Totten mine resumed operations in February 2022

VALE'S PERFORMANCE IN 4Q21 AND 2021

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- **English** at noon Brasilia time (10:00 a.m. New York time, 3:00 p.m. London time).

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Vale's performance in review

Rio de Janeiro, February 24, 2022 – "*In a year still marked by the persistent effects of the COVID-19 pandemic and market volatility, we were able to deliver significant achievements in creating sustainable value to all our stakeholders. In line with our new pact with society, we advanced in repairing Brumadinho and Mariana and reinforced our support for the fight against the pandemic. We also announced investments of up to US$ 6 billion to reduce emissions and defined our social ambition to create a legacy of education, health and income in the communities we operate. We are operating safer by implementing VPS, decommissioning our upstream dams and aligning with the GISTM standards. At the same time, we are recovering our iron ore and base metals production capacity, setting the foundation to create and distribute value consistently.", commented Eduardo Bartolomeo, Chief Executive Officer*.

Highlights of 2021

Our operations

We delivered on our plan to stabilize our operations:

- In the Ferrous business, we reached an iron ore capacity of around 340 Mtpy at the end of 2021 vs. 322 Mtpy at the end of 2020. We expect to achieve 370 Mtpy capacity by the end of 2022.
- We produced 315.6 Mt of iron ore fines in 2021, up 5.1% y/y, mainly due to (i) the resumption of Serra Leste production, (ii) improved performance at Itabira and Timbopeba, (iii) increased production of high-silica products in Brucutu and Fábrica, and (iv) higher volume of third-party purchases. This was partially offset by S11D performance, impacted by the higher strip ratio and lower mining productivity during the year, caused by higher incursion of jaspilite materials in the ore body. For 2022, we expect to increase production to 320-335 Mt.
- Our pellets production totaled 31.7 Mt in 2021, 6.8% higher y/y, mainly from the resumption of operations at Vargem Grande pelletizing plants at the beginning of the year. For 2022, we expect to increase production to 34-38 Mt.
- In Base Metals, we produced 168.0 kt of nickel, down 8.5% y/y, and 296.8 kt of copper in 2021, down 17.6% y/y. The performance was affected by several one-off events, such as the labor disruption in Sudbury and the maintenance activities in Salobo, Sossego, Matsuzaka and Onça-Puma. Nevertheless, we move more positively into 2022, with Ontario operations concluding the ramp-up at Sudbury and Totten mine resuming hoisting activities in early February. Matsuzaka refinery and Onça Puma also had a strong fourth quarter after maintenance. In copper, Salobo mine movement should keep improving during the year. For 2022, we expect nickel production to reach 175-190 kt and copper production 330-355 kt.
- Our coal production increased 44.6% y/y in 2021 to 8.5Mt due to the higher productivity of the revamped plant.

- We advanced in implementing our management system (VPS), a concrete sign of our drive for the cultural transformation that will deliver results safely and consistently. The operations that matured further in VPS presented higher adherence to the maintenance plans and operational stability. A direct consequence is that safety performance improved broadly across the company, and we recorded the lowest Total Recordable Injury Frequency Rate (TRIFR) in our history.
- We simplified our asset portfolio significantly. We concluded the sale of VNC and engaged in the responsible exit of the Coal Business in Mozambique. We also divested the manganese ferroalloy business, the 50% stake in CSI and the Mosaic shares.

Our commitments to reparation and society

Advancing in the reparation initiatives remains one of our priorities.

- In Brumadinho, the Integral Reparation Agreement signed in February 2021 brought legitimacy and legal certainty to the reparation initiatives. We destined R$ 23.0 billion to the reparation in the last three years, including the agreements for individual indemnification with 12.7 thousand people. Among the initiatives in 2021, we paid R$ 4.4 billion as part of the implementation of the Income Transfer Program. We also concluded the commissioning of a system of pipelines and reservoirs to assure the current demand of the Belo Horizonte region.
- In Mariana, we are committed to the Renova Foundation, through its governing body and by providing specialized professionals to implement the reparation programs. The reinstating of the right to housing for 107 families has progressed and, after the adoption of the simplified process, we doubled the number of indemnifications, now reaching 51.8 thousand people. After new court decisions on individual compensation for residents of cities impacted by the Fundão dam failure, we complemented the provision related to Renova Foundation by US$ 1.1 billion in 4Q21. These decisions mainly changed and expanded the concept of damage, categories, indemnifiable amounts and affected municipalities.
- We partnered with the Movimento Unidos pela Vacina to enhance the operational structure for vaccination in Brazil. We continued with our humanitarian support initiatives, donating 1 million baskets of staple food for families in need in the country. Since 2020, we have donated around R$ 830 million to combating COVID-19.

For further details on the reparation progress, an overview of ongoing works and projects, and the terms of the Integral Reparation Agreement, please visit www.vale.com/esg . For more details on Renova Foundation, please visit www.fundacaorenova.org.

Dam safety

In 2021, we improved the safety of our geotechnical structures

- Our de-characterization plan advanced and, by the end of 2021, we had concluded the works on 7 out of the 30 structures.

- We improved the safety conditions on the Doutor, Sul Inferior and Norte Laranjeiras dams, allowing reclassification to Emergency Level 1. Additionally, the Emergency Level was removed from Marés I and Forquilhas IV dams.
- We concluded the construction of the backup dam for Forquilhas I, II, III and IV and Grupo dams, near the Fábrica mine. With that, all the structures currently in Emergency Level 3 have backup dams in place.
- We started the removal of tailings from the B3/B4 dam in Nova Lima (MG) and Sul Superior dam in Barão de Cocais (MG) using uncrewed and remotely operated equipment.
- We established the Independent Tailings Review Board for each Iron Ore business's operational system, aligned with the Global Industry Standard for Tailings Management (GISTM) requirements and other industry references.
- We are committed to implementing the GISTM. As per the self-assessment process conducted, we were more than 60% adherent to the standard requirements by December 2021. We expect to reach 90% adherence in 2022, 100% on tailings facilities with extreme or very high potential consequences by August 2023 and 100% for other structures by August 2025, in line with the deadlines established by the ICMM.
- We started in 2021 the operations of one tailings filtration plant at the Vargem Grande Complex and the commissioning of two tailings filtration plants at the Itabira complex. In 2022, we expect to conclude the last plant in Brucutu, aligned with our commitment to reducing the dependency on the use of dams.
- In 4Q21, we supplemented the provision for the de-characterization of upstream dams by US$ 1.7 billion after an update of our estimates considering new engineering and geotechnical solutions, including new risk management approaches, the use of remotely operated equipment and reinforcement of the containment plans of certain dams.

Sharing value creation

- Our proforma adjusted EBITDA was US$ 33.8 billion in 2021, US$ 11.8 billion higher y/y, mainly due to higher realized prices in ferrous minerals and copper, partially offset by higher costs related to commodities prices and freight.
- Net income was US$ 22.4 billion in 2021, US$ 17.6 billion higher y/y, mainly due to the higher proforma adjusted EBITDA and stronger financial results.

Since 2021, shareholder remuneration reached US$ 23.0 billion:

- In March, June, and September 2021, we have paid US$ 13.5 billion in dividends and interest on capital for the year 2020 and anticipation of 2021 results.
- Today, our Board of Directors approved dividends of US$ 3.5 billion. The amount distributed was calculated based on the December 31, 2021, balance sheet, considering our Shareholder Remuneration Policy and including an extraordinary dividend of $0.7 billion. Payment will be made in March 2022.

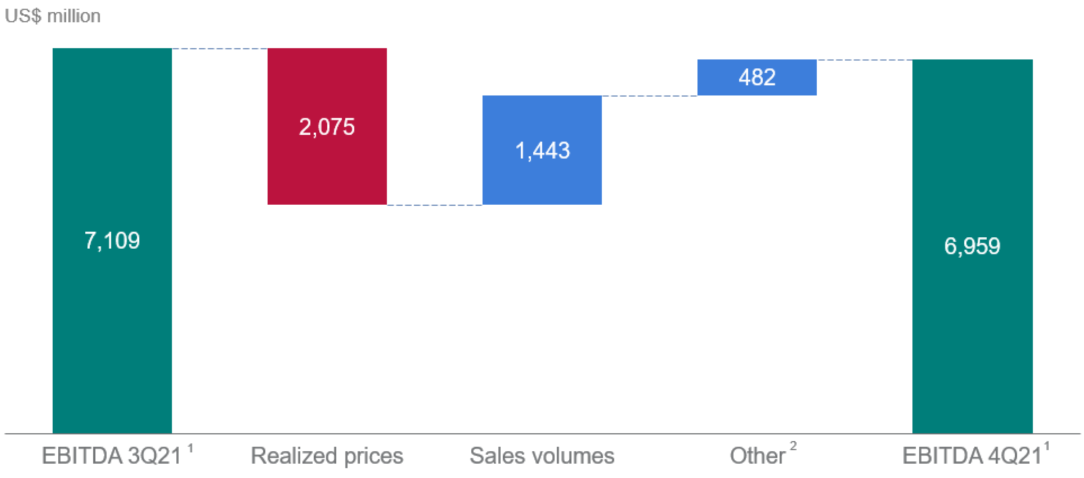
- To date, we have spent US$ 6.0 billion to repurchase the equivalent to 6.3% of our outstanding shares, directly benefiting our shareholders on a per share basis[1,2].

For more information on our Shareholder Remuneration Policy and the historical data on dividends and interest on equity payments, please visit www.vale.com/investors .

Vale's performance 4Q21

In 4Q21, Vale reported a proforma adjusted EBITDA of US$ 6.959 billion, US$ 150 million lower than 3Q21.

Proforma EBITDA 4Q21 vs. 3Q21



¹ Net of Brumadinho expenses and COVID-19 donations
² Includes US$ 154 million in lower unit costs and expenses, US$ 122 million in foreign exchange effect and US$ 206 million in dividends received and others

The main drivers of the difference of 4Q21 performance in comparison to 3Q21 were:

- Lower realized prices (US$ 2.075 billion), mainly in Ferrous Minerals (US$ 2.366 billion), which was partially offset by higher realized prices in Base Metals and Coal (US$ 291 million).
- The US$ 19.9/t lower iron ore fines realized sales prices is mainly explained by the steep US$ 53.3/t q/q decline in the 62% Fe reference price, which was partially offset by the positive impact of lagged prices sales and higher end-of-quarter forward curves.

The negative effect of pricing was partially offset by:

- Higher sales volumes (US$ 1.433 billion) with iron ore fines and pellets sales increasing 23.3%, mainly from the drawdown of transiting inventories formed in 3Q21, leading to record iron ore fines sales in a fourth quarter.

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[1] Includes (i) US$ 5.3 billion related to the repurchase program approved in April 2021 and concluded in October 2021 and (ii) US$ 749 million spent as of the date of this report to repurchase of circa 52 million shares in the October announced repurchase program, which is around 25% complete.

[2] As reflected in our 4Q21 Financial Statement, until December 31, 2021, the Company had bought-back approximately 21 million ordinary shares in the total amount of US$ 264 million, approximately 11 % of the October announced buyback program.

Selected financial indicators

US$ million	4Q21	3Q21	4Q20
Net operating revenues	13,105	12,330	14,641
Total costs and other expenses	(7,228)	(5,917)	(6,188)
Expenses related to Brumadinho and De-characterization	(2,115)	(161)	(4,854)
Adjusted EBIT from continuing operations	3,904	6,257	3,693
Adjusted EBIT from continuing operations margin (%)	30%	51%	25%
Adjusted EBITDA from continuing operations	4,726	6,906	4,531
Adjusted EBITDA from continuing operations margin (%)	36%	56%	31%
Proforma adjusted EBITDA[1]	6,959	7,109	9,103
Iron ore - 62% Fe reference price	109.6	162.9	133.7
Net income attributable to Vale's stockholders	5,427	3,886	739
Net debt [2]	1,877	2,207	769
Capital expenditures	1,831	1,248	1,444

[1] Excluding expenses related to Brumadinho and donations associated with COVID-19.

[2] Including leases (IFRS 16).

US$ million	2021	2020	%
Net operating revenues	54,502	39,545	38%
Total costs and other expenses	(23,807)	(20,157)	18%
Expenses related to Brumadinho and De-characterization	(2,576)	(5,257)	-51%
Adjusted EBIT from continuing operations	28,309	14,304	98%
Adjusted EBIT from continuing operations margin (%)	52%	36%	16%
Adjusted EBITDA from continuing operations	31,343	17,519	79%
Adjusted EBITDA from continuing operations margin (%)	58%	44%	13%
Proforma adjusted EBITDA[1]	33,774	21,954	54%
Net income attributable to Vale's stockholders	22,445	4,881	360%
Capital expenditures[2]	5,227	4,430	18%

[1] Excluding expenses related to Brumadinho and donations associated with COVID-19.

[2] Does not includes Boston Metal investment of US$ 6 million in 2021

Net income in 4Q21 was US$ 5.4 billion, US$ 1.5 billion higher than 3Q21, primarily due to higher financial results (US$ 3.5 billion), mainly due to the reclassification of cumulative foreign exchange variation in equity. The positive effects were partially offset by (i) the higher expenses related to Brumadinho, mainly due to the US$ 1.7 billion additional provision related to de-characterization of upstream dams, and the (ii) lower Equity Results (US$ 1.1 billion), largely due to the additional provisions related to Renova Foundation.

Total CAPEX for 4Q21 amounted to US$ 1.8 billion, US$ 583 million higher than in 3Q21, due to seasonally higher disbursements in the end of the year and acquisition for replacement of mining and railway equipment in Ferrous Minerals business. In 2021, we invested US$ 5.2 billion in growth projects and sustaining, being US$ 1.0 billion in project execution, mainly Northern system 240Mtpy, Capanema, Serra Sul 120 Mtpy and Salobo III projects, and US$ 4.2 billion in sustaining.

Gross debt and leases totaled US$ 13.8 billion, and net debt totaled US$ 1.9 billion at the end of 4Q21, both in line with 3Q21. Expanded net debt increased to US$ 15.1 billion, mainly due to the additional provisions recorded in the quarter for the de-characterization of upstream dams and the Renova Foundation.

Performance of business segments in 4Q21

Ferrous Minerals EBITDA of US$ 6.369 billion in 4Q21

- Ferrous Minerals EBITDA was US$ 361 million lower than 3Q21, mainly from lower realized prices for Iron Ore fines, partially compensated by higher sales volumes and lower unit costs.
- Iron ore fines average realized price was US$ 106.8/t, down US$ 19.9/t q/q, due to the US$ 53.3/t lower 62% Fe reference price, offset in part by the US$ 29.9/t positive impact of pricing mechanisms in the current quarter.
- C1 cost was US$ 18.8/t, US$ 3.9/t lower q/q, mainly due to lower third-party purchases and prices (US$ 3.4/t) and the positive effect of the Brazilian real devaluation (US$ 0.8/t).

Base Metals EBITDA was US$ 811 million in 4Q21, US$ 306 million higher than 3Q21

- Nickel business EBITDA was US$ 405 million in 4Q21, US$ 306 million higher q/q, mainly due to the ramp-up of operations in North Atlantic after the labor disruptions in Sudbury, which allowed for higher byproducts credits, primarily copper and PGMs. The positive effect was partially offset by higher costs, mainly due to the start-up of the production at Voisey's Bay Mine Expansion and higher maintenance and fuel costs in PTVI.
- Copper business EBITDA was US$ 406 million in 4Q21, in line q/q. The effect of higher realized prices, following prior period price adjustments, was offset by lower sales volumes and byproduct credits and higher unit costs, mainly due to the conveyor belt incident limiting production at Salobo.

Coal business EBITDA (discontinued operation) was US$ 102 million in 4Q21, US$ 70 million higher than 3Q21

- Adjusted EBITDA improvement was mainly driven by higher realized prices.

