Arrival in Brazil of the first 500,000 kits for COVID-19 testing – Vale donated 5 million kits to the Brazilian Government

VALE'S PERFORMANCE IN 1Q20

VALE

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- Portuguese (non-translated) at 10:00 a.m. Rio de Janeiro time

- 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 1Q20 in review

Rio de Janeiro, April 28th, 2020 – "*Vale is facing the challenging times brought by the COVID-19 pandemic with responsibility, discipline and sense of urgency. We designed a response plan to this crisis, with actions that prioritize: (a) the* ***health and safety*** *of our people and communities in which we operate; (b) the support to the battle against the virus, honoring our* ***new pact with the society****; and (c) the* ***continuity of our business****. Nevertheless, we keep advancing with Brumadinho* ***reparation and risk management*** *initiatives and our goal remains intact, we are transforming Vale in one of the safest and most reliable mining companies in the world.*", commented Eduardo Bartolomeo, Chief Executive Officer.

Since March 2020, Vale has been adjusting its way to operate to battle the COVID-19 pandemic effects.

Health and safety

In all of its sites Vale has adopted world-class safety standards:

- Implementation of home-office regime to all employees considered in risk groups and those for which the function does not require physical presence
- Access to operations by essential personnel only
- Suspension of all non-essential construction works at the sites
- Adjustments to operational sites and transportation procedures, safeguarding social distancing
- Daily symptoms checklists and continuous monitoring for potential symptoms
- Body temperature scan at operational sites' entrances
- Contact-tracing with Information Technology to quarantine those who have been in touch with suspect cases
- Comprehensive internal communication on contagion and 24/7 health assistance channels

New pact with society

Vale is conscious of its responsibility to the society and its essential role in the economy. Since the outbreak of the pandemic, Vale has been looking for ways to contribute in the fight against the virus, protecting its employees and communities. This is evidenced by the procurement from China and donation of 30 million pieces of individual protection equipment and 5 million detection tests using its logistics and financial capabilities and almost 50 years of presence in China. In addition, Vale has made direct financial contributions to existing hospitals and to build emergency field hospitals in the communities where it operates. As of the date of this release, out of the R$ 500 million Vale has pledged to humanitarian support, around R$ 353 million have already been disbursed.

Vale is also working to keep the ecosystem of suppliers and contractors around its operations healthy during this crisis. Programs to advance payments to more than 3 thousand small and medium-sized suppliers have been implemented in countries where Vale operate, with an injection of more than R$ 900 million in the Brazilian economy, for example. Contractors and workers who were allocated to projects suspended by Vale are also receiving financial support.

Continuity of our business

So far, Vale has been weathering the COVID-19 outbreak with limited impact to its operations.

Up to this moment, the adoption of three restrictive measures were necessary:

- in the Iron Ore business, Vale temporarily halted operations in the Teluk Rubiah Maritime Terminal in Malaysia, with no impact on production,
- in the Base Metals business, Vale ramped down its Voisey's Bay mining operation and placed it on care and maintenance for up to 4 months, and
- in the Coal business, Vale decided to postpone plans for the coal processing plant maintenance revamp in Mozambique.

Looking forward, Vale has postponed scheduled maintenance stoppages at many of its plants, which will hinder achievement of optimal production levels especially at Base Metals operations. Vale may also suffer production impacts from increased absenteeism associated with quarantining measures, and resumption of idled mines in Iron Ore will be postponed due to delays in inspections, assessments and authorizations.

Considering the uncertainties and potential impact of COVID-19 on Vale's operations, the company revised its production guidance for its businesses. The new forecasts for 2020 production are: iron ore fines 310-330 Mt (from 340-355 Mt), pellets 35-40 Mt (from 44 Mt), nickel 180-195 kt[1] (from 200-210 kt) and copper 360-380 kt (from 400 kt), while the guidance for coal production was withdrawn. For additional details on the guidance revision, please refer to Vale's 1Q20 Production and Sales Report released on April 17th, 2020, available at the company's website.

Reparation and risk management

Efforts to mitigate the impacts of COVID-19 do not compete with Vale's initiatives to repair Brumadinho. Indemnification agreements signed reached approximately 7,000 people and, together with emergency payments, are equivalent to approximately R$ 3.6 billion[2].

Vale is also proceeding with the improvements of its risk management practices and, in January 2020, the Engineer of Record (EoR) role was implemented as an additonal step to strengthen the governance of its Tailing Management System. The EoR is responsible for carrying out regular dam safety inspections and monthly technical reports, continuously interpreting the results of these activities and monitoring the integrity of the structures. The EoR is external to the operations and is integrated with Vale's lines of defense and with the senior management level, to act with the authority required for this type of role. The adoption of the EoR is a good

[1] Excluding Vale New Caledonia (VNC)
[2] Approximate figures on April 28th, 2020.

practice recommended by the Mining Association of Canada - MAC, by the Canadian Dam Association- CDA and by the Extraordinary Independent Investigation Committee, providing further reliability and quality to the process of monitoring and reviewing Vale's dams' safety.

Regarding the works from the Extraordinary Independent Committees, in February 2020, the summary report of the Investigation Committee was made public with several technical and governance recommendations. Since most of them were already being addressed Vale could quickly prepare its action plan which indicates a 95% completion rate in December 2020, and the recommendations will be fully met in December 2022. In March 2020, the Support and Reparation Committee issued a report analysing the Vale's actions in response to its recommendations, as well as focus points so that Vale can continue the integral reparation program. Also in March 2020, the Board of Directors decided for the continuity of the Committee for Dam Safety, as relevant discussions around the dam safety standards are still ongoing in the mining industry.

Following Vale's new risk management approach, Vale has decided for the phase-out or substitution of 25 converted vessels (from VLCCs to VLOCs[3]) from its fleet, either through early termination or amendment of contracts.

In February 2020, a vessel built in 2016, owned and operated by the South Korean company Polaris Shipping, suffered damages and ran aground after leaving the Ponta da Madeira Maritime Terminal, in the state of Maranhão, loaded with approximately 295 kt of Vale's iron ore. Vale is supporting the shipowner with technical-operational and preventive measures, to safely remove the fuel (successfully concluded on March 27th, 2020) and the iron ore cargo from this vessel.

Vale's performance in 1Q20

- In 1Q20, proforma adjusted EBITDA, excluding the provisions and incurred expenses related to Brumadinho, totaled US$ 3.041 billion, US$ 1.636 billion lower than in 4Q19, mainly as a result of (i) seasonal lower volumes in the first quarter, the partial stoppage of Brucutu plant and scheduled and unscheduled maintenances carried out in the period, impacting sales volumes in Ferrous Minerals (US$ 1.593 billion), (ii) lower nickel and copper realized prices (US$ 249 million) and (iii) lower base metals sales volumes (US$ 149 million), which were partially offset by the positive effect of the Brazilian real devaluation[4] (US$ 179 million).

- Vale generated US$ 380 million in Free Cash Flow from Operations in 1Q20, US$ 947 million lower than in 4Q19, mainly due to the lower proforma adjusted EBITDA in the quarter (US$ 1.636 billion) which was partially offset by seasonaly lower CAPEX (US$ 348 million) and lower payments related to Brumadinho (US$ 248 million)[5].

[3] Very Large Crude Carriers and Very Large Ore Carries.
[4] The Brazilian real devaluated 29% to USDBRL 5.1987 on March 31st, 2020 from USDBRL 4.0307 on December 31st, 2019, while the average exchange rate for the quarter was 8,5% higher at USDBRL 4.4657 in 1Q20 and USDBRL 4.1158 in 4Q19.
[5] Brumadinho payments of US$ 376 million in 1Q20 and US$ 624 million in 4Q19

- Despite the US$ 380 million free cash flow generation and the US$ 549 million reduction in the US dollar value of the debt denominated in Brazilian Reais due to the devaluation of the currency[6], net debt remained relatively stable at US$ 4.808 billion, due to the US$ 914 million offsetting effect of such currency devaluation on the onshore cash balances held in the Brazilian Reais.

- 1Q20 financial results were heavily impacted by the depreciation of the Brazilian real, mainly through the decrease in the value of derivatives used to hedge some Brazilian real denominated commitments (US$ 1.232 billion) and the increase in the value (measured in Brazilian reais) of our net US dollars liability (US$ 464 million)[7].

- Vale hedges part of its Brazilian real denominated commitments, such as debt, Brumadinho and REFIS future disbursements, through both the use of derivatives and holding cash locally, in Brazil. Because such hedging is partial, in 1Q20, the decrease in the value of the derivatives (US$ 1.091 billion) and the loss in cash position held in Brazilian reais (US$ 914 million) due to the devaluation of the Brazilian real, totaling US$ 2.005 billion, was more than offset by the decrease of the US dollar equivalent value of Vale's debt and commitments denominated in Brazilian reais (US$ 2.984 billion) referred above.

- Vale posted a net income of US$ 239 million in 1Q20, compared to a loss of US$ 1.562 billion in 4Q19. The US$ 1.801 billion increase was mostly driven by the recognition of one-off expenses in 4Q19, such as the impairment charges in nickel and coal assets (US$ 4.202 billion) and provisions related to the Brumadinho (US$ 898 million). These effects were partially offset by lower proforma adjusted EBITDA (US$ 1.636 billion), higher financial expenses (US$ 1.445 billion) and lower tax income (US$ 764 million) due to the lower loss before taxes.

- In March, 2020, as precautionary measure in order to increase its cash position and preserve its financial flexibility in light of current uncertainty in the global markets resulting from the COVID-19 outbreak, Vale disbursed US$ 5 billion from its revolving credit lines, reinforcing its liquidity position to weather the increased risks presented to the business by the COVID-19 pandemic. Additionally, Vale decided to unwind its nickel hedge positions by selling the nickel contract options and cashed a total consideration of US$ 230 million, to be recognized in Vale's top line in tandem with the underlying nickel sales. As of March 31st, 2020, Vale's cash position stands at US$ 12.267 billion, US$ 4.091 billion higher than December 31st, 2019.

Ferrous Minerals

- Adjusted EBITDA of the Ferrous Minerals business segment was US$ 2.847 billion in 1Q20, US$ 1.691 billion lower than in 4Q19, mainly due to sales volumes 34% lower than in 4Q19.

- Vale's realized price CFR/FOB totaled US$ 83.8/t, a slight increase of US$ 0.3/t compared with 4Q19.

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[6] For more details of the impact of Brazilian real devaluation on US dollar equivalent value of cash, commitments and derivatives, please refer to the Net Income section of this report

[7] Vale´s functional currency is the Brazilian Real. A devaluation of the Brazilian Real increases the balance in Brazilian reais of US dollar-denominated liabilities, and such increase flows through the Income Statement as an expense.

- C1 cash cost for iron ore fines increased to US$ 16.2/t in 1Q20 from US$ 14.5/t in 4Q19, mainly due to reduced fixed costs' dilution on seasonal lower volumes (US$ 1.2/t), higher maintenance costs as a result of scheduled and unscheduled maintenances (US$ 0.5/t) and higher demurrage costs, as the heavy rains affected the logistics chain and shipments this quarter (US$ 0.3/t), which were partially offset by the positive effect of the Brazilian real devaluation (US$ 0.8/t). The Brazilian Real devaluation together with higher dilution of fixed cost should bring even greater positive impact to C1 in 2Q20, nonetheless those effects are expected to be offset by (i) consumption of inventories with higher average production costs from 1Q20; (ii) costs related to COVID-19 related expenses such as additional employee benefits; and (iii) increasing the share of higher cost production from Southeastern/Southern Systems with the return of operations with dry processing. In 2H20 however, with increased production, especially in the Northern System on a seasonally higher volume, C1 should be below US$ 14/t.

- Unit maritime freight cost per iron ore metric ton decreased US$ 1.1/t, totaling US$ 17.1/t in 1Q20, mainly due to lower spot freight prices (US$ 1.6/t), which was partially offset by a slight increase of bunker fuel costs due to IMO 2020 regulation (US$ 0.3/t). The bunker fuel cost gains due to the lower oil prices in February will be mostly realized in 2Q20, as vessels were in transit and gradually refueled towards the end of the quarter. We expect freight rates in 2Q20 to decrease by at least US$ 3/ton compared to 1Q20.

Base Metals

- Nickel operations adjusted EBITDA was US$ 350 million in 1Q20, US$ 61 million lower than in 4Q19, mainly due to lower nickel realized prices (US$ 80 million), lower copper as by-product realized prices (US$ 48 million) and lower nickel and copper as by-product sales volumes (US$ 37 million), which were partially offset by higher PGMs by-product credits (US$ 62 million), lower costs and expenses (US$ 31 million) and favourable exchange rate variations (US$ 9 million).

- The Nickel business presented a solid first quarter, with the lower sequential production volume mainly caused by seasonality and routine scheduled maintenance. We are also making progress with the closure of VNC's refinery, which will only produce nickel hydroxide cake at the site starting in May 2020.

- Sales volume was lower than production as Vale is actively managing its inventories to cope with market conditions and also due to regular annual maintenance shutdown at its refinery in Japan. On price realization, the collar hedge structure provided a floor to part of the volume at US$ 16,000/t and, as a result, the average realized price stood US$ 1,711/t above the average LME nickel price of US$ 12,723/t in 1Q20.

- Copper operations adjusted EBITDA was US$ 160 million in 1Q20 vs. US$ 238 million in 4Q19, mainly due to lower realized prices (US$ 113 million) and the combined effect of lower Salobo volumes and higher Sossego volumes (US$ 64 million), which were partially offset by lower costs and expenses (U$ 86 million) and favourable exchange rate variations (US$ 13 million). Copper performance was supported by the resumption of Sossego's operation after the unscheduled maintenance held in the previous quarter and by Salobo's negative unit cash

costs due to higher gold by-product credits, which were partially offset by the unscheduled maintenance at its processing plant in 1Q20.

Selected financial indicators

US$ million	1Q20	4Q19	1Q19
Net operating revenues	6,969	9,964	8,203
Total costs and other expenses	4,818	6,507	5,180
Expenses related to Brumadinho	159	1,141	4,504
Adjusted EBIT	2,067	2,504	(1,453)
Adjusted EBIT margin (%)	30%	25%	(18%)
Adjusted EBITDA	2,882	3,536	(652)
Adjusted EBITDA margin (%)	41%	35%	(8%)
Iron ore - 62% Fe reference price	89.0	88.6	82.7
Net income (loss)	239	(1,562)	(1,642)
Net debt [1]	4,808	4,880	12,031
Capital expenditures	1,124	1,472	611

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

Market overview

IRON ORE

Iron ore 62% Fe reference price averaged US$ 89.0/dmt in 1Q20, in line with 4Q19 and 7.8% higher than 1Q19. Prices started the year at a stronger pace, however, due to the uncertainty brought by the COVID-19, price volatility increased. Prices have outperformed most of other commodities as, in China, blast furnaces production remained firm, electric-arc furnaces utilization dropped and domestic concentrate, which is mainly transported by trucks, was impacted by lockdowns and weather-related events, which balanced supply-demand.

MB65% index averaged US$ 104.3/dmt in 1Q20, 5.8% and 6.7% higher than in 4Q19 and 1Q19, respectively. In 1Q20, the spread between the MB65% and the 62% iron ore reference price was US$ 5.3/t higher than 4Q19 average, mainly due to a combined effect of supply disruptions in Chinese domestic concentrate together with seasonal lower supply from Brazil, in an environment of strong pig iron production in China.

In China, crude steel production totaled 234.5 Mt in 1Q20, 1.2% higher than in 1Q19, outperforming expectations amid efforts and lockdowns to contain the spread of COVID-19, which resulted in the first contraction of Chinese GDP in 30 years. Business resumption in March strongly supported crude steel output and demand and, according to China National Development and Reform Commission, production activities of major industrial companies were almost back to normal. Steel inventories at mills and traders started to normalize, after reaching its record level of 40 Mt in early March, around 60% higher than the peak level last years, demonstrating a normalization of the downstream demand.

