



Loading ship at Ponta da Madeira Maritime Port, São Luís, MA, Brazil.

VALE'S PRODUCTION AND SALES IN 3Q20

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Production and sales in 3Q20

Iron Ore: solid output of 88.7Mt, + 21Mt q/q, up 31.2%	Northern System: all-time production record of 56.9Mt	Base Metals: maintenance has enabled a strong 4Q20 start	COVID-19: world-class safety standards in place and low absenteeism
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Rio de Janeiro, October 19th, 2020 – Vale S.A. (“Vale”) is evolving with its stabilization plan and delivered a strong iron ore production in 3Q20. Nickel and Copper businesses managed to recover productivity for a solid start in 4Q20, after normalizing routine maintenance in the quarter. Results were enabled by the workforce commitment to the company’s safety standards and strict operational discipline, following the continuous implementation of the Vale Production System (VPS).

Vale’s iron ore fines production¹ totalled 88.7 Mt, an increase of 21.1 Mt compared to the previous quarter. The production record of 56.9 Mt in a quarter was reached in the Northern System, with August as the best month with 19.7 Mt. S11D had a record production in September, with 8.3Mt, and in the quarter, with 24.4 Mt.

The Southern and Southeastern Systems overall performance improved across operating units, notably in the Itabira Complex and Timbopéba site (running for a full quarter given the resumption in June) and with the resumption of operations at Fazendão mine in July.

Iron ore production was maintained at around 1 Mtpd² after mid-July, showing consistency and stability throughout almost the entire quarter. Operations have achieved increased rates and stability with safety, based on the progressive implementation of the VPS and measures like the Safe Work Permission (PTS), which are essential to transform Vale’s culture into one driven to safety and operational excellence. All operations were also favoured by regular weather conditions for the period.

Vale’s pellet production totalled 8.6 Mt in 3Q20, up 21.1%, mainly due to higher availability of pellet feed, especially from the Itabira Complex, and improved operational performance at the pelletizing plants.

Sales volumes of iron ore fines and pellets, with a premium of US\$ 4.6/t³, reached 74.2 Mt in 3Q20, an increase of 20.4%. The logistics lead time between production and CFR sales started to normalize in September, as Vale was transiting inventories across its supply chain, with total sales

¹ Including third party purchases, run-of-mine and feed for pelletizing plants. Vale’s product portfolio Fe content reached 63.5%, alumina 1.4% and silica 3.9%.

² Mtpd stands for million tons per day.

³ Iron ore premium of US\$ 3.7/t and weighted average contribution of pellets of US\$ 0.9/t.

of 28.6 Mt, and the performance is expected to improve even further in 4Q20, subject to Vale's approach based on margin maximization, prioritizing blended products in the company's portfolio.

Production of finished nickel was of 47.1 kt in 3Q20, while sales volumes reached 58.2 kt, an increase of 37.3%, as a result of better prices in the quarter and more stable market conditions. Production in 3Q20 was influenced mainly by (i) maintenance work rescheduled from 1Q20 and 2Q20 to 3Q20 in North Atlantic operations, which will pave the way for higher production rates going into the fourth quarter, (ii) a longer route to market associated with PTVI's product portfolio management and (iii) a temporarily spike in VNC source production in 2Q20 as all of the remaining nickel oxide feed inventory was processed in that quarter.

Copper production reached 87.6 kt in 3Q20, higher than the previous quarter, mainly due to the successful resumption of Voisey's Bay operations after the care and maintenance period in 2Q20, and stronger performance at South Atlantic operations. A stronger performance is expected in 4Q20 at South Atlantic operations with the reduction of COVID-19-related impacts on operations and maintenance routines.

Coal production restarted in July, after decelerating since April and temporarily stopping in June, given strong slowdown in demand. Production in 3Q20 reached 1.4 Mt and, as the flow of goods, services and people start to normalize in the region, Vale mobilizes teams to resume the 3-month maintenance plan revamp in November 2020, after which a ramp up to 15 Mtpy run-rate production is expected.

