



REPORT FROM ADMINISTRATION 2018



Rupture of Dam I in Brumadinho

In the early afternoon of January 25th, 2019, there was a rupture of the Dam I in the Córrego do Feijão Mine in Brumadinho (MG) and, since then, Vale has been making every effort to meet the needs of those affected and to mitigate damages.

Since the first days following the rupture of the Dam I, Vale's initiatives have had four main purposes: (i) assistance to the affected people and recovery of the area affected by the rupture of the Dam I, (ii) determination of the causes of the rupture of the Dam I, (iii) assurance of the safety of the upstream structures and of the surrounding communities, and (iv) acceleration of the decommissioning or de-characterization process of our remaining upstream dams.

- (i) Assistance to the affected people and recovery of the affected area

On January 27th, 2019, our Board of Directors established the Extraordinary Independent Consulting Committee for Support and Recovery ("CIAE for Support and Recovery"), dedicated to monitoring the measures to assist the affected people and to recover the area affected by the rupture of the Dam I. The committee is coordinated by Leonardo Pereira, former president of the Brazilian Exchange Commission (Comissão de Valores Mobiliários – CVM), and also includes Ana Cristina Barros and Márcio Gagliato, all external and independent members. Please find below the detailed qualification of the CIAE for Support and Recovery members.

Leonardo Pereira - President at CVM from 2012 to 2017. Independent Advisor of the Oversight Advisory Committee of the World Health Organization. Engineer and economist. Masters in Administration from Warwick University and specialization at AOTs, Japan. Visiting Fellow at Harvard Law School for negotiation and corporate governance. Global experience of more than 25 years in the capital markets.

Ana Cristina Barros - 30 years dedicated to the defense of the environment and sustainable development. Served as National Secretary of Biodiversity and Forests in the Ministry of Environment. Accomplishments: design and promotion of the Rural Environmental Registry, support for the creation of Conservation Units and national policies for management of indigenous lands, negotiations with the Global Environment Fund and representation of Brazil in the assessment of its Biodiversity Policy by the OECD.

Márcio Gagliato - Masters in Social Psychology (PUC) and PhD from the Faculty of Public Health (USP). Technical consultant for United Nations agencies and international non-governmental organizations, more than 12 years of experience in humanitarian responses, including actions in Libya, Iran, Syria, Gaza, South Sudan, Somalia, Zimbabwe among others. Awarded with Fellowship Programme in Human Rights by the University of Columbia (NY). Specialist in emergencies with the Pan American Health Organization and participation in the "Reference Group of the Permanent Interagency Committee on Mental Health and Psychosocial Support in Humanitarian Emergencies".

Similarly, on January 28th, 2019, Vale's Executive Board established the Crisis Response Committee ("CRC") to speed up the processes of providing assistance to the affected people and environmental recovery.

As part of the emergency measures, approximately four hundred Vale employees were assigned to work in the area, providing care to the affected people, in addition to more than two hundred contractors, acting jointly with the Fire Department, Public Defender and other agencies. In addition to the people assigned to provide assistance, helicopters, equipment, ambulances, beds, and the most diverse forms of support and assistance to those affected were made available. As part of these actions, Vale donated R\$ 100,000 to each of the victims' families, R\$ 50,000 per property to those that resided in the self-rescue zone, and R\$ 15,000 to those whose business activities were impacted, allowing for the mitigation of the damages from the accident, on an emergency basis. Vale has structures set up for exclusive treatment of the impacted animals that have been rescued, enabling emergency care and recovery so that they can be returned to their homes. In addition to these units, in regards to animal care, we count on the support of veterinary clinics and hospitals in Belo Horizonte.

You may find, later on in this document, in the box "Main initiatives" some of the actions realized by Vale.

Our purpose is to accelerate the payments of indemnification through negotiation as opposed to judicialization, efficiently serving all the affected people.

Preliminary Agreement for Indemnification

Reinforcing our commitment towards repairing the damages caused by the rupture of the Dam I, in an expedited and comprehensive manner, Vale signed, at the Court of Appeals of Minas Gerais, at a hearing, a Preliminary Agreement for Indemnification with several public authorities and representatives of those affected, which will allow for anticipating the payments of emergency compensation to every person residing in the city of Brumadinho on the date of rupture of the Dam I. The people living within 1km from the Paraopeba Riverbed, from Brumadinho to the city of Pompéu, will also be assisted, covering nearly 100 thousand people.

The agreement also provides for the following measures:

- Advance payment of indemnification through monthly payments equivalent to one minimum wage per adult, 1/2 minimum wage per teenager and 1/4 per child, for the period of one year starting from January 25th, 2019.
- Independent technical assistance for the affected people to negotiate their individual compensations.
- Reimbursement or direct payment of the extraordinary expenses of the State of Minas Gerais, including expenses with transportation, lodging and meals of the officers involved with rescue works and other emergency actions.

(ii) Determination of causes of the rupture of the Dam I

In order to determine the causes of the rupture of the Dam I in the most efficient way possible, the Board of Directors established, on January 27th, 2019, the Extraordinary Independent Consulting Committee for Investigation ("CIAE for Investigation"). This committee, coordinated by Dr. Ellen Gracie, retired Minister of the Federal Supreme Court, also comprises Jose Francisco Compagno and Manuel de Almeida Martins, all external and independent members, with flawless reputation and experienced in the themes related to their roles. Please find below the detailed qualification of the CIAE for Investigation members.

Dr. Ellen Gracie - Retired Minister of the Federal Supreme Court and of the Electoral Superior Court, President of the Special Committee for Investigation at Petrobras, President of the Special Committee for Investigation at Eletrobras.

Jose Francisco Compagno - Leadership Partner of the Forensic Department at EY between 2002 and 2018, and Leadership Partner for Transaction Support from 2001 to 2005. Auditing Partner at Artur Andersen from 1998 to 2001. Director of Auditing at Coopers & Lybrand Auditores Independentes from 1987 to 1998. Graduated in Accounting Sciences at FMU - SP. Member of the Executive Committee at EY from 2016 to 2017.

Manuel de Almeida Martins - Civil Engineer graduated from the School of Engineering of the Federal University of Rio de Janeiro (UFRJ) in 1971, with specialization in geotechnical engineering and dam engineering. He carried out activities for thirty years in studies, project detailing, construction monitoring, supervision, quality control, monitoring and assessments on safety of dams and foundation works in large Brazilian companies as a geotechnical engineer and department manager specialized in geotechnics. For the last twenty years, he has worked as an Independent Consultant in geotechnical engineering for infrastructure projects, mainly dams.

(iii) Assurance of the safety of the upstream structures and of the surrounding communities

The third set of measures aims to ensure the safety of the upstream structures and of the surrounding communities. As such, Vale has been continuously investing in the safety and maintenance of its dams, with standards aligned and constantly updated with the most stringent international practices. Vale is adopting a series of preventive measures to increase the safety conditions of its structures, such as the constant monitoring of all of Vale's structures, specially the upstream ones.

