



XXIII Analyst & Investor Tour Northern System operations

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Disclaimer

“This presentation may include statements that present Vale's expectations about future events or results, including without limitation estimates for steel production on slide 4, execution and production plan of the Mega Hubs initiative on slide 8, production plan and expected start-up of concentration plants on slide 9, iron ore agglomerates production plan and projects approval plan of on slide 11, iron ore production plan on slide 13, projects' expected capacity and start-up on slides 14, 15, 16, 17, 19, 33 and 34, iron ore and agglomerates production plan, average iron grade and average premium expected on slide 20, iron ore production plan in the Northern System on slide 24, iron ore projects expected start-up on slides 26 and 30, waste movement plan at Serra Norte site on slide 27, nickel and copper production plan on slide 39, Iron Solution business cost savings expected on slide 40, production costs of iron ore, nickel and copper on slide 41, investment expectation on slide 42. These risks and uncertainties include factors relating to our ability to perform our production plans and to obtain applicable environmental licenses. It include risks and uncertainties relating to the following: (a) the countries where we operate, especially Brazil, Canada and Indonesia; (b) the global economy; (c) the capital markets; (d) the mining and metals prices and their dependence on global industrial production, which is cyclical by nature; (e) global competition in the markets in which Vale operates; and (f) the estimation of mineral resources and reserves, the exploration of mineral reserves and resources and the development of mining facilities, our ability to obtain or renew licenses, the depletion and exhaustion of mines and mineral reserves and resources. To obtain further information on factors that may lead to results different from those forecast by Vale, please consult the reports Vale files with the U.S. Securities and Exchange Commission (SEC), the Brazilian Comissão de Valores Mobiliários (CVM) and in particular the factors discussed under “Forward-Looking Statements” and “Risk Factors” in Vale’s annual report on Form 20-F.”



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Iron Ore Solutions

Marcello Spinelli, EVP Iron Ore Solutions



Steel demand long-term fundamentals remain intact

Megatrends for steel demand



Population and economic growth



Urbanization



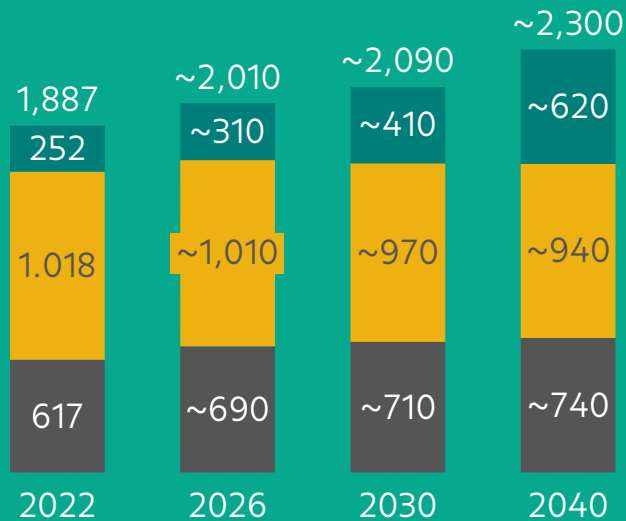
Energy transition



Onshoring and reduced steel imports

Steel production by region (Mt)

- Emerging regions¹
- China
- Europe, America, Japan, Korea and others



Short-term view



Strong micro fundamentals: high BF utilization rates and low steel and iron ore inventories in China



Property market uncertainties: a more encouraging outlook, driven by higher social housing investments



Ex-China: a recovery in steel production is expected in 2024, offsetting the decline in 2023.

Long-term view



Emerging regions: SEA expected to double steelmaking capacity by 2030



Chinese urbanization: ~150 million people migrating to urban areas with greater steel usage



Developed regions: green steel incentives and investments in renewable energy infrastructure

¹Including India, Southeast Asia (SEA), Middle East and Africa.

