b>113</b>	<b>255</b>	<b>526</b>
<b>Coal</b>										
Henan Longyu Energy Resources Co., Ltd.										
	25.00	25.00	285	306	(4)	(3)	32		28	28
<b>Base metals</b>										
Korea Nickel Corp.	25.00	25.00	12	17	(1)	(3)		4		
Teal Minerals Inc.	50.00	50.00			(3)	(129)	(35)			
			<b>12</b>	<b>17</b>	<b>(4)</b>	<b>(132)</b>	<b>(35)</b>	<b>4</b>		
<b>Others</b>										
Aliança Geração de Energia S.A.	55.00	55.00	582	481	46	50		39	30	
Aliança Norte Energia Participações S.A.	51.00	51.00	148	81	(6)	1				
California Steel Industries, Inc.	50.00	50.00	185	157	33	(27)	12	4		6
Companhia Siderúrgica do Pecém	50.00	50.00	527	225	25	(307)	(44)			
Mineração Rio Grande do Norte S.A.	40.00	40.00	129	93	48	40	7	32	3	8
Thyssenkrupp Companhia Siderúrgica do Atlântico Ltd.										
						(80)	(60)			
Others			20	101	(8)	(13)	(76)	1	2	
			<b>1,591</b>	<b>1,138</b>	<b>138</b>	<b>(336)</b>	<b>(161)</b>	<b>76</b>	<b>35</b>	<b>14</b>

<b>Total</b>	<b>3,696</b>	<b>2,940</b>	<b>309</b>	<b>(445)</b>	<b>501</b>	<b>193</b>	<b>318</b>	<b>568</b>
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(i) Note 21

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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	115	743	392	233	903	389
Non-current assets	1,208	3,809	318	2,091	456	4,169
<b>Total assets</b>	<b>1,323</b>	<b>4,552</b>	<b>710</b>	<b>2,324</b>	<b>1,359</b>	<b>4,558</b>
Current liabilities	165	664	109	433	200	677
Non-current liabilities	100	2,835	3	877	19	1,304
<b>Total liabilities</b>	<b>265</b>	<b>3,499</b>	<b>112</b>	<b>1,310</b>	<b>219</b>	<b>1,981</b>
<b>Stockholders equity</b>	<b>1,058</b>	<b>1,053</b>	<b>598</b>	<b>1,014</b>	<b>1,140</b>	<b>2,577</b>
<b>Net income (loss)</b>	<b>84</b>	<b>49</b>	<b>152</b>	<b>119</b>	<b>(17)</b>	<b>95</b>

	December 31, 2015					
	Aliança Geração de Energia	Joint ventures			Associates	
		CSP	Pelletizing (i)	MRS Logística	Henan Longyu	VLI S.A.
Current assets	65	265	350	324	883	503
Non-current assets	915	3,057	313	1,709	529	2,970
<b>Total assets</b>	<b>980</b>	<b>3,322</b>	<b>663</b>	<b>2,033</b>	<b>1,412</b>	<b>3,473</b>
Current liabilities	35	528	118	392	108	511
Non-current liabilities	71	2,344	9	877	80	893
<b>Total liabilities</b>	<b>106</b>	<b>2,872</b>	<b>127</b>	<b>1,269</b>	<b>188</b>	<b>1,404</b>
<b>Stockholders equity</b>	<b>874</b>	<b>450</b>	<b>536</b>	<b>764</b>	<b>1,224</b>	<b>2,069</b>
<b>Net income (loss)</b>	<b>91</b>	<b>(615)</b>	<b>208</b>	<b>90</b>	<b>(11)</b>	<b>121</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:

	<b>December 31, 2016</b>						
	<b>MBR</b>	<b>PTVI</b>	<b>VNC</b>	<b>Compañía Mineradora Miski Mayo S.A.C. (i)</b>	<b>Others</b>	<b>Total</b>	
Current assets	583	576	462	107			
Non-current assets	3,182	1,668	2,101	429			
<b>Total assets</b>	<b>3,765</b>	<b>2,244</b>	<b>2,563</b>	<b>536</b>			
Current liabilities	143	145	283	46			
Non-current liabilities	198	261	1,073	99			
<b>Total liabilities</b>	<b>341</b>	<b>406</b>	<b>1,356</b>	<b>145</b>			
Stockholders equity	3,424	1,838	1,207	391			
<b>Equity attributable to noncontrolling interests</b>	<b>1,406</b>	<b>741</b>	<b>40</b>	<b>235</b>	<b>(440)</b>	<b>1,982</b>	
Net income (loss)	400	2	(807)	3			
<b>Income (loss) attributable to noncontrolling interests</b>	<b>165</b>	<b>1</b>	<b>(40)</b>	<b>2</b>	<b>(134)</b>	<b>(6)</b>	
<b>Dividends paid</b>	<b>653</b>			<b>47</b>			

	<b>December 31, 2015</b>						
	<b>MBR</b>	<b>PTVI</b>	<b>VNC</b>	<b>Compañía Mineradora Miski Mayo S.A.C. (i)</b>	<b>Others</b>	<b>Total</b>	
Current assets	743	567	248	137			
Non-current assets	2,912	1,731	2,388	481			
<b>Total assets</b>	<b>3,655</b>	<b>2,298</b>	<b>2,636</b>	<b>618</b>			
Current liabilities	188	151	518	82			
Non-current liabilities	155	309	2,715	101			

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<b>Total liabilities</b>	<b>343</b>	<b>460</b>	<b>3,233</b>	<b>183</b>		
Stockholders' equity	3,312	1,838	(597)	435		
<b>Equity attributable to noncontrolling interests</b>	<b>1,360</b>	<b>741</b>	<b>55</b>	<b>261</b>	<b>(302)</b>	<b>2,115</b>
Net income (loss)	250	36	(1,916)	16		
<b>Income (loss) attributable to noncontrolling interests</b>	<b>66</b>	<b>15</b>	<b>(373)</b>	<b>10</b>	<b>(209)</b>	<b>(491)</b>
<b>Dividends paid</b>	<b>116</b>			<b>67</b>		

	December 31, 2014					
	Compañía Mineradora Miski Mayo S.A.C. (i)					
	MBR	PTVI	VNC		Others	Total
Net income (loss)	145	202	(982)		7	
<b>Income (loss) attributable to noncontrolling interests</b>	<b>3</b>	<b>82</b>	<b>(191)</b>		<b>4</b>	<b>(304)</b>
<b>Dividends paid</b>		41				

(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 US\$1,089. 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	Right of use	Software	Total
<b>Balance at December 31, 2014</b>	<b>3,760</b>	<b>2,213</b>	<b>297</b>	<b>550</b>	<b>6,820</b>
Additions		549		128	677
Disposals		(20)			(20)
Amortization		(150)	(42)	(155)	(347)
Impairment (note 19)	(81)				(81)
Translation adjustment	(762)	(778)	(48)	(176)	(1,764)
Acquisition of subsidiary	39				39
<b>Balance at December 31, 2015</b>	<b>2,956</b>	<b>1,814</b>	<b>207</b>	<b>347</b>	<b>5,324</b>
Cost	2,956	2,588	464	1,025	7,033
Accumulated amortization		(774)	(257)	(678)	(1,709)
<b>Balance at December 31, 2015</b>	<b>2,956</b>	<b>1,814</b>	<b>207</b>	<b>347</b>	<b>5,324</b>
Additions		1,100	1	13	1,114
Disposals		(12)			(12)
Amortization		(248)	(2)	(153)	(403)

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Impairment of discontinued operations (note 14)	(30)				(30)
Translation adjustment	188	570	9	61	828
Transfers		77	(68)	74	83
<b>Effect of discontinued operations</b>					
Transfer to net assets held for sale	(33)				(33)
<b>Balance at December 31, 2016</b>	<b>3,081</b>	<b>3,301</b>	<b>147</b>	<b>342</b>	<b>6,871</b>
Cost	3,081	4,467	222	1,570	9,340
Accumulated amortization		(1,166)	(75)	(1,228)	(2,469)
<b>Balance at December 31, 2016</b>	<b>3,081</b>	<b>3,301</b>	<b>147</b>	<b>342</b>	<b>6,871</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.

