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Vale's production and sales in 2Q18



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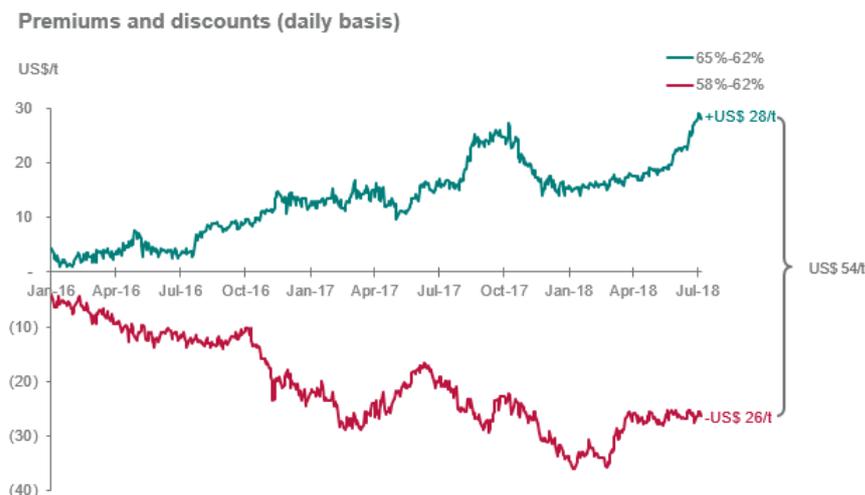


Production and sales highlights

Rio de Janeiro, July 16th, 2018 – Vale S.A (Vale) achieved a new record of 96.8 Mt of iron ore production¹ for a second quarter, despite the nationwide truck drivers’ strike in May, with 12-day disruptions in production and logistics across Brazil, leading to force majeure being declared by many companies. Vale overcame these adversities using the flexibility of its supply chain, with transfers of supplies between sites, alternative use of railways to transport inputs, adjustment in mining methods and production plans and change in mill process parameters. Vale recognizes and thanks the creativity and resilience of its teams to achieve a production record in such an environment.

Record sales volumes for a second quarter of iron ore and pellets totaled 86.5 Mt in 2Q18, 4.8 Mt higher than in 2Q17. The record was achieved despite the increase of offshore stocks to support the ongoing blending activities.

Vale’s premium and flexible product portfolio is being tailored to maximize margin and to benefit from the increase in the “flight to quality” trend. The market premium for the 65% of iron ore content over the 62% in 2Q18 increased from an average of US\$ 16.0/t in 1Q18 to an average of US\$ 20.2/t in 2Q18.



Source: Platts and Metal Bulletin

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

Vale's sales mix improved substantially year-on-year, as a result of the S11D ramp-up and the decision to progressively reduce low grade ore production. The share of premium products (pellets, Carajás, blended ores, pellet feed and sinter feed low alumina) increased to 77% in 2Q18 from 68% of total sales in 2Q17 maximizing the benefit of rising market premiums. Consequently, contributions of quality and average premium to Vale's realized CFR/FOB wmt price increased to US\$ 7.1/t in 2Q18 vs. US\$ 5.2/t in 1Q18 and US\$ 1.2/t in 2Q17.

The Northern System achieved a production record for a second quarter of 46.2 Mt in 2Q18, 11.4% higher than in 2Q17, due to the S11D ramp-up.

In 2H18 Vale's production profile indicates volumes over 100 Mt per quarter, supporting the production guidance for 2018, previously announced on Vale Day, of around 390 Mt.

Vale's pellet production achieved a record for a second quarter of 12.8 Mt, 0.6 Mt higher than in 2Q17 mainly due to the resumption of the Tubarão I and II pellet plants. With the restart of the São Luis pellet plant which is envisioned for 3Q18, Vale will reach approximately 55 Mt as its guidance production and benefit from the negotiated terms for pellet premiums averaging at US\$ 60/dmt for the year, an increase of more than US\$ 10/dmt vs. 2017.

In 2Q18 nickel production has increased to 66,200 t mainly due to (i) the return to production of the Matsusaka refinery in Japan after its scheduled maintenance shutdown in 1Q18; (ii) higher production in VNC, due to higher sales of nickel oxide from VNC in support of high value opportunities, a product that has a shorter time to market when compared to refining into Utility Nickel in Dalian²; and, (iii) the return to production of Sudbury's Coleman mine in April.

Copper production reached 97,900 t in 2Q18, 4,600 t higher than in 1Q18, due to the return to production of Sudbury's Coleman mine in April and the strong performance of the Salobo operation.

