

Vale's 3Q23 production and sales report

Rio de Janeiro, October 17th, 2023

- Iron ore production decreased by 4% y/y, mainly due to lower run-of-mine production from the Paraopeba complex and lower output from Serra Norte. The overall quality has improved with iron content increasing 87 bps y/y. This is a result of higher production at S11D and higher pellet feed output from Brucutu with the commissioning of the Torto dam, boosting pellet production by 11% y/y.
- Iron ore fines and pellet sales increased by 6% y/y, benefiting from favorable market conditions.
- Copper production increased by 10% y/y, mostly due to the continued ramp-up of Salobo III with the Salobo complex reaching, in September, the highest monthly production level since July 2019. Considering performance to date and the expected volume for Q4, we are now forecasting a full year production of 315-325 kt. Copper sales increased by 8% y/y, following higher production volumes.
- Nickel production decreased by 19% y/y, in line with plan, mainly due to the continued transitioning of Voisey's Bay to underground operations and additional maintenance at the Sudbury refinery in Q3. Nickel sales decreased by 12% y/y, in line with production.

Production summary

000' metric tons	3Q23	2Q23	3Q22	9M23	9M22	% change			2023 Guidance
						3Q23/2Q23	3Q23/3Q22	9M23/9M22	
Iron ore ¹	86,238	78,743	89,701	231,755	226,937	9.5%	-3.9%	2.1%	310-320 Mt
Pellets	9,175	9,111	8,256	26,604	23,852	0.7%	11.1%	11.5%	36-40 Mt ²
Copper	81.6	78.8	74.3	227.5	186.8	3.6%	9.8%	21.8%	315-325 kt ³
Nickel	42.1	36.9	51.8	120.0	131.8	14.1%	-18.7%	-9.0%	160-175 kt

¹ Including third-party purchases, run-of-mine and feed for pelletizing plants.

² Iron ore agglomerates guidance, including iron ore pellets and briquettes.

³ Copper production guidance was revised from 335-370 kt.

Sales summary

000' metric tons	3Q23	2Q23	3Q22	9M23	9M22	% change		
						3Q23/2Q23	3Q23/3Q22	9M23/9M22
Iron ore fines ¹	69,714	63,329	65,381	178,904	179,461	10.1%	6.6%	-0.3%
Iron ore pellets	8,613	8,809	8,521	25,556	24,375	-2.2%	1.1%	4.8%
Iron ore ROM	2,232	2,236	3,668	6,132	6,253	-0.2%	-39.1%	-1.9%
Copper	73.8	73.8	70.5	210.3	172.2	0.0%	4.7%	22.1%
Nickel	39.2	40.3	44.3	119.6	122.6	-2.7%	-11.5%	-2.4%

¹ Including third-party purchase sales.

Price realization summary

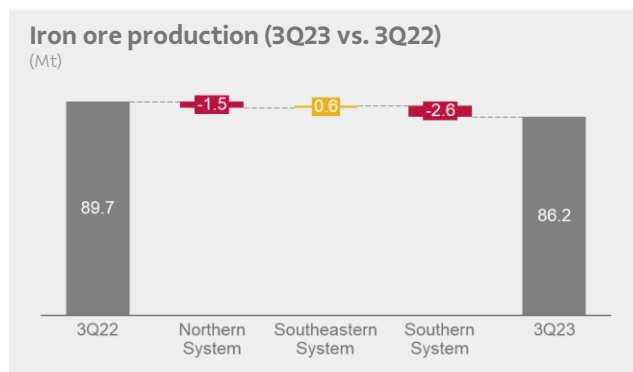
US\$/t	3Q23	2Q23	3Q22	9M23	9M22	% change		
						3Q23/2Q23	3Q23/3Q22	9M23/9M22
Iron ore fines (CFR/FOB, wmt)	105.1	98.5	92.6	103.7	113.8	6.7%	13.5%	-8.9%
Iron ore pellets (CFR/FOB, wmt)	161.2	160.4	194.3	161.4	196.9	0.5%	-17.0%	-18.0%
Copper ¹	7,731	7,025	6,663	7,969	7,787	10.0%	16.0%	2.3%
Nickel	21,237	23,070	21,672	23,203	23,298	-7.9%	-2.0%	-0.4%
Gold (US\$/oz)	1,872	2,082	1,748	1,934	1,824	-10.1%	7.1%	6.0%
Silver (US\$/oz)	22.8	22.4	17.2	23.0	20.4	1.8%	32.6%	12.7%
Cobalt	35,222	34,694	49,228	34,130	67,836	1.5%	-28.5%	-49.7%

¹ Average realized price for copper operations only (Salobo and Sossego). Average realized copper price for all operations, including copper sales originated from nickel operations, was US\$ 7,680/t in 3Q23.

