



B3/B4 back-up dam, delivered in 4Q20

# VALE'S PRODUCTION AND SALES IN 4Q20 AND 2020

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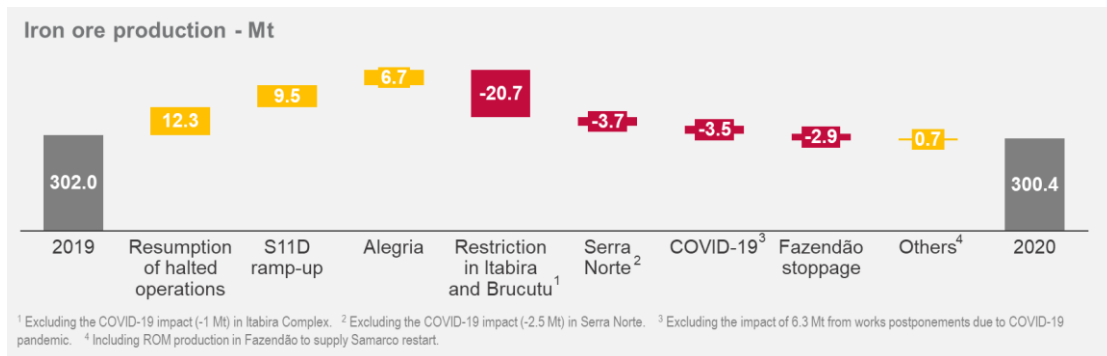
# Production and sales in 4Q20 and 2020

|   |  |   |   |
|---|--|---|---|
| <b>Record iron ore sales to China in 4Q20</b> | <b>Resumption of Serra Leste and Fábrica in 4Q20</b> | <b>Record Nickel sales for a quarter since 4Q17</b> | <b>Moatize plant revamp restart in 4Q20</b> |
|---|--|---|---|

**Rio de Janeiro, February 3<sup>rd</sup>, 2021** – 2020 ends with the partial resumption of all iron ore fines operations halted in 2019, which became even more challenging due to the COVID-19 pandemic and the need to adopt measures to protect employees and support communities. Although the pandemic-related impacts and measures reduced productivity in all businesses and postponed, in 2020, the start-up of the new iron ore assets, Vale remains confident to achieve 400 Mtpy capacity by the end of 2022.

In 4Q20, Vale resumed Serra Leste and Fábrica sites in Iron Ore Business and resumed Moatize revamp works. The quarter was marked by a strong quarter-on-quarter sales increase in the Iron Ore (25.9%), Copper (15.4%) and Nickel (13.6%) businesses.

**Vale’s iron ore fines production<sup>1</sup> totalled 300.4 Mt in 2020**, in line with 2019 as a result of (i) the resumption of halted operations such as Vargem Grande and Timbopeba; (ii) S11D ramp up; and (iii) full year operating Alegria site. These positive effects were fully offset by: (i) constraints in tailings disposal in Itabira and Brucutu; and (ii) delays in opening new mining fronts in Serra Norte; (iii) COVID-19 impacts; and (iv) 4-month stoppage of Fazendão site.



In 4Q20, Vale produced 84.5 Mt of iron ore fines, 5% lower than in 3Q20 mainly due to higher rainfall levels<sup>2</sup> and tailings disposal restrictions in Southeastern System.

<sup>1</sup> Including third party purchases, run-of-mine and feed for pelletizing plants. Vale’s product portfolio Fe content reached 63.3%, alumina 1.5% and silica 4.3%.  
<sup>2</sup> 4Q20 = 461mm / 3Q20 = 33mm / 4Q19 = 377mm.

Considering production restrictions, **Vale ended 2020 with 322 Mt of production capacity and expects to achieve 350 Mt capacity by the end of 2021.**

| Capacity resumption plan for 2021 |   |  |  |   |
|-----------------------------------|---|--|--|---|
| Main milestones                   |   |  |  |   |
| 1Q21                              | <b>Timbopeba</b><br>Plant's adaptation for tailings disposal at Timbopeba pit<br><b>+7 Mtpy</b> | <b>Vargem Grande</b><br>Pellet plant restarted in January<br><b>+7 Mtpy of pellets</b>                     |  |   |
|                                   | 2Q21  | <b>Vargem Grande</b><br>Unlock conveyor belt capacity<br><b>+6 Mtpy</b>                                    |  | <b>Fábrica</b><br>Shift to wet processing<br><b>+4 Mtpy</b>   |
| 3Q21                              |   | <b>Vargem Grande</b><br>Start-up of Maravilhas III dam and filtering plant<br><b>+4 Mtpy</b>               |  |   |
| 4Q21                              | <b>Brucutu</b><br>Torto dam start-up<br><b>+17 Mtpy</b>   | <b>Serra Leste</b><br>Repower crushers<br><b>+2 Mtpy</b>   |  | <b>S11D</b><br>Crushers' installation to process jaspilite ores<br><b>+2 Mtpy</b>                         |
|                                   | Potential restrictions in 2021  | <b>Itabira</b><br>Temporary tailings disposal restrictions due to limited disposal areas<br><b>-9 Mtpy</b> |  | <b>Other sites</b><br>Licensing delays and lower performance (e.g. Mutuca, Serra Norte)<br><b>-5 Mtpy</b> |

**Vale's pellet production totalled 29.7 Mt in 2020**, 29.0% lower than in 2019, as a result of lower pellet feed availability from Vale's sites and production adjustments according to market conditions. Vale's pellet production was 7.1 Mt in the quarter, down 1.4Mt sequentially due to lower pellet feed availability from Brucutu and Itabira and maintenances in Tubarão 6 pellet plant. In January 2021, Vale resumed Vargem Grande pellet plant operations, halted since February 2019, adding 7 Mtpy of pellet plant capacity (from 46.8 Mtpy to 53.8 Mtpy). Vale's bottleneck for pellet production continues to be the lower pellet feed availability from its operations.