Most of the Chinese steel demand was for long products, coming from construction sector given government stimulus mostly driving infrastructure and the return of migrant workers. Flat products are facing a weaker demand, given lower global trade and demand levels for steel-made-products. However, as a response to incentives, Vale expects construction sector to compensate the weakness in flat market, given the higher relevance of construction in steel demand.

Ex-China, according to World Steel Association, crude steel production totaled 209.0 Mt, 4.1% lower than in 1Q19.

European Union showed a 10% decrease in production as steel mills quickly reacted to government protocols, cumulated with shutdowns of manufacturing plants, supply chain disruptions, collapsing consumption and postponements of investments and construction projects.

Following measures to contain the COVID-19 spread, Americas and Developed Asia followed suit, with minor impacts felt until March, but expected to increase from April onwards. Middle East presented an increase of 7.7% in steel production vs. 1Q19 with the resumption of some capacity. The resumption is expected to be short lived as spread containment measures were implemented.

Iron ore supply cuts due to lockdowns are partially softening the impact of steel production cuts, giving support to prices, which is expected to continue in a volatile trend in 2Q20.

Short-term outlook is still uncertain in the sense of intensity and timeframe of cuts being adopted by steel mills. European manufacturing is expected to restart in May, however, there are uncertainties regarding the recovery level as a response of how consumer demand and trade flows will recover. The different timing of lockdowns among regions adds another layer of uncertainty, given the complex supply chain links, delaying a global recovery to a healthy level.

COAL

The seaborne coking coal price averaged US$ 155/t in 1Q20,11% higher than in 4Q19. Buoyed by disruptions in China's domestic production during Lunar New Year Holiday and then by regional COVID-19 lockdowns, prices improved steadily from US$ 140/t at the beginning of January to peak at $163.5/t in the middle of March. By contrast, the second half of March saw a sharp of US$ 16/t price decline, due to widespread demand cuts as the pandemic spread across the rest of the world, culminating in lockdowns in Europe and India which led many ports and steel mills to declare Force Majeure on suppliers.

With uncertainty high, the seaborne coking coal market is expected to weaken further in 2Q20, with more cargoes being diverted into China from the rest of the world, as well as the reopening of the border with Mongolia for landborne supply into China. Nevertheless, China's recovery should be a stabilizing influence, while the increasing likelihood of key coking coal supply regions becoming disrupted by COVID-19 may support prices.

In the thermal coal market, Richards Bay FOB price averaged US$ 78.5/t for the quarter, 3.3% higher than in 4Q19. The first quarter was defined by a steep downward trend wherein nearly US$ 40/t was shed from the peak assessment of US$ 95.5/t at the middle of January until the third week of March, driven by increased Indian domestic production and weaker demand across Europe and Southeast Asia. On the March 26th, Richards Bay Coal Terminal declared force majeure in response to the South African government's 21-day lockdown to curb the spread of COVID-19, causing the index to spike to US$ 80/t.

The thermal coal market sentiment remains negative with the key feature in 2Q20 being the uncertainties around the COVID-19, impacting industrial demand and power generation, but also disrupting supply regions compounding the expected high volatility in prices.

NICKEL

LME nickel prices averaged US$ 12,723/t in 1Q20, 18% lower compared to US$ 15,450 /t in 4Q19.

Total exchange inventories (LME and SHFE) had a net increase, closing at 258.5 kt by the end of 1Q20, up 70.4 kt since the previous quarter as off-exchange inventories came back online.

LME inventories at the end of 1Q20 stood at 229.8 kt, an increase of 41.7 kt since last quarter. SHFE inventories increased by 14.3 kt to 28.7 kt by the end of 1Q20.

Global stainless-steel production decreased 11% in 1Q20 relative to 4Q19 as the impact of the COVID-19 pandemic caused major disruptions across the globe. There has been a mismatch of stainless production and stainless consumption, resulting in a surplus which is evidenced by the record high reported stainless inventories, particularly in China. Sales of electric vehicles worldwide fell 16% in 2M20 relative to 2M19 amid a continued decline in overall automotive sales. This decline was primarily driven by China's lockdown, which caused electric vehicle sales in China to drop 62% over the same period. Demand for nickel in other applications is mixed, with aerospace supporting increased growth in super alloy applications and continuing poor results for the automotive market negatively impacting plating applications. Nickel supply decreased approximately 3% in 1Q20 relative to 4Q19, with both Class I and Class II production decreasing during this period.

The Indonesian export ore ban, which was fast tracked two years earlier than previously indicated, is now in effect. Chinese NPI (nickel pig iron) production, which relies heavily on Indonesian ore imports, is negatively impacted. The end of the Indonesian ore exports hampers the ability of the Chinese domestic NPI production to maintain the high rates of production observed with the high nickel grade Indonesian ore. The Chinese domestic NPI industry needs to find alternative sources. In the near-term, alternative sources of ore are likely to soften the immediate impact, such as, current Chinese ore stockpiles (visible and invisible), and the potential export increases from the Philippines, New Caledonia and Guatemala. However, in the long term, as ore stocks deplete and the Chinese domestic NPI industry starts processing the relatively lower quality and quantity ores from Philippines and New Caledonia and Guatemala, the impact is that of a much lower production.

The current COVID-19 pandemic has caused only minor disruption in nickel supply in 1Q20. Producing operations in South Africa, Madagascar, Canada, Colombia and the Philippines have been impacted. Despite of this impact on mine supply, the inventory of ore and concentrates meant that the impact on finished nickel was moderated. Our estimates indicate that for 1Q20 the finished nickel supply declined 12-15kt of Ni due to the COVID-19 pandemic or approximately 2% of 1Q20 pre COVID-19 estimated output or approximately 2.1% of 4Q19 finished nickel supply. In addition to the impact on existing operations, delay in projects have also been observed given the restriction on the movement of people.

As a result of COVID-19 pandemic, our near-term view for nickel has changed. We now see the nickel market enter into a surplus in 2020 compared to our previous view of continued deficits.

Our long-term outlook for nickel continues to remain 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. However, this growth has been delayed given the global slowdown over the current pandemic conditions. HPAL projects, primarily stemming out of Indonesia and expected to be the primary source of battery-suitable nickel material, 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. While

the Indonesian export ore ban will limit Chinese NPI in the longer term, the ban has incentivized domestic nickel RKEF (Rotary Kiln-Electric Furnace) and HPAL (High Pressure Acid Leach) developments within the country. As a result, several projects and expansions have emerged to fill this growing global demand.

COPPER

The LME copper price averaged US$ 5,637/t in 1Q20, a decrease of 4% from 4Q19 (US$ 5,881/t).

Copper inventories on the LME increased by 76.5 kt in 1Q20 vs. 4Q19. In 1Q20, COMEX decreased by 4.8 kt, while SHFE increased by 240.4 kt in comparison with 4Q19. Overall, copper exchange inventory increased by 321.7 kt, ending the quarter at 615.5 kt.

The COVID-19 pandemic has negatively affected global demand, declining 20.5% in 1Q20 with respect to 4Q19. Global copper production has also been negatively impacted by COVID-19 pandemic. Specifically, producing operations in Canada, USA, Panama, Peru, Ecuador, Brazil, Mexico, Chile, South Africa, Zambia, and China have all been impacted to some degree. Our estimates indicate that for 1Q20, Copper supply declined by 200-250kt of Cu or approximately 4% of 1Q20 pre COVID-19 estimated output or approximately 3.8% of 4Q19 copper output.

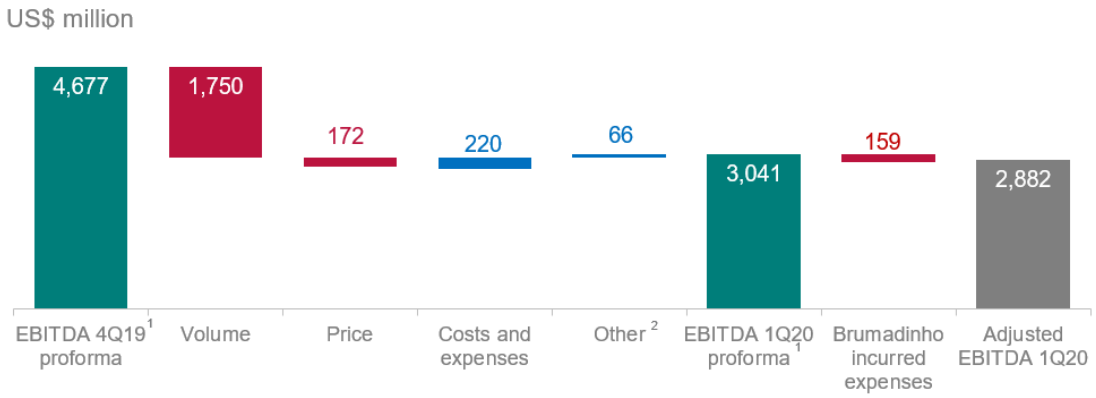
Our near-term outlook for copper is subdued. We expect the market to remain in a minor surplus with further downside risks as economic impacts continue to be evaluated. As a result, we expect increasing monetary and fiscal stimulus packages from across the globe to help buffer the negative impacts and support future growth.

Our long-term outlook for copper remains positive. Copper demand is expected to grow, partially 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.

Adjusted EBITDA

Adjusted EBITDA

US$ million	1Q20	4Q19	1Q19
Net operating revenues	6,969	9,964	8,203
COGS	(4,278)	(5,632)	(4,701)
SG&A	(115)	(139)	(110)
Research and development	(95)	(158)	(71)
Pre-operating and stoppage expenses	(268)	(314)	(214)
Expenses related to Brumadinho	(159)	(1,141)	(4,504)
Other operational expenses	(62)	(264)	(84)
Dividends and interests on associates and JVs	75	188	28
Adjusted EBIT	**2,067**	**2,504**	**(1,453)**
Depreciation, amortization & depletion	815	1,032	801
Adjusted EBITDA	**2,882**	**3,536**	**(652)**
Proforma adjusted EBITDA	**3,041**	**4,677**	**3,852**



[1] Net of Brumadinho provisions and incurred expenses
[2] Including US$ 113 million of dividends received and US$ 179 million of foreign exchange effect

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

Since December 31, 2019, there has been no additional provisions for Brumadinho and the aggregate amount of the provisions are now lower than US$ 4.0 billion, mainly due to payments made during the quarter, in the amount of US$ 217 million, and the impact of the Brazilian real devaluation in 1Q20.

US$ million	EBITDA impact in 2019	Payments in 2019	PV & FX adjust 2019[1]	Provisions balance 31dec19	EBITDA impact in 1Q20	Payments 1Q20	PV & FX adjust 1Q20[1]	Provisions balance 31mar20
Decharacterization	2,624	(158)	23	2,489	-	(65)	(612)	1,812
Agreements & donations	3,926	(831)	(112)	2,983	-	(152)	(668)	2,163
Total Provisions	**6,550**	**(989)**	**(89)**	**5,472**	**-**	**(217)**	**(1,280)**	**3,975**
Incurred expenses	730	(730)	-	-	(159)	(159)	-	-
Others	122	-	-	-	-	-	-	-
Total	**7,402**	**(1,719)**	**-**	**-**	**(159)**	**(376)**	**-**	**-**

[1] Present value and currency translation adjustments. Negative adjustments reduce provisions.

Adjusted EBITDA by business area

US$ million	1Q20	4Q19	1Q19
Ferrous Minerals	2,847	4,538	3,602
Base Metals	510	649	505
Coal	(158)	(186)	(69)
Others	(158)	(324)	(186)
Brumadinho impact	(159)	(1,141)	(4,504)
Total	**2,882**	**3,536**	**(652)**

Net operating revenue by business area

US$ million	1Q20	%	4Q19	%	1Q19	%
Ferrous Minerals	**5,296**	**76.0**	**8,020**	**80.5**	**6,343**	**77.3**
Iron ore fines	4,311	61.9	6,451	64.7	4,477	54.6
ROM	6	0.1	5	0.1	10	0.1
Pellets	852	12.2	1,378	13.8	1,674	20.4
Manganese ore	23	0.3	46	0.5	57	0.7
Ferroalloys	23	0.3	34	0.3	28	0.3
Others	81	1.2	106	1.1	97	1.2
Base Metals	**1,427**	**20.5**	**1,643**	**16.5**	**1,451**	**17.7**
Nickel	637	9.1	764	7.7	632	7.7
Copper	350	5.0	500	5.0	543	6.6
PGMs	210	3.0	148	1.5	102	1.2
Gold as by-product	179	2.6	188	1.9	132	1.6
Silver as by-product	12	0.2	9	0.1	8	0.1
Cobalt	32	0.5	28	0.3	30	0.4
Others	7	0.1	6	0.1	4	0.0
Coal	**148**	**2.1**	**191**	**1.9**	**333**	**4.1**
Metallurgical coal	94	1.3	134	1.3	258	3.1
Thermal coal	54	0.8	57	0.6	75	0.9
Others	**98**	**1.4**	**110**	**1.1**	**76**	**0.9**
Total	**6,969**	**100.0**	**9,964**	**100.0**	**8,203**	**100.0**

COGS by business segment

US$ million	1Q20	%	4Q19	%	1Q19	%
Ferrous Minerals	2,569	60.1	3,763	66.8	2,920	62.1
Base Metals	1,150	26.9	1,238	22.0	1,218	25.9
Coal	393	9.2	453	8.0	473	10.1
Others	166	3.9	178	3.2	90	1.9
Total COGS	**4,278**	**100.0**	**5,632**	**100.0**	**4,701**	**100.0**
Depreciation	729		943		748	
COGS [1], ex-depreciation, depletion and amortization	**3,549**		**4,689**		**3,953**	

[1] COGS currency exposure in 1Q20 was as follows: 48% USD, 44% BRL, 6% CAD and 2% EUR.

Expenses

US$ million	1Q20	4Q19	1Q19
SG&A ex-depreciation	**98**	**125**	**96**
SG&A	**115**	**139**	**110**
Administrative	**98**	**116**	**89**
Personnel	47	49	46
Services	18	33	14
Depreciation	17	14	14
Others	16	20	15
Selling	**17**	**23**	**21**
R&D	**95**	**158**	**71**
Pre-operating and stoppage expenses	**268**	**314**	**214**
Depreciation	69	75	39
Expenses related to Brumadinho	**159**	**1,141**	**4,504**
Provisions	-	898	4,278
Incurred expenses	159	243	226
Brumadinho - extraordinary logistics expenses	**-**	**28**	**-**
Other operating expenses	**62**	**236**	**84**
Total expenses	**699**	**2,016**	**4,983**
Depreciation	86	89	53
Expenses ex-depreciation	**613**	**1,927**	**4,930**

The table below presents the pre-operating and stoppage expenses break-down per site. These expenses will decrease as Vale succeeds in resuming production at those operations.

Pre-operating and stoppage expenses break-down

US$ million	1Q20	4Q19	1Q19
Pre-operating and stoppage expenses	**268**	**314**	**214**
Depreciation	69	75	39
Pre-operating and stoppage expenses, ex-depreciation	**199**	**239**	**175**
Brumadinho - stoppage expenses	**163**	**182**	**160**
Itabira Complex (Cauê, Conceição and others)	6	-	-
Minas Centrais Complex (Brucutu and others)	26	11	21
Mariana Complex (Alegria, Timbopeba and others)	19	36	2
Paraopeba Complex (Mutuca, Fábrica[1] and others)	55	57	19
Vargem Grande Complex (Vargem Grande[1], Pico and others)	57	72	114
Others Brumadinho	-	6	4
Tubarão pellet plants[2]	**15**	**8**	**-**
Stobie & Birchtree	**-**	**-**	**4**
Sossego	**-**	**20**	**-**
Others	**21**	**29**	**11**

[1] Including pelletizing plants.
[2] In 1Q20, Tubarão 1, 2, 4 and 6 pellet plants.

