Vale's performance in 2Q23

Rio de Janeiro, July 27th, 2023. *"We continue to make substantial progress on operational excellence across all businesses. In Iron Solutions we set a new production record for a second quarter at S11D, alongside solid performances from Itabira and Vargem Grande. The Torto dam license is a significant milestone, enhancing our portfolio's overall quality. Our Energy Transition Metals (ETM) business has also performed very well with the successful ramp-up of Salobo III and improved performance at Sossego. Today´s annoucement to form a strategic partnership with Manara Minerals and Engine No.1 is another major milestone in ETM´s journey to accelerate accretive growth and unlock significant long-term value for all our stakeholders. Furthermore, we delivered on our commitment and implemented GISTM for our prioritized tailings facilities. This is an important milestone in the evolution of our dam management and the safety of our operations and surrounding communities. We will continue advancing with the incorporation of the best international practices so that Vale becomes an increasingly safe and sustainable company"*, commented Eduardo Bartolomeo, Chief Executive Officer.

Selected financial indicators

US$ million	2Q23	2Q22	1Q23
Net operating revenues	9,673	11,157	8,434
Total costs and expenses (ex-Brumadinho and de-characterization of dams)[1]	(6,412)	(6,504)	(5,403)
Expenses related to Brumadinho and de-characterization of dams	(271)	(280)	(111)
Adjusted EBIT from continuing operations	**3,095**	**4,444**	**2,920**
Adjusted EBIT margin (%)	32%	40%	35%
Adjusted EBITDA from continuing operations	**3,874**	**5,254**	**3,576**
Adjusted EBITDA margin (%)	40%	47%	42%
Proforma adjusted EBITDA from continuing operations[2]	**4,145**	**5,534**	**3,687**
Net income from continuing operations attributable to Vale's shareholders	892	4,093	1,837
Net debt [3]	8,908	5,375	8,226
Capital expenditures	1,208	1,293	1,130

[1] Includes adjustment of US$ 52 million in 2Q23 and US$ 35 million in 1Q23, to reflect the performance of the streaming transactions at market price.
[2] Excluding expenses related to Brumadinho.
[3] Including leases (IFRS 16).

Highlights

Business Results

- Proforma adjusted EBITDA from continued operations of US$ 4.1 billion in Q2, down US$ 1.4 billion y/y, mainly reflecting lower realized prices of iron ore fines and nickel.

- Free Cash Flow from Operations of US$ 0.8 billion in Q2, representing an EBITDA-to-cash conversion of 19%.

Disciplined capital allocation

- Capital expenditures of US$ 1.2 billion in Q2, including growth and sustaining investments, in line y/y.

- Gross debt and leases of US$ 13.9 billion as of June 30, 2023, US$ 1.0 billion higher q/q, resulting from a US$ 1.5 billion bond issuance and US$ 0.5 billion tender offer in the quarter, as part of Vale's liability management.

- Expanded Net Debt of US$ 14.7 billion as of June 30, 2023, US$ 0.3 billion higher q/q mainly driven by the US$ 1.4 billion share buyback program in the quarter and the US$ 0.8 billion in Free Cash Flow from Operations. Vale's target leverage is US$ 10- 20 billion.

Value creation and distribution

- Disbursement in Q2 as part of the 3rd buyback program was US$ 1.4 billion. At the end of Q2, the 3rd buyback program was 64% complete, with a disbursement of US$ 4.9 billion to repurchase approximately 320 million shares[1].

- Today, the Board of Directors approved the distribution of US$ 1.7 billion in interest on capital, scheduled to be paid in September. The amount is based on the financial results from the first half of the year, in accordance with the Shareholder Remuneration Policy.

Focusing and strengthening the core

- Delivering iron solutions:

  - The Torto dam, at the Brucutu site, has obtained its operating license and commissioning is underway. The dam, together with the tailings filtering plant, will substantially improve overall ore quality, resulting in increased availability of pellet feed to Vale's pellets plants and an improved product mix, which will command higher price premiums.

  - In May, several Memorandums of Understanding ("MoUs") and land reservation agreements were signed with authorities and partners in the United Arab Emirates, Saudi Arabia, and Oman. These agreements aim to advance studies to develop industrial complexes, Mega Hubs, to produce low-carbon emission products for steelmaking.

  - Also in May, an MoU was signed with GravitHy, a French Direct Reduction Iron ("DRI") producer, to jointly evaluate the construction of a co-located briquetting plant in GravitHy's DRI plant project in Fos-sur-Mer, France. The plant is expected to start-up production in 2027 with a 2 Mtpy DRI production capacity.

- Building a unique Energy Transition Metals vehicle:

  - Signed a binding agreement with Manara Minerals, a joint venture between Ma'aden and the Public Investment Fund, under which Manara Minerals will invest in Vale Base Metals ("VBM"), the holding entity of Vale's Energy Transition Metals business, at an implied enterprise value of US$ 26.0 billion. Concurrently, entered into a binding agreement with the investment firm Engine No. 1 pursuant to which Engine No. 1 will make an equity investment in VBM under the same economic terms. The total consideration to be paid to VBM under both agreements is US$ 3.4 billion, for a 13% equity interest. These strategic partnerships will accelerate value generation from the unique set of assets and projects, being a key enabler of the global energy transition.

  - Reorganization of the Energy Transition Metals operations in Brazil was successfully concluded on July 1st. This involved transferring the copper assets in Brazil to Salobo Metais S.A. and the nickel assets to a newly established entity called Mineração Onça Puma S.A., both of which remain under the consolidation and control of Vale. The reorganization will enable a more efficient management of copper and nickel assets in Brazil.

- Advancing the project pipeline:

  - Salobo III plant ramp-up is progressing well, with strong production rates achieved in Q2. Once the plant reaches full capacity, it is expected to yield a 10% to 15% reduction in overall unit costs.

- Samarco:

  - Vale, BHP, Samarco, and certain creditors have entered into a binding agreement for Samarco's debt restructuring. The plan aims to implement a consensual restructuring, with Samarco emerging with a lean capital structure.

[1] Related to the April 2022 3rd buyback program for a total of 500 million shares.

Payments to creditors will be linked to operational ramp-up and cash flow. Samarco's contribution to reparation is capped at US$ 1 billion from 2024 to 2030, with the remaining balance equally shared between Vale and BHP.

Promoting sustainable mining

- Successfully achieved conformance with the Global Industry Standard on Tailings Management (GISTM) for all prioritized tailings facilities[2], within the industry's timeframe. As of now, the company implemented the GISTM for 48 tailings facilities, 37 of them located in Brazil and 11 in Canada, with actions plans in place. By August 2025, all 50 tailings facilities will be in conformance.

- De-characterization works have started at the Campo Grande dam at the Alegria mine, as well as the Grupo and Área IX dams at the Fábrica mine. With that, a total of 8 out of the remaining 18 upstream dams to be eliminated have started de-characterization works. Since 2019, significant progress has been made, with 12 out of the 30 upstream dams already eliminated, representing 40% of the overall program.

- The Sol do Cerrado solar energy complex, one of the largest solar parks in Latin America has reached its full capacity of 766 Megawatts. The complex, located in Minas Gerais state, will supply 16% of all energy requirements from operations in Brazil, in line with the company´s strategy to zero CO_2 emissions by 2050.

[2] Including those with the highest damage potential associated.

Adjusted EBITDA

Adjusted EBITDA

US$ million	2Q23	2Q22	1Q23
Net operating revenues	9,673	11,157	8,434
COGS	(5,940)	(5,950)	(4,949)
SG&A	(139)	(127)	(118)
Research and development	(165)	(151)	(139)
Pre-operating and stoppage expenses	(103)	(111)	(124)
Expenses related to Brumadinho & de-characterization of dams	(271)	(280)	(111)
Other operational expenses[1]	(65)	(165)	(73)
Dividends and interests in affiliated companies and JVs	105	71	-
Adjusted EBIT from continuing operations	**3,095**	**4,444**	**2,920**
Depreciation, amortization & depletion	779	810	656
Adjusted EBITDA from continuing operations	**3,874**	**5,254**	**3,576**
Proforma Adjusted EBITDA from continuing operations[2]	**4,145**	**5,534**	**3,687**
Adjusted EBITDA total	**3,874**	**5,254**	**3,576**
Proforma Adjusted EBITDA total[2]	**4,145**	**5,534**	**3,687**

[1] Includes adjustments of US$ 52 million in 2Q23 and US$ 35 million in 1Q23, to reflect the performance of the streaming transactions at market price.
[2] Excluding expenses related to Brumadinho.

Proforma EBITDA - 2Q23 vs. 2Q22

[1] Excluding Brumadinho expenses. [2] Includes US$ 31 million of FX effect, US$ 34 million of dividends and negative US$ 65 million related to the energy business and other divested assets.

Sales & price realization

Volume sold - Minerals and metals

'000 metric tons	2Q23	2Q22	1Q23
Iron ore fines	63,329	62,769	45,861
ROM	2,236	1,550	1,665
Pellets	8,809	8,843	8,133
Nickel	40	39	40
Copper[1]	74	51	63
Gold as by-product ('000 oz)[1]	88	62	72
Silver as by-product ('000 oz)[1]	518	391	406
PGMs ('000 oz)	89	46	74
Cobalt (metric ton)	660	450	621

[1] Including sales originated from both nickel and copper operations.

Average realized prices

US$/ton	2Q23	2Q22	1Q23
Iron ore - 62% Fe reference price	111.0	137.9	125.5
Iron ore fines Vale CFR/FOB realized price	98.5	113.3	108.6
Pellets CFR/FOB (wmt)	160.4	201.3	162.5
Nickel	23,070	26,221	25,260
Copper[2]	6,986	6,411	9,298
Gold (US$/oz)[1,2]	2,082	1,884	1,845
Silver (US$/oz)[2]	23.96	20.56	22.07
Cobalt (US$/t)[1]	34,694	81,915	32,830

[1] Prices presented above were adjusted to reflect the market prices of products delivered related to the streaming transactions.
[2] Including sales originated from both nickel and copper operations.