The world cannot reach decarbonization targets without significant changes in steelmaking

More than **70 countries** committed to net zero targets

Steelmaking represents **8% of global CO₂ emissions**

> US\$ 1 trillion investments are required to decarbonize the steel industry

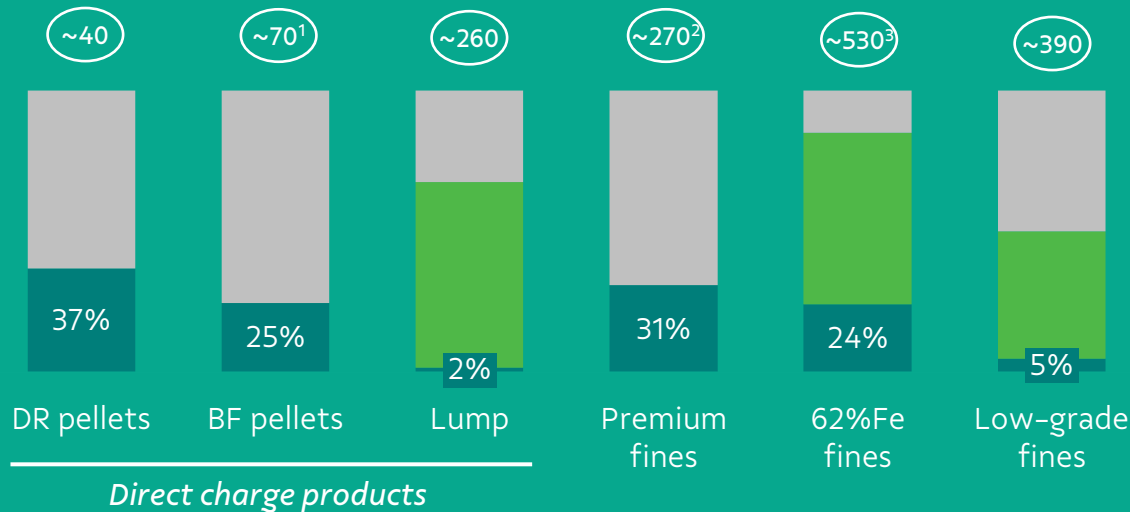
The **steel industry will** most likely **decarbonize in steps**




Vale has the premium iron ore portfolio to support the transition for net-zero emission steelmaking

Vale is a leader in premium products (DRP, BFP and premium fines)

Seaborne supply – 2022 (Mt)

■ Vale
 ■ Main peers
 ■ Others
○ Seaborne market supply (Mt)



- 
Decarbonization creating market segmentation and superior premiums
- 
Vale's ore is suitable to beneficiation, providing multiple options for decarbonization
- 
Leader in iron ore agglomerates and premium fines

¹Including Vale's sales of BF pellets in Brazil. ²Including pellet feed sales. ³Including BRBF low alumina products.

Accelerating breakthrough iron ore solutions to serve growing demand for greener products

Fostering
Mega Hubs



Developing
Concentration capacity



Increasing
Agglomerates production





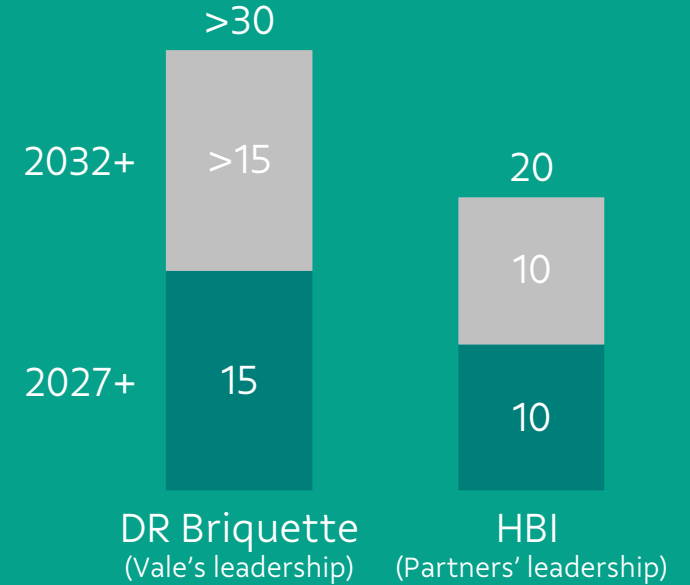
We are partnering with several stakeholders to foster Mega Hubs creation

