

Vale S.A.  
Form 6-K  
October 27, 2016  
[Table of Contents](#)

**United States**  
**Securities and Exchange Commission**

Washington, D.C. 20549

**FORM 6-K**

**Report of Foreign Private Issuer**

**Pursuant to Rule 13a-16 or 15d-16**

**of the**

**Securities Exchange Act of 1934**

**For the month of**

**October 2016**

**Vale S.A.**

**Avenida das Américas, No. 700 Bloco 8, Sala 218  
22640-100 Rio de Janeiro, RJ, Brazil**

(Address of principal executive office)

Edgar Filing: Vale S.A. - Form 6-K

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

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

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

(Check One) Yes  No

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

(Check One) Yes  No

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

(Check One) Yes  No

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

---

Table of Contents

Table of Contents:

Press Release  
Signature Page

69

---

Table of Contents

Vale's performance in 3Q16



Table of Contents

www.vale.com

vale.ri@vale.com

App Vale Investors & Media

iOS: <https://itunes.apple.com/us/app/vale-investor-media-portugues/id1087134066?ls=1&mt=8>

Android: <https://play.google.com/store/apps/details?id=com.theirapp.valeport>

Tel.: (55 21) 3485-3900

**Investor Relations Department**

André Figueiredo

Carla Albano Miller

Fernando Mascarenhas

Andrea Gutman

Bruno Siqueira

Claudia Rodrigues

Denise Caruncho

Mariano Szachtman

Renata Capanema

BM&F BOVESPA: VALE3, VALE5

NYSE: VALE, VALE.P

EURONEXT PARIS: VALE3, VALE5

LATIBEX: XVALO, XVALP

## Edgar Filing: Vale S.A. - Form 6-K

Except where otherwise indicated the operational and financial information in this release is based on the consolidated figures in accordance with IFRS and, with the exception of information on investments and behavior of markets, quarterly financial statements are reviewed by the company's independent auditors. The main subsidiaries that are consolidated are the following: Compañía Minera Miski Mayo S.A.C., Mineração Corumbaense Reunida S.A., PT Vale Indonesia Tbk (formerly International Nickel Indonesia Tbk), Salobo Metais S.A, Vale Australia Pty Ltd., Vale International Holdings GMBH, Vale Canada Limited (formerly Vale Inco Limited), Vale Fertilizantes S.A., Vale International S.A., Vale Manganês S.A., Vale Moçambique S.A., Vale Nouvelle-Calédonie SAS, Vale Oman Pelletizing Company LLC and Vale Shipping Holding PTE Ltd.

---

Table of Contents

**Contents**

<u>Vale's performance in 3Q16</u>	4
<u>Operating revenues</u>	8
<u>Costs and expenses</u>	10
<u>Adjusted earnings before interest, taxes, depreciation and amortization</u>	12
<u>Net income</u>	13
<u>The impact of bunker oil hedging on Vale's financial performance</u>	15
<u>Effects of currency price volatility on Vale's financial performance</u>	17
<u>Investments</u>	18
<u>Free cash flow</u>	25
<u>Debt indicators</u>	26
<u>Performance of the business segments</u>	28
<u>Ferrous minerals</u>	29
<u>Base Metals</u>	42
<u>Coal</u>	52
<u>Fertilizer nutrients</u>	60



Table of Contents

**Vale's performance in 3Q16**

Rio de Janeiro, October 27th, 2016 Vale S.A. (Vale) posted another quarter of sound operational performance, with several production records in 3Q16, namely: (i) iron ore production(1) of 92.1 Mt; (ii) Carajás iron ore production of 38.7 Mt; (iii) Tubarão 3, Tubarão 8 and Vargem Grande pellet plants production of 1.2 Mt, 1.8 Mt and 1.8 Mt, respectively; (iv) contained gold as a by-product in the copper and nickel concentrates of 118,000 oz and (v) Moatize coal production of 1.8 Mt.

Net revenues totaled US\$ 7.324 billion in 3Q16, increasing by US\$ 698 million vs. 2Q16 as a result of higher sales prices for iron ore fines and pellets (US\$ 275 million), nickel and copper (US\$ 95 million), and coal (US\$ 25 million), along with higher sales volumes of fertilizers (US\$ 142 million) and for our ferrous business segment (US\$ 127 million).

Costs and expenses decreased by US\$ 2.180 billion in 9M16 vs. 9M15, mainly due to cost reduction initiatives (US\$ 1.740 billion) and exchange rate variations (US\$ 924 million), being partially offset by higher sales volumes (US\$ 1.190 billion).

Adjusted EBITDA was US\$ 3.023 billion(2) in 3Q16, 26.9% higher than in 2Q16, mainly driven by EBITDA improvements in Ferrous Minerals (US\$ 357 million), Base Metals (US\$ 224 million) and Coal (US\$ 103 million). Adjusted EBITDA margin increased by 5 percentage points, reaching 41.3% in 3Q16.

Capital expenditures totaled US\$ 1.257 billion in 3Q16, decreasing by US\$ 111 million vs. 2Q16. Investments in project execution totaled US\$ 741 million in 3Q16, with expenditures associated with the S11D project accounting for US\$ 530 million. Sustaining capex totaled US\$ 516 million in 3Q16, 11.4% higher than in 2Q16 as a result of the concentration of investment in the second half of the year.

There is now one main project under development, the S11D project, which reached an important milestone, successfully initiating its hot commissioning in 3Q16. S11D's start-up is expected for 4Q16 with the first commercial ore sale planned for 1Q17.

Net income totaled US\$ 575 million in 3Q16 vs. US\$ 1.106 billion in 2Q16, decreasing by US\$ 531 million mostly as a result of foreign exchange rate variations (US\$ 2.237 billion), which were partially offset by the Samarco provision recorded in 2Q16 (US\$ 1.038 billion) and the higher EBITDA in 3Q16 (US\$ 640 million). Underlying earnings (earnings after adjusting for one-off effects) were US\$ 954 million in 3Q16, mainly after the adjustments for foreign exchange variation (US\$ 330 million).

---

(1) Including third party purchases.

(2) Including US\$ 150 million from the goldstream transaction.



Table of Contents

Net debt decreased by US\$ 1.543 billion to US\$ 25.965 billion with a cash position of US\$ 5.484 billion. Gross debt reduced by US\$ 365 million to US\$ 31.449 billion in 3Q16, with the leverage ratio(3) improving to 3.6x, the same level as in 3Q15.

The main highlights of Vale's performance by business segment were:

**EBITDA from the Ferrous Minerals business segment increased 17% in 3Q16 vs. 2Q16, mainly driven by higher realized prices and by lower costs and expenses**

- Adjusted EBITDA for Ferrous Minerals was US\$ 2.493 billion in 3Q16, US\$ 357 million higher than the US\$ 2.136 billion achieved in 2Q16, mainly as a result of higher realized sales prices (US\$ 291 million) and lower costs and expenses(4) (US\$ 213 million), which were partially offset by exchange rate variations (US\$ 117 million).
- Cash flow generation, simplified by measuring adjusted EBITDA less sustaining and growth capex, was US\$ 1.698 billion in 3Q16, increasing US\$ 331 million (24%) from the US\$ 1.367 billion recorded in 2Q16.
- C1 cash cost FOB port per metric ton of iron ore fines in BRL reduced by 10% to R\$ 42.2/t in 3Q16 vs. R\$ 46.9/t in 3Q15, despite inflationary pressures of 8.5%(5), mainly due to improvements in operational performance and ongoing cost-cutting initiatives.
- Iron ore fines and pellets EBITDA break-even, measured by unit cash costs and expenses on a landed-in-China basis(6), decreased US\$ 0.2/dmt(7) to US\$ 28.3/dmt in 3Q16 when compared to 2Q16, despite the negative impacts of the exchange rate (US\$ 1.0/wmt(8)) and bunker oil prices (US\$ 0.7/wmt).

**EBITDA from the Base Metals business segment increased 60%(9) in 3Q16 vs. 2Q16 as a result of the goldstream transaction and higher prices**

- Adjusted EBITDA for Base Metals was US\$ 600 million in 3Q16, US\$ 224 million higher than in 2Q16, positively impacted by the goldstream transaction (US\$ 150 million) and higher prices (US\$ 114 million).

---

(3) Leverage ratio measured by gross debt to LTM (Last Twelve Months) adjusted EBITDA.

Edgar Filing: Vale S.A. - Form 6-K

- (4) Cost and expenses after adjusting the effects of higher volumes, exchange rate variation and lower bunker oil prices.
- (5) IPCA last twelve months until September 2016.
- (6) Adjusted for quality, pellets margins differential and moisture, excluding ROM.
- (7) Dry metric ton.
- (8) Wet metric ton.
- (9) Including US\$ 150 million from the goldstream transaction.

Table of Contents

- Salobo's EBITDA totaled US\$ 131 million in 3Q16, or US\$ 281 million including the impact of the goldstream transaction, increasing US\$ 9 million vs. 2Q16, despite the negative impact of an exchange rate variation of US\$ 12 million.
- Salobo achieved a quarterly production record of 44,300 t in 3Q16 and a monthly production record of 17,000 t in September 2016, running at nominal capacity on a monthly basis.
- Adjusted EBITDA for VNC totaled negative US\$ 39 million in 3Q16 improving by US\$ 11 million when compared to 2Q16 despite a planned maintenance shutdown in 3Q16. VNC's unit cost net of by-product credits reached US\$ 12,425/t in 3Q16, reflecting an US\$ 11 million maintenance expenditures associated with the shutdown.

**EBITDA from Coal almost reached break-even, being positively impacted by lower costs in Mozambique with the ramp-up of the Nacala Logistics Corridor and the start-up of the Moatize II beneficiation plant**

- Adjusted EBITDA for Coal improved significantly from negative US\$ 110 million in 2Q16 to negative US\$ 7 million in 3Q16, despite not fully capturing the recent hike in index prices.
- Metallurgical coal realized price in 3Q16 did not yet reflect the recent sharp increase in coal index prices due to the impact of Vale's lagged pricing systems, with Vale's realized price (US\$ 91.0/t) still significantly lower than the index price average(10) of US\$ 135.6/t. Vale's realized price is expected to improve considerably in 4Q16 alongside the improvement in benchmark prices.
- Adjusted EBITDA at the Nacala port improved by 71% to negative US\$ 7 million, while EBITDA at the Beira Port (-US\$ 28 million) was offset by EBITDA from the Australian operations (US\$ 28 million).
- Production cost per ton at the Nacala port continued to improve at US\$ 87/t in 3Q16, 16% lower than 2Q16, with further improvement expected for the coming quarters.

**EBITDA from the Fertilizers business segment increased 84% in 3Q16 vs. 2Q16, mainly driven by lower costs and higher volumes, despite lower prices and exchange rate variation**

---

(10) Platts Premium Low Vol Hard Coking Coal FOB Australia Index used as reference.

Table of Contents

- Adjusted EBITDA for Fertilizers increased 84% to US\$ 59 million in 3Q16, mainly driven by lower costs(11) (US\$ 42 million) and higher sales volumes (US\$ 13 million).
- Costs decreased by US\$ 42 million(12) in 3Q16 vs. 2Q16, mainly as a result of lower raw material prices.
- Phosphate rock, SSP (single superphosphate) and MAP (monoammonium phosphate) production volumes increased by 14.5%, 9.0% and 3.9% in 3Q16, respectively, as a result of the stabilization of the plants operational performance after maintenance stoppages carried out in 2Q16.

**Selected financial indicators**

US\$ million	3Q16 (A)	2Q16 (B)	3Q15 (C)	% (A/B)	% (A/C)
Net operating revenues	7,324	6,626	6,505	11	13
Adjusted EBIT	2,060	1,339	834	54	147
Adjusted EBIT margin (%)	28.1	20.2	12.8		
Adjusted EBITDA	3,023	2,383	1,875	27	61
Adjusted EBITDA margin (%)	41.3	36.0	28.8		
Net income (loss)	575	1,106	(2,117)	(48)	127
Underlying earnings	954	709	(961)	35	199
Underlying earnings per share on a fully diluted basis (US\$ / share)	0.19	0.14	(0.19)		
Total gross debt	31,449	31,814	28,675	(1)	10
Cash and cash equivalent	5,484	4,306	4,462	27	23
Total Net Debt	25,965	27,508	24,213	(6)	7
Total gross debt/ adjusted EBITDA (x)	3.6	4.2	3.6		
Capital expenditures	1,257	1,368	1,879	(8)	(33)

US\$ million	9M16 (A)	9M15 (B)	% (A/B)
Net operating revenues	19,669	19,710	(0)
Cost and expenses	15,116	17,296	(13)
Adjusted EBIT	4,553	2,414	89
Adjusted EBIT margin (%)	23.1	12.2	
Adjusted EBITDA	7,411	5,690	30
Adjusted EBITDA margin (%)	37.7	28.9	
Underlying earnings	2,177	(667)	426
Underlying earnings per share on a fully diluted basis (US\$ / share)	0.42	(0.13)	
Capital expenditures	4,074	6,207	(34)

(11) Excluding volume and exchange rate variation.

(12) After adjusting for the effects of higher volumes (US\$ 129 million) and exchange rate variation (US\$ 18 million)





Table of Contents**Operating revenues**

Net operating revenues in 3Q16 were US\$ 7.324 billion, 10.5% higher than in 2Q16. The increase in sales revenues was mainly due to higher sales prices for iron ore fines and pellets (US\$ 275 million), for nickel and copper (US\$ 95 million) and coal (US\$ 25 million), and higher sales volumes in fertilizers (US\$ 142 million) and in ferrous minerals (US\$ 127 million).

The following tables show net operating revenues by destination and by business areas, with the main highlights being:

- Net revenue by destination was marked by: (i) the increase in the share of sales to Brazil, from 13.6% in 2Q16 to 15.2% in 3Q16, reflecting higher revenues from Fertilizers (US\$ 148 million) and (ii) the relative decrease in the share of sales to Europe, from 17.2% in 2Q16 to 15.7% in 3Q16.
- Contribution by business segments in 3Q16 was generally in line with 2Q16, with the Ferrous Minerals business segment representing 67.7% of Vale's total net revenues.