Market overview

Iron Ore

Iron ore 62% Fe reference price averaged US$ 159.5/dmt in 2021, 46% higher than 2020. In 4Q21, the index averaged US$ 109.6/dmt, 32.7% lower than 3Q21. Throughout the 4Q21, steel production cuts in China impacted iron ore demand and, as a result, prices retreated from high levels achieved in the 3Q21. By the end of the 4Q21, lower restrictions over China's steel production and positive sentiment over the macroeconomic outlook for the country supported a price recovery.

MB65% index averaged US$ 185.2/dmt, 51% higher than 2020. In 4Q21, the index averaged US$ 128.8/dmt, 32% lower than 3Q21. The spread between the MB65% and the 62% iron ore reference price recovered in 4Q21, closing December at around US$ 20/t, as the increase in coal/coke prices and the high steel margins supported the high-grade premiums.

The economic recovery in China continued in 2021, with the GDP growth rate reaching 8.1% year-on-year in 2021 vs. 2020. However, China's GDP growth in the 4Q21 slowed to 4.0% year-on-year from 4.9% in the 3Q21, as Fixed Asset Investment (FAI) moderated in 4Q21 driven by property and infrastructure. Property sales and construction activities slowed sharply, which was the main headwind to steel demand. Industrial production and exports continued outperforming in the 4Q21. China's crude steel production in 2021 declined by 3% y/y to 1,032.8 Mt, in line with MIIT's targets for 2021.

In the ex-China economies, (i) the easing of restrictions with the rollout of vaccines, (ii) the rebound of economic activity, and (iii) the improvement in manufacturing and supply chain all contributed to the recovery of steel demand in 2021, leading to a total steel production of 917.7 Mt, up 12.5% y/y. Major steel-producing regions such as Brazil and EU28 have fully recovered compared to pre-pandemic levels of 2019, whereas JKT (Japan, Korea and Taiwan) and USA are still slightly below pre-pandemic levels. When compared to 2020, steel production improved by 16.6% in North America, 11.0% in JKT and 15.4% in the EU28, as per the World Steel Association. Nonetheless, in 4Q21, we have seen steel production slowing down again in Brazil and Europe, due to slowdown in economic activities associated with high inflation and resurgence of COVID-19 infections led by Omicron.

Outlook

Our outlook for iron ore remains positive, given the recovery of the global economy driven by the progress in global vaccination and the less-harmful effects of new variants, leading to further opening of economies. We believe world steel production will grow slightly in 2022 as global economy is strengthened by the reduction in supply chain bottlenecks, continued pent-up demand in past years and rising business and consumer confidence. Rising inflation and deceleration in China are drivers that may counterbalance and increase the risk to the recovery momentum. As for ex-China, the outlook remains positive as manufacturers expect the impact of the pandemic to diminish and trigger a sustained recovery in demand and in their supply chains, especially as semiconductors supply recovers, with both construction and automotive sectors supporting further recovery of steel production. In the long term, the transition to a greener economy will require the consumption of high-quality iron ore products to ensure emissions reduction.

Nickel

LME nickel prices averaged US$ 19,821/t in 4Q21, 4% higher quarter over quarter and 24% higher than 4Q20.

Total exchange inventories (LME and SHFE) decreased, closing at 106.9 kt at the end of 4Q21, down 34% in the quarter and 60% year over year. LME inventories stood at 101.9 kt at the end of 4Q21, a decrease of 55.2 kt in the quarter and 144.8 kt year over year. SHFE inventories decreased by 0.3 kt in the quarter and 13.1 kt year over year.

Demand/Supply

Global sales of electric vehicles (EV) increased by 66% in 4Q21 from 4Q20, led by robust growth in China. China sales accelerated up 113% in this period despite subsidies being cut by 20%. EU sales slowed in the third quarter as the semiconductor shortage impacted production but managed to increase 17% in 4Q21 compared to 4Q20 as persistent environmental policies to reduce CO2 emissions encouraged adoption. Global sales of EVs increased by 32% in 4Q21 from 3Q21 as China sales increased ahead of subsidy cuts of 30% starting in 2022. Nickel consumption in battery precursors for EV and energy storage increased 69% in 4Q21 compared to 4Q20 and 2% quarter over quarter led by China.

Global stainless-steel production increased 3% in the fourth quarter when compared to 4Q20. Quarter over quarter, global production decreased 3% due primarily to high energy prices and consequent power rationing in China. A greater focus on 300 series stainless, which contains higher levels of nickel, was slightly offset by increased scrap usage, primarily in China, with total nickel consumption globally in stainless-steel increasing 8% in 4Q21 from 4Q20. Visible Chinese stainless-steel inventories decreased 5% in 4Q21 from 4Q20 with inventories dropping 14% by the end of 4Q21, compared to the end of 3Q21.

The aerospace industry has rebounded with aircraft deliveries from Boeing and Airbus up 35% in 4Q21 compared to 4Q20 and 1% quarter over quarter. The average global commercial flights in 4Q21 were up 34% from 4Q20, however, the Omicron coronavirus variant impacted travel in 4Q21 with average global commercial flights flat compared to 3Q21.

The oil and gas sector has rebounded as demand outpaces supply and energy prices surge. Oil and gas benchmark prices were up 76%, in 4Q21 compared to 4Q20. Rig counts were up 44% in 4Q21 compared to 4Q20 and 8% quarter over quarter led by increases in North America.

Nickel demand in non-stainless and non-battery applications increased 15% in 4Q21 compared to 4Q20

4Q21 nickel production increased 8% from 4Q20 and 3% from 3Q21, as impressive growth in Indonesia was partially offset by unexpected outages due to power rationing in China and operational issues in Russia. Chinese NPI decreased 22% in 4Q21, compared to 4Q20, and decreased by 15% in 4Q21 compared to 3Q21 due to power rationing and adverse weather. China relies heavily on ore inventories and imports from Philippines due to the Indonesia ore ban that began in 2020. These imports were impacted by weather and pandemic-related bottlenecks resulting in historically low ore inventories in the third quarter but have increased 6% in 4Q21 as NPI production slowed. Indonesian NPI production conversely, increased by 30% in 4Q21 compared to 4Q20 as new projects continued to come online. 4Q21 Indonesian NPI production was relatively flat compared to 3Q21 due to pandemic-related disruptions with market sources reporting the successful conversion of NPI into a battery suitable material in the quarter.

Outlook

In the near term, the shift towards the electrification of the world economies will improve demand with solid government incentives and penalty programs continuing to drive EV adoption rates as countries commit to low emission targets. This growth will favor high nickel content batteries chemistry due to its higher energy density. The North American supply chain is particularly dependent on this market dynamic, as the commitment to green initiatives, including the development of the EV supply chain, is forcing manufacturers to look critically at the sustainability of upstream suppliers. In the medium term, additions to NPI and HPAL supply planned in Indonesia may supply a large portion of the growth requirements for stainless steel and batteries. However, environmental concerns around the CO2 intensity of NPI and the push for geographical diversification of the battery supply chain could result in significant supply shortages in the longer term.

Our long-term outlook for nickel remains very positive, driven by strong demand in the EV sector with the prevalence of nickel-rich batteries. Additionally, as countries continue to set aggressive decarbonization goals, EV growth and the infrastructure needed to support them are crucial. Markets previously heavily impacted by the pandemic, such as aerospace, are expected to improve with the success of the global COVID-19 vaccine rollout, while energy shortages in Europe and China are putting increased pressure on an expedited shift to renewable energy. In the long term, the global pursuit of net-zero emissions should positively impact nickel demand in the stainless steel, aerospace, automotive and energy markets.

Copper

LME copper prices averaged US$ 9,699/t in 4Q21, 3% higher quarter over quarter and 35% higher than 4Q20.

Total exchange inventories (LME, SHFE, and COMEX) decreased, closing at 190.3 kt at the end of 4Q21, down 39% in the quarter and 28% year over year. LME inventories stood at 89.0 kt at the end of 4Q21, decreasing 130.6 kt in the quarter and 19.0 kt year over year. SHFE inventories decreased by 5.3 kt in the quarter and 48.5 kt year over year. COMEX inventories increased by 12.0 kt in the quarter and decreased 7.2 kt year over year.

Demand/Supply

Global refined copper demand increased 2.0% in 4Q21 compared to 4Q20 and was flat quarter over quarter. Strong demand recovery from pandemic lows in Europe, India, and the U.S. offset weakness in China led by ongoing economic impacts of the pandemic and weakness in the Chinese property sector.

Global refined copper production increased 0.4% in 4Q21 compared to 4Q20 and 2.7% quarter over quarter. Ongoing community protests in Peru and pandemic-related supply disruptions due to workforce availability and power outages, were offset by higher-than-expected production at various mines. Aggressive smelter maintenance programs and growth in concentrate supply have resulted in continued increased in spot treatment and refining charges (TC/RCs) up 9% in the quarter and 30% from 4Q20.

Outlook

In the near term the market is expected to be balanced and move into a slight surplus as projects come online. In the medium term, the accelerated transition towards copper-intensive sustainable energy will support copper demand.

Our long-term outlook for copper remains very positive. Copper has a solid long-term growth profile driven by industrialization, construction, and the buildout of electrical network infrastructure. Governments globally have set ambitious decarbonization targets that, coupled with falling costs of renewable energy and stimulus investments in the green economy, will pivot towards more copper-intensive uses in renewable energy and transportation projects related to EVs. Additionally, aluminum, one of the few potential substitutes in various copper applications, saw one of the largest price increases in the base metal complex in 2021, following increasing electricity prices and resulting power cuts at smelters. Should aluminum sustain current levels, there is a lower incentive to move away from copper. On the supply side, growth continues to struggle given declining ore grades and the lack of significant discoveries. In the short term, it is expected that the assets currently in development should meet the increasing demand. In the medium to long term, significantly more assets are required to replace existing operations ramping down or closing. Higher costs could defer investment, considering potential increases to taxes or royalties, logistical constraints, and lower ore grades, adding risk to longer-dated supply growth from key greenfield projects.

Adjusted EBITDA

Adjusted EBITDA

US$ million	4Q21	3Q21	4Q20	2021	2020
Net operating revenues	13,105	12,330	14,641	54,502	39,545
COGS	(6,494)	(5,472)	(5,333)	(21,729)	(17,564)
SG&A	(131)	(114)	(186)	(481)	(547)
Research and development	(177)	(135)	(149)	(549)	(415)
Pre-operating and stoppage expenses	(147)	(165)	(193)	(648)	(887)
Expenses related to Brumadinho and De-characterization	(2,115)	(161)	(4,854)	(2,576)	(5,257)
Expenses related to COVID-19 donations	(16)	(10)	(9)	(44)	(109)
Other operational expenses	(263)	(21)	(318)	(356)	(635)
Dividends and interests on associates and JVs	142	5	94	190	173
Adjusted EBIT from continuing operations	**3,904**	**6,257**	**3,693**	**28,309**	**14,304**
Depreciation, amortization & depletion	822	649	838	3,034	3,215
Adjusted EBITDA from continuing operations	**4,726**	**6,906**	**4,531**	**31,343**	**17,519**
Discontinued operations - Coal	102	32	(291)	(189)	(931)
Adjusted EBITDA Total	**4,828**	**6,938**	**4,240**	**31,154**	**16,588**
Proforma adjusted EBITDA[1]	**6,959**	**7,109**	**9,103**	**33,774**	**21,954**

[1] Excluding expenses related to Brumadinho, De-characterization and COVID-19 donations.

Adjusted EBITDA by business area

US$ million	4Q21	3Q21	4Q20	2021	2020
Ferrous Minerals	6,369	6,730	8,800	31,589	21,005
Base Metals	811	505	1,172	3,193	3,131
Others	(323)	(158)	(578)	(819)	(1,251)
Brumadinho and De-characterization expenses	(2,115)	(161)	(4,854)	(2,576)	(5,257)
Expenses related to COVID-19 donations	(16)	(10)	(9)	(44)	(109)
Total of continuing operations	**4,726**	**6,906**	**4,531**	**31,343**	**17,519**

Net operating revenue by business area

US$ million	4Q21	%	3Q21	%	4Q20	%	2021	%	2020	%
Ferrous Minerals	**10,822**	**82.6**	**10,678**	**86.6**	**12,203**	**83.3**	**46,302**	**85.0**	**32,078**	**81.1**
Iron ore fines	8,817	67.3	8,530	69.2	10,765	73.5	38,701	71.0	27,285	69.0
ROM	8	0.1	17	0.1	6	0.0	63	0.1	20	0.1
Pellets	1,889	14.4	2,009	16.3	1,295	8.8	7,053	12.9	4,242	10.7
Manganese ore	6	0.0	18	0.1	40	0.3	81	0.1	158	0.4
Ferroalloys	26	0.2	27	0.2	20	0.1	94	0.2	67	0.2
Others	76	0.6	77	0.6	77	0.5	310	0.6	306	0.8
Base Metals	**2,224**	**17.0**	**1,574**	**12.8**	**2,269**	**15.5**	**7,966**	**14.6**	**6,827**	**17.3**
Nickel	851	6.5	761	6.2	1,028	7.0	3,273	6.0	2,926	7.4
Copper	749	5.7	519	4.2	670	4.6	2,649	4.9	2,031	5.1
PGMs[1]	64	0.5	-20	-0.2	178	1.2	395	0.7	664	1.7
Gold as by-product	138	1.1	166	1.3	231	1.6	601	1.1	819	2.1
Silver as by-product	8	0.1	5	0.0	15	0.1	33	0.1	47	0.1
Cobalt	31	0.2	31	0.3	19	0.1	105	0.2	75	0.2
Others[2]	383	2.9	112	0.9	128	0.9	910	**1.7**	265	**0.7**
Others	**59**	**0.5**	**78**	**0.6**	**169**	**1.2**	**234**	**0.4**	**640**	**1.6**
Total of continuing operations	**13,105**	**100.0**	**12,330**	**100.0**	**14,641**	**100.0**	**54,502**	**100.0**	**39,545**	**100.0**
Coal[3]	**478**	**2.8**	**352**	**2.8**	**128**	**0.9**	**1,083**	**1.8**	**473**	**1.2**

[1] In 3Q21, PGMs revenue was impacted by negative provisional price adjustments along with lower sales volumes
[2] Includes marketing activities
[3] Includes revenues from general cargo

COGS by business segment

US$ million	4Q21	%	3Q21	%	4Q20	%	2021	%	2020	%
Ferrous Minerals	4,789	73.7	4,178	76.4	3,664	68.7	15,768	72.6	11,826	67.3
Base Metals	1,580	24.3	1,187	21.7	1,371	25.7	5,415	24.9	4,550	25.9
Others	125	1.9	107	2.0	298	5.6	546	2.5	1,188	6.8
Total COGS[1]	**6,494**	**100.0**	**5,472**	**100.0**	**5,333**	**100.0**	**21,729**	**100.0**	**17,564**	**100.0**
Depreciation	783		603		791		2,857		2,961	
COGS, ex-depreciation	**5,711**		**4,869**		**4,542**		**18,872**		**14,603**	

[1] COGS currency exposure in 4Q21 was as follows: 58.1% USD, 36.0% BRL, 5.6% CAD and 0.3% Other currencies.