Mega Hub agreements

- 2022** Agreements signed with local authorities in the Middle East
- 2023** MoUs and land lease agreements signed in the Middle East
Development studies in Brazil and US
- 2024** First facilities to start construction after signing off-take agreements
- 2027** Start-up of the first Mega Hub in the Middle East



Volumes (Mt, preliminary estimates)





Concentration solutions to supply high-quality feedstock

Vale's concentration solutions

New



Tailings filtration

Usage of wet processing with dry tailings disposal at stockpiles

4 tailings filtration plants at Conceição, Cauê, Brucutu and Vargem Grande



Dry concentration

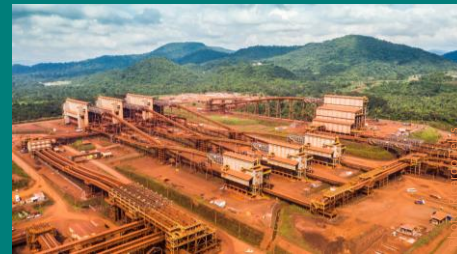
First industrial plant under construction at Vargem Grande with start-up in 2025 with 1.5 Mtpy capacity



Third-party concentration facilities

Usage of concentration capacity where concentration by-products (sand) have commercial value

~13 Mt to be concentrated in 2023



IOIJ ore concentration & solutions

Investment to generate DR quality feed from IOIJ to fulfill the growing demand from 2027 onwards



Sohar concentration

To produce feed for existing pelletizing plant and future briquette plants

~10 Mtpy of concentrate

Located next to Oman's pellet plant

Product portfolio expected Fe content of 63.5% by 2026 and ~64% by 2030+



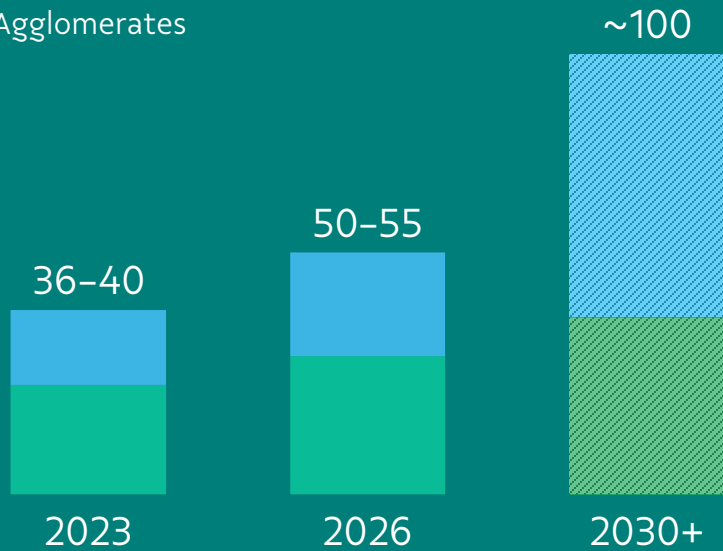
Iron ore briquette

Click [here](#) to watch the video

Vale will produce ~100 Mt of agglomerates by 2030+

Pellets and briquettes production (Mt)

- BF Agglomerates
- DR Agglomerates



Briquette plants expected timeline

- 2023 Approval of +1 plant
- 2024 Approval of +2 plants
- 2025-2027 Approval of +4 plants



