



Interim Financial Statements

June 30, 2019

IFRS in US\$

**Vale S.A. Interim Financial Statements
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Report of Independent Registered Public Accounting Firm

To the stockholders and Board of Directors of
Vale S.A.

Results of Review of Interim Financial Statements

We have reviewed the accompanying consolidated statement of financial position of Vale S.A. and its subsidiaries (the "Company") as of June 30, 2019, the related consolidated income statement, statement of comprehensive income and statement of cash flows for the three and six-month periods ended June 30, 2019, and the related consolidated statement of changes in equity for the six-month period ended June 30, 2019, including the related notes (collectively referred to as the "interim financial statements"). Based on our review, we are not aware of any material modifications that should be made to the accompanying interim financial statements for them to be in conformity with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standards Board (IASB).

Brumadinho's dam failure

We draw attention to Note 3 to the interim financial statements that describes the actions taken by the Company and the impacts on the interim financial statements as a consequence of the Brumadinho's Dam failure. As disclosed by Management, the Company has incurred costs and recorded provisions based on its best estimates and assumptions. Given the nature and uncertainties inherent in this type of event, the amounts recognized and/or disclosed will be reassessed by the Company and may be adjusted significantly in future periods, as new facts and circumstances become known. Our conclusion is not qualified in relation to this matter.

Basis for Review Results

These interim financial statements are the responsibility of the Company's management. We are a public accounting firm registered with the Public Company Accounting Oversight Board (United States) (PCAOB) and are required to be independent with respect to the Company in accordance with the U.S. federal securities laws and the applicable rules and regulations of the Securities and Exchange Commission and the PCAOB. We conducted our review in accordance with the standards of the PCAOB. A review of interim financial statements consists principally of applying analytical procedures and making inquiries of persons responsible for financial and accounting matters. It is substantially less in scope than an audit conducted in accordance with the standards of the PCAOB, the objective of which is the expression of an opinion regarding the financial statements taken as a whole. Accordingly, we do not express such an opinion.

/ s/ PricewaterhouseCoopers
Auditores Independentes
Rio de Janeiro, RJ, Brazil
July 31, 2019

Consolidated Income Statement

In millions of United States dollars, except earnings per share data

	Notes	Three-month period ended June 30,		Six-month period ended June 30,	
		2019	2018	2019	2018
Continuing operations					
Net operating revenue	4(c)	9,186	8,616	17,389	17,219
Cost of goods sold and services rendered	5(a)	(5,173)	(5,377)	(9,874)	(10,601)
Gross profit		4,013	3,239	7,515	6,618
Operating expenses					
Selling and administrative expenses	5(b)	(110)	(122)	(220)	(246)
Research and evaluation expenses		(90)	(92)	(161)	(161)
Pre-operating and operational stoppage	3(d)	(335)	(67)	(549)	(145)
Brumadinho event	3	(1,532)	-	(6,036)	-
Other operating expenses, net	5(c)	(35)	(109)	(119)	(234)
		(2,102)	(390)	(7,085)	(786)
Impairment and disposals of non-current assets	3	(109)	5	(313)	(13)
Operating income		1,802	2,854	117	5,819
Financial income	6	122	81	219	199
Financial expenses	6	(751)	(781)	(1,559)	(1,428)
Other financial items, net	6	(99)	(2,355)	(94)	(2,450)
Equity results and other results in associates and joint ventures	13 and 17	(743)	(370)	(659)	(299)
Income (loss) before income taxes		331	(571)	(1,976)	1,841
Income taxes					
	7				
Current tax		(366)	(127)	(613)	(220)
Deferred tax		(107)	791	772	163
		(473)	664	159	(57)
Net income (loss) from continuing operations		(142)	93	(1,817)	1,784
Net income (loss) attributable to noncontrolling interests		(9)	7	(42)	26
Net income (loss) from continuing operations attributable to Vale's stockholders		(133)	86	(1,775)	1,758
Discontinued operations					
Loss from discontinued operations		-	(10)	-	(92)
Loss from discontinued operations attributable to Vale's stockholders		-	(10)	-	(92)
Net income (loss)		(142)	83	(1,817)	1,692
Net income (loss) attributable to noncontrolling interests		(9)	7	(42)	26
Net income (loss) attributable to Vale's stockholders		(133)	76	(1,775)	1,666
Earnings (loss) per share attributable to Vale's stockholders:					
Basic and diluted earnings (loss) per share:					
Common share (US\$)	8	(0.03)	0.01	(0.34)	0.32

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

Consolidated Statement of Comprehensive Income

In millions of United States dollars

	Three-month period ended June 30,		Six-month period ended June 30,	
	2019	2018	2019	2018
Net income (loss)	(142)	83	(1,817)	1,692
Other comprehensive income (loss):				
Items that will not be subsequently reclassified to income statement				
Translation adjustments	740	(6,318)	498	(6,548)
Retirement benefit obligations	(151)	(55)	(142)	(2)
Fair value adjustment to investment in equity securities	(54)	77	(93)	42
Transfer to reserve	-	4	-	(16)
Total items that will not be subsequently reclassified to income statement, net of tax	535	(6,292)	263	(6,524)
Items that may be subsequently reclassified to income statement				
Translation adjustments	(221)	3,906	70	3,895
Net investments hedge (note 20c)	33	(538)	24	(565)
Transfer of realized results to net income	-	-	-	(78)
Total of items that may be subsequently reclassified to income statement, net of tax	(188)	3,368	94	3,252
Total comprehensive income (loss)	205	(2,841)	(1,460)	(1,580)
Comprehensive income (loss) attributable to noncontrolling interests	3	(87)	(35)	(70)
Comprehensive income (loss) attributable to Vale's stockholders	202	(2,754)	(1,425)	(1,510)
From continuing operations	202	(2,741)	(1,425)	(1,502)
From discontinued operations	-	(13)	-	(8)
	202	(2,754)	(1,425)	(1,510)

Items above are stated net of tax and the related taxes are disclosed in note 7.

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

Consolidated Statement of Cash Flows

In millions of United States dollars

	Three-month period ended June 30,		Six-month period ended June 30,	
	2019	2018	2019	2018
Cash flow from operating activities:				
Income (loss) before income taxes from continuing operations	331	(571)	(1,976)	1,841
Adjusted for:				
Equity results and other results in associates and joint ventures	743	370	659	299
Impairment and disposal of non-current assets	109	(5)	313	13
Depreciation, amortization and depletion	966	861	1,767	1,734
Financial results, net	728	3,055	1,434	3,679
Other	(281)	-	(281)	-
Changes in assets and liabilities:				
Accounts receivable	(557)	201	(93)	218
Inventories	229	(262)	(232)	(206)
Suppliers and contractors (1)	434	(37)	331	(377)
Provision - Payroll, related charges and others remunerations	166	175	(294)	(366)
Proceeds from cobalt stream transaction	-	690	-	690
Liabilities related to Brumadinho (note 3)	1,069	-	3,492	-
De-characterization of the upstream dams (note 3)	83	-	1,938	-
Other assets and liabilities, net	(375)	(440)	(360)	(545)
	3,645	4,037	6,698	6,980
Interest on loans and borrowings paid (note 16)	(237)	(274)	(483)	(655)
Derivatives received (paid), net	(4)	12	(121)	(13)
Interest on participative stockholders' debentures paid	(90)	(72)	(90)	(72)
Income taxes (including settlement program)	(359)	(159)	(849)	(524)
Net cash provided by operating activities from continuing operations	2,955	3,544	5,155	5,716
Cash flow from investing activities:				
Capital expenditures	(730)	(705)	(1,341)	(1,595)
Additions to investments	(1)	(6)	(1)	(23)
Acquisition of subsidiary, net of cash (note 12c)	-	-	(496)	-
Proceeds from disposal of assets and investments	11	259	104	1,360
Dividends received from associates and joint ventures	193	136	193	146
Restricted cash and judicial deposits (note 3)	124	-	(3,366)	-
Others investments activities, net (2)	(190)	(124)	(152)	2,515
Net cash provided by (used in) investing activities from continuing operations	(593)	(440)	(5,059)	2,403
Cash flow from financing activities:				
Loans and borrowings from third-parties (note 16)	300	765	2,142	765
Payments of loans and borrowings from third-parties (note 16)	(1,636)	(2,599)	(1,852)	(4,876)
Payments of leasing	(3)	-	(78)	-
Dividends and interest on capital paid to stockholders	-	-	-	(1,437)
Dividends and interest on capital paid to noncontrolling interest	(14)	(6)	(77)	(97)
Transactions with noncontrolling stockholders	-	-	-	(17)
Net cash provided by (used in) financing activities from continuing operations	(1,353)	(1,840)	135	(5,662)
Net cash used in discontinued operations	-	(2)	-	(46)
Increase in cash and cash equivalents	1,009	1,262	231	2,411
Cash and cash equivalents in the beginning of the period	5,008	5,368	5,784	4,328
Effect of exchange rate changes on cash and cash equivalents	31	(247)	33	(253)
Effects of disposals of subsidiaries and merger, net of cash and cash equivalents	-	(14)	-	(117)
Cash and cash equivalents at end of the period	6,048	6,369	6,048	6,369
Non-cash transactions:				
Additions to property, plant and equipment - capitalized loans and borrowing costs	40	44	77	104

(1) Includes variable lease payments.

(2) Includes loans and advances from/to related parties. For the six-month period ended June 30, 2018, includes proceeds received from Nacala project finance (note 25b) in the amount of US\$2,572.

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

Consolidated Statement of Financial Position

In millions of United States dollars

	Notes	June 30, 2019	December 31, 2018
Assets			
Current assets			
Cash and cash equivalents		6,048	5,784
Accounts receivable	9	2,983	2,648
Other financial assets	11	402	435
Inventories	10	4,724	4,443
Prepaid income taxes		508	543
Recoverable taxes		684	883
Others		565	556
		15,914	15,292
Non-current assets			
Judicial deposits	22(c)	5,035	1,716
Other financial assets	11	3,118	3,144
Prepaid income taxes		695	544
Recoverable taxes		511	751
Deferred income taxes	7(a)	7,698	6,908
Others		367	263
		17,424	13,326
Investments in associates and joint ventures	13	3,115	3,225
Intangibles	14	8,642	7,962
Property, plant and equipment	15	50,637	48,385
		79,818	72,898
Total assets		95,732	88,190
Liabilities			
Current liabilities			
Suppliers and contractors		3,907	3,512
Loans and borrowings	16	1,287	1,003
Leases	2(c)	239	-
Other financial liabilities	11	1,109	1,604
Taxes payable		607	428
Settlement program ("REFIS")	7(c)	445	432
Liabilities related to associates and joint ventures	17	412	289
Provisions	21	942	1,363
Liabilities related to Brumadinho	3	2,320	-
De-characterization of dams	3	388	-
Others		1,178	480
		12,834	9,111
Non-current liabilities			
Loans and borrowings	16	14,503	14,463
Leases	2(c)	1,601	-
Other financial liabilities	11	3,215	2,711
Settlement program ("REFIS")	7(c)	3,815	3,917
Deferred income taxes	7(a)	1,469	1,532
Provisions	21	8,104	7,095
Liabilities related to Brumadinho	3	1,208	-
De-characterization of dams	3	1,630	-
Liabilities related to associates and joint ventures	17	1,298	832
Deferred revenue - Gold stream		1,461	1,603
Others		1,270	2,094
		39,574	34,247
Total liabilities		52,408	43,358
Stockholders' equity			
Equity attributable to Vale's stockholders	24	42,582	43,985
Equity attributable to noncontrolling interests		742	847
Total stockholders' equity		43,324	44,832
Total liabilities and stockholders' equity		95,732	88,190

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

Consolidated Statement of Changes in Equity

In millions of United States dollars

	Share capital	Results on conversion of shares	Capital reserve	Net ownership changes in subsidiaries	Profit reserves	Treasury stocks	Unrealized fair value gain (losses)	Cumulative translation adjustments	Accumulated deficit	Equity attributable to Vale's stockholders	Equity attributable to noncontrolling interests	Total stockholders' equity
Balance at December 31, 2018	61,614	(152)	1,139	(970)	10,968	(2,477)	(1,033)	(25,104)	-	43,985	847	44,832
Loss	-	-	-	-	-	-	-	-	(1,775)	(1,775)	(42)	(1,817)
Other comprehensive income:												
Retirement benefit obligations	-	-	-	-	-	-	(142)	-	-	(142)	-	(142)
Net investments hedge (note 20c)	-	-	-	-	-	-	-	24	-	24	-	24
Fair value adjustment to investment in equity securities	-	-	-	-	-	-	(93)	-	-	(93)	-	(93)
Translation adjustments	-	-	-	-	122	-	(3)	442	-	561	7	568
Transactions with stockholders:												
Dividends of noncontrolling interest	-	-	-	-	-	-	-	-	-	-	(85)	(85)
Capitalization of noncontrolling interest advances	-	-	-	-	-	-	-	-	-	-	15	15
Assignment and transfer of shares (note 24)	-	-	-	-	-	22	-	-	-	22	-	22
Balance at June 30, 2019	61,614	(152)	1,139	(970)	11,090	(2,455)	(1,271)	(24,638)	(1,775)	42,582	742	43,324

	Share capital	Results on conversion of shares	Capital reserve	Net ownership changes in subsidiaries	Profit reserves	Treasury stocks	Unrealized fair value gain (losses)	Cumulative translation adjustments	Retained earnings	Equity attributable to Vale's stockholders	Equity attributable to noncontrolling interests	Total stockholders' equity
Balance at December 31, 2017	61,614	(152)	1,139	(954)	7,419	(1,477)	(1,183)	(22,948)	-	43,458	1,314	44,772
Net income	-	-	-	-	-	-	-	-	1,666	1,666	26	1,692
Other comprehensive income:												
Retirement benefit obligations	-	-	-	(16)	-	-	(2)	-	-	(18)	-	(18)
Net investments hedge (note 20c)	-	-	-	-	-	-	-	(565)	-	(565)	-	(565)
Fair value adjustment to investment in equity securities	-	-	-	-	-	-	42	-	-	42	-	42
Translation adjustments	-	-	-	-	(1,055)	-	47	(1,627)	-	(2,635)	(96)	(2,731)
Transactions with stockholders:												
Dividends of noncontrolling interest	-	-	-	-	-	-	-	-	-	-	(83)	(83)
Acquisitions and disposal of noncontrolling interest	-	-	-	-	-	-	-	-	-	-	(225)	(225)
Capitalization of noncontrolling interest advances	-	-	-	-	-	-	-	-	-	-	4	4
Balance at June 30, 2018	61,614	(152)	1,139	(970)	6,364	(1,477)	(1,096)	(25,140)	1,666	41,948	940	42,888

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

1. Corporate information

Vale S.A. and its direct and indirect subsidiaries (“Vale” or the “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 Company also produces copper, metallurgical and thermal coal, manganese ore, ferroalloys, platinum group metals, gold, silver and cobalt. The information by segment is presented in note 4.

Vale S.A. (the “Parent Company”) is a public company headquartered in the city of Rio de Janeiro, Brazil with securities traded on the stock exchanges of São Paulo – B3 S.A. (VALE3), New York - NYSE (VALE), Paris - NYSE Euronext (VALE3) and Madrid – LATIBEX (XVALO).

2. Basis of preparation of the interim financial statements

a) Statement of compliance

The condensed consolidated interim financial statements of the Company (“interim financial statements”) have been prepared and are being presented in accordance with IAS 34 Interim Financial Reporting of the International Financial Reporting Standards (“IFRS”), as issued by the International Accounting Standards Board (“IASB”).

b) Basis of presentation

The interim financial statements have been prepared to update users about relevant events and transactions that occurred in the period and should be read in conjunction with the financial statements for the year ended December 31, 2018. The accounting policies, accounting estimates and judgements, risk management and measurement methods are the same as those applied when preparing the last annual financial statements, except for the critical judgements and estimates made in determining the financial impacts arising from the Brumadinho dam failure, as described in note 3, and the new accounting policy related to the application of IFRS 16 Leases, which has been adopted by the Company since January 1, 2019 and is described in note 2(c).