Operating expenses

US$ million	4Q21	3Q21	4Q20	2021	2020
SG&A ex-depreciation	**119**	**103**	**121**	**439**	**442**
SG&A	**131**	**114**	**130**	**481**	**491**
Administrative	**116**	**90**	**102**	**401**	**410**
Personnel	42	29	31	170	168
Services	39	29	35	107	114
Depreciation	12	11	9	42	49
Others	23	21	27	82	79
Selling	**15**	**24**	**28**	**80**	**81**
R&D	**177**	**135**	**149**	**549**	**415**
Pre-operating and stoppage expenses	**147**	**165**	**193**	**648**	**887**
Depreciation	25	36	38	134	205
Expenses related to Brumadinho and De-characterization	**2,115**	**161**	**4,854**	**2,576**	**5,257**
Incurred expenses	189	161	128	650	510
Expenses related to COVID-19 donations	**16**	**10**	**9**	**44**	**109**
Other operating expenses	**263**	**21**	**374**	**356**	**691**
Total operating expenses	**2,849**	**606**	**5,709**	**4,654**	**7,850**
Depreciation	39	46	47	177	254
Operating expenses ex-depreciation	**2,810**	**560**	**5,662**	**4,477**	**7,596**

Impact of Brumadinho and De-characterization in 4Q21

US$ million	Provisions balance 30set21	EBITDA impact	Payments	FX and other adjustments[2]	Provisions balance 31dec21
De-characterization	1,857	1,725	(84)	25	3,523
Agreements & donations[1]	4,356	201	(1,004)	(16)	3,537
Total Provisions	**6,213**	1,926	(1,088)	9	**7,060**
Incurred expenses		189	(189)		
Total		2,115	(1,277)		

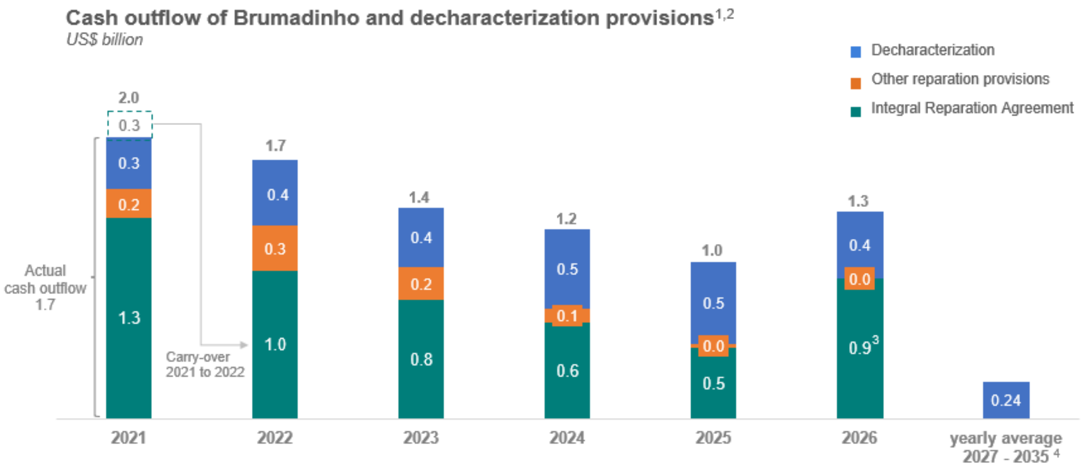
[1] Includes Integral Reparation Agreement, individual, labor and emergency indemnifications, tailing removal and containment works.
[2] Includes foreign exchange, present value and other adjustments

Impact of Brumadinho and De-characterization since 2019

US$ million	EBITDA impact by 2021	Payments By 2021	PV & FX adjust [2]	Provisions balance 31dec21
De-characterization	4,966	(789)	(654)	3,523
Agreements & donations[1]	8,257	(3,908)	(812)	3,537
Total Provisions	13,223	(4,697)	(1,466)	7,060
Incurred expenses	1,890	(1,890)		
Others	122	-		
Total	15,235	(6,587)		

[1] Includes Integral Reparation Agreement, individual, labor and emergency indemnifications, tailing removal and containment works.
[2] Includes foreign exchange, present value and other adjustments

The aggregate amount of the provisions increased by US$ 847 million to US$ 7.060 billion, mainly due to the US$ 1.7 billion in additional provision related to the de-characterization plan, as further investigations leading to greater knowledge about the dams to be de-characterized led us to new engineering and geotechnical solutions with higher associated costs. This effect was partially offset by the US$ 777 in payments made in 4Q21 related to the Income Transfer Program included in the Integral Reparation Agreement of Brumadinho.



[1] Estimate cash outflow for 2022 - 2035 period, given BRL-USD exchange rates of 5.5805
[2] Amounts stated without discount to present value and net of judicial deposits.
[3] Comprises US$ 0.5 billion of inflation adjustments related to performance obligations which projects timeline are not defined by the parties in the Agreement.
[4] Estimate annual average cash flow for Decharacterization provisions in the 2027-2035 period is US$ 240 million per year.

Pre-operating and stoppage expenses breakdown

US$ million	4Q21	3Q21	4Q20	2021	2020
Pre-operating and stoppage expenses	**147**	**165**	**193**	**648**	**887**
Depreciation	25	36	38	134	25
Pre-operating and stoppage expenses, ex-depreciation	**122**	**129**	**155**	**514**	**682**
Brumadinho - stoppage expenses	**98**	**52**	**104**	**301**	**482**
Itabira Complex (Cauê, Conceição and others)	0	0	0	0	6
Minas Centrais Complex (Brucutu and others)	14	0	28	42	95
Mariana Complex (Alegria, Timbopeba and others)	1	0	4	4	34
Paraopeba Complex (Mutuca, Fábrica[1] and others)	46	25	42	137	193
Vargem Grande Complex (Vargem Grande[1], Pico and others)	37	27	30	118	154
Tubarão pellet plants	**6**	**6**	**7**	**26**	**40**
Ontario	**0**	**53**	**0**	**112**	**0**
Voisey's Bay	**0**	**0**	**0**	**0**	**29**
Others	**18**	**18**	**44**	**75**	**131**

[1] Including pelletizing plants.

Net income

Reconciliation of proforma EBITDA to net income

US$ million	4Q21	3Q21	4Q20
EBITDA Proforma	**6,959**	**7,109**	**9,103**
Brumadinho, de-characterization of dams & COVID-19 donations	(2,131)	(171)	(4,863)
EBITDA Coal (Discontinued operation)	(102)	(32)	291
Adjusted EBITDA from continuing operations	**4,726**	**6,906**	**4,531**
Impairment & disposal of non-current assets	(205)	(63)	(679)
Dividends received	(142)	(5)	(94)
Equity results	(1,010)	99	(309)
Financial results	3,158	(350)	(668)
Income taxes	(353)	(461	(445)
Depreciation, depletion & amortization	(822)	(649)	(838)
Net income from continuing operations attributable to Vale's stockholders	**5,352**	**5,477**	**1,498**
Net income from discontinued operations attributable to Vale's stockholders	75	(1,591)	(759)
Net income attributable to Vale's stockholders	**5,427**	**3,886**	**739**

Main factors that affected net income for 4Q21 vs. 3Q21

	US$ million	
3Q21 Net income from continuing operations attributable to Vale's stockholders	**5,477**	
Δ EBITDA proforma	(150)	Lower Ferrous Minerals realized prices (-US$2.4bn) Higher sales volumes, mainly in Ferrous Minerals (+US$1.4bn) Higher Base Metals and Coal realized prices (+US$0.5bn)
Δ Brumadinho, de-characterization of dams & COVID-19 donations	(1,960)	Additional provision for the de-characterization of upstream dams of US$1.7bn after an update of our estimates considering new engineering and geotechnical solutions.
Δ EBITDA Coal (Discontinued operation)	(70)	
Δ Impairment & disposal of non-current assets	(142)	
Δ Dividends received	(137)	Dividends received from pelletizing plants in 4Q21, already accounted for in the EBITDA proforma
Δ Equity results	(1,109)	Additional Renova Foundation provision in 4Q21 (-US$1.1bn)
Δ Financial results	3,508	Reclassification of cumulative foreign exchange variation in equity due to (i) capital reduction of a wholly-owned subsidiary abroad; and (ii) the liquidation of a wholly-owned subsidiary previously operating in international iron ore logistics. (+US$3.2bn)
Δ Income taxes	108	
Δ Depreciation, depletion & amortization	(173)	
4Q21 Net income from continuing operations attributable to Vale's stockholders	**5,352**	

Δ: difference between 4Q21 and 3Q21 figures

Financial results

US$ million	4Q21	3Q21	4Q20	2021	2020
Financial expenses	**(23)**	**(122)**	**(935)**	**(1,653)**	**(3,191)**
Gross interest	(168)	(157)	(185)	(671)	(742)
Capitalization of interest	15	14	13	59	70
Shareholder debentures[1]	393	152	(732)	(716)	(1,565)
Others	(243)	(114)	(2)	(271)	(899)
Financial expenses (REFIS)	(20)	(17)	(9)	(54)	(55)
Financial income	**113**	**90**	**48**	**337**	**307**
Derivatives[1]	**18**	**(458)**	**447**	**(23)**	**(1,210)**
Currency and interest rate swaps	7	(472)	325	(159)	(1,147)
Others (commodities, etc)	11	14	122	136	(63)
Foreign Exchange	**96**	**372**	**(142)**	**408**	**(549)**
CTA	**3,184**	**10**	**-**	**4,326**	**-**
Monetary variation	**(230)**	**(242)**	**(86)**	**(276)**	**(170)**
Financial result, net	**3,158**	**(350)**	**(668)**	**3,119**	**(4,813)**

[1] The cash effect of the derivatives was a loss of US$ 197 million in 2021 and loss of US$ 34 million in 2020.

CAPEX

Investments in 4Q21 totaled US$ 1.831 billion, comprising US$ 1.479 billion in the maintenance of operations and US$ 352 million in growth project execution.

In 2022, Vale expects to invest US$ 5.8 billion, an increase of US$ 0.6 billion vs. 2021, mainly due to (i) carry-over from 2021 related to COVID-19 pandemic; (ii) postponements in Sudbury as a result of labor disruption in 2021; (iii) higher disbursements in Ferrous Business capital projects (e.g., Capanema, dry concentration plant in Vargem Grande, Serra Sul 120); and (iv) capital contribution to the project West III, which consists in expanding the Shulanghu Port facilities in China.

Project Execution and Sustaining by business area

US$ million	4Q21	%	3Q21	%	4Q20	%	2021	%	2020	%
Ferrous Minerals	1,047	57.2	724	58.0	763	52.8	3,027	57.9	2,392	54.0
Base Metals	639	34.9	438	35.1	566	39.2	1,862	35.6	1,654	37.3
Coal	80	4.4	49	3.9	65	4.5	194	3.7	203	4.6
Energy and others	65	3.5	37	3.0	50	3.5	144	2.8	181	4.1
Total	**1,831**	**100.0**	**1,248**	**100.0**	**1,444**	**100.0**	**5,227**	**100.0**	**4,430**	**100.0**

Growth projects execution

Investments in growth project execution totaled US$ 352 million in 4Q21, US$ 67 million higher than 3Q21, mainly due to (i) higher disbursement on equipment acquisition and contractors hiring in iron ore projects (Northern System 240 Mtpy, Capanema and Serra Sul 120 Mtpy), in line with projects' planning; and (ii) Sol do Cerrado solar photovoltaic panels acquisition; which were partially offset by Salobo III lower disbursement.

On January 6, 2022, heavy rainfalls in Salobo III region caused a landslide that damaged part of a conveyor belt and blocked the access to the project site. Safety conditions at the area were reestablished and currently our local teams are working on additional preventive measures and replacement of damaged equipment. A full assessment of impact is ongoing with conclusion expected by early 2Q22.

Growth project execution by business area

US$ million	4Q21	%	3Q21	%	4Q20	%	2021	%	2020	%
Ferrous Minerals	200	56.8	136	47.7	69	47.9	531	53.2	258	49.4
Base Metals	94	26.7	113	39.6	55	38.2	344	34.4	239	45.8
Energy and others	58	16.5	36	12.6	20	13.9	124	12.4	25	4.8
Total	**352**	**100.0**	**285**	**100.0**	**144**	**100.0**	**999**	**100.0**	**522**	**100.0**

Main project developments in 4Q21

- The Northern System 240 Mtpy Project concluded the civil works and advanced in the assembling of the 5th product stockyard stacker.
- Serra Sul 120 Mtpy progressed in preparation for the earthmoving of Area 5 grinding area in S11D. The start-up was postponed to 1H25 (previously 2H24) due to a delay in installation licensing, which is expected to impact construction works schedule in the dry season.
- The Capanema project received equipment for the conveyor belt and crushers, and advanced in contracting suppliers.
- Salobo III project progressed in the mechanical assembly of the processing plant and concluded the assembly of 24 flotation cells, two ball mill motors, 14 flotation columns, as well as the commissioning and energization of the main substation.

Growth projects progress indicator[3]

Projects	Capacity (per year)	Estimated start-up[1]	Executed capex (US$ million)		Estimated capex (US$ million)		Physical progress (%)
			4Q21	Total	2021	Total	
Ferrous Minerals Project							
Northern System 240 Mtpy	10 Mt	2H22	50	379	229	772	91%[1]
Capanema	18 Mt[2]	2H23	21	27	47	495	11%
Serra Sul 120 Mtpy[3]	20 Mt	1H25[4]	75	151	168	1,502	9%
Base Metals Project							
Salobo III	30-40 kt	2H22	83	660	329	1,056	85%

[1] Considering mine-plant project front physical progress.
[2] Capanema project adds 14 Mtpy capacity in Timbopeba site expedition in its first years.
[3] The project consists of increasing the S11D mine-plant capacity by 20 Mtpy.
[4] The start-up was postponed to 1H25 (previously 2H24) due to a delay in installation licensing, which is expected to impact construction works schedule in the dry season.

Sustaining CAPEX

Investments in the maintenance of operations totaled US$ 1,479 million in 4Q21, US$ 516 million higher than in 3Q21, mainly due to: (i) usual seasonally-higher disbursements at the end of the year; (ii) acquisition of mining and railway replacement equipment in Ferrous Minerals business; and (iii) higher disbursements in Voisey's Bay project after postponements related to COVID-19.

The Voisey's Bay Mine Extension project has experienced increased costs due to both internal and external factors. As result, the total investment is expected to increase to US$ 2.690 billion

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[3] 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.

vs. US$ 1.694 billion previously announced, mainly due to: (i) COVID-19 impact and changes to the construction schedule, (ii) changes on engineering design, (iii) higher logistic and sourcing costs. In 2Q21, we achieved the first ore production of Reid Brook deposit, the first of two underground mines to be developed in the project. The start-up of the second deposit, Eastern Deeps, is expected by 2H22.

Sustaining capex by business area

US$ million	4Q21	%	3Q21	%	4Q20	%	2021	%	2020	%
Ferrous Minerals	847	57.3	588	61.1	694	53.4	2,496	59.0	2134	54.6
Base Metals	545	36.8	325	33.7	511	39.3	1,518	35.9	1415	36.2
Nickel	470	31.8	290	30.1	465	35.8	1,353	32.0	1242	31.8
Copper	75	5.1	35	3.6	46	3.5	165	3.9	173	4.4
Coal	80	5.4	49	5.1	65	5.0	194	4.6	203	5.2
Energy and others	7	0.5	1	0.1	30	2.3	20	0.5	156	4.0
Total	**1,479**	**100.0**	**963**	**100.0**	**1,300**	**100.0**	**4,228**	**100.0**	**3,908**	**100.0**

Sustaining capex by type - 4Q21

US$ million	Ferrous Minerals	Base Metals	Coal	Energy and others	Total
Enhancement of operations	448	260	60	1	769
Replacement projects	26	197	9	-	232
Filtration and dry stacking projects	108	-	-	-	108
Dam management	18	10	-	-	28
Other investments in dams and waste dumps	57	11	1	-	69
Health and Safety	75	47	5	-	127
Social investments and environmental protection	34	10	3	-	47
Administrative & Others	81	10	2	6	99
Total	**847**	**545**	**80**	**7**	**1,479**

Main project developments in 4Q21

- On the Gelado project, pipeline assembly was completed and advanced on the construction of pumping stations.
- Voisey's Bay Mine Extension Project Finished the main access decline to Eastern Deeps until 700 level. It continued progressing work in the underground infrastructure of Reid Brook mine as we ramp up production. On the surface facilities, the project advanced on the construction of the power plant for Eastern Deeps and the fuel tanks at the port.

