Conclusion of the Ferro-Carvão Stream Water Treatment Station in Brumadinho, MG

VALE'S PERFORMANCE IN 2Q19

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English, at 12:00 p.m. Rio de Janeiro time (11:00 a.m. New York time, 4:00 p.m. London time).

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Vale's performance in 2Q19

Rio de Janeiro, July 31st, 2019 – Six months after the rupture of Dam I in the Córrego do Feijão mine in Brumadinho (MG), Vale stays committed to the prompt and fair reparation of damages caused to the families, to the infrastructure, to the communities and to the environment. However, the company's agenda goes beyond the full reparation and progress was made in 2Q19 in Vale's journey to achieve operational excellence, asset integrity, sustainable results and shareholder value.

Eduardo Bartolomeo, Chief Executive Officer, commented: "*As we progress towards full and effective **reparation,** 2Q19 has been a transitional quarter for the business, with the Brumadinho dam rupture still impacting volumes, costs and expenses, however our response started to bear fruit to ensure the **safety** of people and of the company's operations, as well as to **reduce uncertainties** and to deliver **sustainable results** through the supply of a high-quality product portfolio, which will already be reflected in the next quarter".*

I. Reparation

- We signed 15 agreements with local, state and federal entities to provide a stable legal framework for reparation. These agreements include: (i) 4 with a social scope providing support for the municipalities, including services and donations; (ii) 9 with an environmental scope, including the construction of new water catchment systems in Pará de Minas city and a water treatment station with the State Sanitation Company (COPASA), as well as initiatives to protect the fauna and flora; and (iii) 2 involving the hiring of new external auditors to review some of Vale's structures with Public Prosecutors.

- We joined the "Alliance for Brumadinho" program, initiated by the Federal Government which will leave a legacy for the area including: (i) 35 new health care units in Brumadinho; (ii) a new train passenger service; (iii) strengthening of tourism in Brumadinho; amongst other projects.

- We advanced with the Preliminary Agreements for indemnifications with the Brazilian authorities with: (i) 104.686 emergency indemnifications[1] paid; (ii) 263 labor agreements signed to indemnify the families of workers who lost their lives; (iii) 188 individual indemnification agreements[2] signed. In 3Q19, our focus will be to accelerate the individual indemnification agreements.

- We concluded several tailings containment structures and the Ferro-Carvão stream water treatment station. This station has 2 million liters per hour capacity and ensures that no more tailings are carried from the epicenter of the dam breach towards the Paraopeba river. We also presented to the public authorities a Tailings Containment Plan to ensure the removal and proper disposal of tailings, as part of the environmental recovery, as well as 23 integrated structures to prevent the flow of tailings into the Paraopeba river.

[1] Payments to all residents of Brumadinho and those who resided within 1 km radius of the Paraopeba riverbed, between Brumadinho and the city of Pompéu, at the Retiro de Baixo dam.
[2] Expedited indemnification procedures with the Support of the Public Defenders office.

- We know there is still a lot to be done, and we are committed to do it. In the following webpage, we present the updated accountability of the actions we have taken so far – vale.com/repairoverview.

II. Safety

- Our operational risk governance was reinforced with the appointment of the new Executive Officer for Safety and Operational Excellence, Carlos Medeiros, with the role of raising safety and operational excellence to a new level.

- The Vargem Grande dam had its emergency level reduced from 2 to 1 as a result of a series of improvements we implemented, such as: lowering the water level of the reservoir; cleaning the drainage channels and updated sensitivity studies carried out by an independent audit firm to evaluate the impact of the water level lowering on the dam's stability. Consequently, 51 people returned to their homes.

III. Reducing uncertainties

- We made substantial progress in 2Q19 concerning the 93 Mtpy of Iron Ore production stopped in 1Q19 with the resumption of Brucutu operations on June 22nd, 2019, recovering 30 Mtpy of production capacity, and the partial return of dry processing at the Vargem Grande complex, adding about 12Mtpy (5 Mt in 2019). Regarding the approximate 50 Mtpy currently curbed, we expect that about 20 Mtpy of dry processing production will be gradually resumed starting by the end of this year and the remaining 30 Mtpy, which includes wet processing, is estimated to return in about two to three years.

- In 2Q19, we were able, at the best of our knowledge, to assess and recognize a provision for all categories of the Brumadinho dam rupture impacts. We recorded a total provision of US$ 1.374 billion related to: (i) the environmental measures and related agreements (US$ 1.190 billion); (ii) the decommissioning or de-characterization of other structures not considered in 1Q19 (US$ 98 million); and (iii) revision of the provision related to the Framework Agreements, including the compensation for collective moral damages, which is part of the terms and conditions set in the agreement recently signed with the Public Ministry of Labor (Ministério Público do Trabalho – MPT) (US$ 86 million). Additionally, we recorded US$ 158 million of ongoing reparation expenses related to the Brumadinho event.

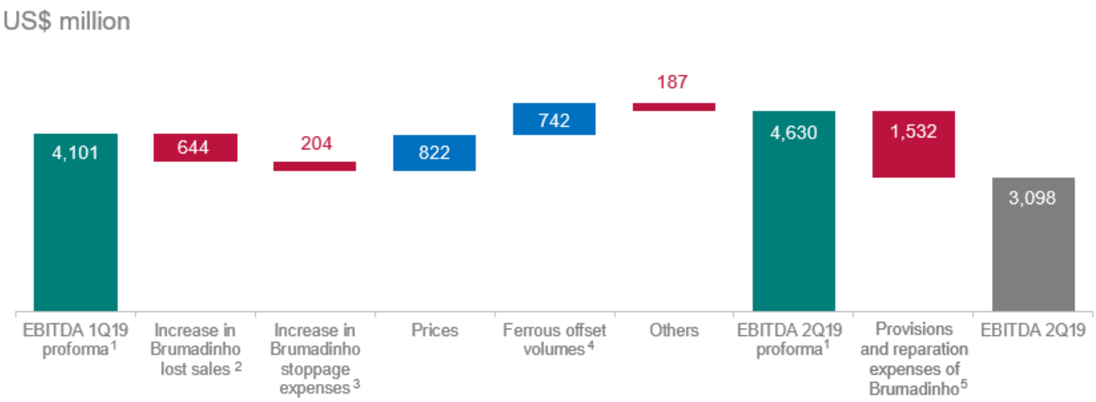
IV. Sustainable results

- Our cash generation of US$ 2.2 billion in 2Q19 enabled us to resume our trajectory of debt reduction and strengthened our balance sheet further. Consequently, our net debt decreased from US$ 12.0 billion in 1Q19 to US$ 9.7 billion in 2Q19.

- Our gross debt totaled US$ 15.8 billion as of June 30th, 2019, decreasing by US$ 1.3 billion vs. March 31st, 2019, mainly as a result of debt repayments primarily related to the new credit lines that were raised in 1Q19.

- In light of the recent decision of the Lower Public Treasury Court of Belo Horizonte authorizing Vale to replace the R$ 5 billion that were frozen by other financial guarantees and the agreement signed with Minas Gerais State Public Ministry of Labor which determined the release of R$ 1.6 billion of the frozen amount, the proforma net debt would be US$ 8.0 billion in 2Q19. The release of funds is expected to occur until August.

- Our proforma EBITDA (excluding the provisions and ongoing reparation expenses from the Brumadinho dam rupture) totaled US$ 4.6 billion in 2Q19, US$ 529 million higher than in 1Q19. The increase was mainly due to higher sales prices (US$ 822 million) and higher Ferrous sales volumes[3] (US$ 742 million), which were partially offset by the increase in lost sales (US$ 644 million) and stoppage and extraordinary logistics expenses (US$ 204 million) related to Brumadinho.



[1] Net of Brumadinho provisions.
[2] Difference between effects of 1Q19 (US$ 290 million) and 2Q19 (US$ 934 million).
[3] Difference between effects of 1Q19 (US$ 160 million) and 2Q19 (US$ 364 million). 2Q19 expenses are related to operations stoppages (US$ 238 million) and extraordinary logistics expenses (US$ 126 million).
[4] Iron ore and pellets sales volumes excluding volume losses in Brumadinho.
[5] Out of which US$ 1.374 billion are related to provisions and US$ 158 million to ongoing reparation expenses.

- We had the second consecutive quarter of losses, as our net income reached negative US$ 133 million in 2Q19, mainly as a result of additional provisions related to: (i) the Brumadinho dam rupture (US$ 1.5 billion); (ii) the decommissioning of Germano dam (US$ 257 million); and (iii) the Renova Foundation (US$ 383 million).

Ferrous Minerals

- The Ferrous Minerals EBITDA totaled US$ 4.2 billion, US$ 621 million higher than 1Q19 despite the impacts of the abnormal rain in the Northern System and of events following the Brumadinho dam rupture, which affected costs and expenses.

- Iron ore and pellets quality premium reached US$ 11.4/t[4] in 2Q19, US$ 0.7/t higher than 1Q19 mainly due to the increase in pellet contribution.

- Iron ore fines C1 cash cost was US$ 17.6/t in 2Q19, US$ 3.6/t higher than 1Q19, mainly due to: (i) consumption of inventories with higher average production costs from 1Q19 (US$ 1.4/t); (ii) higher demurrage costs in the Northern System (US$ 1.2/t), due to the extended queue of

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[3] Excluding Brumadinho lost sales volumes. Does not include Manganese and Ferroalloys.
[4] Iron ore premium of US$ 5.7/t and weighted average contribution of pellets of US$5.7/t. Pellets adjustment contribution released in Vale's 2Q19 Production and Sales report was reassessed. Since this is a managerial number, this change has no impact on Vale's results.

vessels in Ponta da Madeira port which resulted from redirecting vessels bound to the South and Southeast towards the North; (iii) higher iron ore benchmark prices and volumes on the third-party purchases (US$ 1.0/t), which were partially offset by the positive impact of the 4.1% depreciation of the BRL (US$ 0.4/t). The line-up of vessels at Ponta da Madeira port and average production costs have normalized, which will translate into a decrease of about US$ 2.5/t in iron ore C1 cash costs in 3Q19[5].

- Stoppage and extraordinary logistics expenses related to the Brumadinho dam rupture in 2Q19 were US$ 5.7/t, US$ 3.0/t higher than 1Q19 mainly as a result of a full quarter stoppage during 2Q19 (vs. ~2 months of stoppage in 1Q19), provision for clients' contractual claims and related-party railway take-or-pay contracts (MRS). Looking forward, unitary stoppage expenses may be reduced by about US$ 1.5/t in 3Q19[5] as a result of the restart of Brucutu and Vargem Grande operations and the dilution effect on the expenses of higher volumes.

- Vale's unit maritime freight cost per ton decreased US$ 0.3/t, totaling US$ 16.5/t in 2Q19, despite the increase in bunker oil prices (US$ 0.3/t)[6] mainly due to lower freight contracts.

- Iron ore fines and pellets EBITDA break-even totaled US$ 36.8/t in 2Q19, US$ 6.5/t higher than 1Q19, mainly due to the above-mentioned effects of higher C1 cash cost and higher expenses related to Brumadinho, which were offset by a greater pellet contribution and lower freight costs.

Base Metals

- Base Metals EBITDA totaled US$ 465 million in 2Q19, US$ 40 million lower than 1Q19, mainly as a result of lower copper prices, as well as lower VNC production resulting in lower fixed cost dilution; these were partly offset by higher nickel price realization and improvement in the performance of PTVI.

- Nickel realized price reached US$ 12,877/t, US$ 306/t higher than 1Q19, while LME average price was US$ 111/t lower in the same period. As a result, price realization increased to 105.0 % of LME price from 101.6% in 1Q19.

[5] Considering Exchange rate of BRL 3.85/USD in 3Q19.
[6] The average bunker oil price in Vale's freight portfolio increased to US$ 417/t in 2Q19 from US$ 403/t in 1Q19.

Selected financial indicators

US$ million	2Q19	1Q19	2Q18
Net operating revenues	9,186	8,203	8,616
Total costs and other expenses	5,743	5,180	5,767
Expenses related to Brumadinho	1,532	4,504	-
Adjusted EBIT	2,132	(1,453)	3,014
Adjusted EBIT margin (%)	23%	(18%)	35%
Adjusted EBITDA	3,098	(652)	3,875
Adjusted EBITDA margin (%)	34%	(8%)	45%
Iron ore - 62% Fe reference price	100.1	82.7	65.3
Net income (loss)	(133)	(1,642)	76
Net debt [1]	9,726	12,031	11,519
Capital expenditures	730	611	705

[1] Does not include leases (IFRS 16).

US$ million	1H19	1H18	%
Net operating revenues	17,389	17,219	1.0
Total costs and other expenses	10,923	11,317	(3.5)
Expenses related to Brumadinho	6,036	-	-
Adjusted EBIT	679	6,067	(88.8)
Adjusted EBIT margin (%)	4%	35%	(31 bps)
Adjusted EBITDA	2,446	7,801	(68.6)
Adjusted EBITDA margin (%)	14%	45%	(31 bps)
Net income (loss)	(1,775)	1,666	(206.5)
Capital expenditures	1,341	1,595	(15.9)

Market overview

IRON ORE

Iron ore 62% Fe reference price averaged US$ 100.1/dmt in 2Q19, 21% higher than 1Q19 and 53% higher than 2Q18 responding to higher steel production in China and to a decrease in iron ore stocks, as a result of the iron ore supply shortage along 1H19. Seaborne imports decrease was mainly due to supply disruptions in Brazil and Australia.

In China, crude steel production showed a robust output in 2Q19, since the construction sector demand continued strong, guided by improved credit conditions that had a positive knock effect on steel demand in 2019.

The profit margins of Chinese mills declined as steel production volume continued resilient even with rising raw material costs. In Europe, steel mills are reducing production to adapt to a more conservative steel demand scenario and to preserve steel selling prices, while having to bear higher CO2 tax costs. Similarly, the lower steel price in the US has led mills to reduce production in order to protect their margins. Nonetheless, steel mills in these regions are still profitable and expect to improve their results as costs drop and steel production is better aligned with steel demand thus keeping the selling price at a healthy level.

MB65% index averaged US$ 114.4/dmt in 2Q19, 20% higher than 1Q19 and 33% higher than 2Q18. Iron ore premiums usually show correlation with steel margins, since high quality products increase productivity of the blast furnace, creating a higher demand for those products, reducing premiums' downward pressure.

Looking forward, Chinese property data in 1H19 suggests that the demand for metals will stay high, as the Chinese Government is expected to roll out stimulus during the rest of the year, which would offer support to buoy up the country's commodities consumption amid the China-US trade war. Additionally, steel prices in the US and other main steel production regions are recovering, with signs of staying at a higher level in 2H19 when compared to 1H19.

COAL

Seaborne coking coal prices decreased to US$ 203.2/t in 2Q19 from US$ 205.8/t in 1Q19. The quarter started with prices dropping to below $200/t in early April, over 16-month low met coke prices in China, due to lower blast furnace capacity utilization and lower steel margins. Prices recovered in May reaching a high of $212.5/t mainly due to resumption of steel mills, limited availability of domestic premium coals in China amid safety-environmental inspections, and restocking demand before monsoon season in India. Prices started to downtrend again in June and ranged between $195-$200/t mainly due to steel production cuts in Europe, the start of monsoon season in India and the additional volumes from Queensland before the end of 2Q19.