Costs

COGS by business segment

US$ million	2Q23	2Q22	1Q23
Iron Solutions	4,282	4,248	3,290
Energy Transition Metals	1,617	1,424	1,620
Others	41	278	39
Total COGS of continuing operations[1]	**5,940**	**5,950**	**4,949**
Depreciation	737	777	613
COGS of continuing operations, ex-depreciation	**5,203**	**5,173**	**4,336**

[1] COGS currency exposure in 2Q23 was as follows: 47.38% BRL, 46.55% USD, 5.85% CAD and 0.22% Other currencies.

Expenses

Operating expenses

US$ million	2Q23	2Q22	1Q23
SG&A	139	127	118
Administrative	118	103	100
Personnel	52	44	45
Services	30	30	28
Depreciation	14	12	11
Others	22	17	16
Selling	21	24	18
R&D	165	151	139
Pre-operating and stoppage expenses	103	111	124
Expenses related to Brumadinho and de-characterization of dams	271	280	111
Other operating expenses	117	165	108
Total operating expenses	**795**	**834**	**600**
Depreciation	42	33	43
Operating expenses, ex-depreciation	**753**	**801**	**557**

Brumadinho

Impact of Brumadinho and De-characterization in 2Q23

US$ million	Provisions balance 31mar23	EBITDA impact	Payments	FX and other adjustments[2]	Provisions balance 30jun23
De-characterization	3,464	-	95	292	3,661
Agreements & donations[1]	3,358	140	497	275	3,276
Total Provisions	**6,822**	**140**	**592**	**567**	**6,937**
Incurred Expenses and others[3]	58	131	187	2	
Total	**6,880**	**271**	**779**	**569**	**6,937**

[1] Includes Integral Reparation Agreement, individual, labor and emergency indemnifications, tailing removal and containment works.
[2] Includes foreign exchange, present value and other adjustments.
[3] Brumadinho and decharacterization expenses reached US$ 723 million in 2Q23, excluding the US$ 56 million provisioned for the agreement signed with the Securities and Exchange Commission ("SEC").

Impact of Brumadinho and De-characterization from 2019 to 2Q23

US$ million	EBITDA impact	Payments	PV & FX adjust [2]	Provisions balance 30jun23
De-characterization	5,038	(1,311)	(66)	3,661
Agreements & donations[1]	8,798	(5,623)	101	3,276
Total Provisions	13,836	(6,934)	35	6,937
Incurred expenses	2,752	(2,752)	-	-
Others	180	(178)	(2)	-
Total	16,768	(9,864)	33	6,937

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

Cash outflow of Brumadinho & De-characterization commitments[1,2]:

US$ billion	Since 2019 until 2Q23 disbursed	2H23	2024	2025	2026	2027	Yearly average 2028-2035[3]
De-characterization	1.3	0.2	0.6	0.6	0.6	0.5	0.3
Integral Reparation Agreement & other reparation provisions	5.6	0.8	1.3	0.8	0.6	0.2	0.3[4]
Incurred expenses	2.8	0.3	0.4	0.3	0.2	0.2	-
Total	9.7	1.3	2.3	1.7	1.4	0.9	

[1] Estimate cash outflow for 2023-2035 period, given BRL-USD exchange rates of 4.8192.
[2] Amounts stated without discount to present value, net of judicial deposits and inflation adjustments.
[3] Estimate annual average cash flow for De-characterization provisions in the 2028-2035 period is US$ 209 million per year.
[4] Disbursements related to the Integral Reparation Agreement ending in 2028.

Net income

Reconciliation of proforma EBITDA to net income

US$ million	2Q23	2Q22	1Q23
EBITDA Proforma	**4,145**	**5,534**	**3,687**
Brumadinho and de-characterization of dams	(271)	(280)	(111)
Adjusted EBITDA from continuing operations	**3,874**	**5,254**	**3,576**
Impairment reversal (impairment and disposals) of non-current assets, net [1]	(118)	(82)	(39)
Dividends received	(105)	(71)	-
Equity results and net income (loss) attributable to noncontrolling interests	(31)	(108)	(96)
Financial results	(157)	821	(530)
Income taxes	(1,792)	(911)	(418)
Depreciation, depletion & amortization	(779)	(810)	(656)
Net income from continuing operations attributable to Vale's shareholders	**892**	**4,093**	**1,837**

[1] Includes adjustment of US$ 52 million in 2Q23 and US$ 35 million in 1Q23, to reflect the performance of the streaming transactions at market price.

Financial results

US$ million	2Q23	2Q22	1Q23
Financial expenses, of which:	(397)	(372)	(320)
Gross interest	(185)	(162)	(180)
Capitalization of interest	5	17	5
Others	(179)	(188)	(107)
Financial expenses (REFIS)	(38)	(39)	(38)
Financial income	106	137	121
Shareholder Debentures	321	537	(47)
Financial Guarantee	-	356	-
Derivatives[1]	563	(270)	192
Currency and interest rate swaps	558	(287)	216
Others (commodities, etc)	5	17	(24)
Foreign exchange and monetary variation	(750)	433	(476)
Financial result, net	**(157)**	**821**	**(530)**

[1] The cash effect of the derivatives was a gain of US$ 134 million in 2Q23.

Main factors that affected net income for 2Q23 vs. 2Q22

	US$ million	
2Q22 Net income from continuing operations attributable to Vale's stockholders	**4,093**	
∆ EBITDA proforma	(1,389)	Lower realized prices for iron ore fines and nickel.
∆ Brumadinho and de-characterization of dams	9	
∆ Impairment & disposal of non-current assets	16	
∆ Dividends received	(34)	
∆ Equity results and net income (loss) attributable to noncontrolling interests	27	
∆ Financial results	(978)	BRL appreciation; decrease in marked-to-market prices of shareholder debentures.
∆ Income taxes	(881)	Derecognition of deferred income tax assets related to Renova Foundation provisions following the Judicial Reorganization.
∆ Depreciation, depletion & amortization	29	
2Q23 Net income from continuing operations attributable to Vale's shareholders	**892**	

∆: difference between 2Q23 and 2Q22 figures

CAPEX

Growth and sustaining projects execution

US$ million	2Q23	%	2Q22	%	1Q23	%
Growth projects	**376**	**31.2**	**449**	**34.7**	**326**	**28.8**
Iron Solutions	255	21.1	199	15.4	236	20.9
Energy Transition Metals	95	7.9	90	7.0	72	6.4
Nickel	63	5.2	9	0.7	20	1.8
Copper	32	2.6	81	6.3	52	4.6
Energy and others	26	2.2	160	12.4	18	1.6
Sustaining projects	**832**	**68.8**	**844**	**65.3**	**804**	**71.2**
Iron Solutions	472	39.1	477	36.9	512	45.3
Energy Transition Metals	326	26.9	343	26.5	263	23.3
Nickel	282	23.3	293	22.7	204	18.1
Copper	44	3.6	50	3.9	59	5.2
Energy and others	34	2.8	24	1.9	29	2.6
Total	**1,208**	**100.0**	**1,293**	**100.0**	**1,130**	**100.0**

Growth projects

Investments in growth projects under construction totaled US$ 376 million in Q2, a 16% decline y/y, driven by the lower investments in Salobo III and Sol do Cerrado projects, which are already under commissioning, partially offset by investments in Iron Solutions projects and Onça Puma 2nd furnace nickel project.

Growth projects progress indicator[3]

Projects	Capex 2Q23	Financial progress[1]	Physical progress	Comments
Iron Solutions				
Northern System 240 Mtpy *Capacity: 10 Mtpy* *Start-up: 1H23* *Capex: US$ 772 MM*	26	74%	87%[2]	For the mine and plant, the regularization yard flexibilization scope is complete. Assisted operation of the product yard has started. Commissioning of the silo is ongoing. Mechanical works on the reclaimer at port have been completed on schedule.
Capanema's Maximization *Capacity: 18 Mtpy* *Start-up: 1H25* *Capex: US$ 913 MM*	58	28%	47%	Assembly of the long-distance conveyor belt has advanced. The disassembly of older structures at site has been completed, making it possible to finalize the civil concrete construction in the Timbopeba mine. Works on the electrotechnical assembly of tertiary screening silos, the electrical infrastructure of the primary crushing plant, and the welding of the main beam of the reclaimer have all begun in Q2.
Serra Sul 120 Mtpy[3] *Capacity: 20 Mtpy* *Start-up: 2H25* *Capex: US$ 1,502 MM*	81	43%	50%	1/3 of the reinforced earth wall of the crusher at the mine was concluded. The electrotechnical assembly contract is in the final phase of negotiations. Suppression work on the conveyor belt has been concluded and piling and earthwork activities have begun. Changes in the piling methodology at the plant have significantly improved construction execution.
Briquettes Tubarão *Capacity: 6 Mtpy* *Start-up: 3Q23 (Plant 1) and 4Q23 (Plant 2)* *Capex: US$ 256 MM*	37	67%	93%	Load tests of the fines cycle at Plant 1 started in July, and start-up is expected in Q3. The project's budget and start-up date were revised as we advanced in the scope of this state-of-the-art technology project and with the revamp of existing assets at pellet plants 1 & 2 in Tubarão.
Energy Transition Materials				
Salobo III *Capacity: 30-40 ktpy* *Start-up: 2H22* *Capex: US$ 1,056 MM*	31	95%	100%	Performance gradually improved with good production rates achieved in Q2. The ramp-up is expected to be fully completed in 2024.
Onça Puma 2nd Furnace *Capacity: 12-15 ktpy* *Start-up: 1H25* *Capex: US$ 555 MM*	21	7%	14%	Construction physical progress performing slightly above the plan with main activities ongoing, including the detailed engineering, disassembly of the second furnace and equipment acquisition

[1] CAPEX disbursement until end of 2Q23 vs. expected CAPEX.
[2] Considering physical progress of mine, plant and logistics.
[3] The project consists of increasing the S11D mine-plant capacity by 20 Mtpy.

[3] Pre-operating expenses included in the total estimated capex information, in line with Vale's Board of Directors approvals.

