Vale’s performance in 2016

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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: Compañia 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 (formely 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.

Vale's performance in 2016

Rio de Janeiro, February 23rd, 2017 – Vale S.A. (Vale) delivered a sound operational performance, with several production records in 2016, namely: (i) iron ore production[1] of 348.8 Mt; (ii) Carajás iron ore production of 148.1 Mt; (iii) nickel production of 311,000 t; (iv) copper production of 453,100 t ; (v) cobalt production of 5,799 t; (vi) contained gold as a by-product in the copper and nickel concentrates of 483,000 oz and (vii) Moatize coal production of 5.5 Mt.

Net operating revenues in 2016 were US$ 29.363 billion, 14.7% higher than the US$ 25.609 billion registered in 2015. The increase in sales revenues was mainly due to higher realized prices of iron ore fines and pellets (US$ 2.966 billion), and higher volumes of iron ore fines and pellets (US$ 715 million) and base metals (US$ 407 million) partially offset by lower base metals prices (US$ 431 million).

Quarterly net revenues totaled US$ 9.694 billion in 4Q16, 32.4% higher than in 3Q16. The increase in sales revenues was mainly due to higher sales prices for iron ore fines and pellets (US$ 1.613 billion), for coal (US$ 200 million) and base metals (US$ 123 million), and higher sales volumes in ferrous minerals (US$ 441 million), in base metals (US$ 58 million) and in coal (US$ 13 million).

Costs and expenses decreased by US$ 1.841 billion[2] to US$ 17.379 billion in 2016, mainly due to: (i) the impact of exchange rate variations in COGS and SG&A (US$ 399 million), (ii) cost savings initiatives (US$ 1.623 billion) and (iii) a reduction in expenses[3] (US$ 387 million). These reductions were partially offset by higher sales volumes (US$ 942 million).

Quarterly costs and expenses, net of depreciation charges, totaled US$ 5.003 billion in 4Q16, increasing 16.3% from the US$ 4.301 billion in 3Q16, impacted by higher costs (US$ 362 million) and higher expenses (US$ 255 million)[3]. The increase was driven mainly by higher freight costs and by some one-off effects such as the collective bargaining agreement settled with our employees in Brazil and a higher provision for profit sharing, which was impacted by the sharp increase of commodity prices at the end of year, leading to a much higher provision in comparison to previous quarters.

[1] Including third party purchases and excluding Samarco's attributable production.

[2] Net of the effects: (i) of the goldstream transaction recorded in 1Q15 (US$ 230 million), (ii) the goldstream transaction in 3Q16 (US$ 150 million) and (iii) of the adjustment in the Asset Retirement Obligations (ARO) recorded in 4Q15 (US$ 331 million) and in 4Q16 (US$ 37 million).

[3] Net of the positive one-off effects from the goldstream transaction (US$ 150 million) in 3Q16 and the adjustment in ARO (US$ 37 million) in 4Q16.

Adjusted EBITDA was US$ 12.181 billion[4] in 2016, 72.0% higher than the US$ 7.081 billion in 2015 mainly as a result of improvements in the Ferrous Minerals EBITDA (US$ 4.577 billion), Base Metals EBITDA (US$ 460 million) and Coal EBITDA (US$ 454 million). Adjusted EBITDA margin was 41.5% in 2016, improving from the 27.7% recorded in 2015.

Quarterly adjusted EBITDA was US$ 4.770 billion in 4Q16, 57.8% higher than in 3Q16 mainly as a result of improvements in the Ferrous Minerals EBITDA (US$ 1.616 billion) and Coal EBITDA (US$ 163 million). Adjusted EBITDA margin was 49.2% in 4Q16, improving from the 41.3% recorded in 3Q16.

Capital expenditures totaled US$ 1.408 billion in 4Q16 and US$ 5.482 billion in 2016, decreasing US$ 2.919 billion vs. 2015. Investments in project execution totaled US$ 614 million and US$ 3.179 billion in 4Q16 and in 2016, respectively. Sustaining capex totaled US$ 794 million and US$ 2.302 billion in 4Q16 and in 2016, respectively. The S11D project started up successfully in December 2016 with the first shipment in January 2017 of S11D ore blended with ore from other Northern System mines.

Announced asset sales totaled US$ 3.842 billion in 2016, with US$ 2.500 billion stemming from the sale of part of the Fertilizers business[5], US$ 820 million from another goldstream transaction, US$ 269 million from the sale of three very large ore carriers, US$ 140 million from the sale of four capesize carriers and US$ 113 million from additional payments received from the sale of Mineração Paragominas.

Net income totaled US$ 3.982 billion in 2016 vs. a net loss of US$ 12.129 billion in 2015. The US$ 16.111 billion increase was mostly driven by: (i) higher EBITDA (US$ 5.100 billion), (ii) higher gains on foreign exchange and monetary variation (US$ 10.629 billion), and (iii) lower impairment of non-current assets and onerous contracts (US$ 6.014 billion). This increase was partially offset by higher taxes (US$ 7.251 billion) due to the net earnings generated in the period.

Impairments of non-current assets and onerous contracts caused non-cash losses of US$ 2.912 billion in 2016 vs US$ 8.926 billion in 2015. In 2016, impairments were mainly driven by the impact of: (i) the agreement to sell certain Fertilizers assets for US$ 2.5 billion announced in December 2016 (US$ 1.738 billion); (ii) lower price projections for certain products, which reduced the recoverable values of the Vale Newfoundland and Labrador - VNL (US$ 631 million) and Vale New Caledonia - VNC (US$ 284 million) assets, and (iii) the provision related to contracts with minimum guaranteed volume for port services in the Midwestern system (US$ 183 million) and for manganese ore supply (US$ 74 million), which were

[4] Including US$ 150 million from the goldstream transaction.

[5] We expect to close the Fertilizers sale by the end of 2017.

partially offset by the impairment reversal driven by the impact of the decision to re-start the São Luis pellet plant at the beginning of 2018 (US$ 160 million).

Impairments of assets in discontinued operations, with no cash effect, totaled US$ 1.738 billion as a result of the difference between the carrying value and the recoverable amount of the Fertilizer assets held for sale.

Quarterly net income totaled US$ 525 million in 4Q16 vs. US$ 575 million in 3Q16, decreasing by US$ 50 million, mainly as a result of the impairment of non-current assets and onerous contracts (US$ 2.912 billion), which were partially offset by the positive impact of higher EBITDA (US$ 1.151 billion).

Cash flow from operations amounted to US$ 3.715 billion in 4Q16, US$ 1.055 billion lower than the EBITDA due to the negative impact of the increase in accounts receivable in 4Q16 vs. 3Q16, mainly driven by the: (i) final invoices not yet collected (with higher prices than the ones provisionally invoiced at the end of 3Q16); (ii) concentration of iron ore sales volumes provisionally invoiced at the end of 4Q16 (sales not yet collected); and (iii) higher prices on volumes provisionally invoiced at the end of 4Q16 vs. 3Q16. Working capital changes should have a positive impact on cash flows in 1Q17 as sales collections increase throughout the quarter.

Net debt totaled US$ 25.075 billion vs. US$ 25.234 billion as of December 31st, 2015 and US$ 25.965 billion as of September 30th, 2016, with a cash balance of US$ 4.280 billion as of December 31st, 2016. Average debt maturity was 7.9 years with an average cost of debt of 4.63% per annum. Leverage ratio improved significantly to 2.4x as of December 31st, 2016 from the 4.1x as of December 31st, 2015.

In 2016, Vale distributed R$ 857 million (US$ 250 million) of shareholder remuneration in the form of interest on equity. Vale’s Board of Directors approved, subject to the ratification by the General Shareholders Meeting, the additional distribution of R$ 4.667 billion, to be paid at the end of April 2017, in the form of interest on equity.

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

EBITDA from the Ferrous Minerals business segment increased 78% in 2016 vs. 2015, mainly driven by higher prices and gains in competitiveness

- Adjusted EBITDA for Ferrous Minerals was US$ 10.476 billion in 2016, US$ 4.577 billion higher than the US$ 5.899 billion achieved in 2015, mainly as a result of higher market prices (US$ 2.727 billion) and gains in competitiveness (US$ 1.259 billion).

- Adjusted EBITDA per ton for Ferrous Minerals, excluding Manganese and Ferroalloys, was US$ 30.5/t in 2016, 73% higher than the US$ 17.7/t recorded in

2015, positioning Vale better or on par with its Australian peers, despite its geographical disadvantage.

- Cash flow generation, simplified by measuring adjusted EBITDA less sustaining and growth capex, was US$ 7.229 billion in 2016, increasing by US$ 6.277 billion (559%) from the US$ 952 million recorded in 2015.

- Sales volumes of iron ore fines increased 5%, from 276.4 Mt in 2015 to 289.9 Mt in 2016, as a result of the better operational performance in the Northern System.

- Vale's realized CFR/FOB wmt price for iron ore fines (ex-ROM) increased US$ 9.8/wmt, from US$ 44.6/wmt in 2015 to US$ 54.4/wmt in 2016, while average Platts IODEX 62% increased US$ 3.0/dmt, mainly due to marketing and commercial initiatives, the positive impact of the different pricing systems and the increase in the Northern System sales volumes.

- C1 cash cost FOB port per metric ton of iron ore fines in BRL reduced by 7% to R$ 45.9/t in 2016 vs. R$ 49.3/t in 2015, despite inflationary pressures of 6.3%[6], mainly due to improvements in operational performance and ongoing cost-cutting initiatives.

- Unit maritime freight cost per iron ore metric ton was US$ 12.2/t in 2016, US$ 3.8/t lower than the US$ 16.0/t recorded in 2015, mainly due to the lower bunker oil prices (US$ 1.7/t) and the lower spot freight rates (US$ 0.7/t).

- Iron ore fines and pellets EBITDA break-even, measured by unit cash costs and expenses on a landed-in-China basis[7], decreased US$ 5.7/dmt[8] to US$ 28.9/dmt in 2016 when compared to 2015.

Quarterly EBITDA from the Ferrous Minerals business segment increased 65% in 4Q16 vs. 3Q16, mainly driven by higher realized prices and higher sales volumes

- Adjusted EBITDA for Ferrous Minerals was US$ 4.109 billion in 4Q16, US$ 1.616 billion higher than the US$ 2.493 billion achieved in 3Q16, mainly as a result of higher realized prices (US$ 1.647 billion) and higher sales volumes (US$ 247 million), which were partly offset by higher costs and expenses[9] (US$ 354 million).

- Adjusted EBITDA per ton for iron ore fines was US$ 42.2/t in 4Q16, 58% higher than the US$ 26.8/t recorded in 3Q16, mainly as a result of higher CFR/FOB wmt price.

[6] IPCA 2016.

[7] Adjusted for quality, pellet margins differential and moisture, excluding ROM

[8] Dry metric ton.

[9] After adjusting for the effects of higher sales volumes and exchange rate variations.

- Vale's CFR/FOB wmt price for iron ore fines (ex-ROM) increased 36.5% (US$ 18.6/t) from US$ 50.9/t in 3Q16 to US$ 69.5/t in 4Q16[10], while average Platts IODEX 62% increased 20.8% in 4Q16 vs. 3Q16, mainly due to the positive impacts of Vale's provisional pricing system.

- C1 cash cost FOB port per metric ton for iron ore fines ex-royalties increased US$1.4/t, from the US$ 13.0/t recorded in 3Q16 to US$ 14.4/t in 4Q16, mainly as a result of non-recurring events (US$ 0.9/t) such as: the adjustments in inventory, the collective bargaining agreement with employees in Brazil and the provision for profit sharing, which was impacted by the sharp increase of commodity prices at the end of the year, leading to a much higher provision in comparison to previous quarters.

- Unit maritime freight cost per iron ore metric ton was US$ 13.2/t in 4Q16, US$ 1.2/t higher than in 3Q16, mainly due to the negative impacts of: (i) higher bunker oil prices (US$ 0.5/t); (ii) higher spot freight rates (US$ 0.2/t); (iii) higher costs on the freight contracted to replace the transportation capacity of the vessels sold[11] (US$ 0.2/t).

EBITDA from the Base Metals business segment increased significantly in 2016 as a result of lower costs and expenses despite lower prices

- Adjusted EBITDA for Base Metals was US$ 1.848 billion in 2016, US$ 460 million higher than the US$ 1.388 billion in recorded in 2015, positively impacted by lower costs and expenses (US$ 618 million), higher volumes (US$ 148 million) and favorable exchange rate variations (US$ 126 million), which were partially offset by lower base metals prices (US$ 431 million).

- Base Metals realized prices were severely impacted by the decrease in nickel and copper LME prices, which decreased by 19% and 11%, respectively, in 2016 vs. 2015.

- Salobo's EBITDA totaled US$ 736 million[12] in 2016, increasing US$ 135 million vs. 2015, mainly due to higher volumes[13] (US$ 92 million).

- Salobo achieved a yearly production record of 175,900 t in 2016 after completing its ramp-up and reaching nominal capacity as of September 2016.

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[10] After adjusting for moisture and the effect of FOB sales, which accounted for 32% of the total sales volumes in 4Q16.

[11] Three Valemax were sold in August 2016 and two capesizes in December 2016, with the remaining two capsizes delivered to new ship owners in January 2017.

[12] Including US$ 150 million from the goldstream transaction.

[13] Including by products.

- Adjusted EBITDA for VNC totaled negative US$ 169 million in 2016 improving by US$ 240 million when compared to the negative US$ 409 million in 2015, in spite of the 19% decline in nickel price.

- VNC's unit cost net of by-product credits reached US$ 11,017/t at the end of 2016 compared to US$ 17,380/t by the end of 2015.

Quarterly EBITDA from the Base Metals business segment increased with higher nickel and copper prices

- Adjusted EBITDA was US$ 543 million in 4Q16, increasing US$ 93 million vs. 3Q16[14], as a result of higher prices (US$ 123 million) and exchange rate variation (US$ 17 million), which were partially offset by higher costs[15] (US$ 21 million) and SG&A expenses (US$ 13 million).

- Salobo's EBITDA was US$ 203 million increasing US$ 72 million vs 3Q16 (excluding the US$ 150 million impact from the goldstream transaction in 3Q16), mainly due to lower costs and expenses (US$ 31 million), higher prices (US$ 27 million) and higher volumes (US$ 11 million).

- Salobo achieved a quarterly production record of 49,800 t in 3Q16 and a monthly production record of 17,500 t in December 2016.

- VNC's EBITDA was negative US$ 32 million, improving compared to the negative US$ 39 million in 3Q16, as a result of lower costs.

- VNC's unit cost net of by-product credits reached US$ 11,017/t in 4Q16 vs.12,425/t in 3Q16, reflecting lower maintenance costs of US$ 11 million in 4Q16.

EBITDA from Coal improved significantly in 2016, with the EBITDA of coal shipped through the Nacala port reaching US$ 110 million

- Adjusted EBITDA for the Coal business segment improved significantly to negative US$ 54 million in 2016 from negative US$ 508 million in 2015, as a result of the ramp-ups of the Nacala Logistics Corridor and the Moatize II plant and the strong increase in coal prices.

- Adjusted EBITDA of coal shipped through the Nacala port reached US$ 110 million in 2016.

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[14] 3Q16 net of the one-off positive effect of the goldstream transaction (US$ 150 million).

[15] After adjusting for impacts of volumes.

- Railed volume in Mozambique reached 8.8 Mt in 2016, being 113% higher than the 4.1 Mt recorded in 2015, and shipped volume totaled 8.7 Mt in 2016, being 136% higher than the 3.7 Mt recorded in 2015, as a result of the ramp-up of the Nacala Logistics Corridor.

Quarterly EBITDA from Coal improved significantly to US$ 156 million in 4Q16, as a result of higher coal prices

- Adjusted EBITDA for the Coal business segment improved significantly to US$ 156 million in 4Q16 from negative US$ 7 million in 3Q16. The EBITDA increase of US$ 163 million was mainly driven by the positive impacts of higher sales prices (US$ 200 million) which were partially offset by higher costs and expenses[16] (US$ 43 million), mainly in Carborough Downs (US$ 34 million).

- Sales volumes of metallurgical coal totaled 1.38 Mt in 4Q16, increasing 19.6% vs. 3Q16, as a result of the ramp-up of Moatize II, while sales volumes of thermal coal totaled 1.12 Mt in 4Q16, 11.9% lower than in 3Q16, as a result of the increase in the metallurgical coal volume transported through the Nacala Logistics Corridor with the ramp-up of Moatize II.

- The metallurgical coal realized price[17] increased 138% to US$ 217.01/t in 4Q16 from the US$ 91.04/t recorded in 3Q16, as a result of the significant increase of metallurgical coal prices and the higher sales volumes based on index linked prices.

- Production cost per ton of coal shipped through the Nacala port[18] increased 11% to US$ 97.8/t in 4Q16 from US$ 87.3/t in 3Q16, as a result of the constraint on explosives supply for blasting, which impacted production volumes and the dilution of fixed costs.

- The supply of explosives was reestablished and operational performance improved since then, with production totaling 0.6 Mt in December 2016 and reaching the monthly record of 0.8 Mt in January 2017.

- Production cost per ton of coal shipped through the Nacala port[19] decreased by US$ 21.0/t to US$ 76.8/t in January 2017, compared to the US$ 97.8/t recorded in 4Q16, as a result of the growing production and the ramp-up of the Nacala Logistics Corridor.

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[16] After adjusting for the impacts of volumes and exchange rate variation.

[17] Including Moatize coking coal products and Carborough Downs hard coking coal.

[18] FOB cash cost at the port (mine, plant, railroad and port).

[19] FOB cash cost at the port (mine, plant, railroad and port).

Discontinued operations (Fertilizers assets)

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

Considering the expectation to sell all the Fertilizers assets in the short term, Vale will report on its Financial Statements operational and financial results all together for the Fertilizers segment in the income statements under 'loss from discontinued operations attributable to Vale's stockholder'.

For comparison purposes, all analysis presented on this report includes the Fertilizers numbers, however we also present the tables excluding the Fertilizers numbers in order to reconcile with the Financial Statements.

Selected financial indicators including Fertilizers

US$ million	2016	2015	2014	2013	2012
Net operating revenues	29,363	25,609	37,539	46,767	47,694
Total costs and expenses	21,213	22,875	29,042	29,191	32,615
Adjusted EBIT	8,150	2,734	8,497	17,576	14,430
Adjusted EBIT margin (%)	3.6	10.7	22.6	37.6	30.3
Adjusted EBITDA	12,181	7,081	13,353	22,560	19,178
Adjusted EBITDA margin (%)	41.5	27.7	35.6	48.2	40.2
Net income (loss)	3,982	(12,129)	657	585	5,197
Underlying earnings	4,968	(1,698)	4,419	12,269	10,365
Underlying earnings per share on a fully diluted basis (US$ / share)	0.96	-0.33	0.86	2.38	2.03
Total gross debt	29,355	28,853	28,807	29,655	30,546
Cash and cash equivalent	4,280	3,619	4,122	5,324	6,078
Total Net Debt	25,075	25,234	24,685	24,331	24,468
Total gross debt/ adjusted EBITDA (x)	2.4	4.1	2.2	1.3	1.6
Capital expenditures	5,482	8,401	11,979	14,233	8,401

US$ million	4Q16	3Q16	4Q15
Net operating revenues	9,694	7,324	5,899
Total costs and expenses	6,097	5,264	5,579
Adjusted EBIT	3,597	2,059	320
Adjusted EBIT margin (%)	37.1	28.1	5.4
Adjusted EBITDA	4,770	3,023	1,391
Adjusted EBITDA margin (%)	49.2	41.3	23.6
Net income (loss)	525	575	(8,569)
Underlying earnings	2,717	954	(1,032)
Underlying earnings per share on a fully diluted basis (US$ / share)	0.53	0.19	-0.20
Capital expenditures	1,408	1,257	2,193

Selected financial indicators ex-Fertilizers

US$ million	2016	2015	2014	2013	2012
Net operating revenues	27,488	23,384	35,124	43,953	42,983
Total costs and expenses	19,196	20,907	26,486	25,892	29,212
Adjusted EBIT	8,292	2,477	17,717	14,915	14,307
Adjusted EBIT margin (%)	30.2	10.6	50.4	33.9	33.3
Adjusted EBITDA	11,972	6,516	13,075	22,614	18,341

Adjusted EBITDA margin (%)	43.5	27.9	37.2	51.5	42.7
Net income (loss)	3,982	(12,129)	657	585	5,197
Underlying earnings	4,968	(1,698)	4,419	12,269	10,365
Underlying earnings per share on a fully diluted basis (US$ / share)	0.96	(0.33)	0.86	2.38	2.03
Total gross debt	29,322	28,853	28,807	29,655	30,546
Cash and cash equivalent	4,280	3,619	4,122	5,324	6,078
Total Net Debt	25,042	25,234	24,685	24,331	24,468
Total gross debt/ adjusted EBITDA (x)	2.4	4.4	2.2	1.3	1.6
Capital expenditures	5,482	8,401	11,979	14,501	16,844

US$ million	4Q16	3Q16	4Q15
Net operating revenues	9,265	6,726	5,418
Total costs and expenses	5,632	4,615	5,148
Adjusted EBIT	3,633	2,111	270
Adjusted EBIT margin (%)	39.2	31.4	5.0
Adjusted EBITDA	4,722	2,964	1,274
Adjusted EBITDA margin (%)	51.0	44.1	23.6
Net income (loss)	525	575	(8,569)
Underlying earnings	2,717	1,029	(1,032)
Underlying earnings per share on a fully diluted basis (US$ / share)	0.53	0.20	(0.20)
Capital expenditures	1,323	1,157	2,097

Operating revenues

Net operating revenues in 2016 were US$ 29.363 billion, 14.7% higher than the US$ 25.609 billion registered in 2015. The increase in sales revenues was mainly due to higher realized prices of iron ore fines and pellets (US$ 2.966 billion) and higher volumes of iron ore fines and pellets (US$ 715 million) and base metals (US$ 407 million), being partially offset by lower base metals prices (US$ 431 million).

Net operating revenues in 4Q16 were US$ 9.694 billion, 32.4% higher than in 3Q16. The increase in sales revenues was mainly due to higher sales prices for iron ore fines and pellets (US$ 1.613 billion), for coal (US$ 197 million) and for base metals (US$ 123 million), and due to higher sales volumes for ferrous minerals (US$ 441 million), for base metals (US$ 58 million) and for coal (US$ 13 million).

The following tables cover net operating revenues by destination and by business area, with the following highlights:

- Revenues by destination[20]: increase in sales to Asia, which responded for 61.4% of total net revenues in 2016.

- Contribution by business segment[21]: (i) the increase in the Ferrous Minerals business segment share in Vale's net operating revenue to 74.0% in 2016 from 70.8% in 2015; and (ii) the decrease the in Base Metals business segment share in Vale's net operating revenues to 22.3% in 2016 from 26.4% in 2015.

Net operating revenue by destination

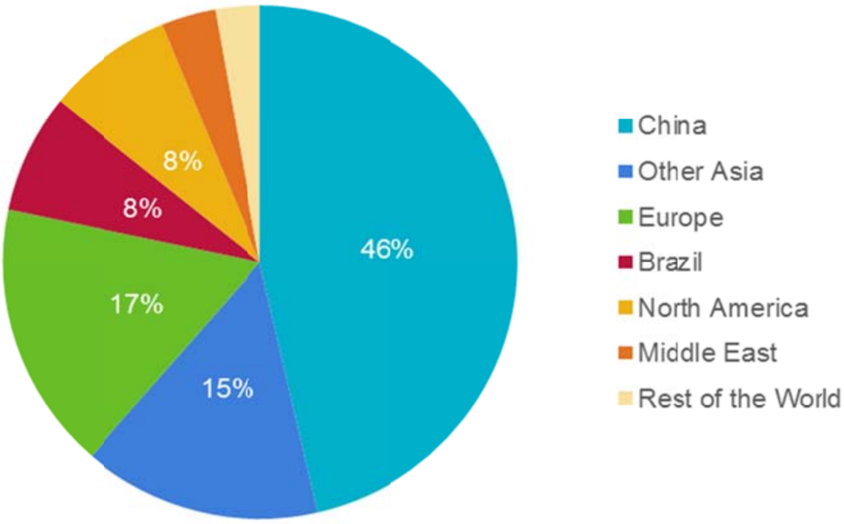
US$ million	4Q16	3Q16	4Q15	2016	%	2015	%
North America	**647**	**542**	**447**	**2,186**	**8.0**	**1,978**	**8.5**
USA	328	239	168	1,005	3.7	855	3.7
Canada	310	303	279	1,172	4.3	1,123	4.8
Mexico	9	(0)	-	9	-	-	-
South America	**713**	**638**	**456**	**2,411**	**8.8**	**2,393**	**10.2**
Brazil	627	557	373	2,064	7.5	2,017	8.6
Others	86	81	83	345	1.3	376	1.6
Asia	**5,898**	**4,070**	**3,166**	**16,878**	**61.4**	**13,294**	**56.8**
China	4,685	2,909	2,180	12,747	46.4	9,095	38.9
Japan	513	483	460	1,741	6.3	1,959	8.4
South Korea	224	270	186	880	3.2	791	3.4
Others	476	409	340	1,510	5.5	1,449	6.2
Europe	**1,497**	**1,125**	**1,114**	**4,649**	**16.9**	**4,529**	**19.4**
Germany	415	326	353	1,379	5.0	1,433	6.1
Italy	85	110	111	435	1.6	461	2.0
Others	997	689	650	2,834	10.3	2,635	11.3
Middle East	**338**	**236**	**170**	**967**	**3.5**	**969**	**4.1**
Rest of the World	**173**	**115**	**66**	**400**	**1.5**	**221**	**0.9**
Total	**9,265**	**6,726**	**5,418**	**27,488**	**100.0**	**23,384**	**100.0**
Fertilizer nutrients	429	598	481	1,875		2,225	

[20] Excluding Fertilizer nutrients

[21] Excluding Fertilizer nutrients

Total including Fertilizers	9,694	7,324	5,899	29,363		25,609	

Net operating revenues by destination in 2016[22]



Net operating revenue by business area

US$ million	4Q16	3Q16	4Q15	2016	%	2015	%
Ferrous minerals	**7,047**	**4,959**	**3,830**	**20,351**	**74.0**	**16,562**	**70.8**
Iron ore fines	5,576	3,782	2,945	15,783	57.4	12,330	52.7
ROM	28	4	13	41	0.1	102	0.4
Pellets	1,217	991	780	3,829	13.9	3,600	15.4
Manganese ore	87	51	4	205	0.7	100	0.4
Ferroalloys	30	25	9	96	0.4	62	0.3
Others	109	106	79	397	1.4	368	1.6
Coal	**376**	**163**	**108**	**839**	**3.1**	**526**	**2.2**
Metallurgical coal	300	105	98	587	2.1	479	2.0
Thermal coal	76	58	10	252	0.9	47	0.2
Base metals	**1,760**	**1,579**	**1,458**	**6,139**	**22.3**	**6,163**	**26.4**
Nickel	894	797	782	3,050	11.1	3,412	14.6
Copper	585	452	413	1,915	7.0	1,720	7.4
PGMs	52	104	96	351	1.3	404	1.7
Gold as by-product	164	179	122	627	2.3	477	2.0
Silver as by-product	13	9	8	42	0.2	31	0.1
Others	53	38	37	154	0.6	119	0.5
Others	**82**	**25**	**22**	**160**	**0.6**	**133**	**0.6**
Total	**9,265**	**6,726**	**5,418**	**27,488**	**100.0**	**23,384**	**100.0**
Fertilizer nutrients	429	597	481	1,875		2,225	
Total including Fertilizers	**9,694**	**7,323**	**5,899**	**29,363**		**25,609**	

[22] Excluding Fertilizer nutrients

Costs and expenses

ANNUAL PERFORMANCE

Costs and expenses, net of depreciation, decreased by US$ 1.841 billion[23] to US$ 17.379 billion in 2016, mainly due to: (i) the impact of exchange rate variations in COGS and SG&A (US$ 399 million), (ii) cost savings initiatives (US$ 1.623 billion) and (iii) the reduction in expenses (US$ 387 million). These reductions were partially offset by higher sales volumes (US$ 942 million).