In the thermal coal market, Richards Bay FOB price averaged US$ 65.9/t, 21% lower than 1Q19 and 34% lower than 2Q18 mainly due to (i) high stock levels; (ii) mild weather and higher use of hydro energy sources in China; (iii) lower gas prices and oversupply of gas, mild weather and higher renewable power generation (4-year high in April) in Europe; and (iv) ample supply from Russia and Indonesia and rising domestic production from China.

NICKEL

Average LME nickel prices remained relatively unchanged for 2Q19 at US$ 12,258/t, compared to US$ 12,369/t, in 1Q19.

Total exchange inventories (LME and SHFE) continued to decline closing at 178 kt by the end of 2Q19, down nearly 13 kt since 1Q19. LME stocks at the end of the 2Q19 stood at 161.7 kt, a decline of 21 kt since the end of 1Q19. SHFE inventories increased 7.6 kt to 16.3 kt by the end of 2Q19.

Global stainless-steel production increased 4.4% in 2Q19 relative to 2Q18 with strong growth led by Indonesia, India and China, while consumption growth is estimated at 2-3%. This mismatch of stainless production and stainless consumption is resulting in surplus and is evidenced by the record-high reported stainless inventories, particularly in China. Sales of EVs worldwide grew 41% in 5M19 relative to 5M18 amid a continued decline in overall automotive sales (down 6% year-on-year 4M19 vs. 4M18). Demand for nickel in other applications is mixed, with aerospace supporting increased growth in super alloy applications and the poor results for the automotive market negatively impacting plating applications. Nickel supply increased approximately 7% in 2Q19 relative to 2Q18, with Class II production growing 15% whereas Class I production declined 3% during this period.

Our near-term outlook for nickel remains relatively positive given that we expect the market to remain in deficit for the rest of 2019. Additional price support can be seen in recent announcements of increasing HPAL costs in Indonesia. This clearly shows that HPAL projects are more complex than originally envisioned and this has the potential to increase the financial burden on nickel producers to meet the growing battery demand. An important consideration for all commodities are the overarching macroeconomic factors such as the ongoing trade dispute and a slowing global economy, which impacts sentiment and demand and as a consequence price.

Our long-term outlook for nickel continues to be positive. Nickel in electric vehicle batteries will become an increasingly important source of demand growth particularly as battery chemistry favors higher nickel content due to lower cost and higher energy density against the backdrop of robust demand growth in other nickel applications. The biggest uncertainty in the market on the supply side are the Indonesia HPAL costs (which as mentioned previously appear to be increasing), pace of construction (which is too early to tell), and the Indonesian nickel ore exports ban in 2022. Indonesian nickel ore exports are set to stop in 2022 after a grace period starting in 2017 began in support of domestic nickel smelter construction. Indonesian nickel ore exports support a large part of Chinese domestic NPI production, supplying as much as 250 kt of Ni in NPI based on 2019 quota. The stoppage of Indonesian nickel ore exports is expected given the recent comments by Indonesian government officials.

COPPER

LME copper price averaged US$ 6,113/t in 2Q19, a decrease of 1.6% from 1Q19 (US$ 6,215/t).

Copper inventories on LME increased by 73 kt 2Q19 vs. 1Q19 while both SHFE and COMEX declined by 115 kt and 10 kt, respectively. Overall, copper exchange inventory declined by 52 kt.

Global demand increased approximately 1.3% in 2Q19 vs. 2Q18 with China growing, US markets remaining firm while those in the EU soften given ongoing economic woes. On the supply side, global refined copper production increased 0.5% in 2Q19 vs. 2Q18 while the recent China scrap ban supports primary use.

Our near-term outlook for copper is relatively positive. We expect the market to remain essentially balanced with some upside risk for deficits in 2019, with macroeconomic factors, such as the trade dispute between China and the US, continuing to influence price as it has over this past quarter.

Our long-term outlook for copper is positive. Copper demand is expected to grow, partly driven by electric vehicles and renewable energy as well as infrastructure investments, while future supply growth is challenged given declining ore grades and the need for greenfield investment creating a positive market outlook.

COBALT

LME cobalt price averaged US$ 34,527/t in 2Q19, remaining relatively similar to 1Q19 price (US$ 34,468/t). Our near-term expectations for cobalt are for a market in continued surplus given growth of output in the Democratic Republic of the Congo (DRC), moderated by artisanal output.

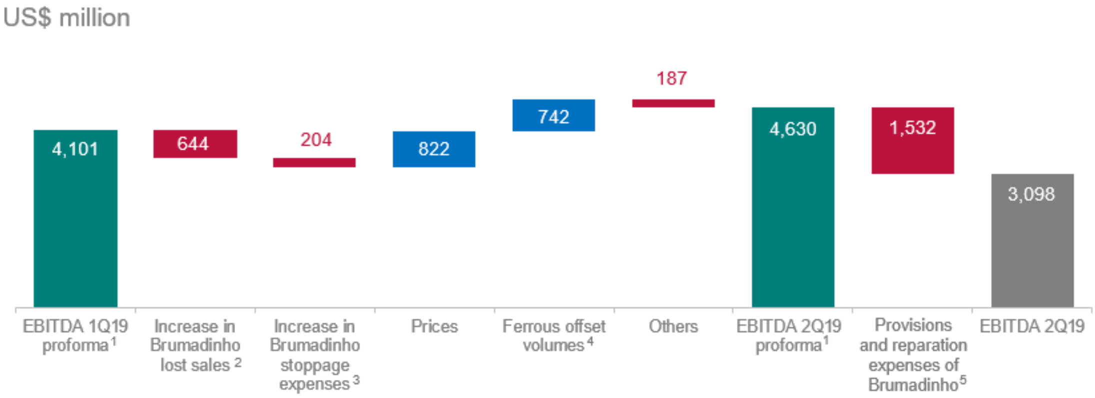
Cobalt is one of the key metals used, besides nickel, to produce some of the highest energy density lithium-ion intercalation batteries for use in electric vehicles. The cobalt market needs to grow significantly in order to feed into battery demand – but unlike other metals, cobalt is predominantly a by-product of nickel and copper mining. This means that it does not have the flexibility to respond to demand pressures as readily as other commodities. Moreover, much of the cobalt comes from and is found in the DRC which introduces ethical sourcing issues as well as reliance on operations in an unpredictable jurisdiction.

Over the long term, although we see demand well supported by the battery market, chemistry developments are shifting to nickel rich materials that offer lower cost and higher density. As a result of demand growth, the market will need to see significant growth of supply. Given the need to grow in nickel to support the electric vehicle market, we see the nickel industry increase its contribution of cobalt units in the future.

Adjusted EBITDA

Adjusted EBITDA was US$ 3.098 billion in 2Q19, US$ 3.750 billion higher than 1Q19 mainly as a result of lower provisions and incurred expenses related to Brumadinho (US$ 1.532 billion in 2Q19 vs. US$ 4.504 billion in 1Q19), higher prices (US$ 822 million) and to the impact of higher sales volumes on revenues and costs (US$ 136 million).

On a proforma basis, EBITDA (excluding the provisions and ongoing reparation expenses from the Brumadinho dam rupture) totaled US$ 4.6 billion in 2Q19, US$ 529 million higher than in 1Q19. The increase was mainly due to higher iron ore fines and pellets realized prices (US$ 822 million) and higher Ferrous sales volumes[7] (US$ 742 million), which were partially offset by the increase in lost sales (US$ 644 million) and stoppage and extraordinary logistics expenses (US$ 204 million) related to Brumadinho.



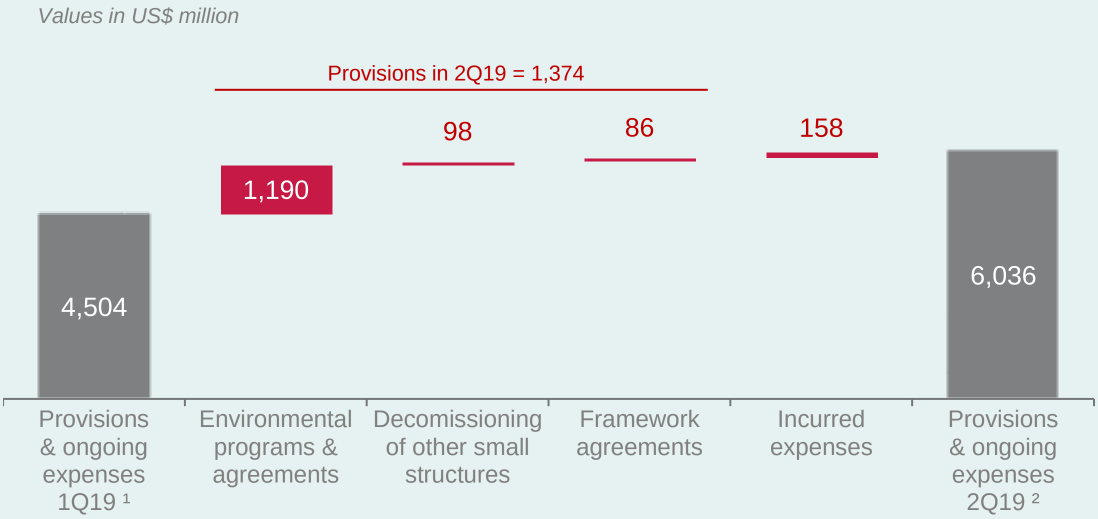
[1] Net of Brumadinho provisions.
[2] Difference between effects of 1Q19 (US$ 290 million) and 2Q19 (US$ 934 million).
[3] Difference between effects of 1Q19 (US$ 160 million) and 2Q19 (US$ 364 million). 2Q19 expenses are related to operations stoppages (US$ 238 million) and extraordinary logistics expenses (US$ 126 million).
[4] Iron ore and pellets sales volumes excluding volume losses in Brumadinho.
[5] Out of which US$ 1.374 billion are related to provisions and US$ 158 million to ongoing reparation expenses.

Impact of provisions and reparation expenses related to the Brumadinho dam rupture

In 2Q19, Vale was able, at the best of the knowledge of its management, to assess and recognize a provision for all categories of the Brumadinho dam rupture impacts. It was recorded a total provision of US$ 1.374 billion related to: (i) the environmental measures and related agreements (US$ 1.190 billion); (ii) the decommissioning or de-characterization of other small structures not considered in 1Q19 provision (US$ 98 million); and (iii) revision of the provision related to the Framework Agreements, including the compensation for collective moral damages, which is part of the terms and conditions set in the agreement recently signed with the Public Ministry of Labor (Ministério Público do Trabalho – MPT) (US$ 86 million). Additionally, it was recorded US$ 158 million of ongoing reparation expenses related to the Brumadinho event.

[7] Excluding Brumadinho lost sales volumes. Does not include Manganese and Ferroalloys.

Provisions and ongoing reparation expenses related to the Brumadinho event



[1] Includes US$1.855 billion related to de-characterization of upstream structures
[2] Includes US$1.953 billion related to de-characterization of structures

Provision for environmental measures and framework agreements

Vale has engaged in negotiations with relevant environmental authorities and has been working to remediate the environmental damages caused. During 2Q19, it has developed studies and projects to ensure geotechnical safety of the remaining structures at the Córrego do Feijão mine, in Brumadinho, and the removal and proper disposal of the tailings, especially alongside the Paraopeba river, among other projects to recover the vegetation and to compensate society.

Vale has reached an agreement with Companhia de Saneamento de Minas Gerais ("COPASA") to build a new water catchment system in the Pará de Minas city and a water treatment station, as well as initiatives to protect the fauna and flora.

Vale has also advanced with the Preliminary Agreements for indemnifications with the Brazilian authorities with: (i) 104.686 thousand emergency indemnifications paid; (ii) 263 labor agreements signed to indemnify the families of workers who lost their lives; (iii) 188 individual indemnification agreements signed.

Vale has recognized a provision for the final agreement with the Public Ministry of Labor to indemnify the direct and third-party employees who were affected by the termination of this operation. Under the terms of the final agreement, Vale will either maintain the jobs of its direct employees and third-party employees until January 25th, 2023 or convert this benefit into a cash compensation.

The agreement set a collective moral damage indemnification payment in the amount of R$ 400 million, approximately US$ 104 million, which will be paid by August 6th, 2019.

The agreement also includes indemnification payments to the relatives of the fatal victims of the event, which may vary depending on their relationship with the victims, and a lifelong medical insurance benefit to the widows and widowers and a similar benefit to the dependents of the victims until they are 25 years old.

Decommissioning of other small structures

Vale has recognized an additional provision for decommissioning to include the de-characterization of other small structures.

Additionally, it was recognized in the current period a provision of US$ 257 million as “Equity results and other results in associates and joint ventures,” not included in the above-mentioned provision, in relation to the de-characterization of the Germano tailings dam owned by Samarco.

Adjusted EBITDA

US$ million	**2Q19**	**1Q19**	**2Q18**
Net operating revenues	9,186	8,203	8,616
COGS	(5,173)	(4,701)	(5,377)
SG&A	(110)	(110)	(122)
Research and development	(90)	(71)	(92)
Pre-operating and stoppage expenses	(335)	(214)	(67)
Expenses related to Brumadinho	(1,532)	(4,504)	-
Other operational expenses	(35)	(84)	(109)
Dividends and interests on associates and JVs	221	28	165
Adjusted EBIT	**2,132**	**(1,453)**	**3,014**
Depreciation, amortization & depletion	966	801	861
Adjusted EBITDA	**3,098**	**(652)**	**3,875**

Adjusted EBITDA by business area

US$ million	**2Q19**	**1Q19**	**2Q18**
Ferrous Minerals	4,223	3,602	3,228
Coal	(106)	(69)	45
Base Metals	465	505	778
Others	48	(186)	(176)
Brumadinho impact	(1,532)	(4,504)	-
Total	**3,098**	**(652)**	**3,875**

Net operating revenue by business area

US$ million	2Q19	%	1Q19	%	2Q18	%
Ferrous Minerals	**7,315**	**79.6**	**6,343**	**77.3**	**6,321**	**73.4**
Iron ore fines	5,849	63.7	4,477	54.6	4,570	53.0
ROM	6	0.1	10	0.1	5	0.1
Pellets	1,300	14.2	1,674	20.4	1,518	17.6
Manganese ore	27	0.3	57	0.7	74	0.9
Ferroalloys	42	0.5	28	0.3	41	0.5
Others	91	1.0	97	1.2	113	1.3
Coal	**256**	**2.8**	**333**	**4.1**	**356**	**4.1**
Metallurgical coal	194	2.1	258	3.1	261	3.0
Thermal coal	62	0.7	75	0.9	95	1.1
Base Metals	**1,538**	**16.7**	**1,451**	**17.7**	**1,870**	**21.7**
Nickel	740	8.1	632	7.7	911	10.6
Copper	495	5.4	543	6.6	570	6.6
PGMs	115	1.3	102	1.2	126	1.5
Gold as by-product	152	1.7	132	1.6	156	1.8
Silver as by-product	5	0.1	8	0.1	9	0.1
Cobalt	26	0.3	30	0.4	94	1.1
Others	5	0.1	4	0.0	4	0.0
Others	**77**	**0.8**	**76**	**0.9**	**69**	**0.8**
Total	**9,186**	**100.0**	**8,203**	**100.0**	**8,616**	**100.0**

COGS by business segment

US$ million	2Q19	%	1Q19	%	2Q18	%
Ferrous Minerals	3,264	63	2,920	62	3,507	65
Base Metals	1,378	27	1,218	26	1,417	26
Coal	445	9	473	10	379	7
Other products	86	2	90	2	74	1
Total COGS	**5,173**	**100**	**4,701**	**100**	**5,377**	**100**
Depreciation	871		748		827	
COGS [1], ex-depreciation	**4,302**		**3,953**		**4,550**	

[1] COGS currency exposure in 2Q19 was as follows: 47% USD, 46% BRL, 6% CAD and 1% EUR.

