



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

VALE'S PRODUCTION AND SALES IN 1Q20

www.vale.com

vale.ri@vale.com

Tel.: (5521) 3485-3900

Investor Relations Department

Ivan Fadel

André Werner

Mariana Rocha

Samir Bassil

B3: VALE3

NYSE: VALE

LATIBEX: XVALO

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Production and sales in 1Q20

Rio de Janeiro, April 17th, 2020 – Vale S.A (“Vale”), first and foremost, wishes to express solidarity with the victims and families impacted by the COVID-19 pandemic. At such a difficult time for everyone, Vale is committed to supporting its people, communities and stakeholders, and to maintain a healthy ecosystem for its value chain, joining forces to prevent or reduce the spread of COVID-19 in every location where Vale operates.

In order to safeguard its employees, businesses and communities surrounding its operations, Vale has increased even further its safety measures. Starting in the second half of March, Vale has been putting in place a set of actions such as: (i) a home-office regime for the great majority of its own and third-party employees with administrative functions; (ii) company-wide communication on the response plan and prevention procedures; (iii) reduction in the number of people in operational sites and in buses to allow for safe distancing, (iv) suspension of all non-essential construction works at sites; (v) scanning body temperature at sites’ entrances, and (vi) implementation of daily checklists and continuous monitoring of potential symptoms for the entire workforce.

Overall, in 1Q20, production across Vale’s businesses suffered limited impact due to the COVID-19 pandemic. Direct impacts on its operations in the first quarter of 2020, as disclosed in different moments, can be summarized as: (i) in the Iron Ore business, Vale temporarily halted operations in the Teluk Rubiah Maritime Terminal in Malaysia, with no impact on production; (ii) in the Base Metals business, Vale ramped down its Voisey’s Bay mining operation and placed it on care and maintenance for an initial period of four weeks, later extending this period additionally by up to three months, with an impact of up to 6 kt of copper concentrate production in 1H20; and (iii) in the Coal business, Vale decided to postpone plans for the coal processing plant maintenance (revamp) in Mozambique.

Looking ahead, the COVID-19 impact on Vale’s operations could be more meaningful, mainly from: (i) the potential increase in absenteeism levels in its producing sites, if Vale needs to intensify safety measures to protect its employees in case there is an escalation of contagion in the communities close to operations, (ii) postponement of scheduled plant maintenance stoppages in Base Metals due to safety restrictions, and (iii) potentially deeper restrictions imposed by authorities in order to fight the COVID-19 pandemic, which may ultimately strain Vale’s minimum labour contingent.

Vale’s iron ore fines production¹ totalled 59.6 Mt, therefore below the production guidance of 63-68 Mt for 1Q20. The main causes for that result are: (i) losses of 4.5 Mt in the Northern System from (a) unscheduled maintenance of the long distance conveyor belt at

¹Including third party purchases, run-of-mine and feed for pelletizing plants. Vale’s product portfolio Fe content reached 64.4%, alumina 1.2% and silica 3.3%.

S11D; (b) concentrated, stronger-than-usual weather-related conditions, especially in March; (c) operational restrictions at the Northern Range connected to the postponement of the start-up of the new Morro 1 mining section; (ii) losses of 1.8 Mt from lower third-party purchases, due to reduced availability caused by the heavy rains in the southeast of Brazil; and (iii) losses of 2.1 Mt from a number of operational issues in the Southeastern System, mainly in the Itabira Complex.

Iron ore production in 1Q20 Mt



Sales volumes of iron ore fines and pellets reached 59.0 Mt, in line with production in 1Q20. The share of premium products totalled 87% in 1Q20. Iron ore fines and pellets quality premiums reached US\$ 5.2/t² in 1Q20, US\$ 1.2/t lower than 4Q19, mainly due to absence of dividends received³ and lower pellet premiums, which were partially offset by higher iron ore fines premiums.

Vale revised its guidance for iron ore fines production in 2020⁴ to 310-330 Mt from 340-355 Mt and its pellet production guidance to 35-40 Mt from 44 Mt. The main reasons for this revision are: (i) the 1Q20 production miss; (ii) delays in the resumption of halted operations, such as Timbopeba and Fabrica, as the COVID-19 pandemic has been delaying inspections, assessments and authorization processes; (iii) delays in implementation of alternatives for the disposal of tailings by the Brucutu plant, which should not be completed until the end of 2Q20; and (iv) additional impacts related to the pandemic, associated with the risk of increasing