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:

	Useful life
Concessions	3 to 50 years
Right of use	22 to 31 years
Software	5 years

Table of Contents**18. Property, plant and equipment**

Changes in property, plant and equipment are as follows:

	Land	Building	Facilities	Equipment	Mineral properties	Others	Constructions in progress	Total
<b>Balance at December 31, 2014</b>	<b>1,069</b>	<b>11,654</b>	<b>10,813</b>	<b>9,287</b>	<b>14,929</b>	<b>10,954</b>	<b>19,416</b>	<b>78,122</b>
Additions (i)							9,499	9,499
Disposals	(3)	(8)	(41)	(81)	(152)	(1,554)	(22)	(1,861)
Assets retirement obligations					(334)			(334)
Depreciation, amortization and depletion		(547)	(713)	(1,066)	(864)	(766)		(3,956)
Transfers to non-current assets held for sale					(127)			(127)
Impairment (note 19)	(13)	(1,828)	(838)	(1,100)	(801)	(1,985)	(1,766)	(8,331)
Impairment of discontinued operations (note 14)					(181)	6	18	(157)
Translation adjustment	(292)	(3,383)	(3,182)	(1,846)	(2,404)	(2,439)	(5,327)	(18,873)
Transfers	5	3,213	2,253	2,112	238	2,871	(10,692)	
Acquisition of subsidiary				1		119		120
<b>Balance at December 31, 2015</b>	<b>766</b>	<b>9,101</b>	<b>8,292</b>	<b>7,307</b>	<b>10,304</b>	<b>7,206</b>	<b>11,126</b>	<b>54,102</b>
Cost	766	13,707	13,152	12,230	17,054	10,617	11,126	78,652
Accumulated depreciation		(4,606)	(4,860)	(4,923)	(6,750)	(3,411)		(24,550)
<b>Balance at December 31, 2015</b>	<b>766</b>	<b>9,101</b>	<b>8,292</b>	<b>7,307</b>	<b>10,304</b>	<b>7,206</b>	<b>11,126</b>	<b>54,102</b>
Additions (i)							5,240	5,240
Disposals	(1)	(8)	(9)	(19)	(125)	(384)	(20)	(566)
Assets retirement obligation					311			311
Depreciation, amortization and depletion		(517)	(705)	(906)	(795)	(631)		(3,554)
Transfers to non-current assets held for sale						(497)		(497)
Impairment (note 19)	(1)	(448)	(175)	(110)	(165)	(88)	70	(917)
Impairment of discontinued operations (note 14)	(53)		(65)		(1,590)			(1,708)
Translation adjustment	111	702	960	639	748	861	1,731	5,752
Transfers	26	2,177	1,253	978	230	1,110	(5,857)	(83)
<b>Effect of discontinued operations</b>								
Transfer to net assets held for sale	(124)	(333)	(80)	(1,095)	(538)	(62)	(429)	(2,661)
<b>Balance at December 31, 2016</b>	<b>724</b>	<b>10,674</b>	<b>9,471</b>	<b>6,794</b>	<b>8,380</b>	<b>7,515</b>	<b>11,861</b>	<b>55,419</b>
Cost	724	16,678	15,664	11,953	16,066	11,319	11,861	84,265
Accumulated depreciation		(6,004)	(6,193)	(5,159)	(7,686)	(3,804)		(28,846)
<b>Balance at December 31, 2016</b>	<b>724</b>	<b>10,674</b>	<b>9,471</b>	<b>6,794</b>	<b>8,380</b>	<b>7,515</b>	<b>11,861</b>	<b>55,419</b>

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

The net book value of property, plant and equipment pledged to secure judicial claims on December 31, 2016 and 2015 were US\$35 and US\$44, 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.

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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.

**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	160	(160)	55	
Coal	Australia	43	27	635	343
Base metals nickel	Newfoundland (VNL)	1,915	631	3,460	
Base metals nickel	Nouvelle Caledonie (VNC)	3,368	284	1,462	238
Base metals nickel	Onça Puma	2,076		(252)	(1,617)
Coal	Mozambique	1,771		2,403	
Iron ore	Midwest system			522	
Iron ore	Simandou Project				1,135
Several segments	Other assets		135	127	
<b>Impairment of non-current assets</b>			<b>917</b>	<b>8,412</b>	<b>99</b>
Onerous contracts			257	357	
<b>Impairment of non-current assets and onerous contracts</b>			<b>1,174</b>	<b>8,769</b>	<b>99</b>
<b>Investments in associates and joint ventures</b>					
Iron ore	Samarco Mineração S.A.			132	
Base metals - Copper	Teal Minerals Inc.			314	
Others	Vale Soluções em Energia S.A.				31
<b>Impairment of investments in associates and joint ventures</b>				<b>446</b>	<b>31</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 US\$160 recorded in 2013 and 2015.

Of the total goodwill (note 17), US\$1,246 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 US\$522 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 US\$1,135 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 US\$27 in 2016 (US\$635 in 2015). The impairment of US\$343 registered in 2014 relates to Integra and Isaac Plans operations which were sold during the fourth quarter of 2015.



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In relation to the coal assets in Mozambique, Vale recognized an impairment loss of US\$2,403 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 US\$631 and US\$284 (US\$3,460 and US\$1,462) in 2016 and 2015 year end, respectively.

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 UGC and considering a discount rate ranging from 6% to 8% per year.

Of the total goodwill (note 17), US\$1,835 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, US\$183 is related to the contracts with minimum guaranteed volume for port structure in the Midwest system and US\$74 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 US\$357 also in the Midwest system.

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

In 2015, the Company recognized an impairment of US\$132 in its investment in Samarco (note 21) and US\$314 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.

**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.**

Table of Contents**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.

	December 31, 2016	December 31, 2015
Debt contracts in the international markets	21,130	21,671
Debt contracts in Brazil	8,192	7,182
<b>Total of loans and borrowings</b>	<b>29,322</b>	<b>28,853</b>
(-) cash and cash equivalents	4,262	3,591
<b>Net debt</b>	<b>25,060</b>	<b>25,262</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 US\$961 denominated in R\$, indexed to the Brazilian Interbank Interest rate ( DI Rate or CDI ), US\$2,899 denominated in US\$, mainly time deposits and US\$402 denominated in other currencies.