Sustaining projects

Investments in sustaining our operations totaled US$ 832 million in Q2, flat y/y, as a result of the combined effect of investments in enhancement of operations and lower investments in tailings filtration plants in the Iron Solutions business, after the start-up and commissioning of the four plants in 2022.

Sustaining projects progress indicator[4]

Projects	Capex 2Q23	Financial progress[1]	Physical progress	Comments
Iron Solutions				
Gelado *Capacity: 10 Mtpy* *Start-up: 2H22* *Capex: US$ 428 MM*	16	87%	100%	Advances on production commissioning and tests protocols, and in parallel, evaluating improvements on assets and operational routines aiming for the reliability of the dredgers and system.
Compact Crushing S11D *Capacity: 50 Mtpy* *Start-up: 2H26* *Capex: US$ 755 MM*	15	7%	12%	The civil works of the primary crusher have started, pile foundations reached 81%, and concrete structures are expected to start in Q3.
Energy Transition Materials				
Voisey's Bay Mine Extension *Capacity: 45 ktpy (Ni) and 20 ktpy (Cu)* *Start-up: 1H21[2]* *Capex: US$ 2,690 MM*	125	83%	85%	After commissioning the paste plant main subsystems, the first paste test was concluded successfully. The tailings system and paste line are near ready for the integrated test, and the start-up is expected in Q3. Reid Brook's bulk material handling system is expected to be delivered in Q3. The lateral development is advancing on the Eastern Deeps, with early works for bulk material handling ongoing.

[1] CAPEX disbursement until end of 2Q23 vs. expected CAPEX.
[2] In 2Q21, Vale achieved the first ore production of Reid Brook deposit, the first of two underground mines to be developed in the project. Eastern Deeps, the second deposit, has started to extract development ore from the deposit and is scheduled to start the main production ramp-up in the second half of 2023.

Sustaining capex by type - 2Q23

US$ million	Iron Solutions	Energy Transition Materials	Energy and others	Total
Enhancement of operations	259	134	1	394
Replacement projects	18	144	-	162
Filtration and dry stacking projects	26	-	-	26
Dam management	25	3	-	28
Other investments in dams and waste dumps	47	10	-	57
Health and Safety	31	24	-	55
Social investments and environmental protection	48	3	-	51
Administrative & Others	18	8	33	59
Total	**472**	**326**	**34**	**832**

[4] Pre-operating expenses included in the total estimated capex column, in line with Vale's Board of Directors approvals.

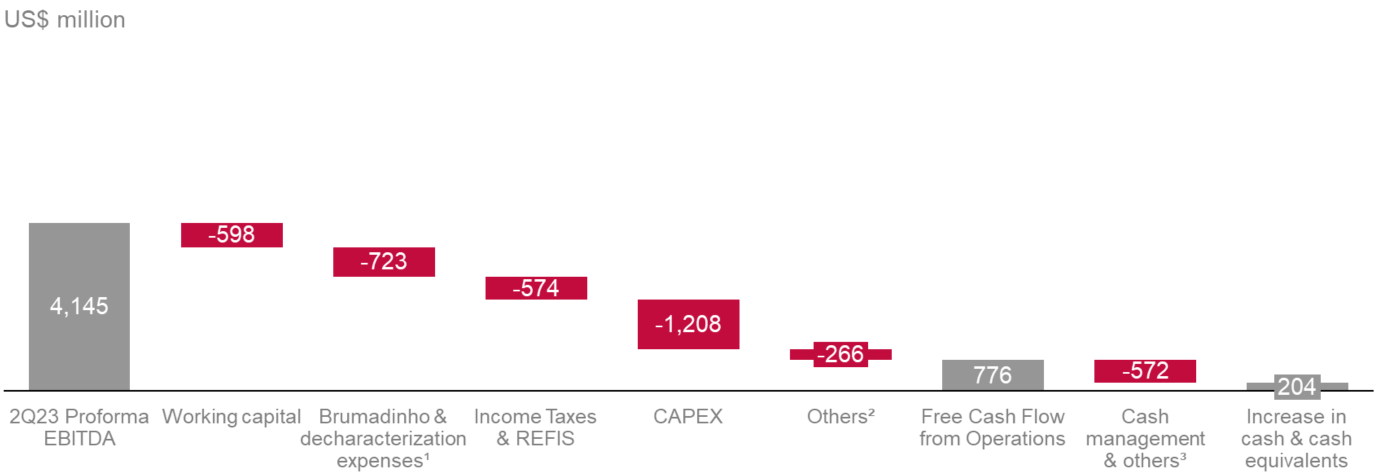
Free cash flow

Free Cash Flow from Operations reached US$ 776 million in 2Q23, US$ 1.519 billion lower than in 2Q22, mainly due to (i) the lower Proforma EBITDA generation (US$ 1.389 billion) and (ii) the lower working capital (US$ 1.026 billion), partially offset by (i) the lower income tax paid (US$ 639 million) and (ii) the lower interests paid on shareholders' debentures (US$ 108 million).

In the quarter, the working capital had a negative impact of US$ 598 million in cash generation, largely explained by 6.8 Mt increase in iron ore sales accrued in the end of the quarter.

The cash generated in the quarter combined with the issuance of US$ 1.5 billion in bonds was primarily used to the repurchase US$ 1.361 billion in shares and US$ 500 million in bonds. Cash & cash equivalents position increased by US$ 204 million in the quarter.

Free Cash Flow 2Q23



[1] Includes US$ 592 million of disbursement of Brumadinho and de-characterization provisioned expenses and US$ 131 million of Brumadinho incurred expenses. Excludes the US$ 56 million paid in April 2023 for the agreement with the United States Securities and Exchange Commission ("SEC").
[2] Includes interest on loans, derivatives, leasing, dividends paid to noncontrolling interest, shareholders debentures, payments to Renova and others.
[3] Includes US$ 1,361 million of share buyback, US$ 130 million of the acquisition of a stake in Oman and US$ 81 million debt repayment, partially offset by the net issuance of US$ 1.0 billion in bonds.

Debt

Debt indicators

US$ million	2Q23	2Q22	1Q23
Gross debt [1]	**12,417**	**11,031**	**11,464**
Lease (IFRS 16)	1,520	1,577	1,520
Gross debt and leases	**13,937**	**12,608**	**12,984**
Cash, cash equivalents and short-term investments	5,029	7,233	4,758
Net debt	**8,908**	**5,375**	**8,226**
Currency swaps[2]	(895)	241	(421)
Brumadinho provisions	3,276	3,680	3,358
Samarco & Renova Foundation provisions[3]	3,401	3,191	3,196
Expanded net debt	**14,690**	**12,487**	**14,359**
Average debt maturity (years)	8.4	9.1	8.4
Cost of debt after hedge (% pa)	5.7	5.0	5.3
Total debt and leases / adjusted LTM EBITDA (x)	0.9	0.5	0.8
Net debt / adjusted LTM EBITDA (x)	0.6	0.2	0.5
Adjusted LTM EBITDA / LTM gross interest (x)	24.1	38.1	27.1

[1] Does not include leases (IFRS 16).
[2] Includes interest rate swaps.
[3] Does not include provision for de-characterization of Germano dam in the amount of US$ 217 million in 2Q23, US$ 203 million in 1Q23 and US$ 195 million in 2Q22.

Gross debt and leases totaled US$ 13.9 billion as of June 30th, 2023, US$ 1.0 billion higher q/q mainly due to the net effect of US$ 1.5 billion in bonds issued and a US$ 500 million tender offer during the quarter.

Expanded net debt reached US$ 14.7 billion as of June 30th, 2023, US$ 0.3 billion higher q/q, mainly driven by the US$ 1.4 billion share buyback program in the quarter and the US$ 0.8 billion in FCF from Operations. Vale's target leverage is US$ 10-20 billion.

The average debt maturity of 8.4 years continues from March 2023. The average cost of debt after currency and interest rate swaps per annum rose slightly to 5.65% per annum from the 5.35% in March 2023.

Performance of the business segments

Proforma Adjusted EBITDA from continuing operations, by business area

US$ million	2Q23	2Q22	1Q23
Iron Solutions	**3,941**	**5,147**	**3,320**
Iron ore fines	3,087	3,975	2,638
Pellets	818	1,140	667
Other Ferrous Minerals	36	32	15
Energy Transition Metals[1]	**476**	**603**	**573**
Nickel	235	572	328
Copper	236	23	220
Other	5	8	25
Others	**(272)**	**(216)**	**(206)**
Total	**4,145**	**5,534**	**3,687**

[1] Includes an adjustment of US$ 52 million increasing the adjusted EBITDA in 2Q23, to reflect the performance of the streaming transactions at market prices, which will be made until the proceeds received on the streaming transactions are fully recognized in the adjusted EBITDA of the business. Based on the current projections for volumes and commodities prices, it will be fully realized by 2027

Segment information 2Q23

US$ million	Net operating revenues	Cost[1]	Expenses			Dividends and interest received from associates and JVs	Adjusted EBITDA
			SG&A and others[1]	R&D[1]	Pre operating & stoppage[1]		
Iron Solutions	**7,776**	**(3,801)**	**19**	**(61)**	**(80)**	**88**	**3,941**
Iron ore fines	6,235	(3,048)	26	(57)	(69)	-	3,087
Pellets	1,413	(674)	(4)	(1)	(4)	88	818
Others ferrous	128	(79)	(3)	(3)	(7)	-	36
Energy Transition Metals	**1,871**	**(1,363)**	**29**	**(60)**	**(1)**	**-**	**476**
Nickel[2]	1,222	(886)	(72)	(29)	-	-	235
Copper[3]	538	(319)	49	(31)	(1)	-	236
Others[4]	111	(158)	52	-	-	-	5
Brumadinho and de-characterization of dams	**-**	**-**	**(271)**	**-**	**-**	**-**	**(271)**
Others	**26**	**(39)**	**(231)**	**(44)**	**(1)**	**17**	**(272)**
Total	**9,673**	**(5,203)**	**(454)**	**(165)**	**(82)**	**105**	**3,874**

[1] Excluding depreciation, depletion and amortization.
[2] Including copper and by-products from the nickel operations.
[3] Including by-products from the copper operations.
[4] Includes an adjustment of US$ 52 million increasing the adjusted EBITDA in 2Q23, to reflect the performance of the streaming transactions at market prices, which will be made until the proceeds received on the streaming transactions are fully recognized in the adjusted EBITDA of the business. Based on the current projections for volumes and commodities prices, it will be fully realized by 2027.