The interim financial statements of the Company 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 (“R\$”). For presentation purposes, these interim financial statements are presented in United States dollars (“US\$”) as the Company believes that this is the relevant currency used by international investors.

The exchange rates used by the Company to translate its foreign operations are as follows:

	Closing rate		Three-month period ended		Average rate	
	June 30, 2019	December 31, 2018	June 30, 2019	June 30, 2018	June 30, 2019	June 30, 2018
US Dollar (“US\$”)	3.8322	3.8748	3.9221	3.6056	3.8459	3.4274
Canadian dollar (“CAD”)	2.9274	2.8451	2.9312	2.7928	2.8833	2.6807
Euro (“EUR” or “€”)	4.3587	4.4390	4.4068	4.2944	4.3440	4.1430

The issue of these interim financial statements was authorized by the Executive Board on July 31, 2019.

c) Changes in significant accounting policies

– **IFRIC 23 Uncertainty over income tax treatments** – IFRIC 23 became effective for annual periods beginning on or after January 1, 2019 and clarifies the measurement and recognition requirements of IAS 12 Income taxes. The Company has assessed these requirements brought by the new interpretation and concluded there is no significant impact on its interim financial statements.

– **IFRS 16 Leases** – The Company has applied IFRS 16 from January 1, 2019, the date of initial application, using the modified retrospective approach. Accordingly, the comparative information has not been restated and continues to be reported under IAS 17 and IFRIC 4. As a result of the IFRS 16 adoption, the Company has changed its accounting policy for lease contracts and the details of these changes are summarized below.

The ferrous minerals produced in Brazil are mainly shipped to Asia. The Company has leased the Ponta da Madeira and Itaguaí maritime terminals in Brazil, that are primarily for the delivery of iron ore and iron ore pellets to bulk carrier vessels. The remaining lease terms are, respectively, 4 and 7 years for the ports in Brazil. Vale also has a lease agreement for a maritime terminal in Oman, which is used to deliver iron ore pellets produced in that location. The remaining lease term is 24 years for the port in Oman.

Some of the delivery of iron ore from Brazil to the Asian clients are made through 5 time charter agreements, which have 11 years remaining on average. As part of the ferrous minerals segment, the Company also has long-term agreements for the exploration and processing of iron ore with its joint ventures, such as the agreements to lease the pelletizing plants in Brazil.

In addition, the Company leases an oxygen plant dedicated to the base metals operation, as part of its nickel operation run in Canada. The remaining period of this lease agreement is 11 years.

The Company also has a long-term contract related to the right of use of certain locomotives dedicated to the transportation of the coal in Mozambique. This agreement has a remaining lease term of 7 years.

Vale has leased properties for its operational facilities and commercial and administrative offices in the various locations where the Company conducts its business.

Until December 31, 2018, these lease arrangements were classified as operating leases and were not recognized in the Company's statement of financial position. The contractual payments were recognized in the income statement on a straight-line basis over the term of the lease.

As at January 1, 2019, these lease agreements were recognized in the statement of financial position and were measured discounting the remaining minimum contractual payments at the present value, using the Company's incremental borrowing rate ranging from 3% to 6%, depending on the remaining lease term. The Company used the following practical expedients when applying IFRS 16:

- Applied a single discount rate to a portfolio of leases with similar characteristics;
- Applied the exemption not to recognize right-of-use assets and liabilities for leases with less than 12 months of lease term and leases of low-value assets. The payments associated to these leases will be recognized as an expense on a straight-line basis over the lease term; and
- Used hindsight when determining the lease term, to determine if the contract contains options to extend or terminate the lease.

Following are the lease liabilities under IFRS 16 reconciled to the disclosed operating lease commitments under IAS 17 at December 31, 2018:

	Lease commitments disclosed on December 31, 2018	Contracts scoped out	Present value adjustment	Lease liability recognized on January 1, 2019
Ports	1,131	-	(364)	767
Vessels	769	(1)	(164)	604
Pellets plants	218	(15)	(52)	151
Properties	162	(1)	(24)	137
Energy plants	94	-	(29)	65
Locomotives	68	(7)	(16)	45
Mining equipment	55	(18)	(5)	32
Total	2,497	(42)	(654)	1,801

The total amount of the variable lease payments not included in the measurement of lease liabilities, which have been recognized straight to the income statement, for the three and six-month periods ended June 30, 2019 were US\$120 and US\$308, respectively. The interest accretion recognized in the income statement is disclosed in note 6.

The lease liability is presented on the statement of financial position as "Leases" and the accounting policy related to leases is disclosed in note 15.

Changes in the recognized right-of-use assets related to the lease agreements are as follows:

	January 1, 2019	Additions (i)	Contract modification	Depreciation	Translation adjustment	June 30, 2019
Ports	767	2	-	(21)	2	750
Vessels	605	-	-	(24)	-	581
Pellets plants	151	62	-	(19)	(1)	193
Properties	137	-	(4)	(14)	(1)	118
Energy plants	64	-	-	(3)	4	65
Locomotives	45	-	-	(3)	-	42
Mining equipment	32	-	-	(6)	2	28
Total	1,801	64	(4)	(90)	6	1,777

(i) Additions mainly relates to the renewal of the contract with Nibrasco, which is a pelletizing plant. The new agreement expires in December 2022.

Following is the lease liability maturity of the agreements in place as at June 30, 2019, presented by contract nature:

	2019	2020	2021	2022	2023 onwards	Total
Ports	30	31	32	34	641	768
Vessels	35	43	42	42	428	590
Pellets plants	38	28	27	27	94	214
Properties	24	28	26	12	43	133
Energy plants	4	3	4	4	50	65
Locomotives	4	4	5	5	24	42
Mining equipment	6	9	5	5	3	28
Total	141	146	141	129	1,283	1,840

3. Brumadinho dam failure

On January 25, 2019, a failure has been experienced in the Dam I of the Córrego do Feijão mine, which belongs to the Paraopeba Complex in the Southern System, located in Brumadinho, Minas Gerais, Brazil (“Brumadinho dam”). This dam, built under the upstream method, was inactive since 2016 (that is, without additional tailings disposal) and there was no other operational activity in the structure.

Under the upstream method, a dam is raised by building successive layers (“lifts”) above the tailings accumulated in the reservoir. There are two other raising methods, the “downstream” method and the “centerline” method. Each of these methods presents a different risk profile.

Due to the Brumadinho dam failure (“event”), 270 people lost their lives or are missing. Around 11.7 million metric tons of iron ore waste were contained in the Brumadinho dam and it is not yet known the exact volume of iron ore waste that was released due to the dam failure. The tailings released have caused an impact of around 270 km in extension, destroying some of Vale’s facilities, affecting local communities and disturbing the environment. The Paraopeba river and its ecosystems have also been impacted by the event.

The Company has been taking the necessary actions to support the victims and to mitigate and recover the social and environmental damages resulting from the dam failure. Vale has provided support in multiple ways, aiming to ensure the humanitarian assistance to those affected by the dam failure.

The Company established three Extraordinary Independent Consulting Committees to support the Board of Directors. All members of these committees are independent and unrelated to management or to the Company’s operations, to ensure that the initiatives and actions are unbiased. Following are the committees:

- The Extraordinary Independent Consulting Committee for Investigation (“CIAEA”), dedicated to investigating the causes and responsibilities for the Brumadinho dam failure;
- The Extraordinary Independent Consulting Committee for Support and Recovery (“CIAEAR”), dedicated to follow-up on the measures taken to support and recover those impacted and the areas affected by the failure of the Brumadinho dam, assuring that all necessary resources will be applied; and
- The Extraordinary Independent Consulting Committee for Dam Safety (“CIAESB”), dedicated to support the Board of Directors on questions related to the diagnosis of safety conditions, management and risk mitigation related to Vale’s tailings dams, also providing recommendations for actions to strengthen safety conditions of those dams.

In addition, Vale has determined the suspension (i) of the variable remuneration of its executives; (ii) the Shareholder's Remuneration Policy and (iii) any other resolution related to shares buyback.

As a result of the dam failure, the Company recognized in the income statement a total impact of US\$1,532 (R\$5,921 million) and US\$6,036 (R\$23,236 million) for the three and six-month periods ended June 30, 2019 to meet its assumed obligations, including indemnification and donations to those affected by the event, remediation of the affected areas and compensation to the society. The financial impacts recognized on the statement of financial position and income statement are presented as follows:

a) De-characterization of dams

On January 29, 2019, the Company informed the market and Brazilian authorities the decision to speed up the plan to "de-characterize" all of its tailings dams built under the upstream method (same method as Brumadinho's dam), located in Brazil. The "de-characterization" means that the structure will be dismantled so the structure is effectively no longer a dam. After the event, the Brazilian National Mining Agency ("*Agência Nacional de Mineração – ANM*") set new safety criteria for dams, determining the de-characterization of structures built under the upstream method.

Following the Company's decision and new standards set by ANM, the Company has undertaken an assessment of its dam structures since the event and recorded a provision in the first quarter of 2019 for the de-characterization of certain upstream structures that have been identified at that point in time. During the current quarter, Vale has concluded that other small structures should be de-characterized as well, leading to an additional provision of US\$98 (R\$378 million), recognized in the income statement for the three-month period ended June 30, 2019.

Vale has developed engineering projects for the upstream structures and the total expected costs to carry out all de-characterization projects resulted in a provision of US\$2,018 (R\$7,733 million), discounted at the present value using the discount rate of 3.61%. In addition, the Company recognized a provision of US\$257 (R\$993 million) in relation to the de-characterization of the Germano tailings dam, owned by Samarco (note 17).

(a.i) Company's dams

Before the event, the decommissioning plans of these dams were based on a method which aimed to ensure the physical and chemical stability of the structures, not necessarily, in all cases, removing in full and potentially reprocessing the tailings contained in the dams. Since the event, the Company has been working to develop detailed de-characterization engineering plan for each of these dams.

The updated plans indicate that for certain of these upstream dams, firstly, the Company will have to reinforce the downstream massive structures, and conclude the de-characterization subsequently, according to the geotechnical and geographic conditions of each of them. It was also considered whether additional containment structures should be built, depending on the safety level of the structure. The conceptual projects for the de-characterization were filed and the conceptual developing projects are also expected to be concluded in 2019.

The Company is currently working on the development of the engineering solution to de-characterize all of these structures and the detailed engineering projects will be filed later this year, which might result in material changes on the provided amount. Moreover, these projects filed during the year are subject to further review and eventual approval by the relevant authorities.

The measurement of the costs and recognition of the provision takes into consideration several assumptions and estimates, which rely on factors, for which some are not under the Company's control. The main critical assumptions and estimates applied considers, among others: (i) volume of the waste to be removed based on historical data available and interpretation of the enacted laws and regulations; (ii) location availability for the tailings disposal; and (iii) acceptance by the authorities of the proposed engineering methods and solution. Therefore, changes in the critical assumptions and estimates may result in a material change to the amount provided as at June 30, 2019.

(a.ii) Associates and joint ventures upstream dams

Some of our investees also operate similar dam structures and as detailed in the note 17 to these financial statements, the Company recognized a provision of US\$257 (R\$993 million) in the current period as “Equity results and other results in associates and joint ventures” in relation to the de-characterization of the Germano tailings dam.

b) Framework Agreements and donations

The Company has been working together with the authorities and society to remediate the environmental and social impacts of the event. Therefore, the Company has started negotiations and entered into agreements with the relevant authorities and affected people. Vale has also signed an instrument committing to donate to Brumadinho city, other institutions, to the families with missing members or affected by fatalities, to business owners of the region and families that resided in the Self-Saving Zone near to Brumadinho dam.

The agreements reached with the relevant authorities were signed with to compensate those affected by the event. As a result of these agreements outlined below, the Company recognized a provision in the income statement for the three and six-month periods ended June 30, 2019 in the amounts of US\$86 (R\$331 million) and US\$2,509 (R\$9,648 million), respectively.

Vale has also developed studies and projects to ensure geotechnical safety of the remaining structures at the Córrego do Feijão mine, in Brumadinho, and the removal and proper disposal of the tailings, especially alongside the Paraopeba river. In addition, Vale has set up an exclusive structure for treatment of the rescued animals, enabling emergency care and recovery.

These projects aiming to recover the environment and compensate the society resulted in a provision of US\$1,162 (R\$4,482 million) recorded as at June 30, 2019.

The total amount of this provision may vary due to the early stage of the ongoing negotiations, timing and scope of the measures currently being discussed, which are subject to the approval and consent by the relevant authorities.

(b.i) Public Defendants

On April 5, 2019, Vale and the Public Defendants of the State of Minas Gerais formalized an agreement under which those affected by the Brumadinho’s Dam failure may join an individual or family group out-of-court settlement agreements for the indemnification of material, economic and moral damages. This agreement establishes the basis for a wide range of indemnification payments, which were defined according to the best practices and case law of Brazilian Courts.

(b.ii) Public Ministry of Labor

On July 15, 2019, Vale signed a final agreement with the Public Ministry of Labor to indemnify the direct and third-party employees of the Córrego do Feijão mine who were affected by the termination of this operation.

Under the terms of the final agreement, Vale will either maintain the jobs of its direct employees and third-party employees until January 25, 2023 or convert this benefit into a cash compensation. The agreement also includes indemnification payments to the relatives of the fatal victims of the event, which may vary depending on their relationship with the victims, and a lifelong medical insurance benefit to the widows and widowers and a similar benefit to the dependents of the victims until they are 25 years old.

In addition, the agreement set a collective moral damage indemnification payment in the amount of US\$104 (R\$400 million) that has to be paid by August 6, 2019.

(b.iii) Brazilian Federal Government, State of Minas Gerais, Public Prosecutors

On February 20, 2019, Vale entered into a preliminary agreement with the State of Minas Gerais, Federal Government and representatives of Public Authorities in which the Company commits to make, subject to registration, emergency indemnification payments to the residents of Brumadinho and the communities that are located up to one kilometer from the Paraopeba river bed, from Brumadinho to the city of Pompéu. Due to this agreement, the Company has been anticipating the indemnification to each family member through monthly payments during a 12-month period, which changes based on the age of the beneficiary, among other factors.

(b.iv) Environmental remediation and compensation

On July 8, 2019, Vale has entered into an agreement with *Companhia de Saneamento de Minas Gerais* (“COPASA”) to implement several actions to clean up the affected areas and to upgrade the retention water system alongside the Paraopeba River and some other collection water points nearby the affected area. In addition, the Company mobilized the dredging of part of the material released, including cleaning and de-sanding of the Paraopeba river channel.

c) Incurred expenses

The Company has incurred in expenses which do not qualify for provision and have been recognized straight to the income statement, in the amounts of US\$158 and US\$262 for the three and six-month periods ended June 30, 2019, respectively. These expenses include communication services, accommodation and humanitarian assistance, equipment, legal services, water, food aid, taxes, among others.

d) Operation stoppages

The Company has some suspended operations due to judicial decisions or technical analysis performed by the Company on its upstream dam structures. Such stoppage currently impacts 50 Mtpy of Vale's production capacity of iron ore, which about 20 Mtpy is expected to be gradually resumed starting by the end of this fiscal year. The Company is working on legal and technical measures to resume these operations at the earliest.