**Sales volumes of iron ore fines and pellets totalled 286.1 Mt in 2020, 5% below iron ore fines production.** In order to supply clients during 2019, Vale drew down its operational inventories, achieving unsustainable low levels. During 2020, Vale needed to rebuild its operational inventories, supporting greater adherence between sales and production in 2021.

**In 4Q20, Vale's sales of iron ore fines and pellets reached 91.3 Mt with a premium of US\$ 4.3/t<sup>3</sup>. Vale achieved record sales to China in 4Q20, totalling 64 Mt (vs. 58 Mt in 4Q19).**

**Production of finished nickel ex-VNC was 183.7 kt in 2020, in line with 2019. On the positive side, annual production was supported by** (i) improved performance of 9.3 kt from Onça Puma, with a full operating year, after receiving judicial authorization<sup>4</sup> to resume mine and

<sup>3</sup> Iron ore premium of US\$ 3.2/t and weighted average contribution of pellets of US\$ 1.1/t.

<sup>4</sup> Mining and processing plant activities in Onça Puma were suspended in September 2017 and June 2019, respectively, when the Court of Appeals of the First Region granted an injunction in favor of the Federal Prosecutors due to the alleged impact on indigenous communities

processing activities in September 2019 and (ii) increased source ore from Indonesia of 3.4 kt due to stable operations throughout the year. COVID-19 impacts estimated to have trimmed annual production by 7.3 kt across all our Base Metals operations and the biennial broader-scope scheduled maintenance at Canada operations, which reduced production by 4.9 kt. In 4Q20, production totalled 55.9 kt, 19% higher than 3Q20, explained by stronger production rates after maintenance works rescheduled from 1H20 to 3Q20 across nickel operations.

**Copper production reached 360.1 kt in 2020, 5.5% lower than 2019, mainly as a result of:** (i) 35.3 kt lower production from COVID-19 impacts, which include the decision to minimize the contingent of workers on site, travel restrictions and disruptions in the supply chain, increase in absenteeism levels and infrastructure and equipment maintenance delays; and (ii) 10.8 kt reduction from limited Canadian mill production due to lower mining rates. These decreases were partially offset by 22.2 kt higher production from strong performance in Sossego, which had increased mill processing rates and higher copper grades. In 4Q20, production totalled 93.5 kt, 7% higher than 3Q20, mostly due to stronger production rates across Brazil and Canada operations.

**Coal business resumed its maintenance activities in November**, which are expected to be completed during 1Q21, followed by the commissioning activities of new and revamped equipment. Mine and plant ramp-up should start by 2Q21 until the end of 2021. Vale expects to achieve a production run-rate of 15 Mtpy in 2H21.

## Production summary

| 000' metric tons           | 4Q20   | 3Q20   | 4Q19   | 2020    | 2019    | % change  |           |           |
|----------------------------|--------|--------|--------|---------|---------|-----------|-----------|-----------|
|                            |        |        |        |         |         | 4Q20/3Q20 | 4Q20/4Q19 | 2020/2019 |
| Iron ore <sup>1</sup>      | 84,508 | 88,676 | 78,344 | 300,385 | 301,972 | -4.7%     | 7.9%      | -0.5%     |
| Pellets                    | 7,117  | 8,562  | 9,415  | 29,676  | 41,794  | -16.9%    | -24.4%    | -29.0%    |
| Manganese Ore              | 119    | 109    | 450    | 740     | 1,576   | 9.2%      | -73.6%    | -53.0%    |
| Coal                       | 1,230  | 1,402  | 1,876  | 5,878   | 8,770   | -12.3%    | -34.4%    | -33.0%    |
| Nickel                     | 55.9   | 47.1   | 56.7   | 214.7   | 208.0   | 18.7%     | -1.4%     | 3.2%      |
| Nickel Ex-VNC <sup>2</sup> | 50.8   | 38.6   | 51.9   | 183.7   | 184.6   | 31.6%     | -2.1%     | -0.5%     |
| Copper                     | 93.5   | 87.6   | 90.3   | 360.1   | 381.1   | 6.7%      | 3.5%      | -5.5%     |
| Cobalt (metric tons)       | 1,042  | 1,223  | 1,141  | 4,672   | 4,376   | -14.8%    | -8.7%     | 6.8%      |
| Gold (000' oz troy)        | 120    | 116    | 132    | 469     | 480     | 3.4%      | -9.1%     | -2.3%     |

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

<sup>2</sup> Nickel ex-VNC production by site totalled 193.2 kt in 2020.

## Sales summary

| 000' metric tons      | 4Q20   | 3Q20   | 4Q19   | 2020    | 2019    | % change  |           |           |
|-----------------------|--------|--------|--------|---------|---------|-----------|-----------|-----------|
|                       |        |        |        |         |         | 4Q20/3Q20 | 4Q20/4Q19 | 2020/2019 |
| Iron ore <sup>1</sup> | 82,825 | 65,769 | 77,907 | 254,865 | 269,306 | 25.9%     | 6.3%      | -5.4%     |
| Pellets               | 8,486  | 8,464  | 10,966 | 31,211  | 43,199  | 0.3%      | -22.6%    | -27.7%    |
| Manganese Ore         | 461    | 428    | 570    | 1,378   | 1,063   | 7.7%      | 19.1%     | 29.6%     |
| Coal                  | 1,535  | 1,381  | 2,042  | 5,867   | 8,784   | 11.1%     | -24.9%    | -33.2%    |
| Nickel                | 66.1   | 58.2   | 47     | 210.9   | 205.7   | 13.6%     | 40.6%     | 2.5%      |
| Copper                | 93.0   | 80.6   | 87.8   | 346.3   | 365.2   | 15.4%     | 5.9%      | -5.2%     |

<sup>1</sup> Including third party purchases and run-of-mine.

located close to the mining site. Vale has appealed this decision and in September 2019 the Federal Supreme Court (SFT) decided to suspend the injunctions and to grant the return of Onça Puma operations.