Business highlights in 3Q23

Iron Ore and Pellets

- **Northern System production decreased by 1.5 Mt y/y**, due to a one-time failure in the conveyor belt system at S11D in August, with an impact of approximately 2 Mt. Despite this one-time event, S11D's output was 0.4 Mt higher y/y, as a result of consistent improvement in leading performance indicators including record mine movement in September. Serra Norte's performance was in line with the production plan for the quarter.

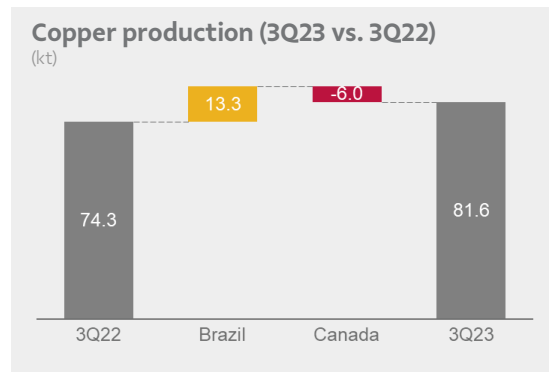


- **The Southeastern System product mix improved after the Torto dam start-up, and output increased by 0.6 Mt y/y**, driven by higher third-party purchases. Torto dam commissioning at Brucutu was concluded, increasing the supply of pellet feed and replacing high-silica products. The full benefit is expected to be captured from 4Q23 onwards.
- **Southern System production decreased by 2.6 Mt y/y** mainly due to lower run-of-mine production and sales from the Paraopeba Complex, and a temporary stoppage at the Viga operations due to one-off maintenance of the tailings pipeline.
- **Pellet production increased by 0.9 Mt y/y**, driven by an increase in pellet feed supply from Brucutu and Itabira. In August, Vale started the commissioning tests of the first of two iron ore briquette plants in Tubarão. After ramping-up, the combined capacity will reach 6 Mtpy.
- **Iron ore fines and pellet sales increased by 4.4 Mt y/y**, with the sale of inventories from the first semester and taking advantage of favorable market conditions. **The all-in premium totaled US\$ 3.8/t¹**, US\$ 2.8/t lower y/y, mainly due to lower pellet premiums. Quarter on quarter, the all-in premium was slightly lower, driven by lower market premiums as steel mills have been favoring lower-grade fines due to the decline in steel margins. This was partially offset by a superior product portfolio sales mix, with a larger share of Northern System volumes.
- **The average realized iron ore fines price was US\$ 105.1/t**, US\$ 12.5/t higher y/y, largely attributed to higher benchmark iron ore prices (US\$ 10.7/t higher y/y), and a positive impact from pricing adjustments (US\$ 2.1/t higher y/y). **The average realized iron ore pellets price was US\$ 161.2/t**, US\$ 33.1/t lower y/y, mainly due to lower quarterly pellet premiums, partially offset by higher benchmark iron ore prices.

¹ Iron ore premium of US\$ 0.8/t and the weighted average contribution of the pellet business of US\$ 3.0/t.