Production summary

000' metric tons	3Q20	2Q20	3Q19	9M20	9M19	% change		
						3Q20/2Q20	3Q20/3Q19	9M20/9M19
Iron ore ¹	88,676	67,598	86,704	215,877	223,628	31.2%	2.3%	-3.5%
Pellets	8,562	7,070	11,133	22,559	32,378	21.1%	-23.1%	-29.5%
Manganese Ore	109	149	443	621	1,126	-26.8%	-75.4%	-44.9%
Coal	1,402	1,283	2,351	4,648	6,935	9.3%	-40.4%	-33.0%
Nickel	47.1	59.4	51.4	159.7	151.2	-20.7%	-8.4%	5.6%
Nickel Ex-VNC	38.6	49.0	45.0	132.8	132.6	-21.2%	-14.2%	0.2%
Copper	87.6	84.5	98.7	266.6	290.8	3.7%	-11.2%	-8.3%
Cobalt (metric tons)	1,223	1,318	1,009	3,730	3,236	-7.2%	21.2%	15.3%
Gold (000' oz troy)	116	114	122	349	349	1.8%	-4.9%	0.0%

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

Sales summary

000' metric tons	3Q20	2Q20	3Q19	9M20	9M19	% change		
						3Q20/2Q20	3Q20/3Q19	9M20/9M19
Iron ore ¹	65,769	54,615	74,039	172,040	191,400	20.4%	-11.2%	-10.1%
Pellets	8,464	6,950	11,077	22,725	32,233	21.8%	-23.6%	-29.5%
Manganese Ore	428	270	150	917	493	59.5%	185.3%	86.0%
Coal	1,381	1,385	2,254	4,332	6,741	-0.3%	-38.7%	-35.7%
Nickel	58.2	42.4	50.9	144.8	158.6	37.3%	14.3%	-8.7%
Copper	80.6	83.5	92.0	253.3	277.4	-3.5%	-12.4%	-8.7%

¹ Including third party purchases and run-of-mine.

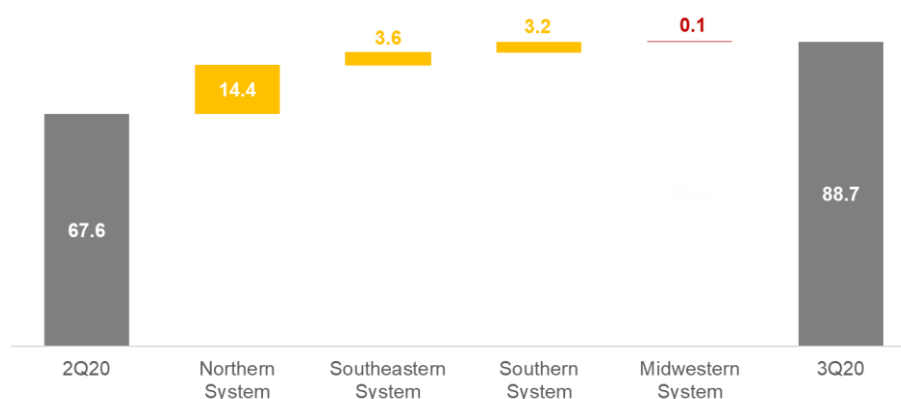
Iron ore

000' metric tons	3Q20	2Q20	3Q19	9M20	9M19	% change		
						3Q20/2Q20	3Q20/3Q19	9M20/9M19
Northern System	56,850	42,463	55,401	139,213	137,992	33.9%	2.6%	0.9%
Serra Norte and Serra Leste	32,459	24,319	35,047	78,258	83,914	33.5%	-7.4%	-6.7%
S11D	24,391	18,144	20,354	60,955	54,078	34.4%	19.8%	12.7%
Southeastern System	16,307	12,721	20,695	40,817	56,129	28.2%	-21.2%	-27.3%
Itabira (Cauê, Conceição and others)	6,465	5,324	9,836	17,796	27,902	21.4%	-34.3%	-36.2%
Minas Centrais (Brucutu and others)	4,394	4,190	8,849	12,233	19,283	4.9%	-50.3%	-36.6%
Mariana (Alegria, Timbopeba and others)	5,448	3,207	2,010	10,788	8,944	69.9%	171.0%	20.6%
Southern System	14,930	11,768	9,806	34,054	27,753	26.9%	52.3%	22.7%
Paraopeba (Mutuca, Fábrica and others)	7,064	5,873	7,109	16,585	19,640	20.3%	-0.6%	-15.6%
Vargem Grande (Vargem Grande, Pico and others)	7,866	5,895	2,697	17,469	8,113	33.4%	191.7%	115.3%
Midwestern System	589	645	802	1,793	1,754	-8.7%	-26.6%	2.2%
Corumbá	589	645	802	1,793	1,754	-8.7%	-26.6%	2.2%
IRON ORE PRODUCTION¹	88,676	67,598	86,704	215,877	223,628	31.2%	2.3%	-3.5%
IRON ORE SALES²	65,769	54,615	74,039	172,040	191,400	20.4%	-11.2%	-10.1%
IRON ORE AND PELLETS SALES	74,233	61,565	85,116	194,765	223,633	20.6%	-12.8%	-12.9%

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

² Including third party purchases and run-of-mine.

