



S11D mine
José Rodrigo Zermiani / Agência Vale

Vale production in 4Q16



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Production highlights

Rio de Janeiro, February 16th, 2017 – Vale S.A. (Vale) delivered a strong operational performance in 4Q16 and in 2016, with annual and quarterly production records in iron ore, pellets, nickel, copper, cobalt and gold.

Ferrous Minerals

IRON ORE

- Annual production record of 348.8 Mt¹ in 2016.
- Annual production record in Carajás of 148.1 Mt in 2016, 18.6 Mt higher than in 2015.
- Annual iron ore and pellets shipments record of 318.4 Mt from Brazil and Argentina and 21.7 Mt from Malaysia in 2016, 17.1 Mt and 7.5 Mt higher than in 2015, respectively.
- Annual blended volumes in Asia of 41 Mt in 2016, compared to 3 Mt in 2014 and 18 Mt in 2015.
- Quarterly production record in Carajás of 40.6 Mt, 1.9 Mt higher than in 3Q16 and 4.1 Mt higher than in 4Q15.

PELLETS

- Annual production² of 46.2 Mt in 2016, in line with 2015.
- Annual production record in the Tubarão VIII pellet plant of 7.2 Mt in 2016, 0.6 Mt higher than in 2015.
- Quarterly production record² of 12.6 Mt in 4Q16, 0.5 Mt higher than in 3Q16.

¹ Including third party purchases and excluding Samarco's attributable production.

² Excluding Samarco's attributable production

Base Metals

NICKEL

- Annual production record of 311,000 t in 2016, 20,000 t higher than in 2015.
- Annual production record from VNC of 34,300 t in 2016, 7,400 t higher than in 2015.
- Quarterly overall production record of 83,000 t in 4Q16, 7,000 t higher than in 3Q16 and 300 t higher than in 4Q15.

COPPER

- Annual production³ record of 453,100 t in 2016, 29,300 t higher than in 2015.
- Annual production record at Salobo of 175,900 t in 2016, 20,500 t higher than in 2015.
- Quarterly overall production³ record of 122,500 t in 4Q16, 11,100 t higher than in 3Q16 and 10,000 t higher than in 4Q15.
- Quarterly production record at Sudbury of 32,200 t in 4Q16, 2,500 t higher than in 3Q16 and 900 t higher than in 4Q15.
- Quarterly production record at Salobo of 49,800 t in 4Q16, 5,500 t higher than in 3Q16 and 7,800 t higher than in 4Q15.

COBALT

- Annual production record of 5,799 t in 2016, 1,266 t higher than in 2015.
- Quarterly production record of 1,600 t in 4Q16, 112 t higher than in 3Q16, driven by higher production from Sudbury and Voisey's Bay sources.

GOLD as a by-product of nickel and copper concentrates

- Annual production record of 483,000 oz in 2016, 62,000 oz higher than in 2015.
- Quarterly production record of 137,000 oz in 4Q16, 18,000 oz higher than in 3Q16 and 19,000 oz higher than in 4Q15.

³ Including Lubambe's attributable production

COAL

- Annual production of 7.2 Mt in 2016, in line with 2015.
- Annual production record at Moatize of 5.5 Mt in 2016, 0.5 Mt higher than in 2015.
- Quarterly overall production of 1.7 Mt, 0.6 Mt lower than in 3Q16, negatively impacted by the divestment of the Carborough Downs operations in November 2016⁴ and by the constraints on the supply of explosives which affected blasting operations in Mozambique.
- The supply of explosives was reestablished and operations performance has been constantly improving since then, with production totaling 0.6 Mt in December 2016 and reaching the monthly record of 0.8 Mt in January 2017.

Production summary

000' metric tons	4Q16	3Q16	4Q15	2016	2015	% change		
						4Q16/3Q16	4Q16/4Q15	2016/2015
Iron ore ¹	92,386	92,093	88,412	348,847	345,880	0.3%	4.5%	0.9%
Pellets ¹	12,620	12,071	10,377	46,220	46,198	4.5%	21.6%	0.0%
Manganese Ore	580	642	651	2,371	2,441	-9.7%	-10.9%	-2.9%
Coal	1,724	2,324	1,585	7,216	7,344	-25.8%	8.8%	-1.7%
Nickel	83.0	76.0	82.7	311.0	290.6	9.2%	0.4%	7.0%
Copper ²	122.5	111.4	112.5	453.1	423.8	10.0%	8.9%	6.9%
Cobalt	1.600	1.488	1.271	5.799	4.533	7.5%	25.9%	27.9%
Gold (000' oz troy)	137	118	118	483	420	16.1%	16.1%	15.0%
Potash	148	142	137	501	481	4.2%	8.0%	4.2%
Phosphate rock	2,058	2,068	2,122	7,546	8,163	-0.5%	-3.0%	-7.6%

¹ Excluding Samarco's attributable production.

² Including Lubambe's attributable production.

⁴ In November 2016, Vale agreed to divest the Carborough Downs operations to a subsidiary of AMCI Euro-holdings BV.