**Net operating revenue by destination**

US\$ million	3Q16	%	2Q16	%	3Q15	%
<b>North America</b>	<b>551</b>	<b>7.5</b>	<b>511</b>	<b>7.7</b>	<b>394</b>	<b>6.1</b>
USA	239	3.3	230	3.5	188	2.9
Canada	303	4.1	281	4.2	206	3.2
Mexico	9	0.1				
<b>South America</b>	<b>1,194</b>	<b>16.3</b>	<b>994</b>	<b>15.0</b>	<b>1,199</b>	<b>18.4</b>
Brazil	1,111	15.2	903	13.6	1,086	16.7
Others	83	1.1	91	1.4	113	1.7
<b>Asia</b>	<b>4,081</b>	<b>55.7</b>	<b>3,668</b>	<b>55.4</b>	<b>3,547</b>	<b>54.5</b>
China	2,908	39.7	2,700	40.7	2,555	39.3
Japan	483	6.6	405	6.1	498	7.7
South Korea	270	3.7	188	2.8	171	2.6
Others	420	5.7	376	5.7	323	5.0
<b>Europe</b>	<b>1,147</b>	<b>15.7</b>	<b>1,137</b>	<b>17.2</b>	<b>1,109</b>	<b>17.1</b>
Germany	326	4.5	358	5.4	330	5.1
Italy	110	1.5	125	1.9	104	1.6
Others	711	9.7	654	9.9	675	10.4
<b>Middle East</b>	<b>236</b>	<b>3.2</b>	<b>240</b>	<b>3.6</b>	<b>227</b>	<b>3.5</b>
<b>Rest of the World</b>	<b>115</b>	<b>1.6</b>	<b>76</b>	<b>1.2</b>	<b>29</b>	<b>0.4</b>
<b>Total</b>	<b>7,324</b>	<b>100.0</b>	<b>6,626</b>	<b>100.0</b>	<b>6,505</b>	<b>100.0</b>



Table of Contents**Net operating revenues by destination****Net operating revenue by business area**

US\$ million	3Q16	%	2Q16	%	3Q15	%
<b>Ferrous minerals</b>	<b>4,959</b>	<b>67.7</b>	<b>4,541</b>	<b>68.5</b>	<b>4,312</b>	<b>66.3</b>
Iron ore fines	3,782	51.6	3,508	52.9	3,278	50.4
ROM	4	0.1	5	0.1	24	0.4
Pellets	991	13.5	868	13.1	883	13.6
Manganese ore	51	0.7	36	0.5	23	0.4
Ferroalloys	25	0.3	25	0.4	3	
Others	106	1.4	99	1.5	101	1.6
<b>Coal</b>	<b>163</b>	<b>2.2</b>	<b>145</b>	<b>2.2</b>	<b>127</b>	<b>2.0</b>
Metallurgical coal	105	1.4	77	1.2	115	1.8
Thermal coal	58	0.8	68	1.0	12	0.2
<b>Base metals</b>	<b>1,579</b>	<b>21.6</b>	<b>1,447</b>	<b>21.8</b>	<b>1,347</b>	<b>20.7</b>
Nickel	797	10.9	710	10.7	785	12.1
Copper	452	6.2	443	6.7	360	5.5
PGMs	104	1.4	99	1.5	58	0.9
Gold as by-product	179	2.4	154	2.3	115	1.8
Silver as by-product	9	0.1	10	0.2	7	0.1
Others	38	0.5	31	0.5	22	0.3
<b>Fertilizer nutrients</b>	<b>598</b>	<b>8.2</b>	<b>464</b>	<b>7.0</b>	<b>698</b>	<b>10.7</b>
Potash	34	0.5	22	0.3	41	0.6
Phosphates	470	6.4	363	5.5	560	8.6
Nitrogen	69	0.9	60	0.9	80	1.2
Others	25	0.3	19	0.3	17	0.3

Edgar Filing: Vale S.A. - Form 6-K

<b>Others</b>	<b>25</b>	<b>0.3</b>	<b>29</b>	<b>0.4</b>	<b>21</b>	<b>0.3</b>
<b>Total</b>	<b>7,324</b>	<b>100.0</b>	<b>6,626</b>	<b>100.0</b>	<b>6,505</b>	<b>100.0</b>

Table of Contents**Costs and expenses**

Costs and expenses were US\$ 5.264 billion in 3Q16 in line with the US\$ 5.287 billion recorded in 2Q16, impacted by cost reduction initiatives (US\$ 244 million) and lower other operating expenses, including the positive impact from the goldstream transaction (US\$ 150 million), which together more than offset the higher sales volumes (US\$ 230 million) and exchange rate variations (US\$ 196 million).

**Costs and expenses**

US\$ million	3Q16	2Q16	3Q15
<b>Costs</b>	<b>4,955</b>	<b>4,795</b>	<b>5,040</b>
<b>Expenses</b>	<b>309</b>	<b>492</b>	<b>631</b>
<b>Total costs and expenses</b>	<b>5,264</b>	<b>5,287</b>	<b>5,671</b>
Depreciation	963	927	1,022
<b>Costs and expenses ex-depreciation</b>	<b>4,301</b>	<b>4,360</b>	<b>4,649</b>

**COST OF GOODS SOLD (COGS)**

COGS totaled US\$ 4.955 billion in 3Q16, increasing US\$ 160 million from the US\$ 4.795 billion recorded in 2Q16, as a result of higher sales volumes (US\$ 230 million) and exchange rate variations(13) (US\$ 174 million), which were partially offset by cost reduction initiatives (US\$ 244 million).

Further details regarding cost performance are provided in the [Performance of the Business Segments](#) section.

**COGS by business segment**

US\$ million	3Q16	%	2Q16	%	3Q15	%
Ferrous minerals	2,663	53.7	2,579	53.8	2,813	55.8
Base metals	1,429	28.8	1,424	29.7	1,406	27.9
Coal	190	3.8	250	5.2	239	4.7
Fertilizers	610	12.3	482	10.1	536	10.6
Other products	63	1.3	60	1.2	46	0.9
<b>Total COGS</b>	<b>4,955</b>	<b>100.0</b>	<b>4,795</b>	<b>100.0</b>	<b>5,040</b>	<b>100.0</b>
Depreciation	899		866		861	
<b>COGS, ex-depreciation</b>	<b>4,056</b>		<b>3,929</b>		<b>4,179</b>	

**EXPENSES**

## Edgar Filing: Vale S.A. - Form 6-K

Total expenses decreased 37.2% to US\$ 309 million in 3Q16 from the US\$ 492 million recorded in 2Q16, mainly due to the positive one-off impact of the goldstream transaction (US\$ 150 million) recorded in other operating expenses, which was partially offset by the increase in SG&A (US\$ 13 million), R&D (US\$ 7 million), and pre-operating and stoppage expenses (US\$ 8 million).

---

(13) COGS currency exposure in 3Q16 was as follows: 60% BRL, 26% USD, 11% CAD, 2% EUR and 1% others.

Table of Contents

SG&A totaled US\$ 153 million in 3Q16, representing a 9.3% increase from the US\$ 140 million recorded in 2Q16, and a 16.8% increase from the US\$ 131 million recorded in 3Q15. SG&A, net of depreciation, increased by US\$ 9 million in 3Q16 vs. 2Q16, mainly as a result of the impact of exchange rate variations (US\$ 7 million) and higher selling expenses (US\$ 3 million).

R&D expenses totaled US\$ 85 million in 3Q16, representing an 8.9% increase from the US\$ 78 million recorded in 2Q16, following the usual seasonality, and a 29.7% decrease from the US\$ 121 million recorded in 3Q15. R&D expenses relate mostly to iron ore and pellets (US\$ 29 million) and nickel (US\$ 21 million).

Pre-operating and stoppage expenses totaled US\$ 122 million in 3Q16, representing a 7.0% increase from the US\$ 114 million recorded in 2Q16, mainly driven by higher S11D project expenses (US\$ 9 million).

Other operating expenses recorded a positive amount of US\$ 51 million in 3Q16, improving by US\$ 211 million when compared to the US\$ 160 million expenses in 2Q16, mainly due to: (i) the positive one-off impact of the goldstream transaction (US\$ 150 million); (ii) lower contingencies (US\$ 28 million); and (iii) lower disposals and write-off of assets (US\$ 21 million).

**Expenses**

US\$ million	3Q16	%	2Q16	%	3Q15	%
<b>SG&amp;A ex-depreciation</b>	<b>116</b>		<b>107</b>		<b>100</b>	
<b>SG&amp;A</b>	<b>153</b>	<b>50</b>	<b>140</b>	<b>28</b>	<b>131</b>	<b>21</b>
<b>Administrative</b>	<b>136</b>	<b>44</b>	<b>126</b>	<b>26</b>	<b>132</b>	<b>21</b>
Personnel	61	20	58	12	56	9
Services	19	6	18	4	26	4
Depreciation	37	12	33	7	31	5
Others	19	6	17	3	19	3
<b>Selling</b>	<b>17</b>	<b>6</b>	<b>14</b>	<b>3</b>	<b>(1)</b>	<b>(0)</b>
<b>R&amp;D</b>	<b>85</b>	<b>28</b>	<b>78</b>	<b>16</b>	<b>121</b>	<b>19</b>
<b>Pre-operating and stoppage expenses(1)</b>	<b>122</b>	<b>39</b>	<b>114</b>	<b>23</b>	<b>266</b>	<b>42</b>
VNC					97	15
Long Harbour	39	13	45	9	65	10
S11D	28	9	19	4	11	2
Moatize	1		9	2	25	4
Others	54	18	41	8	68	11
<b>Other operating expenses</b>	<b>(51)</b>	<b>(17)</b>	<b>160</b>	<b>33</b>	<b>113</b>	<b>18</b>
<b>Total Expenses</b>	<b>309</b>	<b>100</b>	<b>492</b>	<b>100</b>	<b>631</b>	<b>100</b>
Depreciation	64		61		161	
<b>Expenses ex-depreciation</b>	<b>245</b>		<b>431</b>		<b>470</b>	

(1) Includes US\$ 27 million of depreciation charges in 3Q16, US\$ 29 million in 2Q16 and US\$ 83 million in 3Q15





Table of Contents**Adjusted earnings before interest, taxes, depreciation and amortization(14)**

Adjusted EBITDA was US\$ 3.023 billion(15) in 3Q16, 26.8% higher than in 2Q16 mainly as a result of improvements in the Ferrous Minerals EBITDA (US\$ 357 million), Coal EBITDA (US\$ 103 million) and Base Metals EBITDA (US\$ 224 million). Adjusted EBITDA margin was 41.3% in 3Q16, improving from the 36.0% recorded in 2Q16.

Adjusted EBIT was US\$ 2.060 billion in 3Q16, 53.8% higher than in 2Q16.

**Adjusted EBITDA**

US\$ million	3Q16	2Q16	3Q15
Net operating revenues	7,324	6,626	6,505
COGS	(4,955)	(4,795)	(5,040)
SG&A	(153)	(140)	(131)
Research and development	(85)	(78)	(121)
Pre-operating and stoppage expenses	(122)	(114)	(266)
Other operational expenses	51	(160)	(113)
<b>Adjusted EBIT</b>	<b>2,060</b>	<b>1,339</b>	<b>834</b>
Depreciation, amortization & depletion	963	927	1,022
Dividends received		117	19
<b>Adjusted EBITDA</b>	<b>3,023</b>	<b>2,383</b>	<b>1,875</b>

**Adjusted EBITDA by business area**

US\$ million	3Q16	2Q16	3Q15
Ferrous minerals	2,493	2,136	1,652
Coal	(7)	(110)	(129)
Base metals	600	376	193
Fertilizer nutrients	59	32	197
Others	(122)	(51)	(38)
<b>Total</b>	<b>3,023</b>	<b>2,383</b>	<b>1,875</b>

(14) Net revenues less costs and expenses net of depreciation plus dividends received.

(15) Including US\$ 150 million from the goldstream transaction.

Table of Contents**Net income**

Net income totaled US\$ 575 million in 3Q16 vs. US\$ 1.106 billion in 2Q16, decreasing by US\$ 531 million, mainly as a result of the negative impact of the foreign exchange rate variation in 3Q16 vs. 2Q16 (US\$ 2.237 billion), which was partially offset by the Samarco provision recorded in 2Q16 (US\$ 1.038 billion) and the higher EBITDA in 3Q16 (US\$ 640 million).

Underlying earnings (earnings after adjusting for one-off effects) were US\$ 954 million in 3Q16, after the adjustments for foreign exchange variation (US\$ 330 million).

**Underlying earnings**

US\$ million	3Q16	2Q16	3Q15
<b>Underlying earnings</b>	<b>954</b>	<b>709</b>	<b>(961)</b>
<b>Items excluded from basic earnings</b>			
Result on measurement or sale of non-current assets	(29)	(66)	(48)
Deferred Income tax - foreign subsidiaries			2,990
Shareholders Debentures	(48)	(86)	75
Foreign Exchange	(330)	1,960	(5,025)
Monetary variation	2	(51)	(92)
Currency and interest rate swaps	(49)	483	(1,196)
Other financial results	(55)	(31)	29
Other results in investments from joint controlled and associates	(33)	(1,038)	
Income tax over excluded items	163	(774)	2,111
<b>Net Income (loss)</b>	<b>575</b>	<b>1,106</b>	<b>(2,117)</b>

Net financial results showed a loss of US\$ 1.047 billion vs. a gain of US\$ 2.091 billion in 2Q16. The main components of the 3Q16 net financial results are: (i) financial expenses (US\$ 715 million); (ii) financial revenues (US\$ 35 million); (iii) foreign exchange and monetary losses (US\$ 328 million); (iv) currency and interest rate swap losses (US\$ 49 million); and (v) gains on other derivatives (US\$ 10 million), which were partially offset by losses on bunker oil derivatives of US\$ 7 million.

**Financial results**

US\$ million	3Q16	2Q16	3Q15
<b>Financial expenses</b>	<b>(715)</b>	<b>(611)</b>	<b>(277)</b>
Gross interest	(466)	(452)	(239)
Capitalization of interest	172	213	
Tax and labour contingencies	(4)		10
Shareholder debentures	(48)	(86)	75
Others	(225)	(157)	15
Financial expenses (REFIS)	(144)	(129)	(138)
<b>Financial income</b>	<b>35</b>	<b>34</b>	<b>92</b>

<b>Derivatives(1)</b>	<b>(39)</b>	<b>759</b>	<b>(1,799)</b>
Currency and interest rate swaps	(49)	483	(1,196)
Others(2) (bunker oil, commodities, etc)	10	276	(603)
<b>Foreign Exchange</b>	<b>(330)</b>	<b>1,960</b>	<b>(5,025)</b>
<b>Monetary variation</b>	<b>2</b>	<b>(51)</b>	<b>(92)</b>
<b>Financial result, net</b>	<b>(1,047)</b>	<b>2,091</b>	<b>(7,101)</b>

---

(1) The net derivatives losses of US\$ 39 million in 3Q16 are comprised of settlement losses of US\$ 191 million and marked-to-market gains of US\$ 152 million.

(2) Other derivatives include mainly bunker oil derivatives losses of US\$ 7 million

Table of Contents

**Equity income from affiliated companies**

Equity income from affiliated companies was US\$ 46 million in 3Q16 vs. US\$ 190 million in 2Q16. The main contributors to equity income were MRS (US\$ 17 million), CSI (US\$ 17 million) and VLI (US\$ 16 million).

Table of Contents

**The impact of bunker oil hedging on Vale's financial performance**

Vale's financial performance has been impacted by the bunker oil hedge previously contracted. The outstanding bunker oil hedge position is marked-to-market and recorded as financial results, as a proxy for future cash flow. The outstanding hedge position as of September 30th, 2016 will be completely settled by the end of 2016(16).

The impact on the financial statements can be summarized as follows:

- (i) In 3Q16: a negative impact of US\$ 7 million recognized in 3Q16 as financial results due to the net position of:
  - (i) the positive impact of the mark-to-market of the open positions on September 30th, 2016; and
  - (ii) the negative impact of the realized loss on the settlements which occurred in the quarter.

(ii) In 4Q16: financial results will only be impacted by the gains or losses related to the settlements recorded in the quarter, as all current open positions will be settled until December 31st, 2016.

---

(16) Costs are no longer impacted in 2016, since all outstanding bunker oil hedge positions recorded under the hedge accounting program were settled up to 4Q15.

Table of Contents

**Impact of bunker oil hedging on Vale's financial performance**

<b>Freight contract type</b>	<b>Hedge accounting</b>	<b>Concept Impact of derivative position in P/L statement</b>	<b>Current impact Impact incurred in 3Q16 P/L statement</b>	<b>Type of Instrument</b>	<b>Drivers of future impact Bunker oil derivative outstanding position (,000 tons)</b>	<b>Average strike price (US\$/t)</b>
FOB	No	Impact on financial results	US\$7 million decrease in financial results	Forward	352	511
				Zero Cost Collar	540	300 - 380

Table of Contents

**Effects of currency price volatility on Vale's financial performance**

In 3Q16, from end to end, the Brazilian Real (BRL) depreciated 1.1% against the US Dollar (USD) from BRL 3.21/ USD as of June 30th, 2016 to BRL 3.25/ USD as of September 30th, 2016. On a quarterly average, the BRL appreciated 7.5%, from an average BRL 3.51/ USD in 2Q16 to an average BRL 3.25/ USD in 3Q16.