Production Variation (3Q20 x 2Q20) Mt



Northern System

The Northern System, which is comprised of Serra Norte, Serra Leste and S11D mines, produced 56.9 Mt in 3Q20, a record level for a quarter, mainly due to (i) a strong and record

performance of S11D, (ii) a 15-day maintenance in June and July in Serra Norte, which, despite the production losses in the beginning of the quarter, permitted the increase of site's productivity, and (iii) better weather in the region, with lower rainfall levels⁴, guaranteeing more stability in production.

The license and permit necessary to resume operations of Serra Leste are expected to be granted shortly and, after that, maintenances will be carried out to safely resume operations until the end of 2020. Serra Leste operations have been halted since January 2019 and its resumption will add up to 6 Mtpy of production capacity.

Southeastern System

The Southeastern System, which encompasses the Itabira, Minas Centrais and Mariana mining hubs, achieved a solid production of 16.3 Mt in 3Q20, despite the restrictions related to tailings disposal, limiting sites' capacity. The increased production level in the quarter was mainly due to (i) the absence of COVID-19-related impacts, which caused a temporary stoppage of 12-day of Itabira Complex in June and 1 Mt of production loss, (ii) Timbopeba site operations, which restarted in June with 4 Mtpy capacity running in a full quarter, (iii) the resumption of Fazendão mine operations in July, after the granting of license to expand the mining area on the site, and (iv) usual weather-related seasonality.

Southern System

The Southern System, which encompasses the Paraopeba and Vargem Grande mining hubs, produced 14.9 Mt in 3Q20. The increase of production compared with 2Q20 was achieved mainly due to (i) higher production in Vargem Grande complex, after the partial resumption of wet processing production in 2Q20 with tailings filtration, using the Maravilhas I dam and Cianita waste dump as a preliminary solution for tailings disposal, and (ii) seasonally higher third-party purchases.

Operational stabilization and resumption plan

As presented in the 2020 Analyst and Investor Tour presentation, Vale has a set of solutions and new assets for unlocking and resuming capacities in its sites, which are under implementation in collaboration with the National Mining Agency (ANM), the Public Prosecutor's Office of the Minas Gerais State (MPMG) and the external audit firms.

⁴ 3Q20 = 33mm vs. 2Q20 = 533mm

	Actions in progress	Accomplishments in 3Q20	Timeline for resumption
Northern System	- Obtaining license and implementing maintenance works in Serra Leste. - Licensing and opening new mining fronts. - Progressing on the construction of Gelado, Northern System 240 Mtpy and Serra Sul 120 projects.	- Northern System and S11D achieved a record production for a quarter. - Opening of new mining fronts in Morro 1 in progress increasing site's productivity. - Approval of Serra Sul 120 project	4Q20: Resumption of Serra Leste operation, adding 6 Mtpy in capacity. 2020/23: Applying for new licenses and opening of new mining fronts such as Morro 1 and N3. 2020/21: Installation of new crushers to process jaspilite ore bodies in S11D. 2021/23: Usina 1 shift to 100% dry processing temporarily impacting production. 1H22: Start-up of Gelado project, increasing the System's capacity by 10 Mtpy. 2H22: Start-up of Northern System 240 Mtpy project, increasing the System's capacity by 10 Mtpy. 2023: Expansion of Serra Leste to 10 Mtpy capacity. 1H24: Start-up of Serra Sul 120 project.
Brucutu	Completion of Torto dam⁵ and tailings' filtration plant construction to increase wet processing capacity.	- Torto dam construction works achieved 93% of physical progress - Tailings' filtration plant construction works achieved 31% of physical progress.	2Q21: Start-up of Torto dam, increasing site's capacity to 28 Mtpy from current 11 Mtpy. 2022: Start-up of tailings' filtering plant and dry stacking activities and use of Torto and Norte/Laranjeiras⁶ dams as contingency.
Itabira Complex	- Completion of studies (geotechnical investigations) of Itabiruçu dam. - Restart raising construction works of Itabiruçu dam, after removal of emergency level. - Completion of tailings' filtration plants construction to increase wet processing capacity.	- Progressed on studies required by external auditors to remove the emergency level of Itabiruçu dam. - Tailings' filtration plant construction works achieved 19% and 17% of physical progress in Cauê and Conceição, respectively.	1Q21: Removal of emergency level of Itabiruçu dam and start of raising construction. 2022: Start-up of tailings' filtering plants and dry stacking activities⁷, increasing site's capacity to 40 Mtpy from current 26 Mtpy.
Timbopeba	- Application for a permanent authorization to dispose tailings at Timbopeba pit. - Project being concluded to adapt the plant's capacity for tailings disposal at Timbopeba pit.	- First full quarter of operation since the site was halted in Mar/19, achieving a run-rate of 5.1 Mtpy. - Progressed on studies required by National Mining Agency for the final use of the Timbopeba pit and on plant's adaptation to increase capacity.	1Q21: Increase production capacity to 12 Mtpy from current 4 Mtpy fully disposing tailings at Timbopeba pit. 2023: Start-up of Capanema project⁸, adding 7 Mtpy of net capacity in the first years.