The Company recorded a loss of US\$238 and US\$398 related to the operational stoppage and idle capacity of the ferrous mineral segment as “Pre-operating and operational stoppage” for the three and six-month periods ended June 30, 2019, respectively.

e) Assets write-off

Following the event and the decision to speed up the de-characterization of the upstream dams, the Company recognized a loss of US\$65 (R\$251 million) and US\$219 (R\$836 million) as “Impairment and disposal of non-current assets” in the three and six-month period ended June 30, 2019 in relation to the assets write-off of the Córrego do Feijão mine and those related to the other upstream dams in Brazil.

f) Contingencies and other legal matters

Vale is subject to significant contingencies due to the Brumadinho dam failure. Vale has already been named on several judicial and administrative proceedings brought by authorities and affected people and is currently under investigations. Vale is evaluating these contingencies and would recognize a provision based on the updates on the stage of these claims.

Following these contingencies, approximately US\$3.3 billion (R\$12.8 billion) of the Company's assets are blocked as at June 30, 2019, of which approximately US\$96 (R\$366 million) were freeze on the Company's bank accounts and US\$3.2 billion (R\$12.4 billion) were converted into judicial deposits as at June 30, 2019.

For the Brumadinho event, the Company has additional guarantees in the amount of US\$1.4 billion (R\$5.3 billion), of which only US\$131 (R\$500 million) were presented in court and used to release the respective judicial deposit during the period ended June 30, 2019.

Following the conclusion of the final agreement with the Public Prosecutor's Office, signed on July 15, 2019 (subsequent event), the judicial deposit in the amount of US\$418 (R\$1.6 billion), related to the Brumadinho event, was refunded to the Company.

On July 9, 2019 (subsequent event), the decision issued by the 6th Public Treasury Court of Minas Gerais authorized the substitution of US\$1.3 billion (R\$5 billion), being US\$652 (R\$2.5 billion) for each of the two main lawsuits raised by the Public Prosecutors of Minas Gerais due to the dam I failure of Brumadinho, by guarantees. As of the date of issuance of these interim financial statements, such funds have not been released yet.

(f.i) Lawsuits

On January 27, 2019, following the injunctions granted upon the requests of the Public Prosecutors of the State of Minas Gerais and the State of Minas Gerais, the Company had restricted an amount cash on its bank accounts as collateral for the necessary measures to reassure the stability of the other dams of the Córrego do Feijão mine, provide accommodation and assistance to the affected people, remediate environmental and social impacts, among other obligations.

On January 31, 2019, the Public Ministry of Labor filed a Public Civil Action and two preliminary injunctions were granted determining a freezing on the Company's bank accounts to secure the indemnification of direct and third-party employees that worked in the Córrego de Feijão mine at the time of the Brumadinho dam failure. Following the final agreement reached with Public Ministry of Labor signed on July 15, 2019 (subsequent event), the amount has been released to the Company (note 22).

On March 18, 2019 the Public Prosecutor of the State of Minas Gerais filed a Public Civil Action and a preliminary injunction was granted to freeze an amount on the Company's bank accounts, to secure funds to indemnify for potential damages that may arise from the evacuation of the community of Sebastião de Águas Claras – Macacos community.

On March 25, 2019, the Public Prosecutor of the State of Minas Gerais filed a Public Civil Action and two preliminary injunctions were granted to freeze an amount of the Company's assets, to secure funds for potential damages that may arise from evacuation of the communities in Barão de Cocais. On July 11, 2019 (subsequent event), these decisions were suspended, and the amount has been released to the Company (note 24).

(f.ii) Administrative sanctions

The Company was notified of the imposition of administrative fines by the Brazilian Institute of the Environment and Renewable Natural Resources ("IBAMA"), in the amount of US\$65 (R\$250 million), which the Company expects to settle through environmental projects. Furthermore, the Secretary for Environment – SEMA Brumadinho imposed administrative fines, in the total amount of US\$27 (R\$109 million). Both amounts are also provided as at June 30, 2019.

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

The Company became aware through public available information that Vale and certain of its current officers have been named as defendants in putative securities class action complaints in Federal Courts in New York brought by holders of Vale's securities under U.S. federal securities laws. However, neither the Company nor its officers have been officially served of any of these Complaints.

The complaints allege that Vale made false and misleading statements or omitted to make disclosures concerning the risks and potential damage of a failure of the dam in the Córrego de Feijão mine. The plaintiffs have not specified an amount of alleged damages in these complaints. Vale intends to defend these actions and mount a full defense against these claims. Based on the assessment of the Company's legal consultants, although still in a very preliminary stage, the expectation of loss of this proceeding is classified as possible.

Considering that, no official service of process has been received to date, the very early stage of the aforementioned putative class action and the fact that no amounts have been claimed by the plaintiffs against the defendants, it is not possible, at the moment, to reliably estimate the potential amounts involved.

g) Insurance

The Company is negotiating with insurers under its operational risk, general liability and engineering risk policies, but these negotiations are still at a preliminary stage. Any payment of insurance proceeds will depend on the coverage definitions under these policies and assessment of the amount of loss. In light of the uncertainties, no indemnification to the Company was recognized in Vale's financial statements.

Critical accounting estimates and judgments

The measurement of the provisions require the use of assumptions that may be mainly affected by: (i) changes in laws and regulations; (ii) changes in the current estimated market price of the direct and indirect cost related to products and services, (iii) changes in timing for cash outflows, (iv) changes in the technology considered in measuring the provision, (v) number of individuals entitled to the indemnification payments, (vi) resolution of existing and potential legal claims, (vii) demographic assumptions, (viii) actuarial assumptions, and (ix) updates in the discount rate.

Therefore, future expenditures may differ from the amounts currently provided because the realized assumptions and various other factors are not always under the Company's control. These changes to key assumptions could result in a material impact to the amount of the provision in future reporting periods. At each reporting period, the Company will reassess the key assumptions used in the preparation of the projected cash flows and will adjust the provision, if required.

4. Information by business segment and by geographic area

The Company operated the following reportable segments during this year: Ferrous Minerals, Coal and Base Metals. The segments are aligned with products and reflect the structure used by Management to evaluate Company's performance. The responsible bodies for making operational decisions, allocating resources and evaluating performance are the Executive Boards and the Board of Directors. The performance of the operating segments is assessed based on a measure of Adjusted EBITDA.

In 2019, due to the Brumadinho dam failure, the Company has created the Special Recovery and Development Board, which is in-charge of social, humanitarian, environmental and structural recovery measures that are implemented in Brumadinho and other affected areas. This Board reports to the CEO and assess the costs related to the Brumadinho event. These costs are not directly related to the Company's operating activities and, therefore, were not allocated to any operating segment.

The Company allocate to "Others" the sales and expenses of other products, services, research and development, investments in joint ventures and associates of other business and unallocated corporate expenses.

a) Adjusted EBITDA

Adjusted EBITDA is calculated for each segment using operating income or loss plus dividends received and interest from associates and joint ventures, and excluding the amounts charged as (i) depreciation, depletion and amortization and (ii) impairment and disposal of non-current assets.

	Three-month period ended June 30, 2019						
	Net operating revenue	Cost of goods sold and services rendered	Sales, administrative and other operating expenses	Research and evaluation	Pre operating and operational stoppage	Dividends received and interest from associates and joint ventures	Adjusted EBITDA
Ferrous minerals							
Iron ore	5,849	(2,093)	(148)	(24)	(236)	-	3,348
Iron ore Pellets	1,300	(576)	(3)	(5)	(13)	144	847
Ferroalloys and manganese	69	(56)	(1)	(1)	-	-	11
Other ferrous products and services	97	(82)	2	-	-	-	17
	7,315	(2,807)	(150)	(30)	(249)	144	4,223
Coal	256	(386)	2	(6)	-	28	(106)
Base metals							
Nickel and other products	1,076	(794)	(22)	(8)	(4)	-	248
Copper	462	(235)	(3)	(7)	-	-	217
	1,538	(1,029)	(25)	(15)	(4)	-	465
Brumadinho event	-	-	(1,532)	-	-	-	(1,532)
Others	77	(80)	44	(39)	(3)	49	48
Total	9,186	(4,302)	(1,661)	(90)	(256)	221	3,098

	Three-month period ended June 30, 2018						
	Net operating revenue	Cost of goods sold and services rendered	Sales, administrative and other operating expenses (i)	Research and evaluation	Pre operating and operational stoppage	Dividends received and interest from associates and joint ventures	Adjusted EBITDA
Ferrous minerals							
Iron ore	4,570	(2,144)	(26)	(25)	(27)	1	2,349
Iron ore Pellets	1,518	(808)	(6)	(6)	(6)	105	797
Ferroalloys and manganese	115	(65)	(2)	(1)	-	-	47
Other ferrous products and services	118	(84)	1	-	-	-	35
	6,321	(3,101)	(33)	(32)	(33)	106	3,228
Coal	356	(327)	(7)	(6)	-	29	45
Base metals							
Nickel and other products	1,340	(810)	(18)	(8)	(7)	-	497
Copper	530	(245)	-	(4)	-	-	281
	1,870	(1,055)	(18)	(12)	(7)	-	778
Others	69	(67)	(160)	(42)	(6)	30	(176)
Total from continuing operations	8,616	(4,550)	(218)	(92)	(46)	165	3,875
Discontinued operations (Fertilizers)	32	(36)	(3)	-	-	-	(7)
Total	8,648	(4,586)	(221)	(92)	(46)	165	3,868

(i) Restated including in "Others" a loss of US\$27 related to provision for litigation.

	Six-month period ended June 30, 2019						
	Net operating revenue	Cost of goods sold and services rendered	Sales, administrative and other operating expenses	Research and evaluation	Pre operating and operational stoppage	Dividends received and interest from associates and joint ventures	Adjusted EBITDA
Ferrous minerals							
Iron ore	10,326	(3,737)	(161)	(43)	(393)	-	5,992
Iron ore Pellets	2,974	(1,329)	(7)	(10)	(23)	144	1,749
Ferroalloys and manganese	154	(113)	(2)	(1)	-	-	38
Other ferrous products and services	204	(159)	1	-	-	-	46
	13,658	(5,338)	(169)	(54)	(416)	144	7,825
Coal	589	(809)	1	(12)	-	56	(175)
Base metals							
Nickel and other products	2,056	(1,482)	(34)	(15)	(12)	-	513
Copper	933	(461)	(3)	(12)	-	-	457
	2,989	(1,943)	(37)	(27)	(12)	-	970
Brumadinho event	-	-	(6,036)	-	-	-	(6,036)
Others	153	(165)	(104)	(68)	(3)	49	(138)
Total	17,389	(8,255)	(6,345)	(161)	(431)	249	2,446

	Six-month period ended June 30, 2018						
	Net operating revenue	Cost of goods sold and services rendered	Sales, administrative and other operating expenses (i)	Research and evaluation	Pre operating and operational stoppage	Dividends received and interest from associates and joint ventures	Adjusted EBITDA
Ferrous minerals							
Iron ore	9,273	(4,222)	(39)	(45)	(62)	1	4,906
Iron ore Pellets	3,103	(1,621)	(7)	(11)	(9)	105	1,560
Ferroalloys and manganese	239	(139)	(3)	(1)	-	-	96
Other ferrous products and services	233	(157)	(2)	-	-	-	74
	12,848	(6,139)	(51)	(57)	(71)	106	6,636
Coal	736	(662)	(5)	(9)	-	89	149
Base metals							
Nickel and other products	2,472	(1,515)	(33)	(17)	(15)	-	892
Copper	1,032	(493)	(1)	(8)	-	-	530
	3,504	(2,008)	(34)	(25)	(15)	-	1,422
Others	131	(137)	(358)	(70)	(12)	40	(406)
Total from continuing operations	17,219	(8,946)	(448)	(161)	(98)	235	7,801
Discontinued operations							
(Fertilizers)	121	(120)	(4)	-	-	-	(3)
Total	17,340	(9,066)	(452)	(161)	(98)	235	7,798

(i) Restated including in "Others" a loss of US\$72 related to provision for litigation.

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

From continuing operations

	Three-month period ended June 30,		Six-month period ended June 30,	
	2019	2018	2019	2018
Net income (loss) from continuing operations	(142)	93	(1,817)	1,784
Depreciation, depletion and amortization	966	861	1,767	1,734
Income taxes	473	(664)	(159)	57
Financial results	728	3,055	1,434	3,679
Equity results and other results in associates and joint ventures	743	370	659	299
Dividends received and interest from associates and joint ventures (i)	221	165	249	235
Impairment and disposal of non-current assets	109	(5)	313	13
Adjusted EBITDA from continuing operations	3,098	3,875	2,446	7,801

(i) Includes remuneration of the financial instrument in the coal segment.

From discontinued operations

	Three-month period ended June 30, 2018	Six-month period ended June 30, 2018
Loss from discontinued operations	(10)	(92)
Income taxes	(9)	(40)
Financial results	1	5
Impairment of non-current assets	11	124
Adjusted EBITDA from discontinued operations	(7)	(3)

b) Assets by segment

	June 30, 2019			December 31, 2018		
	Product inventory	Investments in associates and joint ventures	Property, plant and equipment and intangibles (i)	Product inventory	Investments in associates and joint ventures	Property, plant and equipment and intangibles (i)
Ferrous minerals	2,397	1,853	33,990	2,210	1,814	31,377
Coal	116	156	1,634	119	317	1,589
Base metals	1,183	14	22,100	1,147	14	21,295
Others	17	1,092	1,555	11	1,080	2,086
Total	3,713	3,115	59,279	3,487	3,225	56,347

	Three-month period ended June 30,					
	2019			2018		
	Capital expenditures (ii)		Depreciation, depletion and amortization	Capital expenditures (ii)		Depreciation, depletion and amortization
Sustaining capital	Project execution	Sustaining capital		Project execution		
Ferrous minerals	312	87	531	291	171	425
Coal	27	-	60	19	15	56
Base metals	259	42	356	189	19	367
Others	2	1	19	1	-	13
Total	600	130	966	500	205	861

	Six-month period ended June 30,					
	2019			2018		
	Capital expenditures (ii)		Depreciation, depletion and amortization	Capital expenditures (ii)		Depreciation, depletion and amortization
Sustaining capital	Project execution	Sustaining capital		Project execution		
Ferrous minerals	591	173	959	613	504	857
Coal	77	-	109	43	24	121
Base metals	441	53	662	370	34	717
Others	3	3	37	2	5	39
Total	1,112	229	1,767	1,028	567	1,734

(i) Goodwill is allocated mainly to ferrous minerals and base metals segments in the amount of US\$1,861 and US\$1,879 in June 30, 2019 and US\$1,841 and US\$1,812 in December 31, 2018, respectively.

(ii) Cash outflows.

Base metals

Onça Puma

In June 2019, the Federal Regional Court ordered the suspension nickel processing activities at the Onça Puma plant. The mining activities in the Onça Puma mine have been halted since September 2017 by means of a prior judicial decision. The Company is challenging and appealing of the suspension decisions, but it is not possible to anticipate when Onça Puma activities will resume. In December 31, 2018, the Company calculated the recoverable amount and no losses were identified. As of June 30, 2019, the Company assessed the impairment trigger described above and concluded that it does not impact Onça Puma's recoverable amount and, therefore, no loss were recognized in the income statement for the period ended June 30, 2019.