Expenses

US$ million	2Q19	1Q19	2Q18
SG&A ex-depreciation	**94**	**96**	**109**
SG&A	**110**	**110**	**122**
Administrative	**85**	**89**	**88**
Personnel	41	46	41
Services	13	14	18
Depreciation	16	14	13
Others	15	15	16
Selling	**25**	**21**	**34**
R&D	**90**	**71**	**92**
Brumadinho - extraordinary logistics expenses	**126**	**-**	**-**
Pre-operating and stoppage expenses	**335**	**214**	**67**
Brumadinho - stoppage expenses	238	160	-
Stobie & Birchtree	-	4	-
Onça Puma	4	-	-
S11D	-	-	19
Others	14	11	27
Depreciation	79	39	21
Expenses related to Brumadinho	**1,532**	**4,504**	**-**
Provisions	1,374	4,278	-
Incurred expenses	158	226	-
Other operating expenses	**(91)**	**84**	**109**
Total expenses	**2,102**	**4,983**	**390**
Depreciation	95	53	34
Expenses ex-depreciation	**2,007**	**4,930**	**356**

Net income (loss)

Vale incurred a loss of US$ 0.1 billion in 2Q19, an improvement of US$ 1.5 billion in comparison to 1Q19. The loss was mainly due to provisions related to: (i) the Brumadinho dam rupture (US$ 1.5 billion); (ii) the decommissioning of Germano dam (US$ 257 million); and (iii) the Renova Foundation (US$ 383 million).

Financial results

Net financial results accounted for a loss of US$ 728 million, in line with 1Q19 and in accordance with Vale's debt structure. Shareholders debentures was US$ 251 million in 2Q19 due to the mark-to-market adjustment as result of higher iron ore prices. For the upcoming quarters, gross interest should decrease following the reduction of the gross debt and the pre-payment of more expensive short-term credit lines.

Financial results

US$ million	2Q19	1Q19	2Q18
Financial expenses	**(751)**	**(808)**	**(781)**
Gross interest	(274)	(252)	(294)
Capitalization of interest	40	37	44
Shareholder debentures[1]	(251)	(377)	(304)
Others	(223)	(174)	(176)
Financial expenses (REFIS)	(43)	(42)	(51)
Financial income	**122**	**97**	**81**
Derivatives[2]	**66**	**93**	**(306)**
Currency and interest rate swaps	25	(9)	(387)
Others[3] (bunker oil, commodities, etc)	41	102	81
Foreign Exchange	**21**	**(7)**	**(1,946)**
Monetary variation	**(186)**	**(81)**	**(103)**
Financial result, net	**(728)**	**(706)**	**(3,055)**

[1] In 2Q19, US$ 90 million were paid as remuneration on shareholder debentures.

[2] The net derivatives gains of US$ 66 million in 2Q19 is comprised of settlement loss of US$ 19 million and mark-to-market gains of US$ 85 million.

[3] Other derivatives include bunker oil derivatives which, for 2Q19 was US$ 0 (zero).

CAPEX

Investments totaled US$ 730 million in 2Q19, consisting of US$ 130 million in project execution and US$ 600 million in maintenance of operations, out of which US$ 67 million are related to replacement projects.

Project Execution and Sustaining by business area

US$ million	2Q19	%	1Q19	%	2Q18	%
Ferrous Minerals	399	54.7	365	59.7	462	65.5
Coal	27	3.7	50	8.2	34	4.8
Base Metals	301	41.2	193	31.6	208	29.5
Power generation	3	0.4	3	0.5	1	0.1
Others	-	-	-	-	-	-
Total	**730**	**100.0**	**611**	**100.0**	**705**	**100.0**

Project execution

Investment in project execution totaled US$ 130 million in 2Q19, with the Northern System 240 Mtpy and Salobo III as the main projects under development.

The Northern System 240 Mtpy project continued to progress with hiring of contractors and the development of detailed engineering, as well as receiving part of the crushers and mobile equipment throughout 2Q19.

The Salobo III project concluded the earthworks in the crushing and flotation plants.

Capital projects progress indicator[8]

Project	Capacity (Mtpy)	Estimated start-up	Executed capex (US$ million)		Estimated capex (US$ million)		Physical progress
			2019	Total	2019	Total	
Ferrous Minerals project							
Northern System 240 Mt	240 (10)[a]	2H22	5	5	50	770	5%
Base Metals project							
Salobo III	(30-40)[a] kt	1H22	38	41	193	1,128	15%

[a] Net additional capacity.

[8] 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.

Project execution by business area

US$ million	2Q19	%	1Q19	%	2Q18	%
Ferrous Minerals	87	66.9	86	86.9	171	83.4
Coal	-	-	-	-	15	7.3
Base Metals	42	32.3	11	11.1	19	9.3
Power generation	1	0.8	2	2.0	-	-
Others	-	-	-	-	-	-
Total	**130**	**100.0**	**99**	**100.0**	**205**	**100.0**

Sustaining CAPEX

Investments in the maintenance of operations totaled US$ 600 million in 2Q19, composed mainly of US$ 358 million in enhancement of operations, US$ 71 million in investments in dams and waste dumps (of which US$ 32 million, 45%, are related to dam management), US$ 67 million in replacement projects and US$ 50 million in health and safety.

Replacement projects progress indicator[9]

Project	Capacity (Ktpy)	Estimated start-up	Executed capex (US$ million)		Estimated capex (US$ million)		Physical progress
			2019	Total	2019	Total	
Voisey's Bay Mine Extension	40	1H21	67	290	311	1,694	29%
Gelado	9,700	2H21	23	28	87	428	17%

Investments in dams and waste dumps – 2Q19

US$ million	2Q19
Dam management	32
New conventional dams	9
Dry stacking	14
Dam raisings	10
Waste dumps	6
Others	-
Total	71

Sustaining capex by type - 2Q19

US$ million	Ferrous Minerals	Coal	Base Metals	TOTAL
Enhancement of operations	182	19	157	358
Replacement projects	24	-	43	67
Dam management	13	-	20	33
Other investments in dams and waste dumps	19	-	20	39
Health and Safety	38	1	11	50
Social investments and environmental protection	14	5	4	23
Administrative & Others	24	2	4	30
Total	**314**	**27**	**259**	**600**

[9] 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 by business area

US$ million	2Q19	%	1Q19	%	2Q18	%
Ferrous Minerals	312	52.0	279	54.5	291	58.2
Coal	27	4.5	50	9.8	19	3.8
Base Metals	259	43.2	182	35.5	189	37.8
Nickel	228	38.0	155	30.3	160	32.0
Copper	31	5.2	27	5.3	29	5.8
Power generation	2	0.3	1	0.2	1	0.2
Others	-	-	-	-	-	-
Total	**600**	**100.0**	**512**	**100.0**	**500**	**100.0**

Dam safety

Vale continues to take several measures to increase its safety standards in dams' management with substantial progress in 2Q19.

In 2Q19, Vale started the automation of piezometers in the dams at level 3 of Emergency Action Plan for Mining Dams (PAEBM). The procedure represents an important step to guarantee a higher frequency of information provided remotely, reducing human exposure to risk areas.

- In the Sul Superior dam, at Gongo Soco mine in Barão de Cocais (MG), the number of automated piezometers increased by 300%, to 20 from 5 (total of 43 piezometers).
- In Forquilha III dam, at Fábrica mine in Ouro Preto (MG) the automation of 17 piezometers has been concluded (total of 108 piezometers).
- In B3/B4 dam, at Mar Azul mine in Nova Lima (MG) Vale automated 17 piezometers in July (total of 18 piezometers).

Due to safety measures, the access to these areas is restricted, therefore, the piezometer checking procedure is being performed using helicopter and climbing techniques. The activity was ratified by the National Civil Aviation Agency (ANAC) and it is done by specialized teams. In case of emergency, the professionals are immediately hoisted up to the helicopter.

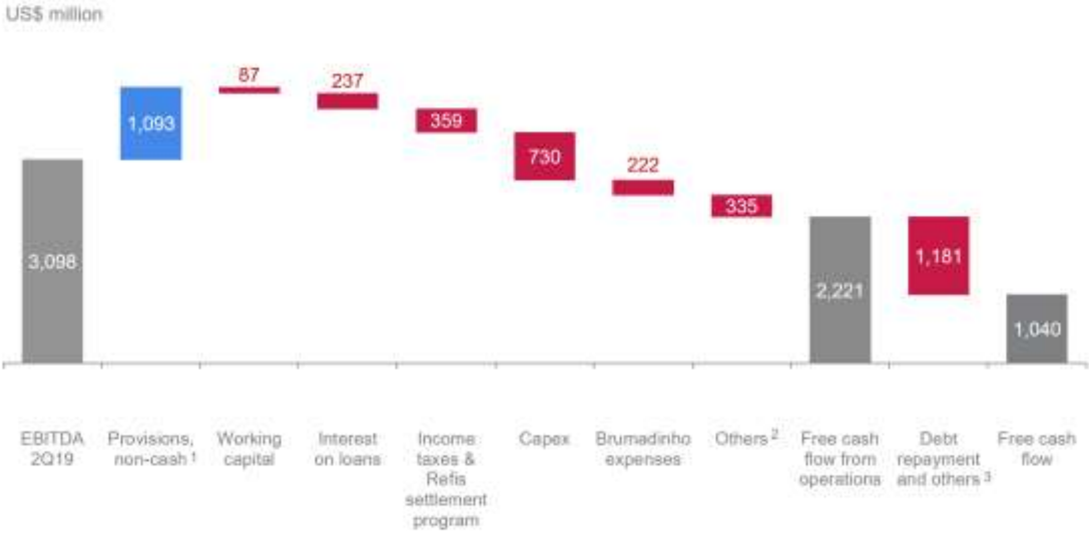
One concrete example of these initiatives to increase safety standards was the PAEBM level reduced from 2 to 1 of the Vargem Grande dam, located in the Abóboras Mine in Nova Lima (MG), on June 5th. This change in the dam's status is the result of a series of improvements that Vale has been implementing in the structure since January this year, such as: lowering the water level of the reservoir; cleaning the drainage channels; sensitivity studies with an audit firm to evaluate the impact of the lowering of the water level on the dam's stability. A detailed technical evaluation of the irregularities presented by the inclinometer monitoring system (instruments installed in drilled holes to measure irregularities) was also undertaken. It is expected that with the completion of the remaining actions, the structure will be totally free of its emergency status. With PAEBM level reduced to 1, 51 residents of the Vargem Grande dam self-rescue zone returned to their homes.

Finally, Vale reinforced its commitment to becoming the safest and most reliable mining company in the world with the creation of the Safety and Operational Excellence Department reporting directly to the CEO and the appointment of Carlos Medeiros. His solid capacity in leading major transformational projects, together with discipline and a strong process-oriented mindset, will bring an important contribution to the safety and efficiency of our operations. As part of the role, the Safety and Operational Excellence Area is responsible for establishing minimum technical, technological and management standards for “critical disciplines” (dams, furnaces, mills, etc.) from a strong set of technical capabilities and to support use of risk and asset management models, having also the authority to stop the operation of the asset in case of critical deviations.

Free cash flow

Free Cash Flow from Operations was US$ 2.221 billion in 2Q19, US$ 639 million higher than 1Q19, mainly due to higher prices (US$ 822 million) and to the impact of higher sales volumes on revenues and costs (US$ 136 million). The solid operational cash flow generation enabled the net debt repayments of US$ 1.3 billion and the cash and cash equivalents increase of US$ 1.040 billion.

Free Cash Flow 2Q19



[1] Includes US$ 1.374 billion of provisions related to Brumadinho and US$ 281 million of provision reversal of contingencies not related to Brumadinho.
[2] Includes derivatives, Samarco, dividends and interest on capital paid to noncontrolling interest and others.
[3] Includes US$ 1.3 billion of net debt repayment and US$ 0.1 billion release of frozen funds up to June 30th, 2019.

Debt indicators

Gross debt totaled US$ 15.790 billion as of June 30th, 2019, decreasing by US$ 1.261 billion vs. March 31st, 2019, mainly as a result of net debt repayments of US$ 1.3 billion mostly related to the new credit lines that were raised in 1Q19.

Net debt totaled US$ 9.726 billion as of June 30th, 2019, decreasing by US$ 2.305 billion vs. US$ 12.031 billion as of March 31st, 2019. In light of the recent decision of the Lower Public Treasury Court of Belo Horizonte authorizing Vale to replace the R$ 5 billion that were frozen by other financial guarantees and of the agreement signed with the Minas Gerais State Public Ministry of Labor which determined the release of R$ 1.6 billion of the frozen amount, the proforma net debt would be US$ 8.0 billion in 2Q19. The release of funds is expected to occur until August.

Average debt maturity increased to 8.37 years on June 30th, 2019 when compared to 7.96 years on March 31st, 2019. Average cost of debt, after currency and interest rate swaps, decreased to 4.96% per annum on June 30th, 2019 when compared to 5.08% per annum on March 31st, 2019. Leverage measured by net debt to LTM[10] adjusted EBITDA decreased to 0.9x, and interest coverage, measured by the ratio of the LTM adjusted EBITDA to LTM gross interest, decreased slightly to 10.4x on June 30th, 2019 against 10.9x on March 31st, 2019.

In addition, pursuant to IFRS 16, Vale recognized leasing liabilities in the amount of US$ 1.840 billion.

Debt indicators

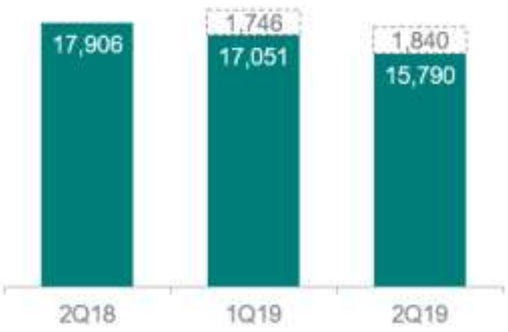
US$ million	2Q19	1Q19	2Q18
Gross debt [1]	15,790	17,051	17,906
Net debt [1]	9,726	12,031	11,519
Leases (IFRS 16)	1,840	1,746	-
Total debt / adjusted LTM EBITDA (x)	1.4	1.4	1.1
Net debt / adjusted LTM EBITDA (x)	0.9	1.0	0.7
Adjusted LTM EBITDA / LTM gross interest (x)	10.4	10.9	11.4

[1] Does not include leases (IFRS 16).