⁵ A positive declaration of stability condition (DCE) and an operating license for Torto dam operations are necessary, relying on the external auditor and authorities' assessment.

⁶ Norte/Laranjeiras dam is under Emergency Level 1 and today does not have a positive stability declaration, which is required to resume operations. The dam's stability assessment and definition of necessary actions is expected in 4Q20 and the use of the dam as contingency in 2025.

⁷ Using Itabiruçu dam as contingency.

⁸ Project with capacity of up to 18 Mtpy expected to be approved in 4Q20.

	Actions in progress	Accomplishments in 3Q20	Timeline for resumption
Vargem Grande Complex	• Completion of Maravilhas III dam⁹ and tailings' filtration plant construction to increase wet processing capacity. • De-characterization of Vargem Grande dam. • Studies to debottleneck logistics capacity, limited by the impossibility to operate the long-distance conveyor belt in the segment close to the Vargem Grande dam and the use of autonomous train in Forquilha and Grupo dams self-rescue zones (ZAS).	• Maravilhas III dam construction works achieved 53% of physical progress. • Tailings' filtration plant construction works achieved 79% of physical progress. • Forquilha I dam emergency level decreased to 2 from 3 in October.	• 2Q21: Start-up of Maravilhas III dam and tailings' filtering plant increasing site's production capacity to 30 Mtpy from current 27 Mtpy¹⁰ and resumption of VGR pellet plant, depending on market conditions. • 2022: Unlock site's conveyor belt capacity¹¹ after progressing on VGR dam de-characterization and licensing of new mining areas, which today limit capacity at 30 Mtpy. • 2020/27: Increase railway capacity, which today limits capacity at 36 Mtpy, advancing in studies to elevate automated train productivity and decreasing emergency levels of Forquilha and Grupo dams¹².
Fábrica	• Conclusion of required vibration tests (to certify the absence of impacts on the site's structures), depending on external assessment/approval. • Construction of pipeline for tailings disposal at Forquilha V dam.	• TAS¹³ railway terminal operations resumed in July, after vibration tests, enabling inventory movement. • Approval received in October to start vibration tests in mines and crushing facilities.	• 1Q21: Conclusion of vibration tests. • 2Q21: Site's resumption with 6 Mtpy of production capacity, after concluding pipeline construction for tailings disposal at Forquilha V dam • 3Q21: Resumption of Fábrica pellet plant, depending on market conditions.

⁹ A positive declaration of stability condition (DCE) for Maravilhas III dam operations are necessary, relying on the external auditor's assessment.

¹⁰ The start-up increases mine-plant capacity to 53 Mtpy.

¹¹ Resumption of conveyor belt relies on external approvals by National Mining Agency (ANM) and external auditors.

¹² Decrease of emergency levels also depends on external evaluation by ANM and external auditors.

¹³ TAS stands for Terminal de Água Santa.