Replacement projects progress indicator

Projects	Capacity (per year)	Estimated start-up	Executed capex (US$ million)		Estimated capex (US$ million)		Physical progress (%)
			4Q21	Total	2021	Total	
Gelado	9.7 Mt	2H22	14	261	100	428	87%
Voisey's Bay Mine Extension	45 kt	1H21[1]	188	1,470	449	2,690	67%[2]

[1] In 2Q21, Vale achieved the first ore production of Reid Brook deposit, the first of two underground mines to be developed in the project. The start-up of the second deposit, Eastern Deeps, is expected by 2H22.
[2] Considering Voisey's Bay Mine Extension project scope review.

Projects under evaluation and growth options

In 4Q21, (i) Serra Norte N1/N2 project investment decision and Serra Leste expansion start-up were reviewed in line with revisions in Vale's production plan, and (ii) we advanced in the engineering of dry concentration and briquetting plants to FEL 3.

Projects	Project scope / capacity	Comments
Copper		
Alemão	• 60ktpy Cu + 115 kozpy Au as byproduct • Underground mine	Stage: FEL3 / Invest decision: 2023
South Hub life of mine extension (Cristalino)	• 80ktpy • Replacement project. Maintain Sossego plant operating at full capacity	Stage: FEL3 / Invest decision: 2023
South Hub Upside or life of mine extension (Bacaba, Barão, Visconde and 118)	Bacaba: • 60 - 70 ktpy Cu • Open Pit mine • Replacement or optionality to increase production 118, Visconde and Barão: • Satellite deposits being developed to assess potential options to increase production	Stage: FEL3 / Invest decision: 2023 Stage: FEL 1 / 2 (Barão)
North Hub	• 70-100ktpy Cu potential in North Hub • Growth Project	Stage: FEL 1
Salobo IV	• +30ktpy potential • Growth project	Stage: FEL1
Victor	• 20ktpy Cu + 4ktpy Ni	JV partnership under discussion Stage: FEL2
Hu'u	• +300-350ktpy[1] Cu potential + 200koz Au • Underground block cave • Growth Project	Stage: FEL2
Nickel		
Onça Puma 2nd furnace	• +50 yrs LoM • +12 - 15ktpy Ni	Stage: FEL3 / Invest decision: 2022
Bahodopi	• 20-year mine saprolite ore • RKEF FeNi smelter plant • Production: 70ktpy Ni	Mine owned by PTVI, FeNi plant owned through JV Stage: FEL3 / Invest decision: 2021/2022
Pomalaa	• 30-year mine limonite and saprolite ore • HPAL plant • Production: 40ktpy[1] Ni + 4ktpy Co as byproduct	Mine owned by PTVI, HPAL plant owned through JV Stage: FEL3 / Invest decision: 2022
CCM PH 3&4	• Replacement • Underground mine	Stage: FEL2
Thompson Mine Extension PH2	• Life extension • Underground mine	Stage: FEL2
Iron ore		
Serra Norte N1/N2	• Replacement project of 50 Mtpy of ROM in Serra Norte	Stage: FEL3 / Invest decision: 2023 Start-up: 2026
Dry concentration plants	• Plants in Oman, Fábrica and Fazendão • Capacity: 17 Mtpy[2]	Stage: FEL2/3 / Invest decision: 2022/23 Start-up: 2024/26
Serra Leste expansion	• Growth project • Project's capacity under evaluation	Stage: FEL2 / Invest decision: 2022 Start-up: 2026
S11C	• Expand Serra Sul to ore body C due to S11D depletion. • Replacement project.	Stage: FEL2
Briquetting plants	• 3 plants under construction (7 Mtpy capacity) • 7 other plants under engineering stage	Stage: FEL3 (two plants) / Invest decision: 2022/2026

[1] Considering full equity in Sumbawa Timur Mining and based on initial studies arising from the ongoing prefeasibility study.
[2] Including 8.5 Mtpy of Oman project, which is expected to improve pellet feed quality to supply direct reduction plants production.

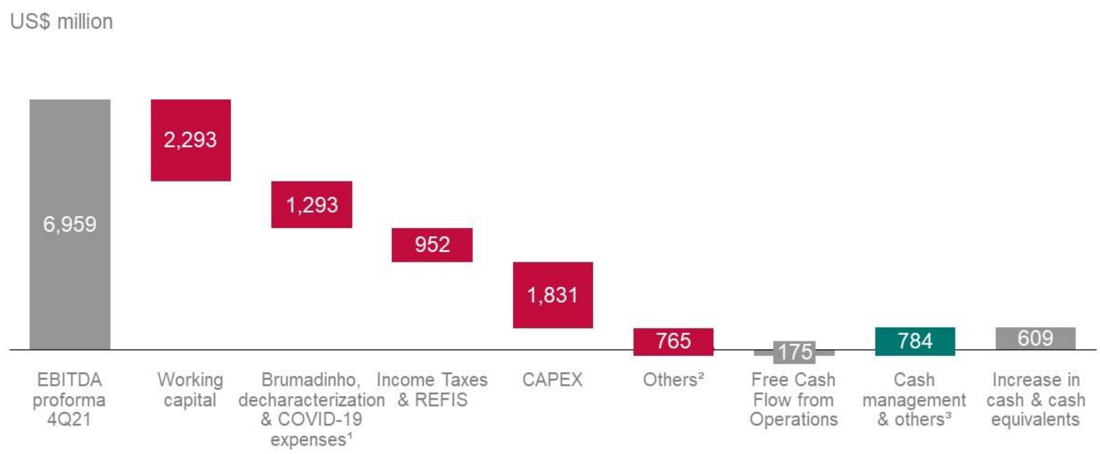
Free cash flow

Free Cash Flow from Operations was negative US$ 175 million in 4Q21, mainly due to (i) the negative impact from working capital build-up; (ii) seasonally higher capital expenditures, and (iii) payments related to the Integral Reparation Agreement of Brumadinho.

The higher working capital is mainly explained by the US$ 3.1 billion increase in accounts receivables due to the combined effect of (i) higher ferrous accrual sales volume (18.1Mt in 4Q21 versus 8.7 Mt in 3Q21) led by stronger CFR sales and, (ii) the positive difference between expected settlement prices and the already collected prices – the opposite effect at a higher magnitude occurred in 3Q21, which led in 4Q21 to material price adjustments related to invoices received at higher prices in the previous quarter, as previously anticipated in 3Q21 earnings call.

In 4Q21, Vale received US$ 1,259 billion from the sale of Mosaic shares, and repurchased US$ 701 million of its own shares, with a net effect of increasing its cash & cash equivalents position by US$ 609 million in the quarter.

Free Cash Flow 4Q21



[1] Includes US$ 1.088 billion of disbursement of Brumadinho provisioned expenses, US$ 189 million of Brumadinho incurred expenses and US$ 16 million of COVID-19 expenses.
[2] Includes interest on loans, derivatives, leasing, dividends paid to noncontrolling interest, payments to Samarco and others.
[3] Includes US$ 1,259 billion from the Mosaic divestment, US$ 701 million of share buyback, US$ 630 million of debt funding, and US$ 404 million of debt repayment.

Debt

Gross debt and leases totaled US$ 13.782 billion, and net debt amounted to US$ 1.877 billion as of December 31, 2021, in line with previous quarter.

Expanded net debt increased to US$ 15.061 billion as of December 31, 2021, in line with our existing target, mainly because of the additional provisions recorded in the quarter for future expenses related to the de-characterization of upstream dams and the Renova Foundation.

The average debt maturity was 8.7 years on December 31st, 2021, in line with the 8.8 years on September 30, 2021. After currency and interest rate swaps, the average cost of debt was also in line with 3Q21 at 4.66% per annum.

Debt indicators

US$ million	4Q21	3Q21	4Q20
Gross debt [1]	**12,180**	**11,951**	**13,360**
Lease (IFRS 16)	1,602	1,634	1,667
Gross debt and leases	**13,782**	**13,585**	**15,027**
Cash, cash equivalents and short-term investments	11,905	11,378	14,258
Net debt	**1,877**	**2,207**	**769**
Currency swaps[2]	722	786	883
Refis	2,288	2,410	2,744
Brumadinho	3,537	4,356	4,575
De-characterization	3,523	1,857	2,289
Samarco & Renova Foundation provisions	3,112	2,265	2,074
Expanded net debt	**15,061**	**13,881**	**13,334**
Total debt / adjusted LTM EBITDA (x)	0.4	0.4	0.8
Net debt / adjusted LTM EBITDA (x)	0.06	0.07	0.04
Adjusted LTM EBITDA / LTM gross interest (x)	46.7	41.1	23.6

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

[2] Includes interest rate swaps.

Performance of the business segments

Segment information — 2021, as per footnote of financial statements

US$ million	Net operating revenues	Cost[1]	Expenses: SG&A and others[1]	Expenses: R&D[1]	Expenses: Pre operating & stoppage[1]	Dividends and interest received from associates and JVs	Adjusted EBITDA
Ferrous Minerals	46,302	(14,099)	(96)	(205)	(394)	81	31,589
Iron ore fines	38,701	(11,468)	(135)	(198)	(330)	10	26,580
Pellets	7,053	(2,231)	30	(3)	(47)	71	4,873
Others ferrous	373	(281)	9	(2)	(2)	-	97
Mn & Alloys	175	(119)	-	(2)	(15)	-	39
Base Metals	7,966	(4,484)	(14)	(158)	(117)	-	3,193
Nickel[2]	5,377	(3,606)	(5)	(77)	(113)	-	1,576
Copper[3]	2,589	(878)	(9)	(81)	(4)	-	1,617
Brumadinho event and de-characterization of dams	-	-	(2,576)	-	-	-	(2,576)
COVID-19 donations	-	-	(44)	-	-	-	(44)
Others	234	(289)	(685)	(185)	(3)	109	(819)
Total of continuing operations	**54,502**	**(18,872)**	**(3,415)**	**(548)**	**(514)**	**190**	**31,343**
Discontinued operations - Coal	1,083	(1,317)	(26)	(7)	-	78	(189)
Total	**55,585**	**(20,189)**	**(3,441)**	**(555)**	**(514)**	**268**	**31,154**

[1] Excluding depreciation, depletion and amortization.

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

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

Segment information — 4Q21, as per footnote of financial statements

US$ million	Net operating revenues	Cost[1]	Expenses: SG&A and others[1]	Expenses: R&D[1]	Expenses: Pre operating & stoppage[1]	Dividends and interest received from associates and JVs	Adjusted EBITDA
Ferrous Minerals	10,822	(4,309)	(12)	(72)	(119)	59	6,369
Iron ore fines	8,817	(3,501)	(20)	(69)	(103)	10	5,134
Pellets	1,889	(716)	1	(1)	(11)	49	1,211
Others ferrous	84	(68)	6	(1)	(2)	-	19
Mn & Alloys	32	(24)	1	(1)	(3)	-	5
Base Metals	2,224	(1,335)	(29)	(47)	(2)	-	811
Nickel[2]	1,555	(1,094)	(27)	(28)	(1)	-	405
Copper[3]	669	(241)	(2)	(19)	(1)	-	406
Brumadinho event and de-characterization of dams	-	-	(2,115)	-	-	-	(2,115)
COVID-19 donations	-	-	(16)	-	-	-	(16)
Others	59	(67)	(340)	(57)	(1)	83	(323)
Total of continuing operations	**13,105**	**(5,711)**	**(2,512)**	**(176)**	**(122)**	**142**	**4,726**
Discontinued operations - Coal	478	(351)	(23)	(2)	-	-	102
Total	**13,583**	**(6,062)**	**(2,535)**	**(178)**	**(122)**	**142**	**4,828**

[1] Excluding depreciation, depletion and amortization.

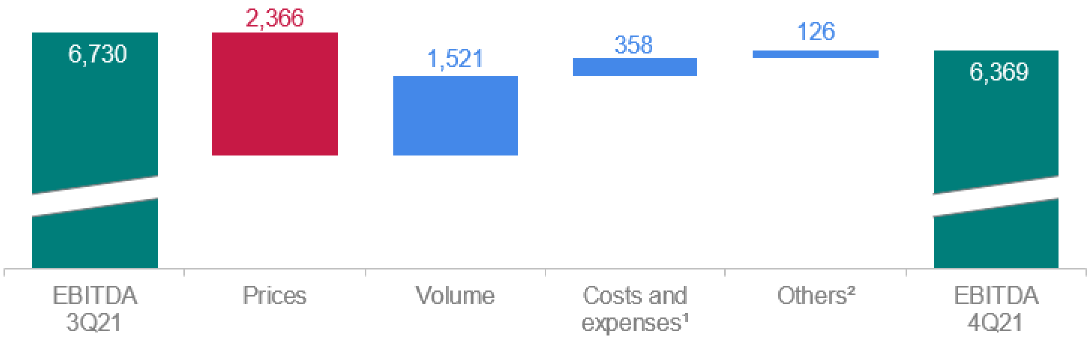
[2] Including copper, by-products from our nickel operations and marketing activities.

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

Ferrous Minerals

Ferrous Minerals adjusted EBITDA totaled US$ 6.369 billion, down only 5.4% q/q, considering the 32.7% lower benchmark price, which was offset by higher sales volumes and lower unit cost and expenses. The adjusted EBITDA per ton for Ferrous Minerals, excluding Manganese and Ferroalloys, totaled US$ 68.1/t, a decrease of US$ 20.5/t compared to 3Q21.

Ferrous Minerals EBITDA variation – US$ million (4Q21 x 3Q21)



[1] Excluding freight, FX and volume effect.
[2] Including the positive effect of FX (US$ 95 million) and higher dividends received (US$ 59 million), which were partially offset by higher freight costs (US$ 28 million).

The share of premium products[4] in total sales was 82% in 4Q21, in line with 3Q21.

Iron ore premium was US$ 4.7/t in 4Q21, a decrease of US$ 1.9/t compared to 3Q21 due to (i) US$ 8.2/t lower spread between 65/62% Fe indexes together with a lower share of IOCJ on total sales; (ii) lower Fe unit contribution due to lower iron ore price; and (iii) lower contractual pellet premiums (-US$ 20/t for direct reduction pellets and -US$ 15/t for blast furnace pellets); which were partially offset by the seasonal dividends received from our pellet's JVs. In addition, under an environment of improved prices and lower spot freight costs prevalent in the second half of the quarter, Vale maintained the share of sales of high-silica products, which, despite the positive margins, negatively impacted average premiums.

Iron ore fines and pellets quality premium

US$/t	4Q21	3Q21	4Q20	2021	2020
Iron ore fines quality premium	0.4	1.9	3.2	2.8	4.1
Pellets weighted average contribution	4.3	4.6	1.1	4.0	1.2
Iron ore fines and pellets total quality premium	**4.7**	**6.6**	**4.3**	**6.8**	**5.3**
Share of premium products[1] (%)	**82%**	**80%**	**90%**	**83%**	**86%**

[1] Composed of pellets, Carajás (IOCJ), Brazilian Blend Fines (BRBF) and pellet feed.

[4] Pellets, Carajás (IOCJ), Brazilian Blend Fines (BRBF) and pellet feed.