Cobalt production at Long Harbour continued its successful ramp-up, reaching output of 415 t in 2Q18, 11% and 19% higher than in 1Q18 and 2Q17, respectively. Cobalt product purity improved in line with the optimization of the Long Harbour refinery, while the shift from cobalt cake to cobalt rounds creates opportunity for further value creation. Vale's total cobalt production was 1,302 t in 2Q18, in line with 1Q18. Cobalt production is anticipated to increase in 2H18 as feed from the Coleman mine in Sudbury is processed through the Port Colborne refinery.

²On a source basis, production is accounted for once the product reaches its saleable stage. Hence, if nickel oxide is sold, it takes less time to be accounted for as production volume whereas a refined nickel product requires further time to be processed until the stage where a saleable product is ready.

The contained volume of gold as a byproduct in the nickel and copper concentrates reached 114,000 oz in 2Q18, in line with 1Q18.

Coal production totaled 2.9Mt in 2Q18, 18.1% higher than 1Q18, as the adverse conditions in the mine site in 1Q18 were only overcome during the first part of 2Q18, preventing a faster recovery in the quarter. In 2Q18 new trucks and excavators were received and are being assembled to support the increase in production volume in 2H18.

Production summary

000' metric tons	2Q18	1Q18	2Q17	1H18	1H17	% change		
						2Q18/1Q18	2Q18/2Q17	1H18/1H17
Iron ore ¹	96,755	81,953	91,849	178,707	178,048	18.1%	5.3%	0.4%
Pellets	12,838	12,780	12,215	25,619	24,637	0.5%	5.1%	4.0%
Manganese Ore	421	434	507	855	1,051	-3.0%	-17.0%	-18.6%
Coal	2,871	2,432	3,037	5,303	5,471	18.1%	-5.5%	-3.1%
Nickel	66.2	58.6	66.0	124.8	137.5	13.0%	0.3%	-9.2%
Copper ²	97.9	93.3	100.8	191.2	208.3	4.9%	-2.9%	-8.2%
Cobalt (metric tons)	1,302	1,327	1,412	2,629	2,672	-1.9%	-7.8%	-1.6%
Gold (000' oz troy)	114	113	110	227	215	0.9%	3.6%	5.6%

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

² Excluding Lubambe's attributable production.

Sales summary

000' metric tons	2Q18	1Q18	2Q17	1H18	1H17	% change		
						2Q18/1Q18	2Q18/2Q17	1H18/1H17
Iron ore ¹	73,290	71,221	69,262	144,510	134,577	2.9%	5.8%	7.4%
Pellets	13,231	13,125	12,479	26,356	25,062	0.8%	6.0%	5.2%
Manganese Ore	239	338	392	577	588	-29.3%	-39.0%	-1.9%
Coal	2,509	2,497	3,121	5,005	5,689	0.5%	-19.6%	-12.0%
Nickel	61.6	57.9	71.4	119.5	143.5	6.4%	-13.7%	-16.7%
Copper	94.6	87.7	102.8	182.3	190.5	7.9%	-8.0%	-4.3%

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



Iron ore

000' metric tons	2Q18	1Q18	2Q17	1H18	1H17	% change		
						2Q18/1Q18	2Q18/2Q17	1H18/1H17
Northern System	46,210	40,601	41,494	86,811	77,467	13.8%	11.4%	12.1%
Northern and Eastern ranges	31,888	28,920	36,400	60,808	69,238	10.3%	-12.4%	-12.2%
S11D	14,322	11,680	5,094	26,002	8,230	22.6%	181.2%	215.9%
Southeastern System	27,630	22,213	27,450	49,843	55,616	24.4%	0.7%	-10.4%
Itabira	10,497	9,040	9,076	19,536	17,897	16.1%	15.7%	9.2%
Minas Centrais	9,373	7,755	9,642	17,128	19,979	20.9%	-2.8%	-14.3%
Mariana	7,761	5,419	8,733	13,179	17,740	43.2%	-11.1%	-25.7%
Southern System	22,244	18,530	22,318	40,774	43,822	20.0%	-0.3%	-7.0%
Paraopeba	7,206	6,132	6,575	13,338	12,679	17.5%	9.6%	5.2%
Vargem Grande	5,795	4,686	6,325	10,479	12,791	23.7%	-8.4%	-18.1%
Minas Itabirito	9,243	7,712	9,418	16,957	18,353	19.9%	-1.9%	-7.6%
Midwestern System	670	609	587	1,279	1,142	10.0%	14.1%	12.0%
Corumbá	670	609	587	1,279	1,142	10.0%	14.1%	12.0%
IRON ORE PRODUCTION¹	96,755	81,953	91,849	178,707	178,048	18.1%	5.3%	0.4%
IRON ORE SALES²	73,290	71,221	69,262	144,510	134,577	2.9%	5.8%	7.4%
IRON ORE AND PELLETS SALES	86,520	84,346	81,741	170,865	159,639	2.6%	5.8%	7.0%