Pellets

000' metric tons	3Q20	2Q20	3Q19	9M20	9M19	% change		
						3Q20/2Q20	3Q20/3Q19	9M20/9M19
Northern System	1,176	919	1,090	2,978	2,846	28.0%	7.9%	4.6%
São Luis	1,176	919	1,090	2,978	2,846	28.0%	7.9%	4.6%
Southeastern System	4,906	3,537	7,628	13,575	21,468	38.7%	-35.7%	-36.8%
Tubarão 1 and 2	-	-	1,012	-	2,692	n.m.	-100%	-100%
Itabasco (Tubarão 3)	821	455	868	2,164	2,183	80.4%	-5.4%	-0.9%
Hispanobras (Tubarão 4)	863	363	942	1,855	2,590	137.7%	-8.4%	-28.4%
Nibrasco (Tubarão 5 and 6)	1,007	842	2,042	3,074	6,009	19.6%	-50.7%	-48.8%
Kobrasco (Tubarão 7)	849	541	995	2,200	2,922	56.9%	-14.7%	-24.7%
Tubarão 8	1,366	1,336	1,769	4,283	5,072	2.2%	-22.8%	-15.6%
Southern System	-	129	-	129	1,069	-100%	n.m.	-87.9%
Fábrica	-	-	-	-	515	n.m.	n.m.	-100%
Vargem Grande	-	129	-	129	554	-100%	n.m.	-76.7%
Oman	2,480	2,485	2,415	5,877	6,841	-0.2%	2.7%	-14.1%
Others¹	-	-	-	-	154	n.m.	n.m.	-100%
PELLETS PRODUCTION	8,562	7,070	11,133	22,559	32,378	21.1%	-23.1%	-30.3%
PELLETS SALES	8,464	6,950	11,077	22,725	32,233	21.8%	-23.6%	-29.5%

¹ Third party capacity utilization.

Production overview

Vale's pellets production in 3Q20 was 21% higher than in 2Q20, mainly due to less maintenance stoppages and higher pellet feed availability, as a result of Timbopeba's site resumption in June and the absence of COVID-19-related disruptions at the Itabira Complex.

Manganese ore and ferroalloys

000' metric tons	3Q20	2Q20	3Q19	9M20	9M19	% change		
						3Q20/2Q20	3Q20/3Q19	9M20/9M19
MANGANESE ORE PRODUCTION	109	149	443	621	1,126	-26.8%	-75.4%	-44.9%
Azul	-	-	267	230	752	-	-100.0%	-69.4%
Urucum	89	131	132	330	247	-21.1%	-32.3%	-33.3%
Morro da Mina	20	18	44	61	127	8.4%	-55.5%	-52.1%
MANGANESE ORE SALES	428	270	150	917	493	58.5%	185.3%	86.0%
FERROALLOYS PRODUCTION	15	15	40	57	124	-	-62.5%	-54.0%
FERROALLOYS SALES	15	10	29	52	92	50.0%	-48.3%	-43.5%

Production and sales overview

Manganese ore production decreased mainly due to (i) the extended halting of operations at the Azul mine and (ii) non-scheduled maintenance works at the Urucum mine in 3Q20. The stoppage at the Azul mine will likely stand until December 2020, being maintained by the current level of inventories, which supported 3Q20 manganese ore sales. Ferroalloys production and sales volumes remained in line with the previous quarter.

Vale informs that the company decided to close its ferroalloys production in Simões Filho, BA, after reiterated attempts to sustain the operation's competitiveness were unsuccessful. The demobilization completion is expected by the end of the year. Vale reinforces its commitment to employees, communities, suppliers and the authorities. With transparency and open dialogue, the company has outlined measures to mitigate the impacts of that decision on its stakeholders.

Nickel

Finished production by source

000' metric tons	3Q20	2Q20	3Q19	9M20	9M19	% change		
						3Q20/2Q20	3Q20/3Q19	9M20/9M19
Canada	18.9	26.6	24.8	67.4	71.3	-28.9%	-23.8%	-5.5%
Sudbury	6.5	13.5	13.3	32.0	35.5	-51.9%	-51.1%	-9.9%
Thompson	2.2	3.6	2.7	8.5	8.4	-38.9%	-18.5%	1.2%
Voisey's Bay	10.1	9.4	8.7	26.8	27.4	7.4%	16.1%	-2.2%
Indonesia	15.3	17.5	18.5	51.4	47.4	-12.6%	-17.3%	8.4%
New Caledonia	8.5	10.4	6.4	26.9	18.6	-18.3%	32.8%	44.6%
Brazil	3.2	3.2	0.1	9.4	8.3	0.0%	3100.0%	13.3%
Feed from third parties ¹	1.3	1.7	1.5	4.8	5.5	-23.5%	-13.3%	-12.7%
NICKEL PRODUCTION	47.1	59.4	51.4	159.7	151.2	-20.7%	-8.4%	5.6%
NICKEL PRODUCTION EX-VNC	38.6	49.0	45.0	132.8	132.6	-21.2%	-14.2%	0.2%
NICKEL SALES	58.2	42.4	50.9	144.8	158.6	37.3%	14.3%	-8.7%