Iron Solutions

Selected financial indicators - Iron Solutions

US$ million	2Q23	2Q22	1Q23
Net Revenues	7,776	9,025	6,411
Costs[1]	(3,801)	(3,771)	(2,918)
SG&A and Other expenses[1]	19	(46)	(41)
Pre-operating and stoppage expenses[1]	(80)	(86)	(89)
R&D expenses	(61)	(46)	(43)
Dividends and interests on associates and JVs	88	71	-
Adjusted EBITDA	**3,941**	**5,147**	**3,320**
Depreciation and amortization	(502)	(497)	(403)
Adjusted EBIT	**3,439**	**4,650**	**2,917**
Adjusted EBIT margin (%)	**44.2**	**51.5**	**45.5**

[1] Net of depreciation and amortization.

Iron Solutions EBITDA Variation 2Q23 vs. 2Q22

		Drivers				
US$ million	2Q22	Volume	Prices	Others	Total variation	2Q23
Iron ore fines	3,975	8	(966)	70	(888)	3,087
Pellets	1,140	(2)	(372)	52	(322)	818
Others	32	4	(4)	4	4	36
Iron Solutions	**5,147**	**10**	**(1,342)**	**126**	**(1,206)**	**3,941**

The 23% decrease in EBITDA y/y is explained mainly by lower realized prices (US$ 1.342 billion), due to a 20% reduction in the benchmark average iron ore price. This was partially offset by better unit costs and expenses, as a result of a decline in freight costs and lower third-party ore acquisition costs (included on "Others" US$ 126 million in the table above).

Revenues

Iron Solutions' volumes, prices, premiums and revenues

	2Q23	2Q22	1Q23
Volume sold ('000 metric tons)			
Iron ore fines	63,329	62,769	45,861
ROM	2,236	1,550	1,665
Pellets	8,809	8,843	8,133
Share of premium products[1] (%)	79%	77%	76%
Average prices (US$/t)			
Iron ore - 62% Fe reference price	111.0	137.9	125.5
Iron ore - Metal Bulletin 62% low alumina index	112.9	141.6	128.7
Iron ore - Metal Bulletin 65% index	124.2	160.8	140.3
Provisional price at the end of the quarter	110.1	119.9	126.0
Iron ore fines Vale CFR reference (dmt)	110.6	128.9	121.7
Iron ore fines Vale CFR/FOB realized price	98.5	113.3	108.6
Pellets CFR/FOB (wmt)	160.4	201.3	162.5

contd.

Iron Solutions' volumes, prices, premiums and revenues *(contd.)*

	2Q23	2Q22	1Q23
Iron ore fines and pellets quality premium (US$/t)			
Iron ore fines quality premium	0.6	1.1	(1.4)
Pellets weighted average contribution	3.9	6.2	3.5
Total	4.5	7.3	2.1
Net operating revenue by product (US$ million)			
Iron ore fines	6,235	7,113	4,982
ROM	34	29	26
Pellets	1,413	1,780	1,322
Others	94	103	81
Total	**7,776**	**9,025**	**6,411**

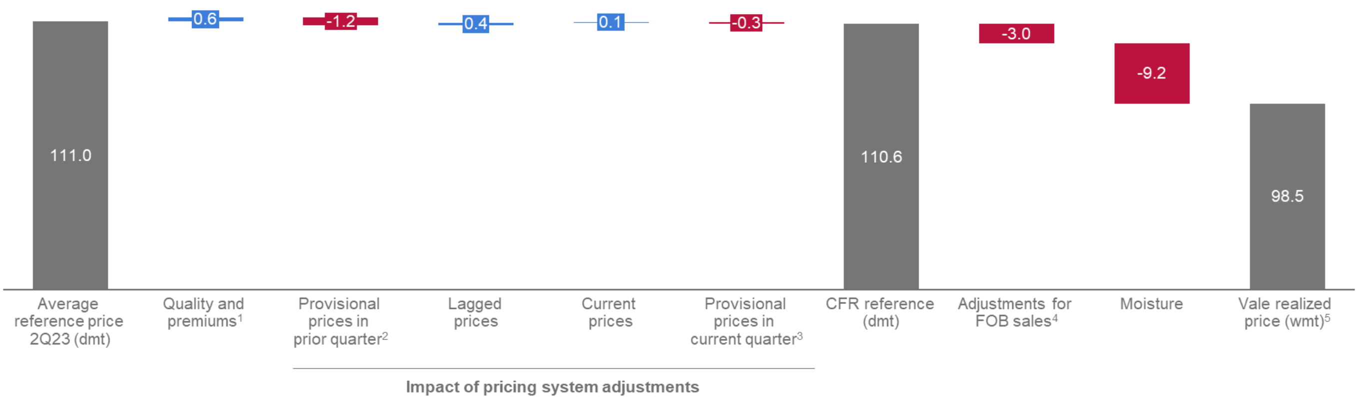
[1] Pellets, Carajás (IOCJ), Brazilian Blend Fines (BRBF) and pellet feed.

The share of premium products in total sales totaled 79% in Q2. All-in premium totaled US$ 4.5/t (vs. US$ 7.3/t in 2Q22), mainly driven by the lower market premiums for high-grade iron ore fines and pellets. Quarter on quarter, the all-in premium increased US$ 2.4/t, mainly driven by more Northern System products in our sales mix and an increased contribution from the pellet business as a result of seasonal dividend received from Tubarão pellet plants joint ventures.

Iron ore fines, excluding Pellets and ROM

Revenues & price realization

Price realization iron ore fines – US$/t, 2Q23



[1] Includes quality (US$ 0.8/t) and premiums/discounts and commercial conditions (US$ -0.2/t).
[2] Adjustment as a result of provisional prices booked in 1Q23 at US$ 126.0/t.
[3] Difference between the weighted average of the prices provisionally set at the end of 2Q23 at US$ 110.1/t based on forward curves and US$ 111.0/t from the 2Q23 average reference price.
[4] Includes freight pricing mechanisms of CFR sales freight recognition.
[5] Vale's price is net of taxes.

Iron ore fines realized price was US$ 98.5/t, down US$ 14.8/t y/y, mainly due to lower benchmark prices (US$ 26.9/t lower y/y). This decline was partially offset by a smaller impact of pricing system adjustments (US$ 9.1/t higher y/y) due to the narrower gap between provisional prices and the average price of the quarter.

Iron Ore fines pricing system breakdown (%)

	2Q23	2Q22	1Q23
Lagged	16	16	19
Current	48	63	62
Provisional	36	21	19
Total	**100**	**100**	**100**

Costs

Iron ore fines cash cost and freight

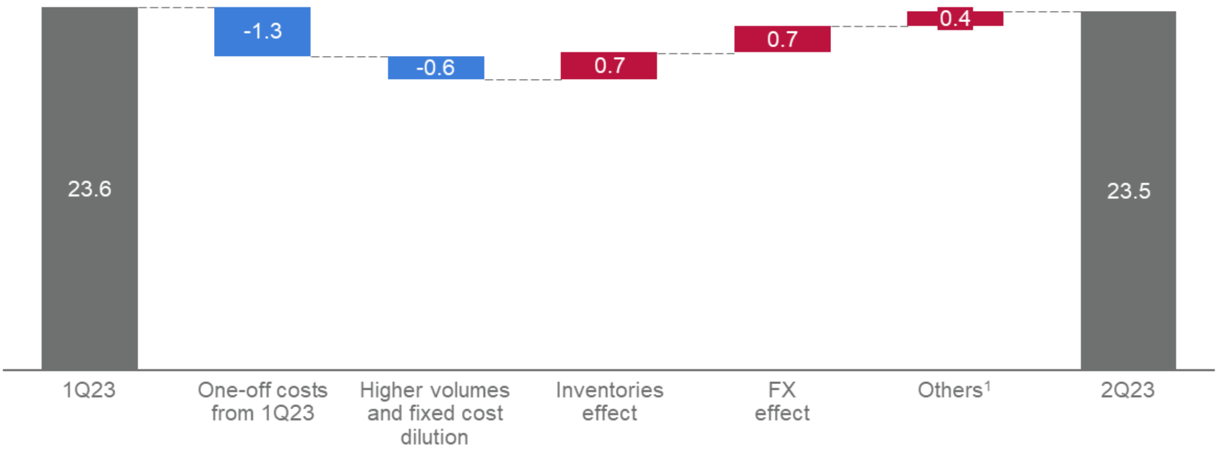
	2Q23	2Q22	1Q23
Costs (US$ million)			
Vale's iron ore fines C1 cash cost (A)	1,676	1,520	1,222
Third-party purchase costs[1] (B)	320	302	222
Vale's C1 cash cost ex-third-party volumes (C = A – B)	1,356	1,218	1,000
Sales Volumes (Mt)			
Volume sold (ex-ROM) (D)	63.3	62.8	45.9
Volume sold from third-party purchases (E)	5.6	4.5	3.5
Volume sold from own operations (F = D – E)	57.8	58.2	42.3
Iron ore fines cash cost (ex-ROM, ex-royalties), FOB (US$ /t)			
Vale's C1 cash cost ex-third-party purchase cost (C/F)	23.5	20.9	23.6
Average third-party purchase C1 cash cost (B/E)	57.4	66.6	62.8
Vale's iron ore cash cost (A/D)	26.5	24.2	26.7
Freight			
Maritime freight costs (G)	920	1,053	622
% of CFR sales (H)	83%	79%	76%
Volume CFR (Mt) (I = D x H)	52.3	49.4	34.9
Vale's iron ore unit freight cost (US$/t) (G/I)	17.6	21.3	17.8

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

Iron ore fines COGS - 2Q22 x 2Q23

		Drivers				
US$ million	2Q22	Volume	Exchange rate	Others	Total variation	2Q23
C1 cash costs	1,520	14	(5)	147	156	1,676
Freight	1,053	63	-	(196)	(133)	920
Distribution costs	137	1	-	19	20	157
Royalties & others	261	2	-	32	34	295
Total costs before depreciation and amortization	**2,971**	**80**	**(5)**	**2**	**77**	**3,048**
Depreciation	334	3	(1)	13	15	349
Total	**3,305**	**83**	**(6)**	**15**	**92**	**3,397**

C1 cash cost variation (excluding 3rd party purchases) – US$/t (2Q23 x 1Q23)



[1] Including cost net effect related to geological inflation, new way to operate, energy, demurrage and others.