Volume sold

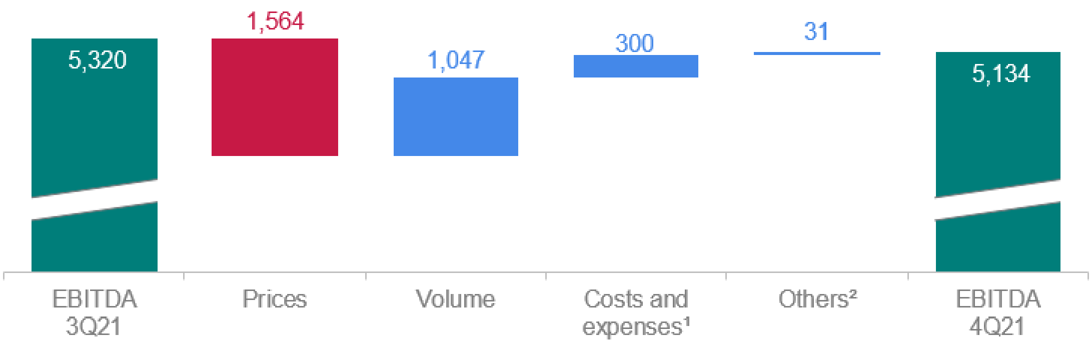
'000 metric tons	4Q21	3Q21	4Q20	2021	2020
Iron ore fines	82,540	67,304	82,391	275,456	254,012
ROM	607	540	434	2,052	853
Pellets	10,351	8,037	8,486	32,306	31,211
Manganese ore	35	111	461	573	1,378
Ferroalloys	14	16	15	58	67

Net operating revenue by product

US$ million	4Q21	3Q21	4Q20	2021	2020
Iron ore fines	8,817	8,530	10,765	38,701	27,285
ROM	8	17	6	62	20
Pellets	1,889	2,009	1,295	7,053	4,242
Manganese & Ferroalloys	32	45	60	175	225
Others	76	77	77	311	306
Total	**10,822**	**10,678**	**12,203**	**46,302**	**32,078**

Iron ore fines (excluding Pellets and ROM)

Iron ore fines EBITDA variation – US$ million (4Q21 x 3Q21)



[1] Excluding freight, FX and volume effect.
[2] Including the positive effect of FX (US$ 65 million) and higher dividends received (US$ 10 million), which were partially offset by higher freight costs (US$ 44 million).

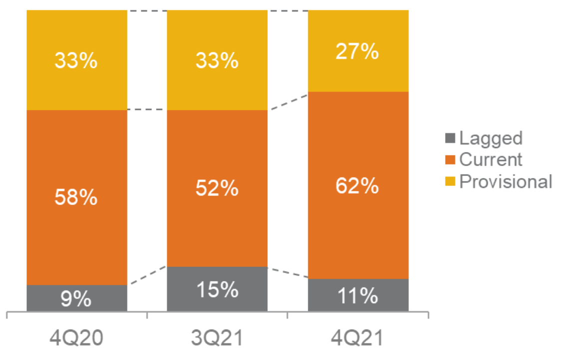
Revenues and sales volumes

Iron ore fines' net revenues grew US$ 287 million in the quarter, mainly due to 22.6% higher sales volumes (US$ 1.851 billion), partially offset by 15.7% lower realized prices (US$ 1.564 billion).

Sales volumes of iron ore fines set a record for a fourth quarter, growing 15.2 Mt q/q, as result of sales of transiting inventories from 3Q21. CFR sales totaled 71.9 Mt in 4Q21, representing 87% of total sales, an 8-p.p. increase from 3Q21 due a record sales volume to China, totaling 64.0 Mt[5]. Sales to China are predominantly CFR-based, due to Vale's blending strategy and customers' usual choice.

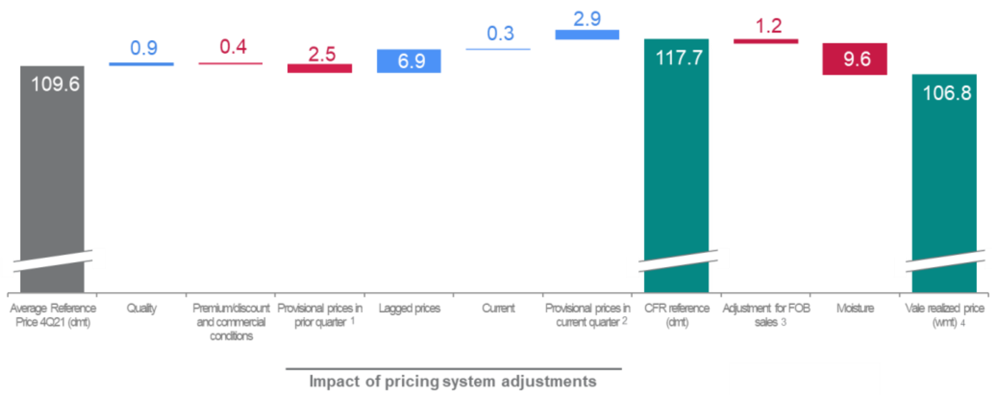
[5] Iron ore fines and pellets sales volume to China totaled 64.6 Mt in 4Q21

Pricing system breakdown (%)



Vale's realized price declined US$ 19.9/t q/q mainly due to lower 62% Fe reference price (US$ 53.3/t), which was partially offset by the positive effect of pricing system adjustments (US$ 29.9/t), following the impact of the higher lagged prices and lower price volatility observed in 4Q21.

Price realization iron ore fines – US$/t, 4Q21



[1] Adjustment as a result of provisional prices booked in 3Q21 at US$ 117.7/t.
[2] Difference between the weighted average of the prices provisionally set at the end of 4Q21 at US$ 120.3/t based on forward curves and US$ 109.6/t from the 4Q21 62% Fe reference price.
[3] Includes freight pricing mechanisms of CFR sales freight recognition.
[4] Vale's price is net of taxes.

Average prices

US$/ metric ton	4Q21	3Q21	4Q20	2021	2020
Iron ore - Metal Bulletin 65% index	128.8	190.4	145.9	185.2	122.3
Iron ore - Metal Bulletin 62% low alumina index	111.8	164.7	133.7	161.0	110.1
Iron ore - 62% Fe reference price	109.6	162.9	133.7	159.5	108.9
Provisional price at the end of the quarter	120.3	117.7	157.7	120.3	157.7
Iron ore fines Vale CFR reference (dmt)	117.7	142.5	143.4	155.6	118.9
Iron ore fines Vale CFR/FOB realized price	106.8	126.7	130.7	140.5	107.4
Pellets CFR/FOB (wmt)	182.6	249.9	152.6	218.3	135.9
Manganese ore	122.4	163.9	87.5	139.3	114.9
Ferroalloys	1,967.3	1,792.3	1,027.2	1,626.1	948.0

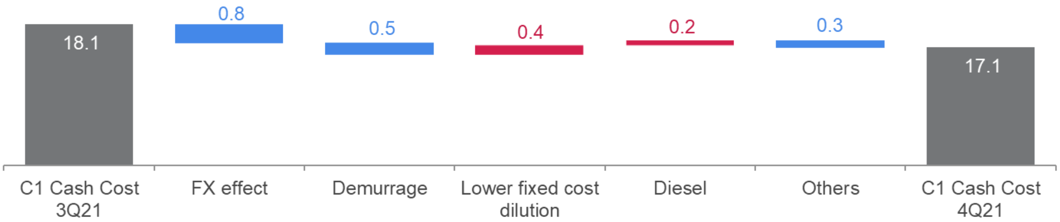
Costs

IRON ORE COGS - 3Q21 x 4Q21

US$ million	3Q21	Variance drivers				4Q21
		Volume	Exchange rate	Others	Total variation	
C1 cash costs	1,529	323	(57)	(243)	23	1,552
Freight	1,077	378	-	44	422	1,499
Distribution costs	82	18	-	(12)	6	88
Royalties & others	376	85	-	(99)	(14)	362
Total costs before depreciation and amortization	**3,064**	**804**	**(57)**	**(310)**	**437**	**3,501**
Depreciation	287	61	(18)	12	55	342
Total	**3,351**	**865**	**(75)**	**(298)**	**492**	**3,843**

Vale's C1 cash cost declined by US$ 3.9/t q/q, mainly driven by (i) lower third-party purchase costs resulting from lower volumes and prices; (ii) favorable foreign exchange effects; and (iii) lower demurrage costs, which were partially offset by (i) lower fixed cost dilution from smaller production volumes; and (ii) higher diesel costs. Vale's C1 cash cost ex-third-party purchases totaled US$ 17.1/t, a decrease of US$ 1.0/t vs. 3Q21.

C1 cash cost variation (excluding 3rd party purchases) – US$/t (4Q21 x 3Q21)



Vale's unit maritime freight cost was US$ 20.8/t in 4Q21, an increase of US$ 0.6/t from 3Q21, mainly explained by higher bunker costs.

Iron ore fines cash cost and freight

	4Q21	3Q21	4Q20	2021	2020
Costs (US$ million)					
Vale's iron ore fines C1 cash cost (A)	1,552	1,529	1,260	5,589	4,002
Third-party purchase costs[1] (B)	194	397	271	1,166	710
Vale's C1 cash cost ex-third-party volumes (C = A – B)	1,357	1.132	989	4,423	3,292
Sales volumes (Mt)					
Volume sold (ex-ROM) (D)	82.5	67.3	82.4	275.5	254.0
Volume sold from third-party purchases (E)	3.2	4.8	4.5	15.6	13.6
Volume sold from own operations (F = D – E)	79.4	62.5	77.9	259.9	240.4
Iron ore fines cash cost (ex-ROM, ex-royalties), FOB (US$ /t)					
Vale's C1 cash cost ex-third-party purchase cost (C/F)	17.1	18.1	12.7	17.0	13.7
Average third-party purchase C1 cash cost (B/E)	61.6	81.9	60.8	74.8	52.1
Vale's iron ore cash cost (A/D)	18.8	22.7	15.3	20.3	15.8
Freight					
Maritime freight costs (G)	1,499	1,077	1,054	4,248	3,137
% of CFR sales (H)	87%	79%	85%	82%	81%
Volume CFR (Mt) (I = D x H)	71.9	53.3	69.7	224.8	205.1
Vale's iron ore unit freight cost (US$/t) (G/I)	20.8	20.2	15.1	18.9	15.3

[1] Includes logistics costs related to third-party purchases.

EXPENSES

Iron ore fines expenses, net of depreciation, amounted to US$ 192 million in 4Q21, up US$ 46 million q/q, largely explained by (i) higher Brumadinho stoppage expenses in Mariana and Vargem Grande complexes (US$ 43 million); and (ii) seasonally higher R&D expenses (US$ 16 million), which were partially offset by lower selling expenses (US$ 11 million).

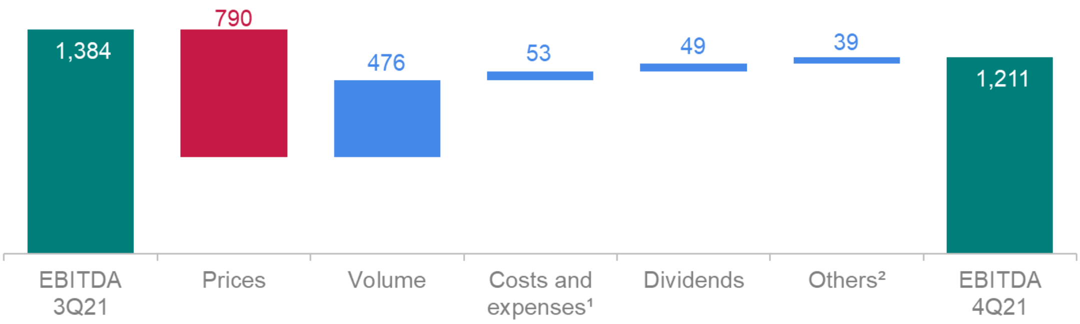
Expenses - iron ore fines

US$ millions	4Q21	3Q21	4Q20	2021	2020
Selling	**8**	**19**	**14**	**56**	**51**
R&D	**69**	**53**	**48**	**198**	**127**
Pre-operating and stoppage expenses	**103**	**61**	**122**	**330**	**534**
Brumadinho stoppage expenses	92	49	93	280	445
Others	11	12	29	50	89
Other expenses	**12**	**13**	**38**	**79**	**136**
Total expenses	**192**	**146**	**222**	**663**	**848**

Iron ore pellets

Adjusted EBITDA for pellets declined 12.5% q/q, due to the lower realized prices as a result of lower 65% Fe price index (32.7% vs. 3Q21) and lower contractual premiums (US$ 20/t for direct reduction pellets and US$ 15/t for blast furnace pellets). This effect was partially offset by (i) 28.8% higher sales volumes; (ii) lower pellet feed costs; and (iii) seasonal dividends received from JVs.

Iron ore pellets EBITDA variation – US$ million (4Q21 x 3Q21)



[1] Excluding freight, FX and volume effect.
[2] Including the positive effect of FX (US$ 23 million) and lower freight costs (US$ 16 million),

Realized prices in 4Q21 averaged US$ 182.6/t, US$ 67.3/t lower than in 3Q21, mainly due to the 32.7% lower 65% Fe price index and lower contractual pellet premiums.

FOB pellets sales of 5.7 Mt in 4Q21, representing 55% of total pellets sales. CFR pellets sales totaled 4.7 Mt in 4Q21, increasing 1.7 Mt vs. 3Q21, mainly due to higher sales to Middle East region clients.

Costs totaled US$ 716 million (or US$ 833 million with depreciation charges) in 4Q21. Excluding the impact of higher sales volumes (US$ 194 million) and considering FX variation, cost improved by US$ 90 million when compared with 3Q21.

Pellets - EBITDA

	4Q21		3Q21	
	US$ million	**US$/wmt**	**US$ million**	**US$/wmt**
Net revenues / Realized price	1,889	182.6	2,009	249.9
Dividends received (Leased pelletizing plants)	49	4.7	-	-
Cash costs (Iron ore, leasing, freight, overhead, energy and other)	(716)	(69.3)	(612)	(76.1)
Pre-operational & stoppage expenses	(11)	(1.0)	(10)	(1.2)
Expenses (Selling, R&D and other)	-	-	(3)	(0.4)
EBITDA	**1,211**	**117.0**	**1,384**	**172.2**

Iron ore fines and pellets cash break-even[6]

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

US$/t	4Q21	3Q21	4Q20	2021	2020
Vale's C1 cash cost ex-third-party purchase cost	17.1	18.1	12.7	17.0	13.7
Third party purchases cost adjustments	1.7	4.6	2.6	3.3	2.1
Vale's iron ore cash cost (ex-ROM, ex-royalties), FOB (US$ /t)	18.8	22.7	15.3	20.3	15.8
Iron ore fines freight cost (ex-bunker oil hedge)	20.8	20.2	15.1	18.9	15.3
Iron ore fines distribution cost	1.1	1.2	1.1	1.2	0.9
Iron ore fines stoppage expenses[2] related to Brumadinho	1.1	0.7	1.1	1.0	1.8
Iron ore fines expenses[2] & royalties	5.5	7.1	4.7	6.1	4.6
Iron ore fines moisture adjustment	4.1	4.5	3.3	4.1	3.4
Iron ore fines quality adjustment	(0.4)	(1.9)	(3.2)	(2.8)	(4.1)
Iron ore fines EBITDA break-even (US$/dmt)	**51.0**	**54.6**	**37.4**	**48.8**	**37.7**
Iron ore fines pellet adjustment	(4.3)	(4.6)	(1.1)	(4.0)	(1.2)
Iron ore fines and pellets EBITDA break-even (US$/dmt)	**46.7**	**49.9**	**36.3**	**44.8**	**36.5**
Iron ore fines sustaining investments	9.4	8.1	7.9	8.4	7.7
Iron ore fines and pellets cash break-even landed in China (US$/dmt)	**56.1**	**58.0**	**44.2**	**53.2**	**44.2**

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

[2] Net of depreciation and includes dividends received

Volume sold by destination – Iron ore and pellets

'000 metric tons	4Q21	3Q21	4Q20	2021	2020
Americas	**9,165**	**9,135**	**8,543**	**37,500**	**29,129**
Brazil	7,916	7,666	7,126	30,314	23,782
Others	1,249	1,469	1,417	7,186	5,347
Asia	**77,249**	**60,020**	**75,848**	**244,175**	**230,811**
China	64,603	47,350	63,933	197,893	191,764
Japan	6,823	7,337	6,272	24,636	19,369
Others	5,823	5,333	5,643	21,646	19,678
Europe	**3,799**	**4,722**	**4,048**	**19,358**	**16,850**
Germany	949	1,096	505	3,957	4,193
France	706	625	376	3,653	2,075
Others	2,144	3,001	3,167	11,748	10,582
Middle East	**1,681**	**486**	**2,061**	**4,009**	**5,523**
Rest of the World	**1,604**	**1,518**	**811**	**4,772**	**3,763**
Total	**93,498**	**75,881**	**91,311**	**309,814**	**286,076**