In the scope of regulation, the National Mining Agency ("ANM") now requires a non-drained safety factor of at least 1.3. In this context, some of Vale's structures – by Vale's own initiative - were placed at emergency level 2 and with initiatives from the company to increase their safety and stability. Vale is working to strengthen some of its upstream structures and evaluating engineering solutions for the remainder, as a way to increase the safety of the surrounding population.

Vale's goal is to ensure the safety of structures and communities. In this sense, Vale is providing all necessary assistance and support to the impacted communities. With ANM's new regulatory parameters, within two months Vale will be able to state which structures will be resumed with security and stability and which will go through improvement works.

On February 15th, 2019, Vale's Board of Directors decided to create the Extraordinary Independent Consulting Committee for Dam Safety ("CIAESB"), to assist the Board with matters related to the diagnosis of the safety conditions, management and mitigation of the risks related to Vale's tailings dams. The committee is also tasked with recommending, if needed, measures to be taken to strengthen safety conditions of the dams. The CIAESB, coordinated by Flávio Miguez de Mello, also includes Willy Lacerda and Pedro Repetto, all independent and external members. Please find below the detailed qualification of the CIAESB members.

Flávio Miguez de Mello - Civil engineer with specialization in hydraulics (1967) from the Federal University of Rio de Janeiro (UFRJ), with master's degree in Geology Science (1975) from UFRJ. Miguez is a reference in engineering of dams. He has taken courses and trainings in the USA, Canada and Portugal, has taught courses at several universities since 1968, has published more than 100 technical papers in Brazil and abroad, and has managed consulting companies and technical institutions in Brazil and abroad, among which, the International Commission of Large Dams, the Brazilian Committee on Dams, the National Academy of Engineering in Brazil, the School of Engineering of UFRJ, and received several academic and professional awards. He has worked on several dam projects in Brazil and abroad.

Willy Lacerda - Graduated in Civil Engineering from the Escola Nacional de Engenharia da Universidade do Brasil (1958), Masters' degree in Geotechnical Engineering from University of California - Berkeley (1969) and PhD in Geotechnical Engineering from University of California - Berkeley (1976). He participated in the creation of the Geotechnical Institute of the city of Rio de Janeiro in 1966. During his teaching as a professor at COPPE - Federal University of Rio de Janeiro (UFRJ), from 1967 to 2007, he supervised over 50 Masters' theses and 18 PhD dissertations. He has over 150 published papers in journals and academic congress publications. He is currently a collaborating professor at COPPE - Federal University of Rio de Janeiro (UFRJ). He has experience in Civil Engineering, with emphasis in slope stability, mainly acting on the following matters: embankments on soft clay, earth dams, landslides, slope stability, collapsible soils, soil mechanics and tropical soils. He was President of the Brazilian Association of Soil Mechanics and Geotechnical Engineering (ABMS) from 1996 to 2000, where he currently is a partner and permanent member of the Board of Directors. Former president of JTC1 – Joint Technical Committee on Landslides and Engineered Slopes, of the following three international societies: ISSMGE, ISRM and IAEG – from 2006 to 2010, where he currently stands as one of its core members. He received the title of Emeritus professor of UFRJ in October 2010. He was nominated for the National Academy of Engineering in Brazil (ANE) in 2012. He was nominated as Eminent Professor by Escola Politécnica of UFRJ in 2015. He is the coordinator of INCT - Geotechnical Institute for Rehabilitation of Slopes and Plains – REAGEO since 2008.

Pedro Repetto - Mr. Repetto is a licensed civil-geotechnical engineer with over 50 years of experience in over 500 projects in 28 countries, including Brazil. Before becoming an independent consultant in 2008, he was Principal and Vice President of URS Corporation in Denver, where he served as Mining Business Line Manager, Office Manager, and Manager of the Engineering Division, the Civil/Geotechnical Group, and the Mining Group. His areas of expertise in the mining industry include tailings storage facilities, heap leach facilities, waste rock dumps, pit slope stability and foundations for mining structures. He has participated in the design and evaluation of dozens of tailings facilities comprising all types of tailings deposition technologies, including conventional slurry, high-density thickened tailings and dry stacking (filtered tailings). Mr. Repetto was a Principal Professor of

Geotechnical Engineering at Catholic University of Peru for over 20 years. He served as an expert to the Federal Institute for Geosciences and Natural Resources of Germany for the organization and teaching of continuing education courses on mining wastes, including tailings. He has served as a Principal Investigator or co-Principal Investigator for three earthquake engineering research projects sponsored by National Science Foundation.

Vale's objective is to ensure the safety of structures and communities. As such, Vale is providing all necessary assistance and support to the impacted communities.

- (iv) Acceleration of the decommissioning or de-characterization process of upstream dams

The fourth set of measures aims to prevent and further mitigate the risks of accidents involving dams in the future. In fact, the decommissioning or de-characterization process of the existing upstream dams was already underway and, after the rupture, the Company decided to accelerate the process for the remaining dams, which are already inactive. The projects are being prepared and will be submitted for the evaluation of the competent bodies so that the activities of the decommissioning or de-characterization process may start on an urgency basis.

After the rupture of the Dam I of Córrego do Feijão, Vale underwent through internal transformations in its structure, processes and personnel. Many initiatives have already been taken and many other initiatives are being planned at the moment, with the objective of strengthening, even further, the safety of all of the Company's operations.

Main initiatives¹

Humanitarian Actions

From the first moments after the breach of Dam I, at the Córrego do Feijão Mine, in Brumadinho (MG), Vale has given its full support to those affected and their families. Humanitarian assistance includes, among other actions, psychological and social support, emergency medical care, accommodation in hotels, hostels and provisional housing, and a supply of food, personal hygiene items and essentials, medicines, clothing and transportation. Below are details of Vale's actions in the region:

- R\$ 2.6 million transferred to the Municipality of Brumadinho to purchase emergency equipment and hire professionals in the health and psychosocial areas, with the objective of increasing the municipality's humanitarian aid to those affected.
- R\$ 8.4 million invested in state-of-the-art equipment for the Instituto Médico Legal (IML) in Belo Horizonte.
- R\$ 20 million invested in the support package to the Fire Service of Minas Gerais (CBMMG) for equipment purchase, infrastructure improvements and professional training.
- Donations of R\$ 100,000 for each affected family that has lost a member due to the breach: 269 payments made.
- Donations of R\$ 50 thousand, per property, to those who resided in the self-rescue zone: 91 payments made.
- Donations of R\$ 15 thousand to those who had their business affected (previous registration); 70 payments made.
- Donation of R\$ 5 thousand to each of the families living in the self-rescue zone of the Sul Superior dam of the Gongo Soco mine in Barão de Cocais: 148 payments made.
- R\$ 289 million used to purchase medicine, water, equipment and on various logistics costs.
- More than 400 professionals currently working in 5 service stations for those affected in Brumadinho, Belo Horizonte, Nova Lima and Itabirito.
- More than 6.8 thousand medical and psychological consultations held.
- More than 51 thousand pharmaceutical items purchased.
- More than 44 million liters of water for human consumption, animal and agricultural irrigation were distributed to 21 municipalities.
- 10 hospitals and health units mobilized to attend those affected.
- 322 accommodations units made available.