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

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

Production and sales overview

Vale's iron ore production achieved a quarterly record of 96.8 Mt in 2Q18, despite the severe truckers strike that affected Brazil during a 12-day period in May 2018. Vale's supply chain flexibility together with the efforts of its team enabled Vale to overcome this crisis almost unscathed. A side effect of the strike was the devaluation of the BRL against the USD, which compensated minor cost impacts related to our efforts to mitigate the abovementioned adversities.

Vale's iron ore production in 2Q18 was 5.3% higher than in 2Q17 marked by lower silica content (4.2% on average in 2Q18 vs. 4.5% in 2Q17) and a lower alumina content (1.3% on average in 2Q18 and in 2Q17) when compared to other market participants. The lower level of contaminants was mainly a result of the S11D ramp-up and the curtailment of high silica production in the Southern and Southeastern Systems as of 3Q17. Higher volumes were

achieved due to the ramp-up of S11D and the completion of the ramp-up of dry processing plants (Mutuca and Pico) in the Southern System, as well as the restart of the Timbopeba plant in the Southeastern System.

Due to unusual circumstances faced in 2Q18, such as heavy rains in April in the Northern System and the abovementioned trucker strike, production average Fe content was exceptionally reduced to 63.8% in 2Q18 from 64.4% in 1Q18.

Sales volumes of iron ore and pellets totaled 86.5 Mt in 2Q18, 4.8 Mt higher than in 2Q17, achieving a record for a second quarter.

Vale's sales mix improved substantially year-on-year, as a result of the S11D ramp-up and the decision to progressively reduce low grade ore production. The share of premium products (pellets, Carajás, blended ores, pellet feed and sinter feed low alumina) increased to 77% in 2Q18 from 68% of total sales in 2Q17 maximizing the benefit of rising market premiums. Consequently, contributions of quality and average premium to Vale's realized CFR/FOB wmt price increased to US\$ 7.1/t in 2Q18 vs. US\$ 5.2/t in 1Q18 and US\$ 1.2/t in 2Q17.

Following the strategy to increase the flexibility of the supply chain and product portfolio, Vale took advantage of its solid production performance in 2Q18 to resume the offshore inventory build-up. In the coming quarters, the sales/production ratio will also reflect the ongoing offshore blending activities.

Northern System

The Northern System, which comprises Carajás and S11D, achieved a production record for a second quarter of 46.2 Mt in 2Q18, 5.6 Mt and 4.7 Mt higher than in 1Q18 and 2Q17, respectively, mainly due to the successful S11D ramp-up, which more than offset the impacts of heavy rain in April (251 mm vs. 180 mm in April 2017) on the production of the Northern and Eastern ranges.

Southeastern System

The Southeastern System, which encompasses the Itabira, Minas Centrais and Mariana mining hubs, produced 27.6 Mt in 2Q18, in line with 2Q17, mainly due to the restart of the Timbopeba plant, which offset the reduction in production of the high silica products, and 5.4 Mt higher than in 1Q18 due to the usual weather-related seasonality in the first quarter.

Southern System

The Southern System, which encompasses the Paraopeba, Vargem Grande and Minas Itabirito mining hubs, produced 22.2 Mt in 2Q18, in line with 2Q17 mainly due to the completion of the ramp-up of the dry processing plants of Mutuca and Pico, which offset the reduction in

production of the high silica products, and 3.7 Mt higher than in 1Q18 due to the usual weather-related seasonality in the first quarter.

Midwestern System

The Midwestern System produced 0.7 Mt in 2Q18, in line with 1Q18 and 2Q17.