[10] Last twelve months.

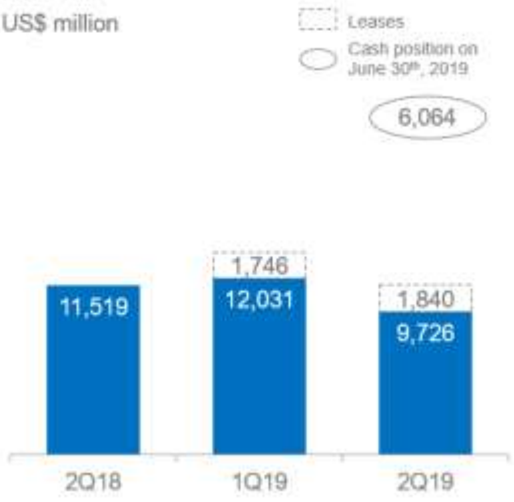
Gross debt

US$ million



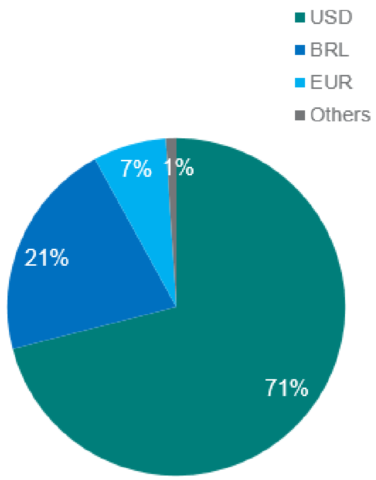
Net debt

US$ million



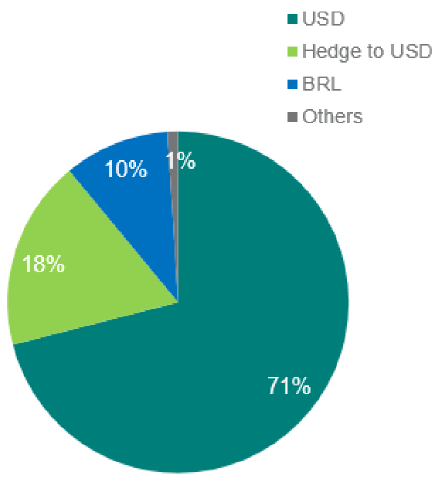
Debt position breakdown by currency (before hedge)

%



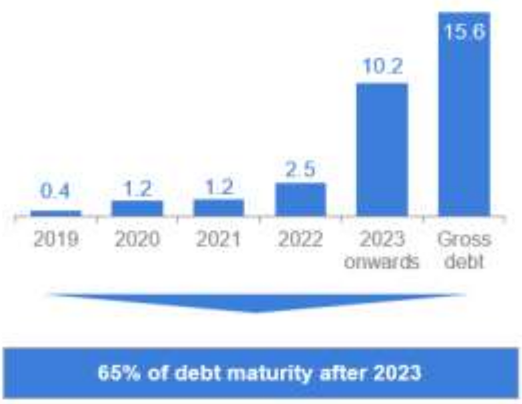
Debt position breakdown by currency (after hedge)

%



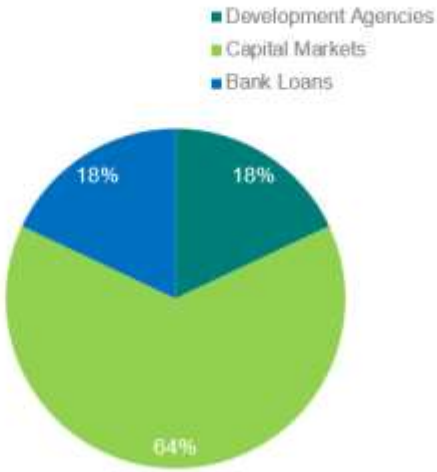
Debt amortization schedule[1]

US$ billion



Debt breakdown by instrument

%



[1] As of June 30th, 2019. Does not include accrued charges.

Performance of the business segments

Segment information - 2Q19, as per footnote of financial statements

US$ million	Net Revenues	Cost[1]	Expenses: SG&A and others[1]	Expenses: R&D[1]	Expenses: Pre- operating & stoppage[1]	Dividends and interests on associates and JVs	Adjusted EBITDA
Ferrous Minerals	7,315	(2,807)	(150)	(30)	(249)	144	4,223
Iron ore fines	5,849	(2,093)	(148)	(24)	(236)	-	3,348
ROM	6	-	-	-	-	-	6
Pellets	1,300	(576)	(3)	(5)	(13)	144	847
Others ferrous	91	(82)	2	-	-	-	11
Mn & Alloys	69	(56)	(1)	(1)	-	-	11
Coal	256	(386)	2	(6)	-	28	(106)
Base Metals	1,538	(1,029)	(25)	(15)	(4)	-	465
Nickel[2]	1,076	(794)	(22)	(8)	(4)	-	248
Copper[3]	462	(235)	(3)	(7)	-	-	217
Others	77	(80)	44	(39)	(3)	49	48
Brumadinho impact	-	-	(1,532)	-	-	-	(1,532)
Total	9,186	(4,302)	(1,661)	(90)	(256)	221	3,098

[1] Excluding depreciation and amortization

[2] Including copper and by-products from our nickel operations

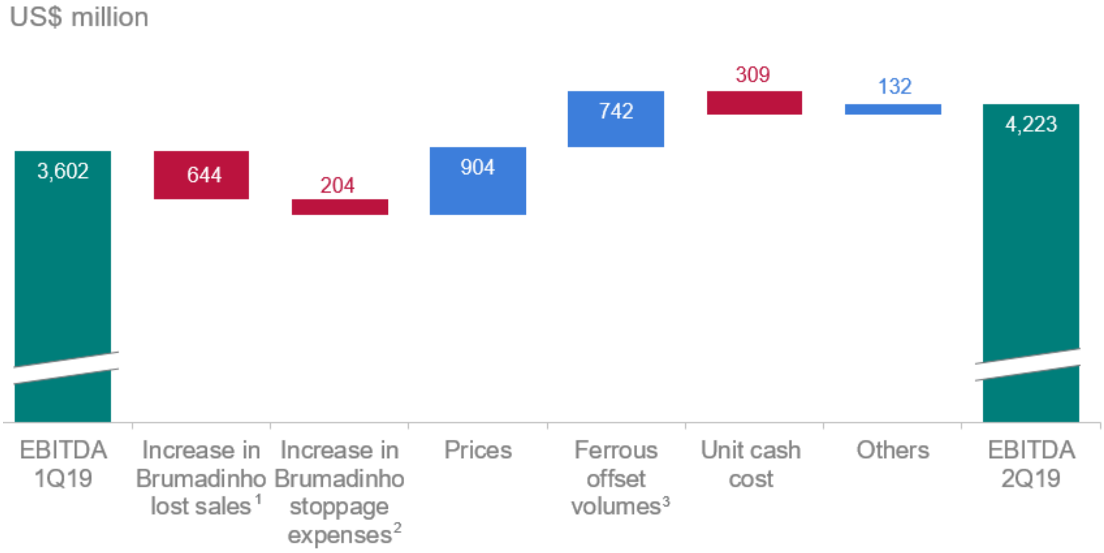
[3] Including by-products from our copper operations

Ferrous Minerals

ADJUSTED EBITDA

Ferrous Minerals EBITDA was still affected by the unfolding of the Brumadinho dam rupture and abnormal rains in the Northern System and at the Tubarão port, which impacted volumes, costs and expenses. Nonetheless, Vale is transitioning into a more predictable performance, with the Brucutu operations resumption on June 22nd, recovering 30 Mtpy of capacity, and the partial return of dry processing at the Vargem Grande complex, adding about 12 Mtpy (5 Mt in 2019), as well as with the normalization of the extended queue of vessels at the Ponta da Madeira port decreasing demurrage costs in 3Q19.

Adjusted EBITDA of the Ferrous Minerals business segment was US$ 4.223 billion in 2Q19, 17% higher than in 1Q19, mainly due to higher sales prices (US$ 904 million) and higher Ferrous sales volumes[11] (US$ 742 million), which were partially offset by: (i) longer period of production stoppages resulting in lost sales (US$ 644 million); (ii) higher stoppage and extraordinary logistics expenses (US$ 204 million); and (iii) higher unit cash costs (US$ 309 million).



[1] Difference between effects of 1Q19 (US$ 290 million) and 2Q19 (US$ 934 million).
[2] Difference between effects of 1Q19 (US$ 160 million) and 2Q19 (US$ 364 million). 2Q19 expenses are related to operations stoppages (US$ 238 million) and extraordinary logistics disbursements (US$ 126 million).
[3] Iron ore and pellets sales volumes excluding volume losses in Brumadinho.

In addition to the impact of the Brumadinho dam rupture on Ferrous Minerals EBITDA, provisions also related to Brumadinho were recorded as detailed in the box "Provisions related to the Brumadinho dam rupture" in the "Adjusted EBITDA" section of this report.

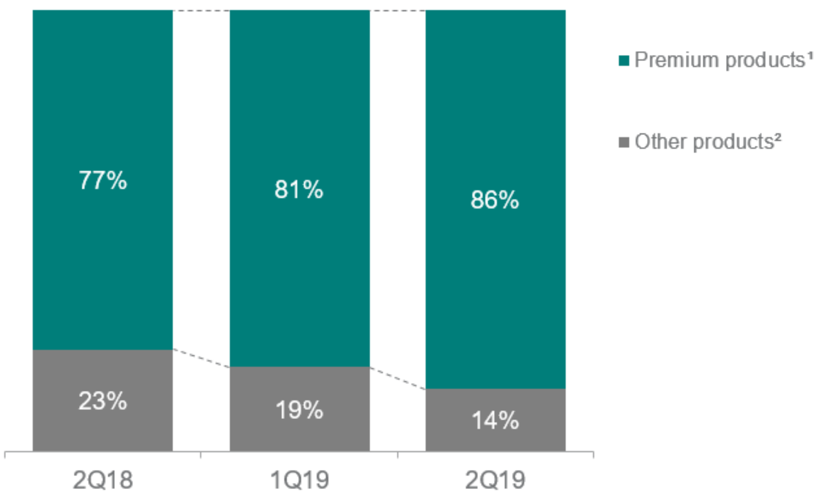
[11] Excluding Brumadinho lost sales volumes

The share of premium products[12] in total sales was 86% in 2Q19, higher than the recorded 81% in 1Q19, mainly due to higher Carajás sales. Iron ore fines and pellet quality premiums reached US$ 11.4/t[13] in 2Q19 vs. US$ 10.7/t in 1Q19, mainly due to a higher contribution from the pellets business.

Iron ore fines and pellets quality premium

US$/t	2Q19	1Q19	2Q18
Iron ore fines quality premium	5.7	5.6	7.1
Pellets weighted average contribution	5.7	5.1	3.2
Iron ore fines and pellets total quality premium	**11.4**	**10.7**	**10.3**

Sales composition - %



¹ Composed of pellets, Carajás, Brazilian Blend Fines (BRBF), pellet feed and Sinter Feed Low Alumina (SFLA)
² Composed of standard sinter feed, lump and high silica

FERROUS MINERALS ADJUSTED EBITDA MARGIN[14]

Adjusted EBITDA per ton for Ferrous Minerals, excluding Manganese and Ferroalloys, was US$ 59.5/t in 2Q19, an increase of US$ 6.7/t when compared to the US$ 52.8/t recorded in 1Q19, mainly as a result of higher market prices and a greater contribution of pellets to margins.

[12] Pellets, Carajás, BRBF (Brazilian Blend Fines), pellet feed and Sinter Feed Low Alumina (SFLA).
[13] Iron ore premium of US$ 5.7/t and weighted average contribution of pellets of US$5.7/t. Pellet adjustment contribution released in Vale's 2Q19 Production and Sales report was reassessed. Since this is a managerial number, this change has no impact on Vale's results.
[14] Excluding Manganese and Ferroalloys.

Iron ore fines (excluding Pellets and ROM)

ADJUSTED EBITDA

Adjusted EBITDA of iron ore fines was US$ 3.348 billion in 2Q19, 27% higher than 1Q19, mainly due to higher sales prices (US$ 795 million), higher sales volumes (US$ 351 million), which were partially offset by higher costs (US$ 246 million) and higher expenses (US$ 227 million).

SALES REVENUES AND VOLUME

Net sales revenues of iron ore fines, excluding pellets and run of mine (ROM), increased to US$ 5.849 billion in 2Q19 vs. US$ 4.477 billion in 1Q19, as a result of higher sales prices (US$ 795 million) and higher sales volumes (US$ 577 million).

Sales volumes of iron ore fines totaled 61.9 Mt in 2Q19, 6.7 Mt higher than in 1Q19, mainly due to offshore inventory drawdowns.

CFR sales of iron ore fines totaled 47.3 Mt in 2Q19, representing 76% of all iron ore fines sales volumes in 2Q19, slightly higher than in 1Q19.

Net operating revenue by product

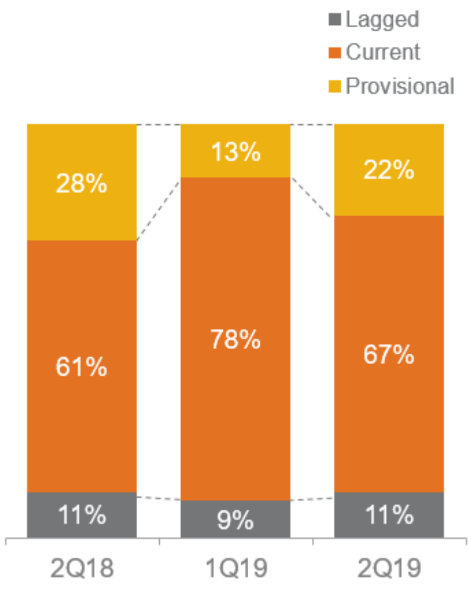
US$ million	2Q19	1Q19	2Q18
Iron ore fines	5,849	4,477	4,570
ROM	6	10	5
Pellets	1,300	1,674	1,518
Manganese & Ferroalloys	69	85	115
Others	91	97	113
Total	**7,315**	**6,343**	**6,321**

Volume sold

'000 metric tons	2Q19	1Q19	2Q18
Iron ore fines	61,873	55,204	72,921
ROM	72	211	368
Pellets	8,842	12,314	13,231
Manganese ore	92	252	239
Ferroalloys	39	25	34

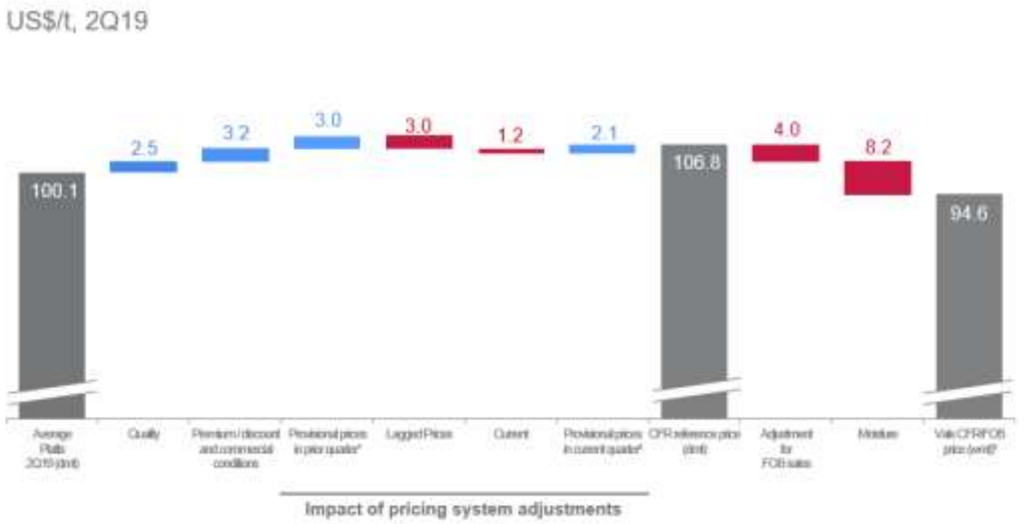
REALIZED PRICES

Pricing system breakdown - %



The percentage of sales recorded under the provisional pricing system in relation to total sales in 2Q19 was higher than in 1Q19 mainly due to the change in the product portfolio mix.