Vale's C1 cash cost, ex-third-party purchases, was slightly lower q/q, despite the significant negative effect of the BRL appreciation. The main drivers were (i) the absence of the one-off events that occurred in Q1, such as the anticipation of maintenance activities and loading restrictions at Ponta da Madeira Terminal, and (ii) the higher volumes, mainly from Northern System, which carries a lower production cost, which was partially offset by the consumption of inventories from the previous quarter at higher costs.

C1 cash cost ex-third-party purchases for 2023 guidance was adjusted to US$ 21.5-22.5/t (vs. US$ 20-21/t previously), mainly due to the average USD/BRL exchange rate expectation change to 4.94 for 2023 (vs. 5.20 previously). Additionally, the iron ore all-in cost[5] guidance was adjusted to US$ 52-54/t (vs. US$ 47/t previously) to reflect the potential impact from external factors such as reduced premiums paid for high-quality products, bringing Vale's all-in premiums to around US$ 4/t (vs. around US$ 8/t previously), and changes in the average USD/BRL. For simulation purposes, a 10-cent appreciation of BRL represents around US$ 0.3/t increase of C1 cash cost ex-third-party purchases and a US$ 0.5/t increase of all-in cost for 2023.

Vale's maritime freight cost was flat q/q and down US$ 3.7/t y/y, mainly reflecting lower bunker fuel costs. CFR sales totaled 52.3 Mt in Q2, reflecting 83% of total iron ore fines sales.

Expenses

Expenses - Iron Ore fines

US$ millions	2Q23	2Q22	1Q23
SG&A	17	16	15
R&D	57	45	39
Pre-operating and stoppage expenses	69	74	79
Other expenses[1]	(43)	32	14
Total expenses	**100**	**167**	**147**

[1] Including the positive effect of tax credits.

[5] Including iron ore fines quality adjustment and iron ore fines pellet adjustment.

Iron ore pellets

Pellets – EBITDA

US$ million	2Q23	2Q22	1Q23	Comments
Net revenues / Realized prices	1,413	1,780	1,322	Realized price was US$ 160.4/t, US$ 40.9/t lower y/y, mainly due to lower 65%Fe index prices and pellet premiums.
Dividends from leased pelletizing plants	88	71	0	
Cash costs (Iron ore, leasing, freight, overhead, energy and other)	(674)	(707)	(648)	Mainly due to lower freight costs. FOB sales were 58% of total sales.
Pre-operational & stoppage expenses	(4)	(6)	(5)	
Expenses (Selling, R&D and other)	(5)	2	(2)	
EBITDA	**818**	**1,140**	**667**	
EBITDA/t	**93**	**129**	**82**	

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

Iron ore fines and pellets cash break-even landed in China

US$/t	2Q23	2Q22	1Q23
Vale's C1 cash cost ex-third-party purchase cost	23.5	20.9	23.6
Third party purchases cost adjustments	3.0	3.3	3.1
Vale's iron ore cash cost (ex-ROM, ex-royalties), FOB (US$ /t)	26.5	24.2	26.7
Iron ore fines freight cost (ex-bunker oil hedge)	17.6	21.3	17.8
Iron ore fines distribution cost	2.5	2.2	3.2
Iron ore fines expenses[1] & royalties	6.2	6.9	7.6
Iron ore fines moisture adjustment	4.7	4.9	5.0
Iron ore fines quality adjustment	(0.6)	(1.1)	1.4
Iron ore fines EBITDA break-even (US$/dmt)	**56.9**	**58.4**	**61.7**
Iron ore fines pellet adjustment	(3.9)	(6.2)	(3.5)
Iron ore fines and pellets EBITDA break-even (US$/dmt)	**53.0**	**52.2**	**58.2**
Iron ore fines sustaining investments	7.2	6.8	9.4
Iron ore fines and pellets cash break-even landed in China (US$/dmt)	**60.2**	**59.0**	**67.6**

[1] Net of depreciation and includes dividends received. Including stoppage expenses.

[6] Measured by unit cost + expenses + sustaining investment adjusted for quality. Does not include the impact from the iron ore fines and pellets pricing system mechanism.

Energy Transition Metals

Energy Transition Metals EBITDA overview – 2Q23

US$ million	Sudbury	Voisey's Bay & Long Harbour	PTVI (site)	Onça Puma	Sossego	Salobo	Others	Subtotal Energy Transition Metals	Marketing activities and others[1]	Total Energy Transition Metals
Net Revenues	850	119	296	79	112	426	(122)	1,760	111	1,871
Costs	(672)	(188)	(170)	(59)	(83)	(235)	202	(1,205)	(158)	(1,363)
Selling and other expenses	(3)	(55)	-	(3)	(3)	30	11	(23)	52	29
Pre-operating and stoppage expenses	-	-	-	-	-	(1)	-	(1)	-	(1)
R&D	(17)	(6)	(3)	-	(9)	(2)	(23)	(60)	-	(60)
EBITDA	**158**	**(130)**	**123**	**17**	**17**	**218**	**68**	**471**	**5**	**476**

[1] Includes an adjustment of US$ 52 million increasing the adjusted EBITDA in 2Q23, to reflect the performance of the streaming transactions at market prices, which will be made until the proceeds received on the streaming transactions are fully recognized in the adjusted EBITDA of the business. Based on the current projections for volumes and commodities prices, it will be fully realized by 2027.

Nickel operations

Selected financial indicators, ex- marketing activities

US$ million	2Q23	2Q22	1Q23
Net Revenues	1,222	1,262	1,321
Costs[1]	(886)	(652)	(949)
SG&A and other expenses[1]	(72)	(12)	(17)
Pre-operating and stoppage expenses[1]	-	-	-
R&D expenses	(29)	(26)	(27)
Adjusted EBITDA	235	572	328
Depreciation and amortization	(229)	(192)	(203)
Adjusted EBIT	6	380	125
Adjusted EBIT margin (%)	0.5	30.1	9.5

[1] Net of depreciation and amortization.

EBITDA variation - US$ million (2Q23 x 2Q22), ex-marketing activities

		Drivers					
US$ million	2Q22	Volume	Prices	By-products	Others	Total variation	2Q23
Nickel excl. marketing	572	9	(127)	61	(280)	(337)	235

EBITDA by operations, ex-marketing activities

US$ million	2Q23	2Q22	1Q23	2Q23 vs. 2Q22 Comments
Sudbury[1]	158	209	226	Lower nickel realized prices and higher third-party feed purchase, partially offset by higher by-product credits.
Voisey's Bay & Long Harbour	(130)	125	21	Lower nickel and by-products sales, as a result of the continued depletion of the open-pit mine and annual planned maintenance at the Long Harbour refinery. Further impacted by write-down of inventories and lower nickel realized prices.
PTVI	123	163	173	Lower nickel realizes prices, partially offset by higher sales volumes.
Onça Puma	17	87	19	Lower nickel realized prices and lower sales volumes.
Others[2]	67	(12)	(111)	
Total	**235**	**572**	**328**	

[1] Includes the Thompson operations and Clydach refinery.
[2] Includes Japanese operations, intercompany eliminations, purchase of finished nickel. Hedge results have been relocated to each nickel business operation.

Revenues & price realization

Revenues & price realization

	2Q23	2Q22	1Q23
Volume sold ('000 metric tons)			
Nickel	40	39	40
Copper	21	17	20
Gold as by-product ('000 oz)	11	10	11
Silver as by-product ('000 oz)	276	198	236
PGMs ('000 oz)	89	46	74
Cobalt (metric ton)	660	450	621
Average realized prices (US$/t)			
Nickel	23,070	26,221	25,260
Copper	6,888	6,240	8,928
Gold (US$/oz)	1,931	1,780	1,915
Silver (US$/oz)	22	19	22
Cobalt	34,694	81,915	32,830
Net revenue by product - ex marketing activities (US$ million)			
Nickel	930	1,032	1,013
Copper	145	105	174
Gold as by-product[1]	21	18	21
Silver as by-product	6	4	5
PGMs	85	65	75
Cobalt[1]	23	37	20
Others	12	1	12
Total	**1,222**	**1,262**	**1,321**

[1] Revenues presented above were adjusted to reflect the market prices of products delivered related to the streaming transactions.

Breakdown of nickel volumes sold, realized price and premium

	2Q23	2Q22	1Q23
Volumes (kt)			
Upper Class I nickel	22.7	19.8	23.9
- of which: EV Battery	0.6	1.0	1.6
Lower Class I nickel	4.5	6.8	4.1
Class II nickel	9.7	11.1	8.1
Intermediates	3.5	1.7	4.1
Nickel realized price (US$/t)			
LME average nickel price	22,308	28,940	25,983
Average nickel realized price	23,070	26,221	25,260
Contribution to the nickel realized price by category:			
Nickel average aggregate premium/(discount)	170	100	(60)
Other timing and pricing adjustments contributions[1]	94	(2,819)	(663)
Premium/discount by product (US$/t)			
Upper Class I nickel	1,820	1,540	1,550
Lower Class I nickel	1,250	770	1,340
Class II nickel	(2,340)	(1,880)	(2,770)
Intermediates	(4,930)	(6,100)	(5,560)

[1] Comprises (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 a negative impact of US$ 245/t , (ii) fixed-price sales, with a negative impact of US$ 151/t and (iii) the effect of the hedging on Vale's nickel price realization, with a positive impact of US$ 490/t in the quarter.
Note: The nickel realized price for 2Q23 was impacted by a settlement price in the quarter of circa US$ 22,393/t. The average strike price for the complete hedge position was flat at US$ 34,929/t.