¹ Updated on March 25th, 2019

Emergency indemnification

- The agreement with competent authorities allows the anticipation of emergency indemnification payment to Brumadinho residents and to people living next to Ri Paraopeba riverbank, between the cities of Brumadinho and Pompeú.
- Indemnity amounts: monthly payment of one minimum wage per adult, 50% of the minimum wage per teenager, and 25% of the minimum wage per child, for a period of 12 months, starting from January 25th, 2019.
- Vale will keep paying 2/3 of the salaries of all own and third-party employees who died in the breach until the company signs the final indemnity agreement, in addition to maintaining the wages of the missing employees.
- Guarantee of employment or salary for own and third-party employees of Brumadinho, until December 31st, 2019.
- Health insurance for the family members of deceased employees and third-party contractors, subject to a registration scheme, with coverage throughout the state of Minas Gerais. Widowers or partners will receive lifetime insurance while dependents will be covered until they reach the age of 22.
- Psychological assistance to employees until discharge.
- R\$ 920 in daycare assistance for employees with children up to the age of 3.
- R\$ 998 in educational assistance for children of employees until they turn 18.

Environment and fauna

After the rupture of the Dam I, Vale implemented detailed monitoring activities in the river, including daily water and soil sampling and turbidity level analysis.

- 65 stations for daily water and sediment collection were installed along Paraopeba river, Três Marias reservoir and São Francisco river.

The work – a compilation of 300,000 analyses carried out so far – is being conducted by four specialized laboratories hired by Vale and involves approximately 250 professionals. Vale hired the Coordination Department of Graduate Engineering Programs of the Federal University of Rio de Janeiro (Coppe-UFRJ) to evaluate the adopted methodology and validate the data already presented by the four laboratories. The assurance that the river can be recovered came from ecotoxicology tests that measured the effects of chemical elements in organisms that are sensitive to environmental changes, found along the Paraopeba basin

and the San Francisco river, including the river mouth in the Atlantic Ocean. Tests with bacteria showed that the previous conditions are being maintained after the plume flow, being non-toxic in 97% of the samples. Regarding the fish contamination analyses, the results demonstrate zero toxicity for 100% of the samples collected from these aquatic organisms so far.

Water supply

The distribution of piped water by water utilities that supply the cities along the Paraopeba river and the metropolitan region of Belo Horizonte remain unaltered.

However, as a preventive measure, Vale has been studying options to strengthen the supply system and to ensure water security for these populations, in the event of potential water shortages in the next drought periods. One example is what is being carried out in Pará de Minas, whose water supply depended on the Paraopeba river. Some emergency measures have already been taken, including the reactivation of three water catchment wells and improvement in the water pumping system in two other streams in the region. Drilling of new wells and surface catchment works are also underway.

By the first half of 2020, Vale will build a 50-km pipeline that will collect water from the Pará river to directly supply Pará de Minas. The expected flow is expected to be 284 liters per second, the same quantity that the city collected from the Paraopeba river before the dam rupture. In the future, with the recovery of Paraopeba river, this pipeline will double the capacity to collect water to supply Pará de Minas, becoming a legacy to the city.

Fauna

- Rental of a farm and installation of a structure for sheltering and treating animals
- 468 animals rescued.
- 79 fishes rescued.
- 190 professionals (among veterinarians, biologists and technicians) working with the rescue of the local fauna.

Vale also has two structures in place for the exclusive treatment of the affected animals that have been rescued, enabling emergency care and recovery so that they may be returned to their homes: Córrego do Feijão Veterinary Hospital, which is prepared for hospitalization and emergency surgeries, and the Fauna Shelter Farm, located near the city of Brumadinho, which has a medical outpatient clinic for emergency care and a shelter space for animals. Besides these units, considering animal care, we have the support of veterinary hospitals and clinics in Belo Horizonte.

Tailings retention works

Section 1 (up to 10 Km from the Dam I breach site):

- Vale will build a dike (consisting of blocks of compacted rock) for the retention of the thicker and heavier tailings. In parallel, the transport and storage of rocks that will be used in the construction of the structure is in progress.
- Vale will install more hydraulic barriers and small dams to assist in the tailings control process.
- The company is also studying the implementation of a Water Treatment Station (ETA) to reduce the turbidity of the water in the Ferro-Carvão stream. The purpose is to return the cleaned water to the Paraopeba River.
- The company has also begun removing the tailings that blocked a stretch of the Alberto Flores Avenue and the installation of a metal barrier to prevent the tailings from covering the road again.
- Construction of a 50-meter metal bridge to restore access to the communities of Parque da Cachoeira and Córrego do Feijão to the central area of Brumadinho.

Section 2 (10 to 30 Km area that stretches to the city of Juatuba):

- Vale is mobilizing and installing equipment that will be used to dredge the coarsest debris, like sand and stones. The main objectives are cleaning and de-sanding the Paraopeba river channel.
- The residue will be collected by two dredgers and will be properly disposed outside of the Permanent Preservation Area (APP) of the river.

Section 3 (range of 170 Km of Paraopeba river between Juatuba and the Retiro

Baixo Plant):

- Installation of five turbidity barriers (membranes): three in the Pará de Minas region and two others in the municipalities of Juatuba and Betim, before the Igarapé Thermoelectric Plant;
- Up to this moment, the efficiency of the barriers installed in the river results in a 10% to 15% reduction in the water turbidity levels.

Residents and rural producers with activities in the affected region are receiving supplies of water for human consumption, drinking water for animals and irrigation water. The support is intended for farmers and families mapped by Vale, by the Agriculture Department of Brumadinho and by the Company for Technical Assistance and Rural Extension of the State of Minas Gerais (Emater-MG).

Dams

- The upstream dams, currently inactive, will be decommissioned or de-characterized.
- The de-characterization assumes an intervention with the objective of completely stripping the structure of the characteristics that define it as a dam.

Regarding the relocations

- By determination of the ANM, Vale has raised to Emergency Level 2 alert of the Emergency Action Plan for Mining Dams (PAEBM) at the Sul Superior dam (Barão de Cocais); B3 / B4 and Vargem Grande dams (Nova Lima); and, Forquilha I, II, III and Grupo dams (Ouro Preto).
- Vale preventively initiated level 3 of the PAEBM of Sul Superior after the independent audit team reported that the dam was at imminent risk of rupture. The level 3 warning siren was then activated as per the PAEBM's protocol.
- Vale has reallocated approximately 700 people that live in the self-rescue zone (area of up to 10 km downstream from the tailings dam) in the municipalities of Barão dos Cocais, Nova Lima and Ouro Preto.
- Out of this total amount, approximately 500 people are allocated to hotels and the remainder opted to stay with relatives.
- In Brumadinho, the total amount of reallocated people was 265.
- Detailing of people reallocated by dam:
 - Barão de Cocais, Nova Lima and Ouro Preto:
 - Sul Superior: approximately 442 people
 - Forquilhas I, II and III: 4 people
 - B3/B4: 201 people
 - Vargem Grande: 27 people
 - Brumadinho:
 - Barragem I: 265 people

Vale regrets the effects caused on the families of those affected and reiterates that it continues to provide all necessary support to the families until the situation is normalized.