QUARTERLY PERFORMANCE

Costs and expenses, net of depreciation charges, totaled US$ 5.003 billion in 4Q16, increasing from the US$ 4.301 billion in 3Q16, impacted by higher costs (US$ 362 million) and higher expenses (US$ 255 million)[24]. The increase was driven mainly by the collective bargaining agreement settled with employees in Brazil and by a higher provision for profit sharing, which is calculated by a parametric formula linked to Vale's cash flow generation.

Costs and expenses including Fertilizers

US$ million	4Q16	3Q16	4Q15	2016	2015
Costs	**5,538**	**4,955**	**5,119**	**19,537**	**20,513**
Expenses	**559**	**309**	**460**	**1,676**	**2,362**
Total costs and expenses	**6,097**	**5,264**	**5,579**	**21,213**	**22,875**
Depreciation	1,094	963	984	3,834	4,029
Costs and expenses ex-depreciation	**5,003**	**4,301**	**4,595**	**17,379**	**18,846**

Costs and expenses ex-Fertilizers

US$ million	4Q16	3Q16	4Q15	2016	2015
Costs	**5,103**	**4,345**	**4,733**	**17,650**	**18,751**
Expenses	**529**	**270**	**415**	**1,546**	**2,156**
Total costs and expenses	**5,632**	**4,615**	**5,148**	**19,196**	**20,907**
Depreciation	1,011	853	917	3,487	3,719
Costs and expenses ex-depreciation	**4,621**	**3,762**	**4,231**	**15,709**	**17,188**

[23] Net of the effects: (i) of the goldstream transaction recorded in 1Q15 (US$ 230 million), (ii) the goldstream transaction in 3Q16 (US$ 150 million); (iii) of the adjustment in the Asset Retirement Obligations (ARO) recorded in 4Q15 (US$ 331 million) and (iv) the ARO recorded in 4Q16 (US$ 37 million).

[24] Net of the positive one-off effects from the goldstream transaction (US$ 150 million) in 3Q16 and the adjustment in ARO (US$ 37 million) in 4Q16.

Cost of Goods Sold (COGS)

ANNUAL PERFORMANCE

COGS[25] totaled US$ 19.537 billion in 2016, decreasing US$ 976 million vs. the US$ 20.513 billion recorded in 2015, despite the increase in sales volumes in iron ore fines, pellets, base metals and coal in 2016. Ferrous Minerals costs decreased by US$ 1.137 billion and Base Metals costs decreased by US$ 166 million[26] 2016 vs. 2015.

After adjusting for the effects of higher sales volumes, costs decreased by US$ 2.074 billion in 2016 vs. 2015. Lower costs were mostly driven by the positive results of cost reduction initiatives (US$ 1.576 billion) and exchange rate variations (US$ 498 million), especially in the Ferrous Minerals business segment (US$ 1.374 billion), mainly driven by improvements in operational and other ongoing cost-cutting initiatives.

QUARTERLY PERFORMANCE

COGS totaled US$ 5.538 billion in 4Q16, increasing US$ 583 million from the US$ 4.955 billion recorded in 3Q16, as a result of higher costs of iron ore (US$ 303 million) and coal (US$ 93 million) and higher sales volumes (US$ 141 million), which were partially offset by the exchange rate variations[27] (US$ 58 million). The increase was mainly driven by the collective bargaining agreement settled with employees in Brazil, which led to an increase in wages.

Further details regarding cost performance are provided in the "Performance of the Business Segments" section.

COGS by business segment

US$ million	4Q16	3Q16	4Q15	2016	%	2015	%
Ferrous minerals	3,213	2,663	2,846	10,623	60.2	11,759	62.7
Base metals	1,498	1,429	1,551	5,697	32.3	5,863	31.3
Coal	292	190	296	1,057	6.0	977	5.2
Other products	100	63	40	273	1.6	151	0.8
Total COGS, ex fertilizers	**5,103**	**4,345**	**4,733**	**17,650**	**100.0**	**18,750**	**100.0**
Depreciation, ex fertilizers	952	790	808	3,267	-	3,235	-
COGS, ex-depreciation, ex-fertilizers	**4,151**	**3,555**	**3,925**	**14,383**	**-**	**15,515**	**-**
Fertilizers	435	610	386	1,887	-	1,763	-
Total COGS	**5,538**	**4,955**	**5,119**	**19,537**	**-**	**20,513**	**-**
Depreciation including Fertilizers	1,032	899	875	3,609	-	3,529	-
COGS, ex-depreciation	**4,506**	**4,056**	**4,244**	**15,928**	**-**	**16,984**	**-**

[25] COGS currency exposure in 2016 was made up as follows: 55% Brazilian Reais, 29% US dollar, 12% Canadian dollar,1% Australian dollar and 3% other currencies.

[26] Includes effects of volume and exchange rate.

[27] COGS currency exposure in 4Q16 was as follows: 54% BRL, 31% USD, 12% CAD, 2% EUR and 1% others.

Expenses

ANNUAL PERFORMANCE

Total expenses decreased to US$ 1.676 billion in 2016 from the US$ 2.362 billion recorded in 2015, mainly due to a reduction in pre-operating expenses (US$ 556 million) and SG&A (US$ 89 million). After deducting: (i) the positive one-off effects of US$ 230 million and US$ 150 million from the goldstream transactions recorded in 1Q15 and 3Q16, respectively, and (ii) adjusting for the Asset Retirement Obligations (ARO) of US$ 331 million and US$ 37 million recorded in 4Q15 and 4Q16, respectively, expenses decreased by US$ 1.060 billion, a reduction of 36.3%.

SG&A totaled US$ 563 million in 2016, representing a 13.7% decrease from the US$ 652 million recorded in 2015. SG&A net of depreciation was US$ 439 million in 2016 and decreased by US$ 80 million when compared to 2015, as a result of the simplification of corporate functions (US$ 36 million), lower expenses with corporate services (US$ 33 million) and the depreciation of the BRL and of the CAD (US$ 19 million).

R&D expenses totaled US$ 341 million in 2016, representing a 28.5% decrease from the US$ 477 million recorded in 2015. R&D expenses were mostly concentrated in iron ore and pellets (US$ 106 million) and nickel (US$ 83 million).

Pre-operating and stoppage expenses totaled US$ 471 million in 2016, representing a 54.1% decrease from the US$ 1.027 billion recorded in 2015. Pre-operating and stoppage expenses net of depreciation were US$ 359 million in 2016 and decreased by US$ 353 million when compared to 2015, as a result of no longer allocating VNC's and Serra Leste's costs to pre-operating expenses, amounting to US$ 287 million and US$ 24 million, respectively.

Other operating expenses[28] totaled US$ 488 million in 2016, representing a 36.4% decrease from the US$ 767 million recorded in 2015, as a result of lower provisions.

QUARTERLY PERFORMANCE

Total expenses increased from US$ 459 million[29] in 3Q16 to US$ 522 million[30] in 4Q16, mainly due to the higher other expenses (US$ 95 million) and higher R&D expenses (US$ 33 million).

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[28] After deducting the positive one-off effects of US$ 230 million and US$ 150 million from the goldstream transaction recorded in 1Q15 and in 3Q16, respectively, and also the US$ 331 million and US$ 37 million from the ARO adjustments recorded in 4Q15 and in 4Q16, respectively.

[29] Net of the one-off effects of US$ 150 million from the goldstream transaction recorded in 3Q16.

[30] Net of the one-off effects of US$ 37 million of ARO in 4Q16.

SG&A totaled US$ 151 million in 4Q16, US$ 2 million lower than in 3Q16. SG&A, net of depreciation, was US$ 120 million, increasing US$ 4 million in 4Q16 vs. 3Q16, mainly as a result of higher services expenses (US$ 8 million).

R&D expenses totaled US$ 118 million in 4Q16, representing a 38.8% increase from the US$ 85 million recorded in 3Q16, following the usual seasonality, and in line with the US$ 119 million recorded in 4Q15. R&D expenses relate mostly to iron ore and pellets (US$ 45 million) and nickel (US$ 22 million).

Pre-operating and stoppage expenses totaled US$ 133 million in 4Q16, representing a 9.0% increase from the US$ 122 million recorded in 3Q16, mainly driven by higher Long Harbour expenses (US$ 8 million).

Other operating expenses were US$ 194 million[31] in 4Q16, increasing by US$ 95 million when compared to the US$ 99 million[32] in 3Q16, mainly due to a higher provision for profit sharing (US$ 38 million) for administrative employees.

Expenses, including Fertilizers

US$ million	4Q16	3Q16	4Q15	2016	%	2015	%
SG&A ex-depreciation	**120**	**116**	**129**	**439**		**519**	
SG&A	**151**	**153**	**167**	**563**	**33.6**	**652**	**27.6**
Administrative		**136**	**150**		**30.2**	603	**25.5**
Personnel	61	61	55	231	13.8	267	11.3
Services	27	19	33	80	4.8	113	4.8
Depreciation	31	37	38	124	7.4	133	5.6
Others	12	19	24		4.2	90	3.8
Selling	12	**17**	**17**	**57**	**3.4**	49	**2.1**
R&D	**118**	**85**	**119**	**341**	**20.3**	**477**	**20.2**
Pre-operating and stoppage expenses¹	**133**	**122**	**238**	**471**	**28.1**	**1,027**	**43.5**
VNC	-	-	93	-	-	340	14.4
Long Harbour	47	39	47	180	10.7	188	8.0
S11D	34	28	14	95	5.7	52	2.2
Moatize	-	1	14	11	3.1	63	2.7
Others	52	54	70	185	**8.6**	241	**16.3**
Other operating expenses	**157**	**-51**	**-64**	**301**	**18.0**	**206**	**8.7**
Total Expenses	**559**	**309**	**460**	**1,676**	**100.0**	**2,362**	**100.0**
Depreciation	62	65	109	225		500	
Expenses ex-depreciation	**497**	**244**	**351**	**1.451**		**1,862**	

¹ Includes US$ 30 million of depreciation charges in 4Q16, US$ 27 million in 3Q16,US$ 67 million in 4Q15, US$ 111 million in 2016 and US$ 314 million in 2015

[31] Net of the US$ 37 million of the ARO.

[32] Net of the effect of the goldstream transaction of US$ 150 million in 3Q16.

Expenses, ex-Fertilizers

US$ million	4Q16	3Q16	4Q15	2016	%	2015	%
SG&A ex-depreciation	**106**	**101**	**116**	**387**	**-**	**481**	**-**
SG&A	**136**	**137**	**154**	**507**	**33**	**612**	**28**
Administrative	**128**	**125**	**141**	**472**	**31**	**578**	**27**
Personnel	52	56	51	209	14	253	12
Services	25	17	31	72	5	105	5
Depreciation	30	36	38	120	8	131	6
Others	21	16	21	71	5	89	4
Selling	**8**	**12**	**13**	**35**	**2**	**34**	**2**
R&D	**112**	**80**	**98**	**319**	**21**	**395**	**18**
Pre-operating and stoppage expenses[1]	**129**	**117**	**228**	**453**	**29**	**942**	**44**
VNC	-	-	93	-	-	340	16
Long Harbour	47	39	47	180	12	188	9
S11D	34	28	14	95	6	52	2
Moatize	-	1	14	11	1	63	3
Others	48	49	60	167	11	299	14
Other operating expenses	**152**	**(64)**	**(65)**	**267**	**17**	**207**	**10**
Total Expenses	**529**	**270**	**415**	**1,546**	**100**	**2,156**	**100**
Depreciation	59	63	109	220	-	483	-
Expenses ex-depreciation	**470**	**207**	**306**	**1,326**	**-**	**1,673**	**-**

[1] Includes US$ 30 million of depreciation charges in 4Q16, US$ 27 million in 3Q16,US$ 66 million in 4Q15, US$ 109 million in 2016 and US$ 300 million in 2015

Adjusted earnings before interest, taxes, depreciation and amortization[33]

ANNUAL PERFORMANCE

Adjusted EBITDA was US$ 12.181 billion[34] in 2016, 72.0% higher than in 2015 mainly as a result of improvements in the Ferrous Minerals EBITDA (US$ 4.577 billion), Base Metals EBITDA (US$ 460 million) and Coal EBITDA (US$ 454 million). Adjusted EBITDA margin was 41.5% in 2016, improving from the 27.7% recorded in 2015.

Adjusted EBIT was US$ 8.150 billion in 2016, 198.1% higher than in 2015.

QUARTERLY PERFORMANCE

Adjusted EBITDA was US$ 4.770 billion in 4Q16, 57.8% higher than in 3Q16 mainly as a result of improvements in the Ferrous Minerals EBITDA (US$ 1.616 billion) and Coal EBITDA (US$ 163 million) which were partially offset by the decrease in Base Metals EBITDA (US$ 57 million[35]). Adjusted EBITDA margin was 49.2% in 4Q16, improving from the 41.3% recorded in 3Q16.

Adjusted EBIT was US$ 3.597 billion in 4Q16, 74.7% higher than in 3Q16.

Adjusted EBITDA including Fertilizers

US$ million	4Q16	3Q16	4Q15	2016	2015
Net operating revenues	9,694	7,323	5,899	29,363	25,609
COGS	(5,538)	(4,955)	(5,119)	(19,537)	(20,513)
SG&A	(151)	(153)	(167)	(563)	(652)
Research and development	(118)	(85)	(119)	(341)	(477)
Pre-operating and stoppage expenses	(133)	(122)	(238)	(471)	(1,027)
Other operational expenses	(157)	51	64	(301)	(206)
Adjusted EBIT	**3,597**	**2,059**	**320**	**8,150**	**2,734**
Depreciation, amortization & depletion	1,094	963	984	3,834	4,029
Dividends received	79	0	87	197	318
Adjusted EBITDA	**4,770**	**3,022**	**1,391**	**12,181**	**7,081**

[33] Net revenues less costs and expenses net of depreciation plus dividends received.

[34] Including US$ 150 million from the goldstream transaction.

[35] Including US$ 150 million from the goldstream transaction in 3Q16.

Adjusted EBITDA ex-Fertilizers

US$ million	4Q16	3Q16	4Q15	2016	2015
Net operating revenues	9,265	6,726	5,418	27,488	23,384
COGS	(5,103)	(4,345)	(4,733)	(17,650)	(18,751)
SG&A	(136)	(137)	(154)	(507)	(612)
Research and development	(112)	(80)	(98)	(319)	(395)
Pre-operating and stoppage expenses	(129)	(117)	(228)	(453)	(942)
Other operational expenses	(152)	64	65	(267)	(207)
Adjusted EBIT	**3,633**	**2,111**	**270**	**8,292**	**2,477**
Depreciation, amortization & depletion	1,011	853	917	3,487	3,719
Dividends received	78	-	87	193	318
Adjusted EBITDA	**4,722**	**2,964**	**1,274**	**11,972**	**6,514**

Adjusted EBITDA by business area

US$ million	4Q16	3Q16	4Q15	2016	2015
Ferrous minerals	4,109	2,493	1,409	10,476	5,899
Coal	156	(7)	(149)	(54)	(508)
Base metals	543	600	111	1,848	1,388
Others	(86)	(122)	(97)	(298)	(265)
Total	**4,722**	**2,964**	**1,274**	**11,972**	**6,514**
Fertilizer nutrients	48	59	117	209	567
Adjusted EBITDA	**4,770**	**3,023**	**1,391**	**12,181**	**7,081**

Net income

ANNUAL PERFORMANCE

Net income totaled US$ 3.982 billion in 2016 vs. a net loss of US$ 12.129 billion in 2015. The US$ 16.111 billion increase was mostly driven by: (i) higher EBITDA (US$ 5.100 billion), (ii) higher gains on foreign exchange and monetary variation (US$ 10.629 billion), and (iii) lower impairment of non-current assets and onerous contracts (US$ 6.014 billion). This increase was partially offset by higher taxes (US$ 7.251 billion) due to net earnings generated in the period as opposed to the losses in 2015.

Underlying earnings were a positive US$ 4.968 billion in 2016 mainly after the adjustments for (i) the impact of impairment of non-current assets and onerous contracts (US$ 2.912 billion), and (ii) other results on the sale or write-off of investments from associates and joint ventures (US$ 1.220 billion). The increase on underlying earnings was partly offset by foreign exchange (US$ 3.307 billion).

Underlying earnings

US$ million	4Q16	3Q16	4Q15	2016	2015
Underlying earnings	**2,717**	**954**	**(1,033)**	**4,968**	**(1,698)**
Items excluded from basic earnings					
Impairment of non-current assets and onerous contracts	(2,912)	-	(9,372)	(2,912)	(9,372)
Reversal of Deferred Income tax	-	-	-	-	2,990
Result on measurement or sale of non-current assets	29	(29)	(29)	(66)	61
Other results in investments from joint controlled and associates	(74)	(33)	-	(1,220)	-
Shareholders Debentures	(167)	(48)	252	(417)	963
Foreign Exchange	66	(330)	255	3,307	(7,164)
Monetary variation	(53)	2	(81)	(158)	(316)
Currency and interest rate swaps	38	(49)	715	958	(1,502)
Other financial results	14	(55)	(80)	(85)	(69)
Gain (loss) on sale of investments	-	-	-	-	97
Tax effects of Impairment	833	-	1,164	833	1,164
Income tax over excluded items	34	163	(360)	(1,226)	2,717
Net Income (loss)	**525**	**575**	**(8,569)**	**3,982**	**(12,129)**

Impairments of non-current assets and onerous contracts caused non-cash losses of US$ 2.912 billion in 2016 vs US$ 8.926 billion in 2015. In 2016, impairments were mainly driven by the impact of: (i) the agreement to sell certain Fertilizers assets for US$ 2.5 billion announced in December 2016 (US$ 1.738 billion); (ii) lower prices projections for certain products, which reduced the recoverable values of VNL (US$ 631 million) and VNC (US$ 284 million) assets, and (iii) the provision related to contracts with minimum guaranteed volume for port services in the Midwestern system (US$ 183 million) and for manganese ore supply (US$ 74 million), which were partially offset by the impairment reversal driven by the impact of the decision to re-start the São Luís pellet plant at the beginning of 2018 (US$ 160 million).

Impairment on continuous operations *US$ million*	**Impairments on assets in 2016**	**Recognition on onerous contracts in 2016**	**Book Value after impairments Dec 31, 2016**
Ferrous Minerals			
Port services in Midwestern system	-	183	-
Manganese ore supply		74	
Pellets plants	(160)	-	160
Coal			
Coal assets in Australia	27	-	43
Base Metals			
Vale New Caledonia (VNC)	284	-	3,368
Vale Newfoundland and Labrador (VNL)	631	-	1,915
Total ex-Fertilizers	**782**	**257**	**5,486**
Fertilizers	1,738	-	2,694
Others	135		
Total	**2,655**	**257**	**8,180**

Net financial results showed a gain of US$ 1.863 billion in 2016, compared to a loss of US$ 10.801 billion in 2015. The main components of the net financial results are: (i) financial expenses (US$ 2.727 billion); (ii) financial revenues (US$ 185 million); (iii) foreign exchange and monetary gains (US$ 3.307 billion); (iv) currency and interest rate swaps gains (US$ 959 million) and (v) gains on other derivatives (US$ 297 million), composed mainly of bunker oil derivative gains of US$ 268 million.

Financial results including Fertilizers

US$ million	**4Q16**	**3Q16**	**4Q15**	**2016**	**2015**
Financial expenses	**(771)**	**(715)**	**(326)**	**(2,727)**	**(1,112)**
Gross interest	(441)	(466)	(422)	(1,771)	(1,652)
Capitalization of interest	91	172	193	653	761
Tax and labor contingencies	15	(4)	(18)	(10)	(59)
Shareholder debentures	(167)	(48)	254	(417)	965
Others	(142)	(225)	(212)	(668)	(580)
Financial expenses (REFIS)	(127)	(144)	(121)	(514)	(547)
Financial income	**56**	**35**	**78**	**185**	**268**
Derivatives[1]	96	(39)	427	1,256	(2,477)
Currency and interest rate swaps	39	(49)	715	959	(1,502)
Others[2] (bunker oil, commodities, etc)	57	10	(288)	297	(975)
Foreign Exchange	**66**	**(330)**	**255**	**3,307**	**(7,164)**
Monetary variation	**(53)**	**2**	**(81)**	**(158)**	**(316)**
Financial result, net	**(606)**	**(1,047)**	**353**	**1,863**	**(10,801)**

[1]The net derivatives losses of US$ 96 million in 4Q16 are comprised of settlement losses of US$ 548 million and mark-to-market gains of US$ 644 million.

[2] Other derivatives include mainly bunker oil derivatives gains of US$ 141 million

Financial results ex-Fertilizers

US$ million	4Q16	3Q16	4Q15	2016	2015
Financial expenses	**(762)**	**(704)**	**(314)**	**(2,677)**	**(1,068)**
Gross interest	(441)	(465)	(420)	(1,768)	(1,647)
Capitalization of interest	91	172	193	653	761
Tax and labor contingencies	15	(4)	(18)	(10)	(59)
Shareholder debentures	(167)	(48)	254	(417)	965
Others	(133)	(215)	(202)	(621)	(541)
Financial expenses (REFIS)	(127)	(144)	(121)	(514)	(547)
Financial income	**52**	**31**	**71**	**170**	**251**
Derivatives[1]	**96**	**(39)**	**427**	**1,256**	**(2,477)**
Currency and interest rate swaps	39	(49)	715	959	(1,502)
Others[2] (bunker oil, commodities, etc)	57	10	(288)	297	(975)
Foreign Exchange	**64**	**(330)**	**253**	**3,252**	**(7,044)**
Monetary variation	**(53)**	**2**	**(81)**	**(158)**	**(316)**
Financial result, net	**(603)**	**(1,040)**	**356**	**1,843**	**(10,654)**

[1]The net derivatives gains of US$ 96 million in 4Q16 are comprised of settlement losses of US$ 548 million and mark-to-market gains of US$ 644 million.

[2] Other derivatives include mainly bunker oil derivatives gains of US$ 141 million

Income tax and social contribution expense totaled US$ 2.151 billion in 2016, representing an effective tax rate of 35%, due to unrecognized tax on current year losses (US$ 713 million), mainly in Mozambique and New Caledonia. After excluding the effects of the unrecognized tax on current year losses, effective tax rate was 26%.

Income tax and social contribution expense

US$ million	2016	%	2016 ex-Fertilizers	%
Income before tax	**6,127**		**7,984**	
Income tax	(2,083)	34%	(2,715)	34%
Adjustments to derive effective tax rate:				
Tax benefits and incentives	431	(5%)	431	(5%)
Results of Equity investments	108	(1%)	108	(1%)
Unrecognized tax on current year losses	(713)	12%	(708)	9%
Undeductible impairment	(97)	2%	(97)	1%
Other non-taxable gains (losses)	203	(3%)	200	(3%)
Income tax and social contribution expense	**2,151**	**35%**	**2,781**	**35%**

QUARTERLY PERFORMANCE

Net income totaled US$ 525 million in 4Q16 vs. US$ 575 million in 3Q16, decreasing by US$ 50 million, mainly as a result of the negative impact of impairment of non-current assets and onerous contracts (US$ 2.912 billion), which were partially offset by the positive impact of higher EBITDA (US$ 1.151 billion).

Underlying earnings were a positive US$ 2.717 billion in 4Q16 after excluding the one-off effects, mainly the impairment of non-current assets and onerous contracts (US$ 2.912 billion).

Net financial results showed a loss of US$ 606 million in 4Q16, compared to a loss of US$ 1.047 billion in 3Q16. The main components of net financial results are: (i) financial expenses (US$ 771 million); (ii) financial revenues (US$ 56 million); (iii) foreign exchange and monetary losses (US$ 13 million); (iv) currency and interest rate swap gains (US$ 39 million) and (v) gains on other derivatives (US$ 24 million), composed mainly of bunker oil derivatives gains of US$ 141 million.

Equity income from affiliated companies

ANNUAL PERFORMANCE

Equity income from affiliated companies was a positive US$ 312 million in 2016 vs. a negative US$ 439 million recorded in 2015. The main contributors to equity income were the leased pelletizing companies in Tubarão (US$ 77 million), MRS (US$ 57 million), MRN (US$ 48 million), Aliança Geração Energia (US$ 46 million), CSI (US$ 32 million) and CSP (US$ 25 million).

QUARTERLY PERFORMANCE

Equity income from affiliated companies was a negative US$ 80 million in 4Q16 vs. a positive of US$ 46 million in 3Q16. The main negative contributor to equity income was CSP (US$ 152 million), which was partially offset by the positive contribution of the leased pelletizing companies in Tubarão (US$ 28 million), Aliança Geração Energia (US$ 13 million), CSI (US$ 12 million) and MRS (US$ 8 million).

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

Vale resumed hedging bunker oil price exposure due to the risk of increased oil prices in 2017. The new program was developed to protect results from extreme bunker oil price scenarios. To this end, Vale has contracted zero-cost collars to protect itself if bunker oil prices increase above the price of US$ 324/t, while relinquishing gains if bunker prices fall below US$ 213/t.

Bunker oil hedge effects will also be recorded within Financial Results in the following quarters.

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

(i) In 4Q16: a positive impact of US$ 141 million recognized in 4Q16 as financial results due to the net position of: (i) the positive impact of the mark-to-market of the open positions on December 31st, 2016 (US$ 116 million); and (ii) the positive impact of the settlements, which occurred in the quarter (US$ 25 million).

(ii) In 1Q17 and subsequent quarters: financial results will be impacted by the changes in the mark-to-market of the outstanding derivative position at the end of each quarter and by the gains or losses related to the settlements recorded in each quarter.

Concept		**Current impact**	**Drivers of future impact**		
Hedge accounting	Impact of derivative position in P/L statement	Impact incurred in 4Q16 P/L statement	Type of Instrument	Bunker oil derivative outstanding position (,000 tons)	Average strike price (US$/t) Call - Put
No	Impact on financial results	US$ 141 million increase in financial results	Zero Cost Collar	2,856	213 - 324

Effects of currency price volatility on Vale's financial performance

ANNUAL PERFORMANCE

In 2016, from end to end, the Brazilian Real (BRL) appreciated 17% against the US Dollar (USD) from BRL 3.90/ USD as of December 30th, 2015 to BRL 3.26/ USD as of December 30th, 2016. On an annual average, the exchange rate depreciated by 4%, from an average BRL 3.34/ USD in 2015 to an average BRL 3.48/USD in 2016.

The end to end appreciation of the BRL against the USD and other currencies caused mainly non-cash gains of US$ 4.266 billion on our earnings before taxes in 2016, 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 gain of US$ 3.307 billion in 2016, 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 gains of US$ 959 million.

The BRL depreciation on an annual average brought positive impacts to Vale's cash flows. In 2016 most of our revenues were denominated in USD, while our COGS were 55% denominated in BRL, 29% in USD and 12% in Canadian dollars (CAD) and about 62% of our capital expenditures were denominated in BRL. The depreciation of the BRL and of other currencies in 2016 reduced our costs and expenses by US$ 399 million.

QUARTERLY PERFORMANCE

In 4Q16, from end to end, the Brazilian Real (BRL) depreciated 0.4% against the US Dollar (USD) from BRL 3.25/ USD as of September 30th, 2016 to BRL 3.26/ USD as of December 30th, 2016. On a quarterly average, the exchange rate depreciated by 1.5%, from an average BRL 3.25/ USD in 3Q16 to an average BRL 3.29/USD in 4Q16.

The end to end depreciation of the BRL against the USD was not material, causing no relevant losses on Foreign exchange and currency swaps.

The BRL depreciation on a quarterly average brought positive impacts on Vale's cash flows.

In 4Q16 most of our revenues were denominated in USD, while our COGS were 53% denominated in BRL, 31% in USD and 12% in Canadian dollars (CAD) and about 60% of our capital expenditures were denominated in BRL. The depreciation of the BRL and of other currencies in 4Q16 reduced our costs and expenses by US$ 46 million.

Update on Samarco Mineração S.A. (Samarco)

Framework Agreement

Samarco and its shareholders, Vale and BHP Billiton Brasil Ltda (BHPB), entered into an Agreement in connection with the R$ 20.2 billion (US$ 6.2 billion) lawsuit ("Framework Agreement") on March 2nd, 2016 with the Brazilian federal government, the two Brazilian states affected by the failure (Espírito Santo and Minas Gerais) and other governmental authorities in order to implement the programs for remediation and compensation of the areas and communities affected by Samarco's dam (Fundão) failure on November 5th, 2015.