Nickel realized price in 2Q23 decreased by 12% y/y, mainly due to lower LME prices (US$ 22,308/t in 2Q23 vs. US$ 28,940/t in 2Q22). The average realized nickel price was 3% or US$ 762/t higher than LME average price, primarily due to a larger share of Upper Class I products in the mix combined with higher average Class I premiums.

Product type by operation

% of source sales	North Atlantic	PTVI & Matsusaka	Onça Puma	Total 2Q23	Total 2Q22
Upper Class I	81.7	-	-	56.3	50.3
Lower Class I	16.1	-	-	11.1	17.2
Class II	1.4	57.6	100.0	24.1	28.1
Intermediates	0.8	42.4	-	8.6	4.4

Costs

Nickel COGS, excluding marketing activities - 2Q23 x 2Q22

		Drivers				
US$ million	2Q22	Volume	Exchange rate	Others	Total variation	2Q23
Nickel operations	652	16	(21)	239	234	886
Depreciation	192	5	(7)	31	29	221
Total	**844**	**21**	**(28)**	**270**	**263**	**1,107**

Unit cash cost of sales by operation, net of by-product credits

US$/t	2Q23	2Q22	1Q23	2Q23 vs. 2Q22 Comments
Sudbury[1,2]	16,594	17,879	16,328	Higher volumes of third-party feed purchased, partially offset by higher by-product revenues.
Voisey's Bay & Long Harbour[2]	34,713	16,639	24,170	Lower fixed cost dilution and higher maintenance costs due to the annual planned maintenance at the Long Harbor refinery.
PTVI	10,297	11,876	11,030	Higher fixed cost dilution due to higher production volumes. 2Q22 unit cost was impacted by the furnace rebuild.
Onça Puma	11,623	10,678	12,284	Lower fixed cost dilution due to lower production volume.

[1] Sudbury figures include Thompson and Clydach costs.
[2] A large portion of Sudbury, including Clydach, and Long Harbour finished nickel production is derived from intercompany transfers, as well as from the purchase of ore or nickel intermediates from third parties. These transactions are valued at fair market value.

EBITDA break-even

EBITDA break-even

US$/t	2Q23	2Q22	1Q23
COGS ex. 3rd-party feed	21,135	15,809	22,434
COGS[1]	21,969	16,591	23,653
By-product revenues[1]	(7,232)	(5,863)	(7,687)
COGS after by-product revenues	14,737	10,728	15,966
Other expenses[2]	2,516	592	1,117
Total Costs	**17,253**	**11,320**	**17,083**
Nickel average aggregate (premium) discount	**(170)**	**(100)**	**60**
EBITDA breakeven[3]	**17,083**	**11,220**	**17,143**

[1] Excluding marketing activities.
[2] Includes R&D, sales expenses and pre-operating & stoppage.
[3] Considering only the cash effect of streaming transactions, nickel operations EBITDA break-even would increase to US$ 17,391/t.

Unit COGS, excluding 3rd-party feed purchases, have increased by US$ 5,326 y/y on the back of lower own source volumes, mainly related to the mine transition in Voisey's Bay and the impact of the 8-week maintenance at Long Harbour refinery (vs. 2-week in 2Q22), in addition to inflation pressure on materials and high fuel costs due to mix of products. Q/q, the unit COGS has stayed at relatively stable levels.

All-in costs increased by US$ 5,863 y/y, primarily due to higher unit COGS, as described above, and the write-down of high costs inventories related to Voisey's Bay and Long Harbour operations. The write-down of high costs inventories is also the main reason for the US$ 1,399/t increase in expenses q/q.

The all-in cost guidance for 2023 has been revised up to US$ 15,500-16,000/t from US$ 13,000/t mostly driven by (i) the lower-than-expected prices for by-products, namely cobalt and PGMs, which dropped 30-40% since the guidance was provided; (ii) lower-than-expected by-products volumes, mainly resulting from the higher-than-anticipated impact of the change in mining method at Coleman mine; and (iii) higher-than-expected nickel and copper prices, impacting 3rd party feed purchase costs.

Copper operations – Salobo and Sossego

Selected financial indicators - Copper operations, ex-marketing activities

US$ million	2Q23	2Q22	1Q23
Net Revenues	538	328	524
Costs[1]	(319)	(268)	(270)
SG&A and other expenses[1]	49	(3)	(6)
Pre-operating and stoppage expenses[1]	(1)	(3)	(3)
R&D expenses	(31)	(31)	(25)
Adjusted EBITDA	236	23	220
Depreciation and amortization	(34)	(35)	(37)
Adjusted EBIT	202	(12)	183
Adjusted EBIT margin (%)	37.5	(3.7)	34.9

[1] Net of depreciation and amortization.

EBITDA variation - US$ million (2Q23 x 2Q22)

		Drivers					
US$ million	2Q22	Volume	Prices	By-products	Others	Total variation	2Q23
Copper	23	10	22	64	117	213	236

EBITDA by operation

US$ million	2Q23	2Q22	1Q23	2Q23 vs. 2Q22 Comments
Salobo	218	110	186	Higher sales volumes resulting from the successful ramp-up of Salobo III, increased copper realized prices and by-products credits as well as tax credits.
Sossego	17	(65)	52	Higher sales volumes, following the extended maintenance work that impacted last year's performance.
Others copper[1]	1	(22)	(18)	
Total	**236**	**23**	**220**	

[1] Includes a positive EBITDA of US$ 1 million related to the Hu'u project in 2Q23, as a result of the reclassification of expenses to capitalized costs.

Revenues & price realization

Revenues & price realization

US$ million	2Q23	2Q22	1Q23
Volume sold ('000 metric tons)			
Copper	53	35	43
Gold as by-product ('000 oz)	77	52	61
Silver as by-product ('000 oz)	242	193	170
Average prices (US$/t)			
Average LME copper price	8,464	9,513	8,927
Average copper realized price	7,025	6,493	9,465
Gold (US$/oz)[1]	2,103	1,904	1,832
Silver (US$/oz)	26	22	22
Revenue (US$ million)			
Copper	371	225	409
Gold as by-product[1]	161	99	111
Silver as by-product	6	4	4
Total	**538**	**328**	**524**

[1] Revenues presented above were adjusted to reflect the market prices of products delivered related to the streaming transactions.

Price realization – copper operations

US$/t	2Q23	2Q22	1Q23
Average LME copper price	8,464	9,513	8,927
Current period price adjustments[1]	(257)	(1,119)	228
Copper gross realized price	8,207	8,394	9,155
Prior period price adjustments[2]	(638)	(1,436)	829
Copper realized price before discounts	**7,569**	**6,958**	**9,983**
TC/RCs, penalties, premiums and discounts[3]	(544)	(465)	(518)
Average copper realized price	**7,025**	**6,493**	**9,465**

Note: Vale's copper products are sold on a provisional princing basis during the quater, with final prices determined in a future period.
[1] Current-period price adjustments: at the end of the quarter, mark-to-market of open invoices based on the copper price forward curve. Includes a small number of final invoices that were provisionally priced and settled within the quarter.
[2] 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
[3] TC/RCs, penalties, premiums, and discounts for intermediate products.

The negative effects of the prior-period price adjustments of US$ 638/t and the current-period price adjustments of US$ 257/t[7] were mainly due the lower LME prices and the downward trend in prices in the quarter. Average TC/RCs discount was US$ 544/t in the quarter, US$ 79/t higher y/y, primarily driven by higher benchmark TC/RCs.

Costs

COGS - 2Q23 x 2Q22

		Drivers				
US$ million	2Q22	Volume	Exchange rate	Others	Total variation	2Q23
Copper operations	268	114	(1)	(62)	51	319
Depreciation	35	15	-	(17)	(2)	33
Total	**303**	**129**	**(1)**	**(79)**	**49**	**352**

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

US$/t	2Q23	2Q22	1Q23	2Q23 vs. 2Q22 Comments
Salobo	2,246	3,329	2,856	Higher fixed costs dilution due to stronger production volumes and by-product revenues.
Sossego	4,705	40,407	5,233	Higher fixed costs dilution and by-product credits, following the extended maintenance work that impacted last year's performance.

[7] On June 30th, 2023, Vale had provisionally priced copper sales from Sossego and Salobo totaling 45,105 tons valued at weighted average LME forward price of US$ 8,321/t, subject to final pricing over the following months.

EBITDA break-even – copper operations

US$/t	2Q23	2Q22	1Q23
COGS	6,046	7,734	6,256
By-product revenues	(3,177)	(2,977)	(2,664)
COGS after by-product revenues	**2,869**	**4,757**	**3,592**
Other expenses[1]	(325)	1,051	782
Total costs	**2,544**	**5,808**	**4,374**
TC/RCs penalties, premiums and discounts	544	465	518
EBITDA breakeven[2]	**3,088**	**6,273**	**4,892**
EBITDA breakeven ex-Hu'u	**3,112**	**5,657**	**4,464**

[1] Includes sales expenses, R&D, pre-operating and stoppage expenses and other expenses
[2] Considering only the cash effect of streaming transactions, copper operations EBITDA break-even would increase to US$ 4,445/t.

The realized price to be compared to the EBITDA break-even should be the copper realized price before discounts (US$ 7,569/t), given that TC/RCs, penalties, and other discounts are already part of the EBITDA break-even build-up.