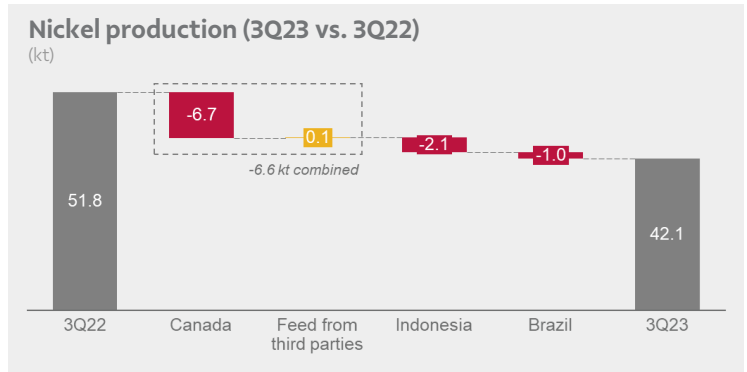
Copper

- **Salobo copper production increased by 14.9 kt y/y**, driven by the ongoing ramp-up of Salobo III and the increase in copper recoveries at the Salobo complex by 4% y/y, attributed to better asset conditions and operational stability at Salobo I and II plants. The increase in production was partially offset by maintenance at the Salobo I and II plants.
- **Sossego copper production decreased by 1.6 kt y/y** due to lower copper grades despite an increase of 17% y/y in the ore process. Production increased by 2.1 kt q/q following maintenance performed in 2Q23. In 4Q23, copper feed grades at the mill are expected to improve as the mine transitions to a higher-grade zone.
- **Copper production in Canada decreased by 6.0 kt y/y**. The decrease is largely explained by the additional mine support required from the mining method at Coleman, the ongoing planned mine transition at Voisey's Bay, and the lower production of Thompson copper precipitate. The 6.2 kt decrease q/q was mainly due to the annual planned maintenance activities at Sudbury and Thompson mines and mills.
- While year-to-date production performance remains strong, up 22% y/y, **the production guidance for 2023 has been revised down by around 15 kt to a new range of 315-325 kt** due to changes to the mining method at Coleman and additional maintenance at Salobo mine and Salobo I and II plants.
- **Copper sales increased by 3.3 kt y/y**, mainly due to improved copper production in the same period. This increase was partially offset by the postponement of one shipment of copper concentrates from 3Q23 to 4Q23 in Brazil.
- **The average copper realized price was US\$ 7,731/t**, up 16% y/y, mainly due to an 8% increase in the LME copper reference price (US\$ 8,356/t in 3Q23 vs. US\$ 7,745/t in 3Q22) and the lower impact of provisional price adjustments in 3Q23 compared to 3Q22.



Nickel

- Finished nickel production from Sudbury sourced ore decreased by 4.1 kt y/y**, caused by unplanned maintenance at the Sudbury refinery and an extended planned maintenance at Creighton mine. Sudbury ore production up 16% y/y year-to-date, in line with increased mine development.
- Finished nickel production from Thompson sourced ore decreased by 1.4 kt y/y**, driven by annual planned maintenance activities at Long Harbour that were finalized in early Q3.
- Finished nickel production from Voisey's Bay sourced ore decreased by 1.2 kt y/y** as result of the maintenance period at the Long Harbour Refinery and the ongoing planned transition period between the depletion of the open-pit Ovoid mine and the ramp-up of the underground VBME project. The transition to underground mining continues to progress according to plan, with VBME ore production increasing 53% y/y and 43% q/q.
- Finished nickel produced from third-party sources increased by 0.1 kt y/y**. Consumption of third-party feed increased as planned and in line with the strategy to maximize the utilization and performance of our downstream operations.
- Finished nickel production from Indonesia sourced material decreased by 2.1 kt y/y** as the Clydach refinery was ramping up after the Q2 planned maintenance and was impacted by the regional water supply outage in July. Nickel-in-matte production reached 18.0 kt in 3Q23 at PTVI, benefiting from the improved mine grade and furnace performance.
- Onça Puma production decreased by 1.0 kt y/y** as the furnace is operating at a lower rate in preparation for the furnace rebuild, which started in the second week of October and will continue up to the end of 1Q24.
- Nickel sales decreased by 5.1 kt y/y** due to lower production volumes. Quarter on quarter, nickel sales were 1.1 kt lower, mainly due to inventories of ferronickel from Onça Puma, which were held to comply with sales commitments in 4Q23 during the furnace rebuild.
- The average nickel realized price was US\$ 21,237/t**, a 2% decrease y/y, mainly due to a 7% decrease in LME nickel reference prices (US\$ 20,344/t in 3Q23 vs. US\$ 22,063/t in 3Q22), mostly offset by the positive effect from hedging results and higher average premiums for Class I products.