Iron Ore

000' metric tons	4Q16	3Q16	4Q15	2016	2015	% change		
						4Q16/3Q16	4Q16/4Q15	2016/2015
Northern System	40,594	38,651	36,534	148,123	129,554	5.0%	11.1%	14.3%
Southeastern System	27,785	27,240	26,616	102,735	113,036	2.0%	4.4%	-9.1%
Itabira	8,573	8,781	9,041	33,357	35,601	-2.4%	-5.2%	-6.3%
Minas Centrais	10,516	10,431	11,197	40,941	41,338	0.8%	-6.1%	-1.0%
Mariana	8,696	8,028	6,378	28,437	36,096	8.3%	36.3%	-21.2%
Southern System	23,430	25,648	24,404	95,686	98,776	-8.6%	-4.0%	-3.1%
Paraopeba	6,789	6,978	6,301	26,404	28,118	-2.7%	7.7%	-6.1%
Vargem Grande	6,716	7,750	8,487	29,151	29,259	-13.3%	-20.9%	-0.4%
Minas Itabirito	9,925	10,919	9,616	40,131	41,399	-9.1%	3.2%	-3.1%
Midwestern System	577	554	857	2,303	4,514	4.2%	-32.7%	-49.0%
Corumbá	577	554	408	1,937	2,819	4.2%	41.4%	-31.3%
Urucum	0	0	449	367	1,695	n.m.	n.m.	-78.3%
IRON ORE	92,386	92,093	88,412	348,847	345,880	0.3%	4.5%	0.9%

Production summary

Vale's iron ore production reached 348.8 Mt in 2016, representing a new annual record, 3.0 Mt higher than in 2015 mainly due to better operational performance at the mines and plants of the Northern System, which more than offset the decrease in production in the other systems.

The annual production of 348.8 Mt was within the original production guidance range of 340-350 Mt and came closer to the upper end of the range, mainly due to the outstanding operational performance of the Northern System in 4Q16, the one-off sale of compact ROM for construction purposes and the start-up of S11D.

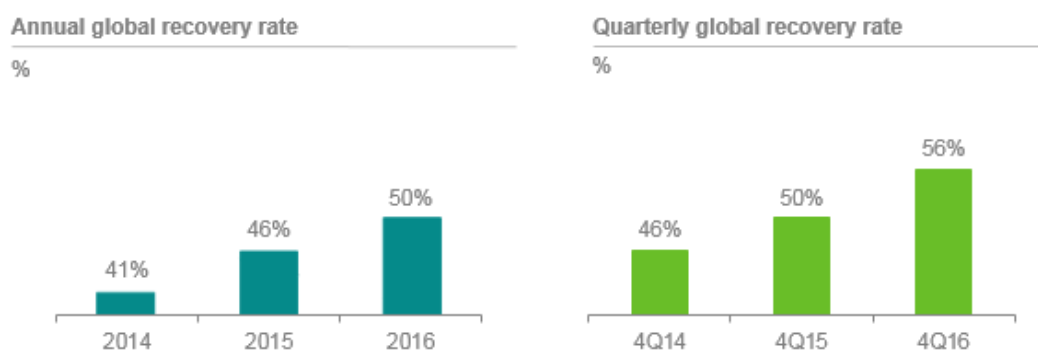
The production guidance for 2017 remains within the 360-380 Mt range as previously announced and from the end of 2018 onwards Vale will most likely achieve the long-term base case target of 400 Mt, as per Vale's presentation at the December 2016 "Vale Day".

Carajás achieved a record production of 148.1 Mt in 2016, an 18.6 Mt increase (14.3%) vs. 2015, mainly due to the abovementioned operational performance and to the successful start-up of the S11D mine and plant in 4Q16.

Production at lower margin operations (the Gongo Soco mine in the Southeastern system, the Urucum and Corumbá mines in the Midwestern system, and the Jangada and Feijão processing

plants in the Southern System) was stopped or reduced in 2016 as per our previously announced strategy.

Vale's Global Recovery (GR)⁵ increased from 41% in 2014 to 46% in 2015 and to 50% in 2016 as a result of the continuous increase in operational productivity throughout the years.



Iron ore and pellets shipments from Brazil and Argentina totaled 280.2 Mt in 2014, 301.3 Mt in 2015 and 318.4 Mt in 2016, the increase being mainly due to the higher production in the Northern System.

Blended volumes in Asia (Malaysia and China) totaled 2.6 Mt in 2014, 18.1 Mt in 2015 and 41.3 Mt in 2016 as a result of the ongoing strategy to bring more flexibility to the integrated supply chain by increasing offshore blending capacity.

The share of offshore inventories over total inventories increased from 9% in 2014 to 15% in 2015 and 2016 and is expected to increase to close to 30% by the end of 2017, reflecting the ongoing strategy to shift inventories downstream along the supply chain.

Vale's iron ore production⁶ achieved a quarterly record of 92.4 Mt in 4Q16, 0.3 Mt higher than in 3Q16 and 4.0 Mt higher than in 4Q15, mainly due to the aforementioned better operational performance and the start-up of S11D.

The average Fe content was 63.9% in 4Q16, remaining in line with 3Q16, due to the relative increase in Carajás production, despite the ongoing change of some beneficiation plants concentration process from wet to dry processing in the Southeastern System.