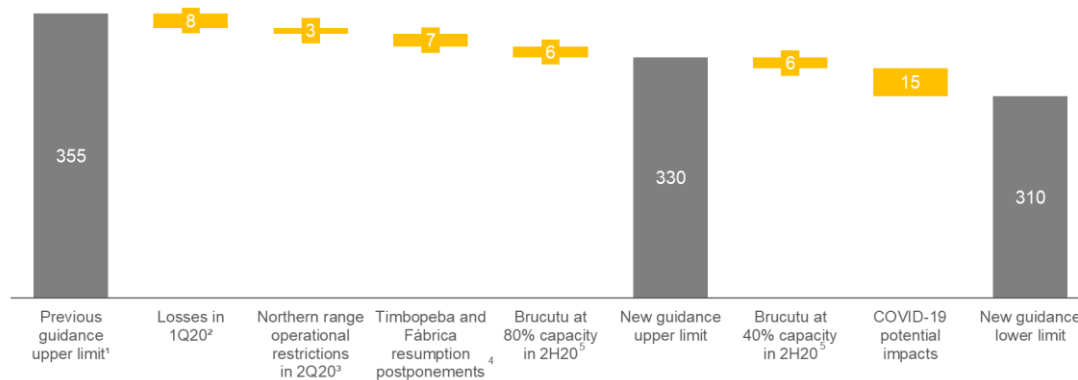
² Iron ore premium of US\$ 4.6/t and weighted average contribution of pellets of US\$ 0.6/t.

³ Dividends from leased pelletizing plants, which are usually paid every six months (in 2Q and 4Q).

⁴ Production volumes continue to depend on the granting of external authorizations to resume halted production. The guidance may change according to market conditions and Vale's strategy of margin over volume, prioritizing blended products in its portfolio.

absenteeism when running different sensitivity scenarios. The chart below illustrates the change in Vale's iron ore fines production guidance for the year:

Iron ore fines production guidance changes Mt



¹ Previous guidance was 340-355 Mt.

² Comparing with upper limit of 63-68 Mt guidance in 1Q20.

³ Associated with the delay of Morro 1 mining section start up.

⁴ Resumption of halted operations was expected to add 15 Mt in 2020. Due to postponements, it is expected to add 8 Mt.

⁵ In the former upper scenario, Brucutu was expected to produce 24 Mt. New upper production scenario is 18 Mt (running at 40% capacity in 1H20 and 80% in 2H20) and new lower scenario is 12 Mt (running at 40% capacity in 2020).

Vale's sales volume in 2020 may change according to market conditions and Vale's strategy of margin over volume, prioritizing blended products in its portfolio and the replenishment of inventories in 2020 as appropriate.

Production of finished nickel was strong, for a first quarter, at 53.2 kt, despite the decline of 2.9% year on year, as 1Q19 also presented a solid performance. The sequential decline of 6.2% from 4Q19 was mainly due to seasonality and routine scheduled maintenance at PTVI site and at the Matsusaka refinery in 1Q20, along with lower source ore from Canadian and Indonesian operations being processed at the Clydach and Dalian refineries, respectively.

The plan to close VNC's refinery is advancing as planned and refining activities responsible for processing the feed into nickel oxide started to ramp down in March 2020, which will lead to the sole production of nickel hydroxide cake at the site starting in May 2020.

Copper production reached 94.5 kt in 1Q20, 4.7% and 0.7% higher than 4Q19 and 1Q19, respectively, mainly due to higher volumes from Sossego after the unscheduled maintenance shutdown in 4Q19.

Considering the idling of Voisey's Bay and the impact of COVID-19 on Vale's ability to perform plant maintenance stoppages common to Base Metals as scheduled, the company revised its 2020 production guidance for nickel ex-VNC to 180-195 kt (from 200-210 kt) and for copper to 360-380 kt (from 400 kt). For more details, please refer to the Nickel and Copper sections.

Coal production of 2.0 Mt in 1Q20 was 4.6% higher than in 4Q19, with March production reaching 918 kt (annualized run rate of 11 Mt) due to better mine/mill performance, despite of weather-related effects in the first quarter. Nonetheless, it is not possible to maintain this production pace in April as the mine and port storage capacity reached their limits due to the lower demand for coal. Due to the uncertainties arising from the COVID-19 pandemic, which include the already announced postponement of the processing plant revamp in Mozambique (without a new start date), **Vale is withdrawing and cannot, at this moment, provide a new coal production guidance for 2020.**

The company is continuously evaluating the impact of the COVID-19 pandemic on its business and will disclose promptly any further material impact on its operations, supply chain or customer demand. **Vale remains committed to resume and stabilize production under the highest safety conditions, while implementing actions to ensure business continuity and proactively collaborating with society during the COVID-19 pandemic.**

Production summary

000' metric tons	1Q20	4Q19	1Q19	% change	
				1Q20/4Q19	1Q20/1Q19
Iron ore ¹	59,605	78,344	72,870	-23.9%	-18.2%
Pellets	6,926	9,415	12,174	-26.4%	-43.1%
Manganese Ore	363	450	365	-19.3%	-0.5%
Coal	1,963	1,876	2,213	4.6%	-11.3%
Nickel	53.2	56.7	54.8	-6.2%	-2.9%
Copper	94.5	90.3	93.8	4.7%	0.7%
Cobalt (metric tons)	1,189	1,140	1,195	4.3%	-0.5%
Gold (000' oz troy)	119	132	108	-9.8%	10.2%