**c) Loans and borrowings****(i) Total debt**

	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>				

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US\$	234	241	5,489	5,174
EUR			211	
<b>Fixed rates in:</b>				
US\$		1,191	13,083	12,923
EUR			1,583	1,633
Other currencies	17	14	209	169
<b>Accrued charges</b>	<b>304</b>	<b>326</b>		
	<b>555</b>	<b>1,772</b>	<b>20,575</b>	<b>19,899</b>
<b>Debt contracts in Brazil</b>				
<b>Floating rates in:</b>				
R\$, indexed to TJLP, TR, IPCA, IGP-M and CDI	402	212	5,621	4,709
Basket of currencies and US\$ indexed to LIBOR	343	290	1,217	1,342
<b>Fixed rates in:</b>				
R\$	66	63	216	268
<b>Accrued charges</b>	<b>294</b>	<b>169</b>	<b>33</b>	<b>129</b>
	<b>1,105</b>	<b>734</b>	<b>7,087</b>	<b>6,448</b>
	<b>1,660</b>	<b>2,506</b>	<b>27,662</b>	<b>26,347</b>

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

	Principal			Total	Estimated future interests payments (i)
	Bank loans	Capital markets	Development agencies		
2017	59		1,002	1,061	1,583
2018	1,861	791	1,172	3,824	1,369
2019	1,088	1,000	1,361	3,449	1,211
2020	1,593	1,338	926	3,857	1,010
2021	622	1,342	912	2,876	844
Between 2022 and 2025	1,313	3,292	1,212	5,817	2,299
2026 onwards	81	7,490	236	7,807	5,319
	<b>6,617</b>	<b>15,253</b>	<b>6,821</b>	<b>28,691</b>	<b>13,635</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:

	Average interest rate (i)	Total debt
<b>Loans and borrowings</b>		
<b>Floating rates in:</b>		
US\$	4.92%	20,615
R\$ (ii)	10.94%	6,624
EUR (iii)	3.82%	1,857
Other currencies	3.35%	226
		<b>29,322</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 US\$4,668, 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	3,000	3,000
Revolving credit facilities	US\$	July 2013	5 years	2,000	2,000
<b>Financing lines</b>					
BNDES (i)	R\$	April 2008	10 years	2,249	88
BNDES - CLN 150	R\$	September 2012	10 years	1,196	6
BNDES - S11D e S11D Logística	R\$	May 2014	10 years	1,899	629

(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.

**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 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.

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In February 2017 (subsequent event), the Company issued through Vale Overseas Limited guaranteed notes due August 2026 totaling 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 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 Eur 750 notes (due in March 2018, which is expected to occur during March 2017).



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**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 US\$472 and US\$495, 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.

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

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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 US\$6.2 billion (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: US\$614 (R\$2.0 billion) in 2016, US\$368 (R\$1.2 billion) in 2017 and US\$368 (R\$1.2 billion) in 2018. From 2019 to 2021, annual contributions to the foundation will range from US\$245 (R\$800) to US\$491 (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 US\$74 (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 US\$153 (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.

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**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 US\$1,732 (R\$5,560) which was discounted at a risk-free rate, resulting in US\$1,163 (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) US\$68 (R\$222) was used by Samarco in the reparation programs in accordance with the Framework Agreement, and therefore, applied against the provision of US\$1,163 (R\$3,733) mentioned above; and (ii) US\$71 (R\$234) was applied by Samarco 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 US\$115 (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.

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 US\$71 (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:

**2016**

<b>Balance on January 1,</b>	
Provision recognized	1,163
Payments made	(139)
Discount rate accretion	72
Translation adjustment	(19)
<b>Balance on December 31,</b>	<b>1,077</b>
Current liabilities	292
Non-current liabilities	785
<b>Liabilities</b>	<b>1,077</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.

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.

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The summarized financial information about Samarco are as follows:

	<b>December 31, 2016</b>
Current assets	165
Non-current assets	6,510
<b>Total assets</b>	<b>6,675</b>
Current liabilities	4,853
Non-current liabilities	3,015
<b>Total liabilities</b>	<b>7,868</b>
<b>Stockholders equity</b>	<b>(1,193)</b>
<b>Loss</b>	<b>(769)</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 US\$614 (R\$2.0 billion) to comply with the obligations under the Framework Agreement.

#### **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 US\$6.2 billion (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.

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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 US\$368 (R\$1.2 billion) by January 2017. This US\$368 (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 US\$48 billion (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 US\$6.2 billion (R\$ 20.2 billion)). Both claims were filed with the 12th Judicial Federal Court of Belo Horizonte.

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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 US\$675 (R\$2.2 billion), of which (i) US\$31 (R\$100) in financial investments; ii) US\$399 (R\$1.3 billion) in insurance bonds; and (iii) US\$245 (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 US\$368 (R\$1.2 billion) in relation to the US\$6.2 billion (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 US\$61 (R\$200).

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

*(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 US\$48 billion (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*

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.



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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.

**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.

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.

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**(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.

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**

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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 reais 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.



Table of Contents**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.

**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			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	Derivatives designated as hedge accounting	Total
<b>Financial assets</b>							
<b>Current</b>							
Cash and cash equivalents	4,262		4,262	3,591			3,591

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Financial investments	18		18	28		28
Derivative financial instruments		274	274		121	121
Accounts receivable	3,663		3,663	1,476		1,476
Related parties	71		71	70		70
	<b>8,014</b>	<b>274</b>	<b>8,288</b>	<b>5,165</b>	<b>121</b>	<b>5,286</b>
<b>Non-current</b>						
Derivative financial instruments		446	446		93	93
Loans	180		180	188		188
Related parties	2		2	1		1
	<b>182</b>	<b>446</b>	<b>628</b>	<b>189</b>	<b>93</b>	<b>282</b>
<b>Total of financial assets</b>	<b>8,196</b>	<b>720</b>	<b>8,916</b>	<b>5,354</b>	<b>214</b>	<b>5,568</b>
<b>Financial liabilities</b>						
<b>Current</b>						
Suppliers and contractors	3,630		3,630	3,365		3,365
Derivative financial instruments		414	414		2,023	53
Loans and borrowings	1,660		1,660	2,506		2,506
Related parties	672		672	475		475
	<b>5,962</b>	<b>414</b>	<b>6,376</b>	<b>6,346</b>	<b>2,023</b>	<b>53</b>
<b>Non-current</b>						
Derivative financial instruments		1,225	1,225		1,570	1,570
Loans and borrowings	27,662		27,662	26,347		26,347
Related parties	127		127	213		213
Participative stockholders debentures		775	775		342	342
	<b>27,789</b>	<b>2,000</b>	<b>29,789</b>	<b>26,560</b>	<b>1,912</b>	<b>28,472</b>
<b>Total of financial liabilities</b>	<b>33,751</b>	<b>2,414</b>	<b>36,165</b>	<b>32,906</b>	<b>3,935</b>	<b>53</b>
						<b>36,894</b>

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

	December 31, 2016						Total
	R\$	US\$	CAD	AUD	EUR	Others currencies	
<b>Financial assets</b>							
<b>Current</b>							
Cash and cash equivalents	961	2,899	45	25	56	276	4,262
Financial investments	1	17					18
Derivative financial instruments	104	170					274
Accounts receivable	337	3,310			1	15	3,663
Related parties	71						71
	<b>1,474</b>	<b>6,396</b>	<b>45</b>	<b>25</b>	<b>57</b>	<b>291</b>	<b>8,288</b>
<b>Non-current</b>							
Derivative financial instruments	400	46					446
Loans	35	96	49				180
Related parties	2						2
	<b>437</b>	<b>142</b>	<b>49</b>				<b>628</b>
<b>Total of assets</b>	<b>1,911</b>	<b>6,538</b>	<b>94</b>	<b>25</b>	<b>57</b>	<b>291</b>	<b>8,916</b>
<b>Financial liabilities</b>							
<b>Current</b>							
Suppliers and contractors	1,897	948	612	7	96	70	3,630
Derivative financial instruments	317	97					414
Loans and borrowings	752	827	17		64		1,660
Related parties	319	353					672
	<b>3,285</b>	<b>2,225</b>	<b>629</b>	<b>7</b>	<b>160</b>	<b>70</b>	<b>6,376</b>
<b>Non-current</b>							
Derivative financial instruments	1,052	173					1,225
Loans and borrowings	5,869	19,790	209		1,794		27,662
Related parties	127						127
Participative stockholders debentures	775						775
	<b>7,823</b>	<b>19,963</b>	<b>209</b>		<b>1,794</b>		<b>29,789</b>
<b>Total of liabilities</b>	<b>11,108</b>	<b>22,188</b>	<b>838</b>	<b>7</b>	<b>1,954</b>	<b>70</b>	<b>36,165</b>