Pellets

000' metric tons	2Q18	1Q18	2Q17	1H18	1H17	% change		
						2Q18/1Q18	2Q18/2Q17	1H18/1H17
Southeastern System	7,913	7,872	7,748	15,784	15,262	0.5%	2.1%	3.4%
Tubarão 1 and 2	889	536	-	1,425	-	65.9%	n.m.	n.m.
Itabrasco (Tubarão 3)	1,006	1,102	1,169	2,108	2,300	-8.7%	-13.9%	-8.3%
Hispanobras (Tubarão 4)	728	1,109	1,126	1,837	2,254	-34.4%	-35.3%	-18.5%
Nibrasco (Tubarão 5 and 6)	2,305	2,295	2,378	4,601	4,779	0.4%	-3.1%	-3.7%
Kobrasco (Tubarão 7)	1,148	1,082	1,201	2,230	2,373	6.1%	-4.4%	-6.0%
Tubarão 8	1,836	1,747	1,873	3,584	3,556	5.1%	-2.0%	0.8%
Southern System	2,805	2,705	2,518	5,510	5,063	3.7%	11.4%	8.8%
Fábrica	1,034	979	919	2,014	1,838	5.6%	12.5%	9.6%
Vargem Grande	1,771	1,725	1,599	3,496	3,225	2.7%	10.8%	8.4%
Oman	2,120	2,204	1,948	4,324	4,312	-3.8%	8.8%	0.3%
PELLETS PRODUCTION	12,838	12,780	12,215	25,619	24,637	0.5%	5.1%	4.0%
PELLETS SALES	13,231	13,125	12,479	26,355	25,062	0.8%	6.0%	5.2%

Production and sales overview

Vale's pellet production achieved a record for a second quarter of 12.8 Mt, in line with 1Q18 and 0.6 Mt higher than in 2Q17 mainly due to the resumption of the Tubarão I and II pellet plants.

The restart of Tubarão I, which occurred in May, was on time and on budget. São Luís pellet plant started its hot commissioning and significant production volumes are expected as of 3Q18. Both also benefit from the negotiated terms for pellet premiums averaging at US\$ 60/dmt for the year, an increase of more than US\$ 10/dmt vs. 2017.

Vale reaffirms its production guidance for 2018 of approximately 55 Mt, as previously announced on Vale Day.

Southeastern system

Production at the Tubarão pellet plants – Tubarão 1, 2, 3, 4, 5, 6, 7 and 8 – totaled 7.9 Mt in 2Q18, in line with 1Q18 mainly due to the restart of the Tubarão I and II pellet plants.

Southern system

The Fábrica pellet plant achieved a production level of 1.0 Mt in 2Q18, in line with 1Q18 and 0.1 Mt higher than in 2Q17 due to the higher productivity of the plant and higher availability of feed.

The Vargem Grande pellet plant reached 1.8 Mt of production in 2Q18, in line with 1Q18 and 0.2 Mt higher than in 2Q17 due to the higher productivity of the plant and higher availability of feed.

Oman operations

The Oman pellet plant reached 2.1 Mt of production in 2Q18, in line with 1Q18 and 0.2 Mt higher than in 2Q17, due to the higher productivity of the plant and higher availability of feed.



Manganese ore and ferroalloys

000' metric tons	2Q18	1Q18	2Q17	1H18	1H17	% change		
						2Q18/1Q18	2Q18/2Q17	1H18/1H17
MANGANESE ORE PRODUCTION	421	434	507	855	1,051	-3.0%	-17.0%	-18.6%
Azul	234	234	318	467	685	-	-26.4%	-31.8%
Urucum	157	171	172	328	335	-8.2%	-8.7%	-2.1%
Morro da Mina	30	29	17	59	31	3.4%	76.5%	90.3%
MANGANESE ORE SALES	239	338	392	577	588	-29.3%	-39.0%	-1.9%
FERROALLOYS PRODUCTION	38	45	40	83	76	-15.6%	-5.0%	9.2%
FERROALLOYS SALES	34	34	37	68	67	-	-8.1%	1.5%

Production and sales overview

Manganese ore production totaled 421,000 t in 2Q18, decreasing 3.0% and 17.0% respectively, when compared to 1Q18 and 2Q17.

Manganese ore sales volumes reached 239,000 t in 2Q18, 29.3% and 39.0% lower than in 1Q18 and in 2Q17, respectively, mainly due to adverse weather conditions for shipments in 2Q18.

Ferroalloy production reached 38,000 t in 2Q18, decreasing 15.6% and 5.0% respectively, when compared to 1Q18 and 2Q17.

Ferroalloys sales volumes totaled 34,000 t in 2Q18, in line with 1Q18.

Manganese ore

Production at the Azul manganese mine totaled 234,000 t in 2Q18, in line with 1Q18 and 26.4% lower than in 2Q17, mainly due to lower grades in the run-of-mine, resulting in lower product recovery.