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

Sales summary

000' metric tons	1Q20	4Q19	1Q19	% change	
				1Q20/4Q19	1Q20/1Q19
Iron ore ¹	51,656	77,907	55,416	-33.7%	-6.8%
Pellets	7,311	10,966	12,314	-33.3%	-40.6%
Manganese Ore	219	570	252	-61.6%	-13.1%
Coal	1,566	2,042	2,394	-23.3%	-34.6%
Nickel	44.2	47.0	50.3	-5.9%	-12.1%
Copper	89.2	87.8	90.4	1.6%	-1.3%

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

Iron ore

000' metric tons	1Q20	4Q19	1Q19	% change	
				1Q20/4Q19	1Q20/1Q19
Northern System	39,900	50,729	41,015	-21.3%	-2.7%
Northern and Eastern Ranges	21,480	31,438	23,029	-31.7%	-6.7%
S11D	18,420	19,291	17,986	-4.5%	2.4%
Southeastern System	11,789	17,019	19,578	-30.7%	-39.8%
Itabira (Cauê, Conceição and others)	6,007	8,067	9,292	-25.5%	-35.4%
Minas Centrais (Brucutu and others)	3,649	6,600	5,191	-44.7%	-29.7%
Mariana (Alegria, Timbopeba and others)	2,133	2,352	5,095	-9.3%	-58.1%
Southern System	7,356	9,980	11,776	-26.3%	-37.5%
Paraopeba (Mutuca, Fábrica and others)	3,648	4,997	6,795	-27.0%	-46.3%
Vargem Grande (Vargem Grande, Pico and others)	3,708	4,983	4,980	-25.6%	-25.5%
Midwestern System	559	616	501	-9.3%	11.6%
Corumbá	559	616	501	-9.3%	11.6%
IRON ORE PRODUCTION¹	59,605	78,344	72,870	-23.9%	-18.2%
IRON ORE SALES²	51,656	77,907	55,416	-33.7%	-6.8%
IRON ORE AND PELLETS SALES	58,967	88,873	67,730	-33.7%	-12.9%

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

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

Resumption Plan

The plan for resuming operations in Timbopeba, Fábrica and Vargem Grande complexes is ongoing, as discussions with the National Mining Agency (ANM), the Public Prosecutor's Office of the Minas Gerais State (MPMG) and the external audit firms are in progress, unfortunately at a slower-than-anticipated pace given the COVID-19 pandemic.

- The resumption of production in Timbopeba, expected to occur in 1Q20, was postponed to 2Q20. Vale received the necessary authorization from the external auditors hired by the public prosecutors⁵ to restart the site operations, starting with dry processing activities. Maintenance works are ongoing for a safe return to operations. Wet processing activities are likely to be resumed in 4Q20, after the construction of a pipeline⁶ is complete; nonetheless, alternatives to anticipate wet processing are under evaluation.
- The dry processing operation at Fábrica, initially expected for 2Q20, is now likely to resume in 3Q20. Vibration trigger tests are necessary to certify the absence of impacts on the site's structures, which depend on approval by the ANM and the auditors hired

⁵ Pursuant to the Agreement between Vale and the Prosecutors on the Public Civil Action for Timbopeba.

⁶ The pipeline will be dedicated to the disposal of tailings at the Timbopeba pit.

by the public prosecutors⁷. Wet processing operations with tailings disposal at Forquilha V dam are now expected in 4Q20, instead of previous estimate for 3Q20.

- Vargem Grande pellet plant operations are expected to resume in 3Q20, as trigger tests related to the pellet plant had their start approved by the auditors hired by the public prosecutors⁸, now pending the approval by ANM. The pellet feed will be sourced from the site's beneficiation plant, therefore requiring tailings disposal at the Maravilhas I dam and Cianita waste dump until the start-up of the Maravilhas III dam, expected for 4Q20. The resumption of the beneficiation plant and its economic mining plan depends on approval by the ANM.

The Brucutu plant, which used to dispose of tailings in the Norte/Laranjeiras dam will continue to operate at around 40% of its capacity through wet processing and tailings filtration. Short-term alternatives for tailings disposal, such as the optimized use of the Sul dam, are being tested by geotechnical and operational teams and may increase Brucutu plant's processing capacity to 80%. If such alternatives for tailings disposal or the reclassification of the emergency level for Norte/Laranjeiras dam are not accomplished, there will likely be an impact on the 2020 annual iron ore fines production volume as illustrated in the chart previously presented.