Financial and Accounting Impacts of the Rupture of Brumadinho Dam I

Shareholders' remuneration

On January 27th, 2019, the Board of Directors determined the suspension of the Shareholders' Remuneration Policy, and consequently the non-payment of dividends and interest on capital, and any other resolution on the shares buyback. For further details on the payment of the minimum legal dividends referring to the year ended on December 31st, 2018, see "Shareholders' remuneration."

Executive compensation

At this same meeting, the Board of Directors also decided to suspend the payment of the variable compensation of the Executive Officers. These amounts will remain suspended until there is more clarity on the results of the ongoing investigation.

Accelerated decommissioning or de-characterization plan

Vale currently has dams built by the upstream heightening method, all of which are inactive. These structures will undergo de-characterization works and will cease to exist. The estimated numbers calculated on January 29th, 2019, four days after the event, based on preliminary studies, indicated expenditures of R\$ 5 billion for the removal and reprocessing of all existing material in the dams, followed by the complete recovery of the areas. Prior to that, previous plans for the decommissioning of these dams were based on methods that ensured the physical and chemical stability of the structures, however, without the removal and processing of the existing tailings. After the event, the Company is working on a detailed plan of individual engineering for each of these dams that will allow their total de-characterization. Up to the present time it is not possible to estimate the costs to be incurred in these de-characterizations and, as soon as a reliable estimate is defined, the Company will disclose and recognize the obligation in 2019.

Accounting impacts

From an accounting point of view, the rupture of Dam I represents an event subsequent to the financial statements as of December 31st, 2018. Therefore, its accounting impacts will be reflected in the financial statements referring to the year of 2019, beginning with the financial statements for the quarter ended on March 31st, 2019.

Vale is subject to significant liabilities and contingencies due to the rupture of Dam I. Vale is already participating in several investigations and judicial and administrative proceedings brought by authorities and by affected people, and new proceedings are expected. Vale is still evaluating these liabilities and contingencies and will make provisions, based on the agreements entered into. Due to the preliminary stage of the investigations and processes, it is not possible to determine a reliable set of results or estimates of the potential exposure related to the rupture of the Dam I at this time.

Due to the rupture of the Dam I and the decision to stop operations to accelerate the decommissioning or de-characterization of upstream dams, Vale carried out the write-off of the assets of the Córrego do Feijão Mine and the assets related to upstream dams in Brazil, resulting in an accounting loss that will impact the Company's balance sheet and income statement in the first quarter of 2019.

The costs incurred to date are mainly related to donations, initial indemnification, humanitarian assistance, equipment, legal counsel, among others.

Provisions and contingent liabilities

Vale is still evaluating the potential liabilities that may arise from the failure of the Dam I. Due to the preliminary stage of the various claims and contingencies, it is not possible to determine a reliable set of results or estimates of the potential exposure. Therefore, the value of other costs related to the failure of the Dam I, which will be recognized in 2019, could not yet be estimated. For more information, refer to the explanatory notes of the financial statements of December 31st, 2018.

Investigations, prosecutions and judicial asset freezing

As a result of the failure of the Dam I, the state court of Minas Gerais determined, in injunctions handed down in compliance with the interlocutory reliefs filed by the Prosecution Office of the State of Minas Gerais and by the State of Minas Gerais, the unavailability and freezing of the approximate total value of R\$ 11 billion from Vale. Of this amount, Vale was ordered to make a judicial deposit of approximately R\$ 7.4 billion in compliance with two court orders.

The Labor Court, in response to the request of the Labor Prosecution Office in the context of a public-interest civil action, determined: (i) the freezing of R\$ 1.6 billion to ensure the indemnification of employees and contractors working in Córrego do Feijão Mine at the moment of the failure of the Dam I; (ii) the maintenance of the payment of wages to the relatives of the employees and contractors who disappeared, until the actual confirmation of life or death; (iii) payment of funeral expenses, transfer of bodies, burial of all its deceased employee and contractors; and, (iv) other administrative measures.

The 2nd Civil Court of Nova Lima, at the request of the Public Defender's Office of the State of Minas Gerais and the Public Prosecution Office of the State of Minas Gerais, determined the freezing of funds on Vale's bank accounts amounting to R\$ 1 billion, aiming to ensure potential reimbursements to cover for losses from the removal occurred in the community of São Sebastião de Águas Claras - Macacos.

The Court of Barão de Cocais determined the freezing of Vale's funds on the amount of R\$ 2.95 billion, aiming to ensure the reimbursements of any potential losses, property and non-property related, suffered by the people affected by removal that occurred or that may occur in relation to Sul Superior Dam, of the Gongo Soco Mine, in Barão de Cocais.

The Court of Belo Horizonte determined the presentation of a report issued by an independent technical auditing firm on the stability condition of the Sul Superior structure, in Gongo Soco, and the development of an action plan to be submitted for approval by ANM and Environmental Secretary of the State of Minas Gerais (Secretaria de Estado de Meio Ambiente e Desenvolvimento Sustentável – SEMAD). The judge on duty refused to grant the request for freezing of Vale's funds on the amount of R\$ 120 million to cover for the cost of the technical auditing of the structures included in the Public Civil Action.

In addition, Brazilian Institute of the Environment and Renewable Natural Resources (Instituto Brasileiro de Meio Ambiente e dos Recursos Naturais Renováveis – IBAMA) and SEMAD imposed administrative sanctions in the amount of R\$ 250 million and approximately R\$ 99 million, respectively.

In addition to the processes described above, Vale is a defendant in several other investigations, including criminal investigations, administrative and judicial proceedings, which may result in other asset freezes, payments of fines and indemnifications.

Class actions in the United States

Vale and some of its executives were considered defendants in claims for civil class actions in federal courts in New York brought by holders of American Depositary Receipts ("ADR") issued by Vale, based on the U.S. Federal Securities Laws. The lawsuits claim that Vale made false and misleading statements or failed to make disclosures related to the potential risks and hazards of the failure of the Dam I of Córrego do Feijão mine. The plaintiffs did not specify the value of the alleged damages in those actions. Vale intends to defend itself from these proceedings and to prepare a complete defense against these claims. As a consequence of the preliminary nature of these lawsuits, it is not possible to determine a reliable set of results or estimates of the potential exposure at this moment, therefore, it was not possible to estimate the amount of the provision that will be recognized in 2019. For more information, refer to the explanatory notes of the financial statements of December 31st, 2018.

Specifically, in regards to indemnifications, the Company has the objective of reaching agreements with the competent authorities in order to efficiently support the affected people and promote the due reparation to the other damages caused.