Net income (loss)

Vale posted a net income of US$ 239 million in 1Q20, compared to a loss of US$ 1.562 billion in 4Q19. The US$ 1.801 billion increase was mostly driven by the recognition of one-off expenses in 4Q19, such as the impairment charges in nickel and coal assets (US$ 4.202 billion) and provisions related to the Brumadinho (US$ 898 million). These effects were partially offset by lower proforma EBITDA (US$ 1.636 billion), higher financial expenses (US$ 1.445 billion) and lower tax income (US$ 764 million) due to the lower loss before taxes.

Financial results

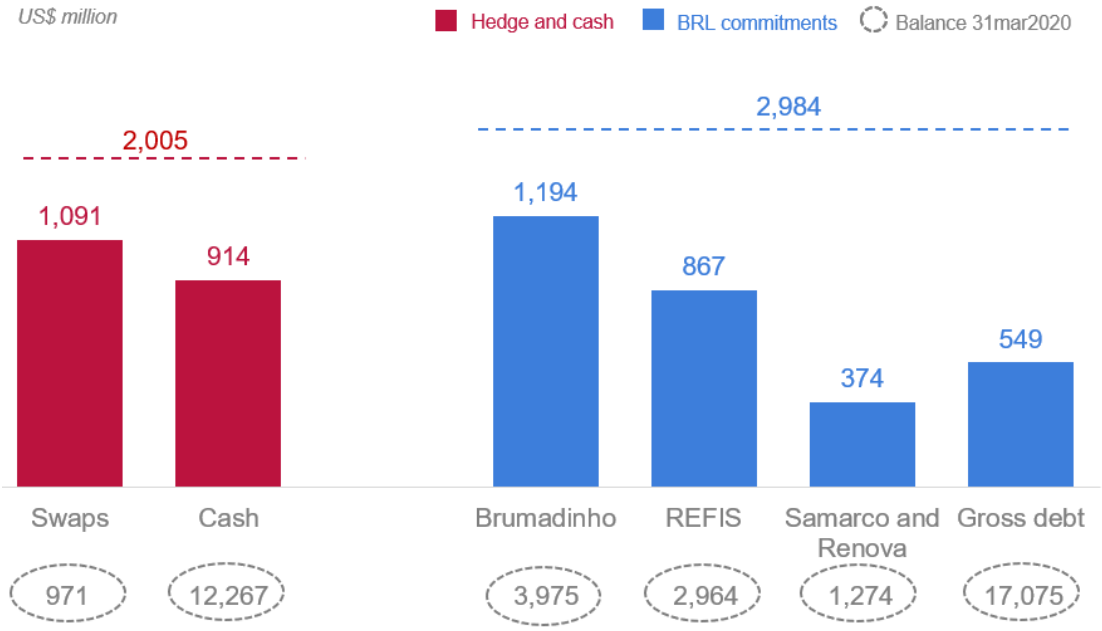
The main drivers of the US$ 1.445 billion lower 1Q20 financial results were:

- Negative impact of the 29% depreciation of the Brazilian real, to USDBRL 5.1987 on March 31st, 2020 from USDBRL 4.0307 on December 31st, 2019. The lower local currency value decreased the value of derivatives used to hedge Brazilian real denominated commitments (US$ 1.232 billion) and increased the value of the net US dollar liability of Vale's balance sheet (US$ 464 million[8]);
- Negative impact on the value of the derivatives positions due to the decline in oil prices as it affected the mark-to-market of the bunker oil hedge program (US$ 357 million);
- Positive impact of the relative stability of the Shareholders debentures (US$ 311 million), in line with the behavior of the iron ore price in the quarter.

Vale hedges part of its Brazilian real denominated commitments, such as debt and Brumadinho, REFIS future disbursements, through both the use of derivatives and holding cash locally in Brazil. Because such hedging is partial, in 1Q20, the decrease in the value of the derivatives and cash position due to the devaluation of the Brazilian real (US$ 2.005 billion) was more than offset by the decrease of the US dollar equivalent value of Vale's commitments denominated in Brazilian reais (US$ 2.984 billion).

[8] Vale´s functional currency is the Brazilian real. A devaluation of the Brazilian real increases the balance in Brazilian reais of US dollar-denominated liabilities, and such increase flows through the Income Statement as an expense.

BRL devaluation impact on USD equivalent value of cash, commitments and derivatives



Financial results

US$ million	1Q20	4Q19	1Q19
Financial expenses	**(525)**	**(1,163)**	**(808)**
Gross interest	(214)	(205)	(252)
Capitalization of interest	32	29	37
Shareholder debentures[1]	(49)	(361)	(377)
Others	(269)	(598)	(174)
Financial expenses (REFIS)	(25)	(28)	(42)
Financial income	**107**	**176**	**97**
Derivatives[2]	**(1,384)**	**159**	**93**
Currency and interest rate swaps	(1,091)	141	(9)
Others (bunker oil, commodities, etc)	(293)	18	102
Foreign Exchange	**(464)**	**-**	**(7)**
Monetary variation	**(19)**	**(12)**	**(81)**
Financial result, net	**(2,285)**	**(840)**	**(706)**

[1] In 1Q20, there were no payments of remuneration on shareholder debentures.

[2] The cash effect of the derivatives was a gain of US$ 273 million in 1Q20.

CAPEX

Investments in 1Q20 totaled US$ 1.124 billion, consisting of US$ 145 million in project execution and US$ 979 million in maintenance of operations. Investments were 23.6% lower than in 4Q19, mainly due to (i) weather-related conditions in the first quarter, which usually slow down construction work at our sites; and (ii) the depreciation of the Brazilian real relative to the US dollar.

Despite of being lower than 4Q19, investments in 1Q20 were the highest for a first quarter in the last three years, mainly due to higher volume of payments made in the 1Q20 related to works executed in the previous quarter. The year-on-year increase is also due to an atypical quarter in 1Q19, which was intensively impacted by the disruptions caused by the Dam 1 rupture. In 1Q20, there was also the start of the execution of projects for filtration, following the company's decision to reduce its dependency on tailings dam. Additionally, Vale started the anticipation of payments to suppliers, especially small and medium-sized contractors, as a measure to mitigate impacts of the COVID-19 pandemic on Vale's value chain.

As per Vale's response plan to the COVID-19 pandemic, the company decided to suspend or postpone works for its non-essential projects, in order to limit the contingent of people at Vale's sites to those with critical operating functions. Investments in dam safety and health and safety are considered essential, therefore not subject to suspension at this moment.

Due to that decision, the investments level presented in 1Q20 is expected to decelerate over the year, while the continuity of investments will largely depend on the developments of the COVID-19 pandemic. Due to that and in addition to the currency depreciation experienced, Vale reviewed its estimates for capital expenditures to US$ 4.6 billion from US$ 5 billion in 2020, and potential updates over the year may be necessary. Nonetheless, such decrease should not be considered as actual savings, since it is possible that those expenditures will be incurred in 2021, with extra costs for remobilization.

Project Execution and Sustaining by business area

US$ million	1Q20	%	4Q19	%	1Q19	%
Ferrous Minerals	627	55.8	815	55.4	365	59.7
Base Metals	413	36.7	569	38.7	193	31.6
Coal	80	7.1	84	5.7	50	8.2
Energy and others	4	0.4	4	0.3	3	0.5
Total	**1,124**	**100.0**	**1,472**	**100.0**	**611**	**100.0**

Project execution

Investments in project execution totaled US$ 145 million in 1Q20, 19.4% lower than 4Q19 and 46.4% higher than 1Q19. Two main multi-year projects are being implemented, the Northern System 240 Mtpy project and the Salobo III project. Both projects have their works impacted due to the COVID-19 pandemic. At this point, the estimate start-up dates have not changed; nonetheless, increased costs related to the future re-mobilization of teams are possible.

The Northern System 240 Mtpy project progressed as per schedule in 1Q20, including the replacement of heavy machinery and had construction and earth-moving works in the railway. As a preventive measure related to the COVID-19 pandemic, services and construction works at the project's site have been suspended since early April 2020.

As for the Salobo III project, civil construction works were ongoing in 1Q20, as well as the mechanical assembly/pre-assembly in some areas of the project. Since the end of March 2020, only critical work fronts have been continued, also as a preventive measure related to the COVID-19 pandemic.

Capital projects progress indicator[9]

Projects	Capacity (tons per year)	Estimated start-up[1]	Executed capex (US$ million)		Estimated capex (US$ million)		Physical progress (%)
			1Q20	Total	2020	Total	
Ferrous Minerals Project							
Northern System 240 Mtpy	240 (10)[2] Mt	2H22	31	100	224	770	20%
Base Metals Project							
Salobo III	(30-40) kt	1H22	46	182	323	1,128	47%

[1] Updates may be required in the future, depending on the developments of the COVID-19 pandemic.
[2] Net additional capacity.

Project execution by business area

US$ million	1Q20	%	4Q19	%	1Q19	%
Ferrous Minerals	91	62.8	122	67.8	86	86.9
Base Metals	52	35.9	56	31.1	11	11.1
Energy and others	2	1.4	2	1.1	2	2.0
Total	**145**	**100.0**	**180**	**100.0**	**99**	**100.0**

Sustaining CAPEX

Investments in the maintenance of operations in 1Q20 decreased 24.3% compared to 4Q19 and increased 91.1% compared to 1Q19. The two main projects are progressing as per schedule: Gelado, in Brazil, and Voisey's Bay underground mine extension ("VBME"), in Canada.

[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.

The Gelado project had services of electromechanical assembly and civil construction works contracted in 1Q20, as well as the continuity of civil construction works. The paving of an access road, a relevant milestone, was completed as per schedule. For the coming weeks, most of the work fronts were suspended temporarily.

The VBME project had the Eastern Deeps Powerhouse exterior cladding main structure completed in 1Q20, while temporary interior construction heaters were commissioned. Buried building services and conduits were underway in this first quarter. Nonetheless, as a measure to support the prevention of the COVID-19 in the aboriginal coastal communities, the project was suspended temporarily in mid-March.

Replacement projects progress indicator[10]

Projects	Capacity (ktpy)	Estimated start-up[1]	Executed capex (US$ million)		Estimated capex (US$ million)		Physical progress (%)
			1Q20	Total	2020	Total	
Voisey's Bay Mine Extension	45	1H21	74	545	499	1,694	46%
Gelado	9.6	2H21	32	107	121	428	54%

[1] Updates may be required in the future, depending on the developments of the COVID-19 pandemic.

Sustaining capex by type - 1Q20

US$ million	Ferrous Minerals	Base Metals	Coal	Energy and others	TOTAL
Enhancement of operations	301	192	71	1	565
Replacement projects	41	75	-	-	116
Dam management	6	6	-		12
Other investments in dams and waste dumps	22	40	2	-	64
Health and Safety	59	20	3	-	82
Social investments and environmental protection	33	14	3	-	50
Administrative & Others	74	14	1	1	90
Total	**536**	**361**	**80**	**2**	**979**

Sustaining capex by business area

US$ million	1Q20	%	4Q19	%	1Q19	%
Ferrous Minerals	536	54.7	693	53.6	279	55.3
Base Metals	361	36.9	513	39.7	182	35.5
Nickel	299	30.5	461	35.7	155	30.3
Copper	62	6.3	52	4.0	27	5.3
Coal	80	8.2	84	6.5	50	9.8
Energy and others	2	0.2	2	0.2	1	0.2
Total	**979**	**100.0**	**1,292**	**100.0**	**512**	**100.0**

[10] 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.

Investments in dam management

Investments in dam management are considered essential to Vale, therefore they will continue to be implemented, in line with the most rigorous international practices. Investments in dam management encompass: dam maintenance; monitoring; safety and operational improvements; audits and risk analysis; revisions of the Emergency Action Plan for Mining Dams (PAEBM); and warning systems, video monitoring and instrumentation.

In 1Q20, investments in dam management reached US$ 12 million, a decrease of 33.3% compared to 4Q19 and a decrease of 64.7% compared to 1Q19. The year-on-year decrease is due to the intense expenditure with the implementation of several measures to enhance Vale's dam management in short term over 2019, while investments in filtration and dry stacking gradually increased since last year, following the company's decision to reduce its dependency on tailings dams.

The quarter-on-quarter decrease is partly due to the same reason, and also due to: (i) the weather-related conditions in the first quarter, as heavy rains hit the construction sites and non-urgent works were decelerated to ensure the safety of operational teams; (ii) currency depreciation.

US$ million	1Q20	4Q19	1Q19
Dam management	12	18	34

Investments in Health and Safety

Investments in Health & Safety reached US$ 82 million in 1Q20, the highest expenditure for a first quarter in the past three years, reflecting measures being implemented by the Safety and Operational Excellence Executive Office, created in 2019.

Investments in Health & Safety were 35.0% lower than 4Q19 and 53.7% higher than 1Q19. The quarter-on-quarter decrease is mainly due to: (I) currency depreciation; and (ii) seasonality, as investments in first quarters are frequently lower. The year-on-year increase surpasses the immediate effects of the Dam 1 rupture in investments in 1Q19 and is in line with the company's commitment to the safety of its employees.

US$ million	1Q20	4Q19	1Q19
Investments in H&S	**82**	**111**	**53**

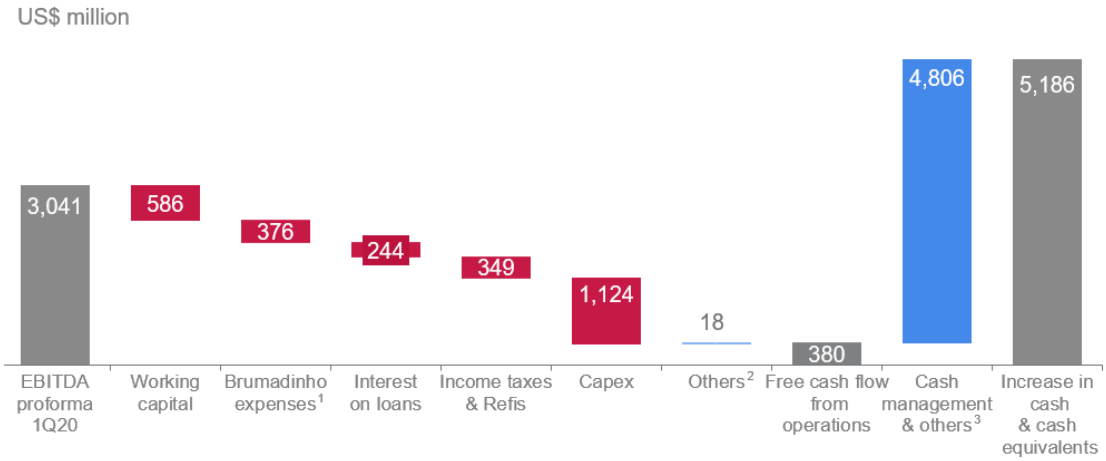
Free cash flow

In 1Q20, Free Cash Flow from Operations was US$ 380 million and cash & cash equivalents increased US$ 5.186 billion.

Vale had an active cash management during the first quarter, mainly in March with the decision to (i) withdraw US$ 5 billion from its Revolving Credit Lines, and (ii) support small and medium-sized suppliers and contractors with an emergency aid package with an estimated amount of R$ 932 million (around US$ 180 million), of which R$ 171 million (around US$ 32 million) were disbursed in March and the remaining disbursed throughout April.

In addition to the effects of the early payment to small and medium-sized suppliers and contractors, which reduced Vale's accounts payable, working capital variation had a negative impact on cash flow in the quarter, mainly due to (i) seasonal effects such as higher investments in 4Q19 being paid in 1Q20; and (ii) the impact on the inventories of higher average iron ore costs and the increase in physical inventories of nickel and copper.

Free Cash Flow 1Q20



[1] Includes US$ 159 million of incurred expenses and US$ 217 million disbursement of provisioned expenses.
[2] Includes derivatives, Samarco, dividends and interest on capital paid to noncontrolling interest and others.
[3] Includes US$ 5 billion of revolving credit lines disbursement, US$ 181 million of short term Brazilian treasury bonds disbursement and US$ 375 million of net debt repayments.