Northern System

The Northern System, which is comprised of the Carajás and S11D mines, produced 39.9 Mt in 1Q20, 4.5 Mt lower than the forecast in the 1Q20 guidance and 1.1 Mt lower than in 1Q19, mainly due to:

- (i) unscheduled maintenance of the long-distance conveyor belt at S11D, due to a global maintenance program after an accident with the conveyor belt in its coal operations in Mozambique which led Vale to review all its conveyor belts around the world;
- (ii) stronger than usual weather-related conditions, very concentrated in a few days of March in the Northern System; this resulted in increased moisture levels in Vale's ores, which required longer drying periods at port stockyards and thus impaired storage capacity in the port, impacting rail transportation from mine to port and forcing down mine production due to lack of storage capacity at the mine;
- (iii) operational restrictions at Northern Range connected to the postponement of the start-up of the new Morro 1 mining section, from 4Q20 to 2Q21, following the delay in obtaining the environmental license (finally granted in December 2019)

⁷ Pursuant to the agreement between Vale and the State Public Prosecutors on the Public Civil Action for Fábrica.

⁸ Pursuant to the agreement between Vale and the State Public Prosecutors on the Public Civil Action for Vargem Grande.

Those negative effects were partially offset by a gradual increase of S11D production that is expected to produce close to 90 Mt in 2020.

The Northern Range is expected to face operating restrictions connected to the Morro 1 mining section postponement (item iii above), with an impact of around 3 Mt in 2Q20. Vale expects to produce 113 Mt from the Northern Range in 2020.

Uncertainties arising from the COVID-19 pandemic may affect production expectations. Vale remains vigilant and monitoring closely any indication of acceleration of contagion levels in the region. The most important thing is to guarantee the safety of workers and communities surrounding its operations. Vale has been conservatively adopting measures such as operating with a minimum contingent of workers at production sites, removal of risk groups from operations and removal of workers that potentially had contact with suspected cases of infection. Such measures allow a less vulnerable environment for the absenteeism risk.

Southeastern System

The Southeastern System, which encompasses the Itabira, Minas Centrais and Mariana mining hubs, produced 11.8 Mt in 1Q20, 5.2 Mt and 7.8 Mt lower than in 4Q19 and 1Q19, respectively, mainly as a result of the suspension of tailings disposal at the Norte/Laranjeiras and Itabiruçu dams, impacting the Brucutu and Conceição sites, respectively, as well as unscheduled maintenances at the Cauê site and the stoppage of Fazendão mine at the end of February due to depletion of the licensed mining area.

The Conceição plants are using tailings filtration and disposal at the Onça and Periquito pits as a short-term alternative for the Itabiruçu stoppage. These alternatives were ramped up in 1Q20, impacting Conceição production, which is expected to present improvements in 2Q20.

The Fazendão mine licensed area became depleted at the end of February, as expected in its mining plan. Vale is applying to expand the licensed mining area, which is expected to be granted in 3Q20.

Southern System

The Southern System, which encompasses the Paraopeba and Vargem Grande mining hubs, produced 7.4 Mt in 1Q20, down 2.6 Mt and 4.4 Mt from 4Q19 and 1Q19, respectively, mainly due to lower third-party purchases and production restrictions at Mutuca, which was already considered in the production plan.

Looking forward, absenteeism in the Southeastern and Southern Systems connected to the COVID-19 may be mitigated by using excess personnel from the idled mines in Minas Gerais.

Midwestern System

The Midwestern System produced 0.6 Mt in 1Q20, in line with 4Q19 and 1Q19.

Pellets

000' metric tons	1Q20	4Q19	1Q19	% change	
				1Q20/4Q19	1Q20/1Q19
Northern System	883	1,152	1,221	-23.4%	-27.7%
São Luis	883	1,152	1,221	-23.4%	-27.7%
Southeastern System	5,132	5,859	7,760	-12.4%	-33.9%
Tubarão 1 and 2	-	34	1,166	-100%	-100%
Itabasco (Tubarão 3)	888	989	575	10.2%	54.4%
Hispanobras (Tubarão 4)	629	1,018	955	-38.2%	-34.1%
Nibrasco (Tubarão 5 and 6)	1,225	1,333	2,186	-8.1%	-44.0%
Kobrasco (Tubarão 7)	810	897	1,086	-9.7%	-25.4%
Tubarão 8	1,580	1,588	1,792	-0.5%	-11.8%
Southern System	-	-	1,069	-	-100%
Fábrica	-	-	515	-	-100%
Vargem Grande	-	-	554	-	-100%
Oman	912	2,404	1,970	-62.1%	-53.7%
Others¹	-	-	154	-	-100%
PELLETS PRODUCTION	6,926	9,415	12,174	-26.4%	-43.1%
PELLETS SALES	7,311	10,966	12,314	-33.3%	-40.6%

¹ Third party capacity utilization.

Production overview

Vale's pellets production⁹ was 6.9 Mt in 1Q20, 26.4% and 43.1% lower than in 4Q19 and 1Q19, mainly due to the voluntary stoppage of Tubarão 1 and 2 plants and pellet feed availability due to the rainy season in the Northern System and Brucutu plant partial stoppage.