Selected financial indicators - Ferrous Minerals

US$ million	4Q21	3Q21	4Q20	2021	2020
Net Revenues	10,822	10,678	12,203	46,302	32,078
Costs[1]	(4,309)	(3,785)	(3,237)	(14,099)	(10,265)
Expenses[1]	(12)	(33)	(50)	(96)	(166)
Pre-operating and stoppage expenses[1]	(119)	(75)	(150)	(394)	(647)
R&D expenses	(72)	(55)	(52)	(205)	(136)
Dividends and interests on associates and JVs	59	-	86	81	141
Adjusted EBITDA	6,369	6,730	8,800	31,589	21,005
Depreciation and amortization	(507)	(412)	(465)	(1,771)	(1,768)
Adjusted EBIT	5,862	6,318	8,335	29,818	19,237
Adjusted EBIT margin (%)	54.2	59.2	68.3	64.4	60.0

[1] Net of depreciation and amortization

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

Selected financial indicators - Iron ore fines

US$ million	4Q21	3Q21	4Q20	2021	2020
Adjusted EBITDA (US$ million)	5,134	5,320	7,881	26,580	18,289
Volume Sold (Mt)	82.5	67.3	82.4	275.5	254.0
Adjusted EBITDA (US$/t)	62	79	96	96	72

Selected financial indicators - Pellets

US$ million	4Q21	3Q21	4Q20	2021	2020
Adjusted EBITDA (US$ million)	1,211	1,384	894	4,873	2,626
Volume Sold (Mt)	10.4	8.0	8.5	32.3	31.2
Adjusted EBITDA (US$/t)	117	172	105	151	84

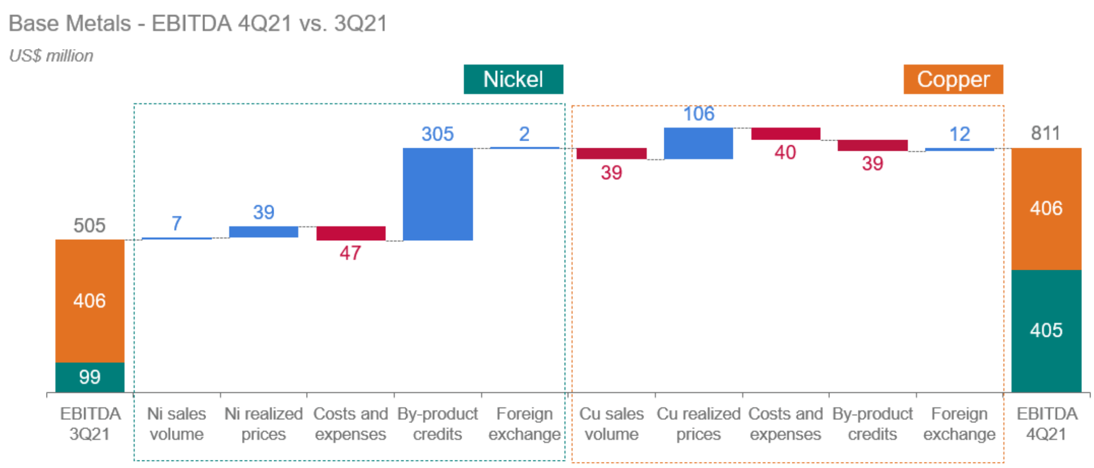
Selected financial indicators - Ferrous ex Manganese and Ferroalloys

US$ million	4Q21	3Q21	4Q20	2021	2020
Adjusted EBITDA (US$ million)	6,364	6,722	8,791	31,550	20,990
Volume Sold (Mt)[1]	93.5	75.9	91.3	309.8	286.1
Adjusted EBITDA (US$/t)	68	89	96	102	73

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

Base Metals

Base Metals adjusted EBITDA[7] was US$ 811 million in 4Q21, US$ 306 million higher than 3Q21.



The higher EBITDA in the quarter was mainly due to:

- Resumption of production at Sudbury operations and as a consequence, the increase in production, led to higher by-product sales volumes, primarily copper and PGMs;
- Higher copper realized prices, mainly due to invoice price adjustments.

These effects were partially offset by:

- Higher nickel costs and expenses, mainly due to the reversal of provisions in 3Q21, increased spending in Voisey's Bay Mine and furnace maintenance and higher fuel costs in PTVI.
- Lower copper and by-products sales volumes in South Atlantic, from lower production volumes at Salobo and Sossego.
- Higher copper costs, mainly due to the Salobo conveyor belt fire in October and the corrective plant maintenance at Sossego.

Base Metals EBITDA overview –4Q21

US$ million	North Atlantic	PTVI (site)	Onça Puma	Sossego	Salobo	Others	**Subtotal Base Metals**	Marketing activities	**Total Base Metals**
Net Revenues	**970**	**267**	**53**	**257**	**412**	**(115)**	**1,844**	**380**	**2,224**
Costs	(690)	(155)	(40)	(83)	(158)	167	(959)	(376)	(1,335)
Selling and other expenses	(8)	(1)	(4)	(4)	1	(13)	(29)	-	(29)
Pre-operating and stoppage expenses	-	-	-	-	(1)	(1)	(2)	-	(2)
R&D	(18)	(5)	(1)	(7)	(1)	(15)	(47)	-	(47)
EBITDA	**254**	**106**	**8**	**163**	**253**	**23**	**807**	**4**	**811**

[7] VNC site results are not reported as part of Base Metals results. Previous Base Metals results were restated to reflect this change. Results from VNC site are being accounted for as "Other" in the Segment Information.

Average prices

US$/ metric ton	4Q21	3Q21	4Q20	2021	2020
Nickel - LME	19,821	19,125	15,930	18,488	13,788
Copper - LME	9,699	9,372	7,166	9,317	6,180
Nickel - realized prices	19,088	18,211	17,387	18,004	15,976
Copper - realized prices[1]	10,229	8,187	7,133	9,337	5,864
Gold (US$/oz)	1,795	1,798	1,895	1,768	1,857
Silver (US$/oz)	21.32	24.15	29.90	23.87	21.10
Cobalt (US$/t)	63,079	56,859	56,097	51,907	43,131

[1]Considers Salobo and Sossego operations.

Nickel operations

Nickel operations, excluding marketing activities – EBITDA by operation

US$ million	4Q21	3Q21	4Q20	2021	2020
North Atlantic operation[1]	254	(38)	485	1,042	1,263
PTVI	106	125	74	392	273
Onça Puma	8	30	50	126	59
Others[2]	33	(22)	116	6	230
Total	**401**	**95**	**725**	**1,566**	**1,825**

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

[2] Includes the PTVI, intercompany sales eliminations, purchase of finished nickel. Hedge results have been relocated to each nickel business operation.

North Atlantic operations' EBITDA was higher in 4Q21 due to the end of the labor disruption and maintenance activities in Sudbury, which led to higher nickel sales volumes and by-products credits.

PTVI's EBITDA was lower in 4Q21 due to (i) lower sales volumes, (ii) furnace maintenance and (iii) price pressures from supplies of coal and HSFO[8].

Onça Puma's EBITDA was lower in 4Q21 mainly due to lower nickel sales volumes due to the inventory rebuild after the drawdown in 3Q21 following the extended maintenance in Onça Puma.

Nickel Revenue and Realized Price

Net operating revenue by product - Nickel operations, excluding marketing activities

US$ million	4Q21	3Q21	4Q20	2021	2020
Nickel	851	761	1,028	3,273	2,926
Copper	210	9	195	631	581
Gold as by-product	11	2	30	46	110
Silver as by-product	5	1	9	17	31
PGMs[1]	64	-20	178	395	664
Cobalt	31	31	19	105	75
Others	3	-4	8	30	23
Total	**1,175**	**780**	**1,467**	**4,497**	**4,410**

[1] In 3Q21, PGMs revenue was impacted by negative provisional price adjustments along with lower sales volumes.

[8] High-Sulphur Fuel Oil

Volume sold - Nickel operations

'000 metric tons	4Q21	3Q21	4Q20	2021	2020
Nickel[1]	45	42	59	182	183
Upper Class I	22	23	18	95	74
- of which: EV Battery	2.5	1.0	0.3	6.3	0.7
Lower Class I nickel	6	6	18	28	46
Class II nickel	13	9	19	44	54
Intermediates	4	4	6	15	20
VNC eliminations[2]	-	-	(2)	-	(10)
Copper	21	3	26	68	99
Gold as by-product ('000 oz)	6	1	16	27	63
Silver as by-product ('000 oz)	224	34	292	756	1,471
PGMs ('000 oz)	33	11	82	173	325
Cobalt (metric ton)	483	538	350	2,017	1,739

[1] Nickel sales volumes were adjusted in the financial report to reflect VNC divestment

[2] Volumes associated with revenues from VNC that are accounted for as Other in segment information.

Nickel sales to OEMs increased from 0.7 kt in 2020 to 6 kt in 2021, in line with our strategy to increase participation in the electric vehicle battery supply chain.

Nickel realized price

US$/t	4Q21	3Q21	4Q20
LME average nickel price	19,821	19,125	15,930
Average nickel realized price	19,088	18,211	17,387
Contribution to the NRP by category:			
Nickel average aggregate premium	140	(120)	(90)
Other timing and pricing adjustments contribution	(873)	(794)	1,547

Nickel realized price in 4Q21 increased 5.0% q/q mainly due to 4% higher LME nickel average price and higher nickel average aggregate premium. The positive effect was partially offset by higher impact of timing and pricing adjustments.

Premiums / discount by nickel product

US$/t	4Q21	3Q21	4Q20
Upper Class I nickel	900	790	1,035
Lower Class I nickel	180	200	74
Class II nickel	20	(770)	(530)
Intermediates	(3,840)	(4,410)	(2,720)

Product type by operation

% of source sales	North Atlantic	PTVI	Onça Puma	Total 4Q21	Total 3Q21
Upper Class I	70.8%	0%	0%	50.0%	54.0%
Lower Class I	19.0%	0%	0%	12.6%	14.5%
Class II	8.9%	66.4%	100%	28.5%	22.2%
Intermediates	1.3%	33.6%	0%	8.9%	9.3%

Other timing and pricing adjustments had an aggregate negative impact of US$ 873/t in 4Q21, due to (i) the Quotational Period effects (based on sales distribution in the prior 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 negative US$ 79/t , (ii) fixed-price sales, with an impact of negative US$ 80/t (iii) the effect of the hedging on Vale's nickel price realization, with a negative impact of US$ 714/t[9] in the quarter.

[9] Vale has put in place derivatives positions related to the Nickel Revenue Hedging Program to provide stable cash generation during a period of significant investments. As of December 31st, 2021, the average strike price for the forward position was US$ 20,008/t.

Nickel Costs and Expenses

Nickel COGS, excluding marketing activities - 3Q21 x 4Q21

US$ million	3Q21	Variance drivers				4Q21
		Volume	Exchange rate	Others	Total variation	
Nickel operations	670	45	(2)	6	48	718
Depreciation	127	(1)	(1)	86	84	211
Total	**797**	**44**	**(3)**	**92**	**132**	**929**

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

US$/t	4Q21	3Q21	4Q20	2021	2020
North Atlantic operations[1]	11,110	19,871	6,531	9,800	5,809
PTVI	8,946	7,813	7,109	8,275	6,675
Onça Puma	13,612	10,928	7,257	9,630	9,751

[1] North Atlantic figures include Clydach refining costs.

North Atlantic operations' unit cash cost was positively impacted by the resumption of operations after the labor disruption at Sudbury, as the higher volumes increased fixed costs dilution and by-product credits.

PTVI's unit cash cost was negatively affected in 4Q21 by lower dilution of fixed costs, higher maintenance activities and price pressures from supplies of coal and High-Sulphur Fuel Oil.

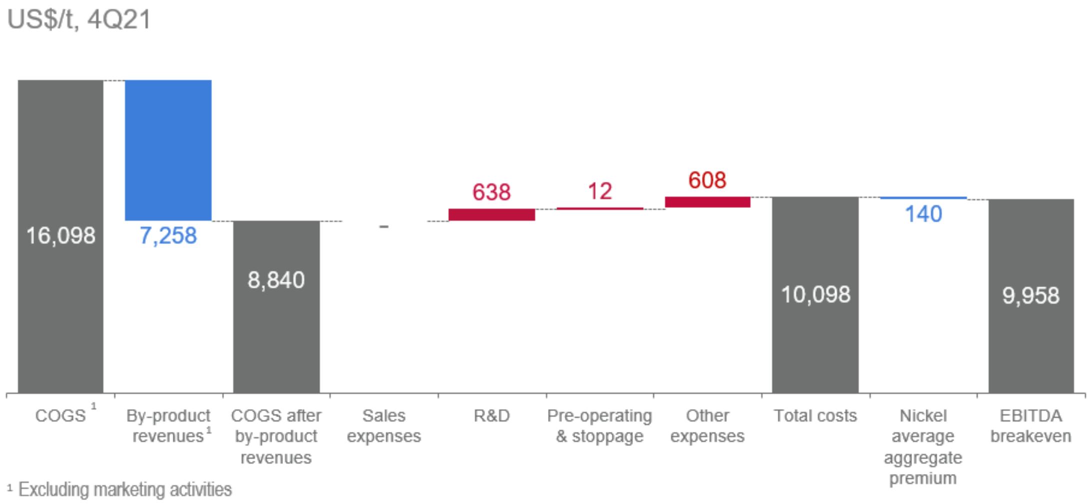
Onça Puma's unit cash cost increased mainly due to lower sales volumes resulting from the inventory rebuild after the drawdown in 3Q21, during extended maintenance downtime.

Selling expenses and other expenses totaled US$ 27 million in 4Q21 (includes US$ 9 million of care and maintenance mines in North Atlantic).

Pre-operating and stoppage expenses totaled US$ 1 million, lower than 3Q21, mainly due to the resumption of Sudbury operations.

R&D expenses were US$ 28 million in 4Q21, higher than 3Q21. These expenses encompass R&D initiatives for further operational improvements in North Atlantic.

EBITDA break-even – nickel operations[10]



Selected financial indicators - Nickel operations, excluding marketing activities

US$ million	4Q21	3Q21	4Q20	2021	2020
Net Revenues	1,175	780	1,467	4,497	4,410
Costs¹	(718)	(670)	(765)	(2,736)	(2,493)
Expenses¹	(27)	57	35	(5)	(21)
Pre-operating and stoppage expenses¹	(1)	(52)	(1)	(113)	(29)
R&D expenses	(28)	(20)	(11)	(77)	(42)
Adjusted EBITDA	401	95	725	1,566	1,825
Depreciation and amortization	(212)	(145)	(240)	(824)	(888)
Adjusted EBIT	189	(50)	485	742	937
Adjusted EBIT margin (%)	16.1	(6.4)	33.1	16.5	21.2

¹ Net of depreciation and amortization

Copper operations – Salobo and Sossego

Copper – EBITDA by operation

US$ million	4Q21	3Q21	4Q20	2021	2020
Salobo	253	270	339	1,158	1,030
Sossego	163	154	122	518	329
Others Copper¹	(10)	(18)	(16)	(59)	(54)
Total	**406**	**406**	**445**	**1,617**	**1,305**

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

Salobo's EBITDA decreased in 4Q21 compared to 3Q21 mainly due to lower sales and higher costs due to the conveyor belt fire, partially offset by higher copper realized prices.

Sossego's EBITDA in 4Q21 increased compared to 3Q21 mainly due to higher copper realized prices, partially offset by lower copper sales volumes and the corrective maintenance at the SAG mill.

[10] Considering only the cash effect of US$ 400/oz that Wheaton Precious Metals pays for 70% of Sudbury's gold by-product, nickel operations EBITDA break-even would increase to US$ 9,986/t.