⁵ Measured by output of final production divided by the total tonnages extracted (ROM and waste).

⁶ Including third party purchases and excluding Samarco's attributable production.

Northern System

Carajás achieved a new quarterly production record of 40.6 Mt in 4Q16 (which represents an annualized production rate of over 160 Mt), 5.0% and 11.1% higher than in 3Q16 and 4Q15, respectively, mainly due to better operational performance at the mines and plants as a result of the positive outcome of several initiatives to increase fleet productivity and the improvement of equipment availability and reliability.

S11D start-up was successfully initiated in 4Q16 with iron ore being fed into two mobile crushing systems and transferred through the belt conveyor system to the processing plant, located 9 km away from the mine. Processed ore was stacked at the stockyard and loaded onto trains for the Ponta da Madeira maritime terminal. Shipments started in January 2017 with blended ore from S11D and the other Northern System mines.

Southeastern System

The Southeastern System, which encompasses the Itabira, Minas Centrais and Mariana mining hubs, produced 27.8 Mt in 4Q16, 1.2 Mt higher than in 4Q15 and in line with 3Q16. The production increase vs. 4Q15 was mainly due to the start-up of a crushing facility at the Fazendão mine from the Mariana mining hub. Mariana Complex production in 2016 was 21% lower than in 2015 due to the stoppage of ROM production.

Southern System

The Southern System, which encompasses the Paraopeba, Vargem Grande and Minas Itabirito mining hubs, produced 23.4 Mt in 4Q16, 8.6% and 4.0% lower than in 3Q16 and 4Q15, respectively, mainly due to heavy rains, which reduced productivity at the mines and plants.

Midwestern System

The Midwestern System, which encompasses the Urucum and the Corumbá mines, produced 0.6 Mt in 4Q16, in line with 3Q16 and 0.3 Mt lower than in 4Q15 as a result of Vale's strategy to optimize margins.



Pellets

000' metric tons	4Q16	3Q16	4Q15	2016	2015	% change		
						4Q16/3Q16	4Q16/4Q15	2016/2015
Southeastern System	7,616	7,000	6,414	28,495	27,934	8.8%	18.7%	2.0%
Itabrasco (Tubarão 3)	1,133	1,150	953	4,502	4,265	-1.5%	18.9%	5.6%
Hispanobras (Tubarão 4)	1,104	1,084	992	4,403	4,301	1.8%	11.3%	2.4%
Nibrasco (Tubarão 5 and 6)	2,378	2,283	1,752	8,535	8,401	4.2%	35.7%	1.6%
Kobrasco (Tubarão 7)	1,150	694	1,100	3,902	4,402	65.7%	4.5%	-11.4%
Tubarão 8	1,851	1,789	1,616	7,153	6,564	3.5%	14.5%	9.0%
Southern System	2,551	2,748	2,462	9,173	10,101	-7.2%	3.6%	-9.2%
Fábrica	981	956	978	2,798	3,731	2.6%	0.3%	-25.0%
Vargem Grande	1,570	1,792	1,484	6,374	6,370	-12.4%	5.8%	0.1%
Oman	2,453	2,323	1,502	8,552	8,163	5.6%	63.3%	4.8%
TOTAL PELLETS	12,620	12,071	10,377	46,220	46,198	4.5%	21.6%	0.0%

Production overview

Vale's annual pellet production achieved 46.2 Mt, in line with 2015, despite the stoppage of the Fábrica pellet plant at the beginning of the year due to the lack of availability of pellet feed. Fábrica resumed operations in July.

Vale's pellet production totaled 12.6 Mt in 4Q16, a quarterly record, 4.5% and 21.6% higher than in 3Q16 and 4Q15, respectively, mainly as a result of higher production at the Oman and Tubarão plants.

Vale is moving forward with its plan to re-start the São Luis pellet plant with its start-up envisioned for the beginning of 2018, after the renewal of its operational license, the revamp of the plant and the upgrade of its automation.

Southeastern system

The Tubarão pellet plants – Tubarão 3, 4, 5, 6, 7 and 8 – reached a production of 7.6 Mt in 4Q16, 8.8% and 18.7% higher than in 3Q16 and 4Q15, respectively, mainly due to scheduled maintenance stoppages in 3Q16 and in 4Q15.

Southern system

The Fábrica pellet plant achieved a production level of 1.0 Mt in 4Q16, in line with 3Q16.

The Vargem Grande pellet plant reached 1.6 Mt of production in 4Q16, 12.4% lower than in 3Q16 due to lower availability of feed, and 5.8% higher than in 4Q15 due to increased productivity at the plant in 4Q16.

Oman operations

The Oman pellet plant reached a quarterly production record of 2.5 Mt in 4Q16, 5.6% and 63.3% higher than in 3Q16 and 4Q15, respectively, mainly due to productivity gains and to better physical availability of the plant in 4Q16 vs. 3Q16 and maintenance stoppages in 4Q15.