Vale's revised pellet production guidance for 2020 is 35-40 Mt from 44 Mt, due to (i) lower pellet feed availability from the Brucutu plant related to the suspension of tailings disposal at the Norte/Laranjeiras dam; and (ii) short-term uncertainties regarding pellet demand.

Northern system

Production at the São Luís pellet plant was 0.9 Mt in 1Q20, 0.3 Mt lower than in 4Q19 and 1Q19, mainly as a result of (i) higher-than-expected pellet feed moisture due to the strong rainy season; and (ii) the voluntary decision to reduce production levels due to market conditions.

Southeastern system

Production at the Tubarão pellet plants¹⁰ was 5.1 Mt in 1Q20, 0.7 Mt and 2.6 Mt lower than in 4Q19 and 1Q19, mainly due to the voluntary stoppage of Tubarão 1 and 2 plants since October

⁹Including third party capacity utilization.

¹⁰Tubarão 1, 2, 3, 4, 5, 6, 7 and 8.

2019, Tubarão 6 unscheduled maintenance carried out in January and February and lower pellet feed availability from the Brucutu plant.

Southern system

The Fábrica and Vargem Grande pellet plants operations were halted on February 20th, 2019, following an ANM (Brazil's Mining National Agency) decision.

Oman operations

The Oman pellet plant production was 0.9 Mt in 1Q20, 1.5 Mt and 1.1 Mt lower than in 4Q19 and 1Q19, respectively, mainly due to lower availability of pellet feed.

Manganese ore and ferroalloys

000' metric tons	1Q20	4Q19	1Q19	% change	
				1Q20/4Q19	1Q20/1Q19
MANGANESE ORE PRODUCTION	363	450	365	-19.3%	-0.5%
Azul	231	251	243	-8.0%	-4.9%
Urucum	109	164	83	-33.5%	31.3%
Morro da Mina	23	35	39	-34.3%	-41.0%
MANGANESE ORE SALES	219	570	252	-61.6%	-13.1%
FERROALLOYS PRODUCTION	28	28	41	-	-31.7%
FERROALLOYS SALES	27	35	25	-22.9%	8.0%

Production and sales overview

Manganese ore production totalled 363 kt in 1Q20, 19.3% lower than in 4Q19 and in line with 1Q19. Manganese ore sales volumes reached 219 kt in 1Q20, 61.6% and 13.1% lower than in 4Q19 and 1Q19, respectively.

The quarter-on-quarter decrease in production and sales was mainly due to unusual weather-related conditions in this period, which affected both production and shipments at the Ponta da Madeira port. Operations at the Urucum underground mine had additional impacts from safety improvement and maintenance activities.

Ferroalloys production totalled 28 kt in 1Q20, in line with 4Q19 production, while sales volumes totalled 27 kt in 1Q20, 22.9% lower than 4Q19, due to production slowdown at the Simões Filho plant for the implementation of safety maintenance measures.

Nickel

Finished production by source

000' metric tons	1Q20	4Q19	1Q19	% change	
				1Q20/4Q19	1Q20/1Q19
Canada	21.9	26.1	25.8	-16.1%	-15.1%
Sudbury	12.0	15.3	12.6	-21.6%	-4.8%
Thompson	2.7	2.8	3.1	-3.6%	-12.9%
Voisey's Bay	7.3	8.0	10.2	-8.8%	-28.4%
Indonesia	18.6	20.7	15.7	-10.1%	18.5%
New Caledonia ¹	8.0	4.8	6.3	66.7%	27.0%
Brazil	3.0	3.3	4.3	-9.1%	-30.2%
Feed from third parties ²	1.8	1.8	2.7	0.0%	-33.3%
NICKEL PRODUCTION	53.2	56.7	54.8	-6.2%	-2.9%
NICKEL SALES	44.2	47.0	50.3	-5.9%	-12.1%

¹ Production at VNC site reached 7,000 tin 1Q20, while production of finished nickel from VNC totalled 8,000 tin 1Q20, the differences stemming from the time required for processing into finished nickel.

² External feed purchased from third parties and processed into finished nickel in its Canadian operations.

Production and sales overview

Production of finished nickel was strong for a first quarter, at 53.2 kt, despite a small decline of 2.9% year on year, as 1Q19 also presented a solid performance. The sequential decline of 6.2% from 4Q19 was mainly due to seasonality and routine scheduled maintenance at PTVI site and at the Matsusaka refinery in 1Q20, along with lower source ore from Canadian and Indonesian operations being processed at the Clydach and Dalian refineries, respectively. The decrease was partially offset by higher source production from VNC.

Nickel sales volumes were 44.2 kt in 1Q20, 5.9% lower than 4Q19, resulting from (i) weaker demand from Asia Pacific due to the COVID-19 pandemic and (ii) lower production from PTVI leading to lower sales of PTVI matte.