# Iron ore

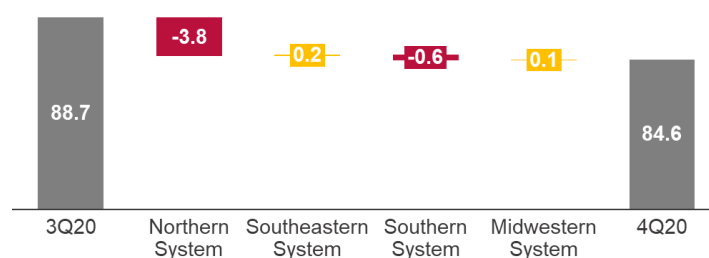
| 000' metric tons                               | 4Q20          | 3Q20          | 4Q19          | 2020           | 2019           | % change      |               |               |
|--|---------------|---------------|---------------|----------------|----------------|---------------|---------------|---------------|
|  |               |               |               |                |                | 4Q20/<br>3Q20 | 4Q20/<br>4Q19 | 2020/<br>2019 |
| <b>Northern System</b>                         | <b>53,053</b> | <b>56,850</b> | <b>50,729</b> | <b>192,266</b> | <b>188,721</b> | <b>-6.7%</b>  | <b>4.6%</b>   | <b>1.9%</b>   |
| Serra Norte and Serra Leste                    | 31,158        | 32,459        | 31,438        | 109,416        | 115,352        | -4.0%         | -0.9%         | -5.1%         |
| S11D   | 21,895        | 23,391        | 19,291        | 82,850         | 73,369         | -6.4%         | 13.5%         | 12.9%         |
| <b>Southeastern System</b>                     | <b>16,468</b> | <b>16,307</b> | <b>17,019</b> | <b>57,285</b>  | <b>73,148</b>  | <b>1.0%</b>   | <b>-3.2%</b>  | <b>-21.7%</b> |
| Itabira (Cauê, Conceição and others)           | 6,117         | 6,465         | 8,067         | 23,913         | 35,969         | -5.4%         | -24.2%        | -33.5%        |
| Minas Centrais (Brucutu and others)            | 3,422         | 4,394         | 6,600         | 15,655         | 25,883         | -22.1%        | -48.2%        | -39.5%        |
| Mariana (Alegria, Timbopeba and others)        | 6,929         | 5,448         | 2,352         | 17,717         | 11,296         | 27.2%         | 194.6%        | 56.8%         |
| <b>Southern System</b>                         | <b>14,314</b> | <b>14,930</b> | <b>9,980</b>  | <b>48,368</b>  | <b>37,733</b>  | <b>-4.1%</b>  | <b>43.4%</b>  | <b>28.2%</b>  |
| Paraopeba (Mutuca, Fábrica and others)         | 6,717         | 7,064         | 4,997         | 23,302         | 24,637         | -4.9%         | 34.3%         | -5.4%         |
| Vargem Grande (Vargem Grande, Pico and others) | 7,597         | 7,866         | 4,983         | 25,066         | 13,096         | -3.4%         | 52.5%         | 91.4%         |
| <b>Midwestern System</b>                       | <b>673</b>    | <b>589</b>    | <b>616</b>    | <b>2,466</b>   | <b>2,370</b>   | <b>14.3%</b>  | <b>9.3%</b>   | <b>4.1%</b>   |
| Corumbá  | 673           | 589           | 616           | 2,466          | 2,370          | 14.3%         | 9.3%          | 4.1%          |
| <b>IRON ORE PRODUCTION<sup>1</sup></b>         | <b>84,508</b> | <b>88,676</b> | <b>78,344</b> | <b>300,385</b> | <b>301,972</b> | <b>-4.7%</b>  | <b>7.9%</b>   | <b>-0.5%</b>  |
| <b>IRON ORE SALES<sup>2</sup></b>              | <b>82,825</b> | <b>65,769</b> | <b>77,907</b> | <b>254,865</b> | <b>269,306</b> | <b>25.9%</b>  | <b>6.3%</b>   | <b>-5.4%</b>  |
| <b>IRON ORE AND PELLETS SALES</b>              | <b>91,311</b> | <b>74,233</b> | <b>88,873</b> | <b>286,076</b> | <b>312,505</b> | <b>23.0%</b>  | <b>2.7%</b>   | <b>-8.5%</b>  |

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

<sup>2</sup> Including third party purchases and run-of-mine.

## Production variation (4Q20 x 3Q20)

Mt



## Northern System

The Northern System was mainly affected by higher rainfall levels<sup>5</sup> impacting production activities.

Serra Leste operation restarted in December after receiving the required Installation License. The site is expected to produce 4-5 Mt in 2021, reaching 6 Mtpy of run-rate until the end of the year. An expansion project will be developed in the coming years to adapt and repower the

<sup>5</sup> 4Q20 = 461mm / 3Q20 = 33mm / 4Q19 = 377mm.

existing plant, allowing a capacity upgrade to 10 Mtpy. The expansion start-up is expected by the first semester of 2023.