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

Production variation (3Q20 x 2Q20) kt



Canadian operations

North Atlantic operations were impacted by maintenance work rescheduled from 1Q and 2Q to 3Q, a consequence of the COVID-19 pandemic. Sudbury-source ore production reached 6.5 kt in 3Q20, 52% lower than 2Q20. Thompson-source ore production reached 2.2 kt in 3Q20, 39% lower than 2Q20. Production decrease resulted from scheduled and unscheduled maintenance at both Copper Cliff Nickel Refinery and Clydach refinery, as well as scheduled maintenance at Sudbury and Thompson mines. 2020 includes a biennial broader-scope scheduled maintenance, with scope of surface plants and underground mines, that should be normalized when comparing to the same period in 2019, which included exclusively underground mines.

Voisey's Bay-source ore production reached 10.1 kt in 3Q20, 7% higher than 2Q20, mainly due to higher productivity of the Long Harbour Processing Plant throughout the quarter. The

resumption of Voisey's Bay operations ensures sufficient feed for continued strong performance in the fourth quarter and beyond.

Indonesian operation (PTVI)

Production of finished nickel from PTVI source reached 15.3 kt in 3Q20, 13% lower than 2Q20, mainly as a result of a longer route to market associated to product portfolio management, and scheduled maintenance work at the Clydach refinery during the quarter. PTVI feed inventory currently stored in Clydach will set up the stage for a stronger fourth quarter production rate.

Nickel in matte production at PTVI site reached 19.5 kt in 3Q20, slightly higher than 2Q20, mainly due to continued stable operations throughout the quarter with no major maintenance interruptions.

New Caledonia operation (VNC)

Production of finished nickel from VNC source reached 8.5 kt in 3Q20, 18% lower than 2Q20, as all the remaining nickel oxide feed inventory was processed in 2Q as part of the plan to ramp down the VNC refinery. Rates have normalized with sole production of nickel hydroxide cake and, as a result of the product mix change, the Dalian refinery began the care and maintenance process in July.

Nickel production at VNC site reached 8.1 kt in 3Q20, 19% higher than in 2Q20, with production focusing entirely on nickel hydroxide cake. Should no sustainable solution be found in the coming months regarding the divestment in VNC, Vale will move forward with the required steps to place it on care and maintenance in 2021.

Brazilian operation (Onça Puma)

Production at Onça Puma reached 3.2 kt in 3Q20, in line with 2Q20. Productivity was limited due to a safety recommendation which extended maintenance work beyond July. Maintenance was successfully completed by quarter-end, which will allow a higher production in 4Q, reaching full capacity.

Copper

Finished production by source

000' metric tons	3Q20	2Q20	3Q19	9M20	9M19	% change		
						3Q20/2Q20	3Q20/3Q19	9M20/9M19
BRAZIL	67.6	60.8	69.0	193.0	196.2	11.2%	-2.0%	-1.6%
Salobo	45.4	41.3	50.9	128.9	137.6	9.9%	-10.8%	-6.3%
Sossego	22.2	19.5	18.1	64.1	58.6	13.8%	22.7%	9.4%
CANADA	20.0	23.7	29.6	73.6	94.5	-15.6%	-32.4%	-22.1%
Sudbury	13.1	21.9	21.8	58.1	69.5	-40.2%	-39.9%	-16.4%
Thompson	0.2	0.3	0.3	0.7	0.8	-33.3%	-33.3%	-12.5%
Voisey's Bay	5.7	0.5	5.9	11.5	18.7	1,040%	-3.4%	-38.5%
Feed from third parties	1.0	1.0	1.6	3.3	5.6	0.0%	-37.5%	-41.1%
COPPER PRODUCTION	87.6	84.5	98.7	266.6	290.8	3.7%	-11.2%	-8.3%
COPPER SALES	80.6	83.5	92.0	253.3	277.4	-3.5%	-12.4%	-8.7%
Copper Sales Brazil	62.3	59.7	67.9	180.5	188.7	4.4%	-8.2%	-4.3%
Copper Sales Canada	18.3	23.7	24.1	72.7	88.8	-22.8%	-24.1%	-18.1%