Tubarão plant



Commissioning
Aug 2023



Capacity
6 Mtpy



First **cargos** directed to
industrial tests

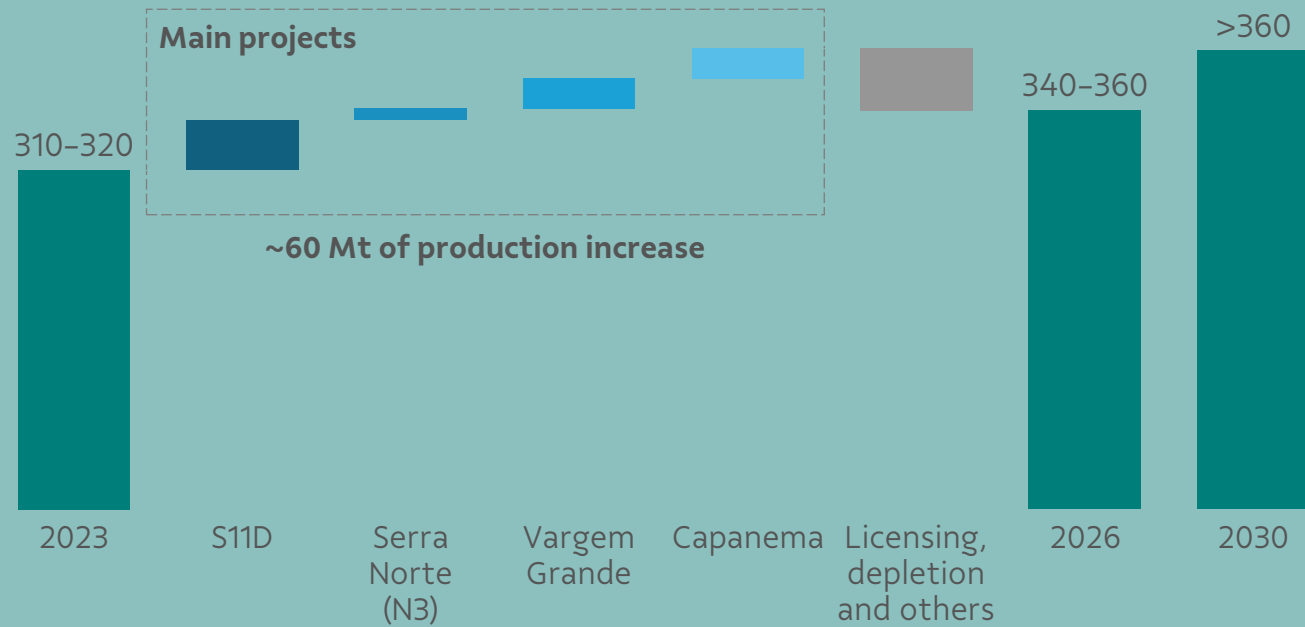
Taking action

to deliver operational flexibility

and high-quality products

We are paving the way to deliver high-quality growth

Iron ore production (Mt)



Our main drivers



Projects

Increasing operational flexibility



Licensing

Preserving the baseline



Quality

Ensuring higher quality portfolio





Delivering 120 Mtpy of premium products at S11D

Serra Sul 120

-  S11D's mine-plant **capacity to increase to 120 Mtpy**
-  Conveyor belt duplication, enhancing **operational flexibility**
-  **51%** physical progress
-  Start-up in **2026**

Compact Crushing S11D

-  Construction of a **new crushing plant for jaspilite waste**, using gyratory crusher technology
-  Potential to debottleneck **50 Mtpy of S11D's capacity**
-  **13%** physical progress
-  Start-up in **2H26**





Delivering 120 Mtpy of premium products at S11D



Area 5 semi-mobile crushing plant
Serra Sul 120 project



Conveyor belt duplication
Serra Sul 120 project



Crushing piles installation
Compact Crushing project



Supply area
Serra Sul 120 project



Vargem Grande complex can add more 17 Mtpy of capacity in the next years

Horizontes and Tamanduá mines expansion

- ↓ License request is under **environmental agency review**
- ↗ **ROM availability** increase for VGR Complex
- ⚙️ Need to **develop waste stockpiles** in the medium-term
- 📅 Expected date: **1H24**

VGR1 plant revamp





- ⚙️ **Enhancing VGR1 plant** with new screening circuit and improved handling system adequacy
- ↗ **Operational flexibility increase**, with Vargem Grande Complex reaching **~50 Mtpy capacity (+17 Mtpy)**
- ✅ **36% physical progress**
- 📅 Start-up in **2H24**





Capanema project increases flexibility in the Southeastern System with BRBF feed addition

Capanema Maximization project

-  **18 Mtpy capacity¹** of sinter feed production using natural moisture processing
-  Increasing **operational flexibility** of Timbopeba
-  **52%** physical progress
-  Start-up in **1H25**



A more collaborative approach for the licensing process

Licensing challenges



Southeastern and Southern Systems

Significant regulatory changes after 2019



Northern System

Conservation of the biome supported by extensive studies

What are we doing?