WEBCAST INFORMATION

Vale will host a webcast on Friday, July 28, 2023, at 11:00 a.m. Brasilia time (10:00 a.m. New York time; 3:00 p.m. London time). Internet access to the webcast and presentation materials will be available on Vale website at www.vale.com/investors. A webcast replay will be accessible at www.vale.com beginning shortly after the completion of the call. Interested parties may listen to the teleconference by dialing in:

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Further information on Vale can be found at: vale.com

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Except where otherwise indicated, the operational and financial information in this release is based on the consolidated figures in accordance with IFRS. Our quarterly financial statements are reviewed by the company's independent auditors. The main subsidiaries that are consolidated are the following: Companhia Portuária da Baía de Sepetiba, Vale Manganês S.A., Minerações Brasileiras Reunidas S.A., Salobo Metais S.A, Tecnored Desenvolvimento Tecnológico S.A., PT Vale Indonesia Tbk, Vale Holdings B.V, Vale Canada Limited, Vale International S.A., Vale Malaysia Minerals Sdn. Bhd., Vale Oman Pelletizing Company LLC e Vale Oman Distribution Center LLC.

Annexes

Simplified financial statements

Income Statement

US$ million	2Q23	2Q22	1Q23
Net operating revenue	**9,673**	**11,157**	**8,434**
Cost of goods sold and services rendered	(5,940)	(5,950)	(4,949)
Gross profit	**3,733**	**5,207**	**3,485**
Gross margin (%)	38.6	46.7	41.3
Selling and administrative expenses	(139)	(127)	(118)
Research and development expenses	(165)	(151)	(139)
Pre-operating and operational stoppage	(103)	(111)	(124)
Other operational expenses, net	(388)	(445)	(219)
Impairment reversal (impairment and disposals) of non-current assets, net	(66)	(82)	(4)
Operating income	**2,872**	**4,291**	**2,881**
Financial income	106	137	121
Financial expenses	(397)	(372)	(320)
Other financial items, net	134	1,056	(331)
Equity results and other results in associates and joint ventures	5	(56)	(55)
Income before income taxes	**2,720**	**5,056**	**2,296**
Current tax	(404)	(1,181)	(218)
Deferred tax	(1,388)	270	(200)
Net income from continuing operations	**928**	**4,145**	**1,878**
Net income (loss) attributable to noncontrolling interests	36	52	41
Net income from continuing operations attributable to Vale's shareholders	**892**	**4,093**	**1,837**
Discontinued operations			
Net income (Loss) from discontinued operations	-	2,058	-
Net income (Loss) from discontinued operations attributable to Vale's shareholders	**-**	**2,058**	**-**
Net income	**928**	**6,203**	**1,878**
Net income (Loss) attributable to Vale's to noncontrolling interests	36	52	41
Net income attributable to Vale's shareholders	**892**	**6,151**	**1,837**
Earnings per share (attributable to the Company's shareholders - US$):			
Basic and diluted earnings per share (attributable to the Company's shareholders - US$)	0.20	1.32	0.41

Equity income (loss) by business segment

US$ million	2Q23	%	2Q22	%	1Q23	%
Iron Solutions	89	91	52	85	(96)	109
Energy Transition Metals	-	-	1	2	-	-
Others	9	9	8	13	8	(9)
Total	**98**	**100**	**61**	**100**	**(88)**	**100**

Balance sheet

US$ million	6/30/2023	3/31/2023	6/30/2022
Assets			
Current assets	**15,547**	**14,508**	**16,022**
Cash and cash equivalents	4,983	4,705	7,185
Short term investments	46	53	48
Accounts receivable	2,967	2,687	2,148
Other financial assets	522	381	229
Inventories	5,193	4,992	5,154
Recoverable taxes	1,502	1,345	744
Other	334	345	240
Non-current assets held for sale	-	-	274
Non-current assets	**14,402**	**14,785**	**13,931**
Judicial deposits	1,326	1,255	1,328
Other financial assets	698	393	210
Recoverable taxes	1,229	1,143	1,147
Deferred income taxes	9,904	10,799	10,360
Other	1,245	1,195	886
Fixed assets	**61,568**	**58,254**	**54,405**
Total assets	**91,517**	**87,547**	**84,358**
Liabilities			
Current liabilities	**13,556**	**12,977**	**12,117**
Suppliers and contractors	5,240	4,464	3,664
Loans, borrowings and leases	912	543	935
Other financial liabilities	1,599	1,581	1,584
Taxes payable	882	672	331
Settlement program ("REFIS")	416	388	356
Provisions	849	722	835
Liabilities related to associates and joint ventures	1,044	2,133	1,783
Liabilities related to Brumadinho	1,201	1,122	1,060
De-characterization of dams and asset retirement obligations	899	785	692
Dividends payable	-	-	-
Other	514	567	750
Liabilities associated with non-current assets held for sale	-	-	127
Non-current liabilities	**37,670**	**35,689**	**35,259**
Loans, borrowings and leases	13,025	12,441	11,673
Participative shareholders' debentures	2,528	2,846	3,219
Other financial liabilities	2,771	2,805	1,820
Settlement program (REFIS)	1,886	1,856	1,976
Deferred income taxes	1,411	1,379	1,759
Provisions	2,700	2,548	2,477
Liabilities related to associates and joint ventures	2,575	1,266	1,603
Liabilities related to Brumadinho	2,075	2,236	2,620
De-characterization of dams and asset retirement obligations	6,786	6,462	6,238
Streaming transactions	1,693	1,636	1,637
Other	220	214	237
Total liabilities	**51,226**	**48,666**	**47,376**
Total equity	**40,291**	**38,881**	**36,982**
Total liabilities and equity	**91,517**	**87,547**	**84,358**

Cash flow

US$ million	2Q23	2Q22	1Q23
Cash flow from operations	**3,259**	**5,738**	**4,280**
Interest on loans and borrowings paid	(200)	(277)	(169)
Cash received (paid) on settlement of Derivatives, net	134	(42)	38
Payments related to Brumadinho	(497)	(319)	(124)
Payments related to de-characterization of dams	(95)	(83)	(78)
Interest on participative shareholders debentures paid	(127)	(235)	-
Income taxes (including settlement program) paid	(574)	(1,213)	(337)
Net cash generated by operating activities from continuing operations	**1,900**	**3,569**	**3,610**
Net cash generated by operating activities from discontinued operations	-	-	-
Net cash generated by operating activities	**1,900**	**3,569**	**3,610**
Cash flow from investing activities			
Short-term investment	67	101	(55)
Capital expenditures	(1,208)	(1,293)	(1,130)
Additions to investment	(1)	-	(7)
Dividends received from joint ventures and associates	105	71	-
Proceeds (payments) from the sale of investments, net	-	-	(67)
Other investment activities, net	(30)	48	(67)
Net cash used in investing activities from continuing operations	**(1,067)**	**(1,073)**	**(1,326)**
Net cash used in investing activities from discontinued operations	-	(65)	-
Net cash used in investing activities	**(1,067)**	**(1,138)**	**(1,326)**
Cash flow from financing activities			
Loans and financing:			
Loans and borrowings from third parties	1,500	200	300
Payments of loans and borrowings from third parties	(581)	(1,433)	(39)
Payments of leasing	(45)	(57)	(47)
Payments to shareholders:			
Dividends and interest on capital paid to Vale's shareholders	-	-	(1,795)
Dividends and interest on capital paid to noncontrolling interest	(5)	(4)	(3)
Share buyback program	(1,361)	(2,596)	(763)
Stake acquisition on subsidiaries	(130)	-	-
Net cash used in financing activities from continuing operations	**(622)**	**(3,890)**	**(2,347)**
Net cash used in financing activities from discontinued operations	-	-	-
Net cash used in financing activities	**(622)**	**(3,890)**	**(2,347)**
Net increase (decrease) in cash and cash equivalents	**211**	**(1,459)**	**(63)**
Cash and cash equivalents in the beginning of the period	4,705	9,061	4,736
Effect of exchange rate changes on cash and cash equivalents	67	(417)	32
Cash and cash equivalents at the end of period	**4,983**	**7,185**	**4,705**
Non-cash transactions:			
Additions to property, plant and equipment - capitalized loans and borrowing costs	5	17	5
Cash flow from operating activities			
Income before income taxes	**2,720**	**5,056**	**2,296**
Adjusted for:			
Provisions related to Brumadinho	140	126	-
Equity results and other results in associates and joint ventures	(5)	56	55
Impairment (impairment reversal) and results on disposal of non-current assets, net	66	82	4
Depreciation, depletion and amortization	779	810	656
Financial results, net	157	(821)	530
Change in assets and liabilities			
Accounts receivable	(247)	902	1,686
Inventories	(157)	(305)	(363)
Suppliers and contractors	570	432	(105)
Other assets and liabilities, net	(764)	(600)	(479)
Cash flow from operations	**3,259**	**5,738**	**4,280**

Reconciliation of IFRS and "non-GAAP" information

(a) Adjusted EBIT

US$ million	2Q23	2Q22	1Q23
Net operating revenues	9,673	11,157	8,434
COGS	(5,940)	(5,950)	(4,949)
Sales and administrative expenses	(139)	(127)	(118)
Research and development expenses	(165)	(151)	(139)
Pre-operating and stoppage expenses	(103)	(111)	(124)
Brumadinho and dam de-characterization of dams	(271)	(280)	(111)
Other operational expenses, net[1]	(65)	(165)	(73)
Dividends received and interests from associates and JVs	105	71	-
Adjusted EBIT from continuing operations	**3,095**	**4,444**	**2,920**

[1] Includes adjustment of US$ 52 million in 2Q23 and US$ 35 million in 1Q23, to reflect the performance of the streaming transactions at market price.