The end-to-end depreciation of the BRL against the USD and other currencies caused mainly non-cash losses of US\$ 379 million on our earnings before taxes in 3Q16, driven by its impact on:

(i) The net position of the USD and other currency denominated liabilities and the USD and other currency denominated assets (accounts receivable and others) which amounted to a loss of US\$ 330 million in 3Q16, recorded in the financial statements as Foreign exchange .

(ii) The changes in fair value and the settlements of the currency swaps from the BRL and other currencies to the USD, which caused one-off losses of US\$ 49 million.

The BRL appreciation on a quarterly average brought negative impacts to Vale's cash flows. In 3Q16 most of our revenues were denominated in USD, while our COGS were 60% denominated in BRL, 26% in USD and 11% in Canadian dollars (CAD) and about 70% of our capital expenditures were denominated in BRL. The appreciation of the BRL and of other currencies in 3Q16 increased our costs and expenses by US\$ 196 million.



Table of Contents**Investments**

Capital expenditures totaled US\$ 1.257 billion in 3Q16 with US\$ 741 million in project execution and US\$ 516 million in sustaining capital. Capital expenditures decreased US\$ 111 million vs. the US\$ 1.368 billion spent in 2Q16.

**Project Execution and Sustaining by business area**

US\$ million	3Q16	%	2Q16	%	3Q15	%
Ferrous minerals	795	63.3	767	56.1	1,099	58.5
Coal	149	11.9	159	11.6	333	17.7
Base metals	189	15.0	232	17.0	370	19.7
Fertilizer nutrients	100	7.9	68	4.9	55	2.9
Power generation	15	1.2	16	1.2	16	0.9
Steel	9	0.7	126	9.2	6	0.3
<b>Total</b>	<b>1,257</b>	<b>100.0</b>	<b>1,368</b>	<b>100.0</b>	<b>1,879</b>	<b>100.0</b>

**Evolution of capital expenditures**

**Project execution**

The Ferrous Minerals and the Coal business segments accounted for about 78% and 14%, respectively, of the total investment in project execution in 3Q16.

The Moatize II project was delivered in 3Q16 with total investments of US\$ 2.034 billion.

There is now one main project under development, the S11D project with a nominal capacity of 90 Mtpy of iron ore which will help reduce Vale's C1 cash costs and improve Vale's

Table of Contents

operational flexibility with the CLN S11D logistics expansion which will increase the capacity in the Northern System to 230 Mtpy by 2020.

**Project execution by business area**

US\$ million	3Q16	%	2Q16	%	3Q15	%
Ferrous minerals	579	78.2	608	67.1	878	71.3
Coal	106	14.3	140	15.5	311	25.2
Base metals	2	0.3	1	0.1	10	0.8
Fertilizer nutrients	30	4.1	14	1.6	11	0.9
Power generation	14	1.9	16	1.7	16	1.3
Steel	9	1.2	126	13.9	6	0.5
<b>Total</b>	<b>741</b>	<b>100.0</b>	<b>905</b>	<b>100.0</b>	<b>1,232</b>	<b>100.0</b>

**FERROUS MINERALS**

About 92% of the US\$ 579 million invested in Ferrous Minerals in 3Q16 relates to the S11D project and the expansion of its associated infrastructure (US\$ 530 million).

**S11D Mine and Plant Plant and stockyards**

## Edgar Filing: Vale S.A. - Form 6-K

S11D (including mine, plant and associated logistics - CLN S11D) achieved combined physical progress of 83% in 3Q16 with 95% progress at the mine site and 74% at the logistic infrastructure sites. The duplication of the railway reached 58% physical progress with 281 Km delivered up to the quarter. The railway spur started up in early October with the circulation of the first train with 330 wagons through the entire route of the spur, including the railway loop. The offshore port initiated its hot commissioning having loaded a Capesize vessel with 160,000t of ore in October, and is expected to start up in November.

The S11D mine and plant successfully initiated its hot commissioning with approximately 196,000 t of accumulated iron ore production in 3Q16, with start-up expected for 4Q16 and the first commercial ore sales planned for 1Q17. S11D will have a 4-year phased ramp-up

Table of Contents

instead of the 2-year ramp-up originally planned in order to maximize margins. The S11D (Southern range) full production of 90 Mtpy will be reached by 2020, adding a net output of 75 Mtpy from the entire Northern System (Northern and Southern ranges), which is expected to supply around 155 Mt from the Northern range only in 2016 and 230 Mtpy from both ranges by 2020.

**S11D Logistics    Railway loop**

COAL

The Moatize II coal handling and processing plant (CHPP) with net additional capacity of 11 Mtpy started up in 3Q16. Ramp-up is progressing well, having reached production of 129,000 t in August and 169,000 t in September. The project was delivered with total investments of US\$ 2.034 billion.

Table of Contents

**Moatize Expansion Stockyard**

Table of Contents

**Description and status of main projects**

<b>Project</b>	<b>Description</b>	<b>Capacity (Mtpy)</b>	<b>Status</b>
<b>Ferrous Minerals projects</b>			
Carajás Serra Sul S11D	<ul style="list-style-type: none"> <li>• Development of a mine and processing plant, located in the Southern range of Carajás, Pará, Brazil.</li> </ul>	90	<ul style="list-style-type: none"> <li>• Hot commissioning in the mine and mill initiated</li> <li>• Ore stocking in the yards initiated</li> <li>• Earthworks of all four systems concluded</li> <li>• Delivery of the electrocenters for the mine 98% completed</li> </ul>
CLN S11D	<ul style="list-style-type: none"> <li>• Duplication of 570 km railway, with construction of rail spur of 101 km. Acquisition of wagons, locomotives, and onshore and offshore expansions at PDM maritime terminal.</li> </ul>	(80)(a)	<ul style="list-style-type: none"> <li>• Duplication of the railway reached 58% physical progress, totaling 281 Km delivered</li> <li>• Railway spur start-up occurred</li> <li>• Offshore expansion achieved 95% physical progress with hot commissioning initiated</li> <li>• Onshore expansion reached 88% physical progress</li> </ul>

---

(a) Net additional capacity

**Progress indicators(17)**

Project	Capacity (Mtpy)	Estimated start-up	Executed capex (US\$ million)		Estimated capex (US\$ million)		Physical progress
			2016	Total	2016	Total	
<b>Ferrous minerals projects</b>							
Carajás Serra Sul S11D	90	2H16	755	5,411	890	6,405(b)	95%
CLN S11D	230 (80)(a)	1H14 to 1H20	951	5,418	1,154	7,850(c)	74%

---

(a) Net additional capacity.

(b) Original capex budget of US\$ 8.089 billion.

(c) Original capex budget of US\$ 11.582 billion.

### Sustaining capex

Sustaining capital increased from US\$ 463 million in 2Q16 to US\$ 516 million in 3Q16. The Ferrous Minerals and Base Metals business segments accounted for 42% and 36% of the total sustaining capex in 3Q16, respectively.

Sustaining capital for the Ferrous Minerals business segment included, among others: (i) enhancement and replacement in operations (US\$ 132 million), (ii) improvement in the current standards of health and safety, social and environmental protection (US\$ 39 million), (iii) maintenance, improvement and expansion of tailing dams (US\$ 30 million). Maintenance of railways and ports in Brazil and Malaysia accounted for US\$ 66 million.

---

(17) Pre-operating expenses were not included in the estimated capex for the year, although included in the total estimated capex column, in line with Vale's Board of Directors approvals. Estimated capex for the year is only reviewed once a year.



Table of Contents

Sustaining investments in iron ore fines (excluding sustaining investments in pellets plants) amounted to US\$ 171 million, equivalent to US\$ 2.5/dmt of iron ore fines in 3Q16, representing a 39% increase vs. the US\$ 1.8/dmt in 2Q16, mainly due to the concentration of sustaining investments in the second half of the year. The last twelve months average of sustaining for iron ore fines amounts to US\$ 2.3/dmt. Sustaining investments for Pellets totaled US\$ 37 million, equivalent to US\$ 3.2/dmt, 10.3% higher than in 2Q16.

Sustaining capex in the Base Metals business segment was mainly dedicated to: (i) enhancement and replacement in operations (US\$ 117 million), (ii) improvement in the current standards of health and safety and environmental protection (US\$ 60 million); (iii) maintenance improvements and expansion of tailing dams (US\$ 8 million).

**Sustaining capex by type - 3Q16**

US\$ million	Ferrous Minerals	Coal	Base Metals	Fertilizer	TOTAL
Operations	132	39	117	50	<b>338</b>
Waste dumps and tailing dams	30		8	3	<b>41</b>
Health and Safety	31	3	13	2	<b>49</b>
CSR - Corporate Social Responsibility	8		47	13	<b>69</b>
Administrative & Others	16	1	1	2	<b>19</b>
<b>Total</b>	<b>217</b>	<b>43</b>	<b>186</b>	<b>70</b>	<b>516</b>

**Sustaining capex by business area**

US\$ million	3Q16	%	2Q16	%	3Q15	%
Ferrous minerals	217	42.0	159	34.4	221	34.2
Coal	43	8.3	19	4.1	22	3.4
Base metals	186	36.1	231	49.9	360	55.6
Fertilizer nutrients	70	13.6	54	11.6	44	6.8
<b>Total</b>	<b>516</b>	<b>100.0</b>	<b>463</b>	<b>100.0</b>	<b>647</b>	<b>100.0</b>

**Corporate social responsibility**

Investments in corporate social responsibility totaled US\$ 114 million in 3Q16, of which US\$ 76 million dedicated to environmental protection and conservation and US\$ 38 million dedicated to social projects.

**Portfolio Management**

Edgar Filing: Vale S.A. - Form 6-K

On August 2<sup>nd</sup>, 2016, Vale sold an additional 25% premium of the goldstream payable in copper concentrate from Salobo for the life of the mine to Silver Wheaton (Caymans) Ltd. (Silver Wheaton) Vale received an initial cash payment of US\$ 800 million and will receive: (i) approximately US\$ 23 million in option value of the 10 million Silver Wheaton warrants held by Vale and (ii) future cash payments for each ounce of gold delivered to Silver Wheaton under the agreement, equal to the lesser of US\$ 400 per oz (plus a 1% annual adjustment from 2019 onwards) and the prevailing market price.

Table of Contents

On September 29th, 2016, Vale reached an important milestone in the Mozambique coal transaction by approving new terms with Mitsui. Mitsui agreed to contribute up to US\$ 450 million, being: (i) an aggregate of US\$ 255 million for a 15% of Vale's stake in the Moatize coal mine; and (ii) an additional contribution of up to US\$ 195 million based on meeting certain conditions, including mine performance. Mitsui will also contribute US\$ 348 million for a 50% stake in the equity and quasi-equity instruments of the Nacala Logistics Corridor (NCL) and extend a long-term facility of US\$ 165 million to the NCL. Vale expects to receive US\$ 768 million after the completion of the equity transaction with Mitsui and up to US\$ 2.7 billion upon closing the Project Financing.

Table of Contents

**Free cash flow**

Free cash flow was US\$ 1.622 billion in 3Q16.

Cash generated from operations was US\$ 3.227 billion in 3Q16, with non-operational uses of cash stemming mainly from: (i) interest on loans (US\$ 423 million); (ii) income taxes and REFIS installments (US\$ 204 million); (iii) settlement of derivatives (US\$ 191 million), of which US\$ 166 million related to bunker oil; and (iv) investments (US\$ 1.249 billion)(18).

The goldstream transaction generated a cash inflow of US\$ 800 million in 3Q16. For accounting purposes, the cash inflow was classified into two components. The first component was recorded as sale of mining rights for US\$ 276 million (included in the net disposal/acquisition of assets and investments), of which US\$ 126 million was deducted from the book value of the mining rights and US\$ 150 million reduced other operational expenses representing the gain on the sale of mining rights. The other component was recorded as deferred revenue of US\$ 524 million (improving Vale's working capital), which will be recognized in our income statement as the actual gold is delivered.

Net additions and repayments of loans were negative US\$ 414 million, with debt repayments exceeding debt additions in 3Q16.

**Free Cash Flow**

---

(18) The investments figure reported in the cash flow statement may differ from the ones reported in the Investments section of this report due to the fact that some actual figures are converted into U.S. dollars at the exchange rate on the date of each cash disbursement, while figures reported in our cash flow statements are converted into U.S. dollars based on average exchange rates.

Table of Contents

**Debt indicators**

Gross debt totaled US\$ 31.449 billion as of September 30th, 2016, decreasing from the US\$ 31.814 billion as of June 30th, 2016, as a result of net debt repayments(19) and the impact of the depreciation of the BRL(20) on the translation of BRL denominated debt into USD.

On August 3rd, 2016, Vale issued, through its wholly-owned subsidiary Vale Overseas Limited, US\$ 1.0 billion of Guaranteed Notes due in August 2026 bearing a coupon of 6.25% per annum. The net proceeds from the offering were used to pay part of the redemption price of the 6.250% notes due January 2017, issued by Vale Overseas Limited. The redemption of the notes due in 2017 was concluded on September 23rd, 2016.

Net debt decreased by US\$ 1.543 billion compared to the end of the previous quarter, totaling US\$ 25.965 billion based on a cash position of US\$ 5.484 billion as of September 30th, 2016. The decrease in net debt was mainly driven by the positive free cash flow of US\$ 1.622 billion in 3Q16.

**Debt position**

Gross debt after currency and interest rate swaps was 92% denominated in USD, with 34% based on floating and 66% based on fixed interest rates as of September 30th, 2016.

Average debt maturity increased slightly to 7.7 years on September 30th, 2016, against 7.6 years on June 30th, 2016. Average cost of debt, after the above-mentioned currency and

---

(19) Debt repayments less debt additions.

(20) In 3Q16, from end to end, the BRL depreciated 1.1% against the USD.

Table of Contents

interest rate swaps, increased slightly, to 4.34% per annum on September 30th, 2016, against 4.23% per annum on June 30th, 2016.

Interest coverage, measured by the ratio of the LTM(21) adjusted EBITDA to LTM gross interest, improved to 5.0x in 3Q16 vs. 4.5x in 2Q16.

Gross debt to LTM adjusted EBITDA decreased to 3.6x as of September 30th, 2016 from 4.2x as of June 30th, 2016.

**Debt indicators**

US\$ million	3Q16	2Q16	3Q15
Total debt	31,449	31,814	28,675
Net debt	25,965	27,508	24,213
Total debt / adjusted LTM EBITDA (x)	3.6	4.2	3.6
Adjusted LTM EBITDA / LTM gross interest (x)	5.0	4.5	4.8

---

(21) Last twelve months.



Table of Contents**Performance of the business segments**

The Ferrous Minerals business segment accounted for 82.5% of Vale's adjusted EBITDA in 3Q16, followed by 19.8% from the Base Metals business segment, 2.0% from the Fertilizers business segment, -0.2% from the Coal business segment and -4.0% from Others.

**Segment information 3Q16, as per footnote of financial statements**

US\$ million			Expenses			Dividends	Adjusted EBITDA(2)
	Net Revenues	Cost(1)	SG&A and others(1)	R&D(1)	Pre operating & stoppage(1)		
Ferrous minerals	4,959	(2,293)	(95)	(29)	(49)		2,493
Iron ore fines	3,782	(1,648)	(80)	(25)	(40)		1,989
ROM	4						4
Pellets	991	(512)	(8)	(4)	(5)		462
Others ferrous	106	(70)	(1)		(1)		34
Mn & Alloys	76	(63)	(6)		(3)		4
Coal	163	(157)	3	(3)	(13)		(7)
Base metals	1,579	(1,046)	116	(23)	(26)		600
Nickel(3)	1,159	(792)	(31)	(21)	(26)		289
Copper(4), (5)	420	(254)	147	(2)			311
Fertilizer nutrients	598	(501)	(29)	(5)	(4)		59
Others	25	(59)	(63)	(25)			(122)
<b>Total</b>	<b>7,324</b>	<b>(4,056)</b>	<b>(68)</b>	<b>(85)</b>	<b>(92)</b>		<b>3,023</b>

---

(1) Excluding depreciation and amortization

(2) Excluding non-recurring effects

(3) Including copper and by-products from our nickel operations

(4) Including by-products from our copper operations

(5) Including US\$ 150 million from the goldstream transaction

Table of Contents

**Ferrous minerals**

Adjusted EBITDA of the Ferrous Minerals business segment was US\$ 2.493 billion in 3Q16, US\$ 841 million higher than in 3Q15, despite the negative impact of exchange rates (US\$ 121 million), which were offset by higher sales prices (US\$ 392 million), lower bunker oil prices (US\$ 63 million) and real gains in competitiveness (US\$ 508 million).