Debt indicators

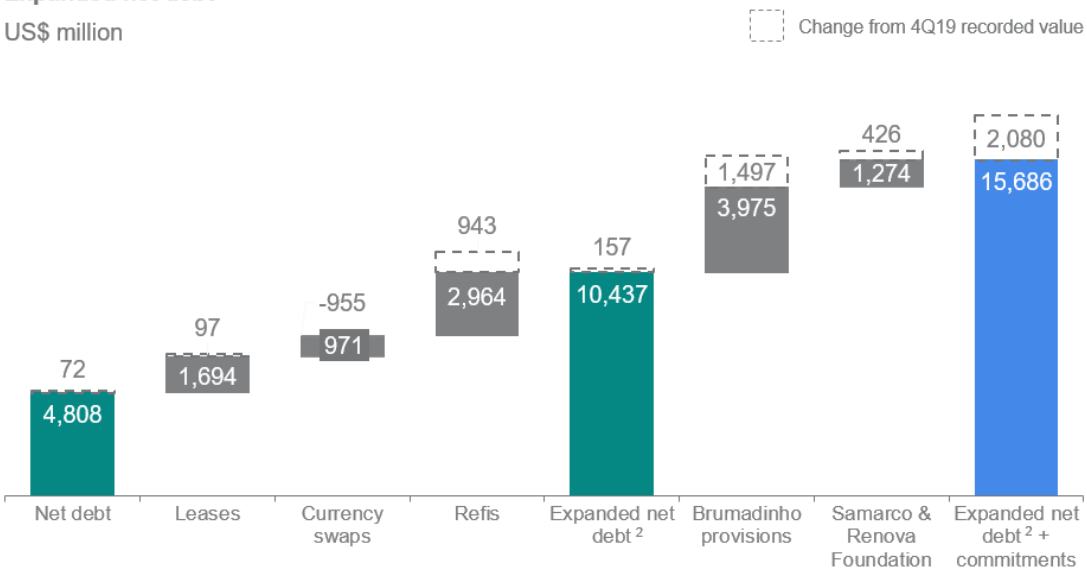
On March 24th, 2020, Vale announced the disbursement of US$ 5 billion from its revolving credit lines maturing June 2022 (US$ 2 billion) and December 2024 (US$ 3 billion), reinforcing its liquidity position to weather the increased risks presented to the business by the COVID-19 pandemic. As of March 31st, 2020, Vale's cash position stands at US$ 12.267 billion.

Despite the US$ 380 million free cash flow generation and the US$ 549 million reduction in the US dollar value of the debt denominated in Brazilian Reais, after the devaluation of the currency, net debt remained relatively stable at US$ 4.808 billion, due to the US$ 914 million offsetting effect of such currency devaluation on the onshore cash balances held in the Brazilian reais.

Net debt remains at its lowest level since 2008 and expanded net debt (including relevant commitments) decreased by US$ 2.080 billion, to US$ 15.686 billion as of March 31st, 2020 from US$ 17.766[11] billion as of December 31st, 2019. The reduction was mainly due to the favorable Brazilian real devaluation in the period since most of the expanded commitments are denominated in Brazilian reais[12].

Expanded net debt[1]

US$ million



[1] As of March 31st, 2020
[2] Expanded net debt adjusted to include currency swaps of US$ 16 million in 4Q19.

Average debt maturity decreased to 7.3 years on March 31st, 2020, when compared to 8.5 years on December 31st, 2019. Likewise, average cost of debt, after currency and interest rate swaps, decreased to 3.71% per annum on March 31st, 2020 when compared to 4.87% per annum on December 31st, 2019, mainly due to the disbursement of the lower yield and shorter-term revolving credit lines in the quarter.

[11] Expanded net debt was adjusted to include currency swaps of US$ 16 million in 4Q19.
[12] In addition to the Brazilian real devaluation effects depicted on page 17, commitments also changed reflecting payments made during the quarter

Debt indicators

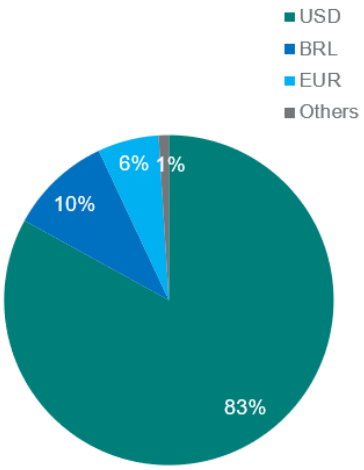
US$ million	1Q20	4Q19	1Q19
Gross debt [1]	17,075	13,056	17,051
Net debt [1]	4,808	4,880	12,031
Cash and cash equivalents [2]	12,267	8,176	5,020
Leases (IFRS 16)	1,694	1,791	1,746
Total debt / adjusted LTM EBITDA (x)	1.2	1.2	1.4
Net debt / adjusted LTM EBITDA (x)	0.3	0.5	1.0
Adjusted LTM EBITDA / LTM gross interest (x)	14.8	10.7	10.9

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

[2] Includes short term investments.

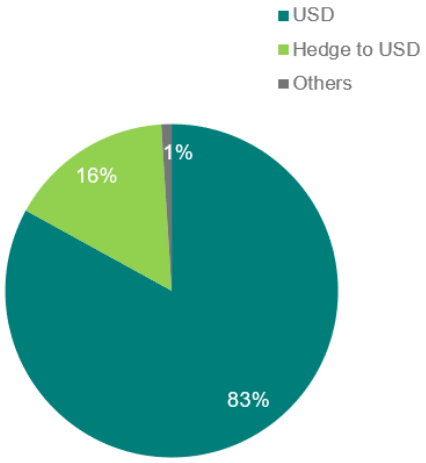
Debt position breakdown by currency (before hedge)

%



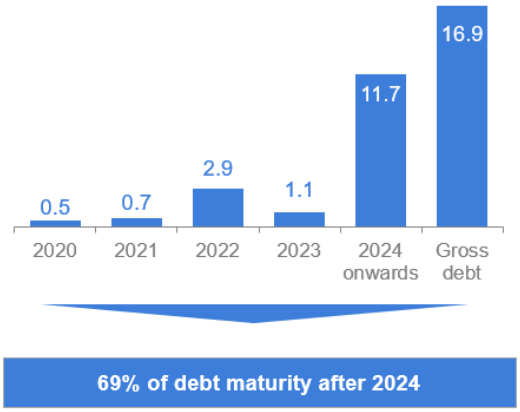
Debt position breakdown by currency (after hedge)

%



Debt amortization schedule[1]

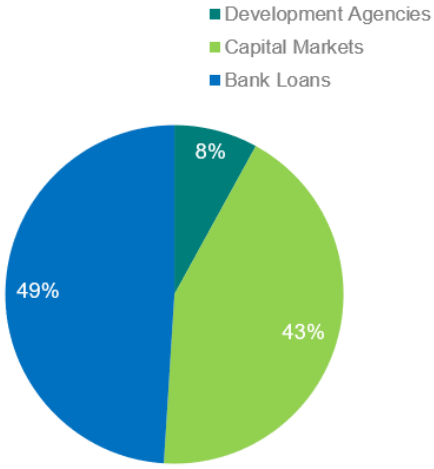
US$ billion



[1] As of March 31st, 2020. Does not include accrued charges.

Debt breakdown by instrument

%



Performance of the business segments

Segment information — 1Q20, as per footnote of financial statements

US$ million	Net Revenues	Cost[1]	Expenses			Dividends and interest received from associates and JVs	Adjusted EBITDA
			SG&A and others[1]	R&D[1]	Pre operating & stoppage[1]		
Ferrous Minerals	5,296	(2,215)	(14)	(25)	(195)	-	2,847
Iron ore fines	4,311	(1,683)	(25)	(23)	(169)	-	2,411
ROM	6	-	-	-	-	-	6
Pellets	852	(412)	10	(1)	(25)	-	424
Others ferrous	81	(71)	1	(1)	-	-	10
Mn & Alloys	46	(49)	-	-	(1)	-	(4)
Base Metals	1,427	(868)	(18)	(31)	-	-	510
Nickel[2]	1,044	(661)	(19)	(14)	-	-	350
Copper[3]	383	(207)	1	(17)	-	-	160
Coal	148	(374)	2	(9)	-	75	(158)
Others	98	(92)	(130)	(30)	(4)	-	(158)
Brumadinho impact	-	-	(159)	-	-	-	(159)
Total	6,969	(3,549)	(319)	(95)	(199)	75	2,882

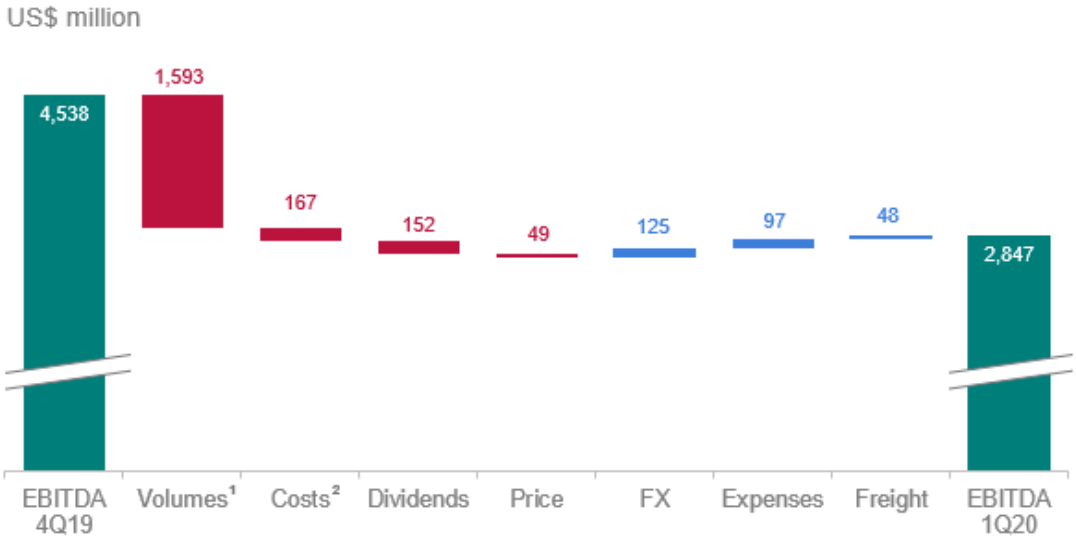
[1] Excluding depreciation, depletion and amortization.

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

[3] Including by-products from our copper operations.

Ferrous Minerals

Adjusted EBITDA of the Ferrous Minerals business segment was US$ 2.847 billion in 1Q20, 37% lower than in 4Q19, mainly due to lower sales volumes (US$ 1.593 billion). Sales volumes decreased 34% in 1Q20 vs. 4Q19, mainly as a result of seasonal lower volumes in the first quarter, the partial stoppage of the Brucutu plant and scheduled and unscheduled maintenances carried out in the period.



¹ Including resumption of halted operations related to Brumadinho event.
² Excluding volume effect, FX and freight costs.

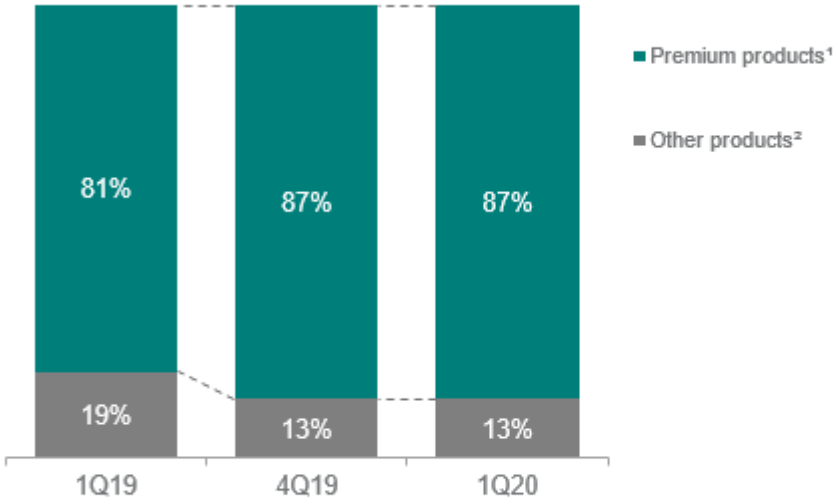
The share of premium products[13] in total sales was 87% in 1Q20, in line with 4Q19. Iron ore fines and pellets quality premiums reached US$ 5.2/t[14] in 1Q20 vs. US$ 6.4/t in 4Q19, mainly due to the absence of seasonal dividends received and lower pellet premiums, which were partially offset by higher iron ore fines premiums.

Iron ore fines and pellets quality premium

US$/t	1Q20	4Q19	1Q19
Iron ore fines quality premium	4.6	3.8	5.6
Pellets weighted average contribution	0.6	2.6	5.1
Iron ore fines and pellets total quality premium	**5.2**	**6.4**	**10.7**

[13] Pellets, Carajás, BRBF (Brazilian Blend Fines) and pellet feed.
[14] Iron ore premium of US$ 4.6/t and weighted average contribution of pellets of US$ 0.6/t.

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[15]

Adjusted EBITDA per ton for Ferrous Minerals, excluding Manganese and Ferroalloys, was US$ 48.3/t in 1Q20, a decrease of US$ 2.7/t when compared to the US$ 51.0/t recorded in 4Q19, mainly as a result of lower fixed costs dilution due to lower volumes, higher costs and lower dividends received, which were partially offset by lower expenses, the positive impact of the Brazilian real devaluation and lower freight costs.

Iron ore fines (excluding Pellets and ROM)

ADJUSTED EBITDA

Adjusted EBITDA of iron ore fines was US$ 2.411 billion in 1Q20, 34% lower than in 4Q19, mainly due to lower sales volumes (US$ 1.327 billion) and higher costs (US$ 126 million), which were partially offset by the positive impact of the Brazilian real devaluation (US$ 85 million), lower expenses (US$ 83 million) and lower freight costs (US$ 41 million).

SALES REVENUES AND VOLUME

Net sales revenues of iron ore fines, excluding pellets and run of mine (ROM), decreased to US$ 4.311 billion in 1Q20 vs. US$ 6.451 billion in 4Q19, mainly as a result of lower sales volumes (US$ 2.183 billion).

[15] Excluding Manganese and Ferroalloys.

Sales volumes of iron ore fines totaled 51.4 Mt in 1Q20, in line with production of 1Q20.

CFR sales of iron ore fines totaled 37.7 Mt in 1Q20, which represented 73% of all iron ore fines sales volumes, in line with 1Q19.