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

Update on programs for remediation and compensation

Since the date of the dam failure, Samarco and its shareholders have disbursed the total amount of R$ 2.0 billion (US$ 614 million) to comply with the obligations under the Framework Agreement.

The progress on the programs has been significant with the following highlights:

- Recuperation of affected communities and infrastructures
  - Each of the communities most severely affected by the dam failure (Bento Rodrigues, Paracatu de Baixo and Gesteira) have now chosen their preferred relocation sites and the residents of Bento Rodrigues have recently approved the design of their new town.
  - Several infrastructure restoration projects were concluded in other communities

Square Manoel Lino Mol at Barra Longa


Public school Gustavo Capanema at Gesteira/Barra Longa

- The stabilization and contention of 12 impacted river banks from the Gualaxo do Norte, Carmo and Doce rivers, listed as a priority, is expected to be concluded by April 2017. The works on the remaining river banks are expected to be concluded by December 2017.

Cleaning actions at Carmo river banks

- 101 tributaries from the Gualaxo do Norte, Carmo and Doce rivers were impacted by the dam failure, of which 60 were restored, while the rest is expected to be completed by June 2017.

Recovery works of Gualaxo river tributary

- Delivery of 3 new water mains and a mobile water treatment station, whose total capacity corresponds to more than 50% of the water demand for the towns of Colatina and Linhares.

Update on estimates used for provision

Vale recognized a provision on its interim financial statements as of June 30th, 2016, in the amount of R$ 5.560 billion (US$ 1.732 billion) which was discounted at a free-risk rate, resulting in a R$ 3.733 billion (US$ 1.163 billion) liability, which represents its best estimate of the obligation to comply with the reparation and compensation programs under the Framework Agreement, equivalent to its 50% equity interest in Samarco.

In August 2016, Samarco issued non-convertible private debentures which were subscribed equally by Vale and BHPB, and the resources contributed by Vale were allocated as follows: (i) R$ 222 million (US$ 68 million) was used by Samarco in the reparation programs in accordance with the Framework Agreement, and therefore, applied against the provision of R$ 3.733 billion (US$ 1.163 billion) mentioned above; and (ii) R$ 234 million (US$ 71 million) was applied by Samarco to fund its working capital, and recognized in Vale's income statement as "Other results in associates and joint ventures" in the year ended in December 31st, 2016. Vale intends to make available short-term facilities in the first half of 2017 of up to R$ 375 million (US$ 115 million) to Samarco to support its operations, without undertaking an obligation to Samarco. Funds for working capital requirements will be released as needed by the shareholders subject to achieving certain milestones.

As a result of constituting the Foundation, most of the reparation and compensation programs were transferred from Samarco. Therefore, Vale made contributions to the Foundation totaling R$ 239 million (US$ 71 million) to be used in the programs in accordance with the Framework Agreement.

Contingencies related to Samarco dam failure

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

The federal government, the two Brazilian states affected by the failure (Espírito Santo and Minas Gerais) and other governmental authorities have initiated a public civil lawsuit against Samarco and its shareholders, Vale and BHPB, with an estimated value indicated by the plaintiffs of R$ 20.2 billion (US$ 6.2 billion).

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

On August 17th, 2016, the TRF of the 1st Region rejected the appeal presented by Samarco, Vale and BHPB against the interim order and overruled the judicial decision that ratified the Framework Agreement. This decision of the TRF of the 1st Region, among other measures, confirmed a prior injunction that prohibited the defendants from transferring or conveying any of their interest in their Brazilian iron ore concessions, without, however, limiting their production and commercial activities and ordered a deposit with the court of R$ 1.2 billion (US$ 375 million) by January 2017. This R$ 1.2 billion cash deposit was provisionally replaced by the guarantees provided for under the agreements with the Federal Prosecution Office in Brazil (MPF), as described below.

In January 2017 Samarco, Vale and BHPB entered into two preliminary agreements with the MPF.

The first agreement (First Agreement) aims to outline the process and timeline for negotiations of a final agreement (Final Agreement), expected to occur by June 30th, 2017. This First Agreement sets the grounds for conciliation of two public civil actions which aim to establish socio-economic and socio-environmental remediation and compensation programs for the impacts of the Fundão dam failure, respectively: claim nº 023863-07.2016.4.01.3800, filed by the Federal Prosecutors (amounting to R$ 155 billion – US$48 billion) as mentioned in item (ii) below , and claim nº 0069758-61.2015.4.01.3400, filed by the Federal Government, the states of Minas Gerais and Espírito Santo and other governmental authorities (amounting to R$20.2 billion – US$ 6.3 billion). Both claims were filed at the 12th Judicial Federal Court of Belo Horizonte.

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

Under the First Agreement, Samarco, Vale and BHPB will provide the 12th Judicial Federal Court of Belo Horizonte with a guarantee for fulfillment of the obligations regarding the financing and payment of the socio-environmental and socio-economic remediation programs resulting from the Fundão dam failure, pursuant to the two public civil actions, until the signing of the Final Agreement, amounting to R$ 2.2 billion (US$ 675 million), of which (i) R$ 100 million (US$ 31 million) in financial investments; (ii) R$ 1.3 billion (US$ 399 million) in insurance bonds; and (iii) R$ 800 million (US$ 245 million) in assets of Samarco. The guarantee will remain in place until the completion of the negotiations for the Final Agreement or until June 30th, 2017, whichever comes first. In order to implement the First Agreement, it has been requested that the 12th Judicial Federal Court of Belo Horizonte accept such guarantees until the completion of the negotiations and the signing of the Final Agreement, or until the parties reach a new agreement regarding the guarantees. If, by June 30th, the negotiations have not been completed, the Federal Prosecutor’s Office may require that the 12th Judicial Federal Court of Belo Horizonte re-institute the order for the deposit of R$ 1.2 billion (US$ 368 million) in relation to the R$ 20.2

billion (US$ 6.2 billion) public civil action, which is currently suspended.

In addition, the Second Agreement (Second Agreement) was signed, which establishes a timetable to make funds available to remediate the social, economic and environmental damages caused by the Fundão dam failure in the municipalities of Barra Longa, Rio Doce, Santa Cruz do Escalvado and Ponte Nova, amounting to R$ 200 million (US$ 61 million).

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

(ii) Public civil action filed by Federal Prosecution Office

On May 3rd, 2016, the Federal Prosecution Office (MPF) filed a public civil action against Samarco and its shareholders and presented several demands, including: (i) the adoption of measures for mitigating the social, economic and environmental impacts resulting from the Fundão dam failure and other emergency measures; (ii) the payment of compensation to the community; and (iii) payments for collective moral damage. The initial action value claimed by the Federal Prosecution Office (MPF) is R$ 155 billion (US$ 48 billion). The first conciliatory hearing was held on September 13th, 2016. On November 21st, 2016 the court ordered that the defendants be served, and the defendants submitted their defense. Given the negotiations of a potential settlement, the parties jointly requested the suspension of the proceedings, in accordance with the First Agreement.

(iii) U.S. Securities class action suits

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

(iv) Criminal lawsuit

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

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

(v) Other lawsuits

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

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

Hedge accounting of net investments in foreign operation

As of January 1st, 2017, Vale implemented a Hedge Accounting program for the foreign currency risk arising from its net investments in foreign operations, namely Vale International and Vale Austria. The purpose of the program is to mitigate the impact of foreign exchange variations in Vale’s earnings, reducing volatility and allowing financial statements to better reflect the economic performance of the company.

Under the hedge accounting program, the Vale SA debt denominated in dollar and euro will serve as a hedge instrument for Vale SA investments in Vale International and Vale Austria respectively. With the program, the impact of exchange rate variations over debt denominated in dollar and euros will be partially recorded under other comprehensive income reducing volatility on financial expenses.

This hedge accounting program will be effective throughout 2017.

Investments

Capital expenditures totaled US$ 5.482 billion in 2016 with US$ 3.179 billion in project execution and US$ 2.302 billion in sustaining capital. Capital expenditures decreased US$ 2.919 billion vs. the US$ 8.401 billion spent in 2015.

In 4Q16, Vale's capital expenditures totaled US$ 1.408 billion with US$ 614 million in project execution and US$ 794 million in sustaining capital.

Project Execution and Sustaining by business area

US$ million	4Q16	%	3Q16	%	4Q15	%
Ferrous minerals	769	58.1	795	68.7	1,087	51.8
Coal	171	12.9	149	12.9	464	22.1
Base metals	366	27.7	189	16.3	533	25.4
Power generation	17	1.3	15	1.3	10	0.5
Steel	-	-	9	0.8	3	0.1
Others	-	-	-	-	-	-
Total ex-Fertilizers	**1,323**	**100.0**	**1,157**	**100.0**	**2,097**	**100.0**
Fertilizers	85		100		97	
Total	**1.408**		**1.257**		**2.193**	

Project execution

The Ferrous Minerals and the Coal business segments accounted for about 76% and 16%, respectively, of the total investment in project execution in 4Q16.

Project execution by business area

US$ million	4Q16	%	3Q16	%	4Q15	%
Ferrous minerals	468	79.6	579	81.5	894	66.1
Coal	98	16.7	106	14.9	431	31.8
Base metals	6	1.0	2	0.3	16	1.2
Power generation	15	2.6	14	2.0	9	0.7
Steel	-	-	9	1.3	3	0.2
Total ex-Fertilizers	**588**	**100.0**	**711**	**100.0**	**1,353**	**100.0**
Fertilizers	26		30		13	
Total	**614**		**741**		**1.366**	

FERROUS MINERALS

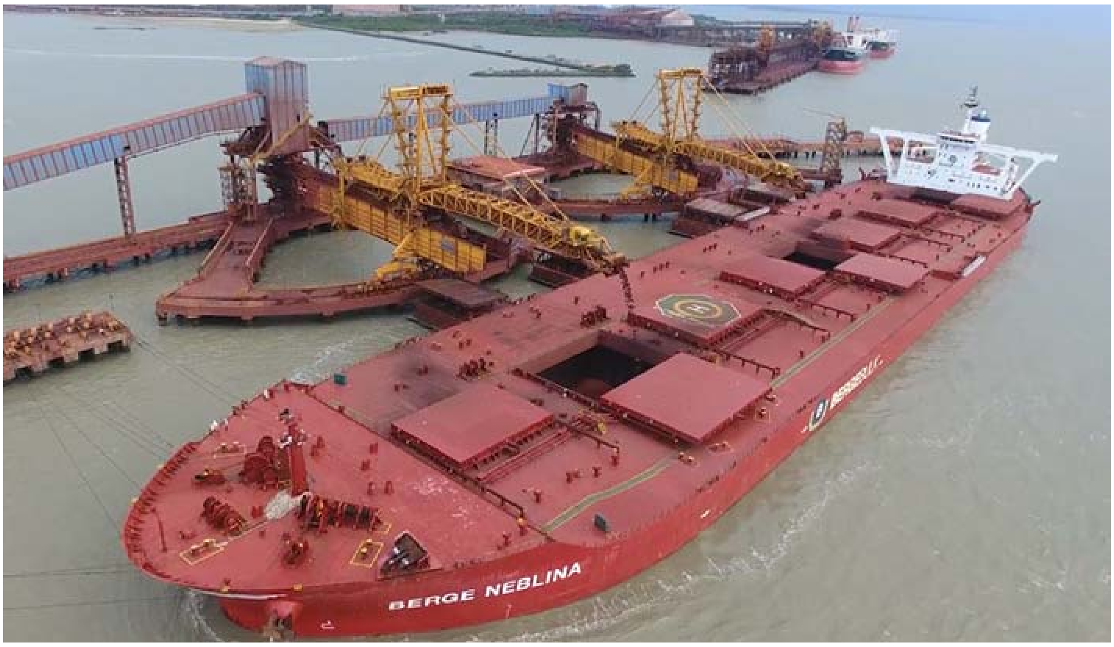
About 90% of the US$ 468 million invested in Ferrous Minerals in 4Q16 relates to the S11D project and the expansion of its associated infrastructure (US$ 428 million).

S11D Mine – In operation

S11D (including mine, plant and associated logistics – CLN S11D) achieved combined physical progress of 85% in 4Q16 with 97% progress at the mine site and 76% at the logistic infrastructure sites. The duplication of the railway reached 60% physical progress with 291 Km delivered up to the quarter. The offshore port initiated its start up in 4Q16, having loaded 11 vessels up to January, of which 2 Valemax with 400,000 t of capacity each.

The successful start-up of S11D mine and plant took place in 4Q16. The ore mined was fed into two mobile crushing systems and transferred through the conveyor belt system to the processing plant, 9 km away from the mine. The processed ore was stacked in the stockyard and railed to the Ponta da Madeira maritime terminal. Shipments of ore blended from S11D with other Northern System mines started in January 2017.

S11D Logistics – First Shipment



Description and status of main projects

Project	Description	Capacity (Mtpy)	Status
Ferrous Minerals projects			
CLN S11D	• 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.	(80)[a]	• Duplication of the railway reached 60% physical progress, totaling 291 Km delivered • Offshore expansion started up having loaded 11 vessels (3,100,000 t) up to January • Onshore expansion reached 89% physical progress

[a] Net additional capacity

Progress indicators[36]

Project	Capacity (Mtpy)	Estimated start-up	Executed capex (US$ million)		Estimated capex (US$ million)		Physical progress
			2016	Total	2017	Total	
Ferrous minerals projects							
CLN S11D	230 (80)[a]	1H14 to 2H19	1,195	5,662	962	7,850[b]	76%

[a] Net additional capacity.
[b] Original capex budget of US$ 11.582 billion.

[36] 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.

Sustaining capex

Sustaining capital expenditures decreased from US$ 2.853 billion in 2015 to US$ 2.302 billion in 2016.

On a quarter on quarter basis, Vale's investments increased due to the seasonality of Vale's disbursements, which are usually concentrated towards the end of the year. Sustaining capital increased from US$ 516 million in 3Q16 to US$ 794 million in 4Q16. The Base Metals and Ferrous Minerals business segments accounted for 45% and 38% of the total sustaining capex in 4Q16, respectively.

Sustaining capex in the Base Metals business segment was mainly dedicated to: (i) enhancement and replacement in operations (US$ 222 million), (ii) improvement in the current standards of health and safety and environmental protection (US$ 108 million); (iii) maintenance improvements and expansion of tailings dams (US$ 23 million).

Sustaining capital for the Ferrous Minerals business segment included, among others: (i) enhancement and replacement in operations (US$ 166 million), (ii) improvement in the current standards of health and safety, social and environmental protection (US$ 66 million), (iii) maintenance, improvement and expansion of tailings dams (US$ 38 million). Maintenance of railways and ports in Brazil and Malaysia accounted for US$ 71 million.

Sustaining investments in iron ore fines (excluding sustaining investments in pellet plants) amounted to US$ 234 million, equivalent to US$ 3.2/dmt of iron ore fines in 4Q16, representing a 28% increase vs. the US$ 2.5/dmt in 3Q16, mainly due to the seasonality of Vale's disbursements in investments which are concentrated in the last quarter of the year. The last twelve months average of sustaining for iron ore fines amounts to US$ 2.6/dmt, decreasing 23% when compared to the US$ 3.4/dmt from 2015.

Sustaining capex by type - 4Q16

US$ million	Ferrous Minerals	Coal	Base Metals	TOTAL ex-Fertilizers	Fertilizer	TOTAL
Operations	171	64	222	**455**	40	**495**
Waste dumps and tailing dams	38	-	23	**61**	4	65
Health and Safety	50	3	23	**75**	5	**80**
CSR - Corporate Social Responsibility	16	-	86	**102**	8	110
Administrative & Others	28	5	7	**41**	3	**44**
Total	**302**	**73**	**360**	**734**	**59**	**794**

Sustaining capex by business area

US$ million	4Q16	%	3Q16	%	4Q15	%
Ferrous minerals	301	40.9	216	48.5	192	25.9
Coal	73	9.9	43	9.7	33	4.5
Base metals	360	49.0	186	41.8	517	69.5
Power generation	1	0.2	-	-	1	0.1
Others	-	-	-	-	-	-
Total ex-Fertilizers	**735**	**100.0**	**446**	**100.0**	**744**	**100.0**
Fertilizers	59		70		83	
Total	**794**		**516**		**827**	

Corporate social responsibility

Investments in corporate social responsibility totaled US$ 704 million in 2016, of which US$ 562 million dedicated to environmental protection and conservation and US$ 142 million dedicated to social projects.

Investments in corporate social responsibility totaled US$ 291 million in 4Q16, of which US$ 235 million dedicated to environmental protection and conservation and US$ 56 million dedicated to social projects.

Portfolio Management

On December 5th, 2016, Vale sold four capesize vessels to Polaris Shipping Co. Ltd. (Polaris), the transaction totaled US$ 140 million.

On December 15th, 2016, Vale concluded the sale of its remaining stake of 13.63% in Mineração Paragominas S.A. to Norsk Hydro ASA. The transaction totaled US$ 113 million and is connected with Vale's aluminum asset sale announced on February 28th, 2011.

On December 19th, 2016, Vale entered into an agreement with The Mosaic Company (Mosaic), to sell its Fertilizer business, excluding its nitrogen and phosphate assets in Cubatão, Brazil. Upon completion of the transaction, Vale will sell to Mosaic (i) the phosphate assets located in Brazil, except the ones based in Cubatão; (ii) its shareholding position in Bayóvar, Peru; (iii) the potash assets located in Brazil, including the Carnalita project; and (iv) the potash project based in Canada (Kronau). The inclusion of the Rio Colorado potash project in the transaction is subject to Mosaic's agreement following appropriate diligence. The transaction with Mosaic provides value of approximately US$ 2.5 billion, consisting of US$ 1.25 billion in cash and approximately 42.3 million shares of common stock to be issued by Mosaic, representing about 11% of Mosaic's total outstanding shares of common stock on a post-issuance basis. As of January 31st, 2016, those 42.3 million shares of Mosaic to be issued had a market value of approximately US$ 1.33 billion.

Free cash flow

ANNUAL PERFORMANCE

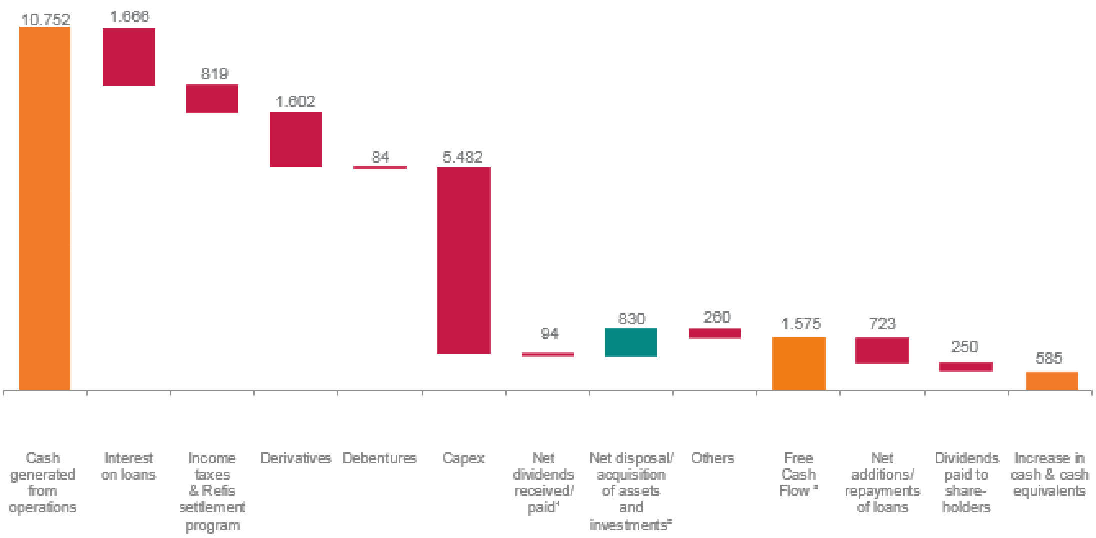
Free cash flow was US$ 1.575 million in 2016.

Cash generated from operations was US$ 10.752 billion in 2016, with non-operational uses of cash stemming mainly from: (i) interest on loans (US$ 1.666 billion); (ii) income taxes and REFIS installments (US$ 819 million); (iii) settlement of derivatives (US$ 1.602 billion), of which US$ 770 million related to the hedge of debt and US$ 799 million related to the hedge of bunker oil; and (iv) investments (US$ 5.482 billion)[37].

Net additions and repayments of loans were negative US$ 740 million, with debt repayments exceeding debt additions in 2016.

Free Cash Flow 2016

US$ million



¹ Dividends and interest on capital received from associates and joint ventures and paid to noncontrolling interest, including dividends paid related to MBR (US$ 260 million).
² Includes the proceeds from the sale of the goldstream transaction (US$ 276 million), sale of vessels (US$ 350 million) and Mineração Paragominas (US$ 113 million).
³ Cash flow before debt additions/repayments and distribution of dividends.

QUARTERLY PERFORMANCE

Free cash flow was US$ 1.158 million in 4Q16.

[37] 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.

Cash generated from operations was US$ 3.715 billion in 4Q16, with non-operational uses of cash stemming mainly from: (i) interest on loans (US$ 421 million); (ii) income taxes and REFIS installments (US$ 168 million); (iii) settlement of derivatives (US$ 548 million), of which US$ 441 million related to hedge debt and US$ 106 million related to bunker oil; and (iv) investments (US$ 1.405 billion)[38].

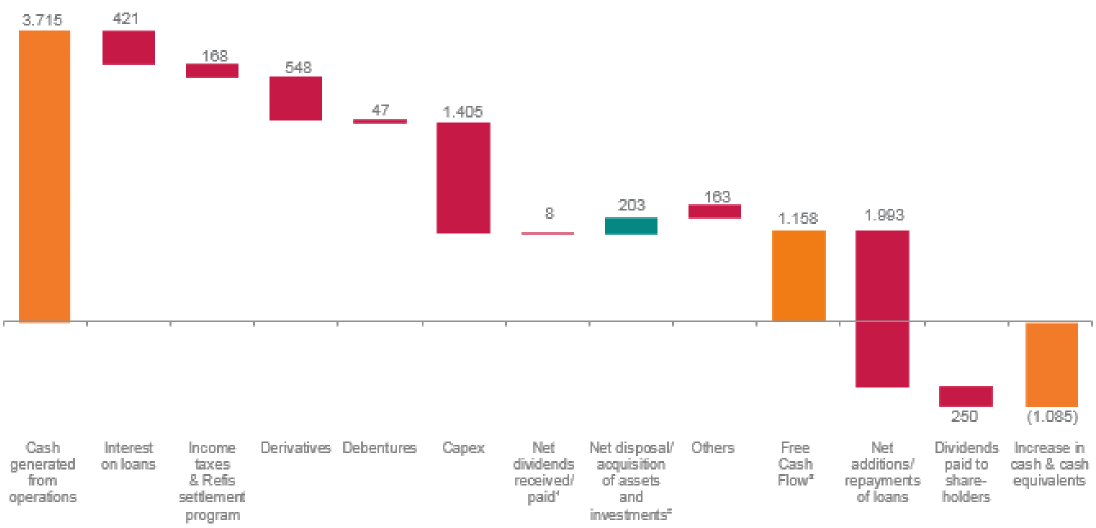
Accounts receivable increased by US$ 1.1 billion in 4Q16 vs. 3Q16 mainly driven by: (i) final invoices not yet collected (with higher prices than the ones provisionally invoiced at the end of 3Q16); (ii) concentration of iron ore sales volumes provisionally invoiced at the end of 4Q16 (sales not yet collected); and (iii) higher prices on volumes provisionally invoiced at the end of 4Q16 vs. 3Q16.

Working capital changes should have a positive impact on cash flows in 1Q17 as sales collections increase throughout the quarter.

Net additions and repayments of loans were negative US$ 1.993 billion, with debt repayments exceeding debt additions in 4Q16, mainly due to the repayment of the outstanding balance of US$ 2.000 billion drawn under the Revolving Credit Lines in January 2016.

Free Cash Flow 4Q16

US$ million



¹ Dividends and interest on capital received from associates and joint ventures and paid to noncontrolling interest, including dividends paid related to MBR (US$ 79 million).
² Includes the proceeds from the sale of Mineração Paragominas (US$ 113 million) and sale of 2 capsizes (US$ 70 million).
³ Cash flow before debt additions/repayments and distribution of dividends.

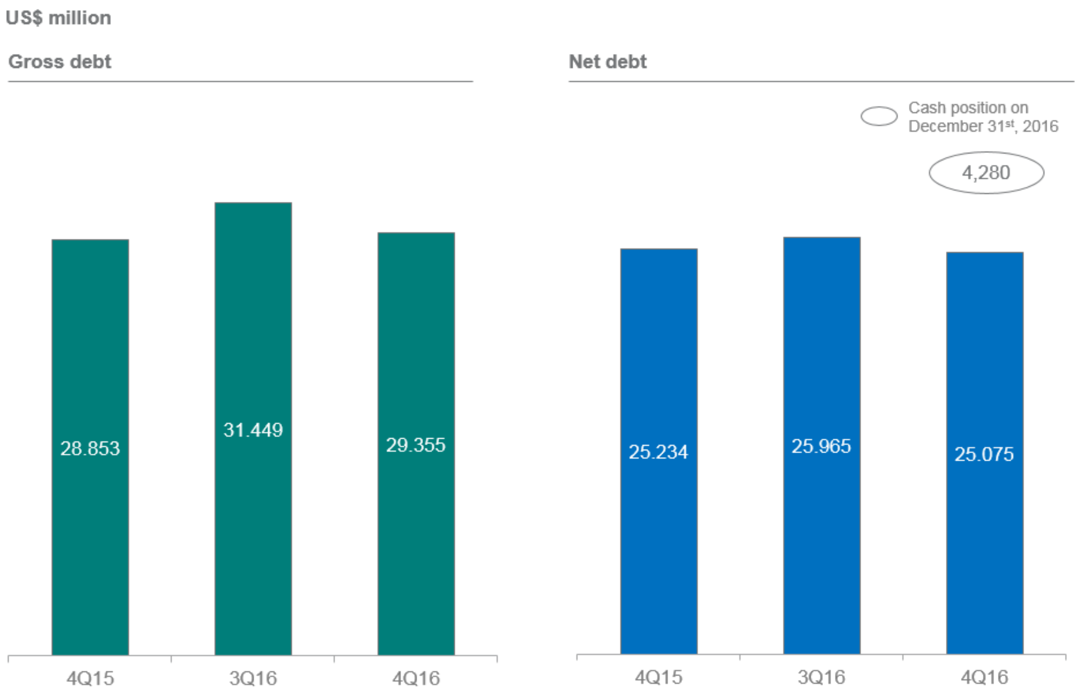
[38] The investments figure reported in the cash flow statement may differ from the ones reported in the Investments section of this report due to the fact that some actual figures are converted into U.S. dollars at the exchange rate on the date of each cash disbursement, while figures reported in our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

Debt indicators

Gross debt totaled US$ 29.355 billion as of December 31st, 2016, increasing from the US$ 28.853 billion as of December 31st, 2015. And decreasing from the US$ 31.449 billion as of September 30th, 2016, as a result of net debt repayments[39].

Net debt decreased by US$ 890 million compared to the end of the previous quarter, totaling US$ 25.075 billion based on a cash position of US$ 4.280 billion as of December 31st, 2016.

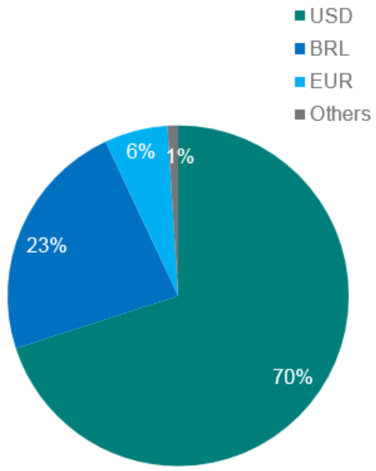
Debt position including Fertilizers



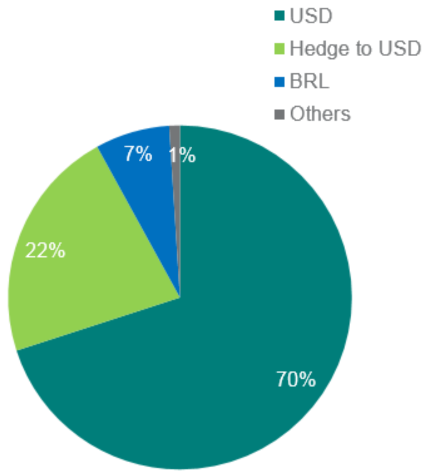
Gross debt after currency and interest rate swaps was 92% denominated in USD, with 31% based on floating and 69% based on fixed interest rates as of December 31st, 2016.