Price realization – iron ore fines



[1] Adjustment as a result of provisional prices booked in 1Q19 at US$ 85.1/t.
[2] Difference between the weighted average of the prices provisionally set at the end of 2Q19 at US$ 109.9/t based on forward curves and US$ 100.1/t from the 2Q19 62% Fe reference price.
[3] Vale price is net of taxes.

In 2Q19, the 62% Fe reference price CFR China increased US$ 17.4/t while Vale's realized price CFR/FOB increased US$ 13.5/t, totaling US$ 94.6/t, mainly due to the effect of the pricing system mechanisms (US$ 2.3/t) which was negatively impacted by lower prices in prior periods and higher moisture discount (US$ 1.4/t).

Average prices

US$/ metric ton	2Q19	1Q19	2Q18
Iron ore - Metal Bulletin 65% index	114.4	95.2	86.0
Iron ore - Metal Bulletin 62% low alumina index	103.6	84.2	n.a
Iron ore - 62% Fe reference price	100.1	82.7	65.3
Provisional price at the end of the quarter	108.4	85.1	64.0
Iron ore fines CFR reference (dmt)	106.8	91.6	72.7
Iron ore fines CFR/FOB realized price	94.6	81.1	62.7
Pellets CFR/FOB (wmt)	147.1	135.9	114.7
Manganese ore	294.6	227.8	310.1
Ferroalloys	1,073.8	1,162.7	1,194.4

COSTS

Costs for iron ore fines amounted to US$ 2.093 billion (or US$ 2.412 billion with depreciation charges) in 2Q19. Costs increased US$ 246 million when compared to 1Q19[15], mainly due to higher unit C1 cash costs.

IRON ORE COGS - 1Q19 x 2Q19

		Variance drivers				
US$ million	1Q19	Volume	Exchange rate	Others	Total variation	2Q19
C1 cash costs	774	90	(23)	245	312	1,086
Freight	680	113	-	(12)	101	781
Others	190	23	-	13	36	226
Total costs before depreciation and amortization	**1,644**	**226**	**(23)**	**246**	**449**	**2,093**
Depreciation	255	28	(23)	59	64	319
Total	**1,899**	**254**	**(46)**	**305**	**513**	**2,412**

Unit maritime freight cost per iron ore metric ton decreased US$ 0.3/t, totaling US$ 16.5/t in 2Q19, despite the increase in bunker oil prices (US$ 0.3/t), mainly due to the lower freight contracts. Freight cost may increase in the short term as a result of current spot freight rates and the new IMO 2020 regulation. IMO 2020 effect will be gradually offset during 2020 and 2021, as scrubbers are installed and the new Guaibamax vessels start operating.

C1 CASH COST

C1 cash cost FOB port per metric ton for iron ore fines ex-royalties increased to US$ 17.6/t in 2Q19 from US$ 14.0/t in 1Q19, mainly due to (i) US$ 1.4/ton of consumption of inventories with higher average production costs; (ii) US$ 1.2/ton of higher demurrage in the Northern System, due to the extended queue of vessels at the Ponta da Madeira port which resulted from redirecting vessels bound to the south towards the north; (iii) US$ 1.0/ton of higher iron ore benchmark prices

[15] After adjusting for the effects of higher sales volumes (US$ 226 million) and the positive impact of exchange rate variations (US$ 23 million).

and volumes on the third-party purchases, which were partially offset by the positive impact of the 4.1% depreciation of the BRL (US$ 0.4/ton). The normalized line-up of vessels at the Ponta da Madeira port combined with lower average production costs in May, June and July, which will positively impact COGS in 3Q19, will translate into a decrease of about US$ 2.5/t in iron ore C1 cash costs in 3Q19[16].

It is important to highlight, though, that the impact of the stoppages following the Brumadinho dam rupture (US$ 5.7/t) were registered as expenses (see "Expenses" below).

Iron Ore Fines Costs and Expenses in BRL

R$/t	2Q19	1Q19	2Q18
C1 cash costs[1]	68.9	52.9	53.3
Stoppage expenses related to Brumadinho[1]	22.1	10.3	-
Other expenses[1]	3.6	2.8	3.9
Total	**94.5**	**66.0**	**57.2**

[1] Net of depreciation

Iron ore fines cash cost and freight

	2Q19	1Q19	2Q18
Costs (US$ million)			
COGS, less depreciation and amortization	2,093	1,644	2,144
(-) Distribution costs	63	67	51
(-) Maritime freight costs (A)	781	680	861
FOB at port costs (ex-ROM)	**1,249**	**897**	**1,232**
(-) Royalties	163	123	160
FOB at port costs (ex-ROM and ex-royalties) (B)	**1,086**	**774**	**1,072**
Sales volumes (Mt)			
Total iron ore volume sold	61.9	55.4	73.3
(-) Total ROM volume sold	0.0	0.2	0.4
Volume sold (ex-ROM) (C)	61.9	55.2	72.9
Vale's iron ore cash cost (ex-ROM, ex-royalties), FOB (US$ /t) (B/C)	**17.6**	**14.0**	**14.7**
Freight			
Maritime freight costs (A)	781	680	861
% of CFR sales (D)	76%	73%	69%
Volume CFR (Mt) (E = C x D)	47.3	40.5	50.0
Vale's iron ore unit freight cost (US$/t) (A/E)	16.5	16.8	17.2

EXPENSES

Iron ore fines expenses, net of depreciation, amounted to US$ 408 million in 2Q19, increasing US$ 219 million vs. 1Q19, mainly as a result of events following the Brumadinho dam rupture: a full quarter stoppage effect during 2Q19 vs. about two months of stoppage in 1Q19 and extraordinary logistics expenses, which are mainly related to provision of clients' contractual claims and third-party railway take-or-pay contracts (MRS).

[16] Considering exchange rate of BRL 3.85/USD in 3Q19.

Sales and other expenses totaled US$ 148 million in 2Q19, increasing US$ 135 million vs. 1Q19, mainly due to the above-mentioned extraordinary logistics expenses. R&D amounted to US$ 24 million, increasing US$ 5 million vs. 1Q19, following the usual seasonality of disbursements.

Pre-operating and stoppage expenses excluding the stoppage expenses related to Brumadinho, net of depreciation, amounted to US$ 11 million in 2Q19, in line with in 1Q19.

Looking forward, unitary stoppage expenses may be reduced by about US$ 1.5/t in 3Q19[17] as a result of the restart of Brucutu and Vargem Grande operations and the dilution effect on the expenses of higher volumes.

Expenses - iron ore fines

US$ million	2Q19	1Q19	2Q18
Selling	**15**	**11**	**19**
R&D	**24**	**19**	**25**
Pre-operating and stoppage expenses	**236**	**157**	**27**
Brumadinho stoppage expenses	225	150	-
Others	11	7	27
Extraordinary logistics expenses	**126**	**-**	**-**
Other expenses	**7**	**2**	**7**
Total expenses	**408**	**189**	**78**

Iron ore pellets

Adjusted EBITDA for pellets was US$ 847 million in 2Q19, 6% lower than in 1Q19, mainly as a result of lower volumes (US$ 253 million), which were partially offset by higher market prices (US$ 78 million) and higher dividends received[18] (US$ 144 million).

Sales totaled 8.8 Mt in 2Q19, 28% lower than in 1Q19 mainly due to the impact of the full stoppage of the Southern System pellet plants during the quarter, as well as maintenance carried out and abnormal rains at the Tubarão plants.

CFR pellet sales of 3.2 Mt in 2Q19 represented 37% of total pellet sales, with this share remaining in line with 1Q19. FOB pellet sales amounted to 5.6 Mt in 2Q19.

Realized prices in 2Q19 were an average CFR/FOB of US$ 147.1/t, increasing US$ 11.2/t vs. 1Q19, lower than the increase in reference price for 62% Fe (US$ 17.4/t), mainly due to the pricing system mechanism based on prior quarter which was impacted by lower prices.

[17] Considering exchange rate of BRL 3.85/USD in 3Q19.
[18] Dividends from leased pelletizing plants, which are usually paid every 6 months (in 2Q and 4Q).

Costs totaled US$ 576 million (or US$ 680 million with depreciation charges) in 2Q19, an increase[19] of US$ 38 million vs. 1Q19, mainly due to higher maintenance costs.

Expenses totaled US$ 21 million in 2Q19, remaining in line with 1Q19.

Pellets - EBITDA

	2Q19		1Q19	
	US$ million	US$/wmt	US$ million	US$/wmt
Net revenues / Realized price	1,300	147.1	1,674	135.9
Dividends received (Leased pelletizing plants)	144	16.3	-	-
Cash costs (Iron ore, leasing, freight, overhead, energy and other)	(576)	(65.1)	(753)	(61.1)
Pre-operating & stoppage expenses	(13)	(1.5)	(10)	(0.8)
Expenses (Selling, R&D and other)	(8)	(0.9)	(9)	(0.7)
EBITDA	847	95.8	902	73.2

Iron ore fines and pellets cash break-even[20]

In 2Q19, Vale's iron ore fines and pellets EBITDA break-even increased US$ 6.5/t, totaling US$ 36.8/t, mainly as a result of higher C1 cash costs (US$ 3.6/t), higher stoppage expenses related to Brumadinho (US$ 3.0/t) and higher royalties expenses (US$ 0.4/t), which were partially offset by a greater pellet contribution (US$ 0.6/t) and lower freight costs (US$ 0.3/t).

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

US$/t	2Q19	1Q19	2Q18
Vale's iron ore cash cost (ex-ROM, ex-royalties), FOB (US$ /t)	17.6	14.0	14.7
Iron ore fines freight cost (ex-bunker oil hedge)	16.5	16.8	17.2
Iron ore fines distribution cost	1.0	1.2	0.7
Iron ore fines stoppage expenses[2] related to Brumadinho	5.7	2.7	-
Iron ore fines expenses[2] & royalties	3.5	2.9	3.3
Iron ore fines moisture adjustment	4.0	3.3	3.2
Iron ore fines quality adjustment	(5.7)	(5.6)	(7.1)
Iron ore fines EBITDA break-even (US$/dmt)	**42.6**	**35.4**	**32.0**
Iron ore fines pellet adjustment	(5.7)	(5.1)	(3.2)
Iron ore fines and pellets EBITDA break-even (US$/dmt)	**36.8**	**30.3**	**28.8**
Iron ore fines sustaining investments	4.5	4.2	3.5
Iron ore fines and pellets cash break-even landed in China (US$/dmt)	**41.3**	**34.4**	**32.3**

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

[2] Net of depreciation and includes dividends received

[19] After adjusting for the effects of lower sales volumes (US$ 199 million) and the negative impact of exchange rate variations (US$ 16 million).

[20] Does not include the impact from the iron ore fines and pellets pricing system mechanism.

Manganese and ferroalloys

Adjusted EBITDA of manganese ore and ferroalloys was US$ 11 million in 2Q19, 59% lower than in 1Q19, mainly due to lower sales volumes and lower market prices.

Manganese ore sales volumes reached 92,000 t in 2Q19, 63.5% lower than in 1Q19, mainly due to lower production and abnormal rains at the Ponta da Madeira port which affected shipments.

Ferroalloys sales volumes totaled 39,000 t in 2Q19, 58.0% higher than in 1Q19 as a result of new clients in the domestic and international markets.

Volume sold by destination – Iron ore and pellets

'000 metric tons	2Q19	1Q19	2Q18
Americas	**9,013**	**8,534**	**10,155**
Brazil	6,720	6,260	7,064
Others	2,293	2,274	3,091
Asia	**50,530**	**46,748**	**59,261**
China	38,984	36,196	45,995
Japan	5,818	5,800	8,094
Others	5,728	4,752	5,172
Europe	**8,242**	**8,349**	**13,109**
Germany	3,272	3,284	4,545
France	1,353	1,121	1,769
Others	3,617	3,944	6,795
Middle East	**1,485**	**2,248**	**1,960**
Rest of the World	**1,517**	**1,851**	**2,035**
Total	**70,787**	**67,730**	**86,520**

Selected financial indicators - Ferrous Minerals

US$ million	2Q19	1Q19	2Q18
Net Revenues	7,315	6,343	6,321
Costs[1]	(2,807)	(2,531)	(3,101)
Expenses[1]	(150)	(26)	(33)
Pre-operating and stoppage expenses[1]	(249)	(160)	(33)
R&D expenses	(30)	(24)	(32)
Dividends and interests on associates and JVs	144	-	106
Adjusted EBITDA	4,223	3,602	3,228
Depreciation and amortization	(532)	(428)	(425)
Adjusted EBIT	3,691	3,174	2,803
Adjusted EBIT margin (%)	50.5	50.0	44.3

[1] Net of depreciation and amortization

Selected financial indicators - Iron ore fines

US$ million	2Q19	1Q19	2Q18
Adjusted EBITDA (US$ million)	3,348	2,644	2,349
Volume Sold (Mt)	61.9	55.2	72.9
Adjusted EBITDA (US$/t)	54	48	32

Selected financial indicators - Pellets

US$ million	2Q19	1Q19	2Q18
Adjusted EBITDA (US$ million)	847	902	797
Volume Sold (Mt)	8.8	12.3	13.2
Adjusted EBITDA (US$/t)	96	73	60

Selected financial indicators - Ferrous ex Manganese and Ferroalloys

US$ million	2Q19	1Q19	2Q18
Adjusted EBITDA (US$ million)	4,212	3,575	3,181
Volume Sold (Mt)[1]	70.8	67.7	86.5
Adjusted EBITDA (US$/t)	60	53	37

[1] Volume including iron ore fines, pellets and ROM.