Net operating revenue by product

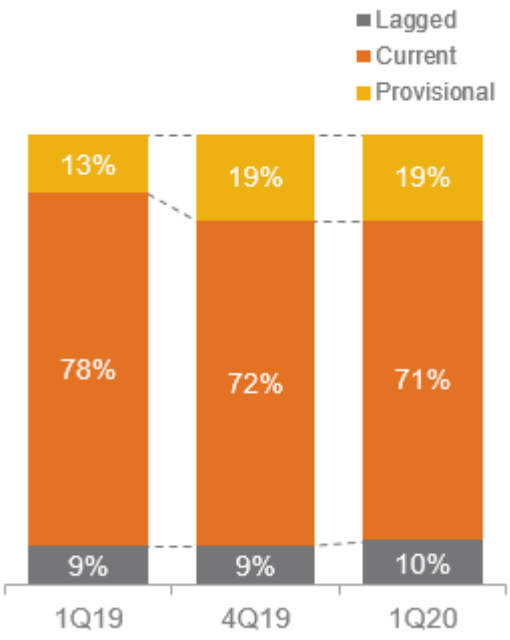
US$ million	1Q20	4Q19	1Q19
Iron ore fines	4,311	6,451	4,477
ROM	6	5	10
Pellets	852	1,378	1,674
Manganese & Ferroalloys	46	80	85
Others	81	106	97
Total	**5,296**	**8,020**	**6,343**

Volume sold

'000 metric tons	1Q20	4Q19	1Q19
Iron ore fines	51,445	77,301	55,204
ROM	211	605	211
Pellets	7,311	10,966	12,314
Manganese ore	219	570	252
Ferroalloys	27	35	25

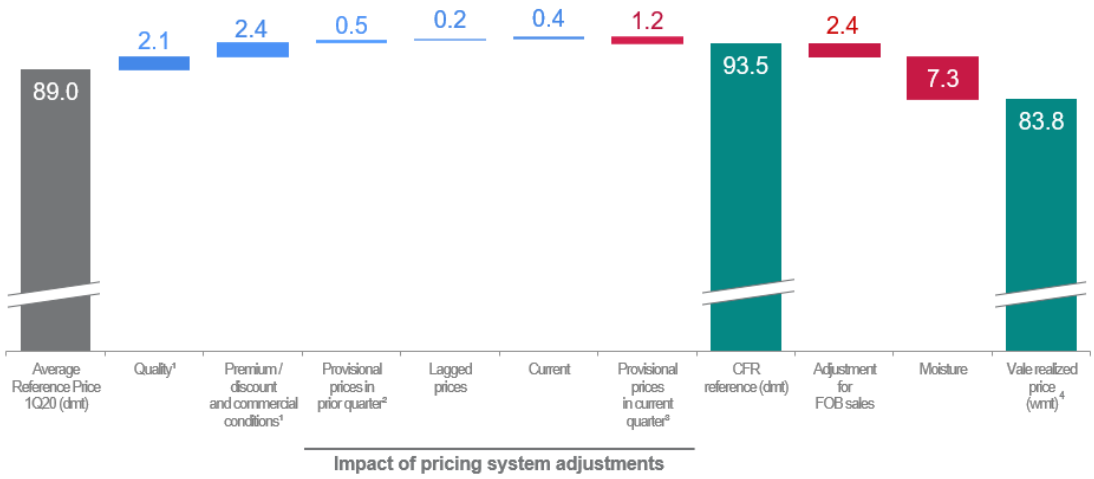
REALIZED PRICES

Pricing system breakdown - %



Price realization – iron ore fines

US$/t, 1Q20



[1] In 1Q20, Quality totalled US$ 2.15/t and Premium/discount and commercial conditions totalled US$ 2.44/t.
[2] Adjustment as a result of provisional prices booked in 4Q19 at US$ 90.3/t.
[3] Difference between the weighted average of the prices provisionally set at the end of 1Q20 at US$ 82.6/t based on forward curves and US$ 89.0/t from the 1Q20 62% Fe reference price.
[4] Vale price is net of taxes.

Vale's realized price CFR/FOB totaled US$ 83.8/t, a slight increase of US$ 0.3/t compared with 4Q19, mainly due to higher premiums/discounts (US$ 1.1/t), higher 62% Fe reference price (US$ 0.4/t) and lower adjustment for FOB sales (US$ 0.4/t), which were partially offset by pricing system mechanisms impacted by a lower forward price curve (US$ 1.4/t).

Average prices

US$/ metric ton	1Q20	4Q19	1Q19
Iron ore - Metal Bulletin 65% index	104.3	98.6	95.2
Iron ore - Metal Bulletin 62% low alumina index	91.0	88.3	84.2
Iron ore - 62% Fe reference price	89.0	88.6	82.7
Provisional price at the end of the quarter	82.6	90.3	85.1
Iron ore fines CFR reference (dmt)	93.5	93.7	91.6
Iron ore fines CFR/FOB realized price	83.8	83.5	81.1
Pellets CFR/FOB (wmt)	116.6	125.7	135.9
Manganese ore	107.4	80.2	227.8
Ferroalloys	870.7	969.9	1,162.7

COSTS

Costs for iron ore fines amounted to US$ 1.683 billion (or US$ 1.914 billion with depreciation charges) in 1Q20, an increase of US$ 85 million vs. 4Q19 after adjusting for the impact of lower sales volumes and exchange rate effect.

IRON ORE COGS - 4Q19 x 1Q20

		Variance drivers				
US$ million	4Q19	Volume	Exchange rate	Others	Total variation	1Q20
C1 cash costs	1,122	(350)	(60)	120	(290)	832
Freight	1,093	(406)	-	(41)	(447)	646
Others	299	(100)	-	6	(94)	205
Total costs before depreciation and amortization	**2,514**	**(856)**	**(60)**	**85**	**(831)**	**1,683**
Depreciation	355	(105)	(36)	17	(124)	231
Total	**2,869**	**(961)**	**(96)**	**102**	**(955)**	**1,914**

C1 cash cost FOB port per metric ton for iron ore fines ex-royalties increased to US$ 16.2/t in 1Q20 from US$ 14.5/t in 4Q19, mainly due to (i) lower fixed costs dilution due to seasonal lower volumes (US$ 1.2/t); (ii) higher maintenance costs as a result of scheduled and unscheduled maintenance (US$ 0.5/t) and; (iii) higher demurrage costs, as a result of the heavy rains that affected the logistics chain and shipments this quarter (US$ 0.3/t). Those effects were partially offset by the positive impact of the Brazilian real devaluation due to the Brazilian real depreciation against the US dollar (US$ 0.8/t). The Brazilian Real devaluation together with higher dilution of fixed cost should bring even greater positive impact to C1 in 2Q20, nonetheless those effects are expected to be offset by (i) consumption of inventories with higher average production costs from 1Q20; (ii) costs related to COVID-19 related expenses such as additional employee benefits; and (iii) increasing the share of higher cost production from Southeastern/Southern Systems with the return of operations with dry processing. In 2H20 however, with increased production, especially in the Northern System on a seasonally higher volume, C1 should be below US$ 14/t.

Unit maritime freight cost per iron ore metric ton decreased US$ 1.1/t, totaling US$ 17.1/t in 1Q20, mainly due to lower spot freight prices (US$ 1.6/t), which was partially offset by a slight increase of bunker fuel costs as a result of IMO 2020 regulation (US$ 0.3/t). Vale expects to gradually offset the impact of the new regulation through scrubbers installations in long term contracts and delivery of newbuilds[16], which may be delayed due to the impacts of COVID-19.

Despite the increase in the quarter, bunker fuel costs were much lower than expected as a result of IMO 2020, mainly due to the sharp drop in oil prices in February and March. Vale's bunker fuel costs per tonne reduced 41% between January and March[17]. However, bunker fuel cost gains were not fully realized in the quarter as vessels were in transit and gradually refueled towards the

[16] In 1Q20, 59% of contracted fleet were with scrubbers installed.
[17] Average of January 2020 and average of March 2020. Considers weighed average of Low Sulphur Fuel Oil and High Sulphur Fuel Oil.

end of the quarter. Vale expects freight rates in 2Q20 to decrease by at least US$ 3/t compared to 1Q20[18].

Iron ore fines cash cost and freight

	1Q20	4Q19	1Q19
Costs (US$ million)			
COGS, less depreciation and amortization	1,683	2,514	1,644
(-) Distribution costs	55	73	67
(-) Maritime freight costs (A)	646	1,093	680
FOB at port costs (ex-ROM)	**982**	**1,348**	**897**
(-) Royalties	150	226	123
FOB at port costs (ex-ROM and ex-royalties) (B)	**832**	**1,122**	**774**
Sales volumes (Mt)			
Total iron ore volume sold	51.6	77.9	55.4
(-) Total ROM volume sold	0.2	0.6	0.2
Volume sold (ex-ROM) (C)	51.4	77.3	55.2
Vale's iron ore cash cost (ex-ROM, ex-royalties), FOB (US$ /t) (B/C)	**16.2**	**14.5**	**14.0**
Freight			
Maritime freight costs (A)	646	1,093	680
% of CFR sales (D)	73%	78%	73%
Volume CFR (Mt) (E = C x D)	37.7	60.0	40.5
Vale's iron ore unit freight cost (US$/t) (A/E)	17.1	18.2	16.8

Iron Ore Fines Costs and Expenses in BRL

R$/t	1Q20	4Q19	1Q19
C1 cash costs[1]	72.8	59.8	52.9
Stoppage expenses related to Brumadinho[1]	13.2	10.4	10.3
Other expenses[1]	5.1	5.3	2.8
Total	**91.1**	**75.5**	**66.0**

[1] Net of depreciation

EXPENSES

Iron ore fines expenses, net of depreciation, totaled US$ 217 million in 1Q20, decreasing US$ 108 million vs. 4Q19, mainly due to the positive effect of the Brazilian real devaluation (US$ 25 million) and lower R&D expenses (US$ 23 million).

R&D was 56% lower than 4Q19, following the usual seasonality of disbursements.

Pre-operating and stoppage expenses excluding the stoppage expenses related to Brumadinho, net of depreciation, which amounted to US$ 16 million in 1Q20, 30% lower than 4Q19 mainly as a result of the resumption of the Viga concentration plant of Ferrous Resources do Brasil in November 2019.

[18] Despite the cost reduction effect, bunker fuel cost savings is not fully translated into cash generation due to bunker derivatives. For further information, see the Net Income section.

In 1Q20, Vale spent close to US$ 1 million supporting the shipowner of the Stellar Banner vessel. Most of the vessel's rescue expenses will be recognized in the second quarter. Discussions with insurance companies are in course to recover amounts related to expenses and cargo revenue.

Expenses - iron ore fines

US$ millions	1Q20	4Q19	1Q19
Selling	**11**	**11**	**11**
R&D	**23**	**52**	**19**
Pre-operating and stoppage expenses	**169**	**191**	**157**
Brumadinho stoppage expenses	153	168	150
Others	16	23	7
Extraordinary logistics expenses	**-**	**28**	**-**
Other expenses	**14**	**43**	**2**
Total expenses	**217**	**325**	**189**

Iron ore pellets

Adjusted EBITDA for pellets was US$ 424 million in 1Q20, 50% lower than in 4Q19, mainly as a result of lower sales volumes (US$ 251 million), absence of seasonal dividends received[19] (US$ 114 million) and lower sales prices (US$ 64 million), which were partially offset by the positive impact of the Brazilian real devaluation (US$ 30 million).

Pellets sales totaled 7.3 Mt in 1Q20, 33% lower than in 4Q19. Vale's revised pellet production guidance for 2020 is 35-40 Mt, down from 44 Mt, due to (i) lower pellet feed availability from the Brucutu plant following the postponement of tailings disposal at the Norte/Laranjeiras dam and (ii) short-term uncertainties regarding pellet demand.

FOB pellets sales of 4.8 Mt in 1Q20 represented 66% of total pellets sales. CFR pellets sales amounted to 2.5 Mt in 1Q20.

Realized prices in 1Q20 were an average CFR/FOB of US$ 116.6/t, decreasing US$ 9.1/t vs. 4Q19, mainly due to lower premiums received and the pricing system mechanism, which were partially offset by a higher 65% Fe price index.

Costs totaled US$ 412 million (or US$ 508 million with depreciation charges) in 1Q20. Excluding the impact of lower sales volumes (US$ 211 million) and the positive impact of the Brazilian real devaluation (US$ 27 million), costs increased US$ 36 million when compared with 4Q19, mainly due to higher maintenance costs.

Pellets expenses, net of depreciation, totaled US$ 16 million in 1Q20, decreasing US$ 12 million when compared with 4Q19, mainly due to reversal of provisions and the positive effect of the Brazilian real devaluation.

[19] Dividends from leased pelletizing plants, which are usually paid every 6 months (in 2Q and 4Q).

Pellets - EBITDA

	1Q20		4Q19	
	US$ million	US$/wmt	US$ million	US$/wmt
Net revenues / Realized price	852	116.5	1,378	125.7
Dividends received (Leased pelletizing plants)	-	-	114	10.4
Cash costs (Iron ore, leasing, freight, overhead, energy and other)	(412)	(56.4)	(614)	(56.0)
Pre-operational & stoppage expenses	(25)	(3.4)	(22)	(2.0)
Expenses (Selling, R&D and other)	9	1.2	(6)	(0.5)
EBITDA	**424**	**58.0**	**850**	**77.5**

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

In 1Q20, Vale's iron ore fines and pellets EBITDA breakeven increased US$ 2.3/t, totaling US$ 39.9/t, mainly as a result of lower pellet contribution (US$ 2.0/t) and higher C1 cash cost (US$ 1.7/t), which were offset by lower freight costs (US$ 1.1/t) and higher quality premiums (US$ 0.8/t).

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

US$/t	1Q20	4Q19	1Q19
Vale's iron ore cash cost (ex-ROM, ex-royalties), FOB (US$ /t)	16.2	14.5	14.0
Iron ore fines freight cost (ex-bunker oil hedge)	17.1	18.2	16.8
Iron ore fines distribution cost	1.1	0.9	1.2
Iron ore fines stoppage expenses[2] related to Brumadinho	3.0	2.5	2.7
Iron ore fines expenses[2] & royalties	4.1	4.3	2.9
Iron ore fines moisture adjustment	3.6	3.6	3.3
Iron ore fines quality adjustment [3]	(4.6)	(3.8)	(5.6)
Iron ore fines EBITDA break-even (US$/dmt)	**40.5**	**40.2**	**35.4**
Iron ore fines pellet adjustment	(0.6)	(2.6)	(5.1)
Iron ore fines and pellets EBITDA break-even (US$/dmt)	**39.9**	**37.6**	**30.3**
Iron ore fines sustaining investments	9.4	8.0	4.2
Iron ore fines and pellets cash break-even landed in China (US$/dmt)	**49.3**	**45.6**	**34.4**

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

[2] Net of depreciation and includes dividends received

[3] In 1Q20, quality adjustment totalled US$ 2.15/t and premium/discount and commercial conditions totalled US$ 2.44/t.

Manganese and ferroalloys

Adjusted EBITDA of manganese ore and ferroalloys was negative US$ 4 million in 1Q20, US$ 9 million lower than in 4Q19, mainly due to lower volumes (US$ 15 million), which was partially offset by the positive impact of the Brazilian real devaluation (US$ 5 million).

Manganese ore sales volumes reached 219kt in 1Q20, 61.6% and 13.1% lower than in 4Q19 and 1Q19, respectively. The quarter-on-quarter decrease in sales was mainly due to unusual weather-related conditions in this period, which affected both production and shipments at the Ponta da Madeira port. Operations at the Urucum underground mine had additional impacts from safety improvement and maintenance activities.

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

Ferroalloys sales volumes totalled 27kt in 1Q20, 23.6% lower than 4Q19, due to production slowdown at the Simões Filho plant for the implementation of safety maintenance measures.

Volume sold by destination – Iron ore and pellets

'000 metric tons	1Q20	4Q19	1Q19
Americas	**7,986**	**7,736**	**8,534**
Brazil	6,558	6,437	6,260
Others	1,428	1,299	2,274
Asia	**43,119**	**70,304**	**46,748**
China	34,239	58,143	36,196
Japan	4,355	6,529	5,800
Others	4,525	5,632	4,752
Europe	**6,069**	**7,684**	**8,349**
Germany	2,500	3,661	3,284
France	994	1,101	1,121
Others	2,575	2,922	3,944
Middle East	**707**	**2,014**	**2,248**
Rest of the World	**1,086**	**1,134**	**1,851**
Total	**58,967**	**88,872**	**67,730**

Selected financial indicators - Ferrous Minerals

US$ million	1Q20	4Q19	1Q19
Net Revenues	5,296	8,020	6,343
Costs[1]	(2,215)	(3,275)	(2,531)
Expenses[1]	(14)	(92)	(26)
Pre-operating and stoppage expenses[1]	(195)	(214)	(160)
R&D expenses	(25)	(53)	(24)
Dividends and interests on associates and JVs	-	152	-
Adjusted EBITDA	2,847	4,538	3,602
Depreciation and amortization	(422)	(556)	(428)
Adjusted EBIT	2,425	3,982	3,174
Adjusted EBIT margin (%)	45.8	49.7	50.0

[1] Net of depreciation and amortization

Selected financial indicators - Iron ore fines

US$ million	1Q20	4Q19	1Q19
Adjusted EBITDA (US$ million)	2,411	3,641	2,644
Volume Sold (Mt)	51.4	77.3	55.2
Adjusted EBITDA (US$/t)	47	47	48

Selected financial indicators - Pellets

US$ million	1Q20	4Q19	1Q19
Adjusted EBITDA (US$ million)	424	850	902
Volume Sold (Mt)	7.3	11.0	12.3
Adjusted EBITDA (US$/t)	58	78	73

Selected financial indicators - Ferrous ex Manganese and Ferroalloys

US$ million	1Q20	4Q19	1Q19
Adjusted EBITDA (US$ million)	2,851	4,533	3,575
Volume Sold (Mt)[1]	59.0	88.9	67.7
Adjusted EBITDA (US$/t)	48	51	53

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

Base Metals

Base Metals operations adjusted EBITDA was US$ 510 million in 1Q20 vs. US$ 649 million in 4Q19, mainly due to lower nickel and copper realized prices (US$ 249 million) and lower sales volumes (US$ 149 million), which were offset by higher by-products realized prices (US$ 119 million), lower costs (US$ 83 million), lower expenses (US$ 34 million) and favorable exchange rate variations (US$ 23 million).