Cobalt streaming transaction

In June 2018, the Company entered into two different agreements, one with Wheaton Precious Metals Corp ("Wheaton") and the other with Cobalt 27 Capital Corp. ("Cobalt 27"), to sell a stream equivalent to 75% of the cobalt extracted as a by-product from the Voisey's Bay mine, in Canada, starting on January 1, 2021. Upon completion of the transaction, the Company received an upfront payment of US\$690 in cash (US\$390 from Wheaton and US\$300 from Cobalt 27), which has been recorded as others non-current liabilities. Vale will receive additional payments of 20%, on average, of the market reference price for cobalt, for each pound of finished cobalt delivered.

c) Net operating revenue, by destination

	Three-month period ended June 30, 2019				
	Ferrous minerals	Coal	Base metals	Others	Total
Americas, except United States and Brazil	145	-	166	-	311
United States of America	123	-	244	-	367
Germany	307	-	146	-	453
Europe, except Germany	466	43	421	-	930
Middle East, Africa and Oceania	491	9	5	-	505
Japan	472	30	87	-	589
China	4,017	-	183	-	4,200
Asia, except Japan and China	513	143	234	-	890
Brazil	781	31	52	77	941
Net operating revenue	7,315	256	1,538	77	9,186

	Three-month period ended June 30, 2018				
	Ferrous minerals	Coal	Base metals	Others	Total
Americas, except United States and Brazil	195	-	184	-	379
United States of America	89	-	265	-	354
Germany	286	-	141	-	427
Europe, except Germany	575	87	460	-	1,122
Middle East, Africa and Oceania	500	33	6	-	539
Japan	614	-	145	-	759
China	3,056	-	208	-	3,264
Asia, except Japan and China	423	222	392	-	1,037
Brazil	583	14	69	69	735
Net operating revenue	6,321	356	1,870	69	8,616

	Six-month period ended June 30, 2019				
	Ferrous minerals	Coal	Base metals	Others	Total
Americas, except United States and Brazil	306	-	386	-	692
United States of America	221	-	453	-	674
Germany	569	-	264	-	833
Europe, except Germany	879	149	817	-	1,845
Middle East, Africa and Oceania	1,119	36	11	-	1,166
Japan	950	96	175	-	1,221
China	7,261	-	326	-	7,587
Asia, except Japan and China	946	262	457	-	1,665
Brazil	1,407	46	100	153	1,706
Net operating revenue	13,658	589	2,989	153	17,389

	Six-month period ended June 30, 2018				
	Ferrous minerals	Coal	Base metals	Others	Total
Americas, except United States and Brazil	414	-	341	-	755
United States of America	171	-	509	8	688
Germany	611	-	212	-	823
Europe, except Germany	1,046	189	959	-	2,194
Middle East, Africa and Oceania	1,093	76	10	-	1,179
Japan	1,071	33	260	-	1,364
China	6,442	-	416	-	6,858
Asia, except Japan and China	769	372	641	-	1,782
Brazil	1,231	66	156	123	1,576
Net operating revenue	12,848	736	3,504	131	17,219

Provisionally priced commodities sales - At June 30, 2019, the Company had an estimated 13 million metric tons of iron ore and pellets (December 31, 2018: 27 million metric tons) and 111 thousand metric tons of copper (December 31, 2018: 78 thousand metric tons) provisionally priced based on forward prices.

The final price of these sales will be determined during the third quarter of 2019. A 10% change in the realized prices compared to the provisionally priced sales, all other factors held constant, would increase or reduce iron ore net income by US\$148 and copper net income by US\$80.

5. Costs and expenses by nature

a) Cost of goods sold and services rendered

	Three-month period ended June 30,		Six-month period ended June 30,	
	2019	2018	2019	2018
Personnel	530	573	992	1,126
Materials and services	972	964	1,925	1,848
Fuel oil and gas	337	378	684	731
Maintenance	713	676	1,341	1,413
Energy	201	240	413	478
Acquisition of products	137	100	244	223
Depreciation and depletion	871	827	1,619	1,655
Freight	844	940	1,605	1,841
Others	568	679	1,051	1,286
Total	5,173	5,377	9,874	10,601
Cost of goods sold	5,001	5,215	9,541	10,292
Cost of services rendered	172	162	333	309
Total	5,173	5,377	9,874	10,601

b) Selling and administrative expenses

	Three-month period ended June 30,		Six-month period ended June 30,	
	2019	2018	2019	2018
Personnel	41	41	87	103
Services	13	18	27	37
Depreciation and amortization	16	13	30	32
Others	40	50	76	74
Total	110	122	220	246

c) Other operating (income) expenses, net

	Three-month period ended June 30,		Six-month period ended June 30,	
	2019	2018	2019	2018
Provision for litigations (i)	161	27	240	72
Profit sharing program	16	61	51	108
Others (ii)	(142)	21	(172)	54
Total	35	109	119	234

(i) Includes the change in the expected outcome of probable loss of the lawsuit related to the accident of ship loaders, at the Praia Mole maritime terminal, in Espírito Santo.

(ii) Includes the reversal of amounts provided for legal proceedings related to the Rede Ferroviária Federal S.A lawsuit.

6. Financial result

	Three-month period ended June 30,		Six-month period ended June 30,	
	2019	2018	2019	2018
Financial income				
Short-term investments	46	50	92	75
Others	76	31	127	124
	122	81	219	199
Financial expenses				
Loans and borrowings gross interest	(274)	(294)	(526)	(630)
Capitalized loans and borrowing costs	40	44	77	104
Participative stockholders' debentures	(251)	(304)	(628)	(487)
Interest on REFIS	(43)	(51)	(85)	(109)
Interest on lease liabilities	(25)	-	(44)	-
Others	(198)	(176)	(353)	(306)
	(751)	(781)	(1,559)	(1,428)
Other financial items, net				
Net foreign exchange gains (losses) - Loans and borrowings	57	(2,376)	47	(2,493)
Derivative financial instruments	66	(306)	159	(216)
Other foreign exchange gains (losses), net	(36)	430	(33)	483
Indexation losses, net	(186)	(103)	(267)	(224)
	(99)	(2,355)	(94)	(2,450)
Financial results	(728)	(3,055)	(1,434)	(3,679)

Net investment of foreign operation

Since January 1, 2019, the Company has considered certain long-term loans payable to Vale International S.A., for which settlement is neither planned nor likely to occur in the foreseeable future, as part of its net investment in that foreign operation. The foreign exchange differences arising on the monetary item are recognized in other comprehensive income, in the "Cumulative translation adjustments", and reclassified from stockholders' equity to income statement at the moment of the disposal or partial disposal of the net investment. The Company recognized a gain of US\$225 (US\$148 net of taxes) and US\$160 (US\$106 net of taxes) for the three and six-month period ended June 30, 2019, respectively, in the "Cumulative translation adjustments" in stockholders' equity.

7. Income taxes

a) Deferred income tax assets and liabilities

Changes in deferred tax are as follow:

	Assets	Liabilities	Deferred taxes, net
Balance at March 31, 2019	7,711	1,524	6,187
Effect in income statement	(117)	(10)	(107)
Translation adjustment	103	21	82
Other comprehensive income	1	(66)	67
Balance at June 30, 2019	7,698	1,469	6,229
Balance at March 31, 2018	6,107	1,704	4,403
Effect in income statement	809	18	791
Transfers between asset and liabilities	1	1	-
Translation adjustment	(673)	(33)	(640)
Other comprehensive income	289	(12)	301
Effect of discontinued operations			
Effect in income statement	8	-	8
Transfer to net assets held for sale	(6)	-	(6)
Balance at June 30, 2018	6,535	1,678	4,857

	Assets	Liabilities	Deferred taxes, net
Balance at December 31, 2018	6,908	1,532	5,376
Effect in income statement	731	(41)	772
Translation adjustment	68	40	28
Other comprehensive income	(9)	(62)	53
Balance at June 30, 2019	7,698	1,469	6,229

	Assets	Liabilities	Deferred taxes, net
Balance at December 31, 2017	6,638	1,719	4,919
Effect in income statement	180	17	163
Transfers between asset and liabilities	9	9	-
Translation adjustment	(696)	(63)	(633)
Other comprehensive income	376	(4)	380
Effect of discontinued operations			
Effect in income statement	40	-	40
Transfer to net assets held for sale	(12)	-	(12)
Balance at June 30, 2018	6,535	1,678	4,857

b) Income tax reconciliation – Income statement

The total amount presented as income taxes in the income statement for the period is reconciled to the statutory rate, as follows:

	Three-month period ended June 30,		Six-month period ended June 30,	
	2019	2018	2019	2018
Income (loss) before income taxes	331	(571)	(1,976)	1,841
Income taxes at statutory rate - 34%	(112)	194	672	(626)
Adjustments that affect the basis of taxes:				
Income tax benefit from interest on stockholders' equity	-	397	-	464
Tax incentives	29	162	61	189
Equity results	31	15	67	44
Unrecognized tax losses of the period	(254)	(109)	(422)	(256)
Others	(167)	5	(219)	128
Income taxes	(473)	664	159	(57)

Income tax expense is recognized based on the estimate of the weighted average effective tax rate expected for the full year, adjusted for the tax effect of certain items recognized in full in the interim period. Therefore, the effective tax rate in the interim financial statement may differ from management's estimate of the effective tax rate for the annual financial statement.

c) Income taxes - Settlement program ("REFIS")

The balance mainly relates to REFIS 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 June 30, 2019, the balance of US\$ 4,260 (US\$ 445 classified as current liabilities and US\$ 3,815 classified as non-current liabilities) is due in 112 remaining monthly installments, bearing interest at the SELIC rate (Special System for Settlement and Custody).

8. Basic and diluted earnings (loss) per share

The basic and diluted earnings (loss) per share are presented below:

	Three-month period ended June 30,		Six-month period ended June 30,	
	2019	2018	2019	2018
Net income (loss) attributable to Vale's stockholders:				
Net income (loss) from continuing operations	(133)	86	(1,775)	1,758
Loss from discontinued operations	-	(10)	-	(92)
Net income (loss)	(133)	76	(1,775)	1,666
Thousands of shares				
Weighted average number of shares outstanding - common shares	5,181,771	5,197,432	5,181,092	5,197,432
Basic and diluted earnings (loss) per share from continuing operations:				
Common share (US\$)	(0.03)	0.02	(0.34)	0.34
Basic and diluted loss per share from discontinued operations:				
Common share (US\$)	-	(0.01)	-	(0.02)
Basic and diluted earnings (loss) per share:				
Common share (US\$)	(0.03)	0.01	(0.34)	0.32

The Company does not have potential outstanding shares or other instruments with dilutive effect on the earnings per share computation.

9. Accounts receivable

	June 30, 2019	December 31, 2018
Accounts receivable	3,048	2,710
Expected credit loss	(65)	(62)
	2,983	2,648
Revenue related to the steel sector - %	87.61%	85.50%

	Three-month period ended June 30,		Six-month period ended June 30,	
	2019	2018	2019	2018
Impairment of accounts receivable recorded in the income statement	(3)	(4)	(3)	(4)

There is no customer that individually represents more than 10% of the Company's accounts receivable or revenues.

10. Inventories

	June 30, 2019	December 31, 2018
Finished products	2,948	2,797
Work in progress	765	690
Consumable inventory	1,011	956
Total	4,724	4,443

	Three-month period ended June 30,		Six-month period ended June 30,	
	2019	2018	2019	2018
Provision for net realizable value	(36)	(16)	(54)	(17)

Finished and work in progress products inventories by segments are presented in note 4(b).

11. Other financial assets and liabilities

	Current		Non-Current	
	June 30, 2019	December 31, 2018	June 30, 2019	December 31, 2018
Other financial assets				
Financial investments	16	32	-	-
Bank accounts restricted	-	-	96	-
Loans	-	-	95	153
Derivative financial instruments (note 20)	57	39	467	392
Investments in equity securities (note 12)	-	-	855	987
Related parties - Loans (note 25)	329	364	1,605	1,612
	402	435	3,118	3,144
Other financial liabilities				
Derivative financial instruments (note 20)	311	470	324	344
Related parties - Loans (note 25)	798	1,134	959	960
Participative stockholders' debentures	-	-	1,932	1,407
	1,109	1,604	3,215	2,711

Participative stockholders' debentures

On April 2, 2019, the Company provided US\$99 (R\$382 million) as remuneration on its stockholders' debentures.

12. Acquisitions and divestitures

a) Fertilizers (discontinued operations)

In January 2018, the Company and The Mosaic Company ("Mosaic") concluded the transaction entered in December 2016, to sell (i) the phosphate assets located in Brazil, except for those located in Cubatão, Brazil; (ii) the control of Companhia Minera Miski Mayo S.A.C., in Peru; (iii) the potassium assets located in Brazil; and (iv) the potash projects in Canada. The Company received US\$1,080 in cash and 34.2 million common shares, corresponding to 8.9% of Mosaic's outstanding common shares after the issuance of these shares totaling US\$899, based on the Mosaic's quotation at closing date of the transaction and a loss of US\$55 was recognized in the income statement from discontinued operations.

Mosaic's shares received have been accounted for as a financial investment measured at fair value through other comprehensive income.

In May 2018, the Company concluded the transaction entered with Yara International ASA to sell its assets located in Cubatão, Brazil and received US\$255 in cash and a loss of US\$69 was recognized in the income statement from discontinued operations.

b) New Steel

On January 24, 2019, the Company acquired 100% of the voting capital of New Steel Global NV ("New Steel") and gained its control for the total cash consideration of US\$496. New Steel is a company that develops processing and beneficiating technologies for iron ore through a completely dry process.

The consideration paid is mainly attributable to the research project and development intangible assets. When completed, the Company expects to use the beneficiation technique on its pelletizing operations.

The useful life of the intangible assets recognized will be defined when those assets are ready for use, which is at the beginning of the operational phase and, until then, those assets are not subject to amortization. Instead, they are reviewed for impairment annually, or more frequently when a trigger for impairment has been identified.

Details of the purchase price, and the net assets acquired are as follows:

	January 24, 2019
Purchase price	496
Acquired assets	(18)
Intangibles (note 14)	(2)
Other assets	(16)
Assumed liabilities	17
Fair value adjustment of an intangible research and development asset (note 14)	(495)
	-

c) Ferrous Resources Limited

In December 2018, the Company entered into an agreement to acquire the control of Ferrous Resources Limited, a company that currently owns and operates iron ore mines nearby some Company's operations in Minas Gerais, Brazil for the amount of US\$550. In July 2019, the Company obtained the approval of the transaction by the Brazilian anti-trust authority (CADE), and thereby, expects to conclude it in the third quarter of 2019.

13. Investments in associates and joint ventures

a) Changes during the period

Changes in investments in associates and joint ventures as follows:

	Associates	Joint ventures	Total
Balance at December 31, 2018	1,392	1,833	3,225
Additions	-	1	1
Translation adjustment	16	15	31
Equity results in income statement	9	187	196
Equity results in statement of comprehensive income	(4)	-	(4)
Impairment (i)	(163)	-	(163)
Dividends declared	(10)	(170)	(180)
Others	-	9	9
Balance at June 30, 2019	1,240	1,875	3,115

	Associates	Joint ventures	Total
Balance at December 31, 2017	1,441	2,127	3,568
Additions	-	23	23
Translation adjustment	(165)	(264)	(429)
Equity results in income statement	3	123	126
Dividends declared	-	(153)	(153)
Transfer from non-current assets held for sale (ii)	87	-	87
Others	6	(2)	4
Balance at June 30, 2018	1,372	1,854	3,226

(i) The Company identified an impairment trigger on its investment in Henan Longyu Energy Resources and recognized a loss of US\$163 within "Equity results and other results in associates and joint ventures" for the period ended June 30, 2019.

(ii) Refers to 18% interest held by Vale Fertilizantes at Ultrafertil which was transferred to Vale as part of the final settlement in January 2018 (note 12).

The investments by segments are presented in note 4(b).

b) Guarantees provided

As of June 30, 2019, 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. were US\$334 and US\$1,349, respectively.