Gains in competitiveness were based mainly on: (i) marketing and commercial initiatives (US\$ 77 million); (ii) higher sales volumes (US\$ 56 million); and (iii) ongoing cost reduction initiatives(22) (US\$ 201 million).

**Year-on-year EBITDA variation 3Q16 vs. 3Q15 Ferrous Minerals business segment**

**Iron ore**

**EBITDA**

## Edgar Filing: Vale S.A. - Form 6-K

Adjusted EBITDA of iron ore fines was US\$ 1.989 billion in 3Q16, 20.1% higher than in 2Q16, as a result of higher realized sales prices (US\$ 199 million), lower costs(23) and expenses(24) (US\$ 180 million) and higher sales volumes (US\$ 38 million), which were partially offset by the negative impacts of the appreciation of the BRL against the USD on a quarterly average (US\$ 84 million).

---

(22) Including the positive impact of renegotiations of chartering freight contracts.

(23) After adjusting for the effects of higher volumes and exchange rate variation.

(24) After adjusting for the effect of exchange rate variation.

Table of Contents**SALES REVENUES AND VOLUME**

Net sales revenues of iron ore fines, excluding pellets and Run of Mine (ROM), amounted to US\$ 3.782 billion in 3Q16 vs. US\$ 3.508 billion in 2Q16, as a result of higher iron ore fines sales prices (US\$ 199 million) and higher sales volumes (US\$ 75 million) in 3Q16 vs. 2Q16.

Production, including third party purchases, was 92.1 Mt in 3Q16, 5.3 Mt higher than in 2Q16 and 1.4 Mt higher than in 3Q15, mainly due to: (i) better operational performance at the mines and plants of the Northern System; (ii) the start-up of a new crushing facility at the Fazendão mine; and (iii) greater productivity in the Southern and Southeastern systems.

Sales volumes of iron ore fines reached 74.2 Mt in 3Q16 vs. 72.7 Mt in 2Q16, 2.1% higher than in 2Q16, respectively, with iron ore inventory increasing by 3.0 Mt as a result of: (i) production and acquisition of ore from third parties of 92.1 Mt; (ii) deduction of 13.2 Mt of iron ore fines used for the production of pellets; (iii) adjustment of iron ore inventories(25) of 1.4 Mt; (iv) sales of iron ore fines of 74.2 Mt; and (v) deduction of 0.4 Mt of ROM sales.

CFR sales of iron ore fines totaled 47.8 Mt in 3Q16, practically in line with the 48.2 Mt in 2Q16. CFR sales represented 64% of all iron ore fines sales volumes in 3Q16, slightly below the share of CFR sales in 2Q16 (66%).

ROM sales totaled 0.4 Mt in 3Q16, remaining in line with the 0.4 Mt recorded in 2Q16.

**Net operating revenue by product**

US\$ million	3Q16	2Q16	3Q15
Iron ore fines	3,782	3,508	3,278
ROM	4	5	24
Pellets	991	868	883
Manganese & Ferroalloys	76	61	26
Others	106	99	101
<b>Total</b>	<b>4,959</b>	<b>4,541</b>	<b>4,312</b>

**Volume sold**

000 metric tons	3Q16	2Q16	3Q15
Iron ore fines	74,231	72,678	70,530
ROM	351	405	3,546
Pellets	12,001	11,388	11,961
Manganese ore	448	354	448

Ferroalloys	31	36	3
-------------	----	----	---

**REALIZED PRICES**

Iron ore sales in 3Q16 were distributed across three pricing systems: (i) 61% based on the current quarter, month and daily spot prices, including provisional price sales that were settled

---

(25) Iron ore inventories are periodically adjusted downwards due to moisture and handling during its processing phases.

Table of Contents

within the quarter; (ii) 28% based on provisional prices with settlement price based on the market price defined on the delivery date, in which case prices had not yet been settled at the end of the quarter; and (iii) 11% linked to past prices (quarter-lagged).

Vale's CFR dmt reference price for iron ore fines (ex-ROM) increased by US\$ 3.0/t from US\$ 56.3/t in 2Q16 to US\$ 59.3/t in 3Q16, equivalent to a price realization of 101% of the average Platts IODEX 62% of US\$ 58.6/t in 3Q16.

Vale's CFR/FOB wmt price for iron ore fines (ex-ROM) increased 5.4% (US\$ 2.6/t) from US\$ 48.3/t in 2Q16 to US\$ 50.9/t in 3Q16, after adjusting for moisture and the effect of FOB sales, which accounted for 36% of the total sales volumes in 3Q16, while average Platts IODEX 62% increased 5.2% in 3Q16 vs. 2Q16.

Price realization in 3Q16 was impacted by:

- Provisional prices set at the end of 2Q16 at US\$ 52.7/t, which were later adjusted based on the price of delivery in 3Q16, which positively impacted prices in 3Q16 by US\$ 1.6/t compared to US\$ 2.0/t in 2Q16, as a result of the higher realized prices in 3Q16.
- Provisional prices set at the end of 3Q16 at US\$ 54.4/t vs. the IODEX average of US\$ 58.6/t in 3Q16 which negatively impacted prices in 3Q16 by US\$ 1.2/t compared to a negative impact of US\$ 1.0/t in 2Q16.
- Quarter-lagged contracts, priced at US\$ 56.9/t based on the average prices for Mar-Apr-May which negatively impacted prices in 3Q16 by US\$ 0.4/t compared to a negative impact of US\$ 1.2/t in 2Q16.

Iron ore sales of 21.0 Mt, or 28% of Vale's sales mix, were recorded under the provisional pricing system, which was set at the end of 3Q16 at US\$ 54.4/t. The final prices of these sales and the required adjustment to sales revenues will be determined and recorded in 4Q16.

Table of Contents**Price realization iron ore fines****Average prices**

<b>US\$/ metric ton</b>	<b>3Q16</b>	<b>2Q16</b>	<b>3Q15</b>
Iron ore - Metal Bulletin 65% index	65.60	59.99	62.11
Iron ore - Platts 62% IODEX	58.60	55.70	54.90
Iron ore fines CFR reference price (dmt)	59.30	56.30	56.00
Iron ore fines CFR/FOB realized price	50.95	48.30	46.48
ROM	11.40	12.35	6.77
Pellets CFR/FOB (wmt)	82.58	76.20	73.82
Manganese ore	113.84	103.13	51.34
Ferroalloys	806.45	690.36	1,000.00

**COSTS**

Costs for iron ore fines amounted to US\$ 1.648 billion (or US\$ 1.899 billion with depreciation charges) in 3Q16. Costs decreased by US\$ 110 million vs. 2Q16, after adjustments for the effects of exchange rate variations (US\$ 69 million) and higher sales volumes (US\$ 37 million). The

decrease was mainly driven by savings in C1 cash costs and freight renegotiations, which more than offset the negative impact of higher bunker oil prices (US\$ 32 million).



Table of Contents**IRON ORE COGS - 2Q16 x 3Q16**

US\$ million	2Q16	Volume	Variance drivers		Total Variation 2Q16 x 3Q16	3Q16
			Exchange Rate	Others		
<b>Total costs before depreciation and amortization</b>	<b>1,652</b>	<b>37</b>	<b>69</b>	<b>(110)</b>	<b>(4)</b>	<b>1,648</b>
Depreciation	250	6	18	(23)	1	251
<b>Total</b>	<b>1,902</b>	<b>43</b>	<b>87</b>	<b>(133)</b>	<b>(3)</b>	<b>1,899</b>

Maritime freight costs, which are fully accrued as cost of goods sold, totaled US\$ 575 million in 3Q16, having increased US\$ 9 million vs. 2Q16 after adjustments for lower CFR volumes (US\$ 5 million).

Unit maritime freight cost per iron ore metric ton was US\$ 12.0/t in 3Q16, remaining practically in line with the average spot freight index of US\$ 11.7/t recorded in September 2016 and Vale's freight cost of US\$ 11.8/t recorded in 2Q16, mainly as a result of short term freight contracts fixed at lower rates than current spot freight levels, which partially offset the negative impact of higher bunker oil prices (US\$ 0.7/t). Vale's average bunker oil price increased from US\$ 197.0/t in 2Q16 to US\$ 232.2/t in 3Q16.

Additional negative impact on Vale's unit maritime freight cost is expected in 4Q16 given the recent increase in bunker oil prices and in the spot freight market, however, such impact will be partially offset by the abovementioned chartering contracts.

**C1 CASH COST**

Total iron ore fines C1 cash cost at the port (mine, plant, railroad and port, ex-royalties) was US\$ 965 million after deducting depreciation of US\$ 251 million, iron ore maritime freight costs of US\$ 575 million and distribution costs of US\$ 18 million.

C1 cash cost FOB port per metric ton for iron ore fines ex-royalties decreased US\$0.2/t, from the US\$ 13.2/t recorded in 2Q16 to US\$ 13.0/t in 3Q16, as a result of the strong cost savings in BRL, which more than offset the negative impact of the BRL appreciation against the USD on a quarterly average (US\$ 1.0/t).

C1 cash cost FOB port per metric ton of iron ore fines in BRL was R\$ 42.2/t in 3Q16, R\$ 3.9/t lower than the R\$ 46.1/t recorded in 2Q16, despite the inflationary pressures in Brazil. The reduction in costs was mainly due to improvements in operational productivity, cost-cutting initiatives and the increased fixed-costs dilution on seasonally higher production volumes.



Table of Contents

**C1 Cash Cost Breakdown**

**Iron Ore Fines Costs and Expenses in BRL**

<b>R\$/t</b>	<b>3Q16</b>	<b>2Q16</b>	<b>3Q15</b>
Costs(1)	42.2	46.1	46.9
Expenses(1)	7.4	9.7	8.5
<b>Total</b>	<b>49.5</b>	<b>55.8</b>	<b>55.4</b>

---

(1) Net of depreciation

Table of Contents

**Evolution of C1 Cash Cost<sup>1</sup> per ton in BRL**

**EXPENSES**

Iron ore expenses, net of depreciation, amounted to US\$ 145 million in 3Q16, 27.5% lower than the US\$ 200 million recorded in 2Q16. SG&A and other expenses totaled US\$ 80 million in 3Q16, 47% lower than the US\$ 150 million recorded in 2Q16, mainly as a result of the adoption of new managerial criteria for allocating, in Other Business Segment, the Simandou and Samarco legal, remediation and other expenses incurred by Vale in 2016, amounting to US\$ 19 million and US\$ 41 million, respectively. R&D amounted to US\$ 25 million, increasing US\$ 9 million vs. 2Q16, following the regular seasonality of expenditures. Pre-operating and stoppage expenses, net of depreciation, amounted to US\$ 40 million, 18% higher than the US\$ 34 million recorded in 2Q16, mainly as a result of the increase in S11D pre-operating expenses (US\$ 9 million).

Table of Contents**Iron ore fines cash cost and freight**

	3Q16	2Q16	3Q15
<b>Costs (US\$ million)</b>			
COGS, less depreciation and amortization	1,648	1,652	1,838
Distribution costs	18	30	14
Maritime freight costs	575	571	736
Bunker oil hedge			109
<b>FOB at port costs (ex-ROM)</b>	<b>1,055</b>	<b>1,051</b>	<b>979</b>
<b>FOB at port costs (ex-ROM and ex-royalties)</b>	<b>965</b>	<b>958</b>	<b>894</b>
<b>Sales volumes (Mt)</b>			
Total iron ore volume sold	74.6	73.1	74.1
Total ROM volume sold	0.4	0.4	3.5
Volume sold (ex-ROM)	74.2	72.7	70.5
% of CFR sales	64.0%	66.0%	64.0%
% of FOB sales	36.0%	34.0%	36.0%
<b>Vale's iron ore cash cost (ex-ROM, ex-royalties), FOB (US\$/t)(1)</b>	<b>13.0</b>	<b>13.2</b>	<b>13.2</b>
<b>Freight</b>			
Volume CFR (Mt)	47.8	48.2	44.9
Vale's iron ore unit freight cost (US\$/t)	12.0	11.8	18.8
Vale's iron ore unit freight cost (ex- bunker oil hedge) (US\$/t)	12.0	11.8	16.4

(1) US\$ 13.2/t is equivalent to the US\$12.7/t reported in 3Q15 after adjusting for the new allocation criteria for ICMS (US\$ 0.5/t) and Distribution Costs (-US\$ 0.2/t) as described in the box "Managerial Allocation Changes" in pages 45-46 of the 4Q15 Earnings Release. Additional adjustment was made to include the cost of Third Party Ore Purchases (US\$ 0.2/t) to our C1 costs.

**Evolution of iron ore fines cash cost, freight and expenses**



Table of Contents

**Evolution of iron ore fines sustaining per ton**

**Iron ore pellets**

Adjusted EBITDA for pellets in 3Q16 was US\$ 462 million, US\$ 25 million higher than in 2Q16, mainly as a result of the positive impacts of higher sales prices (US\$ 76 million) and higher sales volumes (US\$ 21 million), which were partially offset by the lack of dividends received from the leased pelletizing plants (US\$ 60 million), which are usually paid every 6 months, and the negative impact of exchange rate variations (US\$ 25 million).

Net sales revenues for pellets amounted to US\$ 991 million in 3Q16, increasing US\$ 123 million from the US\$ 868 million recorded in 2Q16 as a result of higher realized sales prices (US\$ 76 million), which increased from an average of US\$ 76.2 per ton in 2Q16 to US\$ 82.6 per ton in 3Q16, and higher sales volumes (US\$ 47 million), which increased from the 11.4 Mt recorded in 2Q16 to 12.0 Mt in 3Q16.

Production reached 12.1 Mt in 3Q16, 2.0 Mt higher than in 2Q16 mainly as a result of: (i) the resumption of the Fábrica pelletizing plant; and (ii) the higher feed availability for the Vargem Grande and Tubarão plants.

CFR pellet sales of 2.2 Mt in 3Q16 represented 18% of total pellets sales and were 0.3 Mt higher than in 2Q16. FOB pellet sales increased from 9.5 Mt in 2Q16 to 9.8 Mt in 3Q16.

Pellet CFR/FOB prices increased by US\$ 6.4/t to US\$ 82.6/t in 3Q16, whereas the Platt's IODEX iron ore reference price (CFR China) increased by only US\$ 2.9/t in the quarter, as a result of higher pellet premiums in the quarter and the positive impact from Vale's pricing systems.



Table of Contents

Pellet costs totaled US\$ 512 million (or US\$ 599 million with depreciation charges) in 3Q16. Costs decreased by US\$ 4 million vs. 2Q16 after adjusting for the effects of higher volumes (US\$ 26 million) and exchange rate variations (US\$ 23 million).

Pre-operating and stoppage expenses for pellets were US\$ 4 million in 3Q16, US\$ 5 million lower than in 2Q16 mainly due to the resumption of the Fábrica pellet plant. SG&A and others expenses decreased US\$ 11 million in 3Q16 vs 2Q16.

EBITDA unit margin for pellets was US\$ 38.5/t in 3Q16, in line with 2Q16.