[39] Debt repayments less debt additions.

Debt position breakdown by currency (before hedge)

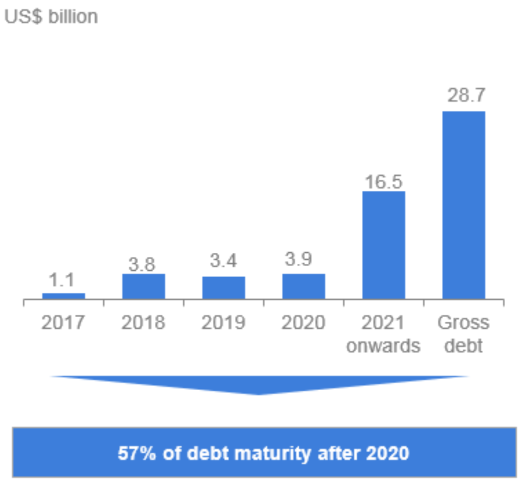


Debt position breakdown by currency (after hedge)



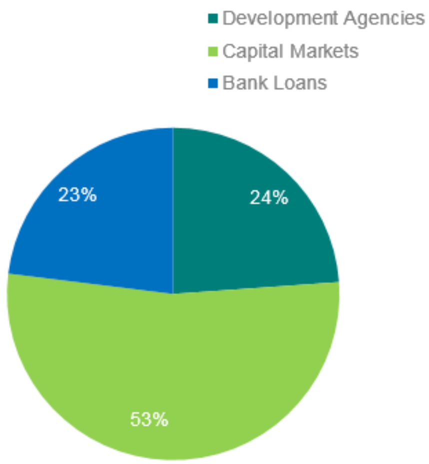
Average debt maturity increased slightly to 7.9 years on December 31st, 2016, against 7.7 years on September 30th, 2016. Average cost of debt, after the above-mentioned currency and interest rate swaps, increased slightly, to 4.63% per annum on December 31st, 2016, against 4.34% per annum on September 30th, 2016, mainly due to the repayment of the outstanding balance of the Revolving Credit Lines which had a lower cost of debt.

Debt amortization schedule[1]



[1] As of December 31st, 2016. Does not include accrued charges

Debt breakdown by instrument



Interest coverage, measured by the ratio of the LTM[40] adjusted EBITDA to LTM gross interest, improved to 6.9x in 4Q16 vs. 5.0x in 3Q16 and vs. 4.3x in 4Q15.

Gross debt to LTM adjusted EBITDA decreased to 2.4x as of December 31st, 2016 from 3.6x as of September 30th, 2016 and from 4.1x as of December 31st, 2015.

[40] Last twelve months.

Debt indicators including Fertilizers

US$ million	4Q16	3Q16	4Q15
Total debt	29,355	31,449	28,853
Net debt	25,075	25,965	25,234
Total debt / adjusted LTM EBITDA (x)	2.4	3.6	4.1
Adjusted LTM EBITDA / LTM gross interest (x)	6.9	5.0	4.3

Debt indicators ex-Fertilizers

US$ million	4Q16	3Q16	4Q15
Total debt	29,322	31,449	28,853
Net debt	25,042	25,965	25,234
Total debt / adjusted LTM EBITDA (x)	2.4	3.7	4.4
Adjusted LTM EBITDA / LTM gross interest (x)	6.8	4.9	3.9

Performance of the business segments

The share of the Ferrous Minerals business segment in the adjusted EBITDA increased to 86.0% in 2016 from 83.3% in 2015, while the Base Metals business segment decreased its share in total EBITDA to 15.2% from 19.6% in 2015 and Fertilizers decreased to 1.7% from 8.0% in 2015. The contribution from the Coal business segment and Others went from -7.2% in 2015 to -0.4% in 2016 and from -3.7% in 2015 to -2.4% in 2016, respectively.

The Ferrous Minerals business segment contribution to total EBITDA in 4Q16 reached 86.1%, followed by the Base Metals business segment, which contributed with 11.4%, the Coal business segment with 3.3% and Fertilizers business segment with 1.0% while Others contributed with -1.8% of Vale's total adjusted EBITDA in 4Q16.

Segment information — 2016

			Expenses				
US$ million	Net Revenues	Cost[1]	SG&A and others[1]	R&D[1]	Pre operating & stoppage[1]	Dividends	Adjusted EBITDA[2]
Ferrous minerals	20,351	(9,124)	(571)	(106)	(187)	113	10,476
Iron ore fines	15,784	(6,622)	(486)	(91)	(150)	10	8,445
Pellets	3,827	(2,002)	(73)	(13)	(22)	103	1,820
Others ferrous	438	(269)	(8)	(2)	(4)	-	155
Mn & Alloys	302	(231)	(4)	-	(11)	-	56
Coal	839	(872)	35	(15)	(41)	-	(54)
Base metals	6,139	(4,128)	30	(83)	(114)	4	1,848
Nickel[3]	4,472	(3,204)	(95)	(78)	(114)	4	985
Copper[4]	1,667	(924)	125	(5)	-	-	863
Others	159	(259)	(157)	(116)	(1)	76	(298)
Total	27,488	(14,383)	(663)	(320)	(343)	193	11,972
Fertilizers	1,875	(1,545)	(87)	(22)	(16)	4	209
Total including Fertilizers	29,363	(15,928)	(750)	(342)	(359)	197	12,181

[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

Segment information — 4Q16

US$ million	Net Revenues	Cost[1]	Expenses: SG&A and others[1]	Expenses: R&D[1]	Expenses: Pre operating & stoppage[1]	Dividends	Adjusted EBITDA[2]
Ferrous minerals	7,047	(2,753)	(141)	(45)	(52)	53	4,109
Iron ore fines	5,576	(2,013)	(100)	(39)	(43)	10	3,391
ROM	28	-	-	-	-	-	28
Pellets	1,216	(594)	(30)	(5)	(5)	43	625
Others ferrous	110	(77)	(10)	(1)	(2)	-	20
Mn & Alloys	117	(69)	(1)	-	(2)	-	45
Coal	376	(185)	(10)	(7)	(18)	-	156
Base metals	1,760	(1,112)	(57)	(22)	(30)	4	543
Nickel[3]	1,264	(872)	(42)	(20)	(30)	4	304
Copper[4]	496	(240)	(15)	(2)	-	-	239
Others	82	(100)	(51)	(38)	1	21	(86)
Total	9,265	(4,150)	(259)	(112)	(99)	78	4,722
Fertilizers	429	(355)	(19)	(6)	(2)	1	48
Total including Fertilizers	9,694	(4,505)	(278)	(118)	(101)	79	4,770

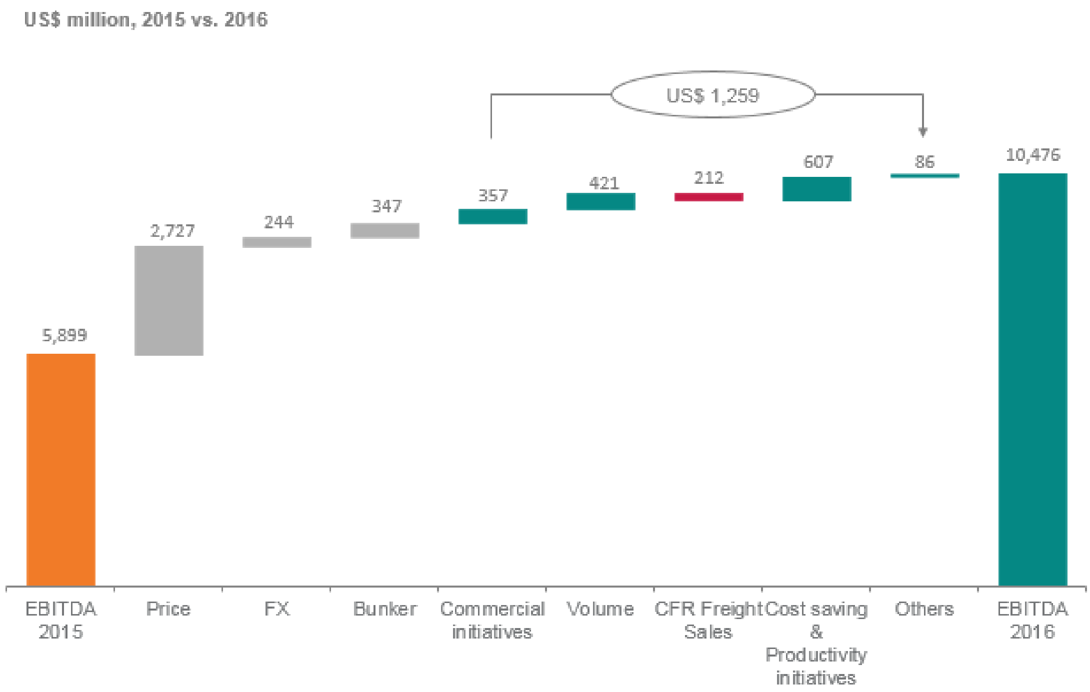
[1] Excluding depreciation and amortization
[2] Excluding non-recurring effects
[3] Including copper and by-products from our nickel operations
[4] Including by-products from our copper operations

Ferrous minerals

Adjusted EBITDA of the Ferrous Minerals business segment was US$ 10.476 billion in 2016, 77.6% higher than in 2015, mainly as a result of higher sales prices (US$ 2.727 billion), the positive impact of exchange rate variations (US$ 244 million), lower bunker oil prices (US$ 347 million) and gains in competitiveness (US$ 1.259 billion).

Gains in competitiveness were based mainly on: (i) marketing and commercial initiatives (US$ 357 million); (ii) higher sales volumes (US$ 421 million); and (iii) ongoing cost reduction initiatives[41] (US$ 607 million). The negative impact of US$ 212 million in CFR freight sales was due to the higher CFR sales volumes, which increased from 189.2 Mt in 2015 to 202.4 Mt in 2016.

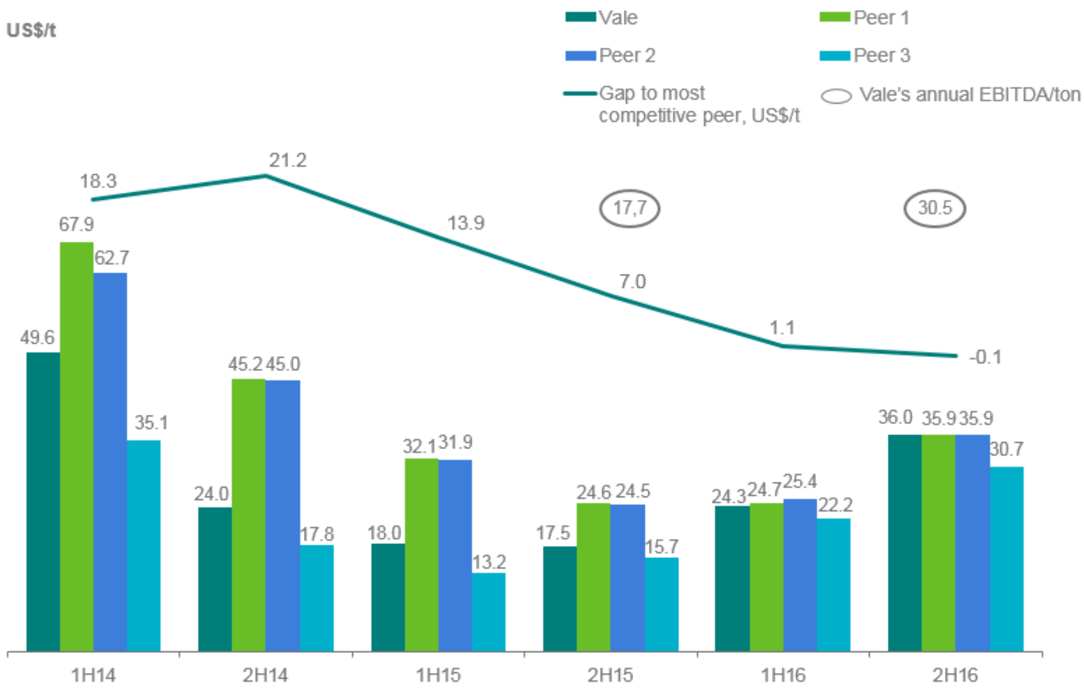
Year-on-year EBITDA variation 2015 vs. 2016 – Ferrous Minerals business segment



[41] Including the positive impact of renegotiations of chartering freight contracts.

Ferrous Minerals EBITDA margin[42]

Adjusted EBITDA per ton for Ferrous Minerals, excluding Manganese and Ferroalloys, was US$ 30.5/t in 2016, 72.3% higher than the US$ 17.7/t recorded in 2015, positioning Vale more competitive or on par with its Australian peers, despite its geographical disadvantage.



¹ Underlying EBITDA of iron ore, pellets, ROM and other ferrous for Vale's figures.
Source: Financial reports of Vale and Peers

Iron ore fines (excluding Pellets and ROM)

ANNUAL PERFORMANCE

EBITDA

Adjusted EBITDA of iron ore fines was US$ 8.445 billion in 2016, US$ 4.105 billion higher than 2015, mainly due to higher sales prices (US$ 2.850 billion), lower costs and expenses[43] (US$ 1.092 billion) and higher sales volumes (US$ 238 million).

SALES REVENUES AND VOLUMES

Net sales revenues for iron ore fines, excluding pellets and Run-of-Mine (ROM), increased to US$ 15.784 billion in 2016, 28.0% higher than in 2015. The increase was a result of higher sales prices (US$ 2.850 billion) and higher sales volumes (US$ 604 million).

[42] Excluding Manganese and Ferroalloys

[43] After adjusting for the effects of sales volumes and exchange rate variation.

The main factor that contributed to the increase in sales volumes of iron ore fines from the 276.4 Mt in 2015 to 289.9 Mt in 2016 was the better operational performance of the Northern System. ROM sales totaled 3.5 Mt, lower than the 12.3 Mt recorded in 2015 mainly due to the stoppage of ROM production at the Mariana Complex.

Vale’s realized CFR/FOB wmt price for iron ore fines (ex-ROM) increased US$ 9.8/wmt, from US$ 44.6/wmt in 2015 to US$ 54.4/wmt in 2016, while average Platts IODEX 62% increased US$ 3.0/dmt, mainly due to marketing and commercial initiatives, the positive impact of the different pricing systems and the above-mentioned increase in Northern System supply.

COSTS AND EXPENSES

Iron ore fines costs totaled US$ 6.622 billion (or US$ 7.666 billion with depreciation charges) in 2016 against US$ 7.604 billion in 2015. After deducting the effects of higher sales volumes (US$ 365 million) and exchange rate variations (-US$ 148 million), costs decreased by US$ 1.199 billion when compared to 2015, mainly driven by improvements in operational productivity and cost-cutting initiatives.

Unit maritime freight cost per iron ore metric ton was US$ 12.2/t in 2016, US$ 3.8/t lower than the US$ 16.0/t recorded in 2015, mainly due to the lower bunker oil prices (US$ 1.7/t) and lower spot freight rates (US$ 0.7/t). Vale’s average bunker oil price decreased from US$ 305/t in 2015 to US$ 219/t in 2016.

Iron ore expenses, net of depreciation, amounted to US$ 749 million[44] in 2016, 22% lower than the US$ 965 million[45] recorded in 2015. SG&A and other expenses totaled US$ 508 million[46] in 2016, 29% lower than the US$ 720 million[47] recorded in 2015, mainly as a result of savings in SG&A and the new allocation criteria for ICMS[46]. R&D amounted to US$ 91 million, decreasing US$ 30 million vs. 2015. Pre-operating and stoppage expenses, net of depreciation, amounted to US$ 150 million, 20.9% higher than the US$ 124 million recorded in 2015, mainly as a result of the increase in S11D pre-operating expenses and Mariana stoppage expenses.

C1 CASH COST

Total iron ore fines C1 cash cost at the port (mine, plant, railroad and port, ex-royalties) was US$ 3.856 billion after deducting depreciation of US$ 1.044 billion, iron ore maritime freight costs of US$ 2.332 billion and distribution costs of US$ 95 million.

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[44] Excluding the positive effect of Asset Retirement Obligations (ARO) of US$ 22 million recorded in 4Q16.

[45] Excluding the positive effect of Asset Retirement Obligations (ARO) of US$ 322 million recorded in 4Q15.

[46] As described in the box “Managerial Allocation Changes” in pages 45-46 of the 4Q15 Earnings Release.

C1 cash cost FOB port per metric ton for iron ore fines ex-royalties decreased US$ 1.6/t, from the US$ 14.9/t recorded in 2015 to US$ 13.3/t in 2016. The reduction in costs was mainly due to improvements in operational productivity, cost-cutting initiatives and the increased fixed-costs dilution on higher production volumes.

C1 cash cost FOB port per metric ton of iron ore fines in BRL was R$ 45.9/t in 2016, R$ 3.4/t lower than the R$ 49.3/t recorded in 2015, a reduction of 7%, despite the inflationary pressures in Brazil.

QUARTERLY PERFORMANCE

EBITDA

Adjusted EBITDA of iron ore fines was US$ 3.391 billion in 4Q16, 70.5% higher than in 3Q16, as a result of higher realized sales prices (US$ 1.485 billion) and higher sales volumes (US$ 172 million), which were partially offset by the negative impacts of higher costs[47] and expenses[48] (US$ 285 million).

SALES REVENUES AND VOLUME

Net sales revenues of iron ore fines, excluding pellets and Run of Mine (ROM), amounted to US$ 5.576 billion in 4Q16 vs. US$ 3.782 billion in 3Q16, as a result of higher iron ore fines sales prices (US$ 1.485 billion) and higher sales volumes (US$ 309 million) in 4Q16 vs. 3Q16.

Production, including third party purchases, was 92.4 Mt in 4Q16, in line with 3Q16 and 4.0 Mt higher than in 4Q15, mainly due to: (i) better operational performance at the mines and plants of the Northern System; (ii) the one-off sale of compact ROM for construction purposes; and (iii) the start-up of S11D.

Sales volumes of iron ore fines reached 80.3 Mt in 4Q16 vs. 74.2 Mt in 3Q16, 8.2% higher than in 3Q16, with iron ore inventory decreasing by 6.0 Mt as a result of: (i) production[49] of 92.4 Mt; (ii) deduction of 13.7 Mt of iron ore fines used for the production of pellets; (iii) adjustment of iron ore inventories[50] of 2.3 Mt; (iv) sales of iron ore fines of 80.3 Mt; and (v) deduction of 2.2 Mt of ROM sales.

CFR sales of iron ore fines totaled 55.1 Mt in 4Q16, 7.3 Mt higher than in 3Q16 mainly due to higher sales to China, which are mostly negotiated on a CFR basis. CFR sales represented

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[47] After adjusting for the effects of higher volumes and exchange rate variation.

[48] After adjusting for the effect of exchange rate variation.

[49] Including third party purchases

[50] Iron ore inventories are periodically adjusted downwards due to moisture and handling during its processing phases.

69% of all iron ore fines sales volumes in 4Q16, higher than the share of CFR sales in 3Q16 (64%).

ROM sales totaled 2.2 Mt in 4Q16, 1.8 Mt higher than in 3Q16 due to the one-off sale of compact ROM for construction purposes mentioned earlier.

Net operating revenue by product

US$ million	4Q16	3Q16	4Q15	2016	2015
Iron ore fines	5,576	3,782	2,945	15,783	12,330
ROM	28	4	13	41	102
Pellets	1,216	991	780	3,828	3,600
Manganese & Ferroalloys	117	76	13	301	162
Others	110	106	79	398	368
Total	**7,047**	**4,959**	**3,830**	**20,351**	**16,562**

Volume sold

'000 metric tons	4Q16	3Q16	4Q15	2016	2015
Iron ore fines	80,287	74,231	79,213	289,940	276,393
ROM	2,220	351	1,627	3,496	12,269
Pellets	13,190	12,001	10,837	47,709	46,284
Manganese ore	534	448	568	1,851	1,764
Ferroalloys	35	31	12	127	69

REALIZED PRICES

Iron ore sales in 4Q16 were distributed across three pricing systems: (i) 45% based on the current quarter, month and daily spot prices, including provisional price sales that were settled within the quarter; (ii) 45% 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) 10% linked to past prices (quarter-lagged).

Vale's CFR dmt reference price for iron ore fines (ex-ROM) increased by US$ 19.8/t from US$ 59.3/t in 3Q16 to US$ 79.1/t in 4Q16, equivalent to a price realization of 112% of the average Platts IODEX 62% of US$ 70.8/t in 4Q16.

Vale's CFR/FOB wmt price for iron ore fines (ex-ROM) increased 36.3% (US$ 18.5/t) from US$ 50.9t in 3Q16 to US$ 69.4/t in 4Q16, after adjusting for moisture and the effect of FOB sales, which accounted for 31% of the total sales volumes in 4Q16, while average Platts IODEX 62% increased 20.8% in 4Q16 vs. 3Q16.

Price realization in 4Q16 was impacted by:

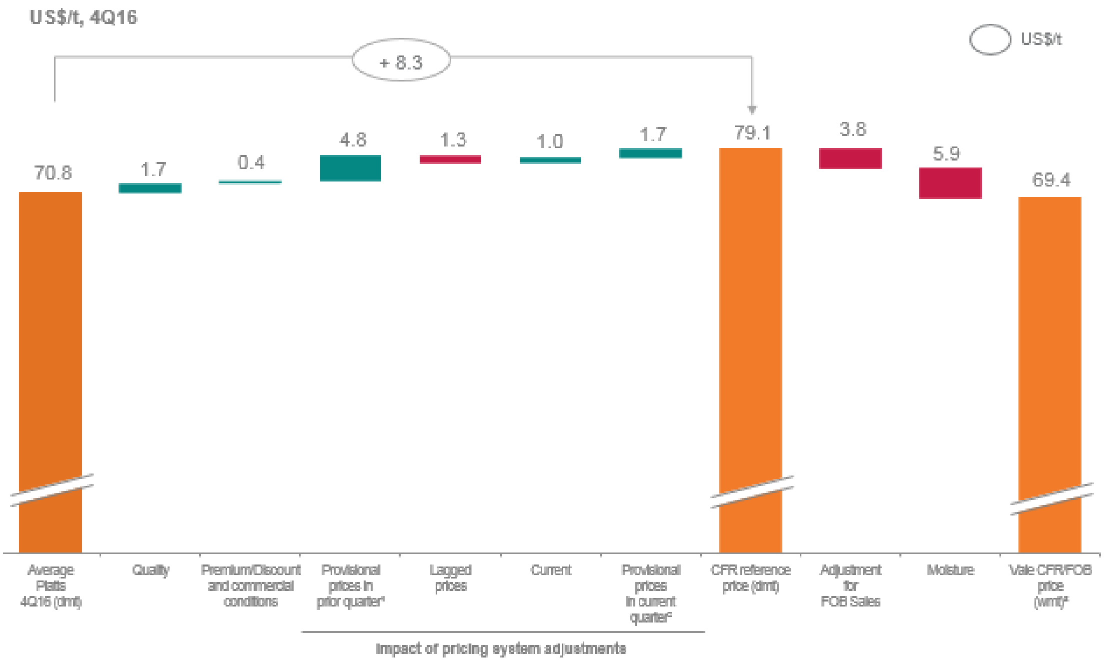
- Provisional prices set at the end of 3Q16 at US$ 54.4/t, which were later adjusted based on the price of delivery in 4Q16, which positively impacted prices in 4Q16 by US$ 4.8/t compared to US$ 1.6/t in 3Q16, as a result of the higher realized prices in 4Q16.

- Provisional prices set at the end of 4Q16 at US$ 74.6/t vs. the IODEX average of US$ 70.8/t in 4Q16 which positively impacted prices in 4Q16 by US$ 1.7/t compared to a negative impact of US$ 1.2/t in 3Q16.

- Quarter-lagged contracts, priced at US$ 56.8/t based on the average prices for Jun-Jul-Aug which negatively impacted prices in 4Q16 by US$ 1.3/t compared to a negative impact of US$ 0.4/t in 3Q16.

Iron ore sales of 35.9 Mt, or 45% of Vale's sales mix, were recorded under the provisional pricing system, which was set at the end of 4Q16 at US$ 74.6/t. The final prices of these sales and the required adjustment to sales revenues will be determined and recorded in 1Q17.

Price realization – iron ore fines



[1] Adjustment as a result of provisional prices booked in 3Q16 at US$ 54.4/t.
[2] Difference between the weighted average of the prices provisionally set at the end of 4Q16 at US$ 74.6/t based on forward curves and US$ 70.8/t from the 4Q16 IODEX.
[3] Vale price is net of taxes.

Average prices

US$/ metric ton	4Q16	3Q16	4Q15	2016	2015
Iron ore - Metal Bulletin 65% index	82.60	65.60	50.09	64.95	62.12
Iron ore - Platts's 62% IODEX	70.76	58.60	46.65	58.45	55.50
Iron ore fines CFR reference price (dmt)	79.10	59.30	45.10	62.34	54.60
Iron ore fines CFR/FOB realized price	69.40	50.95	37.18	54.44	44.61
ROM	12.61	11.40	7.99	11.73	8.35
Pellets CFR/FOB (wmt)	92.27	82.58	71.98	80.26	77.79
Manganese ore	162.92	113.84	7.04	110.87	56.42
Ferroalloys	857.14	806.45	750.00	757.67	899.32

COSTS

Costs for iron ore fines amounted to US$ 2.013 billion (or US$ 2.336 billion with depreciation charges) in 4Q16. Costs increased by US$ 246 million vs. 3Q16, after adjustments for the effects of exchange rate variations (-US$ 14 million) and higher sales volumes (US$ 133 million). The increase was mainly driven by some one-off effects such as the collective bargaining agreement settled with employees in Brazil and by the provision for profit sharing. The provision for profit sharing was impacted by the sharp increase of commodity prices at the end of year, leading to a much higher provision in comparison to previous quarters.

IRON ORE COGS - 3Q16 x 4Q16

		Variance drivers				
US$ million	3Q16	Volume	Exchange Rate	Others	Total Variation 3Q16 x 4Q16	4Q16
Total costs before depreciation and amortization	**1,648**	**133**	**(14)**	**246**	**365**	**2,013**
Depreciation	250	20	(4)	56	73	323
Total	**1,898**	**153**	**(18)**	**302**	**438**	**2,336**

Maritime freight costs, which are fully accrued as cost of goods sold, totaled US$ 725 million in 4Q16, having increased US$ 150 million vs. 3Q16.

Unit maritime freight cost per iron ore metric ton was US$ 13.2/t in 4Q16, US$ 1.2/t higher than in 3Q16, mainly due to the negative impacts of: (i) higher bunker oil prices (US$ 0.5/t); (ii) higher spot freight rates (US$ 0.2/t); (iii) higher costs on the tonnage contracted to replace the capacity of the vessels sold (US$ 0.2/t). Vale's average bunker oil price increased from US$ 232/t in 3Q16 to US$ 257/t in 4Q16.

C1 CASH COST

Total iron ore fines C1 cash cost at the port (mine, plant, railroad and port, ex-royalties) was US$ 1.159 billion after deducting depreciation of US$ 323 million, iron ore maritime freight costs of US$ 725 million and distribution costs of US$ 25 million.

C1 cash cost FOB port per metric ton for iron ore fines ex-royalties increased US$1.4/t, from the US$ 13.0/t recorded in 3Q16 to US$ 14.4/t in 4Q16, mainly as a result of non-recurring events (US$ 0.9/t), such as the collective bargaining agreement with employees in Brazil[51] and the provision for profit sharing[52]. C1 cash costs, excluding the above-mentioned non-recurring effects, totaled US$ 13.5/t.

[51] It does not take into account the increase in wages that will be also applied in the future.

[52] It considers the impact of the sharp increase of commodity prices at the end of year, which led to a much higher provision in comparison to previous quarters.