Canadian operations

Sudbury mines production was aligned with plans aiming to deliver the same amount of nickel in 2020 as in 2019. The Business was able to keep healthy stock levels in front of its refineries despite some impacts in Garson and Copper Cliff mines due to seismic events.

Nickel production associated to a given mine is accounted based on how much of that mine ore (i.e. feed/source) was used to produce the amount of finished nickel product for the specified period. If a mine produced nickel ore that was not used and stayed along the nickel production chain (mine, mill, smelter), that production is not accounted for until it is processed into final product. Decisions about inventory rebalances and flowsheets can impact production accounting for different mines.

Production from Sudbury source ore reached 12.0 kt in 1Q20, 21.6% and 4.8% lower than 4Q19 and 1Q19, respectively, mainly reflecting inventory rebalancing due to flowsheet

fluctuations in 2019, with lower amounts of Sudbury source nickel being processed at the Clydach refinery for the period, as it processed the majority of the feed from PTVI in 1Q20. Strategic decisions supported flowsheet variations in 2019 to optimize business value and altering nickel feed source ratios.

Copper Cliff and Clydach refineries performed well in 1Q20, with a sequential increase in production of 2% and 4% respectively, despite nickel feed source variations.

Production from Voisey's Bay source ore reached 7.3 kt in 1Q20, 8.8% and 28.4% lower than 4Q19 and 1Q19, respectively. Production was lower than in previous periods mainly as a result of an unusual winter storm which shut down the Long Harbour refinery for six days in January together with scheduled maintenance activities in the quarter.

Indonesian operation (PTVI)

Production of finished nickel from PTVI reached 18.6 kt in 1Q20, 10.1% lower than 4Q19 and 18.5% higher than 1Q19. Production was lower than 4Q19 due to the annual scheduled maintenance shutdown at the Matsusaka refinery, in Japan, that further processes matte produced in Indonesia. Production was higher than in 1Q19 since the Clydach refinery consumption was mainly sourced from PTVI in 1Q20.

Nickel in matte production at the PTVI site reached 17.6 kt in 1Q20, 14% lower than 4Q19, mainly due to scheduled maintenance at the site during the quarter.

New Caledonia operation (VNC)

Production of finished nickel from VNC reached 8.0 kt in 1Q20, 66.7% and 27.0% higher than 4Q19 and 1Q19, respectively. Production was higher than in previous periods due to increased asset availability and an increase in direct nickel oxide sales which led to higher VNC source nickel production in the quarter. The plan to close VNC's refinery is advancing as planned and refining activities responsible for processing the feed into nickel oxide started to ramp down in March 2020, which will lead to the sole production of nickel hydroxide cake at the site starting May 2020.

Production of nickel oxide and nickel hydroxide cake at the VNC site reached 7.0 kt in 1Q20, in line with 4Q19 and 30% higher than 1Q19. Nickel oxide represented 80% and nickel hydroxide cake 20% of VNC's site production in 1Q20.

Brazilian operation (Onça Puma)

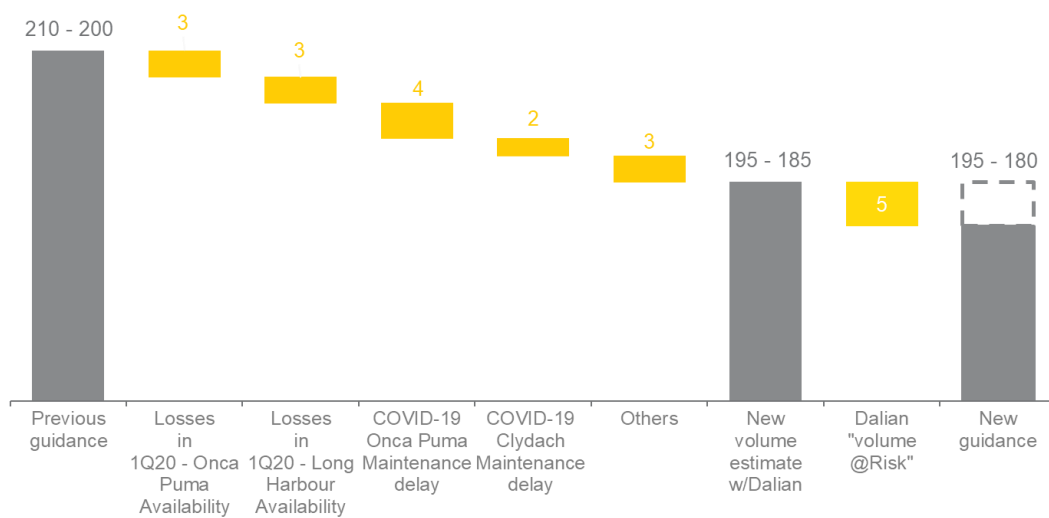
Production at Onça Puma reached 3.0 kt in 1Q20, 9.1% and 30.2% lower than 4Q19 and 1Q19. Production declined versus previous periods due to an 18-day unscheduled maintenance activity carried out in the quarter.