**Pellets - EBITDA ex-Samarco**

	3Q16		2Q16	
	US\$ million	US\$/wmt	US\$ million	US\$/wmt
Net Revenues / Realized Price	991	82.6	868	76.2
Dividends Received (Leased pelletizing plants) ex-Samarco			60	5.3
Cash Costs (Iron ore, leasing, freight, overhead, energy and other)	(512)	-42.7	(459)	-40.3
Expenses (SG&A, R&D and other)	(17)	-1.4	(32)	-2.8
EBITDA ex-Samarco	462	38.5	437	38.4

**Iron ore fines and pellets cash break-even**

Iron ore fines and pellets EBITDA break-even, measured by unit cash costs and expenses on a landed-in-China basis (and adjusted for quality, pellets margins differential and moisture, excluding ROM), decreased slightly from US\$ 28.5/dmt in 2Q16 to US\$ 28.3/dmt in 3Q16, despite the negative impact of the exchange rate and bunker oil prices.

Iron ore and pellets cash break-even on a landed-in-China basis, including sustaining capex per ton of US\$ 2.5/dmt, increased from US\$ 30.3/dmt in 2Q16 to US\$ 30.8/dmt in 3Q16.

**Iron ore and pellets cash break-even landed in China(1)**

US\$/t	3Q16	2Q16	3Q15
<b>Vale's iron ore cash cost (ex-ROM, ex-royalties), FOB (US\$ /t)</b>	<b>13.0(2)</b>	<b>13.2</b>	<b>13.2</b>
Iron ore fines freight cost (ex-bunker oil hedge)	12.0	11.8	16.4
Iron ore fines distribution cost	0.4	0.6	0.3
Iron ore fines expenses(3) & royalties	3.2	4.0	3.5
Iron ore fines moisture adjustment	2.5	2.6	2.8
Iron ore fines quality adjustment	-1.5	-1.6	-2.1

Edgar Filing: Vale S.A. - Form 6-K

<b>Iron ore fines EBITDA break-even (US\$/dmt)</b>	<b>29.6</b>	<b>30.7</b>	<b>34.1</b>
Iron ore fines pellet adjustment(4)	-1.3	-2.2	-1.5
<b>Iron ore fines and pellets EBITDA break-even (US\$/dmt)</b>	<b>28.3</b>	<b>28.5</b>	<b>32.6</b>
Iron ore fines sustaining investments	2.5	1.8	2.7
<b>Iron ore fines and pellets cash break-even landed in China(3) (US\$/dmt)</b>	<b>30.8</b>	<b>30.3</b>	<b>35.3</b>

---

(1) Measured by unit cost + expenses + sustaining investment adjusted for quality

(2) Including negative exchange rate impact of US\$ 1.0/t and real cost reduction of US\$1.2/t

(3) Net of depreciation

(4) US\$ 0.7/t in 2Q16 relates to the dividends received from the pelletizing plants, which are usually paid every six months.

Table of Contents

**Iron ore and pellets cash break-even on a landed-in-China basis**

**Manganese and ferroalloys**

Adjusted EBITDA of manganese ore and ferroalloys was US\$ 4 million in 3Q16, US\$ 2 million lower than the US\$ 6 million in 2Q16, mainly due to the negative impact of higher costs and expenses (US\$ 17 million), which were partially offset by the positive impact of higher prices (US\$ 9 million) and higher sales volumes (US\$ 6 million).

Net sales revenues for manganese increased to US\$ 51 million in 3Q16 from US\$ 36 million in 2Q16 mainly due to higher sales prices (US\$ 5 million) and sales volumes (US\$ 10 million) in 3Q16. Production of manganese ore reached 642,000 t in 3Q16 vs. 553,000 t in 2Q16 and 644,000 t in 3Q15.

Net sales revenues for ferroalloys amounted to US\$ 25 million in 3Q16 in line with 2Q16 with lower sales volumes (US\$ 3 million) offsetting higher sales prices (US\$ 3 million). Ferroalloys production increased to 36,000 t in 3Q16 from the 29,000 t recorded in 2Q16.

Manganese ore and ferroalloys costs totaled US\$ 63 million (or US\$ 71 million with depreciation charges) in 3Q16. Costs increased by US\$ 4 million vs. 2Q16 after adjusting for the effects of lower volumes (US\$ 3 million) and exchange rate variations (US\$ 3 million), due to higher costs in services and materials for the manganese operations.

Table of Contents**Market outlook iron ore**

Iron ore Platts IODEX 62% averaged US\$ 58.60/dmt in 3Q16, increasing 6.7% year-on-year and 5.4% quarter-on-quarter. Prices improved on the back of a continuous growth in fixed asset investments in China and a more positive sentiment towards the Chinese real estate market.

The loosening of the monetary policy in China since the second half of 2015 together with fiscal and credit support in 3Q16 kept the economy growing at healthier levels. Property sales grew 25% year-on-year in 3Q16, supporting investments in new and ongoing constructions and keeping steel demand steady.

Production of steel in China continued strong reaching 603.8 Mt in 9M16, reversing the yearly drop and increasing 0.4% in the period, despite production cuts during events such as the G20 meeting in Hangzhou and the Horticultural Exposition in Tangshan. Demand for imported iron ore surged to 92.9 Mt in September, the highest reading this year, taking the 9M16 iron ore imports to 763 Mt, a 9.1% year-on-year increase compared to 9M15. Also, demand for high grade iron ore was encouraged after the spike in coking coal prices in 3Q16, as the higher the Fe grade the lower the need for coking coal in the steelmaking process. Throughout the quarter, most of the Chinese steel mills continued profitable as steel prices remained at the high levels reached in 2Q16.

Going forward, we expect the market for iron ore to remain stable, as the current credit availability in China should provide support for the economy. However, steel demand and production are expected to ease towards the end of the year due to seasonality.

**Volume sold by destination Iron ore and pellets**

000 metric tons	3Q16	%	2Q16	%	3Q15	%
<b>Americas</b>	<b>9,275</b>	<b>10.7</b>	<b>8,054</b>	<b>9.5</b>	<b>10,760</b>	<b>12.5</b>
Brazil	7,384	8.5	6,291	7.4	9,363	10.9
Others	1,891	2.2	1,763	2.1	1,397	1.6
<b>Asia</b>	<b>61,353</b>	<b>70.9</b>	<b>60,568</b>	<b>71.7</b>	<b>59,597</b>	<b>69.3</b>
China	49,061	56.7	48,176	57.0	46,512	54.1
Japan	7,512	8.7	7,778	9.2	8,548	9.9
Others	4,780	5.5	4,614	5.5	4,537	5.3
<b>Europe</b>	<b>12,421</b>	<b>14.3</b>	<b>12,893</b>	<b>15.3</b>	<b>13,014</b>	<b>15.1</b>
Germany	4,753	5.5	5,160	6.1	5,219	6.1
France	1,549	1.8	1,799	2.1	1,497	1.7
Others	6,119	7.1	5,934	7.0	6,298	7.3
<b>Middle East</b>	<b>2,274</b>	<b>2.6</b>	<b>2,231</b>	<b>2.6</b>	<b>2,401</b>	<b>2.8</b>
<b>Rest of the World</b>	<b>1,260</b>	<b>1.5</b>	<b>725</b>	<b>0.9</b>	<b>265</b>	<b>0.3</b>
<b>Total</b>	<b>86,583</b>	<b>100.0</b>	<b>84,471</b>	<b>100.0</b>	<b>86,037</b>	<b>100.0</b>

Table of Contents**Selected financial indicators Ferrous Minerals**

US\$ million	3Q16	2Q16	3Q15
Net Revenues	4,959	4,541	4,312
Costs(1)	(2,293)	(2,228)	(2,447)
Expenses(1)	(95)	(171)	(153)
Pre-operating and stoppage expenses(1)	(49)	(46)	(32)
R&D expenses	(29)	(20)	(28)
Dividends received		60	
Adjusted EBITDA	2,493	2,136	1,652
Depreciation and amortization	(399)	(381)	(402)
Adjusted EBIT	2,094	1,695	1,250
Adjusted EBIT margin (%)	42.2	37.3	29.0

---

(1) Net of depreciation and amortization

**Selected financial indicators Iron ore fines**

	3Q16	2Q16	3Q15
Adjusted EBITDA (US\$ million)	1,989	1,656	1,236
Volume Sold (Mt)	74.231	72.678	70.530
Adjusted EBITDA (US\$/t)	26.79	22.79	17.52

**Selected financial indicators Pellets (excluding Samarco)**

	3Q16	2Q16	3Q15
Adjusted EBITDA (US\$ million)	462	437	382
Volume Sold (Mt)	12.001	11.388	11.961
Adjusted EBITDA (US\$/t)	38.50	38.37	31.94

**Selected financial indicators Iron ore fines and Pellets**

	3Q16	2Q16	3Q15
Adjusted EBITDA (US\$ million)	2,451	2,093	1,618
Volume Sold (Mt)	86.232	84.066	82.491
Adjusted EBITDA (US\$/t)	28.42	24.90	19.61

Table of Contents**Base Metals**

Adjusted EBITDA was US\$ 600 million in 3Q16, increasing US\$ 224 million vs. 2Q16 mainly as a result of the one-off positive effect of the goldstream transaction (US\$ 150 million) and higher prices (US\$ 114 million), which more than offset the negative impact of higher costs(26) (US\$ 19 million) and exchange rate variation (US\$ 16 million).

## SALES REVENUES AND VOLUMES

Nickel sales revenues were US\$ 797 million in 3Q16, increasing US\$ 87 million vs. 2Q16 as a result of the positive impact of higher realized nickel prices in 3Q16 (US\$ 87 million). Sales volumes were 77 kt in 3Q16, in line with 2Q16.

Copper sales revenues were US\$ 452 million in 3Q16, increasing US\$ 9 million vs. 2Q16 as a result of higher realized copper prices in 3Q16 (US\$ 8 million). Sales volumes were 107 kt in 3Q16, in line with 2Q16.

PGMs (platinum group metals) sales revenues totaled US\$ 104 million in 3Q16, increasing by US\$ 5 million vs. 2Q16. Sales volumes were 130,000 oz in 3Q16 vs. 151,000 oz in 2Q16. PGMs sales volumes decreased, mainly due to lower production of palladium.

Gold contained as a by-product in our nickel and copper concentrates sales revenues was US\$ 179 million in 3Q16, increasing by US\$ 25 million vs. 2Q16 as a result of higher realized prices (US\$ 15 million) and higher sales volumes (US\$ 10 million). Sales volumes of gold as a by-product amounted to 129,000 oz in 3Q16, 7,000 oz higher than in 2Q16.

**Net operating revenue by product**

US\$ million	3Q16	2Q16	3Q15
Nickel	797	710	785
Copper	452	443	360
PGMs	104	99	58
Gold as by-product	179	154	115
Silver as by-product	9	10	7
Others	38	31	22
<b>Total</b>	<b>1,579</b>	<b>1,447</b>	<b>1,347</b>

## REALIZED NICKEL PRICES

Nickel realized price was US\$ 10,317/t, US\$ 52/t higher than the average nickel LME price of US\$ 10,265/t in 3Q16.

---

(26) After adjusting for impacts of volumes.



Table of Contents

Vale's nickel products are divided into two categories, refined nickel (pellets, powder, cathode, FeNi, Utility Nickel and Tonimet ) and intermediates (concentrates, matte, NiO and NHC).

Refined nickel products have higher nickel content, typically commanding a premium over the average LME nickel price, whereas nickel intermediates are less pure as they are only partially processed. Due to this difference, intermediate products are sold at a discount. The amount of the discount will vary depending on the amount of processing still required, product forms and level of impurities. The sales product mix is an important driver of nickel price realization.

Refined nickel sales accounted for 88% of total nickel sales in 3Q16, in line with 2Q16. Sales of intermediate products accounted for the balance.

The realized nickel price differed from the average LME price in 3Q16 due to the following impacts:

- (i) Premium for refined finished nickel products averaged US\$ 319/t, with an impact on the aggregate realized nickel price of US\$ 281/t;
  
- (ii) Discount for intermediate nickel products averaged US\$ 1,944/t, with an impact on the aggregate realized nickel price of -US\$ 229/t.

**Price realization nickel**

REALIZED COPPER PRICES

Realized copper price was US\$ 4,218/t, US\$ 554/t lower than the average copper LME price of US\$ 4,772/t in 3Q16. Vale's copper products are mostly intermediate forms of copper,

Table of Contents

predominately in the form of concentrate, which is sold at a discount to the LME. These products are sold on a provisional pricing basis during the quarter with final prices determined at a future period, generally one to four months forward(27).

The realized copper price differed from the average LME price in 3Q16 due to the following impacts:

- Current period price adjustments: mark-to-market of invoices still open in the quarter based on the copper price forward curve(28) at the end of the quarter (-US\$ 105/t).
- Prior period price adjustment: variance between the price used in final invoices (and in the mark-to-market of invoices from previous quarters still open at the end of the quarter) and the provisional prices used for sales in previous quarters (-US\$ 101/t).
- TC/RCs, penalties, premiums and discounts for intermediate products (-US\$ 348/t).

Excluding the effects of prior period price adjustments and the discounts for copper intermediate products, including TC/RCs, the gross realized copper price(29) was US\$ 4,667/t in 3Q16.

**Price realization copper**

Realized copper prices increased 1.8% in 3Q16 vs. 2Q16, while LME copper prices increased 1% in the same period, mainly due to lower discounts associated with copper intermediate products that decreased the TC/RCs, penalties, premiums and discounts in 3Q16 (US\$ 16

---

(27) On September 30<sup>th</sup>, 2016, Vale had provisionally priced copper sales totaling 106,496 tons valued at a LME forward price of US\$ 4,859/t, subject to final pricing over the next several months.

(28) Includes a small amount of final invoices that were provisionally priced and settled within the quarter.

(29) Price to be used when comparing with other copper producers realized price.

Table of Contents

million), which more than offset the higher impact of the provisional pricing system on sales revenues that was a negative US\$ 22 million in 3Q16 vs. a negative US\$ 9 million in 2Q16.

**Average prices**

US\$/ metric ton	3Q16	2Q16	3Q15
Nickel - LME	10,265	8,823	10,561
Copper - LME	4,772	4,729	5,259
Nickel	10,317	9,180	10,865
Copper	4,218	4,144	3,892
Platinum (US\$/oz)	1,060	909	1,005
Gold (US\$/oz)	1,383	1,266	1,095
Silver (US\$/oz)	15.15	16.66	13.49
Cobalt (US\$/lb)	11.83	10.41	14.54

**SALES VOLUME PERFORMANCE**

Sales volumes of nickel achieved a record for a third quarter of 77 kt in 3Q16, in line with the previous quarter and 5 kt higher than in 3Q15.

Sales volumes of copper achieved a record for a third quarter of 107 kt in 3Q16, in line with 2Q16, and 13 kt higher than in 3Q15, due to higher sales of copper from our North Atlantic nickel operations and Salobo as it continues its ramp-up.

Sales volumes of gold as a by-product achieved a record 129,000 oz in 3Q16, 7,000 oz higher than in 2Q16 and 24,000 oz higher than in 3Q15, as a result of the ongoing ramp-up of Salobo.

**Volume sold**

000 metric tons	3Q16	2Q16	3Q15
Nickel operations & by-products			
Nickel	77	77	72
Copper	42	41	32
Gold as by-product ( 000 oz)	24	23	15
Silver as by-product ( 000 oz)	388	480	374
PGMs ( 000 oz)	130	151	83
Cobalt (metric ton)	1,069	1,000	468
Copper operations & by-products			
Copper	65	66	62
Gold as by-product ( 000 oz)	105	99	90

Silver as by-product ( 000 oz)	221	139	154
--------------------------------	-----	-----	-----

**Costs and expenses**

Costs and expenses, net of the one-off effect of the goldstream transaction (US\$ 150 million) in 3Q16 and the US\$ 30 million insurance payment in 2Q16, increased US\$ 28 million in 3Q16, mainly due to higher costs (US\$ 19 million) and the negative impact of the exchange rate variation (US\$ 16 million), partially offset by lower expenses (US\$ 6 million).