Corporate socio-environmental responsibility

Investments

Throughout 2018, Vale invested R\$ 2.1 billion in corporate socio-environmental responsibility. This total is a result of the sum of R\$ 1.7 billion invested in environmental protection and conservation and another R\$ 421 million regarding social programs. Through the Vale Foundation, the investment was R\$ 51 million in social projects that prioritize work and income generation, health and education in 67 municipalities in the states of Pará, Maranhão, Minas Gerais, Espírito Santo, and Rio de Janeiro.

For 2019, Vale will have the Social Investment area, created at the end of 2018, with the objective of ensuring effectiveness and compliance of the company's and Vale Foundation's socio-cultural projects.

Vale's commitment to climate change was reflected in the establishment of a new goal of reduction of carbon emissions in 2018: 16% by 2030, based on the year 2017, increasing from the previous goal of 5% by 2020. The goals for 2030 were also revised and expanded for water savings and for the recovery of degraded areas. They respectively aim to reduce globally the specific use of new water by 10% and to recover 100,000 hectares of degraded area in our operations and in adjacent areas.

With two years of voluntary membership in the Task Force on Climate-related Financial Disclosures (TCFD), Vale prepared, in 2018, scenarios studies recommended for both low carbon saving and failure to meet the target defined in the Paris Agreement. These studies will support the identification of key risks and material opportunities related to climate change.

With regard to Human Rights, in 2018, Vale invested in the training in Human Rights for its leadership, with a recommendation to be carried out by all employees. The company is a signatory to the Guiding Principles on Safety and Human Rights, and has its policy on the subject published since 2009.

The involvement of employees and managers is reinforced by the Sustainability KPI program, which impacts on variable remuneration and covers critical environmental and social issue indicators.

Renova Foundation

The work performed by the Renova Foundation, with the objective of achieving socio-environmental and socio-economic restoration of the region impacted by the failure of Fundão Dam in 2015, belonging to Samarco, has been evolving consistently.

Since November 2015, approximately R\$ 5.3 billion have been invested in the programs agreed in the Transaction and Consent Decree (TTAC), with R\$ 4.8 billion in remediation actions and R\$ 0.4 billion in compensation actions. In the scope of remediation actions, since 2015, approximately R\$ 1.3 billion have been paid in indemnities, representing more than 26 thousand people assisted. In 2018, investments totaled more than R\$ 2.0 billion, R\$ 596 million of which in indemnities.

As important socio-environmental milestones, the planting of 800 hectares, the enclosure of APPs (Permanent Preservation Areas) in 37 rural properties and around 1,000 springs in the process of restoration, are expected to reach another 500 in 2019. In the socio-economic context, it is worth highlighting the construction in progress of Novo Bento Rodrigues, and the approval of the urban project of Paracatu for more than 90% of the families, besides the indemnities paid.

Commitments

One of the socio-environmental commitments assumed by Vale is the decommissioning or de-characterization of all its dams built using the upstream heightening method. The plan was presented to the Brazilian authorities in January 2019, in the face of the tragic failure of Dam I of Córrego de Feijão Mine in Brumadinho (MG), and also plans to de-characterize structures such as tailings dams to reintegrate them into the environment. The initial estimate, based on preliminary studies carried out on January 29th, 2019, indicated expenditures of R\$ 5 billion for the removal and reprocessing of all material in the dams, followed by the total recovery of the areas in the process of de-characterization.

Prior to the event, plans for the de-characterization of these dams were, up to that moment, based on methods that ensured the physical and chemical stability of structures without necessarily predicting the removal and processing of existing tailings. After the event, the Company is working on a detailed plan of individual engineering for each of these dams that will allow its total de-characterization. Up to the present time it is not possible to define the costs to be incurred in these de-characterizations and as soon as a new solid estimate is defined, the Company will disclose and recognize the obligation in 2019.

In order to carry out the decommissioning works of the upstream dams with speed and safety, Vale will temporarily halt the production of the units where the structures are located, with resumption of operations as the decommissioning works are completed.

Impacts on production

Following the Brumadinho dam rupture, Vale's iron ore fines annualized production was impacted by the equivalent of about 92.8 Mtpy:

- 40 Mtpy from Feijão, Vargem Grande and Fábrica complexes, as a result of the following events: (i) on February 4th, 2019 (and again on February 20th, 2019), Vale disclosed its intention to advance the de-characterization/decommissioning process of all its upstream dams; (ii) on February 18th, 2019, ANM published the new Resolution N° 4 recommending higher dam safety parameters; (iii) on February 20th, 2019, Vale confirmed that Vargem Grande, Grupo and Forquilha I, II and III tailings dams safety parameters could be potentially lower than what the new resolution recommended; and, (iv) on February 20th, 2019, ANM promoted inspections to the sites and determined the suspension of activities at the entire Vargem Grande Complex and Fábrica Mine; as informed in the press release "Clarification on the Vargem Grande, Grupo and Forquilha I, II and III dams," dated March 1st, 2019.
- 30 Mtpy from Brucutu mine, following the decision held by the Court of the Comarca of Santa Barbara, within the scope of the public civil action n° 5000153-77.2019.8.13.0572, filed by the Public Prosecution Office of the State of Minas Gerais ("MPMG"), as informed in the press release "Vale reports on Public Civil Actions," dated March 25th, 2019.
- 12.8 Mtpy from Timbopeba mine, following the decision held by the 2nd Civil Court of the Comarca of Ouro Preto, within the scope of the public civil action n° 5000435-60.2019.8.13.0461, filed by the MPMG, as informed in the press release "Vale on the Timbopeba mine operations," dated March 15th, 2019.
- 10 Mtpy from Alegria mine, following Vale's decision to temporarily suspend on a preventive basis the Alegria mine operation, as informed in the press release "Vale informs on operation of the Alegria mine," dated March 20th, 2019.

Pellets production was impacted by 11 Mtpy, as result of the stoppage of the Fábrica and Vargem Grande pelletizing plants, as informed in the press release "Vale announces the decommissioning of all its upstream tailings dams," dated January 29th, 2019.

Transparency

Vale presents its Sustainability Report annually as an initiative for transparency and disclosure of information on the main topics related to its business. The sustainability report is produced in accordance with the GRI methodology, the most widely disseminated internationally, and its latest version is available on the company's website.

Corporate Governance

Vale, its leadership and employees guide their behavior by the highest ethical standards. However, if a deviation is suspected, the company has an Ethics and Conduct Office channel that can be used by anyone, including employees, contractors, suppliers, and members of communities within the company's areas of activity.

Complaints made to the company's Ethics channel are handled by Vale's Ethics and Conduct Office, an independent area, reporting to the Board of Directors and Fiscal Council, responsible not only for the treatment of complaints received, but also for disclosure of the Company's Code of Ethical Conduct.

In 2018, Vale's Board of Directors approved a relevant update to the company's Code of Ethics and Conduct. The new Code has been widely disclosed to employees and is available on the intranet and the internet in 8 languages.

In 2018, Vale's Ethics and Conduct Office Channel received 2,709 complaints, with 77.4% of them being investigated.