Nickel operations adjusted EBITDA was US$ 350 million in 1Q20 vs. US$ 411 million in 4Q19, mainly due to lower nickel realized prices (US$ 80 million), lower copper as by-product realized prices (US$ 48 million) and lower nickel and copper as by-product sales volumes (US$ 37 million), which were partially offset by higher PGMs by-product credits (US$ 62 million), lower costs and expenses (US$ 31 million) and favorable exchange rate variations (US$ 9 million). Nickel operations continue their progress towards reaching higher asset reliability together with the advance of VNC's plan to close its refinery and achieve further cost improvements.

The average nickel realized price was US$ 14,434/t, US$ 1,711/t higher than the average LME nickel price of US$ 12,723/t in 1Q20, mainly due to the positive hedge program settlements (US$ 1,389/t), reflecting the lower LME prices vis-a-vis the floor price of the collar hedge structure (US$ 16,000/t), and the carryover effect of sales with lagged prices (US$ 94/t). In March 2020, as a precautionary measure in order to increase its cash position and preserve financial flexibility in light of current uncertainty in the global markets resulting from the COVID-19 outbreak, Vale decided to unwind its nickel hedge position by selling the contract options for a total consideration of US$ 230 million. The gain on this transaction was recognized in equity in 1Q20 and will be reclassified to net income in the following periods aligned with the hedged future nickel sales.

Copper operations adjusted EBITDA was US$ 160 million in 1Q20 vs. US$ 238 million in 4Q19, mainly due to lower realized prices (US$ 113 million) and the combined effect of lower Salobo volumes and higher Sossego volumes (US$ 64 million), which were partially offset by lower costs and expenses (U$ 86 million) and favorable exchange rate variations (US$ 13 million). Copper results were supported by the resumption of Sossego's operation after the unscheduled maintenance carried out in the previous quarter and by Salobo's negative unit cash costs due to higher gold by-product credits, which were partially offset by the unscheduled maintenance at its processing plant in 1Q20. Copper sales volumes increased in 1Q20, however, the total combined volume effect of Salobo and Sossego negatively impacted EBITDA mainly due to changes in product mix: volumes coming from the lower-cost Salobo mine slightly decreased whilst volumes of the comparatively higher-cost Sossego operation increased vs. last quarter, impacting the average cost structure of the copper operations.

Average prices

US$/ metric ton	1Q20	4Q19	1Q19
Nickel - LME	12,723	15,450	12,369
Copper - LME	5,637	5,881	6,215
Nickel - realized prices	14,434	16,251	12,571
Copper - realized prices[1]	3,858	5,732	6,051
Gold (US$/oz)	1,636	1,542	1,279
Silver (US$/oz)	15.81	17.60	15.24
Cobalt (US$/t)	26,916	29,860	25,886

[1]Considers Salobo and Sossego operations.

Base Metals EBITDA overview – 1Q20

US$ million	North Atlantic	PTVI Site	VNC Site	Onça Puma	Sossego	Salobo	Others Ni & Cu	Total Base Metals
Net Revenues	**741**	**175**	**88**	**34**	**111**	**272**	**6**	**1,427**
Costs	(470)	(118)	(133)	(37)	(81)	(126)	97	(868)
Selling and other expenses	(7)	-	-	(1)	1	(0)	(11)	(18)
Pre-operating and stoppage expenses	-	-	-	-	-	-	-	-
R&D	(11)	(2)	(1)	(0)	(2)	(1)	(14)	(31)
EBITDA	**253**	**55**	**(46)**	**(4)**	**29**	**145**	**78**	**510**

Nickel operations

Nickel operations – EBITDA by operation

US$ million	1Q20	4Q19	1Q19
North Atlantic operation[1]	253	361	293
PTVI	55	130	4
VNC	(46)	(63)	(64)
Onça Puma	(4)	(3)	16
Others Nickel[2]	92	(14)	16
Total	**350**	**411**	**265**

[1] Includes the operations in Canada and in the United Kingdom.
[2] Includes the PTVI and VNC off-takes, intercompany sales eliminations, purchase of finished nickel and hedge results.

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

US$/t	1Q20	4Q19	1Q19
North Atlantic operations[1]	3,004	3,672	3,972
PTVI	7,037	6,784	8,834
VNC	15,805	18,415	22,771
Onça Puma	13,141	14,924	8,846

[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$ 253 million, decreasing US$ 108 million vs. 4Q19 mainly due to lower nickel and copper realized prices (US$ 154 million), higher costs and expenses (US$ 26 million), which were partially offset by higher PGMs by-product credits (US$ 72 million) and favorable exchange rate variations (US$ 9 million). Unit cash costs after by-products decreased to US$ 3,004/t. The after by-products decrease mainly reflects the positive effect of by-product credits in the quarter as well as the positive effect of exchange rate variations.

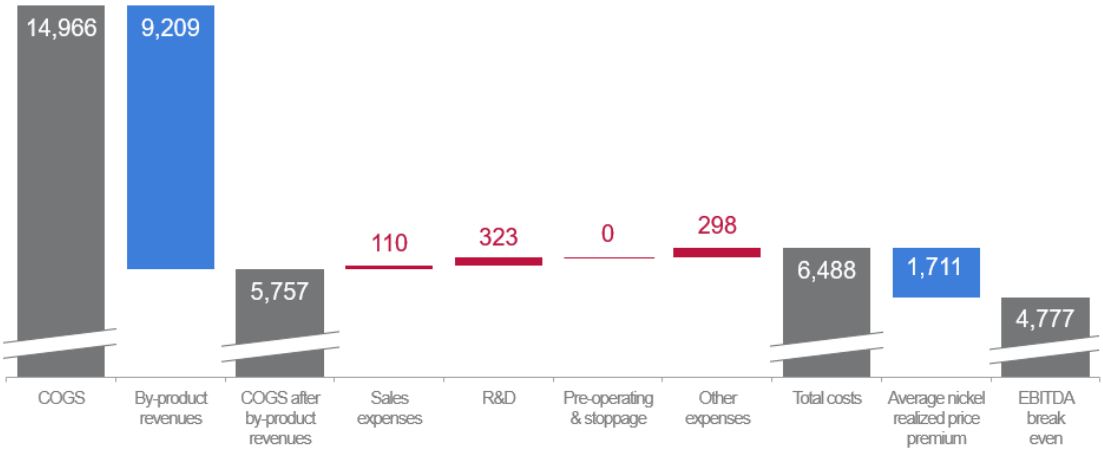
- PTVI's EBITDA was US$ 55 million, decreasing by US$ 75 million compared to 4Q19, mainly due to lower nickel realized prices (US$ 42 million), lower sales volumes (US$ 28 million) and higher costs (US$ 3 million). Unit cash costs increased to US$ 7,037/t in 1Q20 as a result of lower dilution of fixed costs on lower volumes due to scheduled maintenance carried out at the site in the quarter.

- VNC's EBITDA was negative US$ 46 million, increasing by US$ 17 million when compared to 4Q19, mainly due to the combined effect of higher nickel volumes and lower unit costs (US$ 13 million) and higher cobalt by-product realized prices (US$ 4 million). Unit cash costs decreased to US$ 15,805/t in 1Q20 mainly as a result of higher by-product credits and dilution of fixed costs due to higher site production at VNC.

- Onça Puma's EBITDA was negative US$ 4 million, decreasing by US$ 1 million compared to 4Q19, mainly as a result of lower realized prices (US$ 12 million), which were partially offset by lower cost and expenses (US$ 8 million), higher sales volumes (US$ 2 million) and favorable foreign exchange variations (US$ 1 million). Unit cash costs decreased to US$ 13,141/t, as a result of higher dilution of fixed costs on higher sales volumes. Onça Puma's performance was mainly impacted by an 18-day unscheduled maintenance activity carried out in the quarter. The already scheduled major maintenance shutdown in April, which would address 1Q20 issues, was postponed due to the COVID-19 pandemic and, as a result, productivity at the site will be limited until the end of 3Q20.

EBITDA breakeven – nickel operations[21]

US$/t, 1Q20



SALES REVENUES AND VOLUMES

In 2019, to reduce the volatility of its future cash flows arising from changes in nickel prices, Vale implemented a Nickel Revenue Hedging Program. In March 2020, as a precautionary measure in order to increase its cash position and preserve financial flexibility in light of current uncertainty in the global markets resulting from the COVID-19 outbreak, Vale decided to unwind the hedge position by selling the contract options for a total consideration of US$ 230 million, this gain was recognized in equity and will be reclassified to net income in the following periods aligned with the hedged future nickel sales. As of March 31st, 2020, the average strike price for the put positions is US$ 16,000/t and the average strike price of the call options is US$ 19,188/t. The hedging program was completely unwound on April 1st, 2020. The effect of the derivatives settled in the quarter on Vale's nickel realized price was positive US$ 1,389/t, reflecting the lower LME prices vis-a-vis the floor price of the collar structure.

Nickel sales revenues were US$ 637 million in 1Q20, decreasing by US$ 127 million vs. 4Q19 as a result of lower realized prices (US$ 80 million) and lower sales volumes (US$ 47 million). Sales volumes of nickel were 44.2 kt in 1Q20, 2.8 kt lower than in 4Q19, reflecting weaker demand from Asia Pacific due to the COVID-19 pandemic and lower production from PTVI leading to lower sales of PTVI matte.

Copper by-product from nickel operations generated sales revenues of US$ 124 million in 1Q20, decreasing by US$ 61 million vs. 4Q19 mainly as a result of lower realized prices (US$ 48 million) and lower sales volumes (US$ 13 million). Sales volumes of copper by-product totaled 30.7 kt in 1Q20, 2.1 kt lower than in 4Q19 mainly due to lower production in the quarter.

[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 breakeven would increase to US$ 4,906/t.

Net operating revenue by product - Nickel operations

US$ million	1Q20	4Q19	1Q19
Nickel	637	764	632
Copper	124	185	191
Gold as by-product	25	31	16
Silver as by-product	9	5	5
PGMs	210	148	102
Cobalt	32	28	30
Others Nickel	7	6	4
Total	**1,044**	**1,167**	**980**

Volume sold - Nickel operations

'000 metric tons	1Q20	4Q19	1Q19
Nickel	44	47	50
Upper Class I nickel [1]	23	21	23
Lower Class I nickel [1]	5	6	6
Class II nickel [1]	10	12	16
Intermediates [1]	6	8	5
Copper	31	33	32
Gold as by-product ('000 oz)	16	21	13
Silver as by-product ('000 oz)	581	283	302
PGMs ('000 oz)	91	90	76
Cobalt (metric ton)	1,183	941	1,173

[1] 1Q19 reconciled as per new classification.

REALIZED NICKEL PRICES

Vale's nickel products are classified as Upper Class I, Lower Class I, Class II and Intermediates. In 1Q20, 62% of our sales were Upper Class I and Lower Class I nickel products.

Upper Class I products, which have higher nickel content and lower levels of deleterious elements, are more suitable for high end nickel applications, such as utilization in the specialties industries (e.g.: aircraft and spacecraft) and as a result receive a higher premium. Upper Class I products were sourced from 82% of North Atlantic operations and 56% of PTVI operations in 1Q20.

Lower Class I products have slightly more impurities compared to Upper Class I products, and are suitable for more general nickel applications, such as foundry alloys and generally receive a lower premium compared to Upper Class I products. Lower Class I products were sourced from 18% of North Atlantic operations in 1Q20.

Part of the Upper Class I and Lower Class I nickel products is sold at higher premiums for the specialties/high-quality markets, but part of it is sold to stainless-steel markets with lower premiums.

Class II nickel products, which present lower nickel content and higher levels of deleterious elements, are mostly used in the making of stainless steel. The majority of world nickel production

is composed of Class II nickel products, which include nickel pig iron (NPI, with nickel content under 15%).

The Class II products were sourced from 100% of Onça Puma operations, 65% of VNC operations and 26% of PTVI operations in 1Q20.

Intermediate products were sourced from 35% of VNC operations and 18% of PTVI production in 1Q20. 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	1Q20	4Q19	1Q19
Upper Class I nickel	960	1,450	1,550
Lower Class I nickel	320	340	390
Class II nickel	(240)	(470)	90
Intermediates	(2,510)	(2,720)	(3,000)

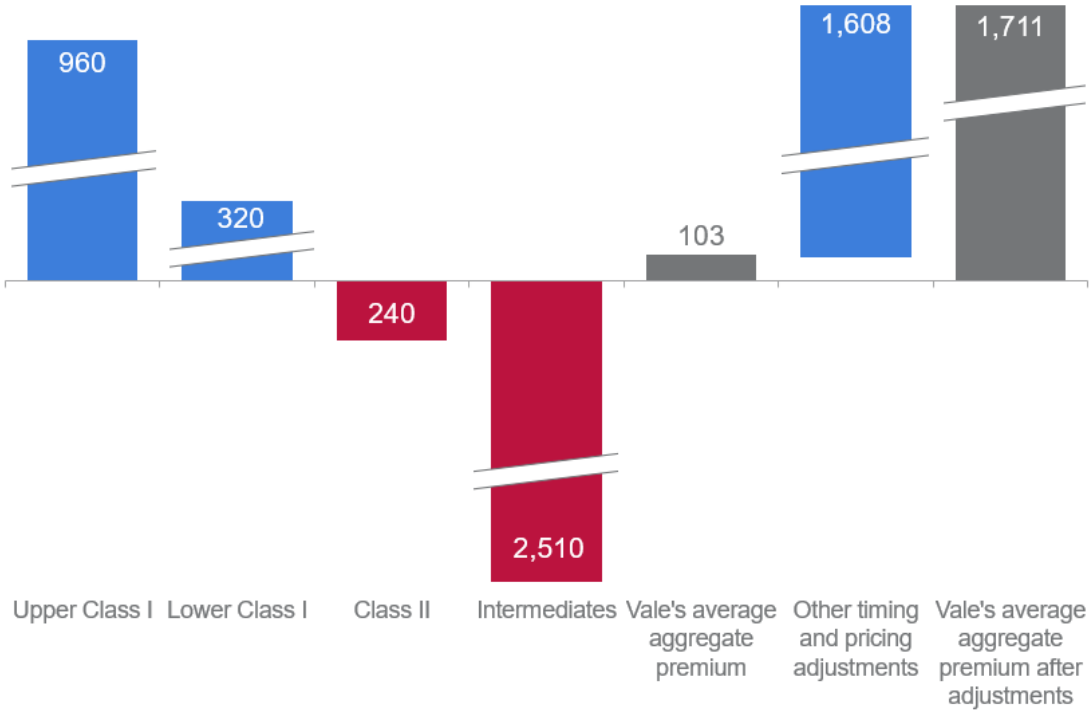
Note: 1Q19 reconciled as per new classification.