Base Metals

Base Metals operations in the North Atlantic achieved solid performance in the mine-mill-smelting activities in 2Q19. In turn, nickel refining activities were affected by scheduled and unscheduled maintenances which also led to lower cobalt, gold, silver and PGMs' feed reducing overall by-product credits. Nevertheless, copper production from Sudbury was 4.7% higher in relation to 1Q19, as the copper concentrate production lines are independent from the nickel refineries operations. In the upcoming quarters, the performance of the North Atlantic mines in 2Q19 shall be reflected in the refineries' post-maintenance output in 2H19. Likewise, after concluding its maintenance in 1Q19, PTVI had a significant boost in site production volume, one of the main factors for it q-o-q increase in EBITDA. Copper operations were impacted by lower copper realized prices in 2Q19, partially offset by Salobo's performance, which reached sub-US$ 900/t unit cash costs due to strong operational performance and higher by-product credits.

Base Metals adjusted EBITDA was US$ 465 million in 2Q19 vs. US$ 505 million in 1Q19, mainly due to lower copper realized prices (US$ 73 million) and higher costs (US$ 25 million) partially offset by higher nickel, copper and by-product volumes (US$ 44 million) and the positive effect of exchange rate variations (US$ 11 million).

Average prices

US$/ metric ton	2Q19	1Q19	2Q18
Nickel - LME	12,258	12,369	14,476
Copper - LME	6,113	6,215	6,872
Nickel	12,877	12,571	14,784
Copper[1]	5,199	6,051	6,030
Gold (US$/oz)	1,341	1,279	1,330
Silver (US$/oz)	13.09	15.24	15.28
Cobalt (US$/t)	24,222	25,886	73,984

[1]Considers Salobo and Sossego operations.

Base Metals EBITDA overview – 2Q19

US$ million	North Atlantic	PTVI Site	VNC Site	Onça Puma	Sossego	Salobo	Others	Total Base Metals
Net Revenues	**789**	**166**	**53**	**49**	**119**	**343**	**19**	**1,538**
Costs	(508)	(132)	(139)	(40)	(82)	(153)	25	(1,029)
Selling and other expenses	(15)	-	-	(1)	(1)	(2)	(6)	(25)
Pre-operating and stoppage expenses	-	-	-	(4)	-	-	-	(4)
R&D	(4)	(1)	(1)	(1)	(6)	(1)	(1)	(15)
EBITDA	**262**	**33**	**(87)**	**3**	**30**	**187**	**37**	**464**

Nickel operations

Nickel operations – EBITDA by operation

US$ million	2Q19	1Q19	2Q18
North Atlantic operations[1]	262	293	393
PTVI	33	4	66
VNC	(87)	(64)	1
Onça Puma	3	16	25
Others[2]	37	16	12
Total	**248**	**265**	**497**

[1] Includes the operations in Canada and in the United Kingdom.

[2] Includes the PTVI and VNC off-takes, intercompany sales eliminations and purchase of finished nickel.

Nickel operations – unit cash cost of sales, net of by-product credits

US$/t	2Q19	1Q19	2Q18
North Atlantic operations[1]	5,159	3,972	4,680
PTVI	7,774	8,834	7,170
VNC	27,316	22,771	12,515
Onça Puma	9,991	8,846	7,957

[1] North Atlantic figures include Clydach refining costs.

Details of nickel operations' adjusted EBITDA by operation are as follows:

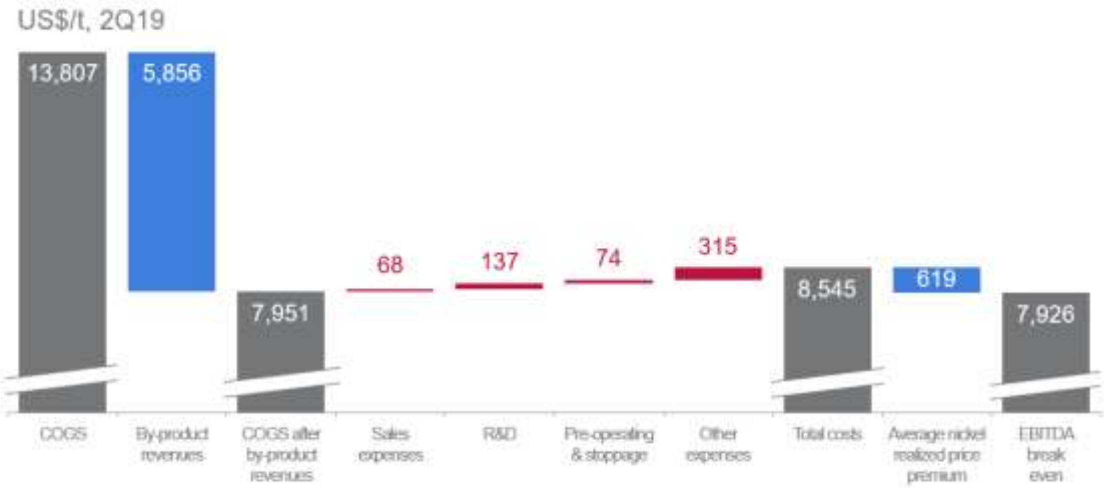
- The North Atlantic operations' EBITDA was US$ 262 million, decreasing US$ 31 million vs. 1Q19 mainly due to lower by-products realized prices (US$ 21 million) and higher expenses (US$ 8 million). Unit cash costs increased to US$ 5,159/t mainly due to lower by-product credits and maintenance costs.

- PTVI's EBITDA was US$ 33 million, increasing by US$ 29 million compared to 1Q19, mainly due to higher dilution of fixed costs on higher volumes (US$ 18 million) and higher nickel realized prices (US$ 9 million). After the completion of maintenance works in 1Q19 at the PTVI site, unit cash costs decreased to US$ 7,774/t in 2Q19 as higher volumes in the quarter diluted fixed costs and operations returned to higher productivity rates with hydroelectric power.

- VNC's EBITDA was negative US$ 87 million, decreasing by US$ 23 million when compared to 1Q19, mainly as a result of higher unit cash costs (US$ 27 million) despite the positive effect of cobalt by-product credits (US$ 9 million). Unit cash costs increased to US$ 27,316/t in 2Q19 mainly due to costs associated with the maintenance program to enhance future operations as well as the effect of lower dilution of fixed costs on lower volumes at VNC site.

- Onça Puma's EBITDA was US$ 3 million, decreasing by US$ 13 million compared to 1Q19, mainly as a result of higher unit costs (US$ 6 million), lower volumes (US$ 4 million) and higher expenses (US$ 4 million). Unit cash costs increased to US$ 9,991/t mainly due to lower volumes as a result of the suspension of processing activities in June 2019 related to a decision by a Brazilian court.

EBITDA break-even – nickel operations[21]



SALES REVENUES AND VOLUMES

Nickel sales revenues were US$ 740 million in 2Q19, increasing US$ 108 million vs. 1Q19 as a result of higher volumes (US$ 93 million) and higher price realization (US$ 15 million). Sales volumes of nickel were 57.5 kt in 2Q19, 7.2 kt higher than in 1Q19, reflecting Vale's decision to optimize supply chain opportunities and draw down regional inventories in line with demand.

Copper by-product from nickel operations generated sales revenues of US$ 170 million in 2Q19, decreasing US$ 21 million vs. 1Q19 as a result of lower copper price realization (US$ 23 million) offset by higher sales volumes (US$ 2 million). Sales volumes of copper by-product totaled 32.5 kt in 2Q19, in line with 1Q19.

Cobalt by-product sales revenues totaled US$ 26 million in 2Q19, decreasing US$ 4 million vs. 1Q19, mainly as a result of lower cobalt prices (US$ 2 million) and lower volumes (US$ 2 million) in the quarter. Sales volumes of cobalt by-product amounted to 1,072 t in 2Q19, 101 t lower than in 1Q19.

[21] Considering only the cash effect of US$ 400/oz that Wheaton Precious Metals pays for 70% of Sudbury's gold by-product, nickel operations EBITDA break-even would increase to US$ 8,831/t.

Net operating revenue by product - Nickel operations

US$ million	2Q19	1Q19	2Q18
Nickel	740	632	911
Copper	170	191	176
Gold as by-product	18	16	23
Silver as by-product	2	5	5
PGMs	115	102	126
Cobalt	26	30	94
Others	5	4	4
Total	**1,076**	**980**	**1,340**

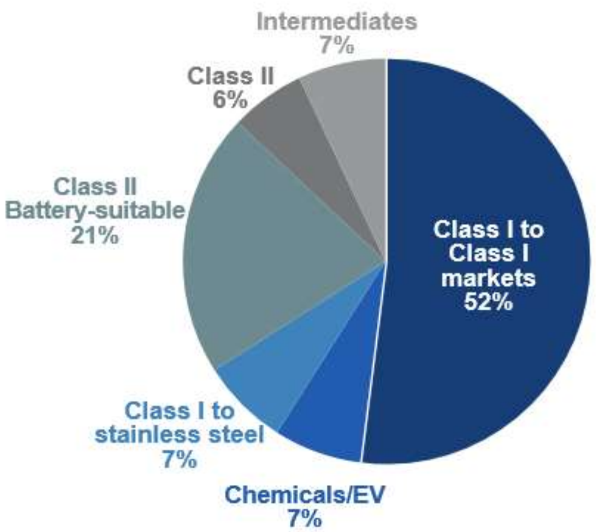
Volume sold - Nickel operations

'000 metric tons	2Q19	1Q19	2Q18
Nickel	57	50	62
Class I nickel	38	29	37
Class II Battery-suitable nickel	12	12	16
Class II nickel	4	5	4
Intermediates	4	4	4
Copper	32	32	30
Gold as by-product ('000 oz)	14	13	18
Silver as by-product ('000 oz)	204	302	329
PGMs ('000 oz)	92	76	138
Cobalt (metric ton)	1,072	1,173	1,272

REALIZED NICKEL PRICES

Vale's nickel products are classified as Class I, Class II Battery-suitable, Class II and Intermediates. In 2Q19, 66% of our sales were high-quality Class I nickel products.

2Q19 sales by product type and end markets

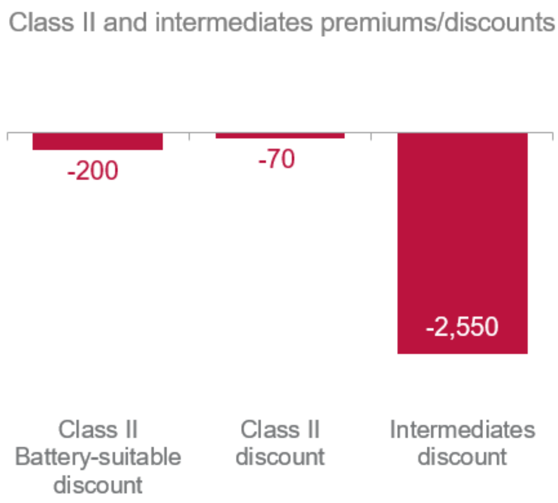


Class I products, 37.9 kt, 66% of nickel sales in 2Q19

Class I products were sourced from 100% of North Atlantic operations and 32% of PTVI operations in 2Q19.

Part of the Class I nickel products is sold at higher premiums for the specialties/high-quality markets but part of it is sold to stainless-steel Class II markets, with lower premiums. As demand for specialty products and EV batteries increases, a larger portion of our high-quality Class I nickel products will be sold to Class I markets, capturing a larger share of premiums in the product mix.

Class II Battery-suitable, Class II and Intermediates, 19.6 kt, 34% of nickel sales in 2Q19



Class II Battery-suitable products offer varied levels of upside for use as feed into the battery supply chain for EV batteries. Although technically any nickel can be upgraded to the purity level required by the EV batteries market, the products comprising the Class II Battery-suitable nickel are those which offer very low-cost solutions to be upgraded and used in that market. The different products included in this category offer different levels of potential and readiness for utilization in EVs. The Class II Battery-suitable products were sourced from 100% of VNC operations and 42% of PTVI operations in 2Q19.

It is economically challenging to use Class II products such as ferro-nickel in electric vehicle battery applications, mainly due to impurities as well as operational and capital costs associated with the conversion process. Vale's Class II products were sourced from 100% of Onça Puma operations in 2Q19.

Intermediate products were sourced from 26% of PTVI production in 2Q19. These products do not represent finished nickel production and are generally sold at a discount given that they still need to be processed before being sold to end customers.

Premiums / discount by nickel product

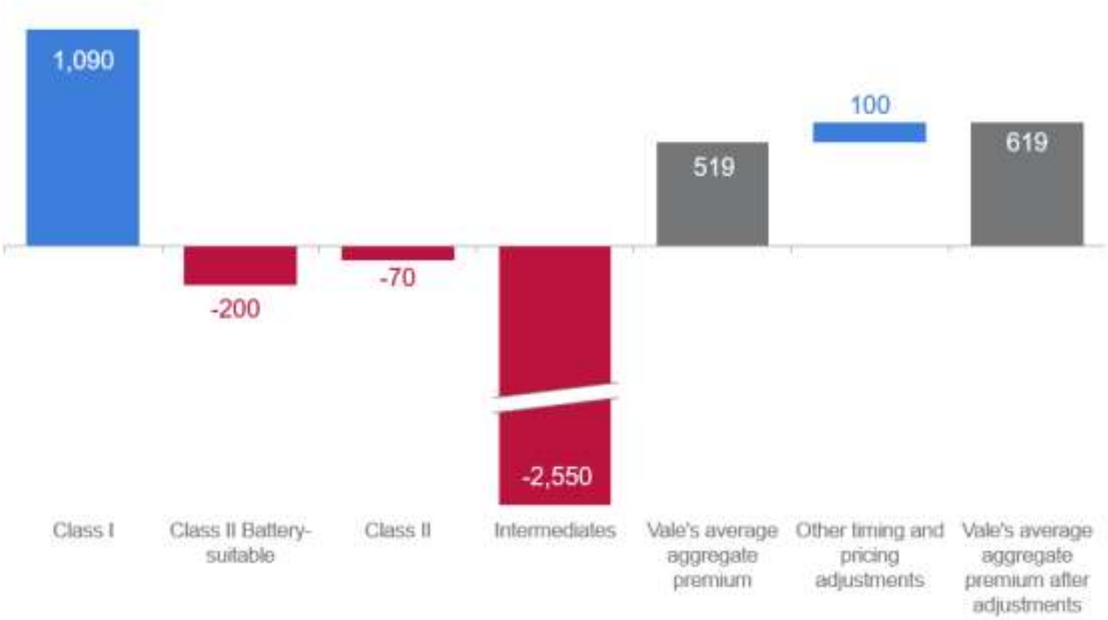
US$/t	2Q19	1Q19	2Q18
Class I nickel	1,090	1,320	1,430
Class II Battery-suitable nickel	(200)	(90)	(180)
Class II nickel	(70)	(50)	420
Intermediates	(2,550)	(2,460)	(2,690)

The average nickel realized price was US$ 12,877/t, US$ 619/t higher than the average LME nickel price of US$ 12,258/t in 2Q19. The aggregate impact of the above-mentioned premiums and discounts (considering their respective volumes in the sales mix) was:

- Premium for Class I nickel products for 66% of sales, with aggregate impact of US$ 719/t;
- Discount for Class II Battery-suitable nickel products for 21% of sales, with aggregate impact of -US$ 42/t;
- Discount for Class II nickel products for 7% of sales, with aggregate impact of -US$ 5/t;
- Discount for Intermediates for 6% of sales, with aggregate impact of -US$ 153/t; and,
- Other timing and pricing adjustments, mainly due to carryover effects from the differences between the LME price at the moment of sale and the quarterly LME average, along with the impact of fixed forward price sales, with an aggregate positive impact of US$ 100/t.