Advancing towards more sustainable operations



Investing in collaborative environmental studies



Portfolio prioritization and active listening

Public-private partnerships to advance

ICMBio

- Workforce training to use new tools for biodiversity monitoring and conservation
- Creation of the Carajás National Park
- Fostering bioeconomy initiatives in the Amazon

Minas Gerais Government

- Collaborative approach to address licensing process backlog and enhance the regulatory framework in Minas



Solutions for overall quality improvement

Brucutu case: monthly margin addition of >US\$ 50 million with quality improvements



Torto dam
Start-up: July 2023



Capacity of ~20 Mtpy of sinter and pellet feed



Increase of 9 p.p. of Fe%, after Torto dam start-up



Tailings filtration plant in operation reducing the use of dams



Need to develop and license new waste and tailings stockpiles

Substantial improvements in the average quality of Vale's portfolio

Adding high-quality capacity to capture higher premiums

	2023	2026	2030+
Volumes	310–320 Mt	340–360 Mt	>360 Mt
High-grade agglomerates	36–40 Mt	50–55 Mt	~100 Mt
Grade	62.4% Fe	~63.5% Fe	~64% Fe
Average premium	~4 US\$ per metric ton	8–12 US\$ per metric ton	18–25 US\$ per metric ton

Potential contribution
to EBITDA vs. 2022

+ US\$ 4–10 bn
by 2026 and 2030+

+ US\$ 20–50 bn
value addition¹



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Northern System operations

Carlos Medeiros, EVP Operations

The Northern System is a low-cost and high-quality growth platform



Mines

- 3 mining complexes
- 5.9 billion tons in reserves



Railway

- 992 km of double-track railway
- 20,000 iron ore wagons



Port

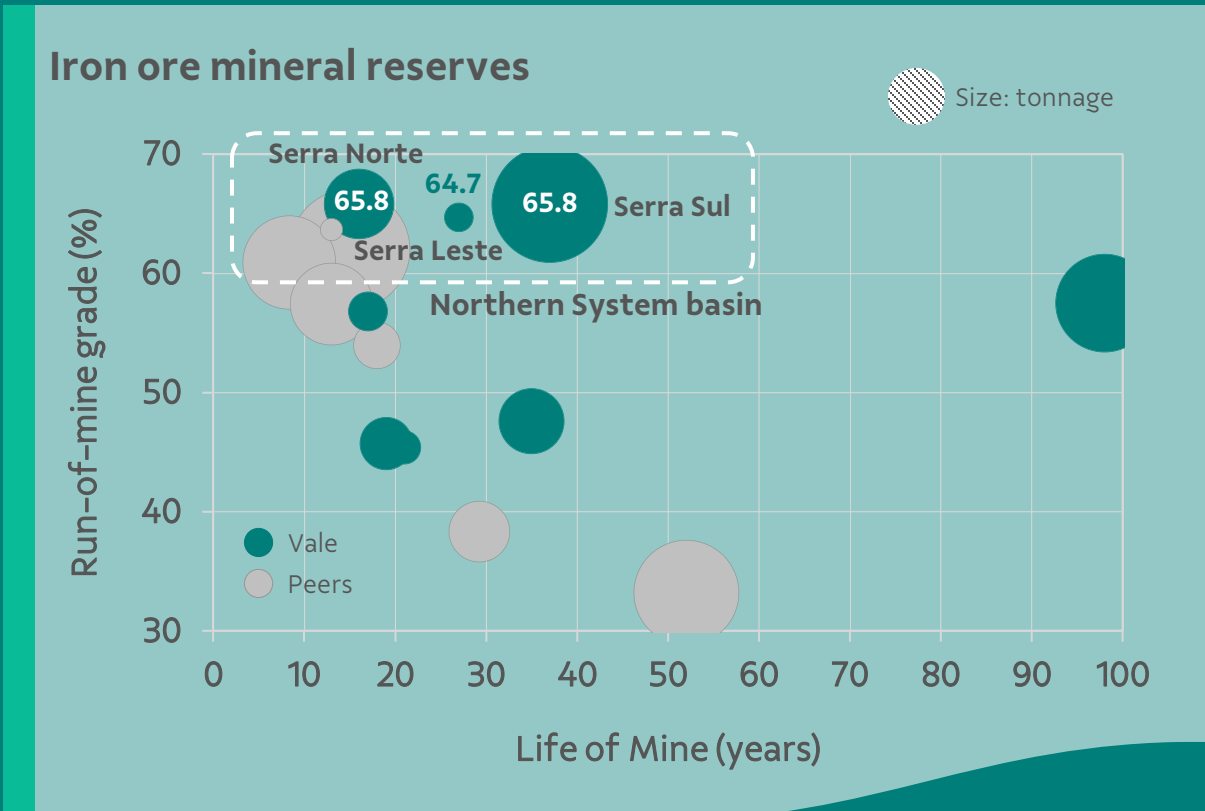
- 5 berths (3 Valemax berths) and 8 ship loaders