Among the complaints made, 44.6% were confirmed. All confirmed cases are handled through a plan of action defined by the company's managers and approved by the Ethics and Conduct Office.

The Ethics and Conduct Office's verifications led to the creation of 3,844 corrective actions, including the termination of 214 employees.

Vale continued the progress of corporate governance practices started in 2017 and had its landmark entry into "*Novo Mercado*" in December, the segment with the highest corporate governance standard in Brazil. Vale is preparing to become a company with pulverized capital by 2020 and is strengthening its corporate governance. In this sense, the Board of Directors revisited most of the company's core policies, such as: (i) Corporate Integrity; (ii) Code of Ethics; (iii) Related Parties; (iv) Socio-environmental; (v) Risk Management; (vi) Remuneration to Shareholders; (vii) Securities Trading; and, (viii) Disclosure of relevant information.

Another highlight of 2018 was the review of the Corporate Risk Management model, which involved several areas of the company. It is also worth noting the continuous efforts to increase transparency, especially in relation to remuneration practices, with emphasis to changes in remuneration packages, which have been made in line with the highest international standards, among which: (i) mandatory ownership of shareholding position for Executive Board; (ii) greater discretionary weight in determining individual goals privileging meritocracy; and, (iii) greater weight of long-term variable remuneration.

2018 was also the first year of disclosure of the Report on the Brazilian Code of Corporate Governance (CBGC), which requires the observation of 31 items covering matters related to ethics and conflict of interest, Board of Directors, executive board, and practices that impact the shareholders. Vale fully adhered to 80% of the practices recommended by the CBGC and, in 17% of practices, the adherence was partial.

Operational and economic-financial performance

Selected financial indicators

<i>R\$ million</i>	2018	2017	2016
Net operating revenues	134,483	108,532	94,633
Adjusted EBIT ¹	48,825	37,150	28,799
Adjusted EBIT margin ¹ (%)	36.3%	34.2%	30.4%
Adjusted EBITDA ²	61,065	48,992	40,906
Net income (loss)	25,657	17,627	13,311

¹ Excluding one-off effects. EBIT = Earnings before interest and taxes. EBITDA: Earnings before interest, taxes, depreciation and amortization.

² Excluding one-off effects.

Reconciliation of EBITDA

<i>R\$ million</i>	2018	2017	2016
Consolidated of continuing operations			
Net income (loss) from continuing operations	26,084	20,278	17,455
Depreciation, amortization and exhaustion	12,240	11,842	12,107
Income taxes	(966)	4,607	9,567
Net financial result	18,058	9,650	(6,302)
EBITDA	55,416	46,377	32,827
Items for Adjusted EBITDA reconciliation			
Special events	1,283	142	228
Results from equity in associates and joint ventures	693	277	3,242
Impairment and other results in associates and joint ventures	2,240	883	3,940
Dividends and interest received in associates and joint ventures	1,433	1,313	669
Adjusted EBITDA from continuing operations	61,065	48,992	40,906

Performance of business segments

Ferrous Minerals

Adjusted EBITDA in the Ferrous Minerals segment was R\$ 54.2 billion in 2018, R\$ 10.9 billion higher than in 2017, mainly due to the positive impact of the exchange rate variations (R\$ 9.1 billion), higher realized prices² (R\$ 3.8 billion), and higher sales volumes (R\$ 4.0 billion), which were partially offset by higher costs and expenses (R\$ 6.2 billion).

Costs and expenses³ of iron ore and pellets totaled R\$ 47.1 billion, R\$ 6.2 billion⁴ more than in 2017, mainly due to the higher costs of maritime freight and the increase in the rate of iron ore royalties.

The average realized price of iron ore fines, encompassing CFR and FOB sales⁵, was US\$ 66.2/t in 2018, 3.0% above the US\$ 64.2/t realized in 2017. The average price of pellets increased from US\$ 109.2/t in 2017 to US\$ 117.5/t in 2018.

Base Metals

Adjusted EBITDA of Base Metals was R\$ 9.3 billion in 2018, 29% higher than the R\$ 7.2 billion registered in 2017, mainly due to higher prices (R\$ 2.5 billion), the favorable impact of exchange rate variations (R\$ 1.4 billion) and lower expenses (R\$ 212 million), which were partially offset by higher costs (R\$ 1.3 billion) and lower volumes (R\$ 812 million). This reflects Vale's strategic decision to reduce the nickel production profile and prioritize the generation of value over volume.

In addition, in line with its strategy of exploiting the potential of Vale's nickel premium products, the average realized price in 2018 was US\$ 13,667/t, US\$ 545/t above the average LME price of US\$ 13,122/t in the year, a nickel price performance 4.2% above LME prices, the highest percentage above the benchmark since 2002. The average realized price of copper decreased by approximately 6.5%, from US\$ 5,970/t in 2017 to US\$ 5,583/t in 2018, mainly due to the decrease in the market benchmark.

Nickel sales volumes decreased from 295,000 t in 2017 to 236,000 t in 2018, also reflecting the strategic decision to reduce nickel production and prioritize the generation of value over volume in the business. Copper sales volumes decreased from 424,000 t in 2017 to 379,000 t in 2018,

² Excluding the effect of exchange rate variations.

³ Excluding depreciation and amortization.

⁴ Excluding the effect of exchange rate variations and higher volumes.

⁵ CFR (Cost and Freight) sales include maritime freight in the price and FOB (Free on Board) sales consider the product delivered at the loading port and therefore do not include sea freight.

mainly due to the strategic decision to reduce nickel volumes in Canada, which led to lower copper production as a by-product of North Atlantic operations.

Coal

In 2018, the Coal business faced operational bottlenecks, which were boosted by the rains both at the beginning and the end of the year, affecting the pace of ramp-up and impacting metallurgical coal production. In response, management decided to stabilize the operation by implementing important initiatives, such as: preparation of new mine pits selected for tailings disposal, transfer of knowledge and support from iron ore operations, and expansion of waste removal.

The smaller volumes impacted the dilution of the tariff of the Nacala Logistics Corridor, which was in force for the entire year of 2018, but only partially during 2017. Additionally, to a lesser extent, costs were also impacted by the structural changes mentioned above.

These combined effects, partially offset by higher prices, were the main factors affecting the adjusted EBITDA for the coal business, which totaled R\$ 617 million in 2018 vs. R\$ 1.153 billion in 2017.

The average realized price of metallurgical coal was US\$ 190.6/t in 2018, 10.4% above the US\$ 172.7/t achieved in 2017, while the average price of thermal coal increased by 19%, from US\$ 71.0/t in 2017 to US\$ 84.2/t in 2018.

Sales volumes of metallurgical coal were 6.2 Mt in 2018, reducing 0.9 Mt in relation to 2017 due to severe weather conditions at various times of the year and the process of opening new mining fronts. Sales volumes of thermal coal increased from 4.6 Mt in 2017 to 5.4 Mt in 2018.