On January 14<sup>th</sup>, 2021, a fire occurred in one (CN6) of the eight ship loaders at the Ponta da Madeira Maritime Terminal, in São Luís, Maranhão. The fire was controlled, without casualties or environmental damage. On January 28<sup>th</sup>, shipping activities at Southern berth of Pier IV were resumed using the second ship loader (CN7) available at the berth, which was not affected. Vale expects to conclude the maintenance activities at the affected ship loader (CN6) in the first half of 2021, without impacts on shipments and production in 2021 (For more details, click [here](#))

## **Southeastern System**

Southeastern System's production was in line with 3Q20, as result of higher ROM production to supply Samarco restart. This was partly offset by (i) a lower production level in Itabira and Brucutu related with lower performance of the temporary tailings disposal solutions; and (ii) and the use of mechanical dismantling and higher average haulage distance in Alegria, decreasing site's productivity since Xingu dam was raised to Emergency Level 2 protocol.

## **Southern System**

The weaker operational performance in 4Q20 can be mainly attributed to (i) the partial stoppage (resumed in January 2021) of Viga's operations due to the suspension of the permit required to dispose tailings in B7 dam; and (ii) lower mining productivity in Abóboras mine, caused by the reduced efficiency of mechanical dismantling in compact itabirite mining fronts. This was partially offset by the resumption of Fábrica's dry processing.

Fábrica site resumed its activities in December after several vibration tests certified the absence of impacts on the site's structures. Site's operations were halted since February 2019. Until the resumption of beneficiation plant activities, which are expected to restart in 2Q21, Fábrica will operate by dry processing and mechanical dismantling, adding around 2 Mtpy of production capacity.

## **Operational stabilization and resumption plan**

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

|                 | Actions in progress  | Accomplishments in 4Q20  | Timeline for resumption  |
|-----------------|--|--|--|
| Northern System | <ul style="list-style-type: none"> <li>Licensing and opening new mining fronts.</li> <li>Progressing on the construction of Gelado, Northern System 240 Mtpy and Serra Sul 120 projects.</li> </ul>  | <ul style="list-style-type: none"> <li>Serra Leste: Installation license conceded by SEMAS/PA and resumption of operations in November.</li> <li>Serra Norte: Opening of new mining fronts in Morro 1 in progress increasing site's productivity.</li> </ul>                           | <ul style="list-style-type: none"> <li>4Q21: Repower Serra Leste crushers.</li> <li>2021/22: Installation of new crushers to process jaspilite ore bodies in S11D.</li> <li>1H22: Start-up of Gelado project with 10 Mtpy capacity.</li> <li>2H22: Start-up of Northern System 240 Mtpy project, increasing the System's capacity by 10 Mtpy.</li> <li>1H23: Expansion of Serra Leste to 10 Mtpy capacity.</li> <li>2021/23: Applying for new licenses and opening new mining fronts.</li> <li>2023: Usina 1 shift to 100% dry processing temporarily impacting production.</li> <li>1H24: Start-up of Serra Sul 120 project.</li> </ul> |
| Itabira         | <ul style="list-style-type: none"> <li>Completion of studies (geotechnical investigations) of Itabiruçu dam.</li> <li>Restart raising construction works of Itabiruçu dam, after removal of emergency level.</li> <li>Completion of tailings' filtration plants construction to increase wet processing capacity.</li> <li>Tailings piles developing and licensing.</li> </ul> | <ul style="list-style-type: none"> <li>Improvements in Onça and Periquito pits tailings disposal capacity, supporting Conceição site.</li> <li>Tailings' filtration plant construction works achieved 31% and 45% of physical progress in Cauê and Conceição, respectively.</li> </ul> | <ul style="list-style-type: none"> <li>1Q21: Removal of emergency level of Itabiruçu dam and start of raising construction.</li> <li>2021: Capacity restrictions throughout the year due to area constraint for tailings disposal.</li> <li>2022: Start-up of tailings' filtering plants and dry stacking activities<sup>6</sup>, increasing site's capacity to 40 Mtpy from current 26 Mtpy.</li> </ul>   |
| Brucutu         | <ul style="list-style-type: none"> <li>Completion of Torto dam<sup>7</sup> and tailings' filtration plant construction to increase wet processing capacity.</li> <li>Assessment of Norte/Laranjeiras dam geotechnical characteristics.</li> </ul>  | <ul style="list-style-type: none"> <li>Torto dam construction works achieved 87% of physical progress.</li> <li>Tailings' filtration plant construction works achieved 49% of physical progress.</li> </ul>  | <ul style="list-style-type: none"> <li>4Q21: Start-up of Torto dam, increasing site's capacity to 28 Mtpy from current 11 Mtpy.</li> <li>2022: Start-up of tailings' filtering plant and dry stacking activities and use of Torto and Norte/Laranjeiras<sup>8</sup> dams as contingency.</li> </ul>  |
| Timbopeba       | <ul style="list-style-type: none"> <li>Project being concluded to adapt the plant's capacity for tailings disposal at Timbopeba pit.</li> </ul>  | <ul style="list-style-type: none"> <li>Progressed on plant's adaptation to increase capacity.</li> <li>Capanema project approved in December.</li> </ul>   | <ul style="list-style-type: none"> <li>1Q21: Increase production capacity to 12 Mtpy from current 5 Mtpy fully disposing tailings at Timbopeba pit.</li> <li>2H23: Start-up of Capanema project, adding 14 Mtpy of net capacity in the first years.</li> </ul>   |

<sup>6</sup> Using Itabiruçu dam as contingency.