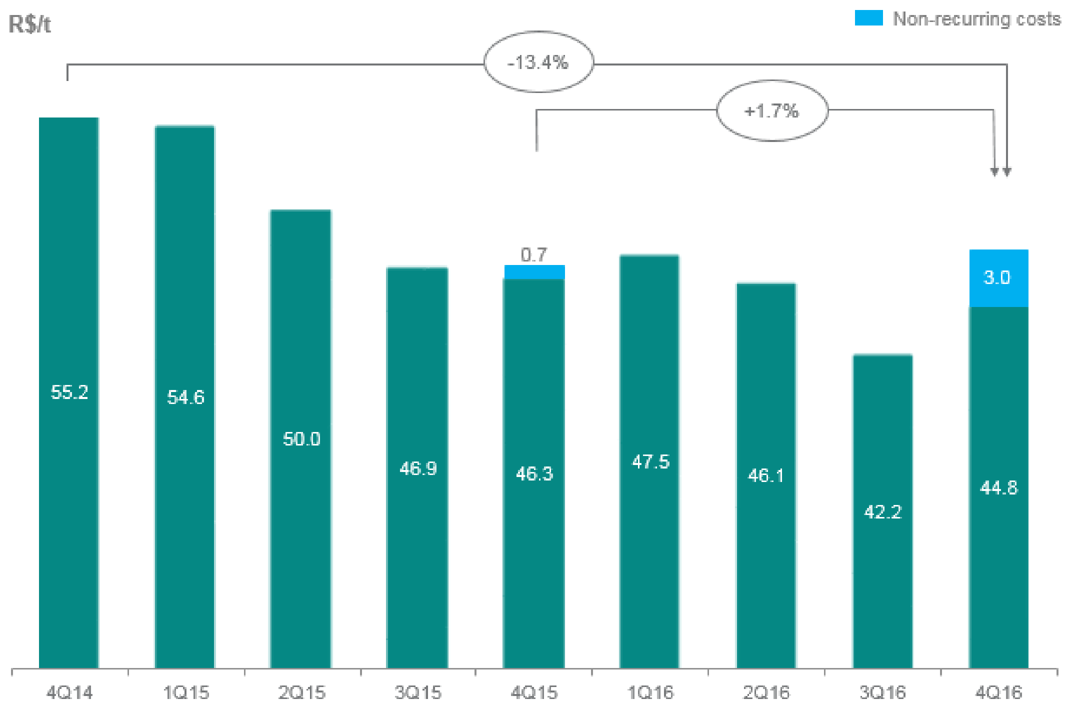
C1 cash cost FOB port per metric ton of iron ore fines in BRL was R$ 47.8/t in 4Q16, R$ 5.6/t higher than the R$ 42.2/t recorded in 3Q16, mainly as a result of the above-mentioned impacts.

Iron Ore Fines Costs and Expenses in BRL

R$/t	4Q16	3Q16	4Q15	2016	2015
Costs[1]	47.8	42.2	47.0	45.9	49.3
Expenses[1]	7.5	7.4	12.1	8.8	10.8
Total	**55.3**	**49.5**	**59.1**	**54.7**	**60.1**

[1] Net of depreciation

Evolution of C1 Cash Cost[1] per ton in BRL



[1] 2014 and 2015 figures were adjusted to the new allocation criteria, as reported in the 4Q15, and include acquisition costs of third party purchased ore.

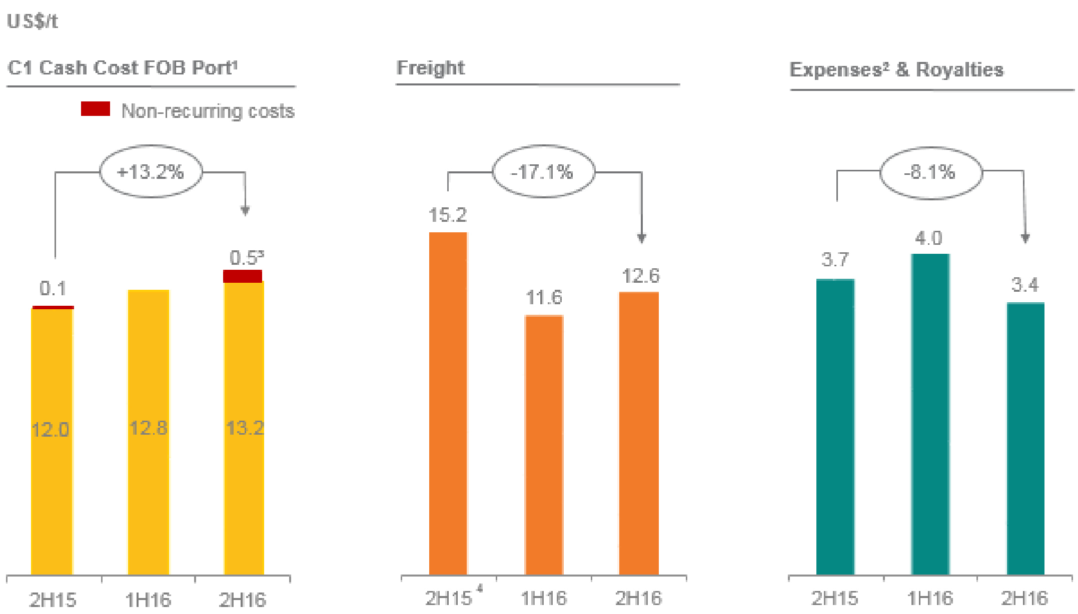
EXPENSES

Iron ore expenses, net of depreciation, amounted to US$ 182 million in 4Q16, 25.5% higher than the US$ 145 million recorded in 3Q16. SG&A and other expenses totaled US$ 100 million in 4Q16, 25% higher than the US$ 80 million recorded in 3Q16, mainly as a result of the provision for profit sharing (US$ 20 million). R&D amounted to US$ 39 million, increasing US$ 14 million vs. 3Q16, following the regular seasonality of expenditures. Pre-operating and stoppage expenses, net of depreciation, amounted to US$ 43 million, 7.5% higher than the US$ 40 million recorded in 3Q16, mainly as a result of the increase in S11D pre-operating expenses (US$ 6 million), but partially offset by a decrease in Mariana stoppage expenses (US$ 4 million).

Iron ore fines cash cost and freight

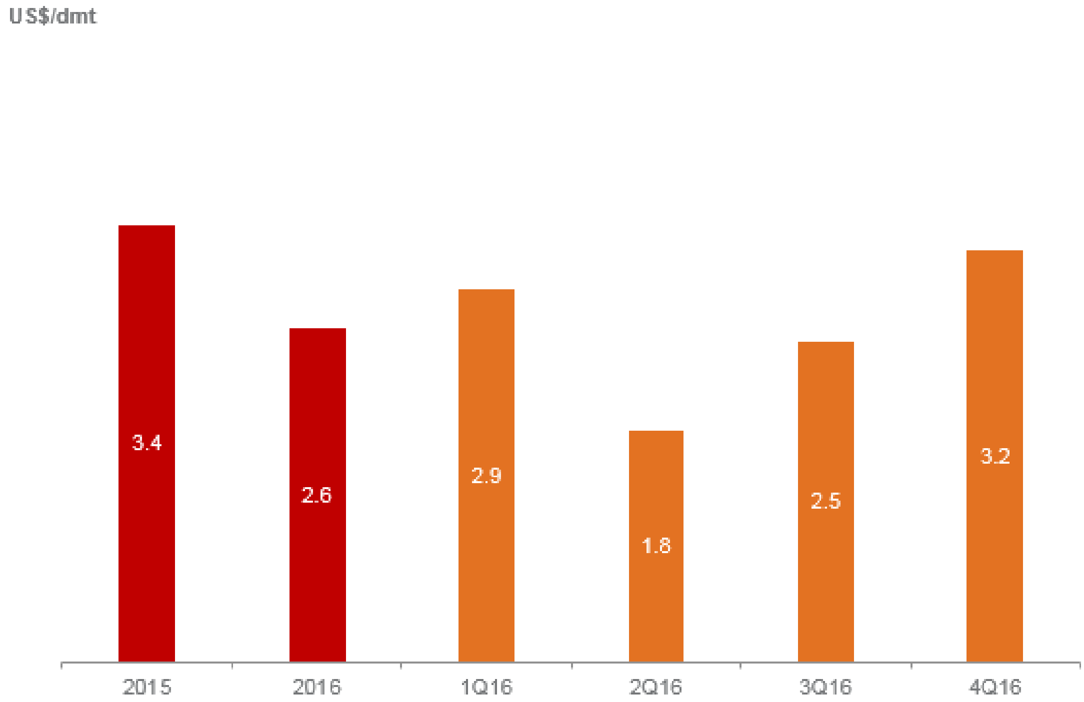
	4Q16	3Q16	4Q15	2016	2015
Costs (US$ million)					
COGS, less depreciation and amortization	2,013	1,648	1,924	6,622	7,604
Distribution costs	25	18	25	95	76
Maritime freight costs	725	575	757	2,332	2,825
Bunker oil hedge	-	-	134	-	412
FOB at port costs (ex-ROM)	**1,263**	**1,055**	**1,008**	**4,195**	**4,291**
FOB at port costs (ex-ROM and ex-royalties)	**1,159**	**965**	**925**	**3,856**	**3,959**
Sales volumes (Mt)					
Total iron ore volume sold	82.5	74.6	80.8	293.4	288.7
Total ROM volume sold	2.2	0.4	1.6	3.5	12.3
Volume sold (ex-ROM)	80.3	74.2	79.2	289.9	276.4
% of CFR sales	69%	64%	68%	66%	64%
% of FOB sales	31%	36%	32%	34%	36%
Vale's iron ore cash cost (ex-ROM, ex-royalties), FOB (US$ /t)	**14.4**	**13.0**	**12.2**	**13.3**	**14.9**
Freight					
Volume CFR (Mt)	55.1	47.8	53.6	191.9	177.0
Vale's iron ore unit freight cost (US$/t)	13.2	12.0	16.6	12.2	18.3
Vale's iron ore unit freight cost (ex- bunker oil hedge) (US$/t)	13.2	12.0	14.1	12.2	16.0

Evolution of iron ore fines cash cost, freight and expenses



[1] Ex-ROM and ex-royalties. All figures were adjusted according to the new managerial allocation changes, as reported in the 4Q15, and include acquisition costs of third party purchased ore.
[2] Net of depreciation.
[3] US$ 0.5/t equates to the non-recurring events of 4Q16 (US$ 0.9/) diluted in 2H16.
[4] Ex bunker oil hedge.

Evolution of iron ore fines sustaining per ton



Iron ore pellets

ANNUAL PERFORMANCE

Adjusted EBITDA for pellets was US$ 1.820 billion in 2016, 8.0% higher than the US$ 1.685 billion recorded in 2015. The increase of US$ 135 million was mainly a result of higher sales prices (US$ 116 million), higher sales volumes (US$ 47 million), and lower costs[53] (US$ 183 million) which were partially offset by higher expenses (US$ 89 million) and lower dividends (US$ 122 million), mainly from Samarco.

Net sales revenues for pellets were US$ 3.827 billion in 2016, 6.3% higher than in 2015, mainly due to the increase in sales prices from US$ 77.8 per metric ton in 2015 to US$ 80.3 per metric ton in 2016 and the increase in sales volumes from 46.3 Mt in 2015 to 47.7 Mt in 2016 as a result of inventory consumption.

Costs for pellets totaled US$ 2.002 billion in 2016 (or US$ 2.342 with depreciation charges). Costs decreased by US$ 132 million when compared to 2015 after deducting the effects of higher volumes (US$ 64 million) and exchange rate variations (-US$ 51 million), mainly due to lower bunker oil prices and the absence of the hedge accounting of the bunker oil in 2016.

[53] After adjusting for the effects of higher volumes

Pre-operating and stoppage expenses for pellets were US$ 22 million in 2016, in line with 2015. SG&A and other expenses increased US$ 89 million in 2016 vs 2015 mainly due to managerial criteria changes[54] and the write-down of inventory items.

QUARTERLY PERFORMANCE

Adjusted EBITDA for pellets in 4Q16 was US$ 625 million, 35.3% higher than the US$ 462 million recorded in 3Q16. The increase of US$ 163 million was mainly a result of higher sales prices (US$ 128 million), higher sales volumes (US$ 48 million) and higher dividends received from the leased pelletizing plants (US$ 43 million), usually paid every 6 months, which were partially offset by higher costs and expenses (US$ 61 million).

Net sales revenues for pellets amounted to US$ 1.216 billion in 4Q16, increasing US$ 225 million from the US$ 991 million recorded in 3Q16 as a result of higher realized sales prices (US$ 128 million), which increased from an average of US$ 82.6 per ton in 3Q16 to US$ 92.3 per ton in 4Q16, and higher sales volumes (US$ 98 million), which increased from the 12.0 Mt recorded in 3Q16 to 13.2 Mt in 4Q16.

Production reached 12.6 Mt in 4Q16, 0.6 Mt higher than in 3Q16 mainly as a result of higher production in the Oman and Tubarão Plants.

CFR pellet sales of 2.2 Mt in 4Q16 represented 16% of total pellet sales and were in line with 3Q16. FOB pellet sales increased from 9.8 Mt in 3Q16 to 11.0 Mt in 4Q16.

Pellet CFR/FOB prices increased by US$ 9.7/t to US$ 92.3/t in 4Q16, whereas the Platt's IODEX iron ore reference price (CFR China) increased by US$ 12.2/t in the quarter, as a result of higher FOB sales in the quarter and some negative impact from Vale's pricing systems.

Pellet costs totaled US$ 594 million (or US$ 692 million with depreciation charges) in 4Q16. After adjusting for the effects of higher volumes (US$ 50 million) and exchange rate variations (-US$ 5 million), costs increased by US$ 37 million vs. 3Q16 mainly due to higher provision for profit sharing and the collective bargaining agreement with employees in Brazil.

Pre-operating and stoppage expenses for pellets were US$ 5 million in 4Q16, in line with 3Q16. SG&A and other expenses increased US$ 22 million in 4Q16 vs 3Q16 mainly due to the write down of inventory items (US$ 14 million).

EBITDA unit margin for pellets was US$ 47.4t in 4Q16, 23.0% higher than in 3Q16 mainly due to higher sales volumes and prices.

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[54] As described in the box 'Managerial Allocation Changes' in pages 45-46 of 4Q15 Earnings Release.

Pellets - EBITDA ex-Samarco

	4Q16		3Q16	
	US$ million	US$/wmt	US$ million	US$/wmt
Net Revenues / Realized Price	1,216	92.2	991	82.6
Dividends Received (Leased pelletizing plants) ex-Samarco	43	3.3	-	-
Cash Costs (Iron ore, leasing, freight, overhead, energy and other)	(594)	(45.0)	(512)	(42.7)
Expenses (SG&A, R&D and other)	(40)	(3.0)	(17)	(1.4)
EBITDA ex-Samarco	625	47.4	462	38.5

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 US$ 5.7/dmt to US$ 28.9/dmt in 2016 when compared to 2015, mainly due to improvements in operational productivity, cost-cutting initiatives, the increased fixed-costs dilution on higher production volumes, lower bunker oil prices and lower spot freight rates.

Iron ore and pellets cash break-even on a landed-in-China basis, including sustaining capex per ton, decreased US$ 6.5/dmt from US$ 38.0/dmt in 2015 to US$ 31.5/dmt in 2016, as a result of the above-mentioned improvement in the EBITDA break-even and a decrease of US$ 0.8/dmt in sustaining capex per ton, from US$ 3.4/dmt in 2015 to US$ 2.6/dmt in 2016.

Iron ore and pellets cash break-even landed in China[1]

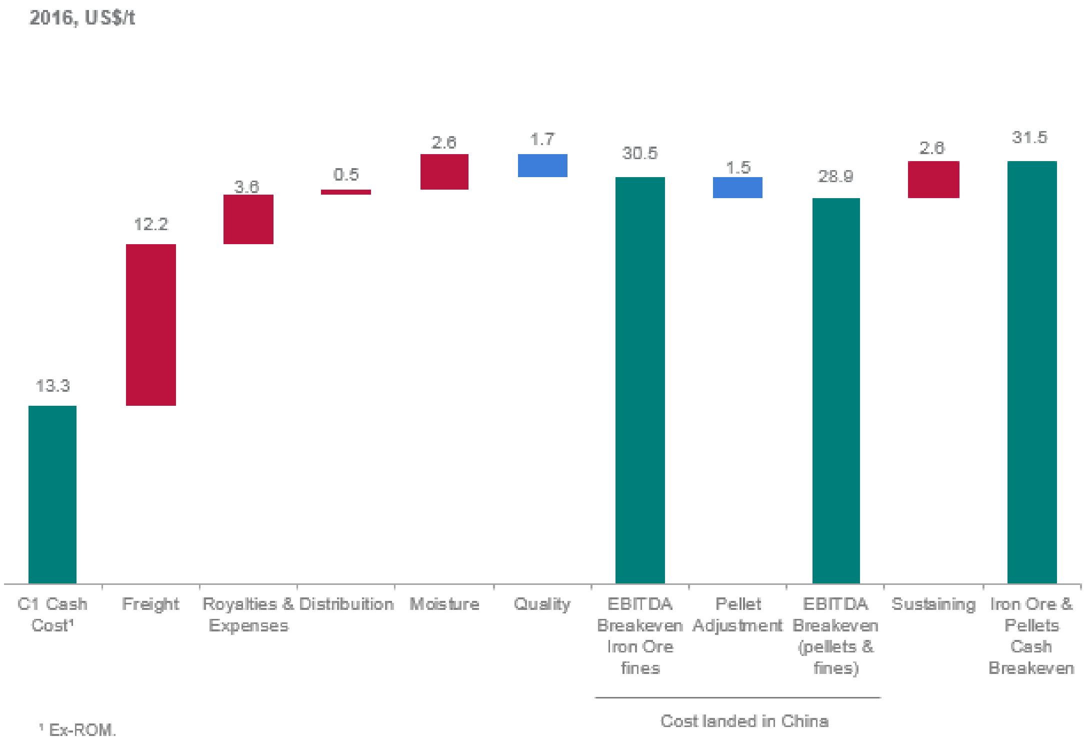
US$/t	4Q16	3Q16	4Q15	2016	2015
Vale's iron ore cash cost (ex-ROM, ex-royalties), FOB (US$ /t)	14.4	13.0	12.2	13.3	14.9
Iron ore fines freight cost (ex-bunker oil hedge)	13.2	12.0	14.1	12.2	16.0
Iron ore fines distribution cost	0.4	0.4	0.5	0.5	0.4
Iron ore fines expenses[2] & royalties	3.5	3.2	3.8	3.6	3.9
Iron ore fines moisture adjustment	2.7	2.5	2.6	2.6	3.0
Iron ore fines quality adjustment	(2.1)	(1.5)	(1.1)	(1.7)	(1.9)
Iron ore fines EBITDA break-even (US$/dmt)	**32.1**	**29.6**	**32.1**	**30.5**	**36.2**
Iron ore fines pellet adjustment[3]	(1.5)	(1.3)	(1.1)	(1.5)	(1.6)
Iron ore fines and pellets EBITDA break-even (US$/dmt)	**30.6**	**28.3**	**31.0**	**28.9**	**34.6**
Iron ore fines sustaining investments	3.2	2.5	2.1	2.6	3.4
Iron ore fines and pellets cash break-even landed in China[3] (US$/dmt)	**33.7**	**30.8**	**33.1**	**31.5**	**38.0**

[1] Measured by unit cost + expenses + sustaining investment adjusted for quality

[2] Net of depreciation

[3] US$ 0.7/t in 2Q16 relates to the dividends received from the pelletizing plants, which are usually paid every six months.

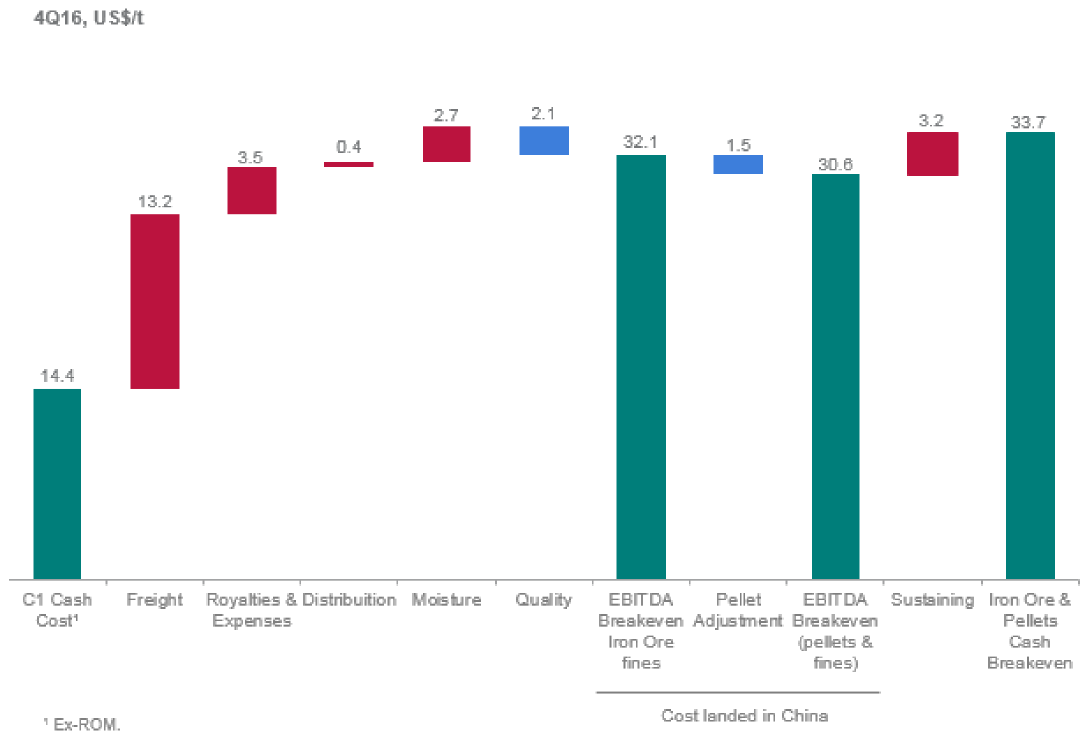
Annual iron ore and pellets cash break-even on a landed-in-China basis



Quarterly 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), increased 8.1%, from US$ 28.3/dmt in 3Q16 to US$ 30.6/dmt in 4Q16, mainly due to the increase in C1 cash costs and in freight costs. C1 cash costs increased mainly due to the collective bargaining agreement with employees in Brazil and the provision for profit sharing, while freight costs increased mainly, as a result of higher bunker prices and higher spot freight rates.

Quarterly iron ore and pellets cash break-even on a landed-in-China basis, including sustaining capex per ton of US$ 3.2/dmt, increased from US$ 30.8/dmt in 3Q16 to US$ 33.7/dmt in 4Q16.

Quarterly iron ore and pellets cash break-even on a landed-in-China basis



Manganese and ferroalloys

ANNUAL PERFORMANCE

Adjusted EBITDA of manganese and ferroalloys was US$ 56 million in 2016, US$ 87 million higher than in 2015, mainly due to higher sales prices (US$ 83 million).

Net sales revenues for manganese ore increased to US$ 206 million in 2016 from the US$ 100 million recorded in 2015, mainly due to the effect of higher sales prices (US$ 83 million). In 2016, manganese ore production totaled 2.371 Mt, in line with 2015. Volumes sold of manganese ore reached 1.851 Mt in 2016 vs. 1.764 Mt in 2015.

Net sales revenues for ferroalloys increased to US$ 96 million in 2016 from US$ 62 million in 2015, mainly due to higher sales volumes (US$ 52 million) which were partially offset by lower sales prices (US$ 18 million). Volumes sold of ferroalloys increased to 127,000 t in 2016 from the 69,000 t recorded in 2015, mainly as a result of the resumption of operations at the Barbacena unit.

Manganese ore and ferroalloys costs totaled US$ 231 million (or US$ 258 million with depreciation charges) in 2016. Costs increased by US$ 9 million vs. 2015 after adjusting for the negative effect of higher volumes (US$ 52 million) and the positive effect of exchange rate variations (US$ 5 million).

Adjusted EBITDA of manganese ore and ferroalloys was US$ 45 million in 4Q16, US$ 41 million higher than the US$ 4 million in 3Q16, mainly due to the impact of higher sales prices (US$ 28 million) and higher sales volumes (US$ 3 million) and lower costs and expenses[55] (US$ 11 million).

Net sales revenues for manganese ore increased to US$ 87 million in 4Q16 from US$ 51 million in 3Q16 mainly due to higher sales prices (US$ 26 million) and sales volumes (US$ 10 million) in 4Q16. Volumes sold of manganese ore reached 534,000 t in 4Q16 vs. 448,000 t in 3Q16.

Net sales revenues for ferroalloys increased to US$ 30 million in 4Q16 from the US$ 25 million in 3Q16, mainly due to higher sales volumes (US$ 3 million) and higher sales prices (US$ 2 million). Volumes sold of ferroalloys increased to 35,000 t in 4Q16 from the 31,000 t recorded in 3Q16.

Manganese ore and ferroalloys costs totaled US$ 69 million (or US$ 77 million with depreciation charges) in 4Q16. Costs decreased by US$ 5 million vs. 3Q16 after adjusting for the negative effect of higher volumes (-US$ 10 million) and the positive effect of exchange rate variations (US$ 1 million).

Market outlook – iron ore

Iron ore Platts IODEX 62% averaged US$ 58.5/dmt in 2016, increasing by 5% from 2015. Since the beginning of 2016, prices started to improve and iron ore Platts IODEX 62% averaged US$ 70.8/dmt in 4Q16, increasing 51.7% year-on-year and of 20.8% quarter-on-quarter.

Steel demand improved in China on the back of credit expansions, which encouraged a rebound in fixed asset investments, particularly in the property and manufacturing sectors from mid-2016. Property sales increased from 6.5% year-on-year in 2015 to 22.5% in 2016, new house starts rebounded from -14% year-on-year to 8.1%, and floor space under construction edged up from 1.3% year-on-year to 3.2% in 2016.

Steel production grew by 1.2% in China, reaching 808 Mt in 2016, propping up Chinese iron ore imports on the seaborne market to a record high of 1,024 Mt (dry basis), representing a 7.5% increase from 2015.

Demand for high grade iron ore also improved in 2H16 driven by the productivity requirements of the Chinese steel mills in times of high coking coal prices and due to an

[55] After adjusting for the effects of higher volumes and exchange rates.

imbalance of supply ratio of high and low grade ores. Premiums for the 65% Fe content iron ore adjusted by 1% Fe differential increased by 108% quarter-on-quarter in 4Q16.

In countries other than China, crude steel production edged up to 820 Mt in 2016, an increase of 0.4% year-on-year and a reversal of the weak start observed at the beginning of 2016.

For 2017, iron ore demand is expected to remain firm supported by credit availability in China and a steady growth in fixed asset investments.