Copper revenue and realized price

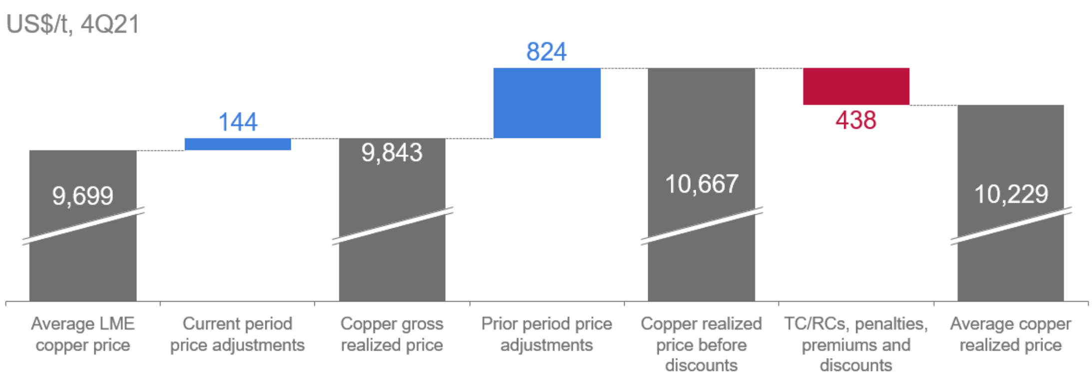
Net operating revenue by product - Copper operations

US$ million	4Q21	3Q21	4Q20	2021	2020
Copper	539	510	476	2,018	1,450
Gold as by-product	127	164	201	555	709
Silver as by-product	3	4	5	16	16
Total	**669**	**678**	**682**	**2,589**	**2,176**

Volume sold - Copper operations

'000 metric tons	4Q21	3Q21	4Q20	2021	2020
Copper	53	62	67	216	247
Gold as by-product ('000 oz)	71	91	106	313	378
Silver as by-product ('000 oz)	128	176	199	643	760

Price realization – copper operations



Vale's copper products are sold on a provisional pricing basis[11] during the quarter, with final prices determined in a future period, generally one to four months forward.

- Current period price adjustments: at the end of the quarter, mark-to-market of open invoices based on the copper price forward curve[12]
- Prior period price adjustment: based on the difference 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 prior quarters
- TC/RCs, penalties, premiums and discounts for intermediate products

The positive effects of the current period price adjustments of US$ 145/t, and prior period price adjustments of US$ 824/t were mainly due to the forward price increase during the fourth quarter.

[11] On December 31st, 2021, Vale had provisionally priced copper sales from Sossego and Salobo totaling 88,526 tons valued at an LME forward price of US$ 9,731/t, subject to final pricing over the following months.
[12] Includes a small number of final invoices that were provisionally priced and settled within the quarter.

Copper Costs and Expenses

Salobo unit cash costs after by-products have increased mainly due to the impact of lower sales volumes impacting fixed costs dilution and the fire in the conveyor belt. As mine movement and production rates continue to improve at Salobo operations, we expect unit cash costs after by-products to reach US$ 200/t – US$ 300/t by 4Q22, considering 4Q21 by-products price levels[13]. Sossego unit cash cost has increased due to lower fixed cost dilution as a result of lower volumes and corrective maintenance at the plant.

Copper COGS - 3Q21 x 4Q21

US$ million	3Q21	Variance drivers				4Q21
		Volume	Exchange rate	Others	Total variation	
Copper operations	242	(39)	(11)	49	(1)	241
Depreciation	37	(5)	(2)	4	(3)	34
Total	**279**	**(44)**	**(13)**	**53**	**(4)**	**275**

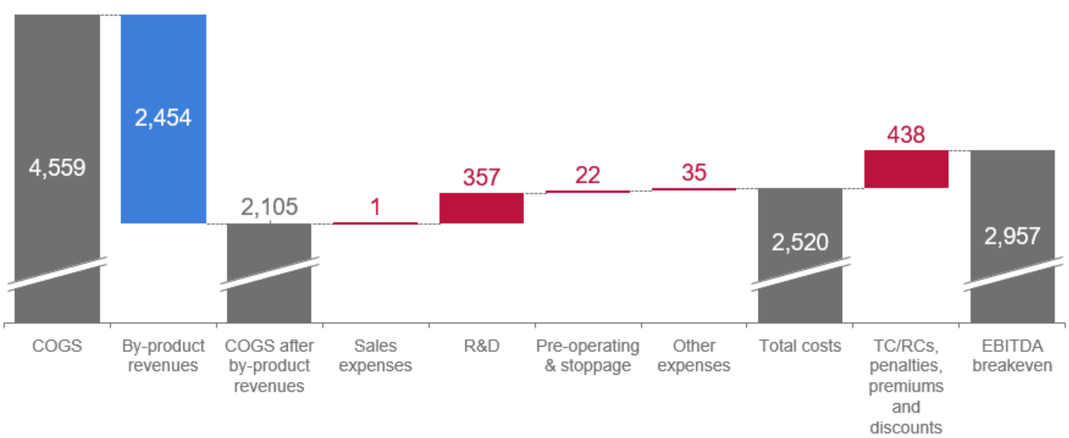
Copper operations – unit cash cost of sales, net of by-product credits

US$/t	4Q21	3Q21	4Q20	2021	2020
Salobo	1,992	700	(808)	773	(586)
Sossego	2,255	1,911	1,742	2,535	1,998

Selling and other expenses were US$ 2 million. Pre-operational and stoppage expenses totaled US$ 1 million in 4Q21. Research and development expenses were US$ 19 million in 4Q21, with Hu'u-related expenditures amounting to US$ 10 million and Sossego-related expenses amounting to US$ 7 million.

EBITDA break-even – copper operations[14]

US$/t, 4Q21



[13] Considering gold prices average of US$ 1,795/oz in 4Q21.
[14] Considering only the cash effect of US$ 400/oz that Wheaton Precious Metals pays for 75% of Salobo's gold by-product, copper operations EBITDA break-even would increase to US$ 4,151/t.

The realized price to be compared to the EBITDA break-even should be the copper realized price before discounts (US$ 10,667/t), given that TC/RCs, penalties and other discounts are already part of the EBITDA break-even build-up.

Selected financial indicators - Copper operations, excluding marketing activities

US$ million	4Q21	3Q21	4Q20	2021	2020
Net Revenues	669	678	682	2,589	2,175
Costs[1]	(241)	(242)	(212)	(878)	(794)
Expenses[1]	(2)	(6)	(3)	(9)	(7)
Pre-operating and stoppage expenses[1]	(1)	(1)	(1)	(4)	(1)
R&D expenses	(19)	(23)	(21)	(81)	(68)
Adjusted EBITDA	406	406	445	1,617	1,305
Depreciation and amortization	(34)	(37)	(35)	(145)	(138)
Adjusted EBIT	372	369	410	1,472	1,167
Adjusted EBIT margin (%)	55.6	54.3	60.1	56.9	53.7

[1] Net of depreciation and amortization

Coal – Discontinued Operations

Adjusted EBITDA for the Coal business segment totaled US$ 102 million in 4Q21, US$ 70 million higher than in 3Q21, mainly driven by higher net revenues (US$ 126 million) and partially offset by higher costs and expenses (US$ 56 million).

In December 2021, Vale entered into a binding agreement with Vulcan Minerals to sell the Moatize coal mine and the Nacala Logistics Corridor. Considering the expectation to sell the assets in the short term, Vale will report on its Financial Statements the coal assets as Discontinued Operations. The closing of the transaction is subject to the satisfaction of customary conditions precedent.

Revenue and price realization

The higher net revenues on 4Q21 were mainly driven by higher realized prices (US$ 146 million).

The average realized price for coking coals was US$ 288.8/t. The higher market prices (+40% vs. 3Q21) were partially offset mainly by the effect of lagged prices, which represented 37% of sales this quarter.

The average realized price for thermal coals was US$ 115.1/t. The higher market prices (+17% vs. 3Q21) were partially offset mainly by the effect of the hedge for thermal coals – US$ 34.1M in the quarter.

Volume sold

'000 metric tons	4Q21	3Q21	4Q20	2021	2020
Metallurgical coal	959	1,150	884	3,295	2,915
Thermal coal	1,691	1,490	651	4,553	2,952
Total	**2,650**	**2,640**	**1,535**	**7,848**	**5,867**

Net operating revenue by product

US$ million	4Q21	3Q21	4Q20	2021	2020
Metallurgical coal	277	222	91	657	313
Thermal coal	195	122	37	410	160
Total[1]	**478**	**352**	**128**	**1,083**	**473**

[1] It includes US$ 6 million of general cargo in 4Q21 and US$ 8 million in 3Q21 and US$ 16 million in 2021

Coal prices

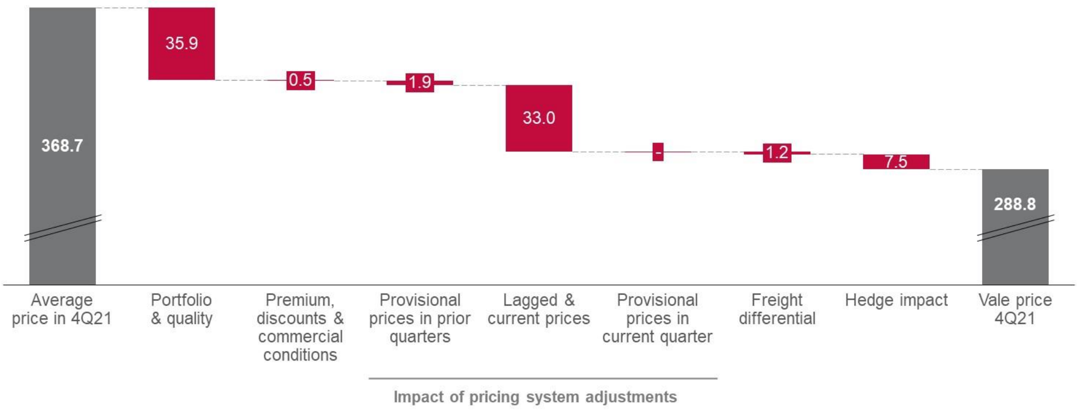
US$/ metric ton	4Q21	3Q21	4Q20
Metallurgical coal index price[1]	368.7	263.7	108.1
Vale's metallurgical coal realized price	288.8	193.2	103.3
Thermal coal index price[2]	162.3	138.7	72.8
Vale's thermal coal realized price	115.1	81.3	56.7
Vale's average realized price	**178.0**	**130.1**	**83.6**

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

[2] McCloskey FOB Richards Bay

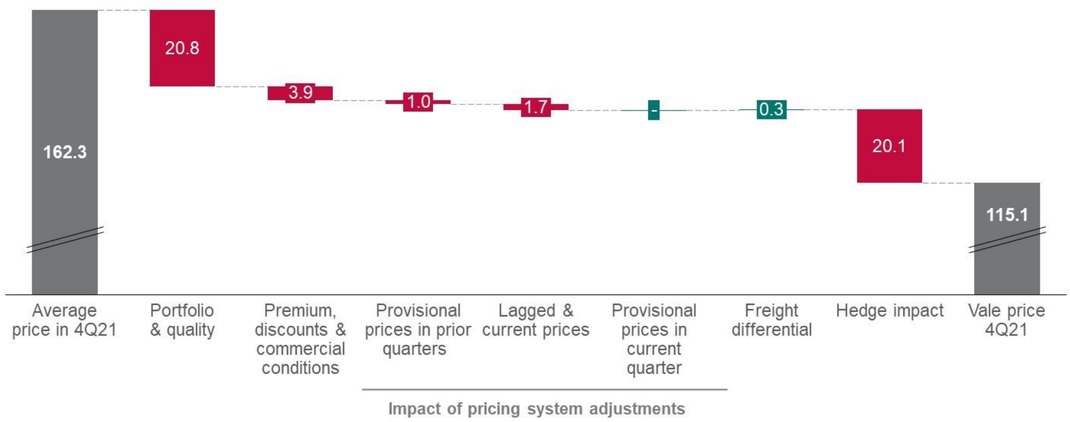
Price realization – Metallurgical coal

US$/t 4Q21



Price realization – Thermal coal

US$/t 4Q21



Costs and expenses

Costs totaled US$ 351 million in 4Q21, US$ 37 million higher than 3Q21. Pro-forma C1 cash cost totaled US$ 129.4/t; an increase compared to 3Q21 mainly due to inventory impairments, given the decline of the forward curve.

Pro-forma cash cost

US$/ metric ton	4Q21	3Q21	4Q20	2021	2020
Pro-forma operational costs (A)	123.8	122.7	113.7	120.8	124.4
Nacala non-operational tariff [1] (B)	n.a.	n.a.	13.4	6.8	39.9
Other costs[2] (C)	5.6	(11.5)	0.3	(1.6)	(0.9)
Cost at Nacala Port (D = A+B+C)	129.4	111.2	127.5	126.0	163.4
NLC's debt service to Vale (E)	n.a.	n.a.	-	10.0	16.2
Pro-forma C1 cash cost (F = D-E)	129.4	111.2	127.5	116.0	147.2
Idle capacity	-	-	133.7	38.9	84.8
Total	129.4	111.2	261.2	154.9	232.0

[1] Up until 2Q21, it included the inferred NLC tariff components related to sustaining capex, working capital, taxes and other financial items.

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

Selected financial indicators - Coal

US$ million	4Q21	3Q21	4Q20	2021	2020
Net Revenues	478	352	128	1,083	473
Costs[1] [2]	(351)	(314)	(400)	(1,317)	(1,456)
Expenses[1]	(23)	(5)	(15)	(26)	(15)
R&D expenses	(2)	(1)	(4)	(7)	(28)
Dividends and interests on associates and JVs	-	-	-	78	95
Adjusted EBITDA	102	32	(291)	(189)	(931)
Depreciation and amortization	-	(51)	-	(68)	(19)
Adjusted EBIT	102	(19)	(291)	(257)	(950)
Adjusted EBIT margin (%)	21	(5)	(227)	(24)	(201)

[1] Net of depreciation and amortization

[2] Including idle capacity

ANNEXES

SIMPLIFIED FINANCIAL STATEMENTS

Income Statement

US$ million	4Q21	3Q21	4Q20	2021	2020
Net operating revenue	**13,105**	**12,330**	**14,641**	**54,502**	**39,545**
Cost of goods sold and services rendered	(6,494)	(5,472)	(5,333)	(21,729)	(17,564)
Gross profit	**6,611**	**6,858**	**9,308**	**32,773**	**21,981**
Gross margin (%)	50.4	55.6	63.6	60.1	55.6
Selling and administrative expenses	(131)	(114)	(130)	(481)	(491)
Research and evaluation expenses	(177)	(135)	(149)	(549)	(415)
Pre-operating and operational stoppage	(147)	(165)	(193)	(648)	(887)
Brumadinho event	(2,115)	(161)	(4,854)	(2,576)	(5,257)
Other operational expenses, net	(279)	(31)	(383)	(400)	(800)
Impairment and disposal of non-current assets	(205)	(63)	(679)	(426)	(1,308)
Operating income	**3,557**	**6,189**	**2,920**	**27,693**	**12,823**
Financial income	113	90	48	337	307
Financial expenses	(23)	(122)	(935)	(1,653)	(3,191)
Other financial items, net	3,068	(318)	219	4,435	(1,929)
Equity results and other results in associates and joint ventures	(955)	128	(312)	(1,271)	(1,020)
Income (loss) before income taxes	**5,760**	**5,967**	**1,940**	**29,541**	**6,990**
Current tax	(483)	(2,464)	(1,982)	(5,663)	(3,398)
Deferred tax	130	2,003	1,537	966	2,663
Net income from continuing operations	**5,407**	**5,506**	**1,495**	**24,844**	**6,255**
Loss attributable to noncontrolling interests	55	29	(3)	108	(3)
Net income from continuing operations attributable to Vale's stockholders	**5,352**	**5,477**	**1,498**	**24,736**	**6,258**
Discontinued operations					
Net income (Loss) from discontinued operations	89	(1,548)	(851)	(2,376)	(1,724)
Net income (Loss) from discontinued operations attributable to noncontrolling interests	14	43	(92)	(85)	(347)
Net income from discontinued operations attributable to Vale's stockholders	75	(1,591)	(759)	(2,291)	(1,377)
Net income (Loss)	**5,496**	**3,958**	**644**	**22,468**	**4,531**
Net income (Loss) attributable to Vale's to noncontrolling interests	69	72	(95)	23	(350)
Net income (Loss) attributable to Vale's stockholders	**5,427**	**3,886**	**739**	**22,445**	**4,881**
Earnings per share (attributable to the Company's stockholders - US$):				-	-
Basic and diluted earnings per share (attributable to the Company's stockholders - US$)	1.07	0.76	0.14	4.47	0.95