The already scheduled major maintenance shutdown in April, which would resolve 1Q20 production issues, was postponed due to the COVID-19 pandemic. As a result, the productivity will be limited to approximately 50% lower volumes until the end of 3Q20 to ensure asset operations under safe and stable conditions.

2020 Guidance Review

Vale revised its nickel 2020 production guidance ex-VNC to 180-195 kt from 200-210 kt. The new nickel production guidance considers limited ability to keep current maintenance shutdown schedules, mainly due to (i) its decision to minimize the workers contingent at the sites as a protective measure against the Covid-19 pandemic, as well as (ii) contractors/service providers' travel restrictions, (iii) disruptions in the supply of the necessary materials, and (iv) relevant absenteeism, which is curbing productivity levels. There is also uncertainty about the continuation of Dalian refinery operations after VNC stops producing nickel oxide by the end of April.

Nickel production guidance changes (ex-VNC) kt



Some effects are already being felt in Onça Puma and Clydach operations, as scheduled maintenance shutdown at both locations are being postponed from 1H20 to 2H20, decreasing effective capacity to operate safely.

Copper

Finished production by source

000' metric tons	1Q20	4Q19	1Q19	% change	
				1Q20/4Q19	1Q20/1Q19
BRAZIL	64.6	58.8	61.4	9.9%	5.2%
Salobo	42.2	51.9	40.9	-18.7%	3.2%
Sossego	22.4	6.9	20.5	224.6%	9.3%
CANADA	29.9	31.6	32.4	-5.4%	-7.7%
Sudbury	23.1	23.3	23.3	-0.9%	-0.9%
Thompson	0.2	0.2	0.3	0.0%	-33.3%
Voisey's Bay	5.3	6.3	6.4	-15.9%	-17.2%
Feed from third parties	1.3	1.9	2.4	-31.6%	-45.8%
COPPER PRODUCTION	94.5	90.3	93.8	4.7%	0.7%
COPPER SALES	89.2	87.8	90.4	1.6%	-1.3%
Copper Sales Brazil	58.5	55.0	58.2	6.4%	0.5%
Copper Sales Canada	30.7	32.8	32.2	-6.4%	-4.7%

Production and sales overview

Copper production reached 94.5 kt in 1Q20, 4.7% and 0.7% higher than 4Q19 and 1Q19, respectively. Production in 1Q20 was higher than 4Q19 mainly due to higher Sossego volumes after an unscheduled maintenance shutdown in 4Q19, that was partially offset by unscheduled maintenance at the Salobo processing plant.

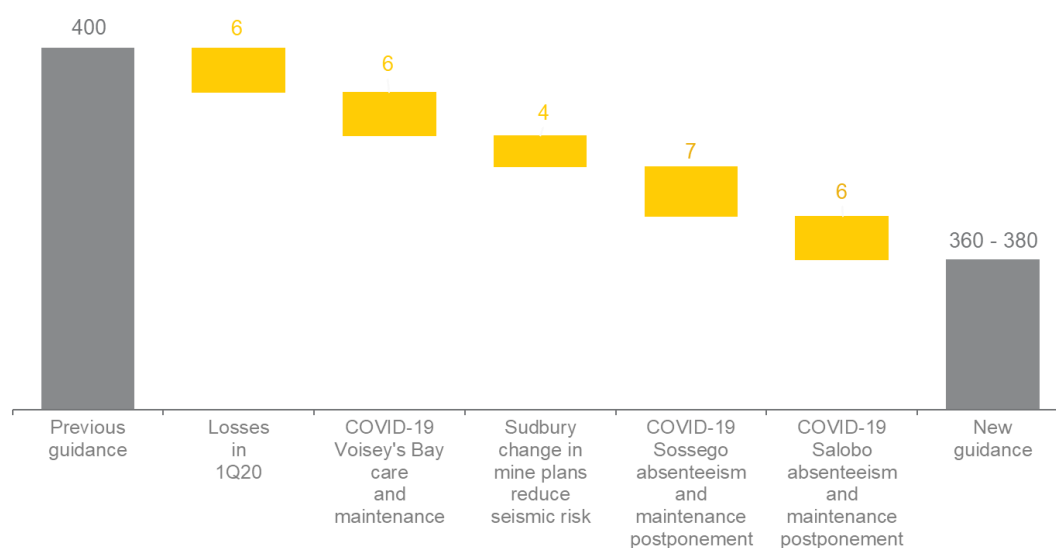
Sales volumes of copper were 89.2 kt in 1Q20, 1.6% higher than 4Q19. This primarily reflected higher production from Sossego in the quarter after unscheduled maintenance in 4Q19, which was offset by lower sales volumes in Canadian operations due to lower production in 1Q20.