Nickel premium/discount by product and average aggregate premiums

US$/t, 2Q19



Nickel COGS - 1Q19 x 2Q19

		Variance drivers				
US$ million	1Q19	Volume	Exchange rate	Others	Total variation	2Q19
Nickel operations	688	85	(5)	26	106	794
Depreciation	257	27	(3)	22	46	303
Total	**945**	**112**	**(8)**	**48**	**152**	**1,097**

EXPENSES

Selling expenses and other expenses totaled US$ 22 million in 2Q19, including other expenses related to maintenance of older mines in the North Atlantic (US$ 12 million), payroll provisions (US$ 4 million) and provision for supplies inventory obsolescence (US$ 4 million).

Pre-operating and stoppage expenses were US$ 4 million in 2Q19 due to stoppage expenses at Onça Puma.

R&D expenses were US$ 8 million in 2Q19, higher than the US$ 7 million recorded in 1Q19. These expenses encompass R&D initiatives for further operational improvements, with the main expenses associated with North Atlantic, VNC, PTVI and Onça Puma, corresponding to US$ 4 million, US$ 1 million, US$ 1 million and US$ 1 million, respectively, in the quarter.

Selected financial indicators - Nickel operations

US$ million	2Q19	1Q19	2Q18
Net Revenues	1,076	980	1,340
Costs[1]	(794)	(688)	(810)
Expenses[1]	(22)	(12)	(18)
Pre-operating and stoppage expenses[1]	(4)	(8)	(7)
R&D expenses	(8)	(7)	(8)
Dividends and interests on associates and JVs	-	-	-
Adjusted EBITDA	248	265	497
Depreciation and amortization	(310)	(259)	(313)
Adjusted EBIT	(62)	6	184
Adjusted EBIT margin (%)	(5.8)	0.6	13.7

[1] Net of depreciation and amortization

Copper operations – Salobo and Sossego

Copper – EBITDA by operation

US$ million	2Q19	1Q19	2Q18
Salobo	187	190	220
Sossego	30	50	61
Total	**217**	**240**	**281**

Copper operations – unit cash cost of sales, net of by-product credits

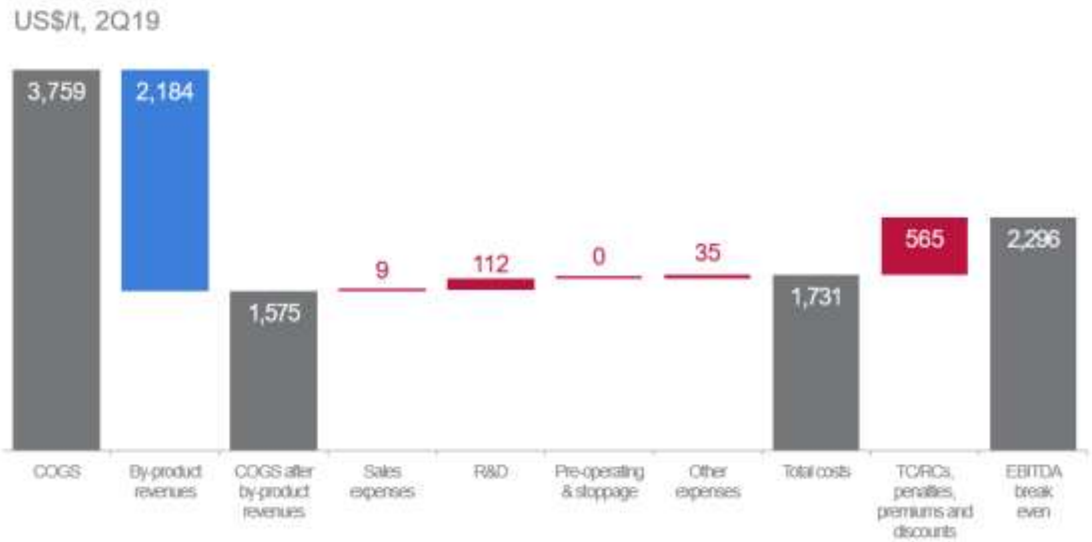
US$/t	2Q19	1Q19	2Q18
Salobo	816	1,086	937
Sossego	3,293	3,383	3,212

Details of copper operations' adjusted EBITDA by operation are as follows:

- Salobo's EBITDA was US$ 187 million, in line with 1Q19, as lower copper realized prices (US$ 31 million) were offset by higher volumes (US$ 15 million), higher by-product prices (US$ 6 million) and lower unit costs (US$ 4 million). Unit cash costs decreased to US$ 816/t mainly due to higher by-product credits.

- Sossego's EBITDA was US$ 30 million, decreasing by US$ 20 million vs. 1Q19, mainly as a result of lower copper realized prices (US$ 19 million). Unit cash costs decreased to US$ 3,293/t due to higher by-product credits.

EBITDA break-even – copper operations[22]



The realized price to be used against the EBITDA break-even should be the copper realized price before discounts (US$ 5,765/t), given that TC/RCs, penalties and other discounts are already part of the EBITDA break-even build-up.

SALES REVENUES AND VOLUMES

Copper sales revenues were US$ 325 million in 2Q19, decreasing by US$ 27 million vs. 1Q19 as a result of lower price realization (US$ 50 million) which was offset by higher volumes (US$ 22 million). Copper sales volumes were 62.5 kt in 2Q19, 4.3 kt higher than in 1Q19, in line with the increase in production over the quarter.

By-product revenues were US$ 137 million in 2Q19, increasing by US$ 18 million vs. 1Q19 as a result of higher by-product volumes (US$ 12 million) and higher price realization (US$ 6 million). Sales volumes of gold by-product were 99 koz in 2Q19, 9 koz higher than in 1Q19 and sales volumes of silver by-product were 164 koz in 2Q19, 40 koz lower than in 1Q19.

Net operating revenue by product - Copper operations

US$ million	2Q19	1Q19	2Q18
Copper	325	352	394
Gold as by-product	134	116	133
Silver as by-product	3	3	4
Total	**462**	**471**	**530**

Volume sold - Copper operations

'000 metric tons	2Q19	1Q19	2Q18
Copper	63	58	65
Gold as by-product ('000 oz)	99	90	99
Silver as by-product ('000 oz)	164	204	259

[22] Considering only the cash effect of US$ 400/oz that Wheaton Precious Metals pays for 75% of Salobo's gold by-product, copper operations EBITDA break-even would increase to US$ 3,220/t.

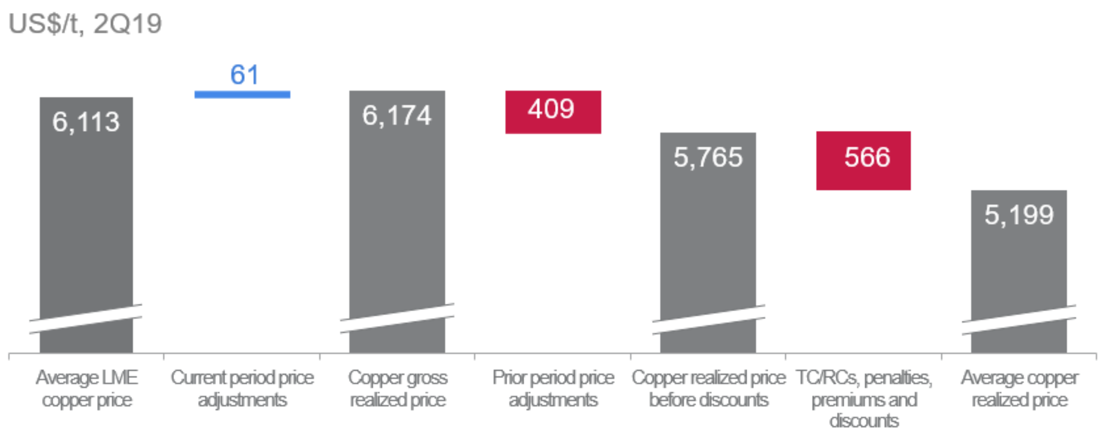
REALIZED COPPER PRICES

The realized copper price was US$ 5,199/t, US$ 914/t lower than the average LME copper price of US$ 6,113/t in 2Q19. Vale's copper products are sold on a provisional pricing basis during the quarter with final prices determined in a future period, generally one to four months forward.

The realized copper price differed from the average LME price in 2Q19 due to the following factors[23]:

- Current period price adjustments: mark-to-market of invoices still open in the quarter based on the copper price forward curve at the end of the quarter (+US$ 61/t);
- Prior period price adjustment: variance between the price used in final invoices (and in the mark-to-market of invoices from previous quarters still open at the end of the quarter) and the provisional prices used for sales in previous quarters (-US$ 409/t); and,
- TC/RCs, penalties, premiums and discounts for intermediate products (-US$ 566/t).

Price realization – copper operations



Copper COGS - 1Q19 x 2Q19

		Variance drivers				
US$ million	1Q19	Volume	Exchange rate	Others	Total variation	2Q19
Copper operations	226	16	(7)	-	9	235
Depreciation	47	3	(1)	(3)	(1)	46
Total	**273**	**19**	**(8)**	**(3)**	**8**	**281**

EXPENSES

Selling expenses and other expenses totaled US$ 3 million in 2Q19. Research and development expenses were US$ 7 million in 2Q19, with Sossego and Salobo corresponding to US$ 6 million and US$ 1 million, respectively, in the quarter.

[23] On June 30th, 2019, Vale had provisionally priced copper sales from Sossego and Salobo totaling 76,928 tons valued at an LME forward price of US$ 5,995/t, subject to final pricing over the following months.

Selected financial indicators - Copper operations

US$ million	2Q19	1Q19	2Q18
Net Revenues	462	471	530
Costs[1]	(235)	(226)	(245)
Expenses[1]	(3)	-	-
Pre-operating and stoppage expenses[1]	-	-	-
R&D expenses	(7)	(5)	(4)
Dividends and interests on associates and JVs	-	-	-
Adjusted EBITDA	217	240	281
Depreciation and amortization	(46)	(47)	(53)
Adjusted EBIT	171	193	228
Adjusted EBIT margin (%)	37.0	41.0	43.0

[1] Net of depreciation and amortization

Coal

ADJUSTED EBITDA

Coal adjusted EBITDA was negative US$ 106 million in 2Q19, US$ 37 million lower than in 1Q19, mainly as a result of lower sales volumes and prices for metallurgical and thermal coal.

2019 has been a challenging year for the Coal business. Despite some initiatives that resulted in a better availability of mine equipment and an increase in tonnage moved, the lower ROM quality and mix gathered during the opening of new mine sections and higher maintenance at processing plants led to the review of the production guidance and the reassessment of mining plans.

Reassessing mining plans in 2H19 will be an important step to pave the way to improve the stability of the quality of the ROM that feeds the plants, thus achieving a higher sustainable ongoing level of production.

Volume sold

'000 metric tons	2Q19	1Q19	2Q18
Metallurgical coal	1,037	1,291	1,408
Thermal coal	1,056	1,103	1,101
Total	**2,093**	**2,394**	**2,509**

Revenues and price realization

Revenues decreased by US$ 77 million to US$ 256 million in 2Q19 from US$ 333 million in 1Q19, due to lower sales volumes (US$ 54 million) and lower thermal and metallurgical coal prices (US$ 23 million).

Sales volumes totaled 2.1 Mt in 2Q19,11.7% lower than production in the same period, mainly as a result of an increase of sales on which the change of the ownership of the cargo to customers and the revenue recognition occur on delivery of the cargo at the port of discharge[24]. These sales will be recognized in the next quarter.

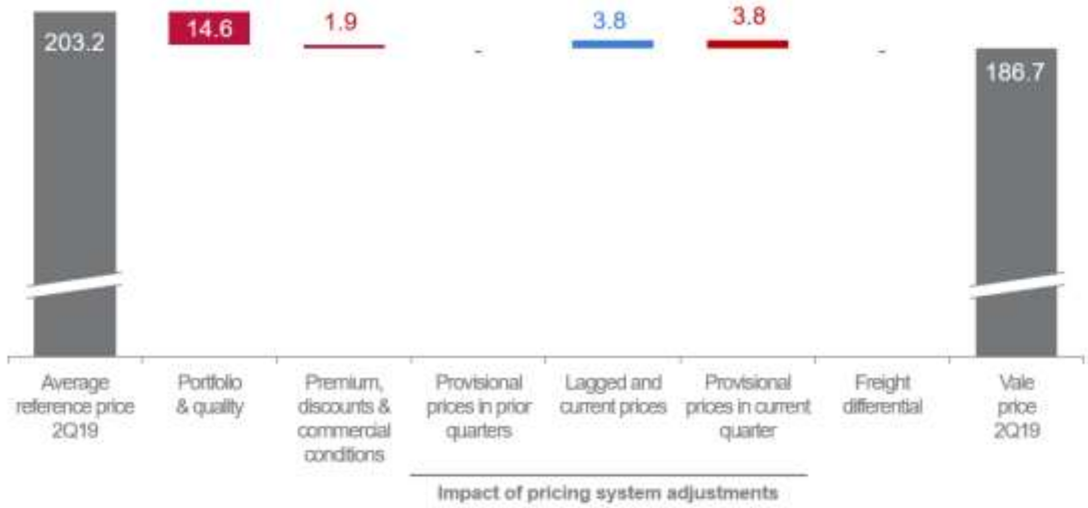
Net operating revenue by product

US$ million	2Q19	1Q19	2Q18
Metallurgical coal	194	258	261
Thermal coal	62	75	95
Total	**256**	**333**	**356**

[24] DAP and DAT International Commercial Terms

Price realization – Metallurgical coal

US$/t, 2Q19



Price realization – Thermal coal

US$/t, 2Q19

Coal prices

US$/ metric ton	2Q19	1Q19	2Q18
Metallurgical coal index price[1]	203.2	205.8	190.2
Vale's metallurgical coal realized price	186.7	200.2	185.9
Thermal coal index price[2]	66.0	83.0	100.3
Vale's thermal coal realized price	59.1	67.7	86.1
Vale's average realized price	**122.3**	**139.1**	**142.1**

[1] Reference price Premium Low Vol Hard Coking Coal FOB Australia.

[2] McCloskey FOB Richards Bay

Costs and expenses

Costs totaled US$ 386 million in 2Q19, US$ 37 million lower than in 1Q19, mainly due to the impact of variable costs on lower sales volumes. Pro-forma C1 cash cost totaled US$ 169.2/t in 2Q19, an increase of US$ 5.7/t in relation to 1Q19 mainly due to lower dilution of fixed costs, which was partially offset by a decrease in the Nacala non-operational tariff.