<sup>7</sup> A positive declaration of stability condition (DCE) and an operating license for Torto dam operations are necessary, relying on the external auditor and authorities' assessment.

<sup>8</sup> Norte/Laranjeiras dam is under Emergency Level 2 and today does not have a positive stability declaration, which is required to resume operations. The use of the dam as contingency is expected in 2025.



|                       | Actions in progress   | Accomplishments in 4Q20   | Timeline for resumption  |
|-----------------------|---|---|--|
| Fábrica               | <ul style="list-style-type: none"> <li>Conclusion of beneficiation plant vibration tests (to certify the absence of impacts on the site's structures), depending on external assessment/ approval.</li> </ul>   | <ul style="list-style-type: none"> <li>Resumption of dry processing operations in December with 2 Mtpy capacity.</li> <li>Approval received to start vibration tests at beneficiation plant facilities.</li> <li>Construction of pipeline for tailings disposal at Forquilha V concluded and progressing on commissioning.</li> </ul>   | <ul style="list-style-type: none"> <li>2Q21: Resumption of beneficiation plant activities, upgrading capacity to 6 Mtpy, after vibration tests conclusion.</li> <li>2022: Resumption of Fábrica pellet plant, depending on market conditions.</li> </ul>   |
| Vargem Grande Complex | <ul style="list-style-type: none"> <li>Completion of Maravilhas III dam<sup>9</sup> and tailings' filtration plant construction to increase wet processing capacity.</li> <li>De-characterization of Vargem Grande dam.</li> <li>Studies to debottleneck logistics capacity, limited by the impossibility to operate the long-distance conveyor belt in the segment close to the Vargem Grande dam and the use of autonomous train in Forquilhas and Grupo dams self-rescue zones (ZAS).</li> </ul> | <ul style="list-style-type: none"> <li>Maravilhas III dam construction works achieved 56% of physical progress.</li> <li>Tailings' filtration plant construction works achieved 86% of physical progress.</li> <li>Approval received to start VGR's conveyor belt tests.</li> <li>Progress on blasting dismantling studies in Sapecado and Galinheiro mine.</li> <li>New Steel plant construction approved in December.</li> <li>VGR pellet plant resumed in January 2021.</li> </ul> | <ul style="list-style-type: none"> <li>2Q21: Unlock site's conveyor belt capacity, increasing site's capacity to 36 Mtpy.<sup>10</sup></li> <li>3Q21: Start-up of Maravilhas III dam and tailings' filtering plant<sup>11</sup>.</li> <li>2022: Start-up of New Steel plant with 1.5 Mtpy capacity</li> <li>2021/27: Increase railway capacity, advancing in studies to elevate automated train productivity and decreasing emergency levels of Forquilhas and Grupo dams<sup>12</sup>.</li> </ul> |

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

<sup>10</sup> Resumption of conveyor belt relies on external approvals by National Mining Agency (ANM) and external auditors

<sup>11</sup> The start-up increases mine-plant capacity to 53 Mtpy, and production is limited by railway capacity.

<sup>12</sup> Decrease of emergency levels also depends on external evaluation by ANM and external auditors.

# Pellets

| 000' metric tons           | 4Q20         | 3Q20         | 4Q19          | 2020          | 2019          | % change      |               |               |
|----------------------------|--------------|--------------|---------------|---------------|---------------|---------------|---------------|---------------|
|                            |              |              |               |               |               | 4Q20/3Q20     | 4Q20/4Q19     | 2020/2019     |
| <b>Northern System</b>     | <b>1,195</b> | <b>1,176</b> | <b>1,152</b>  | <b>4,173</b>  | <b>3,997</b>  | <b>1.6%</b>   | <b>3.7%</b>   | <b>4.4%</b>   |
| São Luis                   | 1,195        | 1,176        | 1,152         | 4,173         | 3,997         | 1.6%          | 3.7%          | 4.4%          |
| <b>Southeastern System</b> | <b>4,174</b> | <b>4,906</b> | <b>5,859</b>  | <b>13,575</b> | <b>27,329</b> | <b>-14.9%</b> | <b>-28.8%</b> | <b>-50.3%</b> |
| Tubarão 1 and 2            | -            | -            | 34            | -             | 2,727         | n.m.          | -100%         | -100%         |
| Itabasco (Tubarão 3)       | 804          | 821          | 989           | 2,968         | 3,172         | -2.1%         | -18.7%        | -6.4%         |
| Hispanobras (Tubarão 4)    | 738          | 863          | 1,018         | 2,593         | 3,607         | -14.5%        | -27.5%        | -28.1%        |
| Nibrasco (Tubarão 5 and 6) | 359          | 1,007        | 1,333         | 3,433         | 7,343         | -64.3%        | -73.1%        | -53.2%        |
| Kobrasco (Tubarão 7)       | 631          | 849          | 897           | 2,831         | 3,819         | -25.7%        | -29.7%        | -25.9%        |
| Tubarão 8                  | 1,642        | 1,366        | 1,588         | 5,925         | 6,661         | 20.2%         | 3.4%          | -11.0%        |
| <b>Southern System</b>     | <b>-</b>     | <b>-</b>     | <b>-</b>      | <b>129</b>    | <b>1,069</b>  | <b>n.m.</b>   | <b>n.m.</b>   | <b>-87.9%</b> |
| Fábrica                    | -            | -            | -             | -             | 515           | n.m.          | n.m.          | -100%         |
| Vargem Grande              | -            | -            | -             | 129           | 554           | n.m.          | n.m.          | -76.7%        |
| <b>Oman</b>                | <b>1,748</b> | <b>2,480</b> | <b>2,404</b>  | <b>7,625</b>  | <b>9,245</b>  | <b>-29.5%</b> | <b>-27.3%</b> | <b>-17.5%</b> |
| <b>Others<sup>1</sup></b>  | <b>-</b>     | <b>-</b>     | <b>-</b>      | <b>-</b>      | <b>154</b>    | <b>n.m.</b>   | <b>n.m.</b>   | <b>-100%</b>  |
| <b>PELLETS PRODUCTION</b>  | <b>7,117</b> | <b>8,562</b> | <b>9,415</b>  | <b>29,676</b> | <b>41,794</b> | <b>-16.9%</b> | <b>-24.4%</b> | <b>-29.0%</b> |
| <b>PELLETS SALES</b>       | <b>8,486</b> | <b>8,464</b> | <b>10,966</b> | <b>31,211</b> | <b>43,199</b> | <b>0.3%</b>   | <b>-22.6%</b> | <b>-27.7%</b> |