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. Additionally, Vale intends to rebuild part of its inventory given its usage in 2019.

Vale revised its copper 2020 production guidance to 360-380 kt from 400 kt. The new copper production guidance considers actual and potential losses, including Voisey's Bay mine shut down since March, which may be extended until July as recently stated, as well as limited ability to keep current maintenance shutdown schedules, mainly due to (i) our decision to minimize the workers contingent at the sites as a protective measure against the Covid-19 pandemic; (ii) travel restrictions and disruptions in the supply of the necessary materials; and (iii) a meaningful increase in absenteeism, which could result in lower productivity levels.

Some effects are already being felt in Salobo, as ongoing and scheduled maintenance is being impacted due to dependency on external contractors and cross-border restrictions.

Copper production guidance changes kt



Brazilian operations

Production of copper in concentrate at Salobo reached 42.2 kt in 1Q20, 18.7% lower than 4Q19 and 3.2% higher than 1Q19. Production was lower than 4Q19 mainly due to unscheduled maintenance at the processing plant in 1Q20. Production was higher than 1Q19 mainly due to higher feed grades.

Production of copper in concentrate at Sossego totalled 22.4 kt in 1Q20, 224.6% and 9.3% higher than 4Q19 and 1Q19, respectively. Production increases were mainly due to the resumption of activities after unscheduled maintenance at the conveyor belt and the sag mill in 4Q19 and better ore grades and increased mill processing rates when compared to 1Q19.

Canadian operations

Production of copper from Sudbury reached 23.1 kt in 1Q20, 0.9% lower than both 4Q19 and 1Q19 due to scheduled maintenance at the Copper Cliff mine.

Production of copper from Voisey's Bay reached 5.3 kt in 1Q20, 15.9% and 17.2% lower than 4Q19 and 1Q19, respectively. Production was lower than previous periods due to Voisey's Bay mine operations being put on care and maintenance due to the COVID-19 pandemic. Copper concentrate production at the site will be reduced by up to 6.0 kt in 1H20.

Cobalt and other by-products

Finished production by source

Metric tons	1Q20	4Q19	1Q19	% change	
				1Q20/4Q19	1Q20/1Q19
COBALT	1,189	1,140	1,195	4.3%	-0.5%
Sudbury	141	137	129	2.9%	9.3%
Thompson	22	21	21	4.8%	4.8%
Voisey's Bay	307	364	467	-15.7%	-34.3%
VNC	627	516	412	21.5%	52.2%
Others	92	103	166	-10.7%	-44.6%
PLATINUM (000' oz troy)	48	45	35	6.7%	37.1%
PALLADIUM (000' oz troy)	59	56	42	5.4%	40.5%
GOLD BY-PRODUCT (000' oz troy)	119	132	108	-9.8%	10.2%

Coal

000' metric tons	1Q20	4Q19	1Q19	% change	
				1Q20/4Q19	1Q20/1Q19
COAL PRODUCTION	1,963	1,876	2,213	4.6%	-11.3%
Metallurgical Coal	983	825	1,051	19.1%	-6.5%
Thermal Coal	980	1,051	1,162	-6.8%	-15.7%
COAL SALES	1,566	2,042	2,394	-23.3%	-34.6%
Metallurgical Coal	706	1,017	1,291	-30.6%	-45.3%
Thermal Coal	860	1,025	1,103	-16.1%	-22.1%

Production and sales overview

Coal production totalled 2.0 Mt in 1Q20, 4.6 % higher than in 4Q19. Despite weather-related impacts, production increased compared to the previous quarter due to continuous improvements in processing plant stabilization and a better yield. These improvements led Vale to achieve a production record for the past fifteen months in March (totaling 918 kt).

Coal sales totalled 1.6 Mt in 1Q20, 23.3% lower than in 4Q19, mainly due to lower demand, an impact of the COVID-19 pandemic. Coal sales were 20.2% lower than production in 1Q20, bringing the storage capacity at mine and port to their limits, which can ultimately narrow the production capacity of the coming quarters if current market conditions persist.

Furthermore, the COVID-19 pandemic brought additional challenges to reaching the sustainable ramp-up of the operation in 2020 due to: (i) the decision to temporarily reduce the workforce on-site and the operational rate to help protect the health and wellbeing of its employees and communities, (ii) uncertainties regarding the regular flow of goods and services, essential for the maintenance of operational stability, and (iii) the postponement of the 3-month maintenance plan revamp (without a new start date), given transportation restrictions on people and equipment, due to the COVID-19 pandemic.

Hence, in the ongoing scenario of uncertainties, Vale temporarily suspended its previous 2020 coal production guidance of 8-10 Mt, as it is not possible, at this moment, to provide a new coal production guidance for 2020.