Selected Notes to the Interim Financial Statements

Expressed in millions of United States dollar, unless otherwise stated



Investments in associates and joint ventures (continued)

Associates and joint ventures	% ownership	% voting capital	Investments in associates and joint ventures		Equity results in the income statement				Dividends received			
			June 30, 2019	December 31, 2018	Three-month period ended June 30,		Six-month period ended June 30,		Three-month period ended June 30,		Six-month period ended June 30,	
					2019	2018	2019	2018	2019	2018	2019	2018
Ferrous minerals												
Baovale Mineração S.A.	50.00	50.00	29	23	4	1	5	3	-	1	-	1
Companhia Coreano-Brasileira de Pelotização	50.00	50.00	83	104	9	18	27	33	32	15	32	15
Companhia Hispano-Brasileira de Pelotização (i)	50.89	50.89	82	83	9	8	21	23	37	23	37	23
Companhia Ítalo-Brasileira de Pelotização (i)	50.90	51.00	96	81	7	15	15	31	27	33	27	33
Companhia Nipo-Brasileira de Pelotização (i)	51.00	51.11	166	148	20	31	51	61	47	34	47	34
MRS Logística S.A.	48.16	46.75	512	496	15	18	27	30	-	-	-	-
VLI S.A.	37.60	37.60	862	857	7	14	8	1	-	-	-	-
Zhuhai YPM Pellet Co.	25.00	25.00	23	22	-	-	-	-	-	-	-	-
			1,853	1,814	71	105	154	182	143	106	143	106
Coal												
Henan Longyu Energy Resources Co., Ltd.	25.00	25.00	156	317	3	8	(2)	12	-	-	-	-
			156	317	3	8	(2)	12	-	-	-	-
Base metals												
Korea Nickel Corp.	25.00	25.00	14	14	-	-	-	1	-	-	-	-
			14	14	-	-	-	1	-	-	-	-
Others												
Aliança Geração de Energia S.A. (i)	55.00	55.00	486	486	9	6	23	25	28	15	28	25
Aliança Norte Energia Participações S.A. (i)	51.00	51.00	165	162	-	3	2	10	-	-	-	-
California Steel Industries, Inc.	50.00	50.00	254	247	10	19	27	40	21	15	21	15
Companhia Siderúrgica do Pecém (ii)	50.00	50.00	-	-	-	(82)	-	(124)	-	-	-	-
Mineração Rio do Norte S.A.	40.00	40.00	97	93	4	(9)	3	(6)	-	-	-	-
Others			90	92	(7)	(9)	(11)	(14)	1	-	1	-
			1,092	1,080	16	(72)	44	(69)	50	30	50	40
Total			3,115	3,225	90	41	196	126	193	136	193	146

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

(ii) Companhia Siderúrgica do Pecém ("CSP") is a joint venture and its results are accounted for under the equity method, in which the accumulated losses are capped to the Company's interest in the investee's capital based on the applicable law and requirements. That is, after the investment is reduced to zero, the Company does not recognize further losses nor liabilities associated with the investee. However, the Company has provided a financial guarantee to CSP, which has a fair value of US\$150 as at June 30, 2019 and is recorded in the balance sheet as "Others non-current liabilities".

14. Intangibles

Changes in intangibles are as follows:

	Goodwill	Concessions (i)	Right of use	Software	Research & development project and patents (ii)	Total
Balance at December 31, 2018	3,653	4,061	137	111	-	7,962
Additions	-	217	-	26	497	740
Disposals	-	(12)	-	-	-	(12)
Amortization	-	(137)	(1)	(39)	-	(177)
Translation adjustment	87	46	5	3	(12)	129
Balance at June 30, 2019	3,740	4,175	141	101	485	8,642
Cost	3,740	5,253	214	984	485	10,676
Accumulated amortization	-	(1,078)	(73)	(883)	-	(2,034)
Balance at June 30, 2019	3,740	4,175	141	101	485	8,642

(i) Based on technical studies carried out by an independent company and after approval by the regulatory agency (ANTT), the Company reduced the useful life of its railroad tracks in 2019.

(ii) Refers mainly to the acquisition of New Steel Global N.V. (note 12c).

	Goodwill	Concessions	Right of use	Software	Research & development project and patents	Total
Balance at December 31, 2017	4,110	4,002	152	229	-	8,493
Additions	-	627	-	5	-	632
Disposals	-	(10)	-	-	-	(10)
Amortization	-	(66)	(3)	(60)	-	(129)
Translation adjustment	(363)	(605)	(8)	(21)	-	(997)
Balance at June 30, 2018	3,747	3,948	141	153	-	7,989
Cost	3,747	4,907	215	1,363	-	10,232
Accumulated amortization	-	(959)	(74)	(1,210)	-	(2,243)
Balance at June 30, 2018	3,747	3,948	141	153	-	7,989

Concessions

The Company started in 2018 the process of early renewal of its railway concessions, which expire in 2027. The early renewal of the concessions will be submitted to the Board of Directors, subject to the analysis of the compensations required by the government, including the implementation of the Midwest Integration Railroad ("FICO"), totaling 377 km between the Brazilian states of Mato Grosso and Goiás. The compensations required for the renewal will be formalized after the stage of public hearing.

15. Property, plant and equipment

Changes in property, plant and equipment are as follows:

	Land	Building	Facilities	Equipment	Mineral properties	Lease agreements	Others	Constructions in progress	Total
Balance at December 31, 2018	635	10,952	11,236	6,407	8,499	-	7,269	3,387	48,385
Effects of IFRS 16 adoption (i)	-	-	-	-	-	1,801	-	-	1,801
Additions (ii)	-	-	-	-	-	64	-	1,721	1,785
Disposals	(21)	(110)	(30)	(24)	(153)	(4)	(164)	(28)	(534)
Assets retirement obligation	-	-	-	-	227	-	-	-	227
Depreciation, amortization and depletion	-	(260)	(319)	(428)	(321)	(90)	(331)	-	(1,749)
Translation adjustment	7	135	148	51	217	6	95	63	722
Transfers	-	89	124	547	338	-	404	(1,502)	-
Balance at June 30, 2019	621	10,806	11,159	6,553	8,807	1,777	7,273	3,641	50,637
Cost	621	18,627	17,754	12,730	17,523	1,927	12,274	3,641	85,097
Accumulated depreciation	-	(7,821)	(6,595)	(6,177)	(8,716)	(150)	(5,001)	-	(34,460)
Balance at June 30, 2019	621	10,806	11,159	6,553	8,807	1,777	7,273	3,641	50,637

	Land	Building	Facilities	Equipment	Mineral properties	Lease agreements	Others	Constructions in progress	Total
Balance at December 31, 2017	718	12,100	11,786	6,893	9,069	-	8,193	6,119	54,878
Additions (ii)	-	-	-	-	-	-	-	1,007	1,007
Disposals	-	(37)	(36)	(15)	(5)	-	(52)	(7)	(152)
Assets retirement obligation	-	-	-	-	(12)	-	-	-	(12)
Depreciation, amortization and depletion	-	(303)	(354)	(437)	(290)	-	(346)	-	(1,730)
Translation adjustment	(80)	(1,260)	(1,381)	(516)	(602)	-	(922)	(520)	(5,281)
Transfers	7	380	1,101	573	273	-	625	(2,959)	-
Balance at June 30, 2018	645	10,880	11,116	6,498	8,433	-	7,498	3,640	48,710
Cost	645	17,816	17,365	12,365	15,866	-	10,961	3,640	78,658
Accumulated depreciation	-	(6,936)	(6,249)	(5,867)	(7,433)	-	(3,463)	-	(29,948)
Balance at June 30, 2018	645	10,880	11,116	6,498	8,433	-	7,498	3,640	48,710

(i) Refers to the recognition of right-of-use assets related to lease agreements in accordance with IFRS 16. Changes in leases by asset class are disclosed in note 2(c).

(ii) Includes capitalized borrowing costs.

There are no material changes to the net book value of consolidated property, plant and equipment pledged to secure judicial claims and loans and borrowings (note 16) compared to those disclosed in the financial statements as at December 31, 2018.

Accounting policy

Leases - At inception of a contract, the Company assesses whether a contract is, or contains, a lease. A contract is, or contains a lease, if the contract conveys the right to control the use of an identified asset for a period of time in exchange for consideration.

The Company recognizes a right-of-use asset and a lease liability at the lease commencement date. The right-of-use asset is initially measured at cost, which comprises the initial amount of the lease liability adjusted for any lease payments made at or before the commencement date. The right-of-use asset is subsequently depreciated using the straight-line method from the commencement date to the earlier of the end of the useful life of the right-of-use asset or the end of the lease term.

The lease liability is initially measured at the present value of the lease payments that are not paid at the commencement date, discounted using the interest rate implicit in the lease or, if that rate cannot be readily determined, the Company's incremental borrowing rate.

Lease payments included in the measurement of the lease liability comprise: (i) fixed payments, including in-substance fixed payments; (ii) variable lease payments that depend on an index or a rate, initially measured using the index or rate; and (iii) the exercise price under a purchase option or renewal option that are under the Company's control and is reasonably certain to be exercised.

The lease liability is measured at amortized cost using the effective interest method. It is remeasured when there is a change in future lease payments arising from a change in an index or rate. When the lease liability is remeasured, a corresponding adjustment is made to the carrying amount of the right-of-use asset or is recorded in profit or loss if the carrying amount of the right-of-use asset has been reduced to zero.

16. Loans, borrowings and cash and cash equivalents

a) 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, part in R\$, indexed to the Brazilian Interbank Interest rate (“DI Rate” or “CDI”) and part denominated in US\$, mainly time deposits.

b) Loans and borrowings

i) Total debt

	Current liabilities		Non-current liabilities	
	June 30, 2019	December 31, 2018	June 30, 2019	December 31, 2018
Principal in:				
US\$	448	256	10,685	10,300
EUR	-	-	1,080	1,088
R\$	600	492	2,620	2,940
Other currencies	14	25	118	127
Accrued charges	225	230	-	8
Total	1,287	1,003	14,503	14,463

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

	Principal	Estimated future interest payments (i)
2019	417	429
2020	1,208	862
2021	1,242	786
2022	2,542	693
Between 2023 and 2027	5,095	2,560
2028 onwards	5,061	3,433
Total	15,565	8,763

(i) Based on interest rate curves and foreign exchange rates applicable as at June 30, 2019 and considering that the payments of principal will be made on their contracted payments dates. The amount includes the estimated interest not yet accrued and the interest already recognized in the interim financial statements.

ii) Reconciliation of debt to cash flows arising from financing activities

	Loans and borrowings
March 31, 2019	17,051
Additions	300
Repayments	(1,636)
Interest paid	(237)
Cash flow from financing activities	(1,573)
Effect of exchange rate	49
Interest accretion	263
Non-cash changes	312
June 30, 2019	15,790
	Loans and borrowings
December 31, 2018	15,466
Additions	2,142
Repayments	(1,852)
Interest paid	(483)
Cash flow from financing activities	(193)
Effect of exchange rate	22
Interest accretion	495
Non-cash changes	517
June 30, 2019	15,790

iii) Credit lines

To mitigate liquidity risk, Vale has two revolving credit facilities, which will mature in 2020 and 2022, in the available amount of US\$5,000 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. As of June 30, 2019, these lines are undrawn.

iv) Guarantees

As at June 30, 2019 and December 31, 2018, loans and borrowings are secured by property, plant and equipment in the amount of US\$224 and US\$221, respectively.

The securities issued through Vale's wholly-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 primary financial covenants in those agreements require maintaining certain ratios, such as debt to EBITDA and interest coverage. The Company has not identified any instances of noncompliance as at June 30, 2019.

17. Liabilities related to associates and joint ventures

On November 5, 2015, a rupture has been experienced in the Fundão tailings dam, in Mariana (MG), operated by Samarco Mineração S.A. ("Samarco"), a joint venture controlled by Vale S.A. and BHP Billiton Brasil Ltda ("BHP"). In March 2016, Samarco and its shareholders entered into a Framework Agreement with governmental authorities, in which Samarco, Vale S.A. and BHP agreed to establish the Fundação Renova, an entity responsible to develop and implement 42 long-term mitigation and compensation programs.

In addition to the Fundão tailings dam, Samarco owns the Germano dam, which was also built under the upstream method and has been inactive since the Fundão dam rupture.

Fundação Renova

During the second quarter of 2019, Fundação Renova reviewed the estimates of the costs required to mitigate and compensate the impacts from the rupture of Fundão dam. As a result, Vale recognized an additional provision of US\$383 (R\$1.477 million), which is the present value of the revised estimate in relation to Vale's responsibility to support Fundação Renova and is equivalent to 50% of Samarco's additional obligations over the next 11 years.

Overall, the programs depend on future actions for their definition, which indicates a broad range of possible estimates. Estimates of mitigation and compensation actions may vary according to the progress of the ongoing programs developed by the Fundação Renova and changes in scope. The amounts disclosed in these interim financial statements have been determined based on Management's best estimates and consider the facts and circumstances known to date.

The contingencies related to the Fundão dam rupture are disclosed in note 22.

Germano dam

Due to the new safety requirements set by ANM, Samarco prepared a project for the de-characterization of this dam. During May 2019, the concept of a project for the de-characterization of the Germano dam was filled. The conceptual project is expected to be concluded in August 2019 and is subject to further review and eventual approval by the competent authorities. Accordingly, based on the information available on the preparation of these interim financial statements, the estimated amount discounted at the present value using the rate of 3.61% and based on the expected cash outflows resulted in a provision of US\$257 (R\$993 million) recorded as at June 30, 2019.

The measurement of the costs and recognition of this provision takes into consideration several assumptions and estimates, which rely on factors, which some of that are not always under the Company's control. The main critical assumptions and estimates applied considers, among others: (i) volume of the waste to be removed based on historical data available and interpretation of the enacted laws and regulations; (ii) location availability for the tailings disposal; and (iii) acceptance by the authorities of the proposed engineering methods and solution. Therefore, changes in the critical assumptions and estimates may result in a material change to the provided amount as at June 30, 2019.

The changes in the provision to meet the obligations under the agreement related to the Fundão dam rupture and to the de-characterization of Germano dam in the six-month period ended June 30, 2019 and 2018 are as follows:

	2019	2018
Balance at January 1	1,121	996
Payments	(149)	(126)
Present value valuation	79	51
Provision increase	640	391
Translation adjustment	19	(144)
Balance at June 30	1,710	1,168
Current liabilities	412	273
Non-current liabilities	1,298	895
Liabilities	1,710	1,168

Samarco's working capital

In addition to the provision, Vale S.A. made available in the three and six-month period ended June 30, 2019 the amount of US\$30 and US\$60, respectively, and the amount of US\$20 and US\$34 in the three and six-month period ended June 30, 2018, respectively, which was fully used to fund Samarco's working capital and was recognized in Vale's income statement as an expense in "Equity results and other results in associates and joint ventures".

Until September 30, 2019, Vale S.A. may still provide a short-term credit facility up to US\$98 to support the Samarco's cash needs, without any binding obligation to Samarco. The availability of funds by the shareholders – Vale S.A. and BHP – is subject to the fulfillment of certain conditions, being deliberated by the shareholders, in the same bases and concomitantly, as they are necessary.

Under Brazilian legislation and the terms of the joint venture agreement, Vale does not have an obligation to provide funding to Samarco. Accordingly, Vale's investment in Samarco was fully impaired and no provision was recognized in relation to the Samarco's negative equity.

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 a result of further technical analysis and the ongoing negotiations with the Federal Prosecution Office, (ii) resolution of uncertainty in respect of the resumption of Samarco's operations; (iii) updates of 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. At each reporting period, the Company reassess the key assumptions used by Samarco in the preparation of the projected cash flows and adjust the provision, if required.