Net income

Net income in 2018 was R\$ 25.7 billion, R\$ 8.0 billion higher than in 2017, mainly due to the higher cash generation measured by EBITDA of R\$ 12.1 billion and the lower impact of the negative result from discontinued operations of R\$ 2.2 billion, which were partially offset by the predominantly non-cash negative effect of the depreciation of the BRL of 14.5% in 2018, which reduced net income by R\$ 9.3 billion.

Impairments

Asset impairments and the recognition of onerous contracts (excluding impairment on investments⁶) from continuing operations, both with no cash effect, totaled R\$ 2.2 billion in 2018, mainly due to the costs of long-term contracts of the Midwest System river transport and port service, which have a guaranteed minimum volume (R\$ 1.5 billion).

Impairment of assets R\$ million	Total impairment in 2018
Diversified segments	
Other assets	713
Onerous contracts	1,527
Total	2,240

⁶ From associates and joint ventures.

Shareholders' remuneration

As a result of the failure of Dam I of Córrego de Feijão mine in Brumadinho (MG) on January 27th, 2019, Vale's Board of Directors, at an extraordinary meeting, decided to suspend the Shareholders' Remuneration Policy, and the non-payment dividends and interest on capital, as well as any other resolution on the repurchase of shares of its own issuance.

Under Brazilian law, there is an obligation of shareholders' remuneration of 25% of the company's profit in the fiscal year. Vale has already paid remuneration to shareholders at a level significantly above the legal minimum threshold through the payment of interest on capital in the amount of R\$ 7.694 billion on September 20th, 2018. This amount was paid as an advance payment on the minimum remuneration for the period ended December 31st, 2018.

The net profit to be used as the basis for calculating the mandatory minimum remuneration to the shareholder in 2018 was R\$ 22.877 billion, which consists of Vale's net accounting profit in 2018 (R\$ 25.657 billion), less the amount of legal minimum reserves and tax incentives (R\$ 2.780 billion), in line with applicable legislation. The share of 25% of this amount is equivalent to R\$ 5.719 billion. Considering that the distribution of interest on capital is subject to the withholding of 15% of income tax on the part of the shareholders and also taking into account that the regulation defines that the amount of 25% of the profit to be distributed must refer to the net value received by the shareholders after deduction of such taxes, the mandatory minimum remuneration to the shareholder for 2018 – as defined by Brazilian law and established in the articles of incorporation – was R\$ 6.729 billion.

Investments

Investments in 2018 remained in line with 2017, totaling US\$ 3.784 billion, consisting of US\$ 888 million in project executions and US\$ 2.896 billion in maintenance of operations.

Progress indicators⁷

Project	Capacity (Mtpa)	Estimated start-up date	Realized Capex (US\$ million)		Estimated Capex (USD million)		Physical progress
			2018	Total	2019	Total	
Ferrous Minerals projects							
CLN S11D	230 (80) ^a	1H14 to 2H19	578	7,146	209	7,679 ^b	97%

^a Additional net capacity.

^b Original Capex budgeted at US\$ 11.582 billion vs. current disbursement trend of US\$ 7.850 billion by the end of the project.

Investments in the maintenance of operations increased by US\$ 666 million in 2018, mainly due to investments in digital transformation and automation, the return of pelletizing plants, the project to recover iron ore fines from the Gelado dam, and the underground expansion project of Voisey's Bay mine in Canada.

US\$ million	2016	2017	2018
Projects	3,102	1,617	888
Maintenance of existing operations	2,088	2,230	2,896
Total	5,190	3,848	3,784

Investment made by business area¹

US\$ million	2016	2017	2018
Ferrous Minerals	3,248	2,680	2,392
Coal	612	118	156
Base Metals	1,057	1,009	1,223
Energy	73	34	12
Steel	201	6	-
Others	1	1	1
Total	5,190	3,848	3,784

¹ Excluding R&D.

² In 2015 and 2016, corporate investments were allocated to their respective business areas, whereas in previous years they were allocated to Others.

Investments in dam management

Investments in dam management in Brazil had already been reinforced continuously since the failure of the Fundão dam of Samarco in 2015. These investments are expected to reach R\$ 256 million (approximately US\$ 70 million) in 2019, according to the budget approved by the

⁷ In the table, we do not include pre-operating expenses in the estimated Capex for the year, although these expenses are included in the total estimated Capex column, in line with our approval process by the Board of Directors. In addition, our estimate for Capex of the year is reviewed only once a year.

company in 2018, an increase of approximately 180% compared to the R\$ 92 million (approximately US\$ 30 million) invested in 2015.

Investments in dam management

R\$ million	2014	2015	2016	2017	2018	2019 ¹
Management of dams	111	92	109	180	241	256

¹ Amounts approved in the company's business plan for 2019

From 2016 to 2019, investments in dam management will total R\$ 786 million (approximately US\$ 220 million), being applied to maintenance and safety actions for dams, such as maintenance, monitoring, improvements, audits, risk analysis, revisions of the Emergency Action Plan for Mining Dams (PAEBM), implementation of warning systems, video monitoring and instrumentation, making it the most significant category with respect to investments in waste dumps and tailings dams, representing more than 30% of the total amount invested.

Investment in waste dumps and tailings dams

In million	2014	2015	2016	2017	2018	2019 ¹
Total investments in waste dumps and tailings dams, in US\$	474	226	152	202	221	435
Brazil	407	174	131	191	178	225
Other countries	67	52	21	11	43	210
Exchange rate R\$ / US\$	2.35	3.33	3.49	3.19	3.65	3.76
Total investments in waste dumps and tailings dams in Brazil, in R\$	956	576	456	608	654	845
Management of dams	111	92	109	180	241	256
New conventional dams	391	230	115	241	140	222
Heightening	168	139	94	96	188	203
Waste dumps	203	109	86	79	81	101
Others	83	6	52	12	4	63

¹ Amounts approved in the company's business plan for 2019

Investments in new dams, all built by the conventional method, reflect the company's operational needs and the implementation schedule of each of the projects in execution. Between 2014 and 2016, important dam building projects of dams have been carried out at Vale, such as the Norte Brucutu Dam (2015) and Forquilha V Dam (2016) in Minas Gerais, and the construction of the Maravilhas III Dam started in 2016.

It is important to emphasize that all Vale's new dam constructions follow the conventional construction method, in line with the decision made in 2016, following the failure of Samarco's dam in Mariana, to render inactive and decommission or de-characterize the upstream dams and whose implementation will be accelerated, as stated in the press release of January 29th, 2019.

With the continuous increase in dry processing, from 45% in 2014 to 60% in 2018 and 70% in 2023, the investments in new dams and heightening of dams tend to be reduced accordingly.

In addition, to treat wet processing tailings, Vale informs that it plans to invest approximately R\$ 1.5 billion (about US\$ 390 million) in the implementation of dry stacking technology from 2020 onwards, with pilot projects to evaluate the use of technology on an industrial scale. This initiative adds to the acquisition of New Steel for US\$ 500 million, announced on December 11th, 2018, with innovative technologies for dry processing of iron ore.