	December 31, 2015						Total
	R\$	US\$	CAD	AUD	EUR	Others currencies	
<b>Financial assets</b>							
<b>Current</b>							
Cash and cash equivalents	816	2,528	12	54	11	170	3,591
Financial investments		28					28
Derivative financial instruments	50	71					121



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Accounts receivable	251	1,084	125	10	4	2	1,476
Related parties	70						70
	<b>1,187</b>	<b>3,711</b>	<b>137</b>	<b>64</b>	<b>15</b>	<b>172</b>	<b>5,286</b>
<b>Non-current</b>							
Derivative financial instruments	75	18					93
Loans	27	103	58				188
Related parties	1						1
	<b>103</b>	<b>121</b>	<b>58</b>				<b>282</b>
<b>Total of assets</b>	<b>1,290</b>	<b>3,832</b>	<b>195</b>	<b>64</b>	<b>15</b>	<b>172</b>	<b>5,568</b>
<b>Financial liabilities</b>							
<b>Current</b>							
Suppliers and contractors	1,499	1,389	335	9	115	18	3,365
Derivative financial instruments	911	1,165					2,076
Loans and borrowings	434	1,992	15		65		2,506
Related parties	475						475
	<b>3,319</b>	<b>4,546</b>	<b>350</b>	<b>9</b>	<b>180</b>	<b>18</b>	<b>8,422</b>
<b>Non-current</b>							
Derivative financial instruments	1,356	214					1,570
Loans and borrowings	5,107	19,439	165	3	1,633		26,347
Related parties	73	140					213
Participative stockholders debentures	342						342
	<b>6,878</b>	<b>19,793</b>	<b>165</b>	<b>3</b>	<b>1,633</b>		<b>28,472</b>
<b>Total of liabilities</b>	<b>10,197</b>	<b>24,339</b>	<b>515</b>	<b>12</b>	<b>1,813</b>	<b>18</b>	<b>36,894</b>

Table of Contents**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			December 31, 2015		
	Level 2	Level 3	Total	Level 2	Level 3	Total
<b>Financial assets</b>						
Derivative financial instruments	405	315	720	214		214
<b>Total</b>	<b>405</b>	<b>315</b>	<b>720</b>	<b>214</b>		<b>214</b>
<b>Financial liabilities</b>						
Derivative financial instruments	1,008	449	1,639	3,505	141	3,646
Participative stockholders debentures	775		775	342		342
<b>Total</b>	<b>1,783</b>	<b>449</b>	<b>2,414</b>	<b>3,847</b>	<b>141</b>	<b>3,988</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.

Table of Contents**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.

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

Financial liabilities	Balance	Fair value	Level 1	Level 2
<b>December 31, 2016</b>				
Debt principal	28,691	27,375	13,874	13,501
<b>December 31, 2015</b>				
Debt principal	28,229	26,233	12,297	13,936

**25. Derivative financial instruments****a) Derivatives effects on statement of financial position**

	December 31, 2016		Assets		December 31, 2015	
	Current	Non-current	Current	Non-current	Current	Non-current
<b>Derivatives not designated as hedge accounting</b>						
<b>Foreign exchange and interest rate risk</b>						

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<b>CDI &amp; TJLP vs. US\$ fixed and floating rate</b>				
swap	132	1	69	
IPCA swap	7	61	2	16
Pré-dolar swap	1	23		
	<b>140</b>	<b>85</b>	<b>71</b>	<b>16</b>
<b>Commodities price risk</b>				
Nickel	4	2	50	11
Bunker oil	130			
	<b>134</b>	<b>2</b>	<b>50</b>	<b>11</b>
<b>Others</b>				
		359		66
		<b>359</b>		<b>66</b>
<b>Total</b>	<b>274</b>	<b>446</b>	<b>121</b>	<b>93</b>

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	December 31, 2016		December 31, 2015	
	Current	Non-current	Current	Non-current
<b>Liabilities</b>				
<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				
	293	638	799	1,131
IPCA swap	20	57	21	101
Eurobonds swap	7	45	146	29
Euro Forward	46			
Pre dollar swap	5	32	93	72
	<b>371</b>	<b>772</b>	<b>1,059</b>	<b>1,333</b>
<b>Commodities price risk</b>				
Nickel	5	2	40	10
Bunker oil	38		924	
	<b>43</b>	<b>2</b>	<b>964</b>	<b>10</b>
<b>Others</b>				
		451		227
		<b>451</b>		<b>227</b>
<b>Derivatives designated as cash flow hedge accounting</b>				
Bunker oil			50	
Foreign exchange			3	
			<b>53</b>	
<b>Total</b>	<b>414</b>	<b>1,225</b>	<b>2,076</b>	<b>1,570</b>

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

	Gain (loss) recognized in the income statement			Year ended December 31 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>									
CDI & TJLP vs. US\$ fixed and floating rate swap									
	869	(1,172)	(437)	(513)	(330)	4			
IPCA swap	78	(61)	(58)	(25)	7				
Eurobonds swap	(19)	(130)	(160)	(142)	(13)	10			
Euro forward	(46)								
Pre dollar swap	77	(139)	(28)	(90)	(42)	7			
	<b>959</b>	<b>(1,502)</b>	<b>(683)</b>	<b>(770)</b>	<b>(378)</b>	<b>21</b>			
<b>Commodities price risk</b>									
Nickel	(42)	(49)	9	(30)	(62)	12			
Bunker oil	268	(742)	(533)	(799)	(270)	(90)			
	<b>226</b>	<b>(791)</b>	<b>(524)</b>	<b>(829)</b>	<b>(332)</b>	<b>(78)</b>			

<b>Others</b>	<b>74</b>	<b>(142)</b>	<b>(5)</b>						
<b>Derivatives designated as cash flow hedge accounting</b>									
Bunker oil		(439)	(81)		(450)	(81)		435	(423)
Foreign exchange	(3)	(42)	(41)	(3)	(42)	(41)	2	17	8
	<b>(3)</b>	<b>(481)</b>	<b>(122)</b>	<b>(3)</b>	<b>(492)</b>	<b>(122)</b>	<b>2</b>	<b>452</b>	<b>(415)</b>
<b>Total</b>	<b>1,256</b>	<b>(2,916)</b>	<b>(1,334)</b>	<b>(1,602)</b>	<b>(1,202)</b>	<b>(179)</b>	<b>2</b>	<b>452</b>	<b>(415)</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 US\$439 and US\$2,477, respectively. In 2016, all derivatives impacts were charged to financial results.

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

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

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**Accounting policy**

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.

**Additional information about derivatives financial instruments**

**In millions of United States dollars, 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.

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Flow	Notional				Index	Average rate	Fair value		Financial Settlement Inflows (Outflows) December 31, 2016	Value at Risk December 31, 2016	Fair value by year			
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015			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%	(121)	(783)	(314)		39	48	(170)	
Payable	US\$ 2.105	US\$ 2.288	Fix			3,78%								
<b>TJLP vs. US\$ fixed rate swap</b>														
Receivable			TJLP				(622)	(1.015)	(197)		62	(207)	(102)	(31)
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				(55)	(63)	(2)		5	(3)	(5)	(4)
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%	(13)	(165)	(90)		23	(4)	13	(2)
Payable	US\$ 343	US\$ 528	Fix			-0,73%								
<b>IPCA vs. US\$ fixed rate swap</b>														
Receivable			IPCA				(51)	(105)	1		11	7	5,7	(6)
Payable	R\$ 1.000	R\$ 1.000	+			6,55%								
	US\$ 434	US\$ 434	Fix			3,98%								
<b>IPCA vs. CDI swap</b>														
Receivable			IPCA				42	2	(26)		0,4	(20)	(8)	7
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

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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.