Production at the Urucum mine totaled 157,000 t in 2Q18, 8.2% and 8.7% lower than in 1Q18 and in 2Q17, respectively, due to a maintenance stoppage related to the mine infrastructure.

Production at the Morro da Mina mine totaled 30,000 t in 2Q18, in line with 1Q18 and 76.5% higher than in 2Q17, mainly due to anticipated measures to prepare the operations for the rainy season, which led to fewer interruptions to clean the bottom of the pit.

Ferroalloy production

Ferroalloy production in 2Q18 totaled 38,000t, 15.6% and 5.0% lower than in 1Q18 and 2Q17, respectively, due to lower production at the Simões Filho plant.

Production in 2Q18 was composed of 23,000 t of ferrosilicon manganese alloys (FeSiMn), 14,000t of high-carbon manganese alloys (FeMnHC) and 1,000 t of medium-carbon manganese alloys (FeMnMC).



Lucas Pupo / Agência Vale

Nickel

Finished production by source

000' metric tons	2Q18	1Q18	2Q17	1H18	1H17	% change		
						2Q18/1Q18	2Q18/2Q17	1H18/1H17
Canada	28.7	28.8	27.3	57.5	63.5	-0.3%	5.1%	-9.4%
Sudbury	13.3	14.0	7.9	27.3	25.8	-5.0%	68.4%	5.8%
Thompson	5.8	5.2	4.6	11.0	9.4	11.5%	26.1%	17.0%
Voisey's Bay	9.5	9.6	14.8	19.1	28.3	-1.0%	-35.8%	-32.5%
Indonesia	17.8	13.8	19.7	31.6	36.0	29.0%	-9.6%	-12.2%
New Caledonia ¹	9.4	7.3	9.0	16.7	19.2	28.8%	4.4%	-13.0%
Brazil	5.6	5.7	5.5	11.3	11.6	-1.8%	1.8%	-2.6%
Feed from third parties ²	4.8	3.0	4.5	7.8	7.2	60.0%	6.7%	8.3%
NICKEL PRODUCTION	66.2	58.6	66.0	124.8	137.5	13.0%	0.3%	-9.2%
NICKEL SALES	61.6	57.9	71.4	119.5	143.5	6.4%	-13.7%	-16.7%

¹ Production at VNC reached 7,500 t in 2Q18, while production of finished nickel from VNC totaled 9,400 t in 2Q18; the differences are due to the required time for processing into finished nickel.

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

Production and sales overview

Production of finished nickel reached 66,200 t in 2Q18, 13.0% higher than in 1Q18 and in line with 2Q17. The increase when compared to 1Q18 was mainly due to: (i) the resumption of the Matsusaka refinery in Japan after its scheduled maintenance shutdown in 1Q18; (ii) higher production in VNC, due to higher sales of nickel oxide from VNC in support of high value opportunities; and, (iii) the return to production of Sudbury's Coleman mine in April.

In line with Vale's commitments to supply discipline, nickel production was reviewed to approximately 250,000 t, given the strategy of pursuing value over volume, current market conditions for different products, with flexibility to further adjust production according to the demand and lead time needed for different products. Nickel production is expected to reach close to 60,000 t in 3Q18 as Sudbury will conduct its annual scheduled maintenance shutdown at the same time as Thompson will fully transition to a mine-mill operation, with its concentrate being sent to the Sudbury smelter for further processing.

Sales volumes of nickel were 61,600 t in 2Q18, an increase compared to sales of nickel in 1Q18 due to higher nickel production in 2Q18. Sales volumes were lower than production volumes

reflecting the priority to maximize value over volume given lower demand in certain market segments and premiums in some of the more time-consuming production lines (such as carbonyl products from PTVI source feed). Nickel sales volumes in 2Q18 decreased compared to 2Q17 mainly due to a drawdown of finished inventory in 2Q17 versus a buildup in 2Q18.

Canadian operations

Production from the Sudbury mines reached 13,300 t in 2Q18, 5.0% lower than in 1Q18 and 68.4% higher than in 2Q17. The decrease compared to 1Q18 was mainly due to the strategic decision to increase Sudbury source inventory in advance of the planned 3Q18 scheduled maintenance shutdown. The increase compared to 2Q17 was mainly due to the planned maintenance shutdown conducted in 2Q17, when Sudbury started the transition to a single furnace operation. As anticipated in the 1Q18 Production and Sales Report, the Coleman mine returned to operation in April 2018 following an unscheduled maintenance shutdown since November 2017.