18. Financial instruments classification

	June 30, 2019				December 31, 2018			
	Amortized cost	At fair value through OCI	At fair value through profit or loss	Total	Amortized cost	At fair value through OCI	At fair value through profit or loss	Total
Financial assets								
Current								
Cash and cash equivalents	6,048	-	-	6,048	5,784	-	-	5,784
Financial investments	-	-	16	16	-	-	32	32
Derivative financial instruments	-	-	57	57	-	-	39	39
Accounts receivable	2,897	-	86	2,983	2,756	-	(108)	2,648
Related parties	329	-	-	329	364	-	-	364
	9,274	-	159	9,433	8,904	-	(37)	8,867
Non-current								
Bank accounts restricted	96	-	-	96	-	-	-	-
Derivative financial instruments	-	-	467	467	-	-	392	392
Investments in equity securities	-	855	-	855	-	987	-	987
Loans	95	-	-	95	153	-	-	153
Related parties	1,605	-	-	1,605	1,612	-	-	1,612
	1,796	855	467	3,118	1,765	987	392	3,144
Total of financial assets	11,070	855	626	12,551	10,669	987	355	12,011
Financial liabilities								
Current								
Suppliers and contractors	3,907	-	-	3,907	3,512	-	-	3,512
Leases	239	-	-	239	-	-	-	-
Derivative financial instruments	-	-	311	311	-	-	470	470
Loans and borrowings	1,287	-	-	1,287	1,003	-	-	1,003
Related parties	798	-	-	798	1,134	-	-	1,134
	6,231	-	311	6,542	5,649	-	470	6,119
Non-current								
Leases	1,601	-	-	1,601	-	-	-	-
Derivative financial instruments	-	-	324	324	-	-	344	344
Loans and borrowings	14,503	-	-	14,503	14,463	-	-	14,463
Related parties	959	-	-	959	960	-	-	960
Participative stockholders' debentures	-	-	1,932	1,932	-	-	1,407	1,407
	17,063	-	2,256	19,319	15,423	-	1,751	17,174
Total of financial liabilities	23,294	-	2,567	25,861	21,072	-	2,221	23,293

19. Fair value estimate

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

	June 30, 2019				December 31, 2018			
	Level 1	Level 2	Level 3	Total	Level 1	Level 2	Level 3	Total
Financial assets								
Financial investments	16	-	-	16	32	-	-	32
Derivative financial instruments	-	177	347	524	-	136	295	431
Accounts receivable	-	86	-	86	-	(108)	-	(108)
Investments in equity securities	855	-	-	855	987	-	-	987
Total	871	263	347	1,481	1,019	28	295	1,342
Financial liabilities								
Derivative financial instruments	-	500	135	635	-	636	178	814
Participative stockholders' debentures	-	1,932	-	1,932	-	1,407	-	1,407
Total	-	2,432	135	2,567	-	2,043	178	2,221

There were no transfers between Level 1 and Level 2, or between Level 2 and Level 3 for the six-month period ended in June 30, 2019.

The following table presents the changes in Level 3 assets and liabilities for the six-month period ended in June 30, 2019:

	Derivative financial instruments	
	Financial assets	Financial liabilities
Balance at December 31, 2018	295	178
Gain and losses recognized in income statement	52	(43)
Balance at June 30, 2019	347	135

Methods and techniques of evaluation

Derivative financial instruments

Derivative financial instruments are evaluated through the use of market curves and prices impacting each instrument at the closing dates, detailed in the item "market curves" (note 26).

For the pricing of options, the Company often uses the Black & Scholes model. In this model, the fair value of the derivative is determined basically as a function of the volatility and the price of the underlying asset, the strike price of the option, the risk-free interest rate and the option maturity. In the case of options where payoff is a function of the average price of the underlying asset over a certain period during the life 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 long and short positions are estimated by discounting their cash flows by the interest rate in the related currency. The fair value is determined by the difference between the present value of the long and short positions of the swap in the reference currency.

For the swaps indexed to TJLP, the calculation of the fair value assumes that TJLP is constant, that is, the projections of future cash flows in Brazilian Reais are made considering the last TJLP disclosed.

Forward and future contracts are priced using the future curves of their corresponding underlying assets. Typically, these curves are obtained on the stock exchanges where these assets 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 of derivatives within level 3 is estimated using discounted cash flows and option model valuation techniques with unobservable inputs of discount rates, stock prices and commodities prices.

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

The fair values and carrying amounts of loans and borrowings are as follows:

Financial liabilities	Balance	Fair value	Level 1	Level 2
June 30, 2019				
Debt principal	15,565	16,546	10,669	5,877
December 31, 2018				
Debt principal	15,228	16,262	10,686	5,576

Due to the short-term cycle, the fair value of cash and cash equivalents balances, financial investments, accounts receivable and accounts payable approximate their book values.

20. Derivative financial instruments

a) Derivatives effects on statement of financial position

	Assets			
	June 30, 2019		December 31, 2018	
	Current	Non-current	Current	Non-current
Foreign exchange and interest rate risk				
CDI & TJLP vs. US\$ fixed and floating rate swap	20	1	9	-
IPCA swap	6	102	7	84
Eurobonds swap	-	-	-	4
Pre-dolar swap	19	1	19	1
	45	104	35	89
Commodities price risk				
Nickel	9	4	2	-
Bunker oil	2	-	1	-
	11	4	3	-
Options - MBR	-	333	-	295
Others	1	26	1	8
	1	359	1	303
Total	57	467	39	392

	Liabilities			
	June 30, 2019		December 31, 2018	
	Current	Non-current	Current	Non-current
Foreign exchange and interest rate risk				
CDI & TJLP vs. US\$ fixed and floating rate swap	282	101	383	98
IPCA swap	10	33	35	47
Eurobonds swap	5	12	5	-
Pre-dolar swap	9	37	10	18
	306	183	433	163
Commodities price risk				
Nickel	5	4	8	2
Bunker oil	-	-	29	-
	5	4	37	2
Options - MBR	-	13	-	16
Conversion options - VLI	-	122	-	162
Others	-	2	-	1
	-	137	-	179
Total	311	324	470	344

b) Effects of derivatives on the income statement and cash flow

	Gain (loss) recognized in the income statement			
	Three-month period ended June 30,		Six-month period ended June 30,	
	2019	2018	2019	2018
Foreign exchange and interest rate risk				
CDI & TJLP vs. US\$ fixed and floating rate swap	16	(232)	11	(197)
IPCA swap	16	(64)	28	(45)
Eurobonds swap	(2)	(39)	(21)	(8)
Pre-dolar swap	(5)	(52)	(2)	(33)
	25	(387)	16	(283)
Commodities price risk				
Nickel	(4)	6	16	10
Bunker oil	-	66	30	66
	(4)	72	46	76
Options - MBR	36	13	38	1
Conversion options - VLI	12	(3)	41	5
Others	(3)	(1)	18	(15)
	45	9	97	(9)
Total	66	(306)	159	(216)

	Financial settlement inflows (outflows)			
	Three-month period ended June 30,		Six-month period ended June 30,	
	2019	2018	2019	2018
Foreign exchange and interest rate risk				
CDI & TJLP vs. US\$ fixed and floating rate swap	(21)	(16)	(106)	(62)
IPCA swap	-	7	(28)	7
Eurobonds swap	-	(4)	(5)	(4)
Pre-dolar swap	16	16	14	16
	(5)	3	(125)	(43)
Commodities price risk				
Nickel	1	10	4	22
Bunker oil	-	(1)	-	8
	1	9	4	30
Total	(4)	12	(121)	(13)

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

	Last maturity dates
Currencies and interest rates	September 2029
Bunker oil	September 2019
Nickel	March 2021
Brent	December 2019
Others	December 2027

c) Hedge in foreign operations

In January 2017, the Company implemented hedge accounting for the foreign currency risk arising from Vale S.A.'s net investments in Vale International S.A. and Vale International Holding GmbH. Under the hedge accounting program, the Company's debt denominated in U.S. dollars and Euros serves as a hedge instrument for these investments. With the program, the impact of exchange rate variations on debt denominated in U.S. dollars and Euros has been partially recorded in other comprehensive income in the "Cumulative translation adjustments". As at June 30, 2019, the carrying value of the debts designated as instrument hedge of these investments are US\$2,497 and EUR750.

	Consolidated			
	Gain (loss) recognized in the other comprehensive income			
	Three-month period ended June 30,		Six-month period ended June 30,	
	2019	2018	2019	2018
Hedge in foreign operation, net of tax	33	(592)	24	(565)

21. Provisions

	Current liabilities		Non-current liabilities	
	June 30, 2019	December 31, 2018	June 30, 2019	December 31, 2018
Payroll, related charges and other remunerations (i)	643	1,046	-	-
Onerous contracts	53	60	649	642
Environmental obligations	95	100	235	202
Asset retirement obligations	71	85	3,555	3,030
Provisions for litigation (note 22)	-	-	1,525	1,357
Employee postretirement obligations (note 23)	80	72	2,140	1,864
Provisions	942	1,363	8,104	7,095

(i) Change mainly due to payment of profit sharing program.

22. Litigations

a) Provision for litigations

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 litigations are as follows:

	Tax litigation	Civil litigation	Labor litigation	Environmental litigation	Total of litigation provision
Balance at December 31, 2018	691	166	497	3	1,357
Additions and reversals, net (i)	2	171	61	6	240
Payments	(12)	(36)	(74)	(1)	(123)
Indexation and interest	(2)	20	15	2	35
Translation adjustment	12	(1)	5	-	16
Balance at June 30, 2019	691	320	504	10	1,525

	Tax litigation	Civil litigation	Labor litigation	Environmental litigation	Total of litigation provision
Balance at December 31, 2017	750	131	582	10	1,473
Additions and reversals, net	5	17	53	(3)	72
Payments	-	(16)	(38)	(1)	(55)
Additions - discontinued operations	21	1	16	-	38
Indexation and interest	14	13	(3)	-	24
Translation adjustment	(108)	(24)	(85)	(1)	(218)
Balance at June 30, 2018	682	122	525	5	1,334

(i) Includes the change in the expected outcome of probable loss of the lawsuit related to the accident of ship loaders, at the Praia Mole maritime terminal, in Espírito Santo.

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:

	June 30, 2019	December 31, 2018
Tax litigations	7,619	8,641
Civil litigations	1,911	1,957
Labor litigations	1,277	1,475
Environmental litigations	1,141	1,051
Total	11,948	13,124

i - Tax litigations - The most relevant contingent tax liabilities are associated with proceedings related to the (i) collection of IRPJ and CSLL, (ii) challenges of PIS and COFINS tax credits, (iii) assessments related to mining royalties (CFEM), and (iv) collection of ICMS, in particular related to credits we claimed in connection with the sale and transmission of electricity; collection of ICMS in connection with goods that enter into the State of Pará and collection of ICMS and penalties in connection with the transportation of iron ore by Vale itself. The changes over the period is mainly due to the reevaluation by the Company of the contingent liabilities regarding the deduction of CSLL from the taxable corporate income, the new tax proceedings related to ISS, PIS, COFINS, CSLL, the variation of the amount involved in IRPJ and IRRF proceedings, as well as the imposition of the accrued interest and monetary updated on the amounts in dispute.

ii - Civil litigations - 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 litigations - 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 litigations - 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.

	June 30, 2019	December 31, 2018
Tax litigations	1,079	1,069
Civil litigations	141	60
Labor litigations	550	555
Environmental litigations	36	32
Brumadinho event	3,229	-
Total	5,035	1,716

In addition to the above-mentioned tax, civil, labor and environmental judicial deposits, the Company contracted US\$2.7 billion (R\$10.2 billion) in guarantees for its lawsuits, as an alternative to judicial deposits.

For the Brumadinho event, the Company has additional guarantees in the amount of US\$1.4 billion (R\$5.3 billion), of which only US\$131 (R\$500 million) were presented in court and used to release the respective judicial deposit during the period ended June 30, 2019.

Following the conclusion of the final agreement with the Public Prosecutor's Office, signed on July 15, 2019 (subsequent event), the judicial deposit in the amount of US\$418 (R\$1.6 billion), related to the Brumadinho event, was refunded to the Company.

On July 9, 2019 (subsequent event), the decision issued by the 6th Public Treasury Court of Minas Gerais authorized the substitution of US\$1.3 billion (R\$5 billion), being US\$652 (R\$2.5 billion) for each of the two main lawsuits raised by the Public Prosecutors of Minas Gerais due to the dam I failure of Brumadinho, by guarantees. As of the date of issuance of these interim financial statements, such funds have not been released yet.

d) Contingencies related to Samarco accident

(i) Public civil claim filed by the Federal Government and others and Public civil claim filed by Federal Prosecution Office ("MPF")

In 2016, the federal government, the Brazilian states of Espírito Santo and Minas Gerais and other governmental authorities have initiated a public civil lawsuit against Samarco and its shareholders, with an estimated value indicated by the plaintiffs of US\$5.3 billion (R\$20.2 billion). In the same year, MPF filed a public civil action against Samarco and its shareholders and presented several claims, including: (i) the adoption of measures for mitigating the social, economic and environmental impacts resulting from the dam failure and other emergency measures; (ii) the payment of compensation to the community; and (iii) payments for the collective moral damage. The action value indicated by MPF is US\$40.5 billion (R\$155 billion).

In June 2018, the parties entered into an agreement ("Term of Adjustment of Conduct"), which extinguishes (i) the public civil claim of US\$5.3 billion (R\$20.2 billion) filed by the Federal Government and others; and (ii) part of the claims included in the public civil claim of US\$40.5 billion (R\$155 billion) filed by MPF.

(ii) United States class action lawsuits

In March 2017, holders of bonds issued by Samarco Mineração S.A., filed a class action suit in the Federal Court in New York against Samarco Mineração S.A., Vale S.A., a BHP Billiton Limited, a BHP Billiton PLC and BHP Brasil Ltda. under U.S. federal securities laws. The plaintiffs allege that Vale S.A. made false and misleading statements or not made disclosures concerning the risks and dangers of the operations of Samarco's Fundão dam and the adequacy of related programs and procedures.

In June 2019, the Court issued a decision and order dismissing with prejudice the putative federal securities class action. Such decision is appealable and plaintiff's legal deadline is still ongoing. Based on the assessment of the Company's legal consultants, the defendants would have better arguments for a defense in case an appeal is filed by plaintiffs.

(iii) Criminal lawsuit

In 2016, the MPF brought a criminal lawsuit against Samarco and its shareholders, VogBr Recursos Hídricos e Geotecnia Ltda. and 22 individuals for the consequences related to Fundão dam failure. Currently, the progress of the criminal action is paralyzed due to the judgment of Habeas Corpus, with no decision.

On April 23, 2019, the Federal Court from the 1st Region ("TRF1") issued an Habeas Corpus writ and granted it to dismiss the criminal charges of homicide and physical injuries committed by oblique intent held against one of the defendants on the criminal action. At the same opportunity, the Court extended the writ's issuance to all other defendants on the case as the criminal information does not describe the crimes of homicide and physical injury, but the crime of flooding qualified by the result of death and physical injury as a consequence of the Fundão dam's failure. Therefore, the Court dismissed the homicide and physical injuries charges held against all defendants.

After acknowledging the Court's decisions, the Ponte Nova Court changed the process, withdrawing the case from the grand jury and putting it in the ordinary processing. In the same opportunity, the judge ruled to determine the parties to manifest themselves about this process alteration and, after the Federal Prosecution and the defenses presented their petitions, the criminal action currently awaits a new ruling. According to the due process of law, this new ruling will necessarily analyze the hypothesis of summary acquittal.