Flow	Notional				Fair value		Financial Settlement	Value at Risk	Fair value by year		
	December 31, 2016	December 31, 2015	Flex	Average rate	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2016	2017	2018	2019+
<b>EUR fixed rate vs. US\$ fixed rate swap</b>											
Receivable	500	1.000	Fix	3,75%	(52)	(175)	(142)	10	(7)	(6)	(39)
Payable	US\$ 613	US\$ 1.302	Fix	4,29%							

Flow	Notional		Bought / Sold	Average rate (USD/EUR)	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, 2016	2017
Forwards	500		B	1,143	(46)			5,8	(46)

### (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 / Sold	Average rate (CAD / USD)	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, 2016	2017
Forwards	CAD 10		B	1,028	(3)		(3)		

### 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.

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Flow	Notional (ton)		Bought / Sold	Average strike (US\$/ton)	Fair value		Financial settlement Inflows (Outflows)		Value at Risk December 31, 2016
	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			(577)	(536)	
Call options	2.856.000	2.041.500	B	324	130		0		28
Put options	2.856.000	2.041.500	S	213	(14)		(297)	(185)	3
<b>Total</b>					<b>116</b>		<b>(873)</b>		

As at December 31, 2016 and 2015, excludes US\$24 and US\$101, 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.

Flow	Notional (ton)		Bought / Sold	Average strike (US\$/ton)	Fair value		Financial settlement Inflows (Outflows)		Value at Risk December 31, 2016
	December 31, 2016	December 31, 2015			December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2016	

**Fixed  
price sales  
protection**

Nickel forwards	11.615	16.917	B	10.156	(1)	(46)	(30)	4
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**Raw  
material  
purchase  
protection**

Nickel forwards	134	118	S	10.823	0,11	0,10	(0,18)	0,04
Copper forwards	441	385	S	5.207	(0,14)	0,09	0,04	0,06
<b>Total</b>					<b>(0,03)</b>	<b>0,19</b>		

Table of Contents**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 v by y 20
	December 31, 2016	December 31, 2015			December 31, 2016	December 31, 2015			
Call options	10.000.000	10.000.000	B	44	44	7		5	

**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.

Flow	Notional (quantity)		Bought / Sold	Average strike (R\$/share)	Fair value		Financial settlement Inflows (Outflows) December 31, 2016	Value at Risk December 31, 2016	Fair v by y 20
	December 31, 2016	December 31, 2015			December 31, 2016	December 31, 2015			
Call options	140.239	140.239	S	8.419	(72)	(39)		5	

**e) 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.

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Flow	Notional (quantity, in millions)		Bought / Sold	Average strike (R\$/share)	Fair value		Financial settlement Inflows (Outflows) December 31, 2016	Value at Risk December 31, 2016	Fair v by y 2017
	December 31, 2016	December 31, 2015			December 31, 2016	December 31, 2015			
Options	2.139	2.139	B/S	1,8	120	15		11	

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 by 2017
	December 31, 2016	December 31, 2015			December 31, 2016	December 31, 2015			
Nickel forwards	5.626	3.877	S	10.950	0,3	3,0			
Copper forwards	3.684	5.939	S	5.249	1,5	2,0			
<b>Total</b>					<b>1,9</b>	<b>5,0</b>			<b>2,5</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.

Flow	Notional (volume/month)		Bought / Sold	Average strike (US\$/ton)	Fair value		Financial settlement Inflows (Outflows) December 31, 2016	Value at Risk December 31, 2016	Fair val 2017
	December 31, 2016	December 31, 2015			December 31, 2016	December 31, 2015			
Call options	746.667	746.667	S	179	(2,0)			1,3	(0,0)



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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 Inflows (Outflows) December 31, 2016	Value at Risk December 31, 2016	Fair value by year 2027
	December 31, 2016	December 31, 2015			December 31, 2016	December 31, 2015			
Put option	1,105,070,863	1,105,070,863	S	3.07	(182)	(141)		14	(1)

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

**26. Provisions**

	Current liabilities		Non-current liabilities	
	December 31, 2016	December 31, 2015	December 31, 2016	December 31, 2015
Payroll and related charges (i)	725	375		
Onerous contracts (note 19)	101		473	306
Environment Restoration	10	8	111	46
Asset retirement obligations (note 27)	47	89	2,472	2,385
Provisions for litigation (note 28)			839	822
Employee postretirement obligations (note 29)	69	68	1,853	1,750
<b>Provisions</b>	<b>952</b>	<b>540</b>	<b>5,748</b>	<b>5,309</b>

(i) Includes profit sharing provision US\$331 and US\$42 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:

	December 31, 2016	December 31, 2015
<b>Balance at beginning of the year</b>	<b>2,474</b>	<b>3,369</b>
Interest expense	115	109
Settlements	(77)	(88)
Revisions on cash flows estimates	230	(135)
Translation adjustment	134	(781)
<b>Effect of discontinued operations</b>		
Transfer to net assets held for sale	(357)	
<b>Balance at end of the year</b>	<b>2,519</b>	<b>2,474</b>
Current	47	89
Non-current	2,472	2,385
	<b>2,519</b>	<b>2,474</b>
Long-term interest rates (per annum)		
Brazil	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:

	Tax litigation	Civil litigation	Labor litigation	Environmental litigation	Total of litigation provision
<b>Balance at December 31, 2014</b>	<b>366</b>	<b>118</b>	<b>706</b>	<b>92</b>	<b>1,282</b>
Additions	178	55	159		392
Reversals	(199)	(41)	(137)	(4)	(381)
Payments	(50)	(40)	(65)	(59)	(214)
Indexation and interest	52	13	7	3	75
Translation adjustment	(79)	(38)	(223)	(12)	(352)
Additions and reversals of discontinued operations	1	12	7		20
<b>Balance at December 31, 2015</b>	<b>269</b>	<b>79</b>	<b>454</b>	<b>20</b>	<b>822</b>
Additions	23	96	243	2	364
Reversals	(37)	(63)	(122)	(5)	(227)
Payments	(53)	(59)	(103)	(5)	(220)
Indexation and interest	9	16	9	(3)	31
Translation adjustment	20	21	89	5	135
<b>Effect of discontinued operations</b>					

Net movements of year		(1)	8	(1)	6
Transfers to net assets held for sale	(17)	(5)	(44)	(6)	(72)
<b>Balance at December 31, 2016</b>	<b>214</b>	<b>84</b>	<b>534</b>	<b>7</b>	<b>839</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.

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:

	December 31, 2016	December 31, 2015
Tax litigation	7,636	5,326
Civil litigation	1,502	1,335
Labor litigation	2,418	1,866
Environmental litigation	1,871	1,381
<b>Total</b>	<b>13,427</b>	<b>9,908</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.

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**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.

	December 31, 2016	December 31, 2015
Tax litigation	193	211
Civil litigation	62	102
Labor litigation	691	553
Environmental litigation	16	16
<b>Total</b>	<b>962</b>	<b>882</b>

**d) Others**

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

**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.

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**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.

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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.