Production from the Thompson mines reached 5,800 t in 2Q18, 11.5% and 26.1% higher than in 1Q18 and 2Q17, respectively. Production was higher than in 1Q18 when Thompson production was adversely impacted by some unscheduled maintenance shutdowns at the smelter and severe winter conditions, as well as mechanical and electrical limitations. The increase compared to 2Q17 was a result of operational issues at the refinery during 2Q17 that limited production during that quarter. Thompson will fully transition to a mine-mill operation in 3Q18, when its furnace and refinery will be shut down.

Production from the Voisey's Bay source reached 9,500 t in 2Q18, in line with 1Q18 and 35.8% lower than in 2Q17. The decrease compared to 2Q17 was mainly due to the strategic decision to decrease production output to extend the mine lifespan in support of the investment schedule. It was also due to large volumes of Voisey's Bay concentrate being processed in the Thompson and Sudbury refineries in 2Q17, whereas in 2Q18 only small residual inventories of the 2017 shipments were processed at Thompson and Sudbury. Shipments of Voisey's Bay concentrates to Thompson and Sudbury ceased in 4Q17 and, by the end of 2Q18, all inventories of Voisey's Bay source concentrate were consumed at Thompson and Sudbury.

Production at the Long Harbour processing plant reached the quarterly record of 8,900 t in 2Q18, 3.5% and 23.6% higher than in 1Q18 and 2Q17, respectively. As the refinery continues its successful ramp-up, Long Harbour nickel products bring an opportunity to enhance Vale's premium products portfolio: Long Harbour nickel plating rounds and melt rounds are high quality products with potential to achieve significant premiums. For the short term, as trial cargoes are still being offered, the premiums currently captured by the Long Harbour products will be subdued compared to their longer-term potential. In the long run, Long Harbour rounds have potential to increase the amount of exposure to high-quality plating applications while capturing the premiums paid for high purity levels in that market. At the same time, Thompson will

transition to a mine-mill operation and the current nickel products being produced at the Thompson refinery and sold to the market at a premium will be halted. In response to that, Long Harbour nickel rounds are being trialed by many of the consumers of nickel products from Thompson, a natural replacement within Vale's product portfolio that will deliver nickel purity as high as the soon-to-be discontinued Thompson product.

Indonesian operation (PTVI)

PTVI nickel in matte production reached 18,900 t in 2Q18, 10.5% higher than in 1Q18 and 6.0% lower than in 2Q17. The increase compared to 1Q18 was mainly due to a scheduled partial maintenance shutdown conducted in 1Q18.

Production of finished nickel from PTVI reached 17,800 t in 2Q18, 29.0% higher than in 1Q18 and 9.6% lower than in 2Q17. The increase compared to 1Q18 was mainly due to the scheduled annual maintenance shutdown in March 2018 at the Matsusaka refinery in Japan. The decrease compared to 2Q17 was mainly due to timing differences between mining and refining PTVI source feed that is being preferentially shipped to the Clydach refinery in Wales rather than the Dalian refinery in China. This decision aims to maximize production of higher value carbonyl products, in line with Vale's margin optimization strategy for the nickel business.

New Caledonia operation (VNC)

Production of NiO and NHC (nickel oxide and nickel hydroxide cake) at the VNC site (prior to shipping to Dalian in China for refining) was 7,500 t in 2Q18. Site production was 19.4% and 13.8% lower than in 1Q18 and 2Q17, respectively. The decrease was mainly related to lower ore deliveries from the mine and operational issues in the processing plant, including lime production delays and autoclave availability, impacting the dilution of fixed costs. Additional trucks are being added to the mining fleet to increase mine production in 2H18. NiO accounted for 87%, and NHC for 13%, of VNC's 2Q18 site production.

Production of finished products from VNC reached 9,400 t in 2Q18, 28.8% and 4.4% higher than in 1Q18 and 2Q17, respectively. Reflecting the potential in the battery segment for our Class II Battery-suitable nickel products as well as other high value opportunities among nickel product segments, VNC production increased mainly due to higher direct sales to market of the nickel oxide product in support of high value opportunities, including increased interest from the battery supply chain in using our battery-suitable product for such applications.

Brazilian operation (Onça Puma)

Production from the Onça Puma operation reached 5,600 t in 2Q18, 1.8% lower than 1Q18 and 1.8% higher than 2Q17. The decrease when compared to 1Q18 was due to lower ore grades

while the increase relative to 2Q17 was due to higher furnace availability and higher nickel recovery.