Manganese ore and ferroalloys

000' metric tons	4Q16	3Q16	4Q15	2016	2015	% change		
						4Q16/3Q16	4Q16/4Q15	2016/2015
MANGANESE ORE	580	642	651	2,371	2,441	-9.7%	-10.9%	-2.9%
Azul	391	475	485	1,697	1,706	-17.7%	-19.4%	-0.5%
Urucum	167	167	166	652	735	0.0%	0.6%	-11.3%
Morro da Mina	22	-	-	22	-	n.m.	n.m.	n.m.
FERROALLOYS (Brazil)	35	36	20	124	99	-2.8%	75.0%	25.3%

Production overview

Manganese ore production totaled 2.4 Mt in 2016, decreasing 2.9% vs. 2015.

Ferroalloy production reached 124,000 t in 2016, increasing 25.3% vs. 2015 mainly due to the resumption of the Barbacena unit in 1Q16, which stopped in 3Q15.

Manganese ore production

Production at the Azul manganese mine totaled 1.7 Mt in 2016, in line with 2015, mainly due to higher Mn content in the run-of-mine, which compensated the decrease in ore recovered from tailing dams. Production reached 391,000 t in 4Q16, 17.7% and 19.4% lower than in 3Q16 and 4Q15, respectively, mainly due to the decrease in ore recovered from tailing dams when compared to 3Q16 and 4Q15. Less ore was recovered from the tailing dams in order to control moisture in the products shipped from the Ponta da Madeira Port.

Production at the Urucum mine totaled 652,000 t in 2016, 11% lower than 2015 due to limitations in run-of-mine availability in the underground mine. In 4Q16, production at the Urucum mine reached 167,000 t, in line with 3Q16 and 4Q15.

Production at the Morro da Mina mine totaled 22,000 t in 4Q16. Operations resumed in October 2016 due to better demand after its stoppage in 2015.

Ferroalloy production

Ferroalloy production in 2016 totaled 124,000 t, 25.3% higher than in 2015, and was composed of 67,000 t of ferrosilicon manganese alloys (FeSiMn), 42,000 t of high-carbon manganese alloys (FeMnHC) and 15,000 t of medium-carbon manganese alloys (FeMnMC).

Ferroalloy production in 4Q16 was 35,000 t, in line with 3Q16 and 75.0% higher than in 4Q15, mainly due to the resumption of the operations at the Barbacena unit, which had been suspended since 3Q15. Product mix was composed of 16,000 t of FeSiMn, 13,000 t of FeMnHC and 6,000 t of FeMnMC in 4Q16.



Nickel

Finished production by source

000' metric tons	4Q16	3Q16	4Q15	2016	2015	% change		
						4Q16/3Q16	4Q16/4Q15	2016/2015
Canada ¹	43.4	37.6	34.9	155.9	132.2	15.4%	24.4%	17.9%
Sudbury	19.9	22.1	13.0	80.4	54.4	-10.0%	53.1%	47.8%
Thompson	7.2	4.9	7.1	26.5	24.8	46.9%	1.4%	6.9%
Voisey's Bay	16.3	10.6	14.7	49.0	53.0	53.8%	10.9%	-7.5%
Indonesia	21.8	20.8	28.3	81.1	79.5	4.8%	-23.0%	2.0%
New Caledonia ²	8.9	7.4	8.3	34.3	26.9	20.3%	7.2%	27.5%
Brazil	5.6	6.6	6.4	24.1	24.4	-15.2%	-12.5%	-1.2%
Feed from third parties ³	3.3	3.6	4.8	15.6	26.7	-8.3%	-31.3%	-41.6%
TOTAL NICKEL	83.0	76.0	82.7	311.0	290.6	9.2%	0.4%	7.0%

¹ Canadian subtotal figures used to include feed from third parties in the previous reports, but since external feed has been processed at our Asian operations in 4Q16, the Canadian subtotal no longer includes the "feed from third parties" category in its calculation.

² Production at VNC reached 9,300 t in 4Q16, while production of finished nickel from VNC totaled 8,900 t in 4Q16; the differences stem from the required processing time into finished nickel.

³ External feed purchased from third parties and processed into finished nickel in our Canadian and Asian operations.

Production overview

Production of nickel reached a record of 311,000 t in 2016, being 7.0% higher than in 2015.

Nickel production reached a quarterly record of 83,000 t in 4Q16, 9.2% higher than in 3Q16 and in line with 4Q15 mainly due to 3Q16 planned maintenance shutdowns in Thompson and New Caledonia, strong production performances in the Canadian, Clydach and Asian refineries alongside increasing production in Long Harbour.

Canadian operations

Production from the Sudbury mines reached 19,900 t in 4Q16, 10.0% lower than in 3Q16 and 53.1% higher than in 4Q15. Sudbury production was adversely impacted in 4Q15 by operational issues and by mine redesign and remediation work. Sudbury will transition to a single furnace operation during 2017 and, as preparation for this, we will take one of the furnaces off-line in

mid-March as we rebuild and expand the furnace. The rebuilt furnace will remain in operation post the transition to one furnace in the second half of the year.

Production from the Thompson mines reached 7,200 t in 4Q16, 46.9% higher than in 3Q16 and in line with 4Q15. Thompson resumed production in 4Q16 after a scheduled maintenance shutdown carried out at its surface plants in August 2016. Thompson transitioned to a single furnace operation in January 2017.