### i. Change in benefit obligation

	Overfunded pension plans	Underfunded pension plans	Other benefits
<b>Benefit obligation as at December 31, 2014</b>	<b>3,728</b>	<b>4,521</b>	<b>1,498</b>
Service costs	20	94	28
Interest costs	359	178	66
Benefits paid	(244)	(258)	(65)
Participant contributions	1		
Transfers	8	(8)	
Effect of changes in the actuarial assumptions	(184)	(70)	(31)
Translation adjustment	(1,214)	(768)	(273)
<b>Benefit obligation as at December 31, 2015</b>	<b>2,474</b>	<b>3,689</b>	<b>1,223</b>
Service costs	10	76	(16)
Interest costs	362	175	66
Benefits paid	(281)	(259)	(61)
Participant contributions	1		
Effect of changes in the actuarial assumptions	271	117	75
Transfer to held for sale	(9)		(59)
Translation adjustment	515	124	68
Others		123	
<b>Benefit obligation as at December 31, 2016</b>	<b>3,343</b>	<b>4,045</b>	<b>1,296</b>



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## ii. Evolution of assets fair value

	Overfunded pension plans	Underfunded pension plans	Other benefits
<b>Fair value of plan assets as at December 31, 2014</b>	<b>5,029</b>	<b>3,716</b>	
Interest income	491	151	
Employer contributions	63	132	65
Participant contributions	1		
Benefits paid	(244)	(258)	(65)
Return on plan assets (excluding interest income)	(284)	(8)	
Transfers	5	(5)	
Translation adjustment	(1,626)	(634)	
<b>Fair value of plan assets as at December 31, 2015</b>	<b>3,435</b>	<b>3,094</b>	
Interest income	512	151	
Employer contributions	42	99	61
Participant contributions	1		
Benefits paid	(281)	(259)	(61)
Return on plan assets (excluding interest income)	281	71	
Transfer to held for sale	(13)		
Translation adjustment	717	105	
Others		158	
<b>Fair value of plan assets as at December 31, 2016</b>	<b>4,694</b>	<b>3,419</b>	

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

	Plans in Brazil					
	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>961</b>			<b>1,301</b>		
Transfer to held for sale	(2)					
Interest income	156			130		
Changes on asset ceiling and onerous liability	35			(54)		
Translation adjustment	201			(416)		
<b>Balance at end of the year</b>	<b>1,351</b>			<b>961</b>		
<b>Amount recognized in the statement of financial position</b>						

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Present value of actuarial liabilities	(3,343)	(386)	(227)	(2,474)	(248)	(160)
Fair value of assets	4,694	257		3,435	214	
Effect of the asset ceiling	(1,351)			(961)		
<b>Liabilities at end of the year</b>		<b>(129)</b>	<b>(227)</b>		<b>(34)</b>	<b>(160)</b>
Current liabilities			(18)			(19)
Non-current liabilities		(129)	(209)		(34)	(141)
<b>Liabilities at end of the year</b>		<b>(129)</b>	<b>(227)</b>		<b>(34)</b>	<b>(160)</b>

	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		(3,659)	(1,069)		(3,441)	(1,063)
Fair value of assets		3,162			2,880	
<b>Liabilities at end of the year</b>		<b>(497)</b>	<b>(1,069)</b>		<b>(561)</b>	<b>(1,063)</b>
Current liabilities		(16)	(35)		(17)	(32)
Non-current liabilities		(481)	(1,034)		(544)	(1,031)
<b>Liabilities at end of the year</b>		<b>(497)</b>	<b>(1,069)</b>		<b>(561)</b>	<b>(1,063)</b>

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	Total					
	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>961</b>			<b>1,301</b>		
Interest income	156			130		
Changes in asset ceiling/ onerous liability	35			(54)		
Translation adjustment	201			(416)		
Transfer to held for sale	(2)					
<b>Balance at end of the year</b>	<b>1,351</b>			<b>961</b>		
<b>Amount recognized in the statement of financial position</b>						
Present value of actuarial liabilities	(3,343)	(4,045)	(1,296)	(2,474)	(3,689)	(1,223)
Fair value of assets	4,694	3,419		3,435	3,094	
Effect of the asset ceiling	(1,351)			(961)		
<b>Liabilities at end of the year</b>		<b>(626)</b>	<b>(1,296)</b>		<b>(595)</b>	<b>(1,223)</b>
Current liabilities		(16)	(53)		(17)	(51)
Non-current liabilities		(610)	(1,243)		(578)	(1,172)
<b>Liabilities at end of the year</b>		<b>(626)</b>	<b>(1,296)</b>		<b>(595)</b>	<b>(1,223)</b>

## iv. Costs recognized in the income statement

	Year ended December 31					
	Overfunded pension plans	2016 Underfunded pension plans	Other benefits	Overfunded pension plans	2015 Underfunded pension plans	Other benefits
Service cost	10	76	(16)	20	94	28
Interest on expense on liabilities	362	175	66	359	178	66
Interest income on plan assets	(512)	(151)		(491)	(151)	
Interest expense on effect of (asset ceiling)/ onerous liability	156			132		
<b>Total of cost, net</b>	<b>16</b>	<b>100</b>	<b>50</b>	<b>20</b>	<b>121</b>	<b>94</b>

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

<b>Balance at beginning of the year</b>	<b>(113)</b>	<b>(495)</b>	<b>(95)</b>	<b>(143)</b>	<b>(570)</b>	<b>(132)</b>
Effect of changes actuarial assumptions	(271)	(117)	(75)	184	70	31
Return on plan assets (excluding interest income)	281	71		(284)	(8)	
Change of asset ceiling / costly liabilities (excluding interest income)	(36)			70		
Other		35			2	1
	<b>(26)</b>	<b>(11)</b>	<b>(75)</b>	<b>(30)</b>	<b>64</b>	<b>32</b>
Deferred income tax	9	16	17	10	2	(9)
<b>Others comprehensive income</b>	<b>(17)</b>	<b>5</b>	<b>(58)</b>	<b>(20)</b>	<b>66</b>	<b>23</b>
Translation adjustments	(23)	(6)	(7)	49	10	14
Transfers/ disposal				1	(1)	
<b>Accumulated other comprehensive income</b>	<b>(153)</b>	<b>(496)</b>	<b>(160)</b>	<b>(113)</b>	<b>(495)</b>	<b>(95)</b>

#### 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).

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**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**

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:

	Overfunded pension plans	December 31, 2016 Underfunded pension plans	Brazil		December 31, 2015 Underfunded pension plans	Other benefits
			Other benefits	Overfunded pension plans		
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

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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%

	December 31, 2016		Foreign		December 31, 2015		
	Underfunded pension plans	Other benefits	Underfunded pension plans	Other benefits	Underfunded pension plans	Other benefits	
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%

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	December 31, 2016 Underfunded pension plans	Other benefits	
<b>Nominal discount rate - 1% increase</b>				
Actuarial liability balance		3,069	3,569	1,171
Assumptions made		11.29%	5.55%	6.33%
<b>Nominal discount rate - 1% reduction</b>				
Actuarial liability balance		3,665	4,583	1,469
Assumptions made		9.56%	3.50%	4.02%

**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 US\$18 and US\$4 and (ii) Brazilian Federal Government securities in the amount of US\$4,180 and US\$2,976.

Foreign plan assets as at December 31, 2016 and 2015 includes Canadian Government securities in the amount of US\$735 and US\$675, respectively.



Table of Contents**ix. Overfunded pension plans**

Assets by category are as follows:

	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
Debt securities - Corporate bonds		117		117		94		94
Debt securities - Government bonds	2,612			2,612	1,659			1,659
Investments funds - Fixed Income	2,411			2,411	1,799			1,799
Investments funds - Equity	168			168	44			44
International investments	12			12	29			29
Structured investments - Private Equity funds	217		140	357	138		136	274
Structured investments - Real estate funds			10	10			6	6
Real estate			370	370			319	319
Loans to participants			260	260			249	249
<b>Total</b>	<b>5,420</b>	<b>117</b>	<b>780</b>	<b>6,317</b>	<b>3,670</b>	<b>94</b>	<b>710</b>	<b>4,474</b>
Funds not related to risk plans				(1,623)				(1,039)
<b>Fair value of plan assets at end of year</b>				<b>4,694</b>				<b>3,435</b>

Measurement of overfunded 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	Total
<b>Balance as at December 31, 2014</b>	<b>253</b>	<b>7</b>	<b>497</b>	<b>404</b>	<b>1,161</b>
Return on plan assets	(84)	1	4	47	(32)
Assets purchases	49	1	1	40	91
Assets sold during the year	(7)		(28)	(118)	(153)
Translation adjustment	(75)	(3)	(156)	(124)	(358)
Transfers in and/ out of Level 3			1		1
<b>Balance as at December 31, 2015</b>	<b>136</b>	<b>6</b>	<b>319</b>	<b>249</b>	<b>710</b>
Return on plan assets	(19)		3	33	17
Assets purchases	30	3	2	55	90
Assets sold during the year	(23)		(17)	(121)	(161)