Copper

Finished production by source

000' metric tons	2Q18	1Q18	2Q17	1H18	1H17	% change		
						2Q18/1Q18	2Q18/2Q17	1H18/1H17
BRAZIL	68.7	66.1	72.2	134.8	139.7	3.9%	-4.8%	-3.5%
Sossego	21.9	22.5	26.2	44.4	51.1	-2.7%	-16.4%	-13.1%
Salobo	46.7	43.7	46.0	90.4	88.6	6.9%	1.5%	2.0%
CANADA	29.2	27.2	28.6	56.4	68.6	7.4%	2.1%	-17.8%
Sudbury	18.4	15.1	17.0	33.5	43.5	21.9%	8.2%	-23.0%
Thompson	0.4	0.2	0.4	0.6	0.7	100.0%	0.0%	-14.3%
Voisey's Bay	6.9	8.4	8.7	15.3	17.8	-17.9%	-20.7%	-14.0%
Feed from third parties	3.5	3.5	2.5	7.0	6.6	0.0%	40.0%	6.1%
COPPER PRODUCTION	97.9	93.3	100.8	191.2	208.3	4.9%	-2.9%	-8.2%
COPPER SALES	94.6	87.7	102.8	182.3	190.5	7.9%	-8.0%	-4.3%

Production and sales overview

Copper production reached 97,900 t in 2Q18, being 4.9% higher than in 1Q18 and 2.9% lower than in 2Q17. The increase compared to 1Q18 was mainly due to the return to production of the Coleman Mine in Sudbury and the strong performance of the Salobo operation. The decrease compared to 2Q17 was mainly due to the scheduled maintenance shutdown at Voisey's Bay and lower feed grades at Sossego.

Sales volumes of copper reached 94,600 t in 2Q18, 7.9% higher than in 1Q18 mainly due to higher copper production in 2Q18. Sales volumes of copper were in line with production volumes³. Copper sales volumes in 2Q18 were 8.0% lower than in 2Q17 mainly due to a drawdown of finished inventory in 2Q17.

³Vale mainly sells copper concentrates with sales volumes approximately 3.5% lower compared to production volumes due to losses in the smelting process.

Brazilian operations

Production of copper in concentrate at Sossego totaled 21,900 t in 2Q18, 2.7% and 16.4% lower than in 1Q18 and 2Q17, respectively, mainly due to lower plant throughput and lower copper feed grade.

Production of copper in concentrate at Salobo reached 46,700 t in 2Q18, 6.9% and 1.5% higher than in 1Q18 and 2Q17, respectively. The increases were related to higher ore grades and strong plant performance.

Canadian operations

Production of copper from the Sudbury mines reached 18,400 t in 2Q18, 21.9% and 8.2% higher than in 1Q18 and 2Q17, respectively. The increase compared to 1Q18 was mainly due to the return of mining production at the Coleman Mine and the increase compared to 2Q17 was due to the scheduled maintenance shutdown at the Sudbury surface plants during 2Q17, as it transitioned to a single furnace operation.

Production of copper from Voisey's Bay source reached 6,900 t in 2Q18, 17.9% and 20.7% lower than in 1Q18 and 2Q17, respectively, mainly due to the strategic decision to optimize margins through the extension of mine life in support of the investment strategy.



Cobalt

Finished production by source

	2Q18	1Q18	2Q17	1H18	1H17	% change		
						2Q18/1Q18	2Q18/2Q17	1H18/1H17
COBALT (metric tons)	1,302	1,327	1,412	2,629	2,672	-1.9%	-7.8%	-1.6%
Sudbury	156	123	124	278	339	26.8%	25.8%	-18.2%
Thompson	56	81	111	136	248	-30.9%	-49.5%	-45.2%
Voisey's Bay	479	495	436	973	648	-3.2%	9.9%	50.2%
VNC	494	589	675	1,084	1,353	-16.1%	-26.8%	-19.9%
Others	118	39	66	157	83	202.6%	78.8%	89.2%

Production overview

Cobalt production totaled 1,302 t in 2Q18, 1.9% and 7.8% lower than in 1Q18 and 2Q17, respectively, mainly due to decreased production from VNC. In 2H18, a series of measures are being implemented to increase VNC production, including adding new trucks to the mining fleet and updating the VNC mining plan to increase cobalt output in light of current market conditions – especially related to higher cobalt demand for EVs.