Volume sold by destination – Iron ore and pellets

'000 metric tons	4Q16	3Q16	4Q15	2016	%	2015	%
Americas	**10,699**	**9,275**	**8,549**	**36,367**	**10.7**	**41,187**	**12.3**
Brazil	8,679	7,384	7,346	28,890	8.5	35,665	10.6
Others	2,020	1,891	1,203	7,477	2.2	5,522	1.6
Asia	**68,013**	**61,353**	**65,574**	**242,244**	**71.0**	**229,268**	**68.4**
China	56,181	49,061	52,898	196,348	57.6	179,470	53.6
Japan	7,042	7,512	7,782	28,188	8.3	29,499	8.8
Others	4,790	4,780	4,894	17,708	5.2	20,299	6.1
Europe	**12,619**	**12,421**	**15,006**	**49,421**	**14.5**	**53,385**	**15.9**
Germany	5,839	4,753	5,471	20,543	6.0	21,991	6.6
France	1,851	1,549	1,474	6,609	1.9	5,814	1.7
Others	4,929	6,119	8,061	22,269	6.5	25,580	7.6
Middle East	**2,795**	**2,274**	**2,095**	**8,999**	**2.6**	**9,745**	**2.9**
Rest of the World	**1,570**	**1,260**	**453**	**3,996**	**1.2**	**1,360**	**0.4**
Total	**95,696**	**86,583**	**91,677**	**341,027**	**100.0**	**334,946**	**100.0**

Selected financial indicators - Ferrous minerals

US$ million	4Q16	3Q16	4Q15	2016	2015
Net Revenues	7,047	4,959	3,830	20,351	16,562
Costs[1]	(2,753)	(2,293)	(2,497)	(9,125)	(10,241)
Expenses[1]	(141)	(95)	120	(572)	(380)
Pre-operating and stoppage expenses[1]	(52)	(49)	(61)	(186)	(169)
R&D expenses	(45)	(29)	(27)	(105)	(128)
Dividends received	53	-	44	113	255
Adjusted EBITDA	4,109	2,493	1,409	10,476	5,899
Depreciation and amortization	(489)	(399)	(388)	(1,616)	(1,669)
Adjusted EBIT	3,567	2,094	977	8,747	3,975
Adjusted EBIT margin (%)	50.6	42.2	25.5	43.0	24.0

[1] Net of depreciation and amortization

Selected financial indicators - Iron ore fines

	4Q16	3Q16	4Q15	2016	2015
Adjusted EBITDA (US$ million)	3,391	1,989	1,095	8,445	4,105
Volume Sold (Mt)	80.287	74.231	79.213	289.940	276.393
Adjusted EBITDA (US$/t)	42.24	26.79	13.82	29.13	14.85

Selected financial indicators - Pellets (excluding Samarco)

	4Q16	3Q16	4Q15	2016	2015
Adjusted EBITDA (US$ million)	625	462	336	1,820	1,539
Volume Sold (Mt)	13.190	12.001	10.837	47.709	46.284
Adjusted EBITDA (US$/t)	47.38	38.50	31.00	38.15	33.24

Selected financial indicators - Iron ore fines and Pellets

	4Q16	3Q16	4Q15	2016	2015
Adjusted EBITDA (US$ million)	4,016	2,451	1,431	10,265	5,644
Volume Sold (Mt)	93.477	86.232	90.050	337.649	322.677
Adjusted EBITDA (US$/t)	42.96	28.42	15.89	30.40	17.49

Base Metals

Annual performance

Base Metals adjusted EBITDA totaled US$ 1.848 billion in 2016, representing an increase of US$ 460 million from the US$ 1.388 billion recorded in 2015. The increase was mainly due to lower expenses (US$ 312 million), lower costs[56] (US$ 305 million), higher volumes (US$ 148 million) and favorable exchange rate variations (US$ 126 million), which were partially offset by lower base metals prices (US$ 431 million).

SALES REVENUES AND VOLUME

Sales from base metals and their by-products totaled US$ 6.139 billion in 2016 against US$ 6.163 billion in 2015. The decrease was mainly driven by lower nickel prices (US$ 544 million) which were partially offset by higher sales of nickel (US$ 182 million) and copper (US$ 144 million), higher prices for silver, gold and cobalt by-products (US$ 101 million) and higher volumes for silver, gold and cobalt by-products (US$ 89 million).

Nickel production achieved the new annual record of 311 kt in 2016, 20 kt higher than in 2015, as a result of higher production from Sudbury and VNC. Copper production achieved a new annual record of 446 kt in 2016, 32 kt higher than in 2015, as a result of higher production from Salobo and Sudbury. Gold contained as a by-product in our nickel and copper concentrates reached an all-time record of 483,000 troy ounces (oz).

COSTS AND EXPENSES

Base metals COGS were US$ 4.128 billion (US$ 5.697 billion including depreciation), a decrease of 3.9% compared to 2015. After adjusting for the effects of volumes (US$ 260 million) and exchange rate variations (US$ 123 million), costs decreased by US$ 305 million vs. 2015.

SG&A and other expenses, excluding depreciation, were US$ 30 million positive in 2016 due to the US$ 150 million effect of the goldstream transaction recorded in 3Q16. SG&A and other expenses decreased by US$ 66 million in 2016 vs. 2015, excluding the positive effects of the goldstream transactions in 1Q15 and 3Q16.

Pre-operating and stoppage expenses, net of depreciation, totaled US$ 114 million, US$ 299 million lower than in 2015, mainly reflecting the end of allocation of VNC costs to pre-operating expenses (US$ 287 million) and lower expenses with Long Harbour (US$ 10 million).

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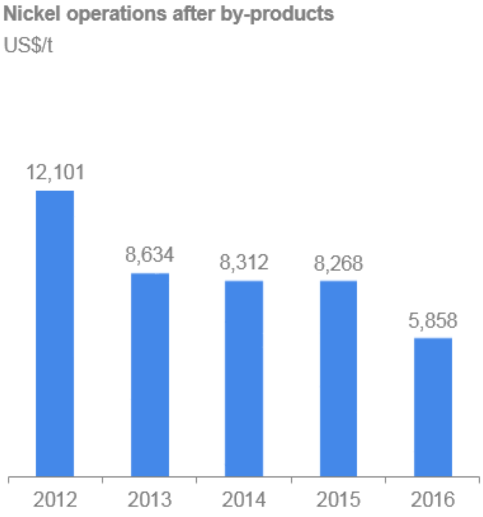
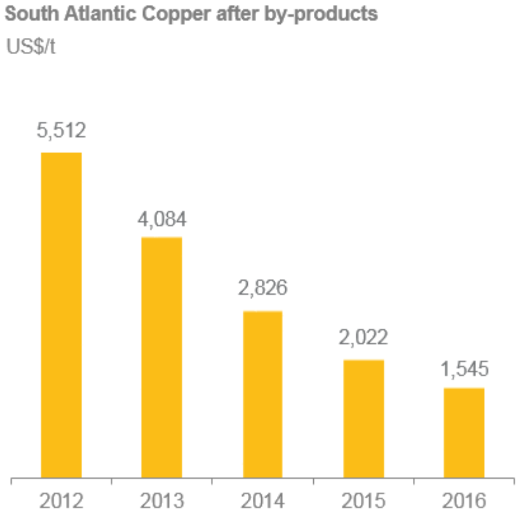
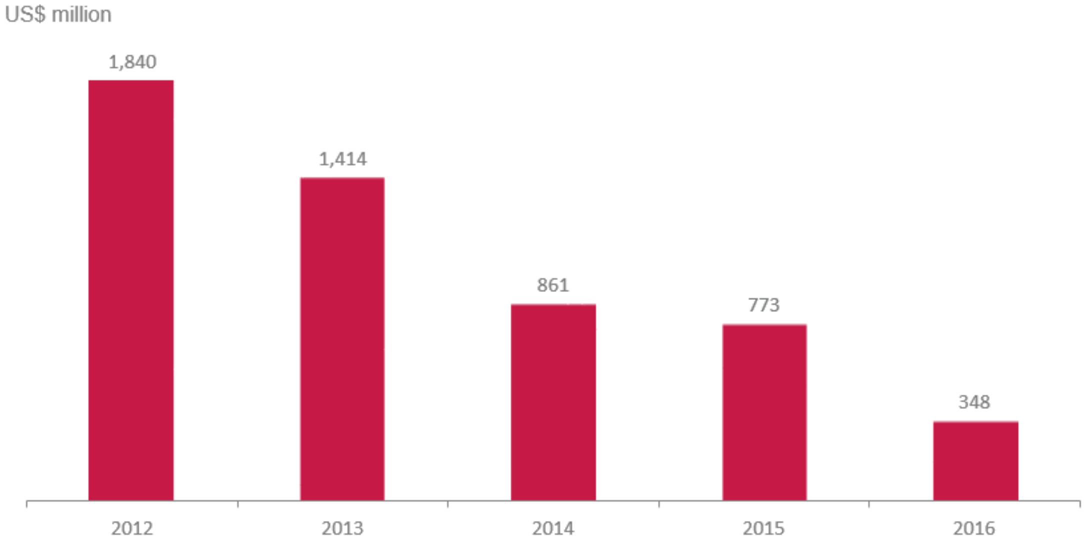
[56] Net of the effects of volumes and exchange rate.

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





Base Metals – total expenses[1]



[1] Excluding depreciation, amortization, insurance and goldstream.

Quarterly performance

Adjusted EBITDA was US$ 543 million in 4Q16, increasing US$ 93 million vs. 3Q16[57], as a result of higher prices (US$ 123 million) and exchange rate variations (US$ 17 million), which were partially offset by higher costs[58] (US$ 21 million) and SG&A expenses (US$ 13 million).

[57] 3Q16 net of the one-off positive effect of the goldstream transaction (US$ 150 million).

[58] After adjusting for impacts of volumes and exchange rate.

SALES REVENUES AND VOLUMES

Nickel sales revenues were US$ 894 million in 4Q16, increasing US$ 97 million vs. 3Q16 as a result of the positive impact of higher volumes (US$ 53 million) and higher realized nickel prices in 4Q16 (US$ 44 million). Sales volumes were 83 kt, an increase of 6 kt when compared to the previous quarter.

Copper sales revenues were US$ 585 million in 4Q16, increasing US$ 133 million vs. 3Q16 as a result of higher realized copper prices in 4Q16 (US$ 101 million) and higher volumes (US$ 32 million). Sales volumes were 115 kt in 4Q16, 8 kt higher than in 3Q16.

PGMs (platinum group metals) sales revenues totaled US$ 52 million in 4Q16, decreasing US$ 52 million vs. 3Q16. Sales volumes were 73,000 oz in 4Q16 vs. 130,000 oz in 3Q16. PGMs sales volumes decreased, mainly due to lower production of platinum and palladium.

Sales revenues from gold contained as a by-product in our nickel and copper concentrates amounted to US$ 164 million in 4Q16, decreasing by US$ 15 million vs. 3Q16 as a result of lower realized prices (US$ 16 million). Sales volumes of gold as a by-product amounted to 132,000 oz in 4Q16, 3,000 oz higher than in 3Q16.

Net operating revenue by product

US$ million	4Q16	3Q16	4Q15	2016	2015
Nickel	894	797	782	3,050	3,412
Copper	585	452	413	1,915	1,720
PGMs	52	104	96	351	404
Gold as by-product	164	179	122	627	477
Silver as by-product	13	9	8	42	30
Others	52	38	37	154	119
Total	**1,760**	**1,579**	**1,458**	**6,139**	**6,163**

REALIZED NICKEL PRICES

Nickel realized price was US$ 10,803/t, US$ 7/t lower than the average LME nickel price of US$ 10,810/t in 4Q16.

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).

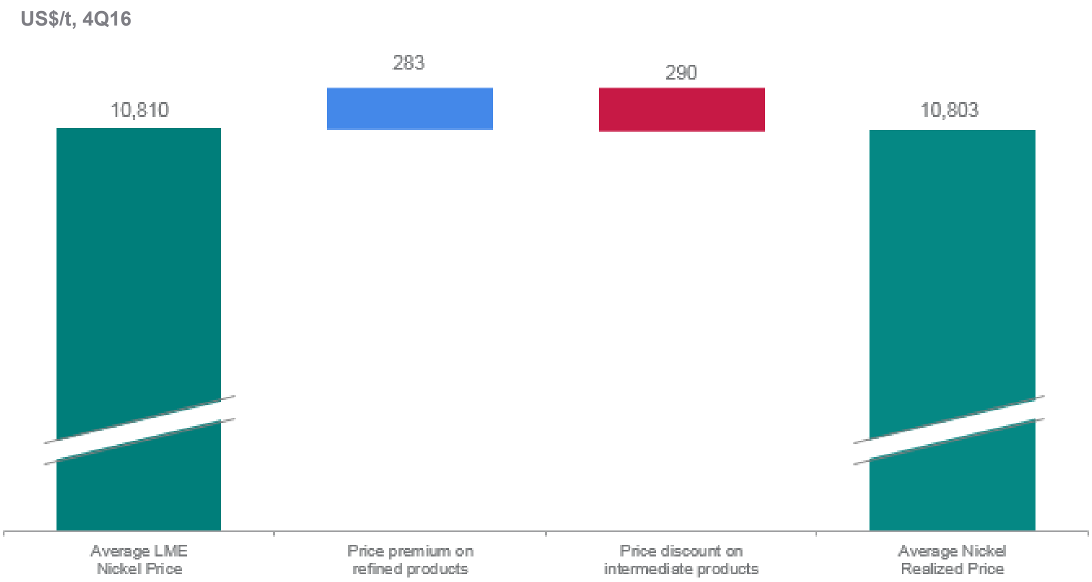
Refined nickel products have higher nickel content, typically commanding a premium over the average LME nickel price, whereas nickel intermediates are less pure as they are only partially processed. Due to this difference, intermediate products are sold at a discount. The amount of the discount will 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 87% of total nickel sales in 4Q16. Sales of intermediate products accounted for the balance.

The realized nickel price differed from the average LME price in 4Q16 due to the following impacts:

- Premium for refined finished nickel products averaged US$ 325/t, with an impact on the aggregate realized nickel price of US$ 283/t;
- Discount for intermediate nickel products averaged US$ 2,238/t, with an impact on the aggregate realized nickel price of -US$ 290/t.

Price realization – nickel



REALIZED COPPER PRICES

Realized copper price was US$ 5,093 /t, US$ 184/t lower than the average LME copper price of US$ 5,277/t in 4Q16. Vale's copper products are mostly intermediate forms of copper, predominantly in the form of concentrate, which is sold at a discount to the LME price. 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[59].

The realized copper price differed from the average LME price in 4Q16 due to the following impacts:

(i) Current period price adjustments: mark-to-market of invoices still open in the quarter

[59] On December 31st, 2016, Vale had provisionally priced copper sales totaling 115,687 tons valued at a LME forward price of US$ 5,239/t, subject to final pricing over the next several months.

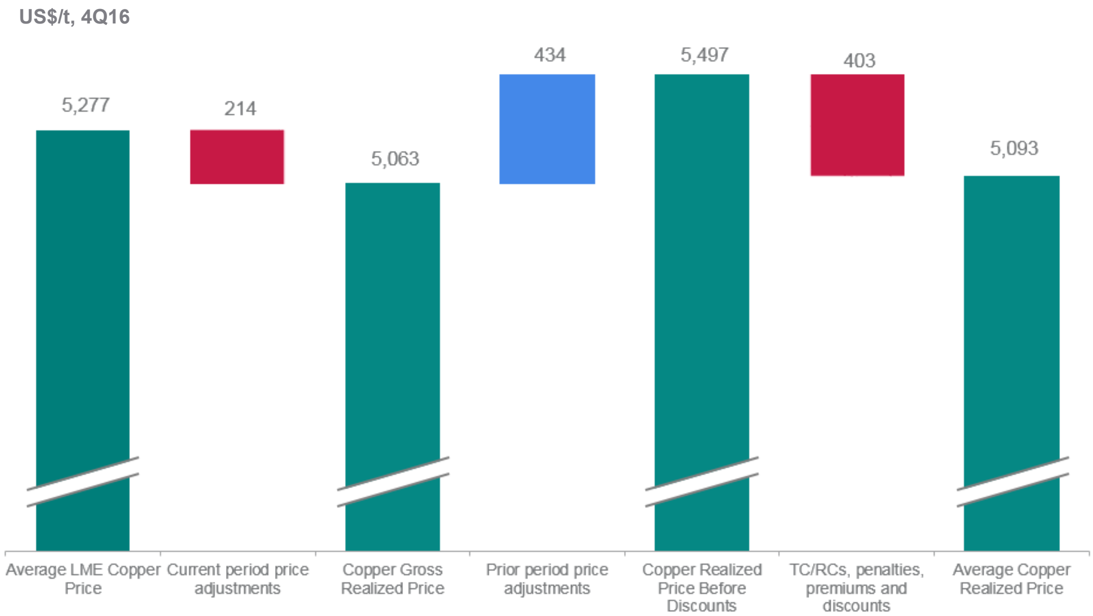
based on the copper price forward curve[60] at the end of the quarter (-US$ 214/t);

(ii) 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$ 434/t);

(iii) TC/RCs, penalties, premiums and discounts for intermediate products (-US$ 403/t).

Excluding the effects of prior period price adjustments and the discounts for copper intermediate products, including TC/RCs, the gross realized copper price[61] was US$ 5,063/t in 4Q16.

Price realization – copper



Realized copper prices increased 21% in 4Q16 vs. 3Q16, while LME copper prices increased 11% in the same period, mainly due to the favourable impact of the provisional pricing system on sales revenues that was US$ 25 million in 4Q16 vs. -US$ 22 million in 3Q16, partially offset by higher discounts associated with copper intermediate products that increased the TC/RCs, penalties and discounts in 4Q16 (US$ 9 million).

Average prices

US$/ metric ton	4Q16	3Q16	4Q15	2016	2015
Nickel - LME	10,810	10,265	9,437	9,609	11,807
Copper - LME	5,277	4,772	4,892	4,863	5,494
Nickel	10,803	10,317	9,310	9,800	11,684
Copper	5,093	4,218	3,824	4,458	4,353
Platinum (US$/oz)	887	1,060	818	919	1,020
Gold (US$/oz)	1,246	1,383	1,064	1,260	1,123
Silver (US$/oz)	18.52	15.15	10.00	16.22	12.63
Cobalt (US$/lb)	12.71	11.83	8.55	11.01	9.95

[60] Includes a small amount of final invoices that were provisionally priced and settled within the quarter.

[61] Price to be used when comparing with other copper producers' realized price.

SALES VOLUME PERFORMANCE

Sales volumes of nickel achieved 83 kt in 4Q16, 6 kt higher than the previous quarter and in line with 4Q15.

Sales volumes of copper achieved an all-time record of 115 kt in 4Q16, 8 kt higher than the previous quarter, and 7 kt higher than in 4Q15, due to higher sales of copper from our North Atlantic nickel operations and Salobo.

Sales volumes of gold as a by-product achieved a record 132,000 oz in 4Q16, 3,000 oz higher than in 3Q16 and 18,000 oz higher than in 4Q15, mainly as a result of Salobo's performance.

Volume sold

'000 metric tons	4Q16	3Q16	4Q15	2016	2015
Nickel operations & by products					
Nickel	83	77	84	311	292
Copper	44	42	43	172	148
Gold as by-product ('000 oz)	25	24	15	94	79
Silver as by-product ('000 oz)	524	388	582	1,851	1,655
PGMs ('000 oz)	73	130	140	507	519
Cobalt (metric ton)	1,487	1,069	1,433	4,734	3,840
Copper operations & by products					
Copper	71	65	65	258	249
Gold as by-product ('000 oz)	107	105	99	403	346
Silver as by-product ('000 oz)	203	221	178	727	648

Costs and expenses

Costs and expenses, net of the one-off effect of the goldstream transaction (US$ 150 million) in 3Q16, increased US$ 88 million in 4Q16, mainly due to higher sales volumes (US$ 61 million), higher expenses (US$ 23 million), and higher costs (US$ 21 million), partially offset by the positive impact of the exchange rate variation (-US$ 17 million).

COSTS OF GOODS SOLD (COGS)

Costs totaled US$ 1.112 billion in 4Q16 (or US$ 1.498 billion including depreciation). After adjusting for the effects of exchange rate variations (-US$ 17 million) and higher sales volumes (US$ 61 million), costs increased by US$ 21 million vs. 3Q16, mainly due to personnel costs related to the profit sharing scheme linked to Vale's performance, being partially offset by lower planned maintenance costs.

BASE METALS COGS - 4Q16 x 3Q16

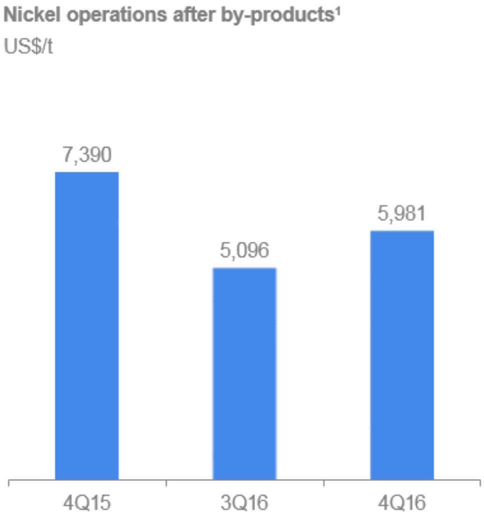
		Variance drivers				
US$ million	3Q16	Volume	Exchange Rate	Others	Total Variation 3Q16 x 4Q16	4Q16
Total costs before depreciation and amortization	**1,047**	**61**	**(17)**	**21**	**65**	**1,112**
Depreciation	382	6	(8)	6	4	386
Total	**1,429**	**67**	**(25)**	**27**	**69**	**1,498**

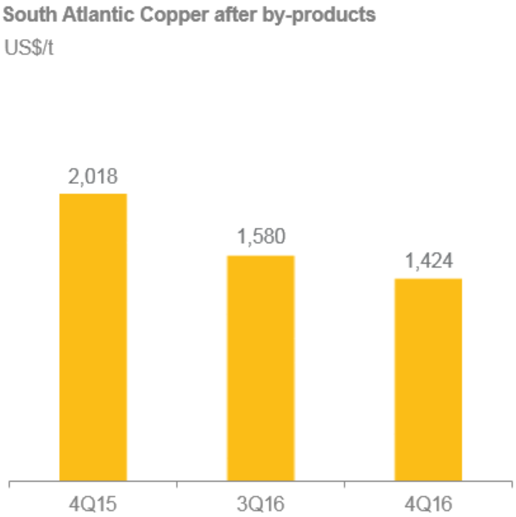
UNIT CASH COST

Unit cash cost in the North Atlantic Operations were in line with 3Q16. The Onça Puma unit cost increased mainly due to the unfavorable impact of 14% lower production in 4Q16. VNC unit cost net of by-product credits decreased from the US$ 12,425/t recorded in 3Q16 to US$ 11,017/t in 4Q16 mainly due to lower costs associated with planned maintenance (US$ 11 million in 3Q16).

Sossego unit cost increased primarily due to the unfavorable impact of 7% lower production in 4Q16. Salobo unit costs decreased mainly due to increased fixed costs dilution as a result of the 12% higher production in 4Q16, together with lower spending on maintenance supplies and services in 4Q16.

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





¹ Excluding the one-off effect of Onça Puma's inventories write-off of US$ 64 million in 3Q16.

Base Metals – unit cash cost of sales per operation, net of by-product credits[1]

US$ / t	4Q16	3Q16	4Q15
NICKEL			
North Atlantic Operations (nickel)	3,412	3,403	3,582
PTVI (nickel)	5,695	5,192	6,326
VNC[2] (nickel)	11,017	12,425	17,380
Onça Puma (nickel)	9,204	8,166[3]	7,710
COPPER			
Sossego (copper)	3,207	2,741	2,840
Salobo (copper)	589	935	1,571

[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) in 3Q16.

EXPENSES

SG&A and other expenses, excluding depreciation, totaled US$ 53 million, an increase of US$ 20 million when compared to the US$ 33 million in 3Q16[62].

Pre-operating and stoppage expenses, net of depreciation, totaled US$ 30 million, as a result of 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 – 4Q16

US$ million	North Atlantic	PTVI Site	VNC Site	Sossego	Salobo	Onça Puma	Other[1]	Total Base Metals
Net Revenues	**846**	**179**	**137**	**141**	**355**	**68**	**34**	**1,760**
Costs[2]	(536)	(123)	(166)	(90)	(150)	(58)	12	(1,112)
SG&A and others	(23)	(4)	(1)	(13)	(2)	(3)	(8)	(53)
R&D	(12)	(3)	(2)	(2)	-	-	(3)	(22)
Pre-operating & stoppage	(30)	-	-	-	-	-	-	(30)
EBITDA	**245**	**49**	**(32)**	**36**	**203**	**7**	**35**	**543**
Ni deliveries (kt)	44	21	12	-	-	6	-	83
Cu deliveries (kt)	44	-	-	23	48	-	-	115

[1] Includes the PTVI and VNC off-takes, intercompany sales, purchase of finished nickel and corporate center expenses allocated for base metals, SG&A and others also include the positive effect of dividends from KNC (US$ 4 million).
[2] Base Metals COGS currency exposure in 4Q16 was made up as follows: 43% in Canadian Dollar, 25% in Brazilian Real, 20% in US Dollar, 9% in Euro and 2% in Indonesian Rupiah.

EBITDA

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

- The North Atlantic operations EBITDA was US$ 245 million, decreasing by US$ 40 million vs. 3Q16 mainly due to higher personnel costs as a result of higher profit sharing incentives (US$ 61 million), higher operational service costs and seasonally higher energy costs in 4Q16 relative to 3Q16 due to lower temperatures.
- PTVI's EBITDA was US$ 49 million, in line with 3Q16.
- VNC's EBITDA was negative US$ 32 million, an improvement compared to the negative US$ 39 million in 3Q16, as a result of lower costs (US$ 7 million).

[62] Net of the effect of the US$ 150 million from the goldstream transaction in 3Q16 recorded as "other expenses"

- Onça Puma's EBITDA was US$ 7 million, increasing US$ 56 million vs. 3Q16, as a result of the one-off effect of the write-off of inventories of low-grade ROM (US$ 64 million) in 3Q16.

- Sossego's EBITDA was US$ 36 million, increasing US$ 4 million vs. 3Q16 mainly as a result of higher prices (US$ 27 million), which were partially offset by higher costs and expenses (US$ 14 million) and lower volumes (US$ 8 million).

- Salobo's EBITDA was US$ 203 million, increasing US$ 72 million vs. 3Q16 (excluding the US$ 150 million impact of the goldstream transaction in 3Q16), mainly due to lower costs and expenses (US$ 31 million), higher prices (US$ 26 million) and volumes (US$ 11 million).

Base metals – EBITDA by operation

US$ million	4Q16	3Q16	4Q15
North Atlantic operation[1]	245	285	187
PTVI	49	48	28
VNC	(32)	(39)	(107)
Onça Puma	7	(49)	(10)
Sossego[2]	36	32	14
Salobo	203	281[3]	75
Other[2]	35	42	(76)
Total	543	600[3]	111

[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.

[3] Includes the positive one-off effect of the goldstream transaction (US$ 150 million).

Market outlook – Base Metals

NICKEL

LME nickel prices continued to improve during 4Q16 to an average of USD 10,810/t Ni, from US$ 10,265/t Ni in 3Q16. The rally in price can be attributed to increased stainless steel production in China and elsewhere. The LME nickel price averaged US$ 9,609/t in 2016, down 18.6% from 2015.

Global stainless steel production continued to increase in 4Q16, rising approximately 12% vs. the same period in 2015. Stainless steel production in China in 4Q16 was up approximately 5% vs. 3Q16 and increased 15% vs. 4Q15 as production continued to expand despite capacity closures during the quarter. Demand for nickel in non-stainless applications remained robust, particularly in the automotive and aerospace sectors.

On the supply side, global refined production declined by almost 2% in 2016 vs. 2015. Chinese NPI production increased 11% in 4Q16 vs. 3Q16 and was up 28% vs. 4Q15.

Despite the increase, nickel ore imports into China, which feed NPI production, were down by 10% in 11M16 vs. 11M15. Imports of FeNi into China increased to 140.8 kt contained Ni in 11M16 versus 127.5 kt contained Ni in 11M15, largely as a result of continued Indonesian nickel smelter production ramping up. Refined nickel imports into China grew in 11M16 with 345 kt of nickel imported in 2016 versus 258 kt over the same period in 2015.

Total exchange inventories continued to decline during the fourth quarter versus the third with increases in LME stocks being outpaced by a decline in SHFE inventories. LME stocks at the end of the year stood at 371 kt, declining by 70 kt since the start of the year. Conversely, inventories on the SHFE increased by 45.6 kt to 93.9 kt over the same period. The net impact on global exchange inventories was a decline of 24.4 kt over the course of 2016, indicating the nickel market was in deficit for the year.

On January 11th, 2017, the Indonesian government released a ministerial decree changing the 2009 Mining Law No. 4/2009, which stipulates a ban on the export of unprocessed and semi-processed ores from the country. The ministerial decree allows for the controlled recommencement of nickel ore exports from Indonesia. This change may have the unintended consequence of delaying investment in smelter development given the availability of Indonesian nickel ore expected to enter the market. On February 2nd, 2017, the Philippine government announced the results of a country-wide mining audit undertaken by the Department of Environment and Natural Resources (DENR) with over half of the mines associated with Philippine nickel ore exports identified for potential closure. It is unclear how much ore could potentially be exported from Indonesia and, likewise, it is uncertain if the Philippine mines will be closed or temporarily suspended. The market was in deficit in 2016 and the deficit was expected to widen in 2017. However, depending on Indonesian ore export volumes as well as Philippine mine closures, if any, the deficit in 2017 is likely to be lower than forecast and with that the reduction in global inventories is also likely to slow down. As a result, price recovery is expected to take longer than previously anticipated.