Equity income (loss) by business segment

US$ million	4Q21	%	3Q21	%	4Q20	%	2021	%	2020	%
Ferrous Minerals	36	19	58	29	13	(28)	166	33	50	(66)
Base Metals	1	1	-	-	-	-	1	1	-	-
Coal	-	-	-	-	-	-	-	-	-	-
Others	154	80	140	71	(59)	128	327	66	(126)	166
Total	**191**	**100**	**198**	**100**	**(46)**	**100**	**494**	**100**	**(76)**	**100**

Balance sheet

US$ million	12/31/2021	9/30/2021	12/31/2020
Assets			
Current assets	**22,360**	**19,991**	**24,403**
Cash and cash equivalents	11,721	10,857	13,487
Short term investments	184	521	771
Accounts receivable	3,914	873	4,993
Other financial assets	111	1,366	329
Inventories	4,377	5,085	4,061
Recoverable taxes	862	824	509
Others	215	405	253
Non-current assets held for sale	976	60	-
Non-current assets	**14,389**	**14,790**	**15,129**
Judicial deposits	1,220	1,221	1,268
Other financial assets	143	162	1,784
Recoverable taxes	935	1,322	1,091
Deferred income taxes	11,441	11,402	10,335
Others	650	683	651
Fixed assets	**52,693**	**52,099**	**52,475**
Total assets	**89,442**	**86,880**	**92,007**
Liabilities			
Current liabilities	**15,198**	**16,074**	**14,594**
Suppliers and contractors	3,475	4,096	3,367
Loans, borrowings and leases	1,204	1,345	1,136
Other financial liabilities	1,962	1,557	1,906
Taxes payable	2,177	2,594	952
Settlement program (REFIS)	324	330	340
Provisions	1,045	1,021	1,664
Liabilities related to associates and joint ventures	1,785	1,551	876
Liabilities related to Brumadinho	1,156	2,336	1,910
De-characterization of dams and asset retirement obligations	621	590	582
Dividends and interest on capital	-	-	1,220
Others	1,094	641	641
Liabilities associated with non-current assets held for sale	355	13	-
Non-current liabilities	**38,938**	**36,717**	**42,592**
Loans, borrowings and leases	12,578	12,240	13,891
Participative stockholders' debentures	3,419	4,128	3,413
Other financial liabilities	2,571	2,825	4,564
Settlement program (REFIS)	1,964	2,080	2,404
Deferred income taxes	1,881	1,928	1,770
Provisions	3,419	3,506	4,113
Liabilities related to associates and joint ventures	1,327	714	1,198
Liabilities related to Brumadinho	2,381	2,020	2,665
De-characterization of dams and asset retirement obligations	7,482	5190	6,229
Streaming transactions	1,779	1,936	2,005
Others	137	150	340
Total liabilities	**54,136**	**52,791**	**57,186**
Stockholders' equity	**35,306**	**34,089**	**34,821**
Total liabilities and stockholders' equity	**89,442**	**86,880**	**92,007**

Cash flow

US$ million	4Q21	3Q21	4Q20	2021	2020
Cash flow from operations	**4,228**	**10,324**	**7,818**	**33,414**	**18,894**
Interest on loans and borrowings paid	(94)	(173)	(140)	(693)	(755)
Cash received (paid) on settlement of Derivatives, net	(80)	22	(63)	(197)	(34)
Payments related to Brumadinho	(1,004)	(93)	(121)	(1,388)	(516)
Payments related to de-characterization of dams	(84)	(93)	(99)	(338)	(293)
Interest on participative stockholders debentures paid	(225)	-	(88)	(418)	(183)
Income taxes (including settlement program)	(951)	(991)	(539)	(4,385)	(1,736)
Net cash provided by operating activities from continuing operations	**1,790**	**8,996**	**6,768**	**25,995**	**15,377**
Net cash provided by operating activities from discontinued operations	**90**	**55**	**(251)**	**(316)**	**(1,055)**
Net cash provided by operating activities	**1,880**	**9,051**	**6,517**	**25,679**	**14,322**
Cash flows from investing activities:					
Capital expenditures	(1,751)	(1,199)	(1,402)	(5,033)	(4,227)
Additions to investment			(56)	(42)	(131)
Short term investment	**331**	424	(697)	582	(194)
Cash paid on the disposal of VNC	-	-		(555)	-
Proceeds from disposal of Mosaic shares	1,259			1,259	
Dividends received from joint ventures and associates	142	5	94	190	173
Other investment activities, net	(276)	18	204	(542)	(161)
Net cash used in investing activities from continuing operations	**(295)**	**(752)**	**(1,857)**	**(4,141)**	**(4,540)**
Net cash used in investing activities from discontinued operations	**(81)**	**(49)**	**(64)**	**(2,469)**	**(129)**
Net cash used in investing activities	(376)	(801)	(1,921)	(6,610)	(4,669)
Cash flows from financing activities:					
Loans and financing:					
Loans and borrowings from third-parties	630	-	-	930	6,800
Payments of loans and borrowings from third-parties	(404)	(111)	(308)	(1,927)	(6,064)
Lease payments	(63)	(55)	(71)	(215)	(204)
Payments to stockholders:					
Dividends and interest on capital paid to stockholders	**-**	**(7,391)**	**(23)**	**(13,483)**	**(3,350)**
Dividends and interest on capital paid to noncontrolling interest	(21)	(3)	(3)	(30)	(14)
Share buyback program	(701)	(2,841)		(5,546)	-
Transactions with noncontrolling stockholders			171		171
Net cash used in financing activities from continuing operations	**(559)**	**(10,401)**	**(234)**	**(20,271)**	**(2,661)**
Net cash used in financing activities from discontinued operations	**(3)**	**(3)**	**(4)**	**(13)**	**(15)**
Net cash used in financing activities	**(562)**	**(10,404)**	**(238)**	**(20,284)**	**(2,676)**
Increase (decrease) in cash and cash equivalents	**942**	**(2,154)**	**4,358**	**(1,215)**	**6,977**
Cash and cash equivalents in the beginning of the period	10,857	13,649	8,845	13,487	7,350
Effect of exchange rate changes on cash and cash equivalents	(78)	(638)	299	(551)	(825)
Cash and cash equivalents from subsidiaries sold, net			(15)		(15)
Cash and cash equivalents at the end of period	**11,721**	**10,857**	**13,487**	**11,721**	**13,487**
Non-cash transactions:					
Additions to property, plant and equipment - capitalized loans and borrowing costs	15	14	13	59	70
Cash flows from operating activities:					
Income before income taxes	**5,760**	**5,967**	**1,940**	**29,541**	**6,990**
Adjusted for:					
Provisions related to Brumadinho	201	-	4,109	201	4,130
Provision for de-characterization of dams	1,725	-	617	1,725	617
Equity results and other results in associates and joint ventures	955	(128)	312	1,271	1,020
Impairment and disposal of non-current assets	205	63	679	426	1,308
Depreciation, depletion and amortization	821	650	838	3,034	3,215
Financial results, net	(3,158)	350	668	(3,119)	4,813
Change in assets and liabilities					
Accounts receivable	(3,142)	3,870	(1,964)	1,029	(2,544)
Inventories	423	(588)	454	(503)	(183)
Suppliers and contractors	(103)	322	74	251	(222)
Provision - Payroll, related charges and other remunerations	170	61	137	27	222
Other assets and liabilities, net	371	(243)	(46)	(469)	(472)
Cash flow from operations	**4,228**	**10,324**	**7,818**	**33,414**	**18,894**

REVENUES, VOLUMES SOLD, PRICES AND MARGINS

Net operating revenue by destination

US$ million	4Q21	%	3Q21	%	4Q20	%	2021	%	2020	%
North America	**464**	**3.5**	**387**	**3.1**	**340**	**2.3**	**1,910**	**3.5**	**1,303**	**3.3**
USA	366	2.8	345	2.8	331	2.3	1,543	2.8	1,041	2.6
Canada	98	0.7	42	0.3	9	0.1	367	0.7	262	0.7
South America	**1,101**	**8.4**	**1,848**	**15.0**	**941**	**6.4**	**6,080**	**11.2**	**3,395**	**8.6**
Brazil	919	7.0	1,582	12.8	834	5.7	5,164	9.5	2,897	7.3
Others	182	1.4	266	2.2	107	0.7	916	1.7	498	1.3
Asia	**9,607**	**73.3**	**8,211**	**66.6**	**11,074**	**75.6**	**37,627**	**69.0**	**28,316**	**71.6**
China	7,119	54.3	5,602	45.4	9,242	63.1	28,603	52.5	23,124	58.5
Japan	1,402	10.7	1,436	11.6	800	5.5	4,523	8.3	2,193	5.5
South Korea	518	4.0	471	3.8	431	2.9	1,744	3.2	1,196	3.0
Others	568	4.3	702	5.7	601	4.1	2,757	5.1	1,803	4.6
Europe	**1,286**	**9.8**	**1,326**	**10.8**	**1,789**	**12.2**	**6,730**	**12.3**	**5,096**	**12.9**
Germany	432	3.3	350	2.8	507	3.5	2,034	3.7	1,526	3.9
Italy	118	0.9	159	1.3	111	0.8	652	1.2	275	0.7
Others	736	5.6	817	6.6	1,171	8.0	4,044	7.4	3,295	8.3
Middle East	**322**	**2.5**	**136**	**1.1**	**343**	**2.3**	**960**	**1.8**	**853**	**2.2**
Rest of the World	**325**	**2.5**	**422**	**3.4**	**154**	**1.1**	**1,195**	**2.2**	**582**	**1.5**
Total	**13,105**	**100.0**	**12,330**	**100**	**14,641**	**100**	**54,502**	**100**	**39,545**	**100**

Volume sold - Minerals and metals

'000 metric tons	4Q21	3Q21	4Q20	2021	2020
Iron ore fines	82,540	67,304	82,391	275,456	254,012
ROM	607	540	434	2,052	853
Pellets	10,351	8,037	8,486	32,306	31,211
Manganese ore	35	111	461	573	1,378
Ferroalloys	14	16	15	58	67
Thermal coal	1,691	1,490	651	4,553	2,952
Metallurgical coal	959	1,150	884	3,295	2,915
Nickel	45	42	59	182	183
Copper	74	65	93	284	346
Gold as by-product ('000 oz)	77	92	122	340	441
Silver as by-product ('000 oz)	352	210	491	1,399	2,231
PGMs ('000 oz)	33	11	82	173	325
Cobalt (metric ton)	483	538	350	2,017	1,739

Average realized prices

US$/ton	4Q21	3Q21	4Q20	2021	2020
Iron ore fines Vale CFR reference (dmt)	117.7	142.5	143.4	155.6	118.9
Iron ore fines Vale CFR/FOB realized price	106.8	126.7	130.7	140.5	107.4
Pellets CFR/FOB (wmt)	182.6	249.9	152.6	218.3	135.9
Manganese ore	122.4	163.9	87.5	139.3	114.9
Ferroalloys	1,967.3	1,792.3	1,027.2	1,626.1	948.0
Thermal coal	115.1	81,3	56.7	90.0	54.3
Metallurgical coal	288.8	193.2	103.3	199.2	107.4
Nickel	19,088	18,211	17,387	18,004	15,976
Copper[1]	10,166	7,933	7,209	9,313	5,864
Gold (US$/oz)	1,795	1,798	1,895	1,768	1,857
Silver (US$/oz)	21.32	24.15	29.90	23.87	21.10
Cobalt (US$/t)	63,079	56,859	56,097	51,907	43,131

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

Operating margin by segment (EBIT adjusted margin)

%	4Q21	3Q21	4Q20	2021	2020
Ferrous Minerals	54.2	59.2	68.3	64.4	60.0
Base Metals	25.4	20.5	39.6	20.8	30.8
Coal - discontinued operations	21.3	5.4	(227.3)	(23.7)	(200.8)
Total	**29,5**	**49.2**	**23.0**	**50,5**	**33.4**

RECONCILIATION OF IFRS AND "NON-GAAP" INFORMATION

(a) Adjusted EBIT

US$ million	4Q21	3Q21	4Q20
Net operating revenues	13,105	12,330	14,641
COGS	(6,494)	(5,472)	(5,333)
Sales and administrative expenses	(131)	(114)	(186)
Research and development expenses	(177)	(135)	(149)
Pre-operating and stoppage expenses	(147)	(165)	(193)
Brumadinho and De-characterization expenses	(2,115)	(161)	(4,854)
Other operational expenses, net	(279)	(31)	(327)
Dividends received and interests from associates and JVs	142	5	94
Adjusted EBIT from continuing operations	**3,904**	**6,257**	**3,693**

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

Reconciliation between adjusted EBITDA and operational cash flow

US$ million	4Q21	3Q21	4Q20
Adjusted EBITDA	**4,828**	**6,938**	**4,240**
Working capital from continuing operation:			
Accounts receivable	(3,142)	3,870	(1,964)
Inventories	423	(588)	454
Suppliers and contractors	(103)	322	74
Provision - Payroll, related charges and other remunerations	170	61	137
Provisions related to Brumadinho	201	-	4,109
Provision for de-characterization of dams	1,725	-	617
Others	126	(279)	151
Cash provided from continuing operations	**4,228**	**10,324**	**7,818**
Income taxes paid - including settlement program	(951)	(991)	(539)
Interest on loans and borrowings paid	(94)	(173)	(140)
Payments related to Brumadinho	(1,004)	(93)	(121)
Payments related to de-characterization of dams	(84)	(93)	(99)
Interest on participative shareholders' debentures paid	(225)	-	(88)
Cash received (paid) on settlement of Derivatives, net	(80)	22	(63)
Net cash provided by operating activities from discontinued operations	**90**	**55**	**(251)**
Net cash provided by (used in) operating activities	**1,880**	**9,051**	**6,517**

(c) Net debt

US$ million	4Q21	3Q21	4Q20
Gross debt	12,180	11,951	13,360
Leases	1,602	634	1,667
Cash and cash equivalents[1]	11,905	11,378	14,258
Net debt	1,877	2,207	769

[1] Including financial investments

(d) Gross debt / LTM Adjusted EBITDA

US$ million	4Q21	3Q21	4Q20
Gross debt and leases / LTM Adjusted EBITDA (x)	0.4	0.5	0.8
Gross debt and leases / LTM operational cash flow (x)	0,5	0,4	0.9

(e) LTM Adjusted EBITDA / LTM interest payments

US$ million	4Q21	3Q21	4Q20
LTM Adjusted EBITDA / LTM gross interest (x)	46.7	41.1	23.6
LTM adjusted EBITDA / LTM interest payments (x)	45.2	41.4	23,2
LTM operational profit / LTM interest payments (x)	37.9	31.0	14.4

(f) US dollar exchange rates

R$/US$	4Q21	3Q21	4Q20	2021	2020
Average	5.5860	5.2286	5.3921	5.3956	5.1578
End of Period	5.5805	5.4394	5.1967	5.5805	5.1967