<sup>1</sup> Third party capacity utilization.

## Production overview

Vale's pellet production declined from 3Q20, mainly due to lower pellet feed availability from Itabira and Brucutu, maintenances in Tubarão 6 in November.

In January 2021, Vale resumed production at Vargem Grande pellet plant, halted since February 2019. With a nominal capacity of 7 Mtpy, the plant is expected to produce approximately 4-5 Mtpy in 2021, according to its ramp-up and pellet feed availability.

## Manganese ore and ferroalloys

| 000' metric tons                | 4Q20 | 3Q20 | 4Q19 | 2020  | 2019  | % change      |               |               |
|---------------------------------|------|------|------|-------|-------|---------------|---------------|---------------|
|                                 |      |      |      |       |       | 4Q20/<br>3Q20 | 4Q20/<br>4Q19 | 2020/<br>2019 |
| <b>MANGANESE ORE PRODUCTION</b> | 119  | 109  | 450  | 740   | 1,576 | 9.2%          | -73.6%        | -53.0%        |
| Azul                            | -    | -    | 251  | 230   | 1,003 | -             | -100.0%       | -77.0%        |
| Urucum                          | 93   | 89   | 164  | 423   | 411   | 4.6%          | -43.2%        | 2.8%          |
| Morro da Mina                   | 26   | 20   | 35   | 87    | 162   | 33.4%         | -25.7%        | -46.4%        |
| <b>MANGANESE ORE SALES</b>      | 461  | 428  | 570  | 1,378 | 1,063 | 7.7%          | 19.1%         | 29.6%         |
| <b>FERROALLOYS PRODUCTION</b>   | 15   | 15   | 28   | 73    | 151   | -             | -46.4%        | -51.7%        |
| <b>FERROALLOYS SALES</b>        | 15   | 15   | 35   | 67    | 127   | 0.0%          | -57.1%        | -47.2%        |

### Production and sales overview

Manganese ore production totaled 119 kt in 4Q20, 9.2% higher than in 3Q20, as a result of (i) performance improvement at the beneficiation plant in Morro da Mina; and (ii) higher productivity of the mining fronts, due to a greater supply of ROM at the Urucum Mine. Azul mine operations remain suspended as effect of the Covid-19 pandemic, with sales being sustained by inventories. Ferroalloys production and sales volumes remained in line with the previous quarter.

# Nickel

## Finished production by source

| 000' metric tons                            | 4Q20        | 3Q20        | 4Q19        | 2020         | 2019         | % change      |               |               |
|---|-------------|-------------|-------------|--------------|--------------|---------------|---------------|---------------|
|   |             |             |             |              |              | 4Q20/<br>3Q20 | 4Q20/<br>4Q19 | 2020/<br>2019 |
| Canada                                      | 22.2        | 18.9        | 26.1        | 89.6         | 97.4         | 17.5%         | -14.9%        | -8.0%         |
| Sudbury                                     | 11.2        | 6.5         | 15.3        | 43.2         | 50.8         | 72.3%         | -26.8%        | -14.8%        |
| Thompson                                    | 2.1         | 2.2         | 2.8         | 10.6         | 11.3         | -4.5%         | -25.0%        | -6.2%         |
| Voisey's Bay                                | 8.9         | 10.1        | 8.0         | 35.7         | 35.4         | -11.9%        | 11.3%         | 0.8%          |
| Indonesia                                   | 20.2        | 15.3        | 20.7        | 71.6         | 68.1         | 32.0%         | -2.4%         | 5.0%          |
| New Caledonia <sup>1</sup>                  | 5.1         | 8.5         | 4.8         | 31.0         | 23.4         | -40.0%        | 6.3%          | 32.5%         |
| Brazil                                      | 6.6         | 3.2         | 3.3         | 16.0         | 11.6         | 106.3%        | 100.0%        | 37.9%         |
| Feed from third parties <sup>2</sup>        | 1.8         | 1.3         | 1.83        | 6.6          | 7.3          | 38.5%         | -1.6%         | -10.0%        |
| <b>NICKEL PRODUCTION</b>                    | <b>55.9</b> | <b>47.1</b> | <b>56.7</b> | <b>214.7</b> | <b>208.0</b> | <b>18.7%</b>  | <b>-1.4%</b>  | <b>3.2%</b>   |
| <b>NICKEL PRODUCTION EX-VNC<sup>3</sup></b> | <b>50.8</b> | <b>38.6</b> | <b>51.9</b> | <b>183.7</b> | <b>184.6</b> | <b>31.6%</b>  | <b>-2.1%</b>  | <b>-0.5%</b>  |
| <b>NICKEL SALES</b>                         | <b>66.1</b> | <b>58.2</b> | <b>47</b>   | <b>210.9</b> | <b>205.7</b> | <b>13.6%</b>  | <b>40.6%</b>  | <b>2.5%</b>   |