Cobalt production from Sudbury was 156 t in 2Q18, 26.8% and 25.8% higher than in 1Q18 and 2Q17, respectively. The increase when compared to 1Q18 was mainly due to Sudbury cobalt production increase since the return to production of the Coleman Mine, in April, along with an increased metallurgical cobalt recovery. The increase when compared to 2Q17 was mainly due to the scheduled maintenance shutdown conducted in 2Q17.

Production from Thompson source was 56 t in 2Q18, 30.9% and 49.5% lower than in 1Q18 and 2Q17, respectively, mainly due to lower mine grades.

Production from Voisey's Bay was 479 t in 2Q18, in line with 1Q18 and 9.9% higher than in 2Q17.

Cobalt production at Long Harbour (cobalt rounds) was 415 t in 2Q18, 11% and 19% higher than in 1Q18 and 2Q17, respectively. Cobalt product purity improved in line with the optimization of the Long Harbour refinery, and the shift from cobalt cake to cobalt rounds creates opportunity for further value creation.

Production from VNC reached 494 t in 2Q18, 16.1% and 26.8% lower than in 1Q18 and 2Q17, respectively. Production in 2Q18 was adversely impacted by (i) lower mine deliveries for which additional trucks are being added to the mining fleet in 2H18; (ii) operational issues in the processing plant including lime production delays and autoclave availability; and (iii) lower cobalt grade in the VNC feed. In order to optimize cobalt value and in light of current market conditions – especially related to EVs – changes to the VNC mining plan are under review.

Production from other sources was 118 t in 2Q18, 202.6% and 78.8% higher than in 1Q18 and 2Q17, respectively. Other source production varies according to the cobalt content of external feeds that are consumed in the processes and it also includes PTVI source material being processed through the Port Colborne cobalt refinery after part of the feed is sent to the Clydach nickel refinery for processing.



Olli Geibel / AFP / Agência Vale

Nickel and copper by-products

Finished production by source

	2Q18	1Q18	2Q17	1H18	1H17	% change		
						2Q18/1Q18	2Q18/2Q17	1H18/1H17
PLATINUM (000' oz troy)	32	31	36	63	72	3.2%	-11.1%	-12.5%
PALLADIUM (000' oz troy)	53	73	64	126	125	-27.4%	-17.2%	0.8%
GOLD BY-PRODUCT (000' oz troy)	114	113	110	227	215	0.9%	3.6%	5.6%

Platinum and palladium

Platinum production in 2Q18 was 32,000 oz and palladium production was 53,000 oz in 2Q18, 3.2% higher and 27.4% lower than in 1Q18, respectively.

Gold as a by-product of nickel and copper concentrates

The contained volume of gold as a by-product in the nickel and copper concentrates reached 114,000 oz in 2Q18, in line with 1Q18 and 3.6% higher than in 2Q17.



Coal

000' metric tons	2Q18	1Q18	2Q17	1H18	1H17	% change		
						2Q18/1Q18	2Q18/2Q17	1H18/1H17
COAL PRODUCTION	2,871	2,432	3,037	5,303	5,471	18.1%	-5.5%	-3.1%
Metallurgical coal	1,559	1,401	2,049	2,959	3,681	11.3%	-23.9%	-19.6%
Thermal Coal	1,313	1,031	988	2,344	1,790	27.4%	32.9%	30.9%
COAL SALES	2,509	2,497	3,121	5,005	5,689	0.5%	-19.6%	-12.0%
Metallurgical coal	1,408	1,432	2,057	2,839	3,594	-1.7%	-31.6%	-21.0%
Thermal coal	1,101	1,065	1,064	2,166	2,095	3.4%	3.5%	3.4%

Production and sales overview

Production totaled 2.9Mt in 2Q18, 18.1% higher than 1Q18 and 5.5% lower than 2Q17, as the adverse conditions in the mine site in 1Q18 were only overcome during the first part of 2Q18, preventing a faster recovery in the quarter. The lower production vs. 2Q17 was mainly due to the difference in the coal seams fed to the plants.

In 2Q18 new trucks and excavators were received and are being assembled to support the increase in production volume in 2H18.

Production of metallurgical coal was 1.6 Mt, 11.3% higher than 1Q18 and 23.9% lower than 2Q17. Thermal coal production was 1.3 Mt, 27.3% higher than 1Q18 and 32.9% higher than 2Q17.

Sales totaled 2.5 Mt, in line with 1Q18 and 19.6% lower than 2Q17, as the lagged impact of higher production in 2Q18 will be felt in 3Q18.