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Translation adjustment	26	1	63	46	136
Transfer to held for sale	(10)			(2)	(12)
<b>Balance as at December 31, 2016</b>	<b>140</b>	<b>10</b>	<b>370</b>	<b>260</b>	<b>780</b>

x. **Underfunded pension plans**

Assets by category are as follows:

	December 31, 2016				December 31, 2015			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Cash and cash equivalents		24		24		49		49
Equity securities	1,240			1,240	1,106			1,106
Debt securities - Corporate bonds		10		10		12		12
Debt securities - Government bonds	83	736		819	56	684		740
Investments funds - Fixed Income	142	307		449	150	281		431
Investments funds - Equity	92	368		460	86	356		442
International investments		27		27	2	30		32
Structured investments - Private Equity funds			187	187			98	98
Real estate			24	24			20	20
Loans to participants			6	6			5	5
Others			173	173			159	159
<b>Total</b>	<b>1,557</b>	<b>1,472</b>	<b>390</b>	<b>3,419</b>	<b>1,400</b>	<b>1,412</b>	<b>282</b>	<b>3,094</b>

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

	Private equity funds	Real estate	Loans to participants	Others	Total
<b>Balance as at December 31, 2014</b>	<b>18</b>	<b>24</b>	<b>7</b>		<b>49</b>
Return on plan assets		5	1		6
Assets purchases	102			186	288
Assets sold during the year	(1)				(1)
Translation adjustment	(21)	(8)	(3)	(27)	(59)
Transfers in and/ out of Level 3		(1)			(1)
<b>Balance as at December 31, 2015</b>	<b>98</b>	<b>20</b>	<b>5</b>	<b>159</b>	<b>282</b>
Return on plan assets	15			9	24
Assets purchases	176				176
Assets sold during the year	(110)				(110)
Translation adjustment	8	4	1	5	18
<b>Balance as at December 31, 2016</b>	<b>187</b>	<b>24</b>	<b>6</b>	<b>173</b>	<b>390</b>

**xi. Disbursement of future cash flow**

Vale expects to disburse US\$165 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	92	238	65
2018	98	237	67
2019	104	237	69
2020	110	238	72
2021	117	238	74
2022 and thereafter	602	1,208	402

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

The Company recorded as cost of goods sold and services rendered and other operating expenses related to the PLR US\$331 and US\$42 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 US\$37, US\$29 and US\$61, respectively, related to long term compensation plan.

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**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.

Table of Contents**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.

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 US\$61,614 corresponding to 5,244,316,120 shares issued and fully paid without par value.

	ON	December 31, 2016 PNA	Total
<b>Stockholders</b>			
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>38,525</b>	<b>23,089</b>	<b>61,614</b>

<b>Total authorized shares</b>	<b>3,600,000,000</b>	<b>7,200,000,000</b>	<b>10,800,000,000</b>
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b) **Profit reserves**

The amount of profit reserves are distributed as follows:

	<b>Investments reserve</b>	<b>Legal reserve</b>	<b>Tax incentive reserve</b>	<b>Additional Remuneration reserve</b>	<b>Total of profit reserves</b>
<b>Balance as at December 31, 2014</b>	<b>16,794</b>	<b>3,061</b>	<b>130</b>		<b>19,985</b>
Dividends and interest on capital of Vale's stockholders	(1,500)				(1,500)
Allocation of loss	(10,859)	(1,176)	(94)		(12,129)
Translation adjustment	(4,435)	(900)	(36)		(5,371)
<b>Balance as at December 31, 2015</b>		<b>985</b>			<b>985</b>
Allocation of Income	1,808	204	377	634	3,023
Translation adjustment		195			195
<b>Balance as at December 31, 2016</b>	<b>1,808</b>	<b>1,384</b>	<b>377</b>	<b>634</b>	<b>4,203</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.

Table of Contentsc) **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>(845)</b>	<b>(453)</b>	<b>(2)</b>	<b>(413)</b>	<b>(1,713)</b>
Other comprehensive income	70	447	1		518
Translation adjustment	72			131	203
<b>Balance as at December 31, 2015</b>	<b>(703)</b>	<b>(6)</b>	<b>(1)</b>	<b>(282)</b>	<b>(992)</b>
Other comprehensive income	(70)	7	1		(62)
Translation adjustment	(36)	(1)		(56)	(93)
<b>Balance as at December 31, 2016</b>	<b>(809)</b>			<b>(338)</b>	<b>(1,147)</b>

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 (US\$1,061). In December, 2016 R\$857 (US\$250) was anticipated and the remaining balance of R\$2,602 (US\$811) 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 (US\$634) 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 in R\$. The equivalent amount in US\$ are as follows:

	2016
<b>Net income of the year</b>	<b>3,982</b>
Legal reserve	(204)
Tax incentive reserve	(272)
<b>Adjusted net income</b>	<b>3,506</b>
Allocation of net income	(1,913)
Cumulative translation adjustments	102
	<b>1,695</b>



**Remuneration:**

Mandatory minimum	1,061
Additional remuneration	634
	<b>1,695</b>

**Remuneration by nature:**

Interest on capital	1,695
	<b>1,695</b>

**Total remuneration per share** **0.328883933**

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

	Dividends	Interest on capital	Total	Amount per share
<b>Amounts paid in 2014</b>				
First installment - April		2,100	2,100	0.407499945
Second installment - October	717	1,383	2,100	0.407499945
<b>Total</b>	<b>717</b>	<b>3,483</b>	<b>4,200</b>	
<b>Amounts paid in 2015</b>				
First installment - April		1,000	1,000	0.194047593
Second installment - October	500		500	0.097023796
<b>Total</b>	<b>500</b>	<b>1,000</b>	<b>1,500</b>	
<b>Amounts paid in 2016</b>				
First installment - December		250	250	0.048511898
<b>Total</b>		<b>250</b>	<b>250</b>	

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**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:

(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.

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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 stockholders' 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.

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.



Table of Contents**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:

	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.	522	324			37	66		
Banco do Brasil S.A.	57	34			395	16		
Companhia Coreano-Brasileira de Pelotização				5				6
Companhia Hispano-Brasileira de Pelotização			1				1	4
Companhia Ítalo-Brasileira de Pelotização				8				8
Companhia Nipo-Brasileira de Pelotização				15				9
Companhia Siderúrgica do Pecem			37					
Consórcio de Rebocadores da Baía de São Marcos			10				15	
Mitsui & Co., Ltd.			4				1	
MRS Logística S.A.				24				17
VLI			9	12			34	10
Others			46	9			27	17
<b>Total</b>	<b>579</b>	<b>358</b>	<b>107</b>	<b>73</b>	<b>432</b>	<b>82</b>	<b>78</b>	<b>71</b>

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	Liabilities							
	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.		16	38			11		
Banco Bradesco S.A.	250			6	205	54		370
Banco do Brasil S.A.	45			2,568	250			2,625
BNDES	72			4,432	39			4,066
BNDES Participações S.A.				414				371
Companhia Coreano-Brasileira de Pelotização		3	59			4	70	
Companhia Hispano-Brasileira de Pelotização		39	14			37	7	
Companhia Ítalo-Brasileira de Pelotização			99			3	64	
Companhia Nipo-Brasileira de Pelotização		3	146			9	112	
Consórcio de Rebocadores da Baía de São Marcos						8		
Ferrovias Centro-Atlântica S.A.			83				68	
Mitsui & Co., Ltd.		17				11		
MRS Logística S.A.		25				23		
Sumic Nickel Netherland B.V			353				352	
VLI		3						
Others		38	7			30	15	
<b>Total</b>	<b>367</b>	<b>144</b>	<b>799</b>	<b>7,420</b>	<b>494</b>	<b>190</b>	<b>688</b>	<b>7,432</b>