Table of Contents**COSTS OF GOODS SOLD (COGS)**

Costs totaled US\$ 1.047 billion in 3Q16 (or US\$ 1.429 billion including depreciation). After adjusting for the effects of exchange rate variations (US\$ 19 million) and lower sales volumes (-US\$ 4 million), costs increased by US\$ 19 million vs. 2Q16, mainly due to scheduled maintenance costs (US\$ 35 million) at our Canadian operations and VNC.

**BASE METALS COGS - 2Q16 x 3Q16**

US\$ million	2Q16	Volume	Variance drivers Exchange Rate	Others	Total Variation 2Q16 x 3Q16	3Q16
<b>Total costs before depreciation and amortization</b>	<b>1,013</b>	<b>(4)</b>	<b>19</b>	<b>19</b>	<b>34</b>	<b>1,047</b>
Depreciation	411		3	(32)	(29)	382
<b>Total</b>	<b>1,424</b>	<b>(4)</b>	<b>22</b>	<b>(13)</b>	<b>5</b>	<b>1,429</b>

**UNIT CASH COST**

Unit cash cost in the North Atlantic Operations decreased in 3Q16 due to an increase in by-product credit prices and volumes. The Onça Puma unit cost increased mainly due to the negative impact of exchange rate variations (US\$ 4 million). VNC unit costs net of by-product credits increased from the US\$ 12,208/t recorded in 2Q16 to US\$ 12,425/t in 3Q16 mainly due to costs associated with the three-week scheduled maintenance shutdown carried-out in 3Q16.

Sossego and Salobo unit costs decreased mainly due to increased revenues from by-products which more than offset the negative impact of the exchange rate.

**Base Metals unit cash cost of sales, net of by-product credits**





Table of Contents**Base Metals unit cash cost of sales per operation, net of by-product credits(1)**

US\$ / t	3Q16	2Q16	3Q15
<b>NICKEL</b>			
North Atlantic Operations (nickel)	3,403	3,582	6,242
PTVI (nickel)	5,192	5,825	6,157
VNC(2) (nickel)	12,425	12,208	23,426
Onça Puma (nickel)	8,166(3)	7,804	8,596
<b>COPPER</b>			
Sossego (copper)	2,741	2,809	2,301
Salobo (copper)	935	954	1,520

(1) North Atlantic figures includes Clydach and Acton refining costs while PTVI and VNC only include standalone operations.

(2) Unit cash cost of sales includes pre-operating expenses for periods prior to 1Q16.

(3) Excluding the one-off effect of the write-off of inventories (US\$ 64 million).

**EXPENSES**

SG&A and other expenses, excluding depreciation, totaled a positive US\$ 117 million in 3Q16, compared to the expense of US\$ 11 million(30) in the previous quarter. The positive amount recorded in 3Q16 resulted from the gain on the sale of US\$ 150 million from the goldstream transaction with Silver Wheaton in August 2016 recorded as other expenses in 3Q16.

Pre-operating and stoppage expenses, net of depreciation, totaled US\$ 26 million, mainly reflecting Long Harbour expenses. VNC costs are now fully allocated to COGS, no longer impacting pre-operating and stoppage expenses as of 1Q16.

**Performance by operation**

The breakdown of the Base Metals EBITDA components per operation is detailed below.

**Base Metals EBITDA overview 3Q16**

Edgar Filing: Vale S.A. - Form 6-K

US\$ million	North Atlantic	PTVI Site	VNC Site	Sossego	Salobo	Onça Puma	Other(1)	Total Base Metals
<b>Net Revenues</b>	<b>813</b>	<b>159</b>	<b>90</b>	<b>126</b>	<b>294</b>	<b>67</b>	<b>30</b>	<b>1,579</b>
Costs	(483)	(105)	(128)	(91)	(164)	(116)	40	(1,047)
SG&A and others	(8)	(3)	3	(1)	151		(25)	117
R&D	(11)	(3)	(4)	(2)			(3)	(23)
Pre-operating & stoppage	(26)							(26)
<b>EBITDA</b>	<b>285</b>	<b>48</b>	<b>(39)</b>	<b>32</b>	<b>281(2)</b>	<b>(49)</b>	<b>42</b>	<b>600</b>
Ni deliveries (kt)	42	20	9			6		77
Cu deliveries (kt)	42			23	42			107

---

(1) Includes the PTVI and VNC off-takes, intercompany sales, purchase of finished nickel and corporate center expenses allocated for base metals.

(2) Includes the accounting gains of US\$ 150 million from the goldstream transaction.

---

(30) Including the one-off effect of Onça Puma insurance payment of US\$ 30 million.

Table of Contents

## EBITDA

Details of Base Metals adjusted EBITDA by operations are as follows:

- (i) The North Atlantic operations EBITDA was US\$ 285 million, increasing by US\$ 52 million vs. 2Q16 mainly as a result of favorable prices (US\$ 46 million), and higher volumes (US\$ 10 million).
- (ii) PTVI's EBITDA was US\$ 48 million, increasing US\$ 22 million vs. 2Q16 mainly as a result of favorable prices (US\$ 18 million).
- (iii) VNC's EBITDA was negative US\$ 39 million, an improvement compared to the negative US\$ 50 million in 2Q16, as a result of lower expenses (US\$ 8 million).
- (iv) Onça Puma's EBITDA was negative US\$ 49 million, decreasing US\$ 80 million vs. 2Q16 mainly as a result of the one-off effect of the write-off of inventories of low-grade ROM (US\$ 64 million) and the US\$ 30 million insurance payment received in 2Q16.
- (v) Sossego's EBITDA was US\$ 32 million, increasing US\$ 2 million vs. 2Q16 mainly as a result of lower costs(31) (US\$ 6 million) and higher realized prices (US\$ 4 million) despite the negative impact of the exchange rate variation (US\$ 8 million).
- (vi) Salobo's EBITDA was US\$ 131 million (US\$ 281 million including the goldstream transaction), increasing US\$ 9 million vs. 2Q16 mainly as a result of higher realized prices (US\$ 11 million) and higher sales volumes (US\$ 10 million) despite the negative impact of the exchange rate variation (US\$ 12 million).

**Base metals EBITDA by operation**

US\$ million	3Q16	2Q16	3Q15
<b>North Atlantic operation(1)</b>	<b>285</b>	<b>233</b>	<b>139</b>
<b>PTVI</b>	<b>48</b>	<b>26</b>	<b>57</b>
<b>VNC</b>	<b>(39)</b>	<b>(50)</b>	<b>(115)</b>

Edgar Filing: Vale S.A. - Form 6-K

<b>Onça Puma</b>	<b>(49)</b>	<b>31</b>	<b>12</b>
<b>Sossego</b>	<b>32</b>	<b>30</b>	<b>36</b>
<b>Salobo</b>	<b>281</b>	<b>122</b>	<b>77</b>
<b>Other(2)</b>	<b>42</b>	<b>(16)</b>	<b>(13)</b>
<b>Total</b>	<b>600</b>	<b>376</b>	<b>193</b>

---

(1) Includes the operations in Canada and in the United Kingdom.

(2) Includes the PTVI and VNC off-takes, intercompany sales, purchase of finished nickel and corporate center allocation for base metals.

---

(31) Net of volume effects of US\$ 6 million.

Table of Contents

**Market outlook base metals**

NICKEL

LME nickel prices improved over the third quarter of 2016 to a quarterly average of US\$ 10,265/t Ni, from US\$ 8,823/t Ni in the second quarter of 2016. The rally in price can be attributed partly to the uncertainty of ore availability, particularly from the Philippines, and the continuing improvement in market fundamentals.

Stainless steel production in China in 3Q16 is expected to be down 4% vs. 2Q16 following seasonal patterns, however when compared to 3Q15 production is expected to be up 9%. Demand for nickel in non-stainless applications remained robust, particularly in the automotive and aerospace sectors, however, oil and gas applications continued to struggle.

On the supply side, Chinese NPI production declined 7% in 3Q16 vs. 2Q16. NPI production is also down 7% 9M16 versus 9M15. Likewise, nickel ore imports into China, which feed NPI production, were down by 20% 8M16 vs. 8M15. Imports of FeNi into China have increased to 97.9 kt contained Ni in 8M16 versus 92.7 kt contained Ni in 8M15, largely as a result of continued Indonesian nickel smelter production ramp-up. Refined nickel imports into China continued to grow January through August of 2016 with 282 kt of nickel imported in 2016 versus 169 kt over the same period in 2015.

The Philippine government announced the results of their environmental audit on September 27th. This could affect significant volumes of nickel ore exports. The audit findings recommended 20 mines for suspension for various environmental, technical, and permitting violations. The cited mines accounted for just over half of 2015 Philippine ore exports. However, the exact volumes of ore exports affected will not be known until the impacted miners have had a chance to respond to the government audit and possibly come to an agreement with the government regarding corrective measures.

Exchange inventories continued to decline during the third quarter. LME inventories at the end of September stood at 362 kt, declining by 79.5 kt since the start of the year. Meanwhile, inventories on the SHFE increased by 61 kt to 111 kt over the same period. The net impact on global exchange inventories was a decline of 18.5 kt since the start of the year to end of September.

The market has shifted into a deficit after several years of consecutive surplus. Inventories are trending down while premiums for non-exchange deliverable metal have improved. The nickel price has recovered from the lows seen in 1H16, however the price continues to be below the costs of much of the nickel industry, exerting pressure on cash flow. Nickel price is expected to slowly recover as market fundamentals continue to improve. However, supply

Table of Contents

uncertainties may help accelerate recovery in price or conversely may precipitate some negative price pressures.

The long-term outlook for nickel continues to be positive as the market shifts deeper into deficit and capital investment for new projects and replacement volumes is deferred within the context of challenging economic conditions. Demand is expected to pick up as global economies stabilize and continue to grow, while increasing demand from the battery segment for electric vehicle manufacturing will play an increasingly important role in the nickel market over the coming years.

COPPER

LME copper prices have remained range bound, improving slightly over the third quarter of 2016 to a quarterly average of US\$ 4,772/t Cu, from US\$ 4,729/t Cu in the second quarter of 2016.

Demand for copper remained soft during the seasonally slow summer period as softness in global economic conditions and copper consumption continued. However, there have been signs of improvement in the Chinese air conditioning, auto production and housing sectors – key copper consuming sectors.

On the supply side, production of Chinese refined copper continues to increase resulting in a pick-up in copper concentrate imports and a slowing of refined imports (+7% and -24% in June vs. August, respectively). There have been limited cuts to mine production in 2016 as miners focus on productivity and lowering production costs in an effort to improve the health of their balance sheets.

Chinese copper smelter spot TC/RCs continue to increase, rising 3% from the end of 2Q16 to the end of 3Q16 but up 22% from the beginning of the year due to new concentrates entering the market.

Shanghai inventories increased 14% during the third quarter after experiencing a steady decline throughout most of 2Q16. LME inventories continued to climb in the third quarter vs. the second quarter, adding 179 kt (+93%).

Auto production and housing sales are expected to bolster copper consumption over the remainder of the year however key sectors such as air conditioner production and grid spending are expected to create a drag on the market. Ongoing tightness in scrap supply continues to provide some support for refined copper demand. However, a lack of cuts to mine supply and a weak demand picture is expected to result in a small surplus for 2016.

The long-term outlook is expected to improve as future supply is constrained by declining ore grades and deferred capital investment.



Table of Contents**Selected financial indicators - Base Metals**

<b>US\$ million</b>	<b>3Q16</b>	<b>2Q16</b>	<b>3Q15</b>
Net Revenues	1,579	1,447	1,347
Costs(1)	(1,047)	(1,013)	(1,038)
Expenses(1)	117	(11)	7
Pre-operating and stoppage expenses(1)	(26)	(25)	(97)
R&D expenses	(23)	(22)	(26)
Adjusted EBITDA	600	376	193
Depreciation and amortization	(403)	(438)	(437)
Adjusted EBIT	197	(63)	(244)
Adjusted EBIT margin (%)	12.6	(4.4)	(18.1)

---

(1) Net of depreciation and amortization.



Table of Contents

**Coal**

**EBITDA**

Adjusted EBITDA for the Coal business segment improved significantly to negative US\$ 7 million in 3Q16 from negative US\$ 110 million in 2Q16, despite not fully capturing the recent spike in index prices. The EBITDA increase of US\$ 103 million was mainly driven by lower costs and expenses(32) (US\$ 77 million).

Adjusted EBITDA at the Nacala port improved by 71% to negative US\$ 7 million, while adjusted EBITDA at the Beira Port (-US\$ 28 million) was offset by the adjusted EBITDA from the Australian operations (US\$ 28 million).

**SALES REVENUES AND VOLUMES**

Net sales revenues of metallurgical coal increased to US\$ 105 million in 3Q16 from US\$ 77 million in 2Q16, as a result of higher sales prices (US\$ 16 million) and higher sales volumes (US\$ 12 million). Net sales revenues of thermal coal decreased to US\$ 58 million in 3Q16 from US\$ 68 million in 2Q16 as a result of lower sales volumes (US\$ 19 million) which were partly offset by higher sales prices (US\$ 9 million).

Sales volumes of metallurgical coal totaled 1.156 Mt in 3Q16, increasing by 155 kt vs. 2Q16, as a result of the good performance of Moatize I and the start-up of Moatize II, being partially offset by lower sales from Carborough Downs due to the inventory build-up after the geological instability issues faced in 2Q16. Sales volumes of thermal coal reached 1.271 Mt in 3Q16, 496 kt lower than in 2Q16, as a result of the increase in the metallurgical coal volume transported through the Nacala Logistics Corridor with the ramp-up of Moatize II.

**REALIZED PRICES**

Coal sales are distributed across three pricing systems, namely the: (i) quarterly fixed benchmark prices; (ii) index prices and (iii) fixed prices.

Quarterly fixed benchmark prices are used for pricing only metallurgical coal and are determined based on negotiations between the Australian coal producers and the main steel mills in Japan, South Korea and Taiwan, usually prior to the beginning of the quarter. Once the quarterly fixed benchmark price is agreed upon and announced to the market, other coal players adopt it for pricing their coal trades.

Index prices are provided by several index providers, such as Platts, Global Coal, TSI and Metal Bulletin, and used as price references considering product type (metallurgical or thermal) and characteristics (low vs. mid volatile; hard vs. semi soft coking coal or

PCI, high

---

(32) After adjusting for the impacts of volumes and exchange rate variation.

Table of Contents

vs. low energy, among others). A premium or discount is then applied over the index reference price depending on Vale's product quality. Vale's index priced sales are generally lagged, i.e. usually based on the average price for the period corresponding to 1-month prior to the ship loading date.

Fixed prices are determined between Vale and the client and are based on Vale's product characteristics and quality.

Vale's coal sales from Mozambique are mostly on a CFR basis with prices determined by adding the specific freight rate to the FOB index reference price, whereas sales from Carborough Downs are based on an FOB Queensland basis.

The main coal products from the Moatize mine are the Chipanga hard coking coal (HCC), the newly launched Moatize Low Volatile (MLV) HCC and the Moatize thermal coal. The main coal products from Carborough Downs are the HCC and the Pulverized Coal Injection (PCI).

**Metallurgical coal**

In 3Q16, metallurgical coal sales were priced as follows: (i) 59% based on the quarterly fixed benchmark prices; (ii) 32% based on index lagged prices; and (iii) 9% based on fixed prices.

The realized metallurgical coal price was US\$ 91.04/ t in 3Q16, increasing 17.5% vs. the US\$ 77.48/t recorded in 2Q16.