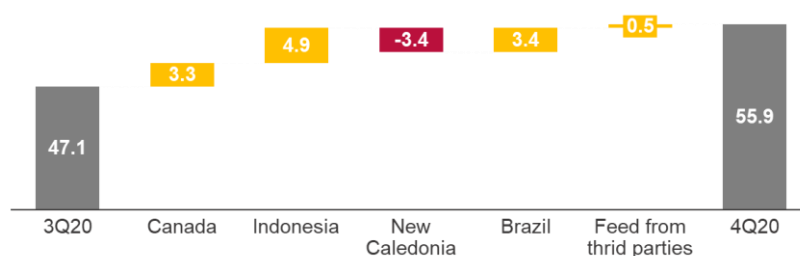
<sup>1</sup> 2Q20 production number was reconciled from 10.4 kt to 9.5 kt.

<sup>2</sup> External feed purchased from third parties and processed into finished nickel in our Canadian operations.

<sup>3</sup> Nickel ex-VNC production by site totaled 193.2 kt in 2020

## Production Variation (4Q20 x 3Q20)

kt



## Production and sales overview

In nickel business, maintenance works planned for 1H20 had to be postponed into 3Q20 due to COVID-19 which caused production in that quarter to be abnormally low, setting production to normal rates into 4Q20.

Nickel sales volumes were 66.1 kt in 4Q20, 13.6% higher than 3Q20, mostly as a result of higher production allowed Vale to take advantage of better prices environment.

## Canadian operations

Sudbury-source ore production reached 11.2 kt in 4Q20, 72.3% higher than 3Q20 mainly due to extended maintenance work carried out in 3Q20, which allowed for higher production rates in 4Q20.

Voisey's Bay-source ore production reached 8.9 kt in 4Q20, 11.9% lower than 3Q20 as a result of productivity challenges during ramp up after scheduled maintenance start at Long Harbour Refinery in 3Q20.

### **Indonesian operation (PTVI)**

Production of finished nickel from PTVI source reached 20.2 kt in 4Q20, 32.0% higher than 3Q20, mainly as a result of increased consumption of PTVI source ore at Clydach refinery after scheduled maintenance in 3Q20.

The consumption of PTVI feed stored in Clydach during 3Q20 maintenance, reduced the lead time between mine and refinery production setting up the stage for a strong quarter production rate.

Nickel in matte production at PTVI site reached 16.4 kt in 4Q20, 16% lower than 3Q20, mainly due to lower feed grade from PTVI ore source and reduced productivity during ramp up after scheduled maintenance in 4Q20.

### **New Caledonia operation (VNC)**

Production of finished nickel from VNC source, reached 5.1 kt in 4Q20, 40.0% lower than 3Q20, mainly due to 50 days of blocked access to mine and plant roads in 2020 caused by independence activist protests in New Caledonia. The plant operations have been halted since December 10<sup>th</sup>, 2020, until safe work and community conditions prevail and protests near the site ends.

### **Brazilian operation (Onça Puma)**

Production at Onça Puma reached 6.6 kt in 4Q20, 106.3% higher than 3Q20, as a result of the successful maintenance works during 3Q20, which allowed for a strong performance quarter in 4Q20.

# Copper

## Finished production by source

| 000' metric tons         | 4Q20 | 3Q20 | 4Q19 | 2020  | 2019  | % change      |               |               |
|--------------------------|------|------|------|-------|-------|---------------|---------------|---------------|
|                          |      |      |      |       |       | 4Q20/<br>3Q20 | 4Q20/<br>4Q19 | 2020/<br>2019 |
| <b>BRAZIL</b>            | 67.5 | 67.6 | 58.8 | 260.5 | 254.9 | -0.1%         | 14.8%         | 2.2%          |
| Salobo                   | 43.9 | 45.4 | 51.9 | 172.7 | 189.4 | -3.3%         | -15.4%        | -8.8%         |
| Sossego                  | 23.7 | 22.2 | 6.9  | 87.7  | 65.5  | 6.8%          | 243.5%        | 33.9%         |
| <b>CANADA</b>            | 25.9 | 20.0 | 31.6 | 99.6  | 126.2 | 29.5%         | -18.0%        | -21.2%        |
| Sudbury                  | 18.5 | 13.1 | 23.3 | 76.5  | 92.8  | 41.2%         | -20.6%        | -17.6%        |
| Thompson                 | 0.1  | 0.2  | 0.2  | 0.8   | 0.9   | -50.0%        | -50.0%        | -11.1%        |
| Voisey's Bay             | 6.2  | 5.7  | 6.3  | 17.8  | 25    | 8.8%          | -1.6%         | -28.8%        |
| Feed from third parties  | 1.2  | 1.0  | 1.9  | 4.5   | 7.5   | 20.0%         | -36.8%        | -40.0%        |
| <b>COPPER PRODUCTION</b> | 93.5 | 87.6 | 90.3 | 360.1 | 381.1 | 6.7%          | 3.5%          | -5.5%         |
| <b>COPPER SALES</b>      | 93.0 | 80.6 | 87.8 | 346.3 | 365.2 | 15.4%         | 5.9%          | -5.2%         |
| Copper Sales Brazil      | 66.7 | 62.3 | 55.0 | 247.2 | 243.7 | 7.1%          | 21.3%         | 1.4%          |
| Copper Sales Canada      | 26.3 | 18.3 | 32.8 | 99.1  | 121.6 | 43.7%         | -19.8%        | -18.5%        |

## Production Variation (4Q20 x 3Q20)

kt



## Production and sales overview

In 4Q20, copper production reached 93.5 kt, 6.7% higher than 3Q20, as a result of: (i) strong performance at Sossego due to increased productivity and higher feed grade, and (ii) successful ramp up following scheduled maintenances in 3Q20 of mines and plants in Canada. These increases were partially offset by lower production from Salobo operations.