Production from the Voisey's Bay source reached 16,300 t in 4Q16, 53.8% higher than in 3Q16 and 10.9% higher than in 4Q15. Production increase over 3Q16 was mainly due to the return of Thompson to full production after its annual maintenance shutdown and the continued successful ramp-up of the Long Harbour refinery.

Production at the Long Harbour processing plant reached 5,200 t in 4Q16, 37.4% higher than in 3Q16. During the quarter, production achieved 100% capacity of the intermediate circuit for the first full month confirming the technical capability of the facility. The final impurity circuits were successfully commissioned during the quarter and will be brought into operation in 1Q17, which requires a two-week full shutdown of the plant.

Indonesian operation (PTVI)

PTVI nickel in matte production reached 19,600 t in 4Q16, 9.9% lower than in 3Q16 and 12.2% lower than in 4Q15. Nickel in matte production was adversely impacted by a transformer failure at one of the electric furnaces in 4Q16. The transformer has since been repaired and production has returned to normal levels.

Production of finished nickel from PTVI reached 21,800 t in 4Q16, 4.8% higher than 3Q16 and 23.0% lower than 4Q15.

New Caledonia operation (VNC)

Production of finished products from VNC reached 8,900 t in 4Q16, 20.3% and 7.2% higher than in 3Q16 and 4Q15, respectively, posting a good result following the annual planned maintenance shutdown in 3Q16.

Production of NiO and NHC at VNC reached 9,300 t in 4Q16, the second best quarter on record, despite planned autoclave maintenance that limited VNC production in November. Site production was 3.4% higher than 3Q16 and 2.7% lower than 4Q15. NiO represented 83% and NHC 17% of VNC's 4Q16 site production.

Brazilian operation (Onça Puma)

Production from the Onça Puma operation reached 5,600 t in 4Q16, 15.2% and 12.5% lower than in 3Q16 and in 4Q15, respectively, due to unplanned electric furnace shutdowns in 4Q16.



Copper

Finished production by source

000' metric tons	4Q16	3Q16	4Q15	2016	2015	% change		
						4Q16/3Q16	4Q16/4Q15	2016/2015
BRAZIL	72.3	68.4	64.8	268.5	259.6	5.7%	11.6%	3.4%
Sossego	22.5	24.1	22.8	92.6	104.3	-6.6%	-1.3%	-11.2%
Salobo	49.8	44.3	42.0	175.9	155.4	12.4%	18.6%	13.2%
CANADA	48.4	40.9	45.5	177.0	154.2	18.3%	6.4%	14.8%
Sudbury	32.2	29.7	31.3	121.6	98.0	8.4%	2.9%	24.1%
Thompson	0.4	0.8	0.3	2.5	1.2	-50.0%	33.3%	108.3%
Voisey's Bay	11.0	5.6	10.8	31.7	32.0	96.4%	1.9%	-0.9%
Feed from third parties	4.8	4.9	3.1	21.2	23.1	-2.0%	54.8%	-8.2%
TOTAL EX-LUBAMBE	120.7	109.3	110.3	445.5	413.9	10.4%	9.4%	7.6%
Lubambe ¹	1.8	2.1	2.2	7.6	9.9	-14.3%	-18.2%	-23.2%
TOTAL COPPER	122.5	111.4	112.5	453.1	423.8	10.0%	8.9%	6.9%

¹ Attributable production.

Production overview

Copper production⁷ reached a record 445.5 kt in 2016, being 7.6% higher than in 2015. Production of copper was a record 120,700 t in 4Q16, 10.4% higher than in 3Q16 and 9.4% higher than in 4Q15. The strong performance was a result of the record quarterly production in both the Sudbury and Salobo operations.

Brazilian operations

Production of copper in concentrate at Sossego totaled 22,500 t in 4Q16, 6.6% lower than in 3Q16 due to lower ore grades being processed at the mill.

⁷ Excluding Lubambe attributable production.

Production of copper in concentrate at Salobo reached a quarterly record of 49,800 t in 4Q16, 12.4% and 18.6% higher than in 3Q16 and 4Q15, respectively. Salobo achieved a monthly production record of 17,449 t of copper in concentrate in December.

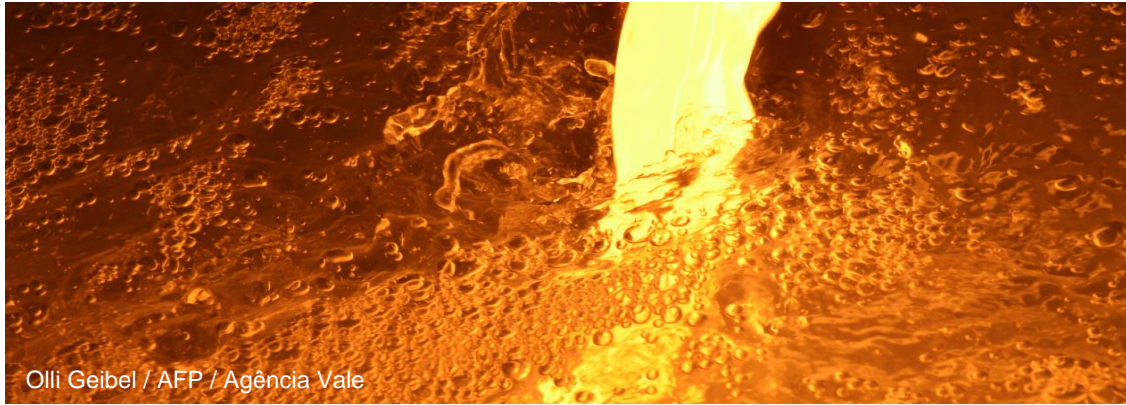
Canadian operations

Production of copper from Sudbury reached a record 32,200 t in 4Q16, 8.4% and 2.9% higher than in 3Q16 and 4Q15, respectively. Production was higher as the smelter and matte processing operations consumed previously accumulated inventory as planned.