Realized prices did not yet reflect the sharp increase in index prices in 3Q16 due to Vale's lagged pricing systems, as the quarterly benchmark price increased only 10%, from US\$ 84.0/t in 2Q16 to US\$ 92.5/t in 3Q16, while the average index price(33) increased 48%, from US\$ 91.4/t in 2Q16 to US\$ 135.6/t in 3Q16, with an average of US\$ 194.0/t in September. Realized sales prices for metallurgical coal are expected to improve in 4Q16 with higher benchmark prices in 4Q16 following the recent increase in the coal index reference price(34) which varied between US\$ 213.0/t and US\$ 250.0/t in October(35).

**Metallurgical coal prices**

US\$ / metric ton	3Q16	2Q16	3Q15
Premium Low Vol HCC index price (1)	135.61	91.36	82.59
Mid Vol HCC index price (2)	120.81	84.05	75.83
HCC benchmark price	92.50	84.00	93.00
Vale's metallurgical coal realized price	91.04	77.48	81.22

---

(1) Platts Premium Low Vol Hard Coking Coal FOB Australia.

(2) Platts Mid Vol Hard Coking Coal 64 CSR FOB Australia.

---

(33) Platts Premium Low Vol Hard Coking Coal FOB Australia Index used as reference.

(34) Platts Premium Low Vol Hard Coking Coal FOB Australia Index used as reference.

(35) Until October 24, 2016.

Table of Contents

Price realization in 3Q16 for metallurgical coal from Mozambique was impacted by:

- Quality adjustment over the index reference price due to product characteristics which negatively impacted prices in 3Q16 by US\$ 2.9/t.
- Sales using lagged index prices which negatively impacted prices in 3Q16 by US\$ 12.7/t, as index prices strongly increased in the second half of 3Q16.
- Sales using quarterly benchmark pricing systems which negatively impacted prices in 3Q16 by US\$ 28.3/t mainly as a result of the gap between quarterly benchmark and index prices in 3Q16.
- Freight differentials which negatively impacted prices in 3Q16 by US\$ 0.3/t, mainly due to freight differentials between Vale's freight rates contracted from Mozambique to the delivery ports and freight rates set in the sales contracts, which are determined considering the index reference port and the delivery ports.
- Other adjustments, mainly price discounts due to market forces and penalties, which negatively impacted prices in 3Q16 by US\$ 1.2/t.

**Price realization Metallurgical coal from Mozambique**



Table of Contents

Price realization in 3Q16 for the Hard Coking Coal from Carborough Downs was impacted by:

- Quality adjustment which positively impacted prices by US\$ 0.6/t.
- Lagged index prices which negatively impacted prices by US\$ 14.5/t.
- Quarterly benchmark prices which negatively impacted prices by US\$ 10.4/t.
- Commercial discount and other items which negatively impacted prices by US\$ 3.4/t

**Price realization Carborough Downs Hard Coking Coal**

**Thermal coal**

In 3Q16, thermal coal sales were priced as follows: (i) 58% based on index prices and (ii) 42% based on fixed prices.

The realized price of thermal coal was US\$ 45.80/t in 3Q16, increasing 19.3% vs. US\$ 38.38/t in 2Q16.

Price realization in 3Q16 for thermal coal was impacted by:

- Quality adjustment which negatively impacted prices by US\$ 8.9/t.
- Lagged index and fixed pricing which negatively impacted prices by US\$ 6.3/t.
- Commercial discount which negatively impacted prices by US\$ 4.3/t.



Table of Contents

**Price realization Thermal coal from Mozambique**

**COSTS AND EXPENSES**

Coal costs and expenses, net of depreciation, totaled US\$ 170 million in 3Q16, decreasing against the US\$ 255 million recorded in 2Q16. After adjusting for the effects of lower volumes (US\$ 3 million) and exchange rate variation (US\$ 1 million) and excluding the reversal of inventory impairments in Carborough Downs (US\$ 10 million), costs and expenses decreased by US\$ 77 million in 3Q16 vs. 2Q16.

**QUARTERLY PERFORMANCE BY OPERATION**

Highlights by operation are:

**Australia**

- Adjusted EBITDA for the Australian operations<sup>(36)</sup> was US\$ 28 million in 3Q16, improving from negative US\$ 10 million in 2Q16. The increase of US\$ 38 million vs. 2Q16 was mainly a result of the positive impacts of the lower costs and expenses<sup>(37)</sup> (US\$ 19 million) and of the reversal of inventory impairments (US\$ 10 million).

- Costs and expenses, net of depreciation, for Australian operations totaled US\$ 1 million in 3Q16, compared to US\$ 40 million in 2Q16, being positively impacted by the reversal of inventory impairments of US\$ 10 million in 3Q16. After adjusting for the effects of lower volumes and exchange rate variation (US\$ 10 million) and

---

(36) Includes Carborough Downs operations; Broadlea and Eagle Downs are currently in care and maintenance.

(37) After adjusting for the impacts of volumes and exchange rate variation.

Table of Contents

excluding the effects of the reversal of inventory impairments (US\$ 10 million), costs and expenses decreased US\$ 19 million in 3Q16 vs. 2Q16.

**Mozambique**

- Adjusted EBITDA for the operations in Mozambique was negative US\$ 35 million in 3Q16 compared to the negative US\$ 100 million in 2Q16. The increase vs. 2Q16 was mainly driven by the positive impacts of lower costs and expenses (38) (US\$ 58 million) and higher sales prices (US\$ 20 million).
- Adjusted EBITDA at the Nacala port improved by 71% to negative US\$ 7 million in 3Q16, while adjusted EBITDA at the Beira Port was negative US\$ 28 million.
- Production cost per ton at the Nacala port decreased 16% to US\$ 87/t in 3Q16 from US\$ 103/t in 2Q16, with further reductions expected for the coming quarters as Nacala and Moatize II ramp up.
- Costs and expenses, net of depreciation, amounted to US\$ 169 million in 3Q16, compared to US\$ 215 million in 2Q16. After adjusting for the effects of lower volumes (US\$ 12 million), costs and expenses decreased US\$ 58 million in 3Q16 vs. 2Q16 mainly as a result of the ramp-up of the Nacala Logistic Corridor and the Moatize II plant.
- The ramp-up of the Nacala Logistics Corridor continued as planned, with 2.002 Mt being transported on the railway in 3Q16 against 1.655 Mt in 2Q16. Twenty one shipments (2.025 Mt) were completed in 3Q16 compared to nineteen shipments (1.567 Mt) in 2Q16.
- The commissioning of the Moatize II coal handling and processing plant was concluded with its start-up in August 2016. The ramp-up of Moatize II is progressing well, with 129,000 t produced in August and 169,000 t in September 2016.

**Market outlook coal**

## Edgar Filing: Vale S.A. - Form 6-K

Coking coal prices have rallied on the back of strong Chinese demand and tight global supply. Prices for the low volatility premium hard coking coal quarterly benchmark FOB Australia increased by 10% from US\$ 84/t in 2Q16 to US\$ 92.5/t in 3Q16. Spot prices for the premium hard coking coal averaged US\$ 133/t in 3Q16, up from US\$ 91/t in 2Q16.

China supply-side reforms were the main reason behind the price rally in the coal market. In March, the Chinese Government limited operations at Chinese coal mines to a maximum of

---

(38) After adjusting for the impact of volumes variation.

Table of Contents

276 days annually, from 330 days previously, in an effort to cut surplus capacity in the coal industry. As a result, coal production dropped by more than 10% year-to-date in August compared to the same period of last year on an annualized basis and created a major supply shock amid low coke inventories at a time of strong steel output in China. Supply disruptions in Australia, due to heavy rains, longwall moves and geological issues, and production cuts from exporting countries amounting to 57 Mt on annualized basis also limited supply in 3Q16.

Recently, Chinese regulators (NDRC) proposed a relaxation of the supply control policy by allowing almost 800 coal mines, with capacity of 350-380 Mtpy of coking coal, to return to operate 330 working days in an attempt to bring the market back to balance in 2017.

Thermal coal market prices (Richards Bay Coal index prices) inched higher from US\$ 52.9/t in 2Q16 to US\$ 65.4/t in 3Q16 supported by Chinese demand. However, Chinese regulators have loosened their production controls, based on a three-tier supply response mechanism, allowing the better rated coal mines (according to product quality, efficiency, safety standards) to increase production as a strategy to prevent a power tariff hike.

Thermal coal demand in China is down only 4% year-on-year from January to August 2016, but demand peaked in July, increasing by 8% month-on-month, and seasonal restocking is likely to occur next quarter, providing further price support.

**Coal business performance**

**Net operating revenue by product**

US\$ million	3Q16	2Q16	3Q15
Metallurgical coal	105	77	115
Thermal coal	58	68	12
<b>Total</b>	<b>163</b>	<b>145</b>	<b>127</b>

**Average prices**

US\$/ metric ton	3Q16	2Q16	3Q15
Metallurgical coal	91.04	77.48	81.22
Thermal coal	45.80	38.38	48.24

**Volume sold**

000 metric tons	3Q16	2Q16	3Q15
Metallurgical coal	1,156	1,001	1,419
Thermal coal	1,271	1,767	243
<b>Total</b>	<b>2,427</b>	<b>2,768</b>	<b>1,662</b>



Table of Contents**Selected financial indicators - Coal**

<b>US\$ million</b>	<b>3Q16</b>	<b>2Q16</b>	<b>3Q15</b>
Net Revenues	163	145	127
Costs(1)	(157)	(237)	(207)
Expenses(1)	3	(6)	(17)
Pre-operating and stoppage expenses(1)	(13)	(9)	(25)
R&D expenses	(3)	(3)	(7)
Adjusted EBITDA	(7)	(110)	(129)
Depreciation and amortization	(41)	(15)	(80)
Adjusted EBIT	(48)	(125)	(209)
Adjusted EBIT margin (%)	(29)	(86)	(165)

---

(1) Net of depreciation and amortization.

Table of Contents

**Fertilizer nutrients**

Adjusted EBITDA for the Fertilizer business segment increased to US\$ 59 million in 3Q16 from US\$ 32 million in 2Q16. The increase of US\$ 27 million was mainly driven by the positive impact of higher sales volumes (US\$ 13 million) and lower costs<sup>(39)</sup> (US\$ 42 million), being partly offset by the negative impact of lower prices (US\$ 17 million) and exchange rate variations (US\$ 9 million).

Potash net sales revenues totaled US\$ 34 million in 3Q16, US\$ 12 million higher than in 2Q16. The increase was due to higher sales volumes (US\$ 13 million), which were partly offset by a slight decrease in realized prices (US\$ 1 million), alongside the reduction in international potash prices.

Phosphate products net sales revenues totaled US\$ 470 million in 3Q16, US\$ 107 million higher than in 2Q16 as a result of higher sales volumes (US\$ 112 million), partially offset by lower prices (US\$ 5 million). Sales volumes increased from 1,880 kt in 2Q16 to 2,377 kt in 3Q16.

Nitrogen fertilizers net sales revenues totaled US\$ 69 million in 3Q16 vs. US\$ 60 million in 2Q16, as a result of higher sales volumes (US\$ 13 million) which were partially offset by lower prices (US\$ 4 million).

Fertilizer costs, net of depreciation, totaled US\$ 501 million in 3Q16 (or US\$ 610 million with depreciation charges), increasing by US\$ 106 million vs. 2Q16. After excluding the effects of higher volumes (US\$ 129 million) and exchange rate variations (US\$ 18 million), costs decreased by US\$ 42 million, mainly as a result of a decrease in raw materials prices.

SG&A and Other expenses, net of depreciation, totaled US\$ 29 million in 3Q16, remaining in line with 2Q16. R&D expenses totaled US\$ 5 million in 3Q16, decreasing US\$ 1 million vs. 2Q16. Pre-operating and stoppage expenses totaled US\$ 4 million in 3Q16, remaining in line with 2Q16.

**Market outlook fertilizer nutrients**

Prices remained subdued as a result of a strong supply of fertilizer products alongside a demand slowdown in major markets such as India and China due to weather conditions in 3Q16. Fertilizer demand improved in Brazil – Vale’s main market for fertilizers – on the back of better agricultural commodities prices relative to fertilizer prices.

---

(39) Excluding volume and exchange rate variations.





Table of Contents

In the phosphate market, most prices remained flat in 3Q16 vs. 2Q16, helped by the announcement that phosphoric acid prices in contracts with Indian producers were set at US\$ 605/t CFR India.

The potash market started to show signs of stability in 3Q16, helped by production cuts in the first half of the year.

The nitrogen market remained oversupplied due to the ramp-up of new ammonia plants worldwide despite production cuts in Ukraine.

In the medium term, the market should become more balanced as low fertilizer prices should stimulate further supply cuts.

**Fertilizer nutrients business performance**

**FERTILIZERS COGS 2Q16 x 3Q16**

US\$ million	2Q16	Volume	Variance drivers Exchange Rate	Others	Total Variation 2Q16 x 3Q16	3Q16
<b>Total costs before depreciation and amortization</b>	<b>395</b>	<b>129</b>	<b>18</b>	<b>(41)</b>	<b>106</b>	<b>501</b>
Depreciation	87	17	4	1	22	109
<b>Total</b>	<b>482</b>	<b>146</b>	<b>22</b>	<b>(40)</b>	<b>128</b>	<b>610</b>

**Net operating revenue by product**

US\$ million	3Q16	2Q16	3Q15
Potash	34	22	41
Phosphates	470	363	560
Nitrogen	69	60	80
Others	25	19	17
<b>Total</b>	<b>598</b>	<b>464</b>	<b>698</b>

**Average prices**

US\$/ metric ton	3Q16	2Q16	3Q15
Potash	205.37	208.45	265.55
Phosphates			

Edgar Filing: Vale S.A. - Form 6-K

MAP	396.68	384.83	494.03
TSP	298.54	306.67	371.09
SSP	190.99	186.97	188.02
DCP	475.83	475.73	474.09
Phosphate rock	63.15	70.94	78.44
Nitrogen	345.01	409.19	431.41

Table of Contents**Volume sold**

<b>000 metric tons</b>	<b>3Q16</b>	<b>2Q16</b>	<b>3Q15</b>
Potash	165	103	155
Phosphates			
MAP	333	210	348
TSP	284	201	317
SSP	587	512	740
DCP	137	128	118
Phosphate rock	852	734	769
Others phosphates	184	95	74
Nitrogen	200	145	185

**Selected financial indicators - Fertilizers**

<b>US\$ million</b>	<b>3Q16</b>	<b>2Q16</b>	<b>3Q15</b>
Net Revenues	598	464	698
Costs(1)	(501)	(396)	(444)
Expenses(1)	(29)	(29)	(5)
Pre-operating and stoppage expenses(1)	(4)	(4)	(29)
R&D expenses	(5)	(6)	(23)
Dividends received		3	
Adjusted EBITDA	59	32	197
Depreciation and amortization	(111)	(88)	(99)
Adjusted EBIT	(52.0)	(59.0)	98.0
Adjusted EBIT margin (%)	(8.7)	(12.7)	14.0

---

(1) Net of depreciation and amortization

Table of Contents

**Financial indicators of non-consolidated companies**

For selected financial indicators of the main non-consolidated companies, see our quarterly financial statements on [www.vale.com / investors](http://www.vale.com/investors) / information to the market / financial statements.

**Conference call and webcast**

Vale will host two conference calls and webcasts on Thursday, October 27<sup>th</sup>, 2016. The first, in Portuguese (non-translated), will begin at 10:00 a.m. Rio de Janeiro time. The second, in English, at 12:00 p.m. Rio de Janeiro time (10:00 a.m. US Eastern Daylight Time, 3:00 p.m. British Standard Time).