The long-term outlook for nickel continues to be positive as the market is likely to remain in deficit while capital investment for new projects and replacement volumes are 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

After being relatively range bound over the first three quarters of 2016, LME copper prices rose by almost 11% in the fourth quarter to an average of US$ 5,277/t Cu from US$ 4,772/t Cu in the third quarter. This price increase was driven by strengthening demand from China as well as positive sentiment surrounding a potential increase in infrastructure spending in the United States. The average copper price in 2016 was US$ 4,863/t, down 11.5% from 2015.

Global demand for refined copper remained subdued in the fourth quarter as higher copper prices resulted in more scrap entering the market. This was evident in China as refined copper consumption declined just over 8% in 4Q16 vs. 3Q16. However, global demand was up over 2% in 4Q16 vs. the same quarter in 2015 as key copper consuming sectors including auto production and air conditioning improved in 2016.

On the supply side, global refined copper production increased by 5% driven primarily by increased output in China where refined output increased by just over 8% in 2016 vs. 2015. This resulted in increased demand for copper concentrate imports and a subsequent slowing of refined imports (+30% and +0.4% in 11M16 vs. 11M15, respectively).

Chinese copper smelter spot TC/RCs declined significantly in November as the 2017 benchmark price settled approximately 5% lower than the 2016 level. Spot TC/RCs continued to fall in December as the concentrate market is expected to tighten going into 2017.

Shanghai and Comex inventories increased over the fourth quarter (39.5 kt and 16.1 kt Cu, respectively) while the LME declined by 43.9 kt Cu. Total inventories increased by 72.7 kt Cu across all three exchanges over the course of 2016 and totaled just over 555 kt Cu at the end of 2016, indicating the copper market was in surplus in 4Q16.

The market is expected to shift into balance in 2017 as demand for refined copper continues to improve and supply growth levels off as projects and recent mine expansions complete ramp-up. However, increased risk of mine supply disruptions, given ongoing labor strikes and negotiations in Chile and export negotiations in Indonesia, are seen to support prices in the near term. Ahead as well, there is some uncertainty on demand growth levels in China during the second half of the year. Still, over the longer term the copper market is expected to improve as future supply is constrained by declining ore grades and deferred capital investment.

Selected financial indicators - Base Metals

US$ million	4Q16	3Q16	4Q15	2016	2015
Net Revenues	1,760	1,579	1,458	6,139	6,163
Costs[1]	(1,112)	(1,047)	(1,131)	(4,128)	(4,296)
Expenses[1]	(57)	117	(95)	30	44
Pre-operating and stoppage expenses[1]	(30)	(26)	(89)	(114)	(412)
R&D expenses	(22)	(23)	(32)	(83)	(111)
Dividends received	4	0	0	4	0
Adjusted EBITDA	543	600	111	1,848	1,388
Depreciation and amortization	(410)	(403)	(484)	(1,658)	(1,840)
Adjusted EBIT	129	197	(373)	186	(452)
Adjusted EBIT margin (%)	7.4	12.5	(25.6)	3.0	(7.3)

[1] Net of depreciation and amortization

Coal

Annual performance

EBITDA

Adjusted EBITDA for the Coal business segment improved significantly to negative US$ 54 million in 2016 from negative US$ 508 million in 2015, as a result of the ramp-up of the Nacala Logistics Corridor and the Moatize II plant and the significant increase in coal prices, which were partly offset by the geological issues faced by Carborough Downs in 2016. The EBITDA increase of US$ 454 million was mainly driven by lower costs and expenses[63] (US$ 386 million) and higher sales prices (US$ 155 million).

Adjusted EBITDA of coal shipped through the Nacala port reached US$ 110 million in 2016 with the ramp-up of the Nacala Logistics Corridor and the start-up of the Moatize II coal handling and processing plant (CHPP). Further improvements in the coal business performance are expected as the ramp-up of both the Nacala Logistics Corridor and of the Moatize II CHPP progress. The ramp-up is progressing very well, with another monthly production record being achieved in January 2017, which led to a reduction of US$ 21.0/t in the production cost per ton of coal shipped through the Nacala port[64], from US$ 97.8/t in 4Q16 to US$ 76.8/t in January 2017.

The adjusted EBITDA of coal shipped through the Beira Port was negative US$ 215 million being partly offset by the adjusted EBITDA from the Australian operations of US$ 51 million in 2016.

SALES REVENUES AND VOLUMES

Net sales revenues of metallurgical coal increased to US$ 587 million in 2016 from US$ 479 million in 2015, as a result of higher sales prices (US$ 161 million) which were partly offset by lower sales volumes (US$ 51 million). Net sales revenues of thermal coal increased to US$ 252 million in 2016 from US$ 47 million in 2015 as a result of higher sales volumes (US$ 208 million) which were partly offset by lower sales prices (US$ 5 million).

Sales volumes of metallurgical coal totaled 4.907 Mt in 2016, decreasing 707 kt vs. 2015, as a result of the 33% decrease in sales volumes from Carborough Downs, which faced geological issues in 2016 and was divested in November 2016. Sales volumes of thermal coal reached 5.457 Mt in 2016, compared to 0.892 Mt in 2015, as a result of the increase in logistics capacity with the ramp-up of the Nacala Logistics Corridor allowing for the sale of thermal coal inventories.

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[63] After adjusting for the impacts of volumes and exchange rate variation.

[64] FOB cash cost at the port (mine, plant, railroad and port).

REALIZED PRICES

The metallurgical coal realized price, including Moatize coking coal products and Carborough Downs hard coking coal, increased to US$ 119.5/t in 2016 from the US$ 85.5/t recorded in 2015, while the thermal coal realized price decreased to US$ 46.2/t in 2016 compared to US$ 52.4/t in 2015.

COSTS AND EXPENSES

Coal costs and expenses, net of depreciation, totaled US$ 893 million in 2016, decreasing from the US$ 1.062 billion recorded in 2015. After adjusting for the effects of higher sales volumes (US$ 220 million) and exchange rate variation (US$ 3 million), costs and expenses decreased by US$ 386 million in 2016 vs. 2015.

ANNUAL PERFORMANCE BY OPERATION

Highlights by operation are:

Australia

- Adjusted EBITDA for the Australian operations[65] was US$ 51 million in 2016, improving from negative US$ 28 million in 2015, despite the lower sales volumes due to the geological issues faced in 2016 and the divestment of the Carborough Downs operations in November 2016. The increase of US$ 79 million vs. 2015 was mainly a result of the positive impacts of lower costs and expenses[66] (US$ 42 million) and higher sales prices (US$ 15 million).

- Costs and expenses, net of depreciation, for the Australian operations decreased to US$ 111 million in 2016, compared to US$ 258 million in 2015. After adjusting for the effects of lower volumes and exchange rate variation (US$ 105 million), costs and expenses decreased US$ 42 million in 2016 vs. 2015.

Mozambique

- Adjusted EBITDA for the operations in Mozambique was negative US$ 105 million in 2016 compared to the negative US$ 508 million in 2015. The improvement vs. 2015 was mainly driven by the positive impacts of lower costs and expenses[67] (US$ 344 million) and higher sales prices (US$ 140 million).

[65] Includes Carborough Downs operations, Broadlea, currently in care and maintenance, and Eagle Downs.

[66] After adjusting for the impacts of volumes and exchange rate variation.

[67] After adjusting for the impact of volumes variation.

- Adjusted EBITDA for coal shipped through the Nacala port was US$ 110 million in 2016, while adjusted EBITDA for coal shipped through the Beira Port was negative US$ 215 million.

- Production cost per ton of coal shipped through the Nacala port[68] was US$ 107.3/t in 2016, while production cost per ton of coal shipped through the Beira port[70] totaled US$ 143.3/t in 2015.

- Costs and expenses, net of depreciation, decreased to US$ 782 million in 2016, compared to US$ 804 million in 2015. After adjusting for the effects of higher volumes (US$ 322 million), costs and expenses decreased US$ 344 million in 2016 vs. 2015 as a result of the ramp-up of the Nacala Logistics Corridor and the Moatize II CHPP.

- Railed volume[69] reached 8.8 Mt in 2016, being 113% higher than the 4.1 Mt recorded in 2015, and shipped volume[71] totaled 8.7 Mt in 2016, being 136% higher than the 3.7 Mt recorded in 2015, as a result of the ramp-up of the Nacala Logistics Corridor.

Quarterly performance

EBITDA

Adjusted EBITDA for the Coal business segment improved significantly to US$ 156 million in 4Q16 from negative US$ 7 million in 3Q16. The increase of US$ 163 million was mainly driven by the positive impacts of higher sales prices (US$ 200 million) which were partly offset by higher costs and expenses[70] (US$ 43 million).

Adjusted EBITDA of coal shipped through the Nacala port improved significantly to US$ 163 million in 4Q16 from negative US$ 7 million in 3Q16. The adjusted EBITDA at the Beira Port was negative US$ 21 million being partially offset by the adjusted EBITDA from the Australian operations of US$ 14 million in 4Q16.

SALES REVENUES AND VOLUMES

Net sales revenues of metallurgical coal increased to US$ 300 million in 4Q16 from US$ 105 million in 3Q16, as a result of higher sales prices (US$ 179 million) and higher sales volumes (US$ 20 million). Net sales revenues of thermal coal increased to US$ 76 million in 4Q16 from US$ 58 million in 3Q16 as a result of higher sales prices (US$ 21 million) which were partly offset by lower sales volumes (US$ 7 million).

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[68] FOB cash cost at the port (mine, plant, railroad and port).

[69] Includes Sena-Beira and Nacala Logistics Corridor.

[70] After adjusting for the impacts of volumes and exchange rate variation.

Sales volumes of metallurgical coal totaled 1.382 Mt in 4Q16, increasing 19.6% vs. 3Q16, as a result of the ramp-up of Moatize II. Sales volumes of thermal coal totaled 1.121 Mt in 4Q16, 11.9% lower than in 3Q16, 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 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 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 differential 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 4Q16, metallurgical coal sales were priced as follows: (i) 16% based on the quarterly fixed benchmark prices; (ii) 78% based on index lagged prices; and (iii) 6% based on fixed prices.

The metallurgical coal realized price, including Moatize coking coal products and Carborough Downs hard coking coal, increased 137% to US$ 216.9/t in 4Q16 from the US$ 91.04/t recorded in 3Q16.

Seaborne coking coal prices have maintained an upward trend in 4Q16 until peaking at US$ 310/t by late November 2016 and easing back to US$ 230/t by the end of 2016. Higher realized sales prices for metallurgical coal were a result of the significant increase of coking coal prices and the higher sales volumes based on index linked prices despite the gap between the benchmark price fixed at US$ 200/t for 4Q16 versus the index average[71] of US$ 266.85/t in the same period.

Metallurgical coal prices

US$ / metric ton	4Q16	3Q16	4Q15
Premium Low Vol HCC index price [1]	266.2	135.6	76.6
Mid Vol HCC index price [2]	233.4	120.8	73.9
HCC benchmark price	200.0	92.5	84.0
Vale's metallurgical coal realized price	216.9	91.0	73.8

[1] Platts Premium Low Vol Hard Coking Coal FOB Australia.
[2] Platts Mid Vol Hard Coking Coal 64 CSR FOB Australia.

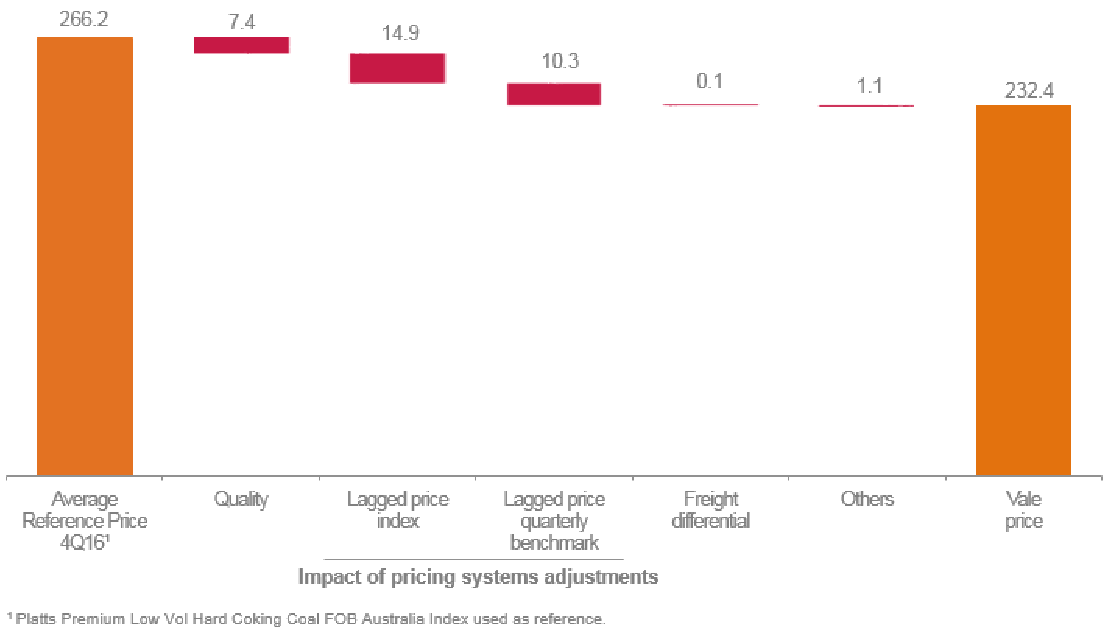
Price realization in 4Q16 for metallurgical coal from Mozambique was impacted by:

- Quality adjustment over the index reference price due to product characteristics which negatively impacted prices in 4Q16 by US$ 7.4/t.
- Sales using lagged index prices which negatively impacted prices in 4Q16 by US$ 14.9/t, as index prices sharply increased in 4Q16,
- Sales using the quarterly benchmark pricing system which negatively impacted prices in 4Q16 by US$ 10.3/t mainly as a result of the gap between the quarterly benchmark price and the average index price in 4Q16.
- Freight differentials which negatively impacted prices in 4Q16 by US$ 0.1/t, mainly due to freight differentials between Vale's freight rates contracted from Mozambique to the delivery ports and the freight rates set in the sales contracts, which are determined considering the delivery from the index reference port.
- Other adjustments, mainly price discounts due to penalties and trials with new costumers or new products, which negatively impacted prices in 4Q16 by US$ 1.1/t.

[71] Premium Low Vol HCC index price.

Price realization – Metallurgical coal from Mozambique

US$/t 4Q16

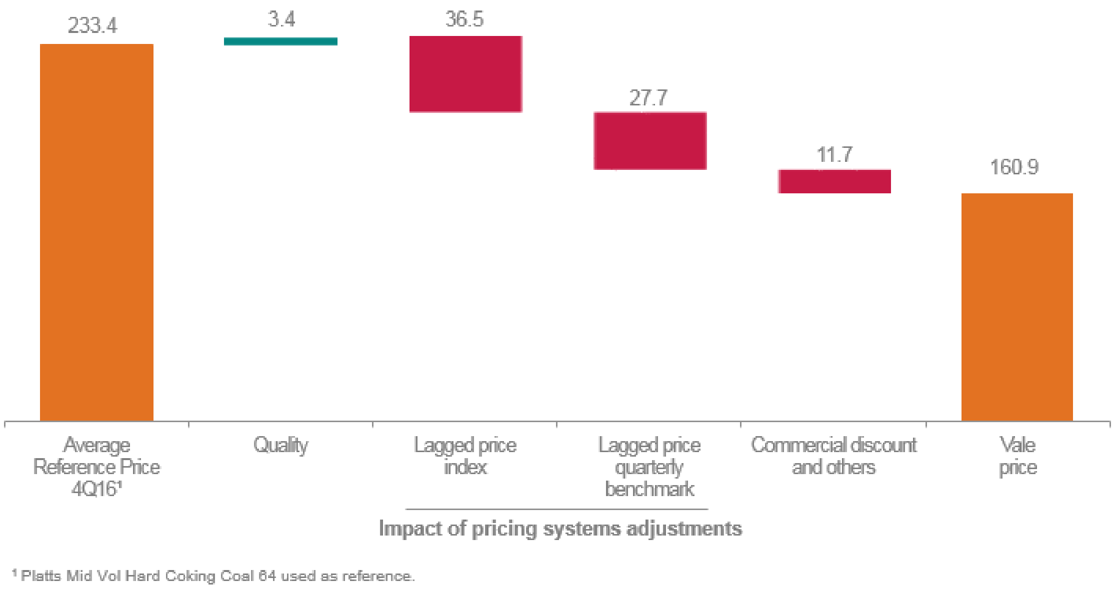


Price realization in 4Q16 for the Hard Coking Coal from Carborough Downs was impacted by:

- Quality adjustment which positively impacted prices by US$ 3.4/t.
- Lagged index prices which negatively impacted prices by US$ 36.5/t.
- Quarterly benchmark price which negatively impacted prices by US$ 27.7/t.
- Commercial discount and other items which negatively impacted prices by US$ 11.7/t

Price realization – Carborough Downs Hard Coking Coal

US$/t, 4Q16



Thermal coal

In 4Q16, thermal coal sales were priced as follows: (i) 83% based on index prices and (ii) 17% based on fixed prices.

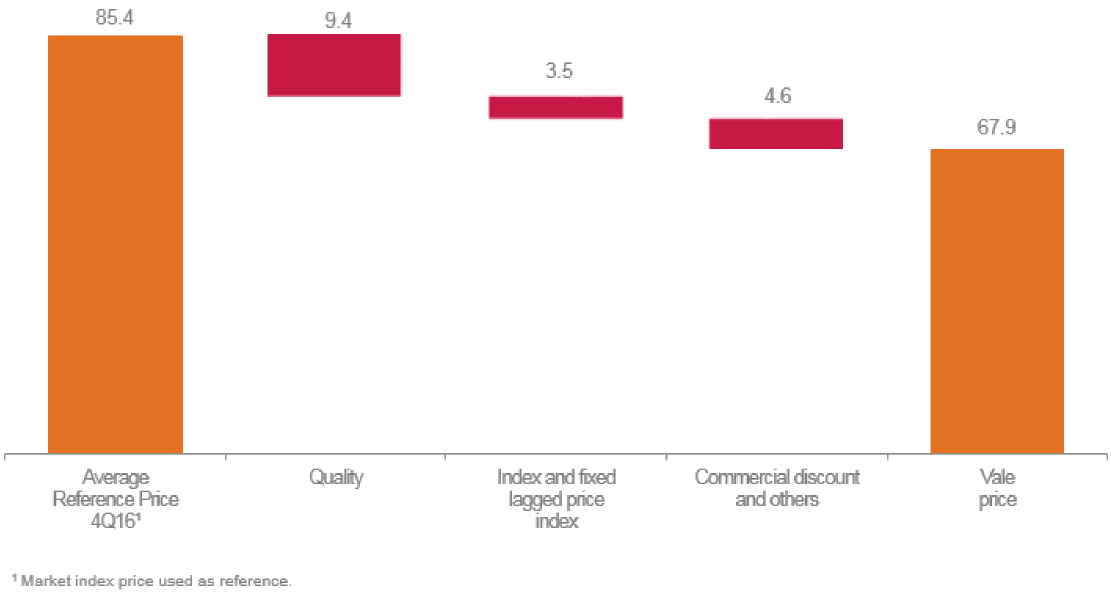
The realized price of thermal coal was US$ 67.9/t in 4Q16, increasing 48.2% vs. US$ 45.8/t in 3Q16. Thermal coal price realization improved as a result of the increase in sales volumes under contracts and higher prices. A better demand in 4Q16 with restocking in Europe and Asia ahead of winter partially supported prices amid uncertainties regarding weather disruptions in Australia and Indonesia.

Price realization in 4Q16 for thermal coal was impacted by:

- Quality adjustment which negatively impacted prices by US$ 9.4/t.
- Lagged index and fixed pricing which negatively impacted prices by US$ 3.5/t.
- Commercial discount which negatively impacted prices by US$ 4.6/t.

Price realization – Thermal coal from Mozambique

US$/t, 4Q16



COSTS AND EXPENSES

Coal costs and expenses, net of depreciation, totaled US$ 220 million in 4Q16, increasing against the US$ 170 million recorded in 3Q16. After adjusting for the effects of higher volumes (US$ 7 million), costs and expenses increased by US$ 43 million in 4Q16 vs. 3Q16, mainly in the Carborough Downs operations (US$ 34 million).

QUARTERLY PERFORMANCE BY OPERATION

Highlights by operation are:

Australia

- Adjusted EBITDA for the Australian operations[72] was US$ 14 million in 4Q16, decreasing from US$ 28 million in 3Q16 as a result of the divestment of the Carborough Downs operations in November 2016.
- Costs and expenses, net of depreciation, for Australian operations totaled US$ 35 million in 4Q16, compared to US$ 1 million in 3Q16, which was positively impacted by the reversal of inventory impairments of US$ 10 million. After adjusting for the reversal of inventory impairments in 3Q16, costs and expenses increased by US$ 26 million.

[72] Includes Carborough Downs operations; Broadlea and Eagle Downs are currently in care and maintenance.

Mozambique

- Adjusted EBITDA for the operations in Mozambique improved significantly to US$ 142 million in 4Q16 compared to the negative US$ 35 million in 3Q16. The increase of US$ 177 million vs. 3Q16 was mainly driven by the positive impacts of higher sales prices (US$ 178 million).

- Adjusted EBITDA of coal shipped through the Nacala port improved to US$ 163 million in 4Q16 from negative US$ 7 million in 3Q16. Adjusted EBITDA at the Beira port was negative US$ 21 million.

- Production cost per ton of coal shipped through the Nacala port[73] increased 11% to US$ 97.8/t in 4Q16 from US$ 87.3/t in 3Q16 due to constraints on the supply of explosives affecting the blasting process and resulting in a lower production figure compared to 3Q16.

- Supply of explosives was reestablished and operational performance has been constantly improving since then, with production totaling 0.6 Mt in December 2016 and reaching the monthly record of 0.8 Mt in January 2017.

- Production cost per ton of coal shipped through the Nacala port[75] decreased by US$ 21.0/t to US$ 76.8/t in January 2017, compared to the US$ 97.8/t recorded in 4Q16, as a result of growing production and the ramp-up of the Nacala Logistics Corridor.

- Costs and expenses, net of depreciation, amounted to US$ 185 million in 4Q16, compared to US$ 169 million in 3Q16. After adjusting for the effects of higher volumes (US$ 7 million), costs and expenses increased US$ 9 million in 4Q16 vs. 3Q16 as a result of higher stoppage expenses at Beira and the above-mentioned increase in production costs.

- Railed volume[74] was 2.4 Mt in 4Q16, being 13% higher than the 2.1 Mt railed in 3Q16. Shipped volume[76] was 2.1 Mt in 4Q16, in line with the 2.2 Mt shipped in 3Q16. In December 2016, our logistics operations in Mozambique reached all-time records, with railed volumes[76] of 1,097,000 t and shipped volumes[76] of 1,071,000 t.

COAL MARKET OUTLOOK

Coking coal prices continued to perform well in 4Q16 on the back of a still strong Chinese demand, production restrictions in China and operational problems at mines in Australia.

[73] FOB cash cost at the port (mine, plant, railroad and port).
[74] Includes Sena-Beira and Nacala Logistics Corridor.

Prices for the low volatility premium hard coking coal quarterly benchmark FOB Australia increased by 116% from US$ 92/t in 3Q16 to US$ 200/t in 4Q16, and also spot prices continued to climb from US$ 133/t in 3Q16 to US$ 262/t in 4Q16.

The coking coal price rally started in 2H16, when China's supply side reform discouraged local coal production, mainly with restrictions on the number of days of mine operations, as demand for coal, an input for steel production, continued strong. In the year, China's coal production declined by 11% year-on-year, while its steel production increased by 1.2%. To meet its needs for metallurgical coal, China resorted to the seaborne market, increasing its coking coal imports by nearly 24% year-on-year reaching 59.2 Mt, reversing the decline observed over the two preceding years.

As the market remained tight, Chinese regulators (NDRC) began to ease production controls in September and decided to lift the 276-day constraint mid-November allowing domestic coal miners to reestablish the 330 days per annum of operation at the mines. Local raw production rebounded, increasing by 9.3% MoM from 282 Mt in October to 308 Mt in November, and prices started to decrease as well. The NDRC decision was extended until the end of 1Q17.

Despite the price decrease at the end of 4Q16, benchmark price for low-volatile hard coking coal was set at US$ 285/t in 1Q17 and low-volatile PCI settled at US$ 180/t FOB Australia.

Thermal coal prices also rallied in 4Q16. The Richards Bay Thermal Coal index first inched higher from around US$ 75/t at the beginning of 4Q16 to US$ 101/t in early November 2016. The average price in 4Q16 increased from US$ 65/t to US$ 85/t supported by Chinese demand and weather disruptions in Indonesia.

Electricity output in China increased 4.5% year on year to 5,911 TWh in 2016. Of this, thermal power output was 4,396 TWh, or 74.4% of its total output, rising 2.6% year on year. Conversely, European thermal coal demand has fallen by 13% year on year, largely due to coal-fired power plant capacity closures in the UK.

The renewed relaxation measure in China should allow the market to return to balance into 2017 and the thermal coal price to correct through the year.

Coal business performance

Net operating revenue by product

US$ million	4Q16	3Q16	4Q15	2016	2015
Metallurgical coal	300	105	98	587	479
Thermal coal	76	58	10	252	47
Total	**376**	**163**	**108**	**839**	**526**

Average prices

US$/ metric ton	4Q16	3Q16	4Q15	2016	2015
Metallurgical coal	217.01	91.04	73.75	119.54	85.55
Thermal coal	67.67	45.80	44.19	46.17	52.36

Volume sold

'000 metric tons	4Q16	3Q16	4Q15	2016	2015
Metallurgical coal	1,382	1,156	1,329	4,907	5,614
Thermal coal	1,121	1,271	226	5,457	892
Total	**2,503**	**2,427**	**1,555**	**10,365**	**6,506**

Selected financial indicators - Coal

US$ million	4Q16	3Q16	4Q15	2016	2015
Net Revenues	376	163	108	839	526
Costs[1]	(185)	(157)	(260)	(872)	(839)
Expenses[1]	(10)	3	(9)	35	(140)
Pre-operating and stoppage expenses[1]	(18)	(13)	(12)	(41)	(61)
R&D expenses	(7)	(3)	(4)	(15)	(22)
Dividends received	-	-	28	-	28
Adjusted EBITDA	156	(7)	(149)	(54)	(508)
Depreciation and amortization	(111)	(41)	(41)	(190)	(192)
Adjusted EBIT	45	(48)	(218)	(244)	(728)
Adjusted EBIT margin (%)	12	(29)	(202)	(29)	(138)

[1] Net of depreciation and amortization

Mozambique – EBITDA by logistics corridor

US$ million	4Q16	3Q16	4Q15	2016	2015
Nacala	163	(7)	0	110	0
Beira	(21)	(28)	(144)	(215)	(508)
Total Mozambique	**142**	**(35)**	**(144)**	**(105)**	**(508)**

Mozambique - Production cost by logistics corridor

US$ / t	4Q16	3Q16	4Q15	2016	2015
Nacala	97.8	87.3	0	107.3	0
Beira	162.1	190.8	138.3	163.9	142.6
Total Mozambique	**107.2**	**102.7**	**138.3**	**120.9**	**142.6**

Fertilizer nutrients

On December 19th 2016, Vale announced the sale of its Fertilizers assets to Mosaic, excluding its nitrogen and phosphate assets at Cubatão. Vale also announced that it expects to sell the Cubatão assets in 2017. Considering the expectation to sell all the Fertilizers assets in the short term, Vale will report on its Financial Statements operational and financial results altogether for the Fertilizers segment in the income statements under “loss of discontinued operations”. For comparison purposes, all analysis presented on this press release includes the Fertilizers numbers, however we also present the tables without the Fertilizers numbers (“ex-Fertilizers”) in order to allow reconciliation with the Financial Statements.