Production of copper from Voisey's Bay reached 11,000 t in 4Q16, 96.4% and 1.9% higher than in 3Q16 and 4Q15, respectively. Voisey's Bay carried out its annual planned maintenance in 3Q16 and the Sudbury smelter consumed a sizeable volume of Voisey's Bay concentrate in 4Q16.

African operation (Lubambe)

Lubambe delivered 4,400 t of copper in concentrate on a 100% basis (attributable production of 1,800 t).



Olli Geibel / AFP / Agência Vale

Nickel and copper by-products

Finished production by source

	4Q16	3Q16	4Q15	2016	2015	% change		
						4Q16/3Q16	4Q16/4Q15	2016/2015
COBALT (metric tons)	1,600	1,488	1,271	5,799	4,533	7.5%	25.9%	27.9%
Sudbury	286	198	272	882	751	44.4%	5.1%	17.4%
Thompson	156	191	86	700	365	-18.3%	81.4%	91.8%
Voisey's Bay	320	227	90	887	849	41.0%	255.6%	4.5%
VNC	814	843	780	3,188	2,391	-3.4%	4.4%	33.3%
Others	23	30	43	143	177	-23.3%	-46.5%	-19.2%
PLATINUM (000' oz troy)	27	44	37	166	154	-38.6%	-27.0%	7.8%
Sudbury	27	44	37	166	154	-38.6%	-27.0%	7.8%
PALLADIUM (000' oz troy)	48	79	79	322	341	-39.2%	-39.2%	-5.6%
Sudbury	48	79	79	322	341	-39.2%	-39.2%	-5.6%
SILVER BY-PRODUCT (000' oz troy)	621	474	518	2,165	1,669	31.0%	19.9%	29.7%
Sudbury	621	474	518	2,165	1,669	31.0%	19.9%	29.7%
GOLD BY-PRODUCT (000' oz troy)	137	118	118	483	420	16.1%	16.1%	15.0%

Cobalt

Cobalt production totaled a record 1,600 t in 4Q16, 7.5% and 25.9% higher than in 3Q16 and 4Q15, respectively, mainly driven by higher production from Sudbury and Voisey's Bay sources. The impact of the Thompson scheduled maintenance shutdown in August 2016 was partially offset by inventory drawdown at Port Colborne.

Cobalt production from Sudbury increased to 286 t in 4Q16 from the 198 t and 272 t in 3Q16 and 4Q15, respectively. Production from Voisey's Bay increased to 320 t in 4Q16 from 227 t and 90 t in 3Q16 and 4Q15, respectively. This increase was primarily due to the Long Harbour refinery ramp-up with no cobalt production in 4Q15 and 277 t in 4Q16.

Platinum and palladium

Platinum production was 27,000 oz and palladium production was 48,000 oz, 38.6% and 39.2% lower than in 3Q16, respectively.

Gold as a by-product of nickel and copper concentrates

The contained volume of gold as a by-product in our nickel and copper concentrates reached a record of 137,000 oz in 4Q16, 16.1% higher than in 3Q16 and 4Q15.



Coal

000' metric tons	4Q16	3Q16	4Q15	2016	2015	% change		
						4Q16/3Q16	4Q16/4Q15	2016/2015
METALLURGICAL COAL	1,145	1,631	1,244	5,204	5,784	-29.8%	-8.0%	-10.0%
Moatize	1,006	1,063	873	3,480	3,401	-5.4%	15.2%	2.3%
Carborough Downs	139	568	371	1,724	2,383	-75.5%	-62.5%	-27.7%
THERMAL COAL	579	693	341	2,012	1,559	-16.5%	69.8%	29.1%
Moatize	579	693	341	2,012	1,559	-16.5%	69.8%	29.1%
TOTAL COAL	1,724	2,324	1,585	7,216	7,344	-25.8%	8.8%	-1.7%

Production overview

Coal production totaled 7.2 Mt in 2016, in line with the 7.3 Mt in 2015. The slight reduction was a result of the divestment of the Carborough Downs operations in November 2016⁸, as well as operational challenges with the longwall in Carborough Downs throughout the year.

Production at Moatize totaled 5.5 Mt in 2016 below the production guidance of 10.0 Mt announced on the Vale Day 2015. The main reasons for the lower production compared to the guidance were the delay on the start-up of the Moatize II plant, which occurred in August 2016, and the constraints on the supply of explosives, which impacted production in 4Q16. The supply of explosives was reestablished and operations performance has been constantly improving since then, with production totaling 0.6 Mt in December 2016 and reaching the monthly record of 0.8 Mt in January 2017.