(iv) Tax proceedings

In 2018, the Office of the Attorney General for the National Treasury (PGFN) requested for a judicial order to secure the payment of alleged federal tax and social security debts in the amount of US\$ 2.6 billion (R\$10 billion) regarding a Samarco. In May 2019, a favorable decision was issued dismissing the claim without prejudice, due to lack of procedural interest. Such decision shall be submitted to the confirmation by Superior Courts.

e) Contingent Assets

(i) Compulsory loan

In 1999, the Company filed an ordinary suit in order to obtain the refund of the monetary adjustment and interests due over the compulsory loans paid in the period within 1977 and 1993. The Company has obtained a favorable unappealable decision, which partially recognized its right to be refunded about the difference of the monetary adjustment and interests due over the compulsory loans related to the third convertible bonds issued by Eletrobrás in the period within 1987 and 1993. The pleadings of the Company regarding the first and second convertible bonds (1978 to 1986) were refused by the Court. In 2015, the Company requested for the execution of the judgement in the amount of US\$137 (R\$524 million). A judicial decision determining the total amount to be refunded to the Company is still pending, then the related asset has not been accounted in Vale's financial statements yet.

(ii) ICMS included in PIS and COFINS tax base

In March 2017, the Federal Supreme Court (STF) decided that the ICMS shall not be included in PIS and COFINS tax basis. The decision is not final as an appeal by the Office of the Attorney General for the National Treasury (PGFN) is still pending. Vale has been litigating this issue in two judicial proceedings, related to taxable events after December 2001. On March 18, 2019, a favorable judicial decision in one of these proceedings became final and unappealable (with respect to assessments after March 2012). In the other case, Vale is waiting the publication of the decision issued by Federal Regional Court of the 2nd Region on July 30, 2019 (subsequent event), which applied the STF position. This decision is not final, once it is challengeable. The asset has not yet been recognized in the financial statements as the determination of its amount is subject to a final decision request for clarification (embargos de declaração) before the STF, which is pending.

(iii) Arbitral award related to Simandou

In 2010, Vale acquired a 51% stake in VBG - Vale BSGR Limited ("VBG") (formerly BSG Resources (Guiné) Limited), which had iron ore concession rights in Simandou South ("Zogota") and iron ore exploration permits in Simandou North (Blocks 1 & 2) in Guinea. In 2014, the Republic of Guinea revoked that concession after a finding that BSGR had obtained it through bribery of Guinean government officials, while finding that Vale did not participate in any way in that bribery.

In April 2019, the Company was summoned of an award from an arbitral tribunal in London granting the amount of US\$1.2 billion plus costs and interest (with interest and costs, exceeding US\$2.0 billion), against BSG Resources Limited (“BSGR”), for fraud, misrepresentations and breaches of warranties by BSGR in inducing Vale to enter into a joint venture to develop a concession for mining iron ore in the Simandou region of the Republic of Guinea.

Vale S.A. commenced proceedings against BSG Resources Limited (“BSGR”) before Courts in London, United Kingdom and in the United States District Court for the Southern District of New York to enforce Vale’s arbitral award against BSGR.

On the other hand, BSGR has also commenced proceedings in London challenging the enforcement of the award and before Courts in New York. Vale intends to defend the enforcement of the award and to pursue collection of this award by all legally available means, including other possible jurisdictions, but since there can be no assurance as to the timing and amount of any collections, the asset was not recognized in its financial statements.

23. Employee postretirement obligations

Reconciliation of net liabilities recognized in the statement of financial position

	June 30, 2019			December 31, 2018		
	Overfunded pension plans	Underfunded pension plans	Other benefits	Overfunded pension plans	Underfunded pension plans	Other benefits
Amount recognized in the statement of financial position						
Present value of actuarial liabilities	(3,425)	(4,345)	(1,445)	(3,577)	(3,929)	(1,280)
Fair value of assets	5,298	3,570	-	4,737	3,273	-
Effect of the asset ceiling	(1,873)	-	-	(1,160)	-	-
Liabilities	-	(775)	(1,445)	-	(656)	(1,280)
Current liabilities	-	(7)	(73)	-	(20)	(52)
Non-current liabilities	-	(768)	(1,372)	-	(636)	(1,228)
Liabilities	-	(775)	(1,445)	-	(656)	(1,280)

24. Stockholders’ equity

a) Share capital

As at June 30, 2019, the share capital was US\$61,614 corresponding to 5,284,474,782 shares issued and fully paid without par value.

Stockholders	June 30, 2019		
	ON	PNE	Total
Litel Participações S.A. and Litela Participações S.A.	1,075,773,534	-	1,075,773,534
BNDES Participações S.A.	323,496,276	-	323,496,276
Bradespar S.A.	293,907,266	-	293,907,266
Mitsui & Co., Ltd	286,347,055	-	286,347,055
Foreign investors - ADRs	1,193,226,629	-	1,193,226,629
Foreign institutional investors in local market	1,161,679,558	-	1,161,679,558
FMP - FGTS	51,559,059	-	51,559,059
PIBB - Fund	2,726,464	-	2,726,464
Institutional investors	422,279,974	-	422,279,974
Retail investors in Brazil	317,287,379	-	317,287,379
Brazilian Government (Golden Share)	-	12	12
Shares outstanding	5,128,283,194	12	5,128,283,206
Shares in treasury	156,191,576	-	156,191,576
Total issued shares	5,284,474,770	12	5,284,474,782
Share capital per class of shares (in millions)	61,614	-	61,614
Total authorized shares	7,000,000,000	-	7,000,000,000

b) Shares in treasury

As of June 30, 2019, the Company had 156.191.576 treasury shares of which 58.619.166 are judicially blocked due to the Brumadinho event. On July 11, 2019 (subsequent event), the amount has been released to the Company, due to the suspension of the judicial decision.

The Company used 2,024,059 of its treasury shares to pay the Matching program of its eligible executives, except for those whose variable remuneration was suspended as described in note 3, in the amount of US\$22. It was recognized as "assignment and transfer of shares".

25. Related parties

The Company's related parties are subsidiaries, joint ventures, associates, stockholders and its related entities and key management personnel of the Company. Transactions between the parent company and its subsidiaries are eliminated on consolidation and are not disclosed in this note.

Related party transactions were made by the Company on terms equivalent to those that prevail in arm's-length transactions, with respect to price and market conditions that are no less favorable to the Company than those arranged with third parties.

Purchases, accounts receivable and other assets, and accounts payable and other liabilities relate largely to amounts charged by joint ventures and associates related to the pelletizing plants operational lease and railway transportation services.

Information about related party transactions and effects on the financial statements is set out below:

a) Transactions with related parties

	Three-month period ended June 30,							
	2019				2018			
	Joint Ventures	Associates	Major stockholders	Total	Joint Ventures	Associates	Major stockholders	Total
Net operating revenue	96	68	46	210	72	77	53	202
Cost and operating expenses	(398)	(7)	-	(405)	(504)	(4)	-	(508)
Financial result	(12)	-	(1)	(13)	62	-	(96)	(34)

	Six-month period ended June 30,							
	2019				2018			
	Joint Ventures	Associates	Major stockholders	Total	Joint Ventures	Associates	Major stockholders	Total
Net operating revenue	160	136	90	386	176	155	101	432
Cost and operating expenses	(896)	(15)	-	(911)	(1,008)	(25)	-	(1,033)
Financial result	(10)	-	(31)	(41)	102	-	(149)	(47)

Net operating revenue relates to sale of iron ore to the steelmakers and right to use capacity on railroads. Cost and operating expenses mostly relates to the leases of the pelletizing plants.

b) Outstanding balances with related parties

	June 30, 2019				December 31, 2018			
	Joint Ventures	Associates	Major stockholders	Total	Joint Ventures	Associates	Major stockholders	Total
	Assets							
Cash and cash equivalents	-	-	693	693	-	-	1,256	1,256
Accounts receivable	108	56	3	167	110	42	3	155
Dividends receivable	109	10	-	119	132	-	-	132
Loans	1,934	-	-	1,934	1,976	-	-	1,976
Derivatives financial instruments	-	-	336	336	-	-	297	297
Other assets	61	-	-	61	25	-	-	25
Liabilities								
Supplier and contractors	450	24	36	510	221	21	24	266
Loans	-	1,356	2,607	3,963	-	1,325	2,650	3,975
Derivatives financial instruments	-	-	102	102	-	-	112	112
Other liabilities	401	70	-	471	769	-	-	769

Major stockholders

Refers to regular financial instruments with large financial institutions of which the stockholders are part of the controlling “shareholders’ agreement”.

Coal segment transactions

In March 2018, Nacala BV, a joint venture between Vale and Mitsui on the Nacala’s logistic corridor, closed the project financing and repaid a portion of the shareholders loans from Vale, in the amount of US\$2,572. The outstanding receivable of US\$1,934 carries interest at 7.44% p.a.

The loan from associates mainly relates to the loan from Pangea Emirates Ltd, part of the group of shareholders which owns 15% interest on Vale Moçambique which carries interest at 6.54% p.a.

26. Additional information about derivatives financial instruments

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.

The following tables detail the derivatives positions for Vale and its controlled companies as of June 30, 2019, 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

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.

Flow	Notional		Index	Average rate	Fair value		Financial Settlement Inflows (Outflows) June 30, 2019	Value at Risk June 30, 2019	Fair value by year		
	June 30, 2019	December 31, 2018			June 30, 2019	December 31, 2018			2019	2020	2021+
CDI vs. US\$ fixed rate swap											
Receivable	R\$ 2,591	R\$ 1,581	CDI	100.71%	(34)	(46)	(5)	8	(8)	(16)	(10)
Payable	US\$ 704	US\$ 456	Fix	3.24%							
TJLP vs. US\$ fixed rate swap											
Receivable	R\$ 2,887	R\$ 2,303	TJLP +	1.18%	(275)	(370)	(98)	11	(199)	(15)	(61)
Payable	US\$ 1,029	US\$ 994	Fix	1.71%							
TJLP vs. US\$ floating rate swap											
Receivable	R\$ 166	R\$ 181	TJLP +	0.81%	(53)	(56)	(3)	1	(53)	-	-
Payable	US\$ 98	US\$ 107	Libor +	-1.25%							
R\$ fixed rate vs. US\$ fixed rate swap											
Receivable	R\$ 1,126	R\$ 1,078	Fix	7.21%	(26)	(8)	14	5	(4)	11	(33)
Payable	US\$ 355	US\$ 351	Fix	-0.78%							
IPCA vs. US\$ fixed rate swap											
Receivable	R\$ 976	R\$ 1,315	IPCA +	6.37%	(42)	(80)	(28)	5	-	(9)	(33)
Payable	US\$ 303	US\$ 434	Fix	4.25%							
IPCA vs. CDI swap											
Receivable	R\$ 1,350	R\$ 1,350	IPCA +	6.62%	107	89	-	-	6	56	45
Payable	R\$ 1,350	R\$ 1,350	CDI	98.58%							

(ii) Protection program for EUR denominated debt instruments

To reduce the cash flow volatility, swap 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\$.

The swap 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			Average rate	Fair value		Financial Settlement Inflows (Outflows)	Value at Risk	Fair value by year		
	June 30, 2019	December 31, 2018	Index		June 30, 2019	December 31, 2018			June 30, 2019	June 30, 2019	2019
EUR fixed rate vs. US\$ fixed rate swap					(17)	(1)	(5)	6	-	(5)	(12)
Receivable	€ 500	€ 500	Fix	3.75%							
Payable	US\$ 613	US\$ 613	Fix	4.29%							

b) Commodities derivative positions

(i) Bunker Oil and Brent Crude Oil purchase cash flows protection program

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 hedging transactions were implemented, through options contracts and on Brent Crude Oil for different portions of the exposure.

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

Flow	Notional (ton)			Average strike (US\$/ton)	Fair value		Financial settlement Inflows (Outflows)	Value at Risk	Fair value by year
	June 30, 2019	December 31, 2018	Bought / Sold		June 30, 2019	December 31, 2018			
Call options	175,000	2,100,000	B	414	2	1	-	1	2
Put options	175,000	2,100,000	S	284	-	(29)	-	-	-
Total					2	(28)	-	1	2

Brent Crude Oil Contracts

Flow	Notional (bbl)			Average strike (US\$/bbl)	Fair value		Financial settlement Inflows (Outflows)	Value at Risk	Fair value by year
	June 30, 2019	December 31, 2018	Bought / Sold		June 30, 2019	December 31, 2018			
Call options	1,047,750	-	B	83	-	-	-	-	-
Put options	1,047,750	-	S	40	-	-	-	-	-
Total					-	-	-	-	-

(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, 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, 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)				Fair value		Financial settlement Inflows (Outflows)	Value at Risk	Fair value by year	
	June 30, 2019	December 31, 2018	Bought / Sold	Average strike (US\$/ton)	June 30, 2019	December 31, 2018	June 30, 2019	June 30, 2019	2019	2020+
Fixed price sales protection										
Nickel forwards	9,413	7,244	B	12,325	3	(10)	4	3	4	(1)
Raw material purchase protection										
Nickel forwards	195	120	S	12,342	-	-	-	0.1	-	-
Copper forwards	61	81	S	6,137	-	-	-	-	-	-
Total					3	(10)	4	3.1	4	(1)

c) Freight derivative positions

To reduce the impact of maritime freight price volatility on the Company's cash flow, freight hedging transactions were implemented, through Forward Freight Agreements (FFAs). The protected item is part of Vale's costs linked to maritime freight spot prices. The financial settlement inflows/outflows of the FFAs are offset by the protected items' losses/gains due to freight prices changes.

The FFAs are contracts traded over the counter and can be cleared through a Clearing House, in this case subject to margin requirements.

Flow	Notional (days)				Fair value		Financial Settlement Inflows (Outflows)	Value at Risk	Fair value by year
	June 30, 2019	December 31, 2018	Bought / Sold	Average strike (US\$/day)	June 30, 2019	December 31, 2018	June 30, 2019	June 30, 2019	2019
Freight forwards	675	480	B	13,868	2	1	(1)	1	2

d) Wheaton Precious Metals Corp. warrants

The Company owns warrants issued by Wheaton Precious Metals Corp. (WPM), a Canadian company with stocks negotiated in Toronto Stock Exchange and New York Stock Exchange. Such warrants have payoff similar to that of an American call option 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) June 30, 2019	Value at Risk June 30, 2019	Fair value by year 2023
	June 30, 2019	December 31, 2018			June 30, 2019	December 31, 2018			
	Call options	10,000,000			10,000,000	B			

e) Debentures convertible into shares of Valor da Logística Integrada (“VLI”)

The Company has debentures which lenders have the option to convert the outstanding debt into a specified quantity of VLI’s shares, owned by the Company. This option may be fully or part exercised, upon payment to the Company of the strike price, considering the terms, conditions and other limitations existing in the agreement, at any time and at the discretion of the creditor, as of December 2017 until the maturity date of the debentures, December 2027.

Flow	Notional (quantity)		Bought / Sold	Average strike (R\$/share)	Fair value		Financial settlement Inflows (Outflows) June 30, 2019	Value at Risk June 30, 2019	Fair value by year 2027
	June 30, 2019	December 31, 2018			June 30, 2019	December 31, 2018			
	Conversion options	140,239			140,239	S			

f) Options related to Minerações Brasileiras Reunidas S.A. (“MBR”) shares

In 2015, the Company entered into an agreement to sell a stake of its interest in MBR and under the terms agreed, the Company has a call option in place giving right to buy back this non-controlling interest at any time by 2025 for a consideration calculated based on terms set under the agreement. Moreover, under certain restrict and contingent conditions, which are beyond both acquirer’s and seller’s control, the contract gives the acquirer the right to sell back its stake to the Company.