In 4Q20, copper production in Salobo was impacted by reduced plant productivity due to unscheduled maintenance and an incident which led Vale to review and halt mine activities for 9 days and plant activities for 4 days in Salobo, during which changes in maintenance routines have been implemented to improve operations and safety conditions.

Sales volumes<sup>13</sup> of copper were 93 kt in 4Q20, 15.4% higher than 3Q20 mostly as a result of higher production and favourable market conditions.

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<sup>13</sup> Sales volumes are lower compared to production volumes due to payable copper vs. contained copper content: part of the copper contained in the concentrates is lost in the smelting and refining process, hence payable quantities of copper are approximately 3.5% lower than production volumes.

## Cobalt and other by-products

### Finished production by source

| Metric tons                               | 4Q20  | 3Q20  | 4Q19  | 2020  | 2019  | % change  |           |           |
|---|-------|-------|-------|-------|-------|-----------|-----------|-----------|
|   |       |       |       |       |       | 4Q20/3Q20 | 4Q20/4Q19 | 2020/2019 |
| <b>COBALT</b>                             | 1,042 | 1,223 | 1,141 | 4,672 | 4,376 | -14.8%    | -8.7%     | 6.8%      |
| Sudbury                                   | 96    | 61    | 137   | 454   | 495   | 57.4%     | -29.9%    | -8.3%     |
| Thompson                                  | 15    | 10    | 21    | 60    | 80    | 50.0%     | -28.6%    | -25.0%    |
| Voisey's Bay                              | 388   | 464   | 364   | 1,592 | 1,608 | -16.4%    | 6.6%      | -1.0%     |
| VNC                                       | 416   | 601   | 516   | 2,197 | 1,703 | -30.8%    | -19.4%    | 29.0%     |
| Others                                    | 127   | 86    | 103   | 369   | 490   | 47.7%     | 23.3%     | -24.7%    |
| <b>PLATINUM<br/>(000' oz troy)</b>        | 31    | 26    | 45    | 140   | 148   | 19.2%     | -31.1%    | -5.4%     |
| <b>PALLADIUM<br/>(000' oz troy)</b>       | 38    | 37    | 56    | 186   | 182   | 2.7%      | -32.1%    | 2.2%      |
| <b>GOLD BY-PRODUCT<br/>(000' oz troy)</b> | 120   | 116   | 132   | 469   | 480   | 3.4%      | -9.1%     | -2.3%     |

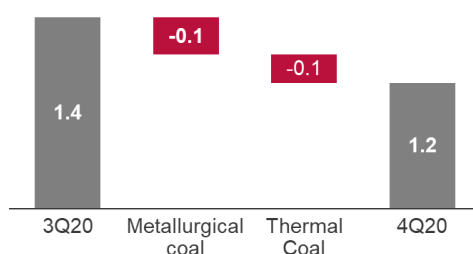


# Coal

| 000' metric tons       | 4Q20         | 3Q20         | 4Q19         | 2020         | 2019         | % change      |               |               |
|------------------------|--------------|--------------|--------------|--------------|--------------|---------------|---------------|---------------|
|                        |              |              |              |              |              | 4Q20/3Q20     | 4Q20/4Q19     | 2020/2019     |
| <b>COAL PRODUCTION</b> | <b>1,230</b> | <b>1,402</b> | <b>1,876</b> | <b>5,878</b> | <b>8,770</b> | <b>-12.3%</b> | <b>-34.4%</b> | <b>-33.0%</b> |
| Metallurgical Coal     | 658          | 756          | 825          | 3,095        | 4,032        | -12.9%        | -20.2%        | -23.2%        |
| Thermal Coal           | 572          | 646          | 1,051        | 2,783        | 4,738        | -11.5%        | -45.6%        | -41.3%        |
| <b>COAL SALES</b>      | <b>1,535</b> | <b>1,381</b> | <b>2,042</b> | <b>5,867</b> | <b>8,784</b> | <b>11.1%</b>  | <b>-24.9%</b> | <b>-33.2%</b> |
| Metallurgical Coal     | 884          | 809          | 1,017        | 2,914        | 4,427        | 9.2%          | -13.1%        | -34.2%        |
| Thermal Coal           | 651          | 572          | 1,025        | 2,953        | 4,356        | 13.8%         | -36.5%        | -32.2%        |

## Production Variation (4Q20 x 3Q20)

Mt



## Production and sales overview

Coal production totalled 1.2 Mt in 4Q20 and 5.9 Mt in 2020, reflecting the impacts of the COVID-19 pandemic on the seaborne demand and postponement of the plant's revamp project from March to November 2020. After reaching a coal production record in March, compared to the previous 15 months, Vale decelerated production in Moatize in April and temporarily stopped production in June when inventories at mine built up to its storage limits.

As previously reported, Vale decided to resume its maintenance plan in November 6<sup>th</sup>, 2020. The first phase of the revamp project, which includes coal handling and processing plant revitalization, is currently running on scheduled. During this period, the material flow, services rendered, and movement of people were carried out without major challenges.

Due to the plant's revamp, production slowed and decreased 12.3% compared to 3Q20, however, inventory levels supported the 4Q20 sales increase.