Coal production was 1.7 Mt in 4Q16, 25.8% lower than in 3Q16 but 8.8% higher than in 4Q15, being negatively impacted by the divestment of the Carborough Downs operations in November 2016. In addition, Moatize faced supply constraints for explosives affecting the blasting process and resulting in a lower production figure compared to 3Q16. The production increase compared to 4Q15 was a result of the ramp-up of Moatize II.

⁸ In November 2016, Vale agreed to divest the Carborough Downs operations to a subsidiary of AMCI Euro-holdings BV.

Australian operations

Production in Australia totaled 1.7 Mt in 2016, 27.7% lower than in 2015, due to the divestment of Carborough Downs in November 2016 and the geological issues resulting in the longwall operational delays in 3Q16 and 4Q16.

Production at Carborough Downs was 139,000 t in 4Q16, 75.5% and 62.5% lower than in 3Q16 and 4Q15, respectively. The decrease was due to the longwall move, which resulted in no production in November 2016. The divestment of the operations at the end of November 2016 resulted in no production recorded for Vale in December 2016.

Moatize operations

Production at Moatize was 5.5 Mt in 2016, comprised of 3.5 Mt of metallurgical coal and 2.0 Mt of thermal coal, being 10.7% higher than in 2015. The increase was a result of several operational improvements at Moatize I, as well as the start-up of Moatize II in August 2016.

Production at Moatize was 1.6 Mt in 4Q16, being 9.7% lower than in 3Q16 but 30.5% higher than in 4Q15. After reaching a record in 3Q16, Moatize production decreased in 4Q16 due to constraints on the supply of explosives used in the blasting process. The ramp-up of Moatize II is progressing well, with a production of 940,000 t in 2016.

Production of metallurgical coal was 5.4% lower than in 3Q16 but 15.2% higher than in 4Q15, while production of thermal coal was 16.5% lower than in 3Q16 but 69.8% higher than in 4Q15.

Railed volume⁹ reached 8.8 Mt in 2016, being 113% higher than the 4.1 Mt railed in 2015. Shipped volume⁹ totaled 8.7 Mt in 2016, being 136% higher than the 3.7 Mt shipped in 2015, as a result of the ramp-up of the Nacala Corridor.

Railed volume was 2.4 Mt in 4Q16, being 13% higher than the 2.1 Mt railed in 3Q16. Shipped volume was 2.1 Mt in 4Q16, in line with the 2.2 Mt shipped in 3Q16. In December 2016, our logistics operations in Mozambique reached all-time records, with railed volumes⁹ of 1,097,000 t and shipped volumes⁹ of 1,071,000 t.

⁹ Includes Sena-Beira and Nacala Logistics corridors.



Fertilizer Nutrients

Important Disclosures

On December 19th 2016, Vale announced the sale of its Fertilizer assets to Mosaic¹⁰, excluding its nitrogen and phosphate assets at Cubatão. On the same date, Vale also announced that it expects to explore the sale of the remaining assets at Cubatão in 2017. Considering the expectations of the company to sell all the assets in the short term, Vale will stop reporting Fertilizers' production after 4Q16. Operational and financial results for the Fertilizer segment will be reported in Vale Financial Statements under "earnings of discontinued operations" already as of 4Q16.

On January 5th, 2017, the Cubatão unit 2 reported a fire on a belt conveyor that feeds the facility's ammonium nitrate's warehouse. The fire reached the warehouse, burning ammonium nitrate and releasing a reddish-orange smoke, which when inhaled in large quantities could cause health discomfort. Safety guidelines were followed soon after the fire was spotted, leading to the shutdown of all the plants in the facility, the evacuation of the area and the firefighting with the unit's own brigade supported by local teams of the Cubatão hub. There were no injuries, the fire was quickly controlled and the smoke rapidly dissipated in the atmosphere.

With the incident, the production of Cubatão unit 2 will decrease in 1Q17, impacting Vale's production of nitrogen (this unit is the main producer of nitric acid and ammonium nitrate) and to some extent of monoammonium phosphate (MAP). Despite the expected slowdown in production, almost all of the plants at Cubatão unit 2 resumed operations a few days after the incident after safety checks and only the production of ammonium nitrate fertilizer should be significantly impacted in 1Q17.

Operations at other units of Cubatão (unit 1 and 3) were not affected by the incident.

¹⁰ The completion of the transaction is subject to conditions described in the sales' release, but it is expected to occur in late 2017.