Flow	Notional (quantity, in millions)		Bought / Sold	Average strike (R\$/share)	Fair value		Financial settlement Inflows (Outflows) June 30, 2019	Value at Risk June 30, 2019	Fair value by year 2019+
	June 30, 2019	December 31, 2018			June 30, 2019	December 31, 2018			
	Options	2,139			2,139	B/S			

g) Option related to SPCs Casa dos Ventos

The Company acquired in January 2019 a call option related to shares of the special purpose companies Ventos de São Bento Energias Renováveis, Ventos São Galvão Energias Renováveis and Ventos de Santo Eloy Energias Renováveis (SPCs Casa dos Ventos), which are part of the wind farm of Folha Larga Sul project, in Campo Formoso, Bahia, with commercial operation scheduled for the first half of 2020. This option was acquired in the context of the Company’s signing of electric power purchase and sale agreements with Casa dos Ventos, supplied by this wind farm.

Flow	Notional (quantity)		Bought / Sold	Average strike (R\$/share)	Fair value		Financial settlement Inflows (Outflows) June 30, 2019	Value at Risk June 30, 2019	Fair value by year 2022
	June 30, 2019	December 31, 2018			June 30, 2019	December 31, 2018			
	Call option	137,751,623			-	B			

h) Embedded derivatives in contracts

In August 2014 the Company sold part of its stake in Valor da Logística Integrada ("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 until August 2020. This clause is considered an embedded derivative, with payoff equivalent to that of a put option.

Flow	Notional (quantity)		Bought / Sold	Average strike (R\$/share)	Fair value		Financial settlement Inflows (Outflows) June 30, 2019	Value at Risk June 30, 2019	Fair value by year 2019+
	June 30, 2019	December 31, 2018			June 30, 2019	December 31, 2018			
Put option	1,105,070,863	1,105,070,863	S	3.88	(67)	(103)	-	9	(67)

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) June 30, 2019	Value at Risk June 30, 2019	Fair value by year 2019
	June 30, 2019	December 31, 2018			June 30, 2019	December 31, 2018			
Nickel forwards	1,130	3,763	S	12,263	0.5	2	-	0.4	0.5
Copper forwards	981	2,035	S	6,162	0.5	-	-	0.1	0.5
Total					1	2	-	0.5	1

The Company has also a natural gas purchase agreement in which there's 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) June 30, 2019	Value at Risk June 30, 2019	Fair value by year	
	June 30, 2019	December 31, 2018			June 30, 2019	December 31, 2018			2019	2020+
Call options	746,667	746,667	S	233	(2)	(1)	-	1	(1)	(1)

i) 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:

- *Probable*: the probable scenario was defined as the fair value of the derivative instruments as at June 30, 2019
- *Scenario I*: fair value estimated considering a 25% deterioration in the associated risk variables
- *Scenario II*: fair value estimated considering a 50% deterioration in the associated risk variables

Instrument	Instrument's main risk events	Probable	Scenario I	Scenario II
CDI vs. US\$ fixed rate swap	R\$ depreciation	(34)	(191)	(348)
	US\$ interest rate inside Brazil decrease	(34)	(39)	(44)
	Brazilian interest rate increase	(34)	(35)	(35)
Protected item: R\$ denominated debt	R\$ depreciation	n.a.	-	-
TJLP vs. US\$ fixed rate swap	R\$ depreciation	(275)	(481)	(687)
	US\$ interest rate inside Brazil decrease	(275)	(285)	(294)
	Brazilian interest rate increase	(275)	(295)	(313)
	TJLP interest rate decrease	(275)	(295)	(314)
Protected item: R\$ denominated debt	R\$ depreciation	n.a.	-	-
TJLP vs. US\$ floating rate swap	R\$ depreciation	(53)	(77)	(101)
	US\$ interest rate inside Brazil decrease	(53)	(53)	(53)
	Brazilian interest rate increase	(53)	(53)	(53)
	TJLP interest rate decrease	(53)	(53)	(53)
Protected item: R\$ denominated debt	R\$ depreciation	n.a.	-	-
R\$ fixed rate vs. US\$ fixed rate swap	R\$ depreciation	(26)	(110)	(194)
	US\$ interest rate inside Brazil decrease	(26)	(31)	(35)
	Brazilian interest rate increase	(26)	(36)	(44)
Protected item: R\$ denominated debt	R\$ depreciation	n.a.	-	-
IPCA vs. US\$ fixed rate swap	R\$ depreciation	(42)	(121)	(200)
	US\$ interest rate inside Brazil decrease	(42)	(44)	(46)
	Brazilian interest rate increase	(42)	(47)	(52)
	IPCA index decrease	(42)	(45)	(48)
Protected item: R\$ denominated debt	R\$ depreciation	n.a.	-	-
IPCA vs. CDI swap	Brazilian interest rate increase	107	94	82
	IPCA index decrease	107	99	92
	Protected item: R\$ denominated debt linked to IPCA	IPCA index decrease	n.a.	(99)
EUR fixed rate vs. US\$ fixed rate swap	EUR depreciation	(17)	(182)	(348)
	Euribor increase	(17)	(18)	(19)
	US\$ Libor decrease	(17)	(27)	(37)
	Protected item: EUR denominated debt	EUR depreciation	n.a.	182

Instrument	Instrument's main risk events	Probable	Scenario I	Scenario II
Bunker Oil protection				
Options	Bunker Oil price decrease	2	(2)	(24)
Protected item: Part of costs linked to bunker oil prices	Bunker Oil price decrease	n.a.	2	24
Maritime Freight protection				
Forwards	Freight price decrease	2	(1)	(4)
Protected item: Part of costs linked to maritime freight prices	Freight price decrease	n.a.	1	4
Nickel sales fixed price protection				
Forwards	Nickel price decrease	4	(25)	(54)
Protected item: Part of nickel revenues with fixed prices	Nickel price fluctuation	n.a.	25	54
Purchase protection program				
Nickel forwards	Nickel price increase	-	(1)	(1)
Protected item: Part of costs linked to nickel prices	Nickel price increase	n.a.	1	1
Copper forwards	Copper price increase	-	(0.1)	(0.2)
Protected item: Part of costs linked to copper prices	Copper price increase	n.a.	0.1	0.2
Wheaton Precious Metals Corp. warrants	WPM stock price decrease	11	3	-
Conversion options - VLI	VLI stock value increase	(55)	(90)	(140)
Options - MBR	Iron ore price decrease	320	223	130
Option - SPCs Casa dos Ventos	SPCs Casa dos Ventos stock value decrease	14	5	1

Instrument	Main risks	Probable	Scenario I	Scenario II
Embedded derivatives - Raw material purchase (nickel)	Nickel price increase	-	(3)	(6)
Embedded derivatives - Raw material purchase (copper)	Copper price increase	-	(1)	(3)
Embedded derivatives - Gas purchase	Pellet price increase	(2)	(3)	(7)
Embedded derivatives - Guaranteed minimum return (VLI)	VLI stock value decrease	(67)	(208)	(456)

j) 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 published by agencies Moody's and S&P regarding the main financial institutions that we hire derivative instruments, cash and cash equivalents transactions.

Long term ratings by counterparty	Moody's	S&P	Long term ratings by counterparty	Moody's	S&P
Agricultural Bank of China	A1	A	Credit Suisse	Baa2	BBB+
ANZ Australia and New Zealand Banking	Aa3	AA-	Deutsche Bank	A3	BBB+
Banco ABC	Ba3	BB-	Goldman Sachs	A3	BBB+
Banco Bradesco	Ba3	BB-	HSBC	A2	A
Banco do Brasil	Ba3	BB-	Industrial and Commercial Bank of China	A1	A
Banco do Nordeste	Ba3	BB-	Intesa Sanpaolo Spa	Baa1	BBB
Banco Safra	Ba3	BB-	Itaú Unibanco	Ba3	BB-
Banco Santander	A2	A	JP Morgan Chase & Co	A2	A-
Banco Votorantim	Ba3	BB-	Macquarie Group Ltd	A3	BBB
Bank of America	A2	A-	Mega Int. Commercial Bank	A1	A
Bank of China	A1	A	Millenium BIM	A1	A-
Bank of Mandiri	Baa2	BBB-	Mitsui & Co	A1	A-
Bank of Montreal	Aa2	A+	Mizuho Financial	A1	A-
Bank of Nova Scotia	A2	A+	Morgan Stanley	A3	BBB+
Bank of Shanghai	Baa2	-	Muscat Bank	Ba2	BB
Bank of Tokyo Mitsubishi UFJ	A1	A-	National Australia Bank	Aa3	AA-
Bank Rakyat	Baa2	BBB-	National Bank of Canada	Aa3	A
Banpará	-	BB-	National Bank of Oman	Ba2	-
Barclays	Baa3	BBB	Natixis	A1	A+
BBVA Banco Bilbao Vizcaya Argentaria	A3	A-	Rabobank	Aa3	A+
BNP Paribas	Aa3	A+	Royal Bank of Canada	Aa2	AA-
BTG Pactual	Ba3	BB-	Societe Generale	A1	A
Caixa Econômica Federal	Ba3	BB-	Standard Bank Group	Ba1	-
Calyon	A1	A+	Standard Chartered	A2	BBB+
Canadian Imperial Bank	Aa2	A+	Sumitomo Mitsui Financial	A1	A-
China Construction Bank	A1	A	Toronto Dominion Bank	Aa3	AA-
CIMB Bank	Baa1	A-	UBS	Aa3	A-
Citigroup	A3	BBB+	Unicredit	Baa1	BBB

k) Market curves

The curves used on the pricing of derivatives instruments were developed based on data from B3, 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	12,665	DEC19	12,756	JUN20	12,910
JUL19	12,657	JAN20	12,783	JUN21	13,197
AUG19	12,687	FEB20	12,807	JUN22	13,495
SEP19	12,704	MAR20	12,837	JUN23	13,807
OCT19	12,710	APR20	12,861		
NOV19	12,730	MAY20	12,883		

Copper					
Maturity	Price (US\$/lb)	Maturity	Price (US\$/lb)	Maturity	Price (US\$/lb)
SPOT	2.71	DEC19	2.72	JUN20	2.73
JUL19	2.72	JAN20	2.72	JUN21	2.75
AUG19	2.72	FEB20	2.73	JUN22	2.77
SEP19	2.72	MAR20	2.73	JUN23	2.79
OCT19	2.72	APR20	2.73		
NOV19	2.72	MAY20	2.73		

Bunker Oil					
Maturity	Price (US\$/ton)	Maturity	Price (US\$/ton)	Maturity	Price (US\$/ton)
SPOT	410	DEC19	330	JUN20	316
JUL19	402	JAN20	323	JUN21	299
AUG19	386	FEB20	319	JUN22	254
SEP19	367	MAR20	317	JUN23	217
OCT19	350	APR20	316		
NOV19	338	MAY20	316		

Brent Crude					
Maturity	Price (US\$/bbl)	Maturity	Price (US\$/bbl)	Maturity	Price (US\$/bbl)
SPOT	65	DEC19	63	JUN20	62
JUL19	65	JAN20	63	JUN21	60
AUG19	64	FEB20	63	JUN22	58
SEP19	64	MAR20	63	JUN23	56
OCT19	64	APR20	63		
NOV19	64	MAY20	62		

Maritime Freight (Capesize 5TC)					
Maturity	Price (US\$/day)	Maturity	Price (US\$/day)	Maturity	Price (US\$/day)
SPOT	19,360	DEC19	19,593	JUN20	13,983
JUL19	18,317	JAN20	13,213	Cal 2020	15,106
AUG19	17,996	FEB20	13,213	Cal 2021	13,433
SEP19	18,079	MAR20	13,213	Cal 2022	13,371
OCT19	18,433	APR20	13,983		
NOV19	19,238	MAY20	13,983		

(ii) Foreign exchange and interest rates

US\$-Brazil Interest Rate					
Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)
08/01/19	3.28	06/01/20	2.46	10/03/22	2.42
09/02/19	2.97	07/01/20	2.47	01/02/23	2.43
10/01/19	2.86	10/01/20	2.44	04/03/23	2.46
11/01/19	2.79	01/04/21	2.37	07/03/23	2.48
12/02/19	2.74	04/01/21	2.39	10/02/23	2.50
01/02/20	2.69	07/01/21	2.37	01/02/24	2.55
02/03/20	2.62	10/01/21	2.36	04/01/24	2.60
03/02/20	2.59	01/03/22	2.38	07/01/24	2.60
04/01/20	2.56	04/01/22	2.40	01/02/25	2.64
05/04/20	2.50	07/01/22	2.38	07/01/25	2.69

US\$ Interest Rate					
Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)
1M	2.39	6M	2.12	11M	2.03
2M	2.33	7M	2.09	12M	2.02
3M	2.32	8M	2.07	2Y	1.83
4M	2.22	9M	2.05	3Y	1.78
5M	2.16	10M	2.04	4Y	1.79

TJLP					
Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)
08/01/19	6.26	06/01/20	6.26	10/03/22	6.26
09/02/19	6.26	07/01/20	6.26	01/02/23	6.26
10/01/19	6.26	10/01/20	6.26	04/03/23	6.26
11/01/19	6.26	01/04/21	6.26	07/03/23	6.26
12/02/19	6.26	04/01/21	6.26	10/02/23	6.26
01/02/20	6.26	07/01/21	6.26	01/02/24	6.26
02/03/20	6.26	10/01/21	6.26	04/01/24	6.26
03/02/20	6.26	01/03/22	6.26	07/01/24	6.26
04/01/20	6.26	04/01/22	6.26	01/02/25	6.26
05/04/20	6.26	07/01/22	6.26	07/01/25	6.26

BRL Interest Rate					
Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)
08/01/19	6.40	06/01/20	5.81	10/03/22	6.55
09/02/19	6.36	07/01/20	5.80	01/02/23	6.64
10/01/19	6.28	10/01/20	5.81	04/03/23	6.73
11/01/19	6.18	01/04/21	5.85	07/03/23	6.80
12/02/19	6.07	04/01/21	5.94	10/02/23	6.86
01/02/20	5.98	07/01/21	6.03	01/02/24	6.92
02/03/20	5.90	10/01/21	6.16	04/01/24	6.95
03/02/20	5.88	01/03/22	6.28	07/01/24	7.02
04/01/20	5.85	04/01/22	6.38	01/02/25	7.12
05/04/20	5.83	07/01/22	6.46	07/01/25	7.21

Implicit Inflation (IPCA)					
Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)
08/01/19	3.78	06/01/20	3.20	10/03/22	3.71
09/02/19	3.74	07/01/20	3.20	01/02/23	3.73
10/01/19	3.66	10/01/20	3.33	04/03/23	3.76
11/01/19	3.57	01/04/21	3.44	07/03/23	3.78
12/02/19	3.46	04/01/21	3.50	10/02/23	3.79
01/02/20	3.37	07/01/21	3.56	01/02/24	3.81
02/03/20	3.29	10/01/21	3.60	04/01/24	3.80
03/02/20	3.27	01/03/22	3.66	07/01/24	3.83
04/01/20	3.24	04/01/22	3.68	01/02/25	3.86
05/04/20	3.22	07/01/22	3.69	07/01/25	3.89

EUR Interest Rate					
Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)
1M	(0.42)	6M	(0.37)	11M	(0.36)
2M	(0.41)	7M	(0.37)	12M	(0.36)
3M	(0.39)	8M	(0.37)	2Y	(0.38)
4M	(0.38)	9M	(0.37)	3Y	(0.35)
5M	(0.38)	10M	(0.36)	4Y	(0.30)

CAD Interest Rate					
Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)	Maturity	Rate (% p.a.)
1M	1.96	6M	2.00	11M	1.05
2M	1.97	7M	1.70	12M	0.95
3M	1.97	8M	1.49	2Y	1.80
4M	1.99	9M	1.30	3Y	1.77
5M	2.01	10M	1.16	4Y	1.77

Currencies - Ending rates					
CAD/US\$	0.7638	US\$/BRL	3.8322	EUR/US\$	1.1380