(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 reversal (impairment and disposals) 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	2Q23	2Q22	1Q23
Adjusted EBITDA from continuing operations	**3,874**	**5,254**	**3,576**
Working capital:			
Accounts receivable	(247)	902	1,686
Inventories	(157)	(305)	(363)
Suppliers and contractors	570	432	(105)
Provisions related to Brumadinho	140	126	-
Others	(921)	(671)	(514)
Cash flow from continuing operations	**3,259**	**5,738**	**4,280**
Income taxes paid (including settlement program)	(574)	(1,213)	(337)
Interest on loans and borrowings paid	(200)	(277)	(169)
Payments related to Brumadinho	(497)	(319)	(124)
Payments related to de-characterization of dams	(95)	(83)	(78)
Interest on participative shareholders' debentures paid	(127)	(235)	-
Cash received (paid) on settlement of Derivatives, net	134	(42)	38
Net cash generated by operating activities from continuing operations	**1,900**	**3,569**	**3,610**
Net cash generated by operating activities	**1,900**	**3,569**	**3,610**

Reconciliation between adjusted EBITDA and net income (loss)

US$ million	2Q23	2Q22	1Q23
Adjusted EBITDA from continuing operations	**3,874**	**5,254**	**3,576**
Depreciation, depletion and amortization	(779)	(810)	(656)
Dividends received and interest from associates and joint ventures	(105)	(71)	-
Impairment reversal (impairment) and results on disposals of non-current assets,net[1]	(118)	(82)	(39)
Operating income	**2,872**	**4,291**	**2,881**
Financial results	(157)	821	(530)
Equity results and other results in associates and joint ventures	5	(56)	(55)
Income taxes	(1,792)	(911)	(418)
Net income from continuing operations	**928**	**4,145**	**1,878**
Net income (loss) attributable to noncontrolling interests	36	52	41
Net income attributable to Vale's shareholders	**892**	**4,093**	**1,837**

[1] Includes adjustment of US$ 52 million 2Q23 and US$ 35 million 1Q23, to reflect the performance of the streaming transactions at market price.

(c) Net debt

US$ million	2Q23	2Q22	1Q23
Gross debt	12,417	11,031	11,464
Leases	1,520	1,577	1,520
Cash and cash equivalents[1]	(5,029)	(7,233)	(4,758)
Net debt	**8,908**	**5,375**	**8,226**

[1] Including financial investments.

(d) Gross debt / LTM Adjusted EBITDA

US$ million	2Q23	2Q22	1Q23
Gross debt and leases / LTM Adjusted EBITDA (x)	0.9	0.5	0.8
Gross debt and leases / LTM operational cash flow (x)	0.8	0.6	0.7

(e) LTM Adjusted EBITDA / LTM interest payments

US$ million	2Q23	2Q22	1Q23
Adjusted LTM EBITDA / LTM gross interest (x)	24.1	38.1	27.1
LTM adjusted EBITDA / LTM interest payments (x)	20.1	23.0	22.1

(f) US dollar exchange rates

R$/US$	2Q23	2Q22	1Q23
Average	4.9485	4.9266	5.1963
End of period	4.8192	5.2380	5.0804

Revenues and volumes

Net operating revenue by destination

US$ million	2Q23	%	2Q22	%	1Q23	%
North America	**554**	**5.7**	**585**	**5.2**	**653**	**7.7**
USA	431	4.5	474	4.2	511	6.1
Canada	123	1.3	111	1.0	142	1.7
South America	**1,098**	**11.4**	**1,434**	**12.9**	**1,067**	**12.7**
Brazil	994	10.3	1,222	11.0	919	10.9
Others	104	1.1	212	1.9	148	1.8
Asia	**6,278**	**64.9**	**7,024**	**63.0**	**4,726**	**56.0**
China	4,638	47.9	5,102	45.7	3,407	40.4
Japan	824	8.5	1,014	9.1	689	8.2
South Korea	374	3.9	359	3.2	312	3.7
Others	442	4.6	549	4.9	318	3.8
Europe	**1,227**	**12.7**	**1,426**	**12.8**	**1,563**	**18.5**
Germany	294	3.0	315	2.8	428	5.1
Italy	182	1.9	207	1.9	183	2.2
Others	751	7.8	904	8.1	952	11.3
Middle East	**162**	**1.7**	**348**	**3.1**	**238**	**2.8**
Rest of the World	**354**	**3.7**	**340**	**3.0**	**187**	**2.2**
Total	**9,673**	**100.0**	**11,157**	**100.0**	**8,434**	**100.0**

Volume sold by destination – Iron ore and pellets

'000 metric tons	2Q23	2Q22	1Q23
Americas	**10,784**	**9,422**	**10,151**
Brazil	9,512	8,551	8,749
Others	1,272	871	1,402
Asia	**56,618**	**55,498**	**38,058**
China	44,908	43,668	28,295
Japan	6,269	6,666	5,545
Others	5,441	5,164	4,218
Europe	**4,022**	**5,265**	**5,168**
Germany	426	753	964
France	742	972	1,080
Others	2,854	3,540	3,124
Middle East	**953**	**1,510**	**1,240**
Rest of the World	**1,997**	**1,466**	**1,042**
Total	**74,374**	**73,161**	**55,659**

Net operating revenue by business area

US$ million	2Q23	%	2Q22	%	1Q23	%
Iron Solutions	**7,776**	**80%**	**9,025**	**81%**	**6,411**	**76%**
Iron ore fines	6,235	64%	7,113	64%	4,982	59%
ROM	34	0%	29	0%	26	0%
Pellets	1,413	15%	1,780	16%	1,322	16%
Others	94	1%	103	1%	81	1%
Energy Transition Metals	**1,871**	**19%**	**1,875**	**17%**	**1,998**	**24%**
Nickel	930	10%	1,032	9%	1,013	12%
Copper	516	5%	330	3%	583	7%
PGMs	85	1%	65	1%	75	1%
Gold as by-product[1]	131	1%	117	1%	97	1%
Silver as by-product	12	0%	8	0%	9	0%
Cobalt[1]	22	0%	37	0%	21	0%
Others[2]	175	2%	286	3%	200	2%
Others	**26**	**0%**	**257**	**2%**	**25**	**0%**
Total of continuing operations	**9,673**	**100%**	**11,157**	**100%**	**8,434**	**100%**

[1] Exclude the adjustment of US$ 52 million in 2Q23 and US$ 35 million in 1Q23, related to the performance of streaming transactions at market price.
[2] Includes marketing activities.

Projects under evaluation and growth options

Copper		
Alemão	**Capacity: 60 ktpy**	**Stage: FEL3**
Carajás, Brazil	Growth project	Investment decision: 2023-2024
Vale's ownership: 100%	Underground mine	115 kozpy Au as byproduct
South Hub extension	**Capacity: 60-80 ktpy**	**Stage: FEL3[1]**
Carajás, Brazil	Replacement project	Investment decision: 2023-2024
Vale's ownership: 100%	Open pit	Development of mines to feed Sossego mill
Victor	**Capacity: 20 ktpy**	**Stage: FEL3**
Ontario, Canada	Replacement project	Investment decision: 2024
Vale's ownership: N/A	Underground mine	5 ktpy Ni as co-product; JV partnership under discussion
Hu'u	**Capacity: 300-350 ktpy**	**Stage: FEL2**
Dompu, Indonesia	Growth project	200 kozpy Au as byproduct
Vale's ownership: 80%	Underground block cave	
North Hub	**Capacity: 70-100 ktpy**	**Stage: FEL1**
Carajás, Brazil	Growth project	
Vale's ownership: 100%	Mines and processing plant	
Nickel		
Sorowako Limonite	**Capacity: 60 ktpy**	**Stage: FEL3**
Sorowako, Indonesia	Growth project	Investment decision: 2023
Vale's ownership: N/A[2]	Mine + HPAL plant	8 kpty Co as by-product
Pomalaa	**Capacity: 120 ktpy**	**Stage: FEL 3**
Kolaka, Indonesia	Growth project	Investment decision: 2023 (mine)
Vale's ownership: N/A[2]	Mine + HPAL plant (under construction)	15 ktpy Co as by-product
Creighton Ph. 5	**Capacity: 15-20 ktpy**	**Stage: FEL3**
Ontario, Canada	Replacement project	Investment decision: 2023-2024
Vale's ownership: 100%	Underground mine	10-16 ktpy Cu as by-product
CCM Pit	**Capacity: 12-15 ktpy**	**Stage: FEL3**
Ontario, Canada	Replacement project	Investment decision: 2023-2024
Vale's ownership: 100%	Open pit mine	7-9 ktpy Cu as by-product
CCM Ph. 3	**Capacity: 5-10 ktpy**	**Stage: FEL3**
Ontario, Canada	Replacement project	7-13 ktpy Cu as by-product
Vale's ownership: 100%	Underground mine	
CCM Ph. 4	**Capacity: 7-12 ktpy**	**Stage: FEL2**
Ontario, Canada	Replacement project	7-12 ktpy Cu as by-product
Vale's ownership: 100%	Underground mine	
Iron ore		
Dry concentration plant	**Capacity: 8 Mtpy DR pellet feed**	**Stage: FEL3**
Oman	Replacement project	Investment decision: 2023
Vale's ownership: N/A	Cleaner to produce DR pellet feed	
Green briquette plants	**Capacity: Under evaluation**	**Stage: FEL3 (two plants)**
Brazil and other regions	Growth project	Investment decision: 2023-2029
Vale's ownership: N/A	Cold agglomeration plant	8 plants under engineering stage, including co-located plants in clients' facilities
Serra Leste expansion	**Capacity: +4 Mtpy (10 Mtpy total)**	**Stage: FEL2**
Northern System (Brazil)	Growth project	
Vale's ownership: 100%	Open pit mine	
S11C	**Capacity: Under evaluation**	**Stage: FEL2**
Northern System (Brazil)	Growth project	
Vale's ownership: 100%	Open pit mine	

contd.

contd.

Iron ore		
Serra Norte N1/N2[3]	**Capacity: Under evaluation**	**Stage: FEL2**
Northern System (Brazil)	Replacement project	
Vale's ownership: 100%	Open pit mine	
Mega Hubs	**Capacity: Under evaluation**	**Stage: Prefeasibility Study**
Middle East	Growth project	
Vale's ownership: N/A	Industrial complexes for iron ore concentration and agglomeration and production of direct reduction metallics	Vale signed three agreements with Middle East local authorities and clients to jointly study the development of Mega Hubs

[1] Refers to the most advanced projects (Bacaba and Cristalino).
[2] Indirect ownership through Vale's 44.34% equity in PTVI. PTVI will own 100% of the mine and has the option to acquire up to 30% of the plant as part of the JV agreement.
[3] Project scope is under review given permitting constraints.