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 / information to the market / financial statements.

Conference call and webcast

Vale will host two conference calls and webcasts on Thursday, February 23, 2017. The first, in Portuguese (non-translated), 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 Standard Time and 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. A podcast will be available on Vale's Investor Relations website.

ANNEX 1 – SIMPLIFIED FINANCIAL STATEMENTS INCLUDING FERTILIZERS

Income statement

US$ million	4Q16	3Q16	4Q15	2016	2015
Net operating revenue	9,694	7,324	5,899	29,363	25,609
Cost of goods sold	(5,538)	(4,955)	(5,119)	(19,537)	(20,513)
Gross profit	**4,156**	**2,369**	**780**	**9,826**	**5,096**
Gross margin (%)	42.9	32.3	13.2	33.5	19.9
Selling, general and administrative expenses	(151)	(153)	(167)	(563)	(652)
Research and development expenses	(118)	(85)	(119)	(341)	(477)
Pre-operating and stoppage expenses	(133)	(122)	(238)	(471)	(1,027)
Other operational expenses	(157)	51	64	(301)	(206)
Results on measurement or sale of non-current assets	29	(29)	(29)	(66)	61
Impairment of non-current assets and onerous contracts	(2,912)	-	(8,926)	(2,912)	(8,926)
Operating profit	**714**	**2,031**	**(8,635)**	**5,172**	**(6,131)**
Financial revenues	56	35	78	185	268
Financial expenses	(771)	(715)	(326)	(2,727)	(1,112)
Gains (losses) on derivatives, net	96	(39)	427	1,256	(2,477)
Monetary and exchange variation	13	(328)	174	3,149	(7,480)
Equity income	(80)	46	(37)	312	(439)
Other results on sale or write-off of investments from associates and joint ventures	(74)	(33)	(446)	(1,220)	(349)
Income (loss) before taxes	**(46)**	**997**	**(8,765)**	**6,127**	**(17,720)**
Current tax	(126)	(57)	(152)	(941)	(389)
Deferred tax	665	(358)	74	(1,210)	5,489
Net Earnings (loss) from continuing operations	**493**	**582**	**(8,843)**	**3,976**	**(12,620)**
Loss attributable to noncontrolling interest	32	(7)	274	6	491
Net earnings (attributable to the Company's stockholders)	**525**	**575**	**(8,569)**	**3,982**	**(12,129)**
Earnings (loss) per share (attributable to the Company's stockholders - US$)	0.10	0.11	(1.66)	0.77	(2.35)
Diluted earnings (loss) per share (attributable to the Company's stockholders - US$)	0.10	0.11	(1.66)	0.77	(2.35)

Equity income (loss) by business segment

US$ million	4Q16	3Q16	4Q15	2016	%	2015	%
Ferrous minerals	41	62	44	179	57	26	(6)
Coal	4	2	3	(4)	(1)	(3)	1
Base metals	-	(2)	(99)	(4)	(1)	(132)	30
Steel	(140)	(35)	(21)	57	18	(414)	94
Others	15	19	36	84	27	84	(19)
Total	(80)	46	(37)	312	100	(439)	100

Balance sheet

US$ million	31/12/2016	30/9/2016	31/12/2015
Assets			
Current assets	**19,093**	**19,507**	**15,473**
Cash and cash equivalents	4,262	5,369	3,591
Accounts receivable	3,749	2,556	1,476
Other financial assets	363	322	219
Inventories	3,736	3,900	3,528
Prepaid income taxes	171	317	900
Recoverable taxes	1,679	1,603	1,404
Others	587	651	311
Non-current assets held for sale and discontinued operation	4,546	4,789	4,044
Non-current assets	**11,151**	**10,518**	**10,653**
Judicial deposits	1,023	1,073	882
Other financial assets	628	705	282
Recoverable income taxes	548	542	471
Recoverable taxes	879	688	501
Deferred income taxes	7,554	6,849	7,904
Others	519	661	613
Fixed assets	**68,771**	**72,062**	**62,366**
Total assets	**99,014**	**102,087**	**88,492**
Liabilities			
Current liabilities	**10,675**	**10,847**	**10,545**
Suppliers and contractors	3,910	3,751	3,365
Loans and borrowing	1,677	2,181	2,506
Other financial liabilities	1,086	1,426	2,551
Taxes payable	673	634	595
Provision for income taxes	173	154	241
Provisions	1,043	752	540
Dividends and interest on capital	798	0	0
Liabilities related to associates and joint ventures	292	329	0
Others	963	1,471	640
Liabilities directly associated with non-current assets held for sale and discontinued operations	60	149	107
Non-current liabilities	**47,316**	**49,409**	**42,243**
Loans and borrowing	27,678	29,268	26,347
Other financial liabilities	2,127	1,962	1,984
Taxes payable	4,961	4,977	4,085
Deferred income taxes	1,700	1,676	1,670
Provisions	6,215	6,608	5,309
Liabilities related to associates and joint ventures	785	795	0
Gold stream transaction	2,090	2,158	1,749
Others	1,760	1,965	1,099
Total liabilities	**57,991**	**60,256**	**52,788**
Stockholders' equity	**41,024**	**41,831**	**35,704**
Total liabilities and stockholders' equity	**99,014**	**102,087**	**88,492**

Cash flow

US$ million	4Q16	3Q16	4Q15	2016	2015
Cash flows from operating activities:					
Net income (loss) before taxes on income	(46)	997	(8,765)	6,127	(17,720)
Adjustments to reconcile					
Depreciation, depletion and amortization	1,094	963	984	3,834	4,029
Equity Income	80	(46)	37	(312)	439
Other items from non-current assets	45	62	29	1,136	136
Impairment on assets and investments	2,912	0	9,372	2,912	8,926
Items of the financial result	606	1,047	(353)	(1,863)	10,801
Variation of assets and liabilities					
Accounts receivable	(1,548)	(343)	785	(2,799)	1,671
Inventories	370	12	(73)	398	(304)
Suppliers and contractors	(194)	255	491	42	740
Payroll and related charges	123	(16)	(79)	152	(603)
Tax assets and liabilities, net	(6)	(43)	91	(100)	(258)
Goldstream transaction	0	524	0	524	532
Others	278	(186)	(330)	701	(258)
Net cash provided by operations	3,714	3,226	2,189	10,752	8,131
Interest on loans and financing	(421)	(423)	(305)	(1,666)	(1,462)
Derivatives received (paid), net	(548)	(191)	(275)	(1,602)	(1,202)
Remuneration paid to debentures	(47)	0	(26)	(84)	(65)
Income taxes	(55)	(88)	(162)	(402)	(527)
Income taxes - settlement program	(113)	(116)	(86)	(417)	(384)
Net cash provided by operating activities	2,530	2,408	1,335	6,581	4,491
Cash flows from investing activities:					
Additions to investments	(9)	(9)	(12)	(239)	(156)
Additions to property, plant and equipment	(1,396)	(1,249)	(2,190)	(5,243)	(8,371)
Proceeds from disposal of assets and investments	203	327	423	554	1,456
Dividends and interest on capital received from joint ventures and associates	79	0	87	197	318
Proceeds from goldstream transaction	0	276	0	276	368
Others	(163)	(2)	(36)	(243)	226
Net cash used in investing activities	(1,286)	(657)	(1,728)	(4,698)	(6,159)
Cash flows from financing activities:					
Loans and financing					
Additions	788	1,573	1,045	6,994	4,995
Repayments	(2,781)	(1,987)	(1,012)	(7,734)	(2,826)
Dividends and interest on capital attributed to shareholders	(250)	0	(500)	(250)	(1,500)
Dividends and interest on capital attributed to noncontrolling interest	(87)	(129)	(3)	(291)	(15)
Other transactions with noncontrolling interest	0	0	0	(17)	1,049
Net cash provided by (used in) financing activities	(2,330)	(543)	(470)	(1,298)	1,703
Increase (decrease) in cash and cash equivalents	(1,085)	1,208	(863)	585	35
Cash and cash equivalents in the beginning of the period	5,369	4,168	4,397	3,591	3,974
Effect of exchange rate changes on cash and cash equivalents	(22)	(7)	57	86	(418)
Cash and cash equivalents, end of period	4,261	5,369	3,591	4,262	3,591
Non-cash transactions:					
Additions to property, plant and equipment - interest capitalization	90	172	193	653	761

ANNEX 2 – VOLUMES SOLD, PRICES AND MARGINS

Volume sold - Minerals and metals

'000 metric tons	4Q16	3Q16	4Q15	2016	2015
Iron ore fines	80,287	74,231	79,213	289,940	276,393
ROM	2,220	351	1,627	3,496	12,269
Pellets	13,190	12,001	10,837	47,709	46,284
Manganese ore	534	448	568	1,851	1,764
Ferroalloys	35	31	12	127	69
Thermal coal	1,121	1,271	226	5,457	892
Metallurgical coal	1,382	1,156	1,329	4,907	5,614
Nickel	83	77	84	311	292
Copper	115	107	108	430	397
Gold as by-product ('000 oz)	132	129	114	497	425
Silver as by-product ('000 oz)	727	609	760	2,578	2,303
PGMs ('000 oz)	73	130	140	507	519
Cobalt (metric ton)	1,487	1,069	1,433	4,734	3,840

Average prices

US$/ton	4Q16	3Q16	4Q15	2016	2015
Iron ore fines CFR reference price (dmt)	79.10	59.30	45.10	62.34	54.60
Iron ore fines CFR/FOB realized price	69.40	50.95	37.18	54.44	44.61
ROM	12.61	11.40	7.99	11.73	8.35
Pellets CFR/FOB (wmt)	92.27	82.58	71.98	80.26	77.79
Manganese ore	162.92	113.84	7.04	110.87	56.42
Ferroalloys	857.14	806.45	750.00	757.67	899.32
Thermal coal	67.67	45.80	44.19	46.17	52.36
Metallurgical coal	217.01	91.04	73.75	119.54	85.55
Nickel	10,803.00	10,317.00	9,310.00	9,800.00	11,684.00
Copper	5,093.00	4,218.00	3,823.90	4,458.00	4,353.00
Platinum (US$/oz)	887.00	1,060.30	818.00	919.00	1,020.00
Gold (US$/oz)	1,246.00	1,383.00	1,064.00	1,260.49	1,123.00
Silver (US$/oz)	18.52	15.15	10.00	16.22	12.63
Cobalt (US$/lb)	12.71	11.83	8.55	11.01	9.95

Operating margin by segment (EBIT adjusted margin)

%	4Q16	3Q16	4Q15	2016	2015
Ferrous minerals	50.6	42.2	25.5	43.0	24.0
Coal	12.0	(29.4)	(201.9)	(29.1)	(138.4)
Base metals	7.3	12.5	(25.6)	3.0	(7.3)
Total[1]	**39.2**	**31.4**	**5.0**	**30.2**	**10.6**

[1] Excluding non-recurring effects

Annex 3 – reconciliation of IFRS and "NON-GAAP" information including Fertilizers

(a) Adjusted EBIT[1]

US$ million	4Q16	3Q16	4Q15
Net operating revenues	9,694	7,323	5,899
COGS	(5,538)	(4,955)	(5,119)
SG&A	(151)	(153)	(167)
Research and development	(118)	(85)	(119)
Pre-operating and stoppage expenses	(133)	(122)	(238)
Other operational expenses	(157)	51	64
Adjusted EBIT	**3,597**	**2,059**	**320**

[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	4Q16	3Q16	4Q15
Adjusted EBITDA	4,770	3,023	1,391
Working capital:			
Accounts receivable	1,548	57	985
Inventories	370	12	(73)
Suppliers	(194)	255	491
Payroll and related charges	123	(16)	(79)
Others	476	79	(414)
Adjustment for non-recurring items and other effects	(105)	(183)	(112)
Cash provided from operations	3,892	3,227	2,189
Income taxes paid - current	(55)	(88)	(162)
Income taxes paid - settlement program	(113)	(116)	(86)
Interest paid for third parties	(421)	(423)	(305)
Participative stockholders' debentures paid	(47)	0	(26)
Derivatives received (paid), net	(548)	(191)	(275)
Net cash provided by (used in) operating activities	**2,708**	**2,409**	**1,335**

(c) Net debt

US$ million	4Q16	3Q16	4Q15
Total debt	29,355	31,449	28,853
Cash and cash equivalents[1]	4,280	5,484	3,619
Net debt	25,075	25,965	25,234

[1] Including financial investments

(d) Total debt / LTM Adjusted EBITDA

US$ million	4Q16	3Q16	4Q15
Total debt / LTM Adjusted EBITDA (x)	2.4	3.6	4.1
Total debt / LTM operational cash flow (x)	9.9	17.6	6.5

(e) LTM Adjusted EBITDA / LTM interest payments

US$ million	4Q16	3Q16	4Q15
Adjusted LTM EBITDA / LTM gross interest (x)	6.9	5.0	4.3
LTM adjusted EBITDA / LTM interest payments (x)	7.2	5.5	4.5

ANNEX 4 – SIMPLIFIED FINANCIAL STATEMENTS EX-FERTILIZERS

Income statement

US$ million	4Q16	3Q16	4Q15	2016	2015
Net operating revenue	**9,265**	**6,726**	**5,418**	**27,488**	**23,384**
Cost of goods sold	(5,103)	(4,344)	(4,734)	(17,648)	(18,751)
Gross profit	**4,162**	**2,382**	**684**	**9,840**	**4,633**
Gross margin (%)	44.9	35.4	12.6	35.8	19.8
Selling, general and administrative expenses	(136)	(137)	(154)	(507)	(611)
Research and development expenses	(112)	(80)	(97)	(319)	(395)
Pre-operating and stoppage expenses	(129)	(117)	(228)	(453)	(942)
Other operational expenses	(152)	64	65	(267)	(208)
Results on measurement or sale of non-current assets	29	(29)	(29)	(66)	61
Impairment of non-current assets and onerous contracts	(1,174)	-	(8,769)	(1,174)	(8,769)
Operating profit	**2,488**	**2,083**	**(8,528)**	**7,054**	**(6,231)**
Financial revenues	52	31	71	170	251
Financial expenses	(762)	(704)	(314)	(2,677)	(1,068)
Gains (losses) on derivatives, net	96	(39)	427	1,256	(2,477)
Monetary and exchange variation	11	(328)	172	3,094	(7,360)
Equity income	(83)	46	(43)	309	(445)
Other results on sale or write-off of investments from associates and joint ventures	(74)	(33)	(446)	(1,220)	(349)
Income (loss) before taxes	**1,728**	**1,056**	**(8,661)**	**7,986**	**(17,679)**
Current tax	(125)	(64)	(128)	(943)	(332)
Deferred tax	67	(369)	36	(1,838)	5,581
Net Earnings (loss) from continuing operations	**1,670**	**623**	**(8,753)**	**5,205**	**(12,430)**
Loss attributable to noncontrolling interest	33	(11)	277	8	501
Gain (loss) from discontinued operations	(1,178)	(37)	(93)	(1,231)	(200)
Net earnings (attributable to the Company's stockholders)	**525**	**575**	**(8,569)**	**3,982**	**(12,129)**
Earnings (loss) per share (attributable to the Company's stockholders - US$)	0.10	0.11	(1.66)	0.77	(2.35)
Diluted earnings (loss) per share (attributable to the Company's stockholders - US$)	0.10	0.11	(1.66)	0.77	(2.35)

Equity income (loss) by business segment

US$ million	4Q16	3Q16	4Q15	2016	%	2015	%
Ferrous minerals	41	62	44	179	58	26	(6)
Coal	4	2	3	(4)	(1)	(3)	1
Base metals	-	(2)	(99)	(4)	(1)	(132)	30
Steel	(140)	(35)	(21)	57	18	(414)	93
Others	14	19	34	81	26	78	(18)
Total	**(81)**	**46**	**(39)**	**309**	**100.0**	**(445)**	**100.0**

Balance sheet

US$ million	12/31/2016	09/30/2016	12/31/2015
Assets			
Current assets	**22,567**	**19,507**	**15,473**
Cash and cash equivalents	4,262	5,369	3,591
Accounts receivable	3,663	2,556	1,476
Other financial assets	363	322	219
Inventories	3,349	3,900	3,528
Prepaid income taxes	159	317	900
Recoverable taxes	1,625	1,603	1,404
Others	557	651	311
Non-current assets held for sale and discontinued operation	8,589	4,789	4,044
Non-current assets	**10,461**	**10,518**	**10,653**
Judicial deposits	962	1,073	882
Other financial assets	628	705	282
Recoverable income taxes	527	542	471
Recoverable taxes	727	688	501
Deferred income taxes	7,343	6,849	7,904
Others	274	661	613
Fixed assets	65,986	72,062	62,366
Total assets	**99,014**	**102,087**	**88,492**
Liabilities			
Current liabilities	**11,232**	**10,847**	**10,545**
Suppliers and contractors	3,630	3,751	3,365
Loans and borrowing	1,660	2,181	2,506
Other financial liabilities	1,086	1,426	2,551
Taxes payable	657	634	595
Provision for income taxes	171	154	241
Provisions	952	735	532
Dividends and interest on capital	798	-	-
Liabilities related to associates and joint ventures	292	329	-
Others	896	1,488	648
Liabilities directly associated with non-current assets held for sale and discontinued operations	1,090	149	107
Non-current liabilities	**46,758**	**49,409**	**42,243**
Loans and borrowing	27,662	29,268	26,347
Other financial liabilities	2,127	1,962	1,984
Taxes payable	4,961	4,977	4,085
Deferred income taxes	1,700	1,676	1,670
Provisions	5,748	6,608	5,309
Liabilities related to associates and joint ventures	785	795	-
Gold stream transaction	2,090	2,158	1,749
Others	1,685	1,965	1,099
Total liabilities	**57,990**	**60,256**	**52,788**
Stockholders' equity	**41,024**	**41,831**	**35,704**
Total liabilities and stockholders' equity	**99,014**	**102,087**	**88,492**

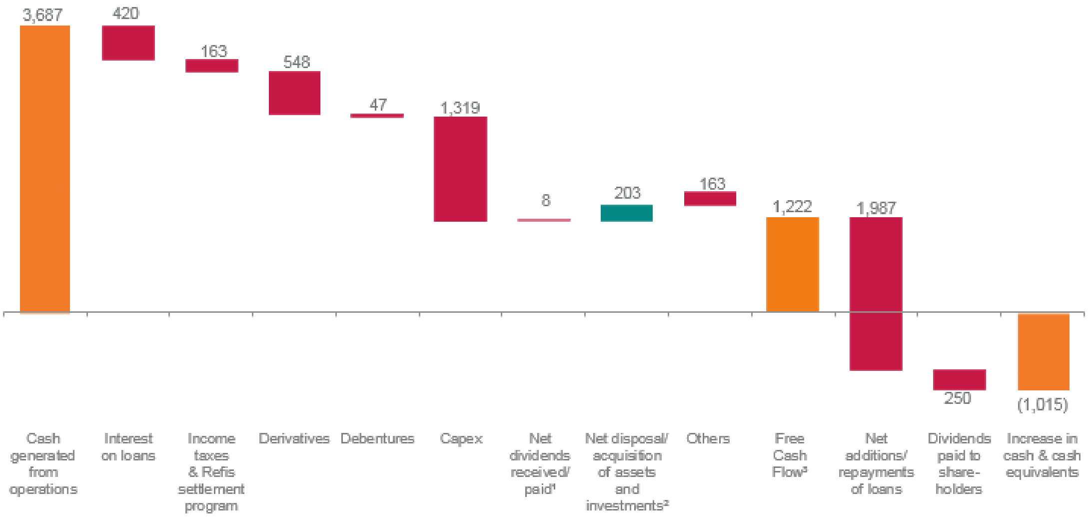
Cash flow

US$ million	4Q16	3Q16	4Q15	2016	2015
Cash flows from operating activities:					
Net income (loss) before taxes on income	1,726	1,056	(8,661)	7,984	(17,679)
Adjustments to reconcile					
Depreciation, depletion and amortization	1,006	852	917	3,487	3,719
Equity Income	83	(46)	37	(309)	445
Other items from non-current assets	45	(101)	29	1,136	136
Impairment on assets and investments	1,174	0	9,215	1,174	8,769
Items of the financial result	603	1,040	(354)	(1,843)	10,654
Variation of assets and liabilities					
Accounts receivable	(1,557)	103	949	(2,744)	1,671
Inventories	396	(113)	(14)	288	(217)
Suppliers and contractors	(163)	261	506	243	658
Payroll and related charges	106	(20)	(80)	133	(578)
Tax assets and liabilities, net	(7)	(58)	91	(109)	(222)
Goldstream transaction	0	524	0	524	532
Others	273	(359)	(537)	591	(304)
Net cash provided by operations	3,685	3,139	2,098	10,555	7,584
Interest on loans and financing	(420)	(422)	(304)	(1,663)	(1,457)
Derivatives received (paid), net	(548)	(191)	(275)	(1,602)	(1,202)
Remuneration paid to debentures	(47)	0	(26)	(84)	(65)
Income taxes	(50)	(90)	(160)	(388)	(544)
Income taxes - settlement program	(113)	(116)	(86)	(417)	(384)
Net cash provided by operating activities from continuing operations	**2,507**	**2,320**	**1,247**	**6,401**	**3,932**
Net cash provided by operating activities from discontinued operations	24	89	84	180	559
Net cash provided by operating activities	**2,531**	**2,409**	**1,331**	**6,581**	**4,491**
Cash flows from investing activities:					
Additions to investments	(9)	(9)	(12)	(239)	(65)
Additions to property, plant and equipment	(1,310)	(1,150)	(2,138)	(4,951)	(8,114)
Proceeds from disposal of assets and investments	203	315	423	543	1,456
Dividends and interest on capital received from joint ventures and associates	79	0	87	193	318
Proceeds from goldstream transaction	0	276	0	276	368
Others	(163)	(7)	(35)	(239)	224
Net cash used in investing activities from continuing operations	**(1,200)**	**(658)**	**(1,728)**	**(4,613)**	**(6,159)**
Net cash used in investing activities from discontinued operations	(86)	83	(53)	(281)	(346)
Net cash used in investing activities	**(1,286)**	**(658)**	**(1,728)**	**(4,698)**	**(6,159)**
Cash flows from financing activities:					
Loans and financing					
Additions	788	1,573	1,045	6,994	4,995
Repayments	(2,775)	(1,983)	(1,008)	(7,717)	(2,753)
Dividends and interest on capital	(250)	0	(500)	(250)	(1,500)
Dividends and interest on capital attributed to noncontrolling interest	(87)	(129)	(3)	(291)	(15)
Other transactions with noncontrolling interest	-	-	-	(17)	1,049
Net cash provided by (used in) financing activities from continuing operations	**(2,324)**	**(539)**	**(466)**	**(1,281)**	**1,776**
Net cash provided by (used in) financing activities from discontinuing operations	(6)	(4)	(4)	(17)	(73)
Net cash provided by (used in) financing activities	**(2,330)**	**(543)**	**(470)**	**(1,298)**	**1,703**
Increase (decrease) in cash and cash equivalents	(1,085)	1,208	(863)	586	36
Cash and cash equivalents in the beginning of the period	5,369	4,168	4,397	3,591	3,974
Effect of exchange rate changes on cash and cash equivalents	(22)	(7)	57	86	(418)
Cash and cash equivalents, end of period	**4,262**	**5,369**	**3,591**	**4,262**	**3,591**
Non-cash transactions:					
Additions to property, plant and equipment - interest capitalization	90	172	193	653	761

ANNEX 5 – FREE CASH FLOW EX-FERTILIZERS

Free Cash Flow 4Q16 – ex-Fertilizers

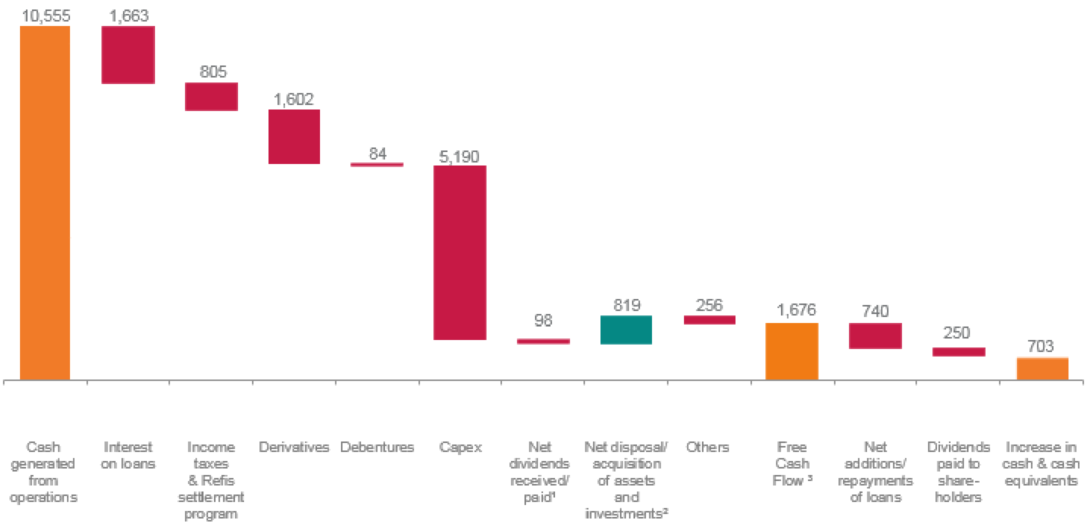
US$ million



[1] Dividends and interest on capital received from associates and joint ventures and paid to noncontrolling interest, including dividends paid related to MBR (US$ 79 million).
[2] Includes the proceeds from the sale of Mineração Paragominas (US$ 113 million) and sale of 2 capsizes (US$ 70 million).
[3] Cash flow before debt additions/repayments and distribution of dividends.

Free Cash Flow 2016 – ex-Fertilizers

US$ million



[1] Dividends and interest on capital received from associates and joint ventures and paid to noncontrolling interest, including dividends paid related to MBR (US$ 260 million).
[2] Includes the proceeds from the sale of the goldstream transaction (US$ 276 million), sale of vessels (US$ 350 million) and Mineração Paragominas (US$ 113 million).
[3] Cash flow before debt additions/repayments and distribution of dividends.

Annex 6 – reconciliation of IFRS and "NON-GAAP" information ex-Fertilizers segment

(a) Adjusted EBIT[1]

US$ million	4Q16	3Q16	4Q15
Net operating revenues	9,265	6,726	5,418
COGS	(5,103)	(4,344)	(4,734)
SG&A	(136)	(137)	(154)
Research and development	(112)	(80)	(97)
Pre-operating and stoppage expenses	(129)	(117)	(228)
Other operational expenses	(152)	64	65
Adjusted EBIT	**3,633**	**2,112**	**270**

[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	4Q16	3Q16	4Q15
Adjusted EBITDA	**4,722**	**2,965**	**1,274**
Working capital:			
Accounts receivable	(1,557)	57	985
Inventories	396	12	(73)
Suppliers	(163)	255	491
Payroll and related charges	106	(16)	(79)
Others	266	79	(414)
Adjustment for non-recurring items and other effects	(105)	(183)	(112)
Cash provided from operations	**3,665**	**3,169**	**2,072**
Income taxes paid - current	(50)	(88)	(162)
Income taxes paid - settlement program	(113)	(116)	(86)
Interest paid for third parties	(420)	(423)	(305)
Participative stockholders' debentures paid	(47)	-	(26)
Derivatives received (paid), net	(548)	(191)	(275)
Net cash provided by (used in) operating activities	**2,487**	**2,351**	**1,218**

(c) Net debt

US$ million	4Q16	3Q16	4Q15
Total debt	29,322	31,449	28,853
Cash and cash equivalents[1]	4,280	5,484	3,619
Net debt	25,042	25,965	25,234

[1] Including financial investments

(d) Total debt / LTM Adjusted EBITDA

US$ million	4Q16	3Q16	4Q15
Total debt / LTM Adjusted EBITDA (x)	2.4	3.7	4.4
Total debt / LTM operational cash flow (x)	9.9	17.6	6.5

(e) LTM Adjusted EBITDA / LTM interest payments

US$ million	4Q16	3Q16	4Q15
Adjusted LTM EBITDA / LTM gross interest (x)	6.8	4.9	4.0
LTM adjusted EBITDA / LTM interest payments (x)	7.2	5.5	4.5