The average nickel realized price was US$ 14,434/t, US$ 1,711/t higher than the average LME nickel price of US$ 12,723/t in 1Q20. The aggregate impact of the above-mentioned premiums and discounts (considering their respective volumes in the sales mix) was:

- Premium for Upper Class I nickel products for 51% of sales, with aggregate impact of US$ 490/t;
- Premium for Lower Class I nickel products for 11% of sales, with aggregate impact of US$ 40/t;
- Discount for Class II nickel products for 24% of sales, with aggregate impact of -US$ 60/t;
- Discount for Intermediates for 15% of sales, with aggregate impact of -US$ 370/t; and,
- Other timing and pricing adjustments with an aggregate positive impact of US$ 1,608/t. The main drivers for this positive adjustment in 1Q20 are (i) the Quotational Period carryover effects (based on sales volume distribution in the last three months, as well as the differences between the LME price at the moment of sale and the LME average price), with an impact of approximately US$ 94/t; (ii) fixed price sales, with impact of approximately US$ 125/t; and, (iii) the above-mentioned effect of the hedging on Vale's nickel price realization, with an impact of US$ 1,389/t in the quarter.

Nickel premium/discount by product and average aggregate premiums

US$/t, 1Q20



Nickel COGS - 4Q19 x 1Q20

		Variance drivers				
US$ million	**4Q19**	**Volume**	**Exchange rate**	**Others**	**Total variation**	**1Q20**
Nickel operations	709	(21)	(9)	(18)	(48)	661
Depreciation	283	(18)	(5)	(18)	(41)	242
Total	**992**	**(39)**	**(14)**	**(36)**	**(89)**	**903**

EXPENSES

Selling expenses and other expenses totaled US$ 19 million in 1Q20, including selling expenses (US$ 5 million), expenses related to other project and travel expenditures (US$ 4 million) and related to mines under care and maintenance in North Atlantic (US$ 3 million).

R&D expenses were US$ 14 million in 1Q20, lower than the US$ 18 million recorded in 4Q19. These expenses encompass R&D initiatives for further operational improvements, with the main expenses associated with North Atlantic, PTVI and VNC, corresponding to US$ 11 million, US$ 2 million and US$ 1 million, respectively, in the quarter.

Selected financial indicators - Nickel operations

US$ million	1Q20	4Q19	1Q19
Net Revenues	1,044	1,167	980
Costs[1]	(661)	(709)	(688)
Sales and other expenses[1]	(19)	(29)	(12)
Pre-operating and stoppage expenses[1]	-	-	(8)
R&D expenses	(14)	(18)	(7)
Dividends and interests on associates and JVs	-	-	-
Adjusted EBITDA	350	411	265
Depreciation and amortization	(242)	(283)	(259)
Adjusted EBIT	108	128	6
Adjusted EBIT margin (%)	10.3	11.0	0.6

[1] Net of depreciation and amortization

Copper operations – Salobo and Sossego

Copper – EBITDA by operation

US$ million	1Q20	4Q19	1Q19
Salobo	145	273	190
Sossego	29	(19)	50
Others Copper[1]	(14)	(16)	-
Total	**160**	**238**	**240**

[1] Includes research expenses related to the Hu'u project.

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

US$/t	1Q20	4Q19	1Q19
Salobo	(264)	53	1,086
Sossego	2,985	6,409	3,383

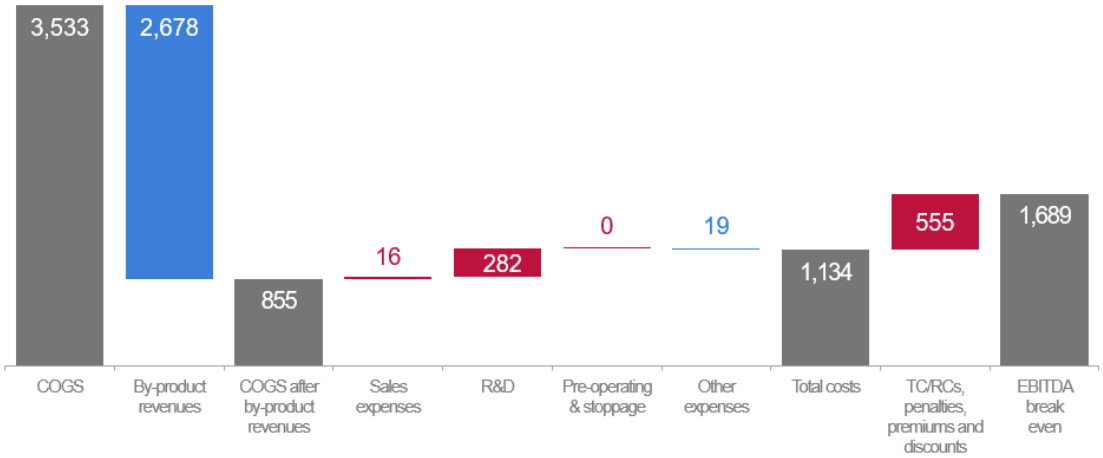
Details of copper operations adjusted EBITDA by operation are as follows:

- Salobo's EBITDA was US$ 145 million, decreasing by US$ 128 million vs. 4Q19, mainly due to lower copper realized prices (US$ 81 million), lower copper sales volumes (US$ 28 million) and lower by-product volumes (US$ 24 million), partially offset by higher by-product realized prices (US$ 9 million). Unit cash costs decreased to negative US$ 264/t, mainly due to high gold by-product credits.

- Sossego's EBITDA was US$ 29 million, increasing by US$ 48 million vs. 1Q20, mainly as a result of lower costs (US$ 80 million) and the positive effect of exchange rate variations (US$ 5 million), which were partially offset by lower copper realized prices (US$ 40 million). Unit cash costs decreased to US$ 2,985/t as a result of better dilution of fixed costs on higher volumes after the partial shutdown due to unscheduled maintenance in 4Q19.

EBITDA breakeven – copper operations[22]

US$/t, 1Q20



The realized price to be used against the EBITDA break-even should be the copper realized price before discounts (US$ 4,413/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$ 226 million in 1Q20, decreasing by US$ 89 million vs. 4Q19 mainly as a result of lower copper realized prices (US$ 121 million) which were partially offset by higher sales volumes (US$ 32 million). Copper sales volumes were 58.5 kt in 1Q20, 3.5 kt higher than in 4Q19, reflecting higher production from Sossego in the quarter after unscheduled maintenance in 4Q19.

By-product revenues were US$ 157 million in 1Q20, US$ 4 million lower than 4Q19. Sales volumes of gold by-product were 93 koz in 1Q20, 8 koz lower than in 4Q19 and sales volumes of silver by-product were 186 koz in 1Q20, 45 koz lower than in 4Q19.

Net operating revenue by product - Copper operations

US$ million	1Q20	4Q19	1Q19
Copper	226	315	352
Gold as by-product	154	157	116
Silver as by-product	3	4	3
Total	**383**	**476**	**471**

[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 breakeven would increase to US$ 3,190/t.

Volume sold - Copper operations

'000 metric tons	1Q20	4Q19	1Q19
Copper	59	55	58
Gold as by-product ('000 oz)	93	101	90
Silver as by-product ('000 oz)	186	231	204

REALIZED COPPER PRICES

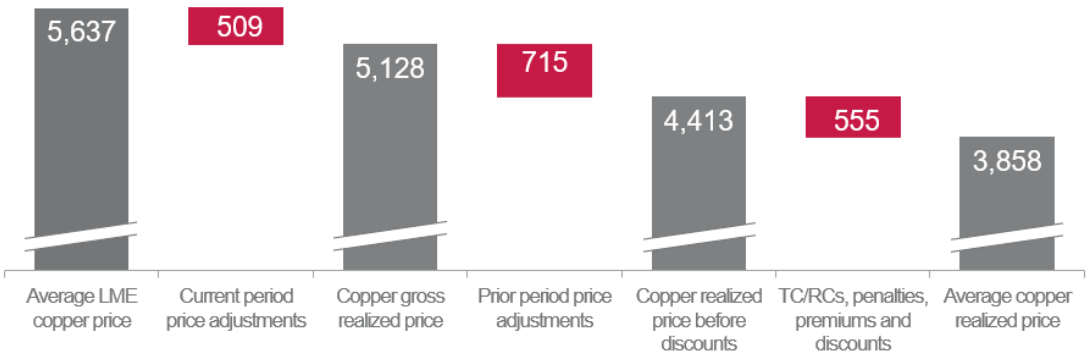
The realized copper price for copper operations in 1Q20 was US$ 3,858/t, US$ 1,779/t lower than the average LME copper price of US$ 5,637/t in the quarter. Vale's copper products are sold on a provisional pricing basis during the quarter with final prices determined in a future period, generally one to four months forward.

The realized copper price differed from the average LME price in 1Q20 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$ 509/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$ 715/t); and,
- TC/RCs, penalties, premiums and discounts for intermediate products (-US$ 555/t).

Price realization – copper operations

US$/t, 1Q20



[23] On March 31st, 2020, Vale had provisionally priced copper sales from Sossego and Salobo totaling 55,660 tons valued at an LME forward price of US$ 4,948/t, subject to final pricing over the following months.

Copper COGS - 4Q19 x 1Q20

		Variance drivers				
US$ million	4Q19	Volume	Exchange rate	Others	Total variation	1Q20
Copper operations	200	84	(12)	(65)	7	207
Depreciation	46	19	(3)	(22)	(6)	40
Total	**246**	**103**	**(15)**	**(87)**	**1**	**247**

EXPENSES

Research and development expenses were US$ 17 million in 1Q20, with Hu'u-related expenditures amounting to US$ 14 million, Sossego corresponding to US$ 2 million and Salobo corresponding to US$ 1 million in the quarter.

Selected financial indicators - Copper operations

US$ million	1Q20	4Q19	1Q19
Net Revenues	383	476	471
Costs[1]	(207)	(200)	(226)
Sales and other expenses[1]	1	-	-
Pre-operating and stoppage expenses[1]	-	(20)	-
R&D expenses	(17)	(18)	(5)
Dividends and interests on associates and JVs	-	-	-
Adjusted EBITDA	160	238	240
Depreciation and amortization	(40)	(53)	(47)
Adjusted EBIT	120	185	193
Adjusted EBIT margin (%)	31.3	38.9	41.0

[1] Net of depreciation and amortization

Coal

ADJUSTED EBITDA

Coal adjusted EBITDA was negative US$ 158 million in 1Q20, an increase of US$ 28 million in relation to 4Q19, mainly as a result of seasonally[24] higher interest received related to Nacala Logistic Corridor debt service to Vale (US$ 47 million) and higher prices (US$ 7 million), which were partially offset by higher costs and expenses (US$ 19 million) and lower sales volumes (US$ 7 million).

Furthermore, the recent COVID-19 outbreak brought additional challenges to reaching the sustainable ramp-up of the operation in 2020 and Vale temporally suspended its previous 2020 coal production guidance, as it is not possible, at this moment, to provide a new coal production guidance for 2020.

For further information, please see Vale's 1Q20 Production and Sales Report, available on the company's website.

Revenues and price realization

Revenues decreased by US$ 43 million to US$ 148 million in 1Q20 from US$ 191 million in 4Q19, mainly due to lower volumes (US$ 50 million), which were partially offset by higher realized prices (US$ 7 million).

Volume sold

'000 metric tons	1Q20	4Q19	1Q19
Metallurgical coal	706	1,017	1,291
Thermal coal	860	1,025	1,103
Total	**1,566**	**2,042**	**2,394**

Net operating revenue by product

US$ million	1Q20	4Q19	1Q19
Metallurgical coal	94	134	258
Thermal coal	54	57	75
Total	**148**	**191**	**333**

Coal prices

US$/ metric ton	1Q20	4Q19	1Q19
Metallurgical coal index price[1]	155.1	140.0	205.8
Vale's metallurgical coal realized price	132.9	131.4	200.2
Thermal coal index price[2]	78.0	75.8	83.0
Vale's thermal coal realized price	63.5	56.0	67.7
Vale's average realized price	**94.8**	**93.5**	**139.1**

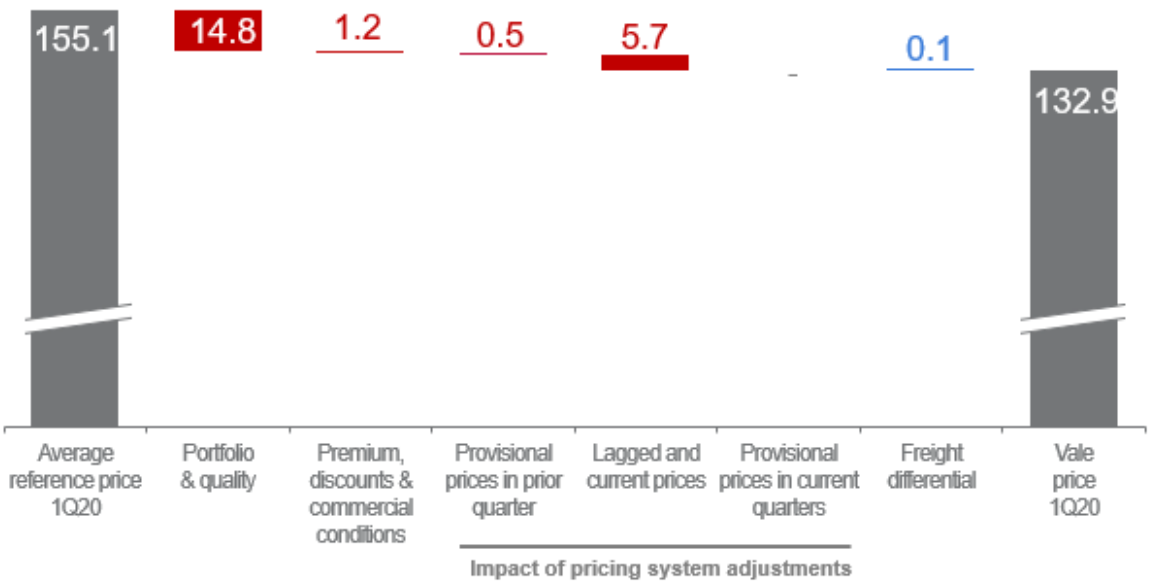
[1] Reference price Premium Low Vol Hard Coking Coal FOB Australia.

[2] McCloskey FOB Richards Bay

[24] From 1Q20 onwards, and for Adjusted EBITDA purposes only, Vale is recognizing interest on a cash basis. Therefore interest from the Nacala Logistic Corridor will be recognized in the Adjusted EBITDA every 6 months (usually in 1Q and 3Q of each fiscal year) as provided for in the debt service contract.

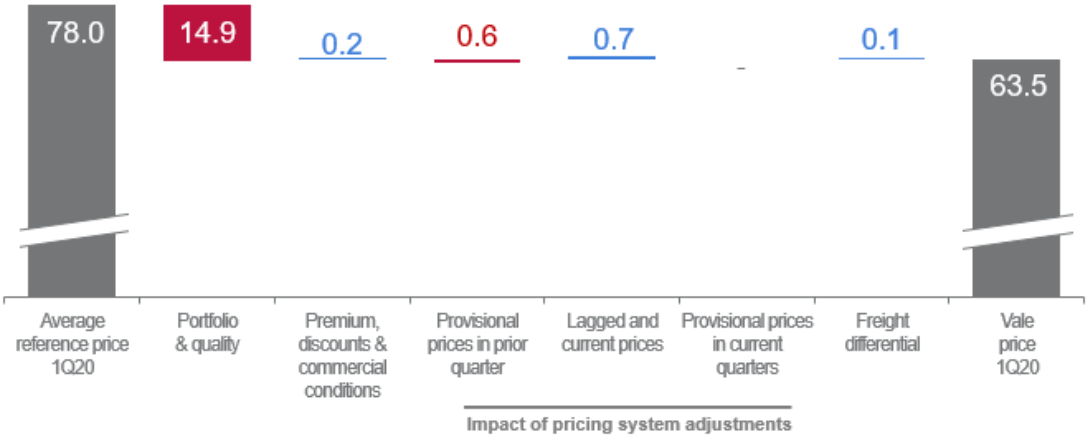
Price realization – metallurgical coal

US$/t 1Q20



Price realization – thermal coal

US$/t, 1Q20



Costs and expenses

Costs totaled US$ 374 million in 1Q20, US$ 18 million lower than in 4Q19, mainly due to lower variable costs resulting from lower sales volumes. Pro-forma C1 cash cost totaled US$ 190.6/t in 1Q20, US$ 12.8/t higher than in 4Q19, mainly due to: (i) the substantial inventory impairments[25] (Other costs), a consequence of the lower demand, which increased inventories storage capacity

[25] Average costs of the inventories are monthly tested vs. the expected sales prices, leading to positive or negative variations depending on previous provisions recorded.

to its limits, and (ii) lower dilution of fixed costs, which was partially offset by the seasonally higher interest received related to Nacala Logistic Corridor debt service to Vale.