Investments in Health and Safety

Vale has also made significant investments in health and safety, mainly in electrical rehabilitation, structural rehabilitation and operational adequacy, fire prevention and firefighting systems, as well as other actions aimed at mitigating risks and complying with legal requirements.

In 2014 and 2015, Vale executed large projects of electric rehabilitation and firefighting, as well as structural rehabilitation actions and, consequently, investments in 2017 decreased to R\$ 479 million.

Since then, Vale has been increasing its investments in projects related to health and safety and, in 2018, R\$ 673 million were invested, a 41% increase compared to 2017. The 2019 budget approved by the Board of Directors in 2018 foresees an even greater investment in health and safety, representing an increase of 30% in relation to the amount realized in 2018, and the highest amount in the last five years.

Investment in health and safety

<i>R\$ million</i>	2014	2015	2016	2017	2018	2019 ¹
Investments in H&S, in US\$	360	353	198	207	233	291
Brazil	317	178	125	151	184	233
Other countries	43	175	73	56	49	58
Exchange rate R\$/US\$	2.35	3.33	3.49	3.19	3.65	3.76
Total investments in H&S in Brazil, in R\$	744	593	435	479	673	877

¹ Amounts approved in the company's business plan for 2019

Debt indicators

Vale managed to reach its net debt target of US\$ 10 billion, reducing it to US\$ 9.650 billion as of December 31, 2018, a decrease of US\$ 8.493 billion compared to the position as of December 31, 2017. The leverage, as measured by net debt/LTM⁸ EBITDA, decreased to 0.6x.

In 2018, the benefits of Vale having lower debt levels could be seen in the reduction of gross interest, which was reduced by 31% from US\$ 1.697 billion in 2017 to US\$ 1.185 billion in 2018.

Gross debt totaled US\$ 15.466 billion on December 31, 2018, representing a reduction of US\$ 1.344 billion compared to September 30, 2018 and US\$ 7.023 billion compared to December 31, 2017. The reduction in gross debt compared to 2017 was mainly due to the repayment of US\$ 7.753 billion in 2018, including the repurchase of bonds maturing in 2020, 2021, 2022, 2036 and 2042.

The average term of the debt remained at 8.9 years on December 31, 2018, in line with the average term of December 31, 2017. The average cost of debt after foreign exchange and interest rate swap transactions was 5.07% per year on December 31, 2018, in line with the value of 5.06% per year on December 31, 2017.

Debt indicators

<i>in US\$ million</i>	2016	2017	2018
Gross debt	29,322	22,489	15,466
Net debt	25,042	18,143	9,650
Gross debt / LTM EBITDA adjusted ¹ (x)	2.4	1.5	0.9
LTM EBITDA adjusted ¹ / gross interest expenses (x)	6.8	9.0	14.0
Gross debt / EV ²	46.2%	27.4%	19.7%

¹ Excluding non-recurring effects ² EV = market value on 12/28/2018 plus net debt

⁸ LTM = last twelve months

Policy regarding independent auditors

Vale has specific internal procedures for the pre-approval of services contracted with its external auditors, in order to avoid conflict of interest or the loss of objectivity of its external independent auditors.

Vale's policy, in relation to independent auditors and in the provision of services not related to external auditing, is based on principles that preserve its independence. In line with best corporate governance practices, all services provided by our independent auditors are supported by a letter of independence issued by the auditors and pre-approved by the Fiscal Council.

According to CVM Instruction 381/2003, the services contracted with external auditors of the company KPMG Auditores Independentes, for a biennial term until April 2019, for the financial year of 2018 for Vale and its subsidiaries were as follows:

Fees in R\$ thousand	Vale and subsidiaries	%¹
Financial Audit	15,544	92.6
Auditing - Sarbanes Oxley Act	1,194	7.1
Audit Related Services ²	51	0.3
Total External Audit Services	16,789	100.00

¹ Percentage relating to total fees of external audit services.

² Those services are mostly contracted for periods of less than one year.

Vale Board of Directors approved the contracting of PricewaterhouseCoopers Auditores Independentes (PwC), replacing KPMG Auditores Independentes (KPMG), to provide audit services for its financial statements for a period of five years beginning in 2019. That service will start to be provided as of the review of the quarterly information (ITRs) for the period ending on June 30th, 2019.

The replacement of KPMG by PwC aims to comply with the provisions of art. 31 of CVM Instruction 308/99, which determines the rotation of independent auditors every five years, and was approved by current auditors.

Accounting information

Income statement

<i>R\$ million</i>	2018	2017	2016
Net operating revenue	134,483	108,532	94,633
Cost of goods sold and services provided	(81,201)	(67,257)	(61,143)
Gross profit	53,282	41,275	33,490
Gross margin (%)	39.6%	38.0%	35.4%
Selling and administrative expenses	(1,917)	(1,697)	(1,755)
Research and development expenses	(1,376)	(1,086)	(1,098)
Pre-operating and stoppage expenses	(984)	(1,317)	(1,570)
Other operational expenses, net	(1,613)	(1,338)	(937)
Impairment and others results in non-current assets	(3,523)	(1,025)	(4,168)
Operating profit	43,869	34,812	23,962
Financial revenues	1,549	1,532	606
Financial expenses	(8,394)	(10,512)	(9,295)
Other financial items	(11,213)	(670)	14,991
Equity results in associates and joint ventures	(693)	(277)	(3,242)
Income (loss) before taxes	25,118	24,885	27,022
Current tax	(2,806)	(2,664)	(3,307)
Deferred tax	3,772	(1,943)	(6,260)
Net income (loss) from continuing operations	26,084	20,278	17,455
Net income (loss) attributable to noncontrolling interest	117	65	(6)
Net income (loss) from continuing operations attributable to Vale's shareholders	25,967	20,213	17,461
Discontinued operations			
Losses from discontinued operations	(310)	(2,608)	(4,159)
Income (loss) attributable to noncontrolling interest	-	(22)	(9)
Income (loss) from discontinued operations attributable to Vale's shareholders	(310)	(2,586)	(4,150)
Net income (loss)	25,774	17,670	13,296
Net income (prejuízo) attributable to noncontrolling interest	117	43	(15)
Net income (loss) attributable to Vale's shareholders	25,657	17,627	13,311

Equity income (loss) by business segment

<i>R\$ million</i>	2018	2017	2016
Ferrous Minerals	1,540	846	616
Coal	58	63	(18)
Base Metals	5	2	(4)
Steel	(578)	(714)	242
Others	120	105	275
Total	1,145	302	1,111

Balance sheet – consolidated

<i>R\$ million</i>	2018	2017	2016
Assets			
Current	59,256	62,701	73,547
Non-current	51,631	43,965	34,092
Permanent	230,826	221,431	215,057
Total	341,713	328,097	322,696
Liabilities			
Current	35,285	43,357	36,610
Non-current liabilities	132,745	136,634	152,384
Net assets	173,683	148,106	133,702
Share capital	77,300	77,300	77,300
Reserves	42,502	24,539	13,698
Others	50,601	41,919	36,243
Equity attributable to non-controlling interests	3,280	4,348	6,461
Total	341,713	328,097	322,696