ANNEX – Production and sales summary

Iron ore

000' metric tons	3Q23	2Q23	3Q22	9M23	9M22	% change		
						3Q23/2Q23	3Q23/3Q22	9M23/9M22
Northern System	48,188	40,157	49,652	124,115	126,457	20.0%	-2.9%	-1.9%
Serra Norte and Serra Leste	28,833	21,000	30,678	69,283	75,812	37.3%	-6.0%	-8.6%
S11D	19,355	19,156	18,974	54,832	50,646	1.0%	2.0%	8.3%
Southeastern System	20,350	21,795	19,725	60,749	54,237	-6.6%	3.2%	12.0%
Itabira (Cauê, Conceição and others)	8,543	8,362	7,017	24,344	20,276	2.2%	21.7%	20.1%
Minas Centrais (Brucutu and others)	5,250	6,537	5,845	17,198	15,364	-19.7%	-10.2%	11.9%
Mariana (Alegria, Timbopeba and others)	6,557	6,895	6,864	19,205	18,599	-4.9%	-4.5%	3.3%
Southern System	17,701	16,792	20,324	46,892	46,244	5.4%	-12.9%	1.4%
Paraopeba (Mutuca, Fábrica and others)	8,273	7,483	10,725	20,082	21,703	10.6%	-22.9%	-7.5%
Vargem Grande (Vargem Grande, Pico and others)	9,428	9,308	9,599	26,810	24,541	1.3%	-1.8%	9.2%
IRON ORE PRODUCTION¹	86,238	78,743	89,701	231,755	226,937	9.5%	-3.9%	2.1%
OWN PRODUCTION	79,073	73,020	83,266	215,583	213,454	8.3%	-5.0%	1.0%
THIRD-PARTY PURCHASES	7,165	5,723	6,435	16,172	13,483	25.2%	11.3%	19.9%
FINES AND PELLET SALES	78,327	72,138	73,902	204,460	203,836	8.6%	6.0%	0.3%
FINES SALES²	69,714	63,329	65,381	178,904	179,461	10.1%	6.6%	-0.3%
PELLET SALES	8,613	8,809	8,521	25,556	24,375	-2.2%	1.1%	4.8%
ROM SALES	2,232	2,236	3,668	6,132	6,253	-0.2%	-39.1%	-1.9%
SALES FROM 3RD PARTY PURCHASE	6,646	5,572	6,211	15,764	13,446	19.3%	7.0%	17.2%

¹ Including third-party purchases, run-of-mine and feed for pelletizing plants. Vale's product portfolio Fe content reached 62.9%, alumina 1.4% and silica 5.4% in 3Q23.

² Including third-party purchases.

Pellets

000' metric tons	3Q23	2Q23	3Q22	9M23	9M22	% change		
						3Q23/2Q23	3Q23/3Q22	9M23/9M22
Northern System	1,037	665	899	2,486	2,473	55.9%	15.4%	0.5%
São Luis	1,037	665	899	2,486	2,473	55.9%	15.4%	0.5%
Southeastern System	4,403	4,633	3,284	13,705	11,061	-5.0%	34.1%	23.9%
Itabrasco (Tubarão 3)	801	1,004	525	2,756	1,765	-20.2%	52.6%	56.1%
Hispanobras (Tubarão 4)	720	57	-	777	-	1,163.2%	n.m.	n.m.
Nibrasco (Tubarão 5 and 6)	837	1,130	349	3,175	2,334	-25.9%	139.8%	36.0%
Kobrasco (Tubarão 7)	557	800	924	2,305	2,856	-30.4%	-39.7%	-19.3%
Tubarão 8	1,488	1,642	1,485	4,692	4,104	-9.4%	0.2%	14.3%
Southern System	1,107	1,200	1,268	3,454	3,083	-7.8%	-12.7%	12.0%
Fábrica	-	-	-	-	-	-	-	-
Vargem Grande	1,107	1,200	1,268	3,454	3,083	-7.8%	-12.7%	12.0%
Oman	2,628	2,613	2,805	6,960	7,235	0.6%	-6.3%	-3.8%
PELLET PRODUCTION	9,175	9,111	8,256	26,604	23,852	0.7%	11.1%	11.5%
PELLET SALES	8,613	8,809	8,521	25,556	24,375	-2.2%	1.1%	4.8%