Pro-forma cash cost

US$/ metric ton	1Q20	4Q19	1Q19
Pro-forma operational costs[1] (A)	144.8	143.1	117.8
Nacala non-operational tariff [2] [3] (B)	58.3	55.6	53.6
Other costs (C)	35.4	(7.2)	3.8
Cost at Nacala Port (D = A+B+C)	238.5	191.5	175.2
NLC's debt service to Vale (E)	47.9	13.7	11.7
Pro-forma C1 cash cost (F = D-E)	190.6	177.8	163.5

[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

Selected financial indicators - Coal

US$ million	1Q20	4Q19	1Q19
Net Revenues	148	191	333
Costs[1]	(374)	(392)	(423)
Expenses[1]	2	(5)	(1)
Pre-operating and stoppage expenses[1]	-	-	-
R&D expenses	(9)	(8)	(6)
Dividends and interests on associates and JVs	75	28	28
Adjusted EBITDA	(158)	(186)	(69)
Depreciation and amortization	(19)	(61)	(49)
Adjusted EBIT	(177)	(247)	(118)
Adjusted EBIT margin (%)	(119.6)	(129.3)	(35.4)

[1] Net of depreciation, depletion and amortization

ANNEXES

SIMPLIFIED FINANCIAL STATEMENTS

Income Statement

US$ million	1Q20	4Q19	1Q19
Net operating revenue	**6,969**	**9,964**	**8,203**
Cost of goods sold and services rendered	(4,278)	(5,632)	(4,701)
Gross profit	**2,691**	**4,332**	**3,502**
Gross margin (%)	38.6	43.5	42.7
Selling and administrative expenses	(115)	(139)	(110)
Research and evaluation expenses	(95)	(158)	(71)
Pre-operating and operational stoppage	(268)	(314)	(214)
Brumadinho event	(159)	(1,141)	(4,504)
Other operational expenses, net	(62)	(264)	(84)
Impairment and disposal of non-current assets	(29)	(4,731)	(204)
Operating income (loss)	**1,963**	**(2,415)**	**(1,685)**
Financial income	107	176	97
Financial expenses	(525)	(1,163)	(808)
Other financial items, net	(1,867)	147	5
Equity results and other results in associates and joint ventures	(166)	(154)	84
Loss before income taxes	**(488)**	**(3,409)**	**(2,307)**
Current tax	(347)	(52)	(247)
Deferred tax	996	1,465	879
Net income (loss)	**161**	**(1,996)**	**(1,675)**
Loss attributable to noncontrolling interests	(78)	(434)	(33)
Net income (loss) attributable to Vale's stockholders	**239**	**(1,562)**	**(1,642)**
Earnings (loss) per share (attributable to the Company's stockholders - US$):			
Basic and diluted earnings (loss) per share (attributable to the Company's stockholders - US$)	0.05	(0.30)	(0.32)

Equity income (loss) by business segment

US$ million	1Q20	%	4Q19	%	1Q19	%
Ferrous Minerals	(18)	16	11	183	84	79
Coal	-	-	-	-	(5)	(5)
Base Metals	-	-	-	-	-	-
Others	(92)	84	(5)	(83)	27	25
Total	**(110)**	**100**	**6**	**100**	**106**	**100**

Balance sheet

US$ million	3/31/2020	12/31/2019	3/31/2019
Assets			
Current assets	**19,944**	**17,042**	**15,075**
Cash and cash equivalents	11,788	7,350	5,008
Short term investments	479	826	12
Accounts receivable	2,096	2,529	2,453
Other financial assets	510	759	455
Inventories	4,090	4,274	4,909
Prepaid income taxes	176	370	567
Recoverable taxes	395	552	1,188
Others	410	382	483
Non-current assets	**16,396**	**16,798**	**17,360**
Judicial deposits	2,436	3,133	5,124
Other financial assets	2,247	2,748	3,108
Prepaid income taxes	557	597	560
Recoverable taxes	538	607	560
Deferred income taxes	10,060	9,217	7,711
Others	558	496	297
Fixed assets	**48,242**	**57,873**	**61,715**
Total assets	**84,582**	**91,713**	**94,150**
Liabilities			
Current liabilities	**11,578**	**13,845**	**12,467**
Suppliers and contractors	3,009	4,107	3,331
Loans and borrowing	940	1,214	2,715
Leases	226	225	219
Other financial liabilities	1,565	1,074	1,434
Taxes payable	385	512	669
Settlement program (REFIS)	336	431	433
Provisions	787	1,230	818
Liabilities related to associates and joint ventures	453	516	280
Liabilities related to Brumadinho	990	1,568	1,642
De-characterization of dams	274	309	158
Interest on capital	1,218	1,571	-
Others	1,395	1,088	768
Non-current liabilities	**39,747**	**38,875**	**38,490**
Loans and borrowing	16,135	11,842	14,336
Leases	1,468	1,566	1,527
Other financial liabilities	4,363	4,372	3,011
Settlement program (REFIS)	2,628	3,476	3,825
Deferred income taxes	1,741	1,882	1,524
Provisions	7,478	8,493	7,456
Liabilities related to associates and joint ventures	821	1,184	765
Liabilities related to Brumadinho	1,173	1,415	749
De-characterization of dams	1,538	2,180	1,674
Streaming transactions	2,046	2,063	2,212
Others	356	402	1,411
Total liabilities	**51,325**	**52,720**	**50,957**
Stockholders' equity	**33,257**	**38,993**	**43,193**
Total liabilities and stockholders' equity	**84,582**	**91,713**	**94,150**

Cash flow

US$ million	1Q20	4Q19	1Q19
Cash flow from operations	**2,005**	**3,782**	**3,054**
Interest on loans and borrowings paid	(244)	(236)	**(246)**
Derivatives received (paid), net	273	(115)	(118)
Interest paid on shareholders debentures	-	(89)	-
Income taxes (including settlement program)	(349)	(467)	(490)
Net cash provided by operating activities	**1,685**	**2,875**	**2,200**
Cash flows from investing activities:			
Capital expenditures	(1,124)	(1,472)	(611)
Additions to investments	**(75)**	(1)	**-**
Acquisition of subsidiary, net of cash	-	(13)	(496)
Proceeds from disposal of assets and investments	1	18	93
Dividends received from joint ventures and associates	-	160	-
Judicial deposits and restricted cash related to Brumadinho event	-	(45)	(3,490)
Short term investments (including Brazilian treasury securities)	181	98	14
Other investment activities, net	(54)	**(157)**	24
Net cash used in investing activities	**(1,071)**	**(1,412)**	**(4,466)**
Cash flows from financing activities:			
Loans and financing:			
Loans and borrowings from third-parties	5,000	-	1,842
Payments of loans and borrowings from third-parties	(375)	(1,871)	(216)
Payments of leasing	(50)	(93)	(75)
Payments to stockholders:			
Dividends and interest on capital paid to noncontrolling interest	(3)	(3)	(63)
Transactions with noncontrollers stockholders	-	(812)	-
Net cash provided by (used in) financing activities	**4,572**	**(2,779)**	**1,488**
Increase (decrease) in cash and cash equivalents	**5,186**	**(1,316)**	**(778)**
Cash and cash equivalents in the beginning of the period	7,350	8,559	5,784
Effect of exchange rate changes on cash and cash equivalents	(748)	107	2
Cash and cash equivalents at the end of period	**11,788**	**7,350**	**5,008**
Non-cash transactions:			
Additions to property, plant and equipment - interest capitalization	32	29	37
Cash flows from operating activities:			
Income (loss) before income taxes from continuing operations	**(488)**	**(3,409)**	**(2,307)**
Adjusted for:			
Provisions related to Brumadinho	-	898	4,278
Equity results and other results in associates and joint ventures	166	154	(84)
Impairment and disposal of non-current assets	29	4,731	204
Depreciation, depletion and amortization	815	1,032	801
Financial results, net	2,285	840	706
Change in assets and liabilities			
Accounts receivable	621	(943)	483
Inventories	(227)	411	(461)
Suppliers and contractors	(674)	(88)	(103)
Provision - Payroll, related charges and other remunerations	(208)	13	(460)
Payments related to Brumadinho	(217)	(381)	-
Other assets and liabilities, net	(97)	524	(3)
Cash flow from operations	**2,005**	**3,782**	**3,054**

REVENUES, VOLUMES SOLD, PRICES AND MARGINS

Net operating revenue by destination

US$ million	1Q20	%	4Q19	%	1Q19	%
North America	**494**	**7.1**	**576**	**5.8**	**557**	**6.8**
USA	289	4.1	349	3.5	307	3.7
Canada	204	2.9	169	1.7	220	2.7
Mexico	1	0.0	58	0.6	30	0.4
South America	**819**	**11.8**	**870**	**8.7**	**896**	**10.9**
Brazil	725	10.4	793	8.0	765	9.3
Others	94	1.3	77	0.8	131	1.6
Asia	**4,291**	**61.6**	**6,829**	**68.5**	**4,794**	**58.4**
China	3,196	45.9	5,182	52.0	3,387	41.3
Japan	484	6.9	796	8.0	632	7.7
South Korea	240	3.4	325	3.3	292	3.6
Others	371	5.3	526	5.3	483	5.9
Europe	**1,087**	**15.6**	**1,272**	**12.8**	**1,295**	**15.8**
Germany	376	5.4	471	4.7	380	4.6
Italy	58	0.8	58	0.6	66	0.8
Others	653	9.4	743	7.5	849	10.3
Middle East	**108**	**1.5**	**247**	**2.5**	**356**	**4.3**
Rest of the World	**170**	**2.4**	**170**	**1.7**	**305**	**3.7**
Total	**6,969**	**100.0**	**9,964**	**100.0**	**8,203**	**100.0**

Volume sold - Minerals and metals

'000 metric tons	1Q20	4Q19	1Q19
Iron ore fines	51,445	77,301	55,204
ROM	211	605	211
Pellets	7,311	10,966	12,314
Manganese ore	219	570	252
Ferroalloys	27	35	25
Thermal coal	860	1,025	1,103
Metallurgical coal	706	1,017	1,291
Nickel	44	47	50
Copper	89	88	90
Gold as by-product ('000 oz)	109	122	103
Silver as by-product ('000 oz)	767	514	505
PGMs ('000 oz)	91	90	76
Cobalt (metric ton)	1,183	941	1,173

Average prices

US$/ton	1Q20	4Q19	1Q19
Iron ore fines CFR reference (dmt)	93.5	93.7	91.6
Iron ore fines CFR/FOB realized price	83.8	83.5	81.1
Pellets CFR/FOB (wmt)	116.6	125.7	135.9
Manganese ore	107.4	80.2	227.8
Ferroalloys	870.7	969.9	1,162.7
Thermal coal	63.5	56.0	67.7
Metallurgical coal	132.9	131.4	200.2
Nickel	14,434	16,251	12,571
Copper[1]	3,924	5,693	6,012
Gold (US$/oz)	1,636	1,542	1,279
Silver (US$/oz)	15.81	17.60	15.24
Cobalt (US$/t)	26,916	29,860	25,886

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

Operating margin by segment (EBIT adjusted margin)

%	1Q20	4Q19	1Q19
Ferrous Minerals	45.8	49.7	50.0
Coal	(119.6)	(129.3)	(35.4)
Base Metals	15.9	19.1	13.7
Total	**29.7**	**25.1**	**(17.7)**

RECONCILIATION OF IFRS AND "NON-GAAP" INFORMATION

(a) Adjusted EBIT

The definition of Adjusted EBIT is Adjusted EBITDA plus depreciation, depletion and amortization.

US$ million	1Q20	4Q19	1Q19
Net operating revenues	6,969	9,964	8,203
COGS	(4,278)	(5,632)	(4,701)
Sales and administrative expenses	(115)	(139)	(110)
Research and development expenses	(95)	(158)	(71)
Pre-operating and stoppage expenses	(268)	(314)	(214)
Brumadinho event	(159)	(1,141)	(4,504)
Other operational expenses, net	(62)	(264)	(84)
Dividends received and interests from associates and JVs	75	188	28
Adjusted EBIT	**2,067**	**2,504**	**(1,453)**

(b) Adjusted EBITDA

EBITDA defines profit or loss before interest, tax, depreciation, depletion and amortization. The definition of Adjusted EBITDA for the Company is the operating income or loss plus dividends received and interest from associates and joint ventures, and excluding the amounts charged as (i) depreciation, depletion and amortization and (ii) impairment and disposal of non-current assets. 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 tables shows the reconciliation between adjusted EBITDA and operational cash flow and adjusted EBITDA and net income, in accordance with its statement of changes in financial position:

Reconciliation between adjusted EBITDA and operational cash flow

US$ million	1Q20	4Q19	1Q19
Adjusted EBITDA	**2,882**	**3,536**	**(652)**
Working capital:			
Accounts receivable	621	(943)	483
Inventories	(227)	411	(461)
Suppliers and contractors	(674)	(88)	(103)
Provision - Payroll, related charges and other remunerations	(208)	13	(460)
Payments related to Brumadinho	(217)	(381)	-
Provisions related to Brumadinho	-	898	4,278
Others	(172)	336	(31)
Cash provided from operations	**2,005**	**3,782**	**3,054**
Income taxes paid - including settlement program	(349)	(467)	(490)
Interest on loans and borrowings paid	(244)	(236)	(246)
Participative stockholders' debentures paid	-	(89)	-
Derivatives received (paid), net	273	(115)	(118)
Net cash provided by (used in) operating activities	**1,685**	**2,875**	**2,200**

Reconciliation between adjusted EBITDA and net income (loss)

US$ million	1Q20	4Q19	1Q19
Adjusted EBITDA	**2,882**	**3,536**	**(652)**
Depreciation, depletion and amortization	(815)	(1,032)	(801)
Dividends received and interest from associates and joint ventures	(75)	(188)	(28)
Impairment and disposal of non-current assets	(29)	(4,731)	(204)
Operating income	**1,963**	**(2,415)**	**(1,685)**
Financial results	(2,285)	(840)	(706)
Equity results and other results in associates and joint ventures	(166)	(154)	84
Income taxes	649	1,413	632
Net income (loss) from continuing operations	**161**	**(1,996)**	**(1,675)**
Net income (loss) attributable to noncontrolling interests	(78)	(434)	(33)
Net income (loss) attributable to Vale's stockholders	**239**	**(1,562)**	**(1,642)**

(c) Net debt

US$ million	1Q20	4Q19	1Q19
Total debt	17,075	13,056	17,051
Cash and cash equivalents[1]	12,267	8,176	5,020
Net debt	4,808	4,880	12,031

[1] Including short term investments

(d) Gross debt / LTM Adjusted EBITDA

US$ million	1Q20	4Q19	1Q19
Gross debt / LTM Adjusted EBITDA (x)	1.2	1.2	1.4
Gross debt / LTM operational cash flow (x)	1.5	1.1	1.3

(e) LTM Adjusted EBITDA / LTM interest payments

US$ million	1Q20	4Q19	1Q19
Adjusted LTM EBITDA / LTM gross interest (x)	14.8	10.7	10.9
LTM adjusted EBITDA / LTM interest payments (x)	11.9	8.9	12.1
LTM operational profit / LTM interest payments (x)	4.6	1.5	8.1