Production variation (3Q20 x 2Q20) kt



Production and sales overview

Copper production reached 87.6 kt in 3Q20 as a result of (i) stronger operational performance of Brazilian operations after COVID-19-related absenteeism level decreased significantly, and (ii) Voisey's Bay successfully resuming operations in July after being on care and maintenance since March related to the COVID-19 pandemic. These increases were partially offset by lower production from Sudbury, which was affected by the schedule maintenance work done during the summer, as well as lower copper grades.

Sales volumes¹⁴ of copper were 80.6 kt in 3Q20, 3.5% lower than 2Q20 mainly reflecting the rebuilding of inventories throughout the quarter and lagged timing of sales.

¹⁴ Sales volumes are lower compared to production volumes due to payable copper vs. contained copper content: part of the copper contained in the concentrates is lost in the smelting and refining process, hence payable quantities of copper are approximately 3.5% lower than production volumes.

Cobalt and other by-products

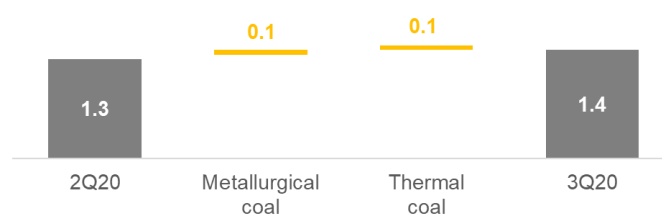
Finished production by source

Metric tons	3Q20	2Q20	3Q19	9M20	9M19	% change		
						3Q20/2Q20	3Q20/3Q19	9M20/9M19
COBALT	1,223	1,318	1,009	3,730	3,236	-7.2%	21.2%	15.3%
Sudbury	61	156	90	358	358	-60.9%	-32.2%	0.0%
Thompson	10	13	18	45	59	-23.1%	-44.4%	-23.7%
Voisey's Bay	464	433	372	1,204	1,244	7.2%	24.7%	-3.2%
VNC	601	653	428	1,881	1,187	-8.0%	40.4%	58.5%
Others	86	64	101	242	387	34.4%	-14.9%	-37.5%
PLATINUM (000' oz troy)	26	35	25	109	103	-25.7%	4.0%	5.8%
PALLADIUM (000' oz troy)	37	51	32	147	126	-27.5%	15.6%	16.7%
GOLD BY- PRODUCT (000' oz troy)	116	114	122	349	349	1.8%	-4.9%	0.0%

Coal

000' metric tons	3Q20	2Q20	3Q19	9M20	9M19	% change		
						3Q20/2Q20	3Q20/3Q19	9M20/9M19
COAL PRODUCTION	1,402	1,283	2,310	4,648	6,894	9.3%	-39.3%	-32.6%
Metallurgical Coal	756	698	1,020	2,436	3,207	8.3%	-25.9%	-24.0%
Thermal Coal	646	585	1,290	2,212	3,687	10.4%	-49.9%	-40.0%
COAL SALES	1,435	1,385	2,254	4,386	6,741	3.6%	-36.3%	-34.9%
Metallurgical Coal	809	516	1,083	2,031	3,411	56.8%	-25.2%	-40.5%
Thermal Coal	626	869	1,172	2,355	3,330	-28.0%	-46.6%	-29.3%

Production Variation (3Q20 x 2Q20) Mt



Production and sales overview

The depression in the seaborne coal demand continues to influence Vale's coal production levels, as inventories at mine and port remain high, close to the facilities' storage limits. In 3Q20, production increased by 9.3% compared to 2Q20, since no further operational stoppages were required.

With increased flexibility in the flow of goods, services and people in the region, which enabled the inbound logistics of equipment and materials to the site, and based on the safety levels maintained at this stage, Vale decided to resume its maintenance plan revamp in November 2020, and teams are already being mobilized for that. After that action, improved operational conditions will likely lead to a run-rate production of 15 Mtpy.