Copper – Finished production by source

000' metric tons	3Q23	2Q23	3Q22	9M23	9M22	% change		
						3Q23/2Q23	3Q23/3Q22	9M23/9M22
Brazil	66.7	57.7	53.4	170.5	126.1	15.6%	24.9%	35.2%
Salobo	49.6	42.7	34.7	125.1	98.3	16.2%	42.9%	27.3%
Sossego	17.1	15.0	18.7	45.4	27.8	14.0%	-8.6%	63.3%
Canada	14.9	21.1	20.9	57.0	60.7	-29.4%	-28.7%	-6.1%
Sudbury	9.4	16.7	12.3	42.4	43.1	-43.7%	-23.6%	-1.6%
Thompson	1.6	0.05	3.6	1.8	4.1	3,100.0%	-55.6%	-56.1%
Voisey's Bay	2.7	2.2	3.3	7.0	8.9	22.7%	-18.2%	-21.3%
Feed from third parties ¹	1.2	2.1	1.7	5.8	4.6	-42.9%	-29.4%	26.1%
COPPER PRODUCTION	81.6	78.8	74.3	227.5	186.8	3.6%	9.8%	21.8%
COPPER SALES	73.8	73.8	70.5	210.3	172.2	0.0%	4.7%	22.1%
Copper Sales Brazil	61.8	52.7	52.9	157.7	121.6	17.3%	16.8%	29.7%
Copper Sales Canada	12.0	21.0	17.6	52.5	50.6	-42.9%	-31.8%	3.8%

¹ External feed purchased from third parties and processed into copper in our Canadian operations.

Nickel – Finished production by source

000' metric tons	3Q23	2Q23	3Q22	9M23	9M22	% change		
						3Q23/2Q23	3Q23/3Q22	9M23/9M22
Canada	13.3	13.2	20.0	42.8	55.1	0.8%	-33.5%	-22.3%
Sudbury	8.1	10.6	12.2	28.2	27.9	-23.6%	-33.6%	1.1%
Thompson	1.3	0.9	2.7	4.6	7.7	44.4%	-51.9%	-40.3%
Voisey's Bay	3.9	1.7	5.1	10.0	19.5	129.4%	-23.5%	-48.7%
Indonesia	17.1	13.2	19.2	44.3	45.9	29.5%	-10.9%	-3.5%
Brazil	5.8	5.7	6.8	16.4	18.5	1.8%	-14.7%	-11.4%
Feed from third parties¹	5.9	4.8	5.8	16.6	12.3	22.9%	1.7%	35.0%
NICKEL PRODUCTION	42.1	36.9	51.8	120.0	131.8	14.1%	-18.7%	-9.0%
NICKEL SALES	39.2	40.3	44.3	119.6	122.6	-2.7%	-11.5%	-2.4%

¹ External feed purchased from third parties and processed into finished nickel in our Canadian operations.

Energy Transition Metals by-products – Finished production

	3Q23	2Q23	3Q22	9M23	9M22	% change		
						3Q23/2Q23	3Q23/3Q22	9M23/9M22
COBALT (000' metric tons)	452	361	609	1,410	1,906	25.2%	-25.8%	-26.0%
PLATINUM (000' oz troy)	24	36	32	94	76	-33.3%	-25.0%	23.7%
PALLADIUM (000' oz troy)	24	46	37	110	94	-47.8%	-35.1%	17.0%
GOLD (000' oz troy) ¹	117	91	84	287	216	28.6%	39.3%	32.9%
TOTAL BY-PRODUCTS (000' metric tons Cu eq.)^{2 3}	38	39	41	111	101	-2.6%	-4.9%	-63.1%

¹ Includes Gold from Copper and Nickel operations.

² Includes Iridium, Rhodium, Ruthenium, and Silver.

³ Copper equivalent tons calculated using average market metal prices for each quarter. Market reference prices: for copper and cobalt: LME spot; for Gold and Silver: LME spot for 2Q22 (also included in 1H22) and NYMEX from 3Q22 onwards; for Platinum and Palladium: NYMEX spot; for other PGMs: Johnson Matthey.

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

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