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	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.		(132)		12					
Banco Bradesco S.A. (i)			205			(75)			(24)
Banco do Brasil S.A. (i)			(456)			(374)			(110)
Baovale Mineração S.A.		(17)			(24)				
BNDES (i)			(558)			(372)			(199)
BNDES Participações S.A. (i)			(73)			(50)			(41)
California Steel Industries, Inc.	12						183	(215)	
Companhia Coreano-Brasileira de Pelotização		(62)	(6)		(80)			(97)	
Companhia Hispano-Brasileira de Pelotização		(43)	(4)		(50)			(47)	
Companhia Ítalo-Brasileira de Pelotização		(49)	(8)		(66)			(49)	
Companhia Nipo-Brasileira de Pelotização		(114)	(11)		(106)			(155)	
Companhia Siderúrgica do Atlântico		(6)							
Companhia Siderúrgica do Pecem	132	(29)							
Ferrovias Centro Atlântica S.A.	36	(28)	(2)	47	(39)	(1)	59	(61)	
Ferrovias Norte Sul S.A.	16								
Mitsui & Co., Ltd.	141	(37)		187			111	(35)	
MRS Logística S.A.		(464)			(489)			(593)	
Samarco Mineração S.A.	22		1	127			210		
VLI	275	(22)		251			350		8
Others	18	(1)	2	55	(44)	8	102	(42)	19
<b>Total</b>	<b>652</b>	<b>(1,004)</b>	<b>(910)</b>	<b>679</b>	<b>(898)</b>	<b>(864)</b>	<b>1,015</b>	<b>(1,294)</b>	<b>(347)</b>

(i) Does not include exchange rate variation.

The key management personnel remuneration is as follows:

	Year ended December 31		
	2016	2015	2014
<b>Short-term benefits</b>			
Wages or pro-labor	8	8	11
Direct and indirect benefits	4	6	7
Bonus		8	12
	<b>12</b>	<b>22</b>	<b>30</b>
<b>Long-term benefits</b>			
Shares based	1	1	1
<b>Termination of position</b>	<b>5</b>	<b>6</b>	
	<b>18</b>	<b>29</b>	<b>31</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.



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**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 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 US\$84 (R\$268) and US\$65 (R\$209), respectively, for the year ended December 31, 2016 and 2015.

**c) Others commitments**

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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	149	134	131	130	485
Purchase obligations	2,572	363	186	140	1,127
<b>Total minimum payments required</b>	<b>2,721</b>	<b>497</b>	<b>317</b>	<b>270</b>	<b>1,612</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 US\$266, US\$329 and US\$348, 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

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 US\$361 and US\$1,450 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

Instrument	Instrument's main risk events	Scenario I	Scenario II	Scenario III
<b>CDI vs. US\$ fixed rate swap</b>	R\$ depreciation	(121)	(658)	(1.195)
	US\$ interest rate inside Brazil decrease	(121)	(134)	(146)
	Brazilian interest rate increase	(121)	(124)	(127)
Protected item: R\$ denominated debt	R\$ depreciation	n.a.		
<b>TJLP vs. US\$ fixed rate swap</b>	R\$ depreciation	(622)	(1.115)	(1.609)
	US\$ interest rate inside Brazil decrease	(622)	(648)	(676)
	Brazilian interest rate increase	(622)	(675)	(723)
	TJLP interest rate decrease	(622)	(660)	(700)
Protected item: R\$ denominated debt	R\$ depreciation	n.a.		
<b>TJLP vs. US\$ floating rate swap</b>	R\$ depreciation	(55)	(88)	(120)
	US\$ interest rate inside Brazil decrease	(55)	(57)	(60)
	Brazilian interest rate increase	(55)	(59)	(62)
	TJLP interest rate decrease	(55)	(58)	(61)
Protected item: R\$ denominated debt	R\$ depreciation	n.a.		
<b>R\$ fixed rate vs. US\$ fixed rate swap</b>	R\$ depreciation	(13)	(102)	(190)
	US\$ interest rate inside Brazil decrease	(13)	(25)	(38)
	Brazilian interest rate increase	(13)	(41)	(66)
Protected item: R\$ denominated debt	R\$ depreciation	n.a.		

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<b>IPCA vs. US\$ fixed rate swap</b>	R\$ depreciation	(51)	(168)	(285)
	US\$ interest rate inside Brazil decrease	(51)	(58)	(66)
	Brazilian interest rate increase	(51)	(78)	(102)
	IPCA index decrease	(51)	(64)	(77)
Protected item: R\$ denominated debt	R\$ depreciation	n.a.		
<b>IPCA vs. CDI swap</b>	Brazilian interest rate increase	42	(3)	(41)
	IPCA index decrease	42	19	(2)
Protected item: R\$ denominated debt linked to IPCA	IPCA index decrease	n.a.	(19)	2
<b>EUR fixed rate vs. US\$. fixed rate swap</b>	EUR depreciation	(52)	(216)	(380)
	Euribor increase	(52)	(58)	(64)
	US\$ Libor decrease	(52)	(71)	(92)
Protected item: EUR denominated debt	EUR depreciation	n.a.	216	380
<b>EUR Forward</b>	EUR depreciation	(46)	(177)	(308)
	Euribor increase	(46)	(46)	(46)
	US\$ Libor decrease	(46)	(46)	(46)
Protected item: EUR denominated debt	EUR depreciation	n.a.	177	308

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Instrument	Instrument's main risk events	Scenario I	Scenario II	Scenario III
<b>Bunker Oil protection</b>				
Forwards and options	Bunker Oil price decrease	116	(11)	(154)
Protected item: Part of costs linked to bunker oil prices	Bunker Oil price decrease	n.a.	11	154
<b>Nickel sales fixed price protection</b>				
Forwards	Nickel price decrease	(1)	(30)	(59)
Protected item: Part of nickel revenues with fixed prices	Nickel price fluctuation	n.a.	30	59
<b>Purchase protection program</b>				
Nickel forwards	Nickel price increase	0,1	(0,2)	(0,6)
Protected item: Part of costs linked to nickel prices	Nickel price increase	n.a.	0,2	0,6
Copper forwards	Copper price increase	(0,1)	(0,7)	(1,4)
Protected item: Part of costs linked to copper prices	Copper price increase	n.a.	0,7	1,4
<b>SLW warrants</b>	SLW stock price decrease	44	23	8
<b>VLI call options</b>	VLI stock value increase	(72)	(109)	(151)
<b>Options regarding non-controlling interest in subsidiary</b>	Subsidiary stock value decrease	121	34	(21)
Instrument	Main risks	Scenario I	Scenario II	Scenario III
Embedded derivatives- Raw material purchase (nickel)	Nickel price increase	0,3	(15)	(31)
Embedded derivatives-Raw material purchase (copper)	Copper price increase	2	(4)	(9)
Embedded derivatives-Gas purchase	Pellet price increase	(2)	(4)	(7)
Embedded derivatives-Guaranteed minimum return (VLI)	VLI stock value decrease	(182)	(303)	(473)

**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.

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.

<b>Long term ratings by counterparty</b>	<b>Moody's</b>	<b>S&amp;P</b>
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 Santander	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 Sanpaolo Spa	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 Contentsc) **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
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**

<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	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**

<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	0,77	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**

<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	7,50	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**

<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	0,94	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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Fernando Santos do Nascimento

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**Investors Relations and Controller Director**

Murilo Muller  
**Controllershship Executive Manager**

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

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**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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