Pro-forma cash cost

US$/ metric ton	2Q19	1Q19	2Q18
Pro-forma operational costs[1] (A)	128.7	117.8	75.5
Nacala non-operational tariff [2] [3] (B)	46.5	53.6	49.0
Other costs (C)	7.4	3.8	3.6
Cost at Nacala Port (D = A+B+C)	182.6	175.2	128.1
NLC's debt service to Vale (E)	13.4	11.7	11.6
Pro-forma C1 cash cost (F = D-E)	169.2	163.5	116.6

[1] Includes the inferred NLC tariff components related to fixed and variable costs and excludes royalties

[2] Includes the inferred NLC tariff components related to sustaining capex, working capital, taxes and other financial items

[3] Reallocation of US$ 6.9/t in 2Q18, US$ 11.7/t in 1Q19 between pro-forma operational costs and Nacala non-operational tariff lines.

Selected financial indicators - Coal

US$ million	2Q19	1Q19	2Q18
Net Revenues	256	333	356
Costs[1]	(386)	(423)	(327)
Expenses[1]	2	(1)	(7)
Pre-operating and stoppage expenses[1]	-	-	-
R&D expenses	(6)	(6)	(6)
Dividends and interests on associates and JVs	28	28	29
Adjusted EBITDA	(106)	(69)	45
Depreciation and amortization	(60)	(49)	(56)
Adjusted EBIT	(166)	(118)	(10)
Adjusted EBIT margin (%)	(64.8)	(35.4)	(2.9)

[1] Net of depreciation and amortization

ANNEXES

SIMPLIFIED FINANCIAL STATEMENTS

Income Statement

US$ million	2Q19	1Q19	2Q18
Net operating revenue	**9,186**	**8,203**	**8,616**
Cost of goods sold and services rendered	(5,173)	(4,701)	(5,377)
Gross profit	**4,013**	**3,502**	**3,239**
Gross margin (%)	43.7	42.7	37.6
Selling and administrative expenses	(110)	(110)	(122)
Research and evaluation expenses	(90)	(71)	(92)
Pre-operating and operational stoppage	(335)	(214)	(67)
Brumadinho event	(1,532)	(4,504)	-
Other operational expenses, net	(35)	(84)	(109)
Impairment and disposal of non-current assets	(109)	(204)	5
Operating income	**1,802**	**(1,685)**	**2,854**
Financial income	122	97	81
Financial expenses	(751)	(808)	(781)
Other financial items, net	(99)	5	(2,355)
Equity results and other results in associates and joint ventures	(743)	84	(370)
Income (loss) before income taxes	**331**	**(2,307)**	**(571)**
Current tax	(366)	(247)	(127)
Deferred tax	(107)	879	791
Net income (loss) from continuing operations	**(142)**	**(1,675)**	**93**
Net income (loss) attributable to noncontrolling interest	(9)	(33)	(7)
Loss from discontinued operations	-	-	(10)
Net income (loss) attributable to Vale's stockholders	**(133)**	**(1,642)**	**76**
Earnings (loss) per share (attributable to the Company's stockholders - US$)	(0.03)	(0.32)	0.01
Basic and diluted earnings (loss) per share (attributable to the Company's stockholders - US$)	(0.03)	(0.32)	0.01

Equity income (loss) by business segment

US$ million	2Q19	%	1Q19	%	2Q18	%
Ferrous Minerals	71	79	84	79	105	256
Coal	3	3	(5)	(5)	8	20
Base Metals	-	-	-	-	-	-
Logistics	-	-	-	-	-	-
Others	16	18	27	25	(72)	(176)
Total	**90**	**100**	**106**	**100**	**41**	**100**

Balance sheet

US$ million	6/30/2019	3/31/2019	6/30/2018
Assets			
Current assets	**15,914**	**15,075**	**15,468**
Cash and cash equivalents	6,048	5,008	6,369
Accounts receivable	2,983	2,453	2,348
Other financial assets	402	467	482
Inventories	4,724	4,909	3,999
Prepaid income taxes	508	567	657
Recoverable taxes	684	1,188	1,023
Others	565	483	590
Non-current assets	**17,424**	**17,360**	**12,694**
Judicial deposits	5,035	5,124	1,744
Other financial assets	3,118	3,108	3,042
Prepaid income taxes	695	560	505
Recoverable taxes	511	560	564
Deferred income taxes	7,698	7,711	6,535
Others	367	297	304
Fixed assets	**62,394**	**61,715**	**59,925**
Total assets	**95,732**	**94,150**	**88,087**
Liabilities			
Current liabilities	**12,834**	**12,467**	**9,186**
Suppliers and contractors	3,907	3,331	3,587
Loans and borrowing	1,287	2,715	1,822
Leases	239	219	-
Other financial liabilities	1,109	1,434	795
Taxes payable	607	669	640
Settlement program (REFIS)	445	433	255
Provisions	942	818	1,005
Liabilities related to associates and joint ventures	412	280	273
Liabilities related to Brumadinho	2,320	1,642	-
De-characterization of dams	388	158	-
Others	1,178	768	809
Non-current liabilities	**39,574**	**38,490**	**36,013**
Loans and borrowing	14,503	14,336	16,084
Leases	1,601	1,527	-
Other financial liabilities	3,215	3,011	2,994
Settlement program (REFIS)	3,815	3,825	4,071
Deferred income taxes	1,469	1,524	1,678
Provisions	8,104	7,456	6,567
Liabilities related to associates and joint ventures	1,298	765	895
Liabilities related to Brumadinho	1,208	749	-
De-characterization of dams	1,630	1,674	-
Deferred revenue - Gold stream	1,461	1,522	1,725
Others	1,270	2,101	1,999
Total liabilities	**52,408**	**50,957**	**45,199**
Stockholders' equity	**43,324**	**43,193**	**42,888**
Total liabilities and stockholders' equity	**95,732**	**94,150**	**88,087**

Cash flow

US$ million	2Q19	1Q19	2Q18
Cash flows from operating activities:			
Income (loss) before income taxes from continuing operations	331	(2,307)	(571)
Adjusted for:			
Depreciation, depletion and amortization	966	801	861
Equity results and other results in associates and joint ventures	743	(84)	370
Impairment and disposal of non-current assets	109	204	(5)
Financial results, net	728	706	3,055
Others	(281)	-	-
Change in assets and liabilities			
Accounts receivable	(557)	464	201
Inventories	229	(461)	(262)
Suppliers and contractors	434	(103)	(37)
Provision - Payroll, related charges and other remunerations	166	(460)	175
Proceeds from cobalt stream transaction	-	-	690
Liabilities related to Brumadinho	1,069	2,423	-
De-characterization of dams	83	1,855	-
Other assets and liabilities, net	(375)	16	(440)
Net cash provided by operations	**3,645**	**3,054**	**4,037**
Interest on loans and borrowings paid	(237)	(246)	(274)
Derivatives received (paid), net	(4)	(118)	12
Remuneration paid to debentures	(90)	-	(72)
Income taxes (including settlement program)	(359)	(490)	(159)
Net cash provided by operating activities	**2,955**	**2,200**	**3,544**
Cash flows from investing activities:			
Capital expenditures	(730)	(611)	(705)
Additions to investments	(1)	-	(6)
Acquisition of subsidiary, net of cash	-	(496)	-
Proceeds from disposal of assets and investments	11	93	259
Dividends received from joint ventures and associates	193	-	136
Restricted cash and judicial deposits	124	(3,490)	-
Other investment activities, net	(190)	38	(124)
Net cash used in investing activities	**(593)**	**(4,466)**	**(440)**
Cash flows from financing activities:			
Loans and financing:			
Loans and borrowings from third-parties	300	1,842	765
Payments of loans and borrowings from third-parties	(1,636)	(216)	(2,599)
Payments of leasing	(3)	(75)	-
Payments to stockholders:			
Dividends and interest on capital paid to noncontrolling interest	(14)	(63)	(6)
Net cash provided by (used in) financing activities	**(1,353)**	**1,488**	**(1,840)**
Net cash used in discontinued operations	**-**	**-**	**(2)**
Increase (decrease) in cash and cash equivalents	1,009	(778)	1,262
Cash and cash equivalents in the beginning of the period	5,008	5,784	5,368
Effect of exchange rate changes on cash and cash equivalents	31	2	(247)
Effects of disposals of subsidiaries and merger, net of cash and cash equivalents	-	-	(14)
Cash and cash equivalents, end of period	**6,048**	**5,008**	**6,369**
Non-cash transactions:			
Additions to property, plant and equipment - interest capitalization	40	37	44

REVENUES, VOLUMES SOLD, PRICES AND MARGINS

Net operating revenue by destination

US$ million	2Q19	%	1Q19	%	2Q18	%
North America	**533**	**5.8**	**557**	**6.8**	**578**	**6.7**
USA	367	4.0	307	3.7	354	4.1
Canada	137	1.5	220	2.7	184	2.1
Mexico	29	0.3	30	0.4	40	0.5
South America	**1,086**	**11.8**	**896**	**10.9**	**890**	**10.3**
Brazil	941	10.2	765	9.3	735	8.5
Others	145	1.6	131	1.6	155	1.8
Asia	**5,679**	**61.8**	**4,794**	**58.4**	**5,060**	**58.7**
China	4,200	45.7	3,387	41.3	3,264	37.9
Japan	589	6.4	632	7.7	759	8.8
South Korea	320	3.5	292	3.6	402	4.7
Others	570	6.2	483	5.9	635	7.4
Europe	**1,383**	**15.1**	**1,295**	**15.8**	**1,549**	**18.0**
Germany	453	4.9	380	4.6	427	5.0
Italy	152	1.7	66	0.8	150	1.7
Others	778	8.5	849	10.3	972	11.3
Middle East	**252**	**2.7**	**356**	**4.3**	**252**	**2.9**
Rest of the World	**253**	**2.8**	**305**	**3.7**	**287**	**3.3**
Total	**9,186**	**100.0**	**8,203**	**100.0**	**8,616**	**100.0**

Volume sold - Minerals and metals

'000 metric tons	2Q19	1Q19	2Q18
Iron ore fines	61,873	55,204	72,921
ROM	72	211	368
Pellets	8,842	12,314	13,231
Manganese ore	92	252	239
Ferroalloys	39	25	34
Thermal coal	1,056	1,103	1,101
Metallurgical coal	1,037	1,291	1,408
Nickel	57	50	62
Copper	95	90	95
Gold as by-product ('000 oz)	113	103	117
Silver as by-product ('000 oz)	368	505	588
PGMs ('000 oz)	92	76	138
Cobalt (metric ton)	1,072	1,173	1,272

Average prices

US$/ton	2Q19	1Q19	2Q18
Iron ore fines CFR reference (dmt)	106.8	91.6	72.7
Iron ore fines CFR/FOB realized price	94.6	81.1	62.7
Pellets CFR/FOB (wmt)	147.1	135.9	114.7
Manganese ore	294.6	227.8	310.1
Ferroalloys	1,073.8	1,162.7	1,194.4
Thermal coal	59.1	67.7	86.1
Metallurgical coal	186.7	200.2	185.9
Nickel	12,877	12,571	14,784
Copper[1]	5,206	6,012	6,020
Gold (US$/oz)	1,341	1,279	1,330
Silver (US$/oz)	13.09	15.24	15.28
Cobalt (US$/t)	24,222	25,886	73,984

[1]Considers Salobo, Sossego and North Atlantic operations.

Operating margin by segment (EBIT adjusted margin)

%	2Q19	1Q19	2Q18
Ferrous Minerals	50.5	50.0	44.3
Coal	(64.8)	(35.4)	(2.9)
Base Metals	7.1	13.7	22.0
Total[1]	**23.2**	**(17.7)**	**35.3**

[1] Excluding non-recurring effects

RECONCILIATION OF IFRS AND "NON-GAAP" INFORMATION

(a) Adjusted EBIT

US$ million	2Q19	1Q19	2Q18
Net operating revenues	9,186	8,203	8,616
COGS	(5,173)	(4,701)	(5,377)
SG&A	(110)	(110)	(122)
Research and development	(90)	(71)	(92)
Pre-operating and stoppage expenses	(335)	(214)	(67)
Expenses related to Brumadinho	(1,532)	(4,504)	-
Other operational expenses	(35)	(84)	(109)
Dividends and interests on associates and JVs	221	28	165
Adjusted EBIT	**2,132**	**(1,453)**	**3,014**

(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	2Q19	1Q19	2Q18
Adjusted EBITDA	**3,098**	**(652)**	**3,875**
Working capital:			
Accounts receivable	(557)	464	201
Inventories	229	(461)	(262)
Suppliers and contractors	434	(103)	(37)
Provision - Payroll, related charges and other remunerations	166	(460)	175
Liabilities related to Brumadinho	1,069	2,423	-
De-characterization of dams	83	1,855	-
Others	(877)	(12)	85
Cash provided from operations	**3,645**	**3,054**	**4,037**
Income taxes paid - current	(251)	(378)	(46)
Income taxes paid - settlement program	(108)	(112)	(113)
Interest paid for third parties	(237)	(246)	(274)
Participative stockholders' debentures paid	(90)	-	(72)
Derivatives received (paid), net	(4)	(118)	12
Net cash provided by (used in) operating activities	**2,955**	**2,200**	**3,544**

Reconciliation between adjusted EBITDA and net income (loss)

US$ million	2Q19	1Q19	2Q18
Adjusted EBITDA	**3,098**	**(652)**	**3,875**
Depreciation, depletion and amortization	(966)	(801)	(861)
Dividends received and interest from associates and joint ventures	(221)	(28)	(165)
Impairment and disposal of non-current assets	(109)	(204)	5
Operating income	**1,802**	**(1,685)**	**2,854**
Financial results	(728)	(706)	(3,055)
Equity results and other results in associates and joint ventures	(743)	84	(370)
Income taxes	(473)	632	664
Net income (loss) from continuing operations	**(142)**	**(1,675)**	**93**
Net income (loss) attributable to noncontrolling interests	(9)	(33)	7
Net income (loss) attributable to Vale's stockholders	**(133)**	**(1,642)**	**86**

(c) Net debt

US$ million	2Q19	1Q19	2Q18
Total debt	15,790	17,051	17,906
Cash and cash equivalents[1]	6,064	5,020	6,387
Net debt	9,726	12,031	11,519

[1] Including financial investments

(d) Gross debt / LTM Adjusted EBITDA

US$ million	2Q19	1Q19	2Q18
Gross debt / LTM Adjusted EBITDA (x)	1.4	1.4	1.1
Gross debt / LTM operational cash flow (x)	1.3	1.3	1.5

(e) LTM Adjusted EBITDA / LTM interest payments

US$ million	2Q19	1Q19	2Q18
Adjusted LTM EBITDA / LTM gross interest (x)	10.4	10.9	11.4
LTM adjusted EBITDA / LTM interest payments (x)	11.8	12.1	11.4
LTM operational profit / LTM interest payments (x)	7.0	8.1	8.6