Potash

000' metric tons	4Q16	3Q16	4Q15	2016	2015	% change		
						4Q16/3Q16	4Q16/4Q15	2016/2015
POTASH	148	142	137	501	481	4.2%	8.0%	4.2%
Taquari-Vassouras	148	142	137	501	481	4.2%	8.0%	4.2%

Phosphates

000' metric tons	4Q16	3Q16	4Q15	2016	2015	% change		
						4Q16/3Q16	4Q16/4Q15	2016/2015
PHOSPHATE ROCK	2,058	2,068	2,122	7,546	8,163	-0.5%	-3.0%	-7.6%
Brazil	960	1,062	1,102	3,693	4,282	-9.6%	-12.9%	-13.8%
Bayóvar	1,098	1,005	1,019	3,853	3,881	9.3%	7.8%	-0.7%
MAP¹	284	244	276	1,020	1,097	16.4%	2.9%	-7.0%
TSP²	182	192	206	833	866	-5.2%	-11.7%	-3.8%
SSP³	478	495	523	1,753	1,953	-3.4%	-8.6%	-10.2%
DCP⁴	122	128	129	487	480	-4.7%	-5.4%	1.5%

¹ Monoammonium phosphate

² Triple superphosphate

³ Single superphosphate

⁴ Dicalcium phosphate

Potash

Production of potash totaled 501 kt in 2016, 4.2% higher than in 2015, due to the higher availability and the lower ROM moisture at the mine.

Potash production reached 148 kt in 4Q16, 4.2% and 8.0% higher than in 3Q16 and 4Q15, respectively, due to the lower ROM moisture and the higher productivity at the concentration plant.

Phosphate Rock

Production of phosphate rock was 7.5 Mt in 2016, 7.6% lower than in 2015, as a result of a 13.8% production decline at the Brazilian operations. Production was mainly affected by the scheduled maintenance stoppage at the Araxá plant throughout 1Q16 and the unscheduled maintenance stoppages at Tapira, Catalão and Cajati, which was impacted by heavy storms in January 2016.

Output from the Brazilian operations was 960 kt in 4Q16, 9.6% and 12.9% lower than in 3Q16 and 4Q15, respectively, due to a scheduled maintenance stoppage at Tapira and Cajati in November and Catalão in December and an unscheduled maintenance stoppage at Araxá in December.

Bayóvar's output was 1.1 Mt in 4Q16, 9.3% and 7.8% higher than in 3Q16 and 4Q15, respectively, as a result of an unscheduled maintenance stoppage in 3Q16 to fix the belt conveyor and the higher quality of ore compared to 4Q15.

MAP

Production of MAP (monoammonium phosphate) totaled 1.0 Mt in 2016, 7% lower than in 2015, due to the lower availability of phosphoric acid at the Uberaba plant as a result of lower phosphate rock production at Tapira and a scheduled maintenance stoppage and operational adjustments at the Cubatão 2 plant.

Production of MAP totaled 284 kt in 4Q16, 16.4% and 2.9% higher than in 3Q16 and 4Q15, respectively, due to higher availability of phosphoric acid and a scheduled maintenance stoppage in July 2016 at the Uberaba plant.

TSP

Production of TSP (triple superphosphate) totaled 833 kt in 2016, 3.8% lower than in 2015 due to the lower availability of phosphoric acid at Uberaba plant. Uberaba is the only TSP production unit.

Production of TSP totaled 182 kt in 4Q16, 5.2% and 11.7% lower than in 3Q16 and 4Q15, respectively, due to the prioritization of phosphoric acid use for MAP production (rather than TSP) in 4Q16.

SSP

Production of SSP (single superphosphate) totaled 1.8 Mt in 2016, 10.2% lower than in 2015, mainly due to a scheduled and unscheduled maintenance stoppage at the Araxá plant throughout 1H16 leading to lower availability of sulphuric acid, an input for the production of phosphate fertilizers, and a scheduled and unscheduled maintenance stoppage at Cubatão 3.

Production of SSP totaled 478 kt in 4Q16, 3.4% and 8.6% lower than in 3Q16 and 4Q15, respectively, as a result of unscheduled maintenance stoppage at Araxá, Catalão and Cubatão 3 in 4Q16.

DCP

DCP (dicalcium phosphate) production totaled 487 kt in 2016, in line with 2015.

DCP production totaled 122 kt in 4Q16, 4.7% and 5.4% lower than in 3Q16 and 4Q15 respectively, due to the lower availability of phosphate rock at Cajati.



Nitrogen

000' metric tons	4Q16	3Q16	4Q15	2016	2015	% change		
						4Q16/3Q16	4Q16/4Q15	2016/2015
AMMONIA	29	39	6	135	138	-25.6%	383.3%	-2.2%
NITRIC ACID	115	119	116	468	475	-3.4%	-0.9%	-1.5%
AMMONIUM NITRATE	128	132	130	523	515	-3.0%	-1.5%	1.6%

Ammonia production

Ammonia production totaled 135 kt in 2016, mostly in line with 2015.

Ammonia production totaled 29 kt in 4Q16, 25.6% lower than in 3Q16 due to operational problems at Cubatão 2, which were solved in the same quarter, but 383.3% higher than in 4Q15 due to a prolonged schedule maintenance stoppage at Cubatão 2 throughout 4Q15.

Nitric acid and ammonium nitrate production

Nitric acid production was 468 k t in 2016, in line with 2015.

Nitric acid production totaled 115 kt in 4Q16, 3.4% lower than in 3Q16 due to lower availability of ammonia at Cubatão 2. Production of nitric acid was in line with 4Q15.

Ammonium nitrate production was 523 kt in 2016, in line with 2015.

Ammonium nitrate production totaled 128 kt in 4Q16, 3.0% lower than 3Q16 due to the lower availability of nitric acid and ammonia as abovementioned, but in line with 4Q15.