Dial in to conference calls/webcasts:

In Portuguese:

Participants from Brazil: (55 11) 3193-1001 or (55 11) 2820-4001

Participants from the US: (1 888) 700-0802

Participants from other countries: (1 786) 924-6977

Access code: VALE

In English:

Participants from Brazil: (55 11) 3193-1001 or (55 11) 2820-4001

Participants from the U.S.: (1 866) 262-4553

Participants from other countries: (1 412) 317-6029

Access code: VALE

Instructions for participation will be available on the website: [www.vale.com/investors](http://www.vale.com/investors). A podcast will be available on Vale's Investor Relations website.

## Edgar Filing: Vale S.A. - Form 6-K

This press release may include statements that present Vale's expectations about future events or results. All statements, when based upon expectations about the future, involve various risks and uncertainties. Vale cannot guarantee that such statements will prove correct. These risks and uncertainties include factors related to the following: (a) the countries where we operate, especially Brazil and Canada; (b) the global economy; (c) the capital markets; (d) the mining and metals prices and their dependence on global industrial production, which is cyclical by nature; and (e) global competition in the markets in which Vale operates. To obtain further information on factors that may lead to results different from those forecast by Vale, please consult the reports Vale files with the U.S. Securities and Exchange Commission (SEC), the Brazilian Comissão de Valores Mobiliários (CVM) and the French Autorité des Marchés Financiers (AMF), and in particular the factors discussed under "Forward-Looking Statements" and "Risk Factors" in Vale's annual report on Form 20-F.

Table of Contents**Annex 1 Simplified Financial Statements****Income statement**

US\$ million	3Q16	2Q16	3Q15
<b>Net operating revenue</b>	<b>7,324</b>	<b>6,626</b>	<b>6,505</b>
Cost of goods sold	(4,955)	(4,795)	(5,040)
<b>Gross profit</b>	<b>2,369</b>	<b>1,831</b>	<b>1,465</b>
Gross margin (%)	32.3	27.6	22.5
Selling, general and administrative expenses	(153)	(140)	(131)
Research and development expenses	(85)	(78)	(121)
Pre-operating and stoppage expenses	(122)	(114)	(266)
Other operational expenses	51	(160)	(113)
Gain (loss) from sale of assets	(29)	(66)	(48)
<b>Operating profit</b>	<b>2,031</b>	<b>1,273</b>	<b>786</b>
Financial revenues	35	34	92
Financial expenses	(715)	(611)	(352)
Gains (losses) on derivatives, net	(39)	759	(1,799)
Monetary and exchange variation	(328)	1,909	(5,117)
Equity income	46	190	(349)
Other results on sale or write-off of investments from associates and joint ventures	(33)	(1,113)	
<b>Income (loss) before taxes</b>	<b>997</b>	<b>2,441</b>	<b>(6,739)</b>
Current tax	(57)	(413)	(100)
Deferred tax	(358)	(907)	4,603
<b>Net Earnings (loss) from continuing operations</b>	<b>582</b>	<b>1,121</b>	<b>(2,236)</b>
Loss attributable to noncontrolling interest	(7)	(15)	119
<b>Net earnings (attributable to the Company's stockholders)</b>	<b>575</b>	<b>1,106</b>	<b>(2,117)</b>
Earnings (loss) per share (attributable to the Company's stockholders - US\$)	0.11	0.21	(0.41)
Diluted earnings (loss) per share (attributable to the Company's stockholders - US\$)	0.11	0.21	(0.41)

**Equity income (loss) by business segment**

US\$ million	3Q16	%	2Q16	%	3Q15	%
Ferrous minerals	62	134.8	37	19.5	(65)	18.6
Coal	2	4.3			(9)	2.6
Fertilizers			1	0.5		
Base metals	(2)	(4.3)			(10)	2.9
Steel	(35)	(76.1)	121	63.7	(282)	80.8
Others	19	41.3	31	16.3	17	(4.9)
<b>Total</b>	<b>46</b>	<b>100.0</b>	<b>190</b>	<b>100.0</b>	<b>(349)</b>	<b>100.0</b>

Table of Contents**Balance sheet**

US\$ million	30/09/2016	30/06/2016	30/09/2015
<b>Assets</b>			
<b>Current assets</b>	<b>19,507</b>	<b>18,274</b>	<b>17,701</b>
Cash and cash equivalents	5,369	4,168	4,397
Financial investments	115	138	65
Derivative financial instruments	141	136	158
Accounts receivable	2,556	2,452	2,028
Related parties	66	68	343
Inventories	3,900	3,866	3,808
Prepaid income taxes	317	299	904
Recoverable taxes	1,603	1,781	1,364
Others	651	708	746
Non-current assets held for sale and discontinued operation	4,789	4,658	3,888
<b>Non-current assets</b>	<b>10,581</b>	<b>10,861</b>	<b>10,857</b>
Related parties	19	3	23
Loans and financing agreements receivable	182	179	194
Judicial deposits	1,073	1,090	838
Recoverable income taxes	542	513	417
Deferred income taxes	6,849	7,289	7,982
Recoverable taxes	688	619	527
Derivative financial instruments	504	497	133
Others	661	671	743
Fixed assets	72,062	71,835	70,467
<b>Total assets</b>	<b>102,087</b>	<b>100,970</b>	<b>99,025</b>
<b>Liabilities</b>			
<b>Current liabilities</b>	<b>10,847</b>	<b>11,546</b>	<b>10,226</b>
Suppliers and contractors	3,751	3,891	3,482
Payroll and related charges	593	493	455
Derivative financial instruments	868	1,010	1,422
Loans and financing	2,181	3,153	3,030
Related parties	558	600	141
Income taxes settlement program	449	442	330
Taxes payable and royalties	185	262	261
Provision for income taxes	154	120	217
Employee postretirement obligations	72	77	69
Asset retirement obligations	70	81	81
Redeemable noncontrolling interest			135
Other results on sale or write-off of investments from associates and joint ventures	329	289	
Others	1,488	1,048	323
Liabilities directly associated with non-current assets held for sale and discontinued operations	149	80	280
<b>Non-current liabilities</b>	<b>49,409</b>	<b>47,941</b>	<b>44,298</b>
Derivative financial instruments	1,167	1,201	2,808
Loans and financing	29,268	28,661	25,645
Related parties	137	144	76
Employee postretirement obligations	2,113	2,150	1,881
Provisions for litigation	919	924	858
Income taxes settlement program	4,977	5,013	3,992
Deferred income taxes	1,676	1,739	2,896
Asset retirement obligations	3,169	2,759	2,648
Participative stockholders debentures	658	617	603



Edgar Filing: Vale S.A. - Form 6-K

Gold stream transaction	2,158	1,666	1,785
Other results on sale or write-off of investments from associates and joint ventures	795	874	
Others	2,372	2,193	1,106
<b>Total liabilities</b>	<b>60,256</b>	<b>59,487</b>	<b>54,524</b>
<b>Stockholders equity</b>	<b>41,831</b>	<b>41,483</b>	<b>44,501</b>
<b>Total liabilities and stockholders equity</b>	<b>102,087</b>	<b>100,970</b>	<b>99,025</b>

Table of Contents**Cash flow**

US\$ million	3Q16	2Q16	3Q15
<b>Cash flows from operating activities:</b>			
Net income (loss) before taxes on income	997	2,441	(6,739)
<b>Adjustments to reconcile</b>			
Depreciation, depletion and amortization	963	927	1,022
Equity Income	(46)	(190)	349
Other items from non-current assets	(121)	1,209	48
Items of the financial result	1,047	(2,091)	7,176
<b>Variation of assets and liabilities</b>			
Accounts receivable	57	108	343
Inventories	12	78	(331)
Suppliers and contractors	255	364	422
Payroll and related charges	(16)	45	53
Tax assets and liabilities, net	(43)	(4)	(143)
Goldstream transaction	524		
Others	(402)	228	113
<b>Net cash provided by operations</b>	<b>3,227</b>	<b>3,115</b>	<b>2,313</b>
Interest on loans and financing	(423)	(362)	(381)
Derivatives received (paid), net	(191)	(353)	(167)
Remuneration paid to debentures		(37)	
Income taxes	(88)	(113)	(47)
Income taxes - settlement program	(116)	(100)	(89)
<b>Net cash provided by operating activities</b>	<b>2,409</b>	<b>2,150</b>	<b>1,629</b>
<b>Cash flows from investing activities:</b>			
Additions to investments	(9)	(136)	(8)
Additions to property, plant and equipment	(1,249)	(1,232)	(1,870)
Proceeds from disposal of assets and investments	326	12	472
Dividends and interest on capital received from joint ventures and associates		117	19
Proceeds from goldstream transaction	276		
Others	(2)	(126)	76
<b>Net cash used in investing activities</b>	<b>(658)</b>	<b>(1,365)</b>	<b>(1,311)</b>
<b>Cash flows from financing activities:</b>			
Loans and financing			
Additions	1,573	1,433	1,066
Repayments	(1,987)	(1,808)	(928)
Dividends and interest on capital attributed to noncontrolling interest	(129)	(71)	
Other transactions with noncontrolling interest			1,089
<b>Net cash provided by (used in) financing activities</b>	<b>(543)</b>	<b>(446)</b>	<b>1,227</b>
Increase (decrease) in cash and cash equivalents	1,208	339	1,545
Cash and cash equivalents in the beginning of the period	4,168	3,782	3,158
Effect of exchange rate changes on cash and cash equivalents	(7)	47	(306)
<b>Cash and cash equivalents, end of period</b>	<b>5,369</b>	<b>4,168</b>	<b>4,397</b>
<b>Non-cash transactions:</b>			
Additions to property, plant and equipment - interest capitalization	172	213	196

Table of Contents**Annex 2 Volumes sold, prices and margins****Volume sold - Minerals and metals**

<b>000 metric tons</b>	<b>3Q16</b>	<b>2Q16</b>	<b>3Q15</b>
Iron ore fines	74,231	72,678	70,530
ROM	351	405	3,546
Pellets	12,001	11,388	11,961
Manganese ore	448	354	448
Ferroalloys	31	36	3
Thermal coal	1,271	1,767	243
Metallurgical coal	1,156	1,001	1,419
Nickel	77	77	72
Copper	107	107	94
Gold as by-product ( 000 oz)	129	122	105
Silver as by-product ( 000 oz)	609	619	528
PGMs ( 000 oz)	130	151	83
Cobalt (metric ton)	1,069	1,000	468
Potash	165	103	155
Phosphates			
MAP	333	210	348
TSP	284	201	317
SSP	587	512	740
DCP	137	128	118
Phosphate rock	852	734	769
Others phosphates	184	95	74
Nitrogen	200	145	185

**Average prices**

<b>US\$/ton</b>	<b>3Q16</b>	<b>2Q16</b>	<b>3Q15</b>
Iron ore fines CFR reference price (dmt)	59.30	56.30	56.00
Iron ore fines CFR/FOB realized price	50.95	48.30	46.48
ROM	11.40	12.35	6.77
Pellets CFR/FOB (wmt)	82.58	76.20	73.82
Manganese ore	113.84	103.13	51.34
Ferroalloys	806.45	690.36	1,000.00
Thermal coal	45.80	38.38	48.24
Metallurgical coal	91.04	77.48	81.22
Nickel	10,317.00	9,180.00	10,866.00
Copper	4,218.00	4,144.00	3,892.00
Platinum (US\$/oz)	1,060.30	908.64	1,004.75
Gold (US\$/oz)	1,383.00	1,265.93	1,094.81
Silver (US\$/oz)	15.15	16.66	13.49
Cobalt (US\$/lb)	11.83	10.41	14.54
Potash	205.37	208.45	265.55
Phosphates			
MAP	396.68	384.83	494.03

Edgar Filing: Vale S.A. - Form 6-K

TSP	298.54	306.67	371.09
SSP	190.99	186.97	188.02
DCP	475.83	475.73	474.09
Phosphate rock	63.15	70.94	78.44
Nitrogen	345.01	409.19	431.44

Operating margin by segment (EBIT adjusted margin)

%	3Q16	2Q16	3Q15
Ferrous minerals	42.2	37.3	29.0
Coal	(29.4)	(86.2)	(164.6)
Base metals	12.5	(4.4)	(18.1)
Fertilizer nutrients	(8.7)	(12.7)	14.0
<b>Total(1)</b>	<b>28.1</b>	<b>20.2</b>	<b>12.8</b>

---

(1) Excluding non-recurring effects

Table of Contents**Annex 3 reconciliation of IFRS and NON-GAAP information****(a) Adjusted EBIT(1)**

US\$ million	3Q16	2Q16	3Q15
Net operating revenues	7,324	6,626	6,505
COGS	(4,955)	(4,795)	(5,040)
SG&A	(153)	(140)	(131)
Research and development	(85)	(78)	(121)
Pre-operating and stoppage expenses	(122)	(114)	(266)
Other operational expenses	51	(160)	(113)
<b>Adjusted EBIT</b>	<b>2,060</b>	<b>1,339</b>	<b>834</b>

---

(1) Excluding non-recurring effects.

**(b) Adjusted EBITDA**

EBITDA defines profit or loss before interest, tax, depreciation and amortization. Vale uses the term adjusted EBITDA to reflect exclusion of gains and/or losses on sale of assets, non-recurring expenses and the inclusion of dividends received from non-consolidated affiliates. However our adjusted EBITDA is not the measure defined as EBITDA under IFRS, and may possibly not be comparable with indicators with the same name reported by other companies. Adjusted EBITDA should not be considered as a substitute for operational profit or as a better measure of liquidity than operational cash flow, which are calculated in accordance with IFRS. Vale provides its adjusted EBITDA to give additional information about its capacity to pay debt, carry out investments and cover working capital needs. The following table shows the reconciliation between adjusted EBITDA and operational cash flow, in accordance with its statement of changes in financial position:

**Reconciliation between adjusted EBITDA and operational cash flow**

US\$ million	3Q16	2Q16	3Q15
<b>Adjusted EBITDA</b>	<b>3,023</b>	<b>2,383</b>	<b>1,875</b>
<b>Working capital:</b>			
Accounts receivable	57	108	343
Inventories	12	78	(331)
Suppliers	255	364	422
Payroll and related charges	(16)	45	53
Others	79	224	30
Adjustment for non-recurring items and other effects	(183)	(87)	(78)
<b>Cash provided from operations</b>	<b>3,227</b>	<b>3,115</b>	<b>2,313</b>
Income taxes paid - current	(88)	(113)	(47)
Income taxes paid - settlement program	(116)	(100)	(89)
Interest paid for third parties	(423)	(362)	(381)

Participative stockholders debentures paid		(37)	
Derivatives received (paid), net	(191)	(353)	(167)
<b>Net cash provided by (used in) operating activities</b>	<b>2,409</b>	<b>2,150</b>	<b>1,629</b>

**(c) Net debt**

US\$ million	3Q16	2Q16	3Q15
Total debt	31,449	31,814	28,675
Cash and cash equivalents(1)	5,484	4,306	4,462
Net debt	25,965	27,508	24,213

---

(1) Including financial investments

**(d) Total debt / LTM Adjusted EBITDA**

US\$ million	3Q16	2Q16	3Q15
Total debt / LTM Adjusted EBITDA (x)	3.6	4.2	3.6
Total debt / LTM operational cash flow (x)	5.8	6.9	13.6

**(e) LTM Adjusted EBITDA / LTM interest payments**

US\$ million	3Q16	2Q16	3Q15
Adjusted LTM EBITDA / LTM gross interest (x)	5.0	4.5	4.8
LTM adjusted EBITDA / LTM interest payments (x)	5.7	5.1	5.3
LTM operational profit / LTM interest payments (x)	(2.8)	(3.7)	2.0

Table of Contents

**Signatures**

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

Vale S.A.  
(Registrant)

By: /s/ André Figueiredo  
Director of Investor Relations

Date: October 27, 2016