230 Mtpy capacity¹



¹ Capacity in 2023 without current operational restrictions.

The best iron ore reserve basin in the industry



-  **Premium reserves**
65% Fe without concentration
-  **Low impurity levels**
< 2.8% of SiO₂ and Al₂O₃
-  **Potential opportunities for growth in iron ore**

Production commenced in 1985 with Serra Norte and was raised to a new level with the S11D start-up

Northern System production (Mt)

■ Serra Leste ■ Serra Sul ■ Serra Norte



¹ Capacity in 2023 without current operational restrictions.

Serra Norte is the largest iron ore mine in the world

Operations:

- Capacity¹: 140 Mtpy
- 12 open pits
- 3 processing plants
- Autonomous haulage system and drilling

Challenge:

- ROM availability

Serra Norte mines



Start-up date:

- 1985: **N4E**
- 1996: **N4WN**
- 1998: **N5W**
- 2012: **N5S**
- 2015: **N4WS**
- 2019: **Morro 1**
- 2025: **N3 (expected)**
- 2030+: **N1/N2 (expected)**

Improving operational approach to debottleneck iron ore production

Challenges

Limited space and surface drainage for ore release

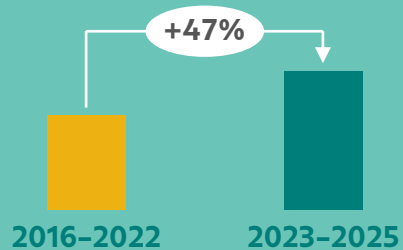


Natural depletion and strip ratio increase



Our approach

Average waste movement (Mt)



- Revised strategy for better movement within the mine
- Well-equipped to meet the mining plan
- Current haulage capacity at 250 Mtpy



N4WS Pit
Serra Norte, Pará, Brazil

Gelado is a sustainable solution for mine tailings

Gelado is an innovative project

- ▶ Initial capacity¹ of **5.0 Mtpy**
- 🔄 **High-quality pellet feed production** by reusing tailings
- 🔗 **Magnetic concentration to beneficiate 63%Fe tailings**
- 🏠 **100% electric dredges** to extract the material
- 🔄 **~65% mass recovery**

Gelado project
Start-up: Dec 2022

S11D is a pathway for growth in high-quality products

Operations:

- Capacity¹: 90 Mtpy
- 4 truckless systems with hybrid operations
- 3 processing plants
- 144 km of conveyor belt

Challenges:

- Compact and clayed waste material
- Asset reliability

Serra Sul mines

S11B

S11C

Area 5
(Serra Sul 120)

S11D
(four lines)

Compact
crusher

Start-up dates:

- 2016: **S11D (four lines)**
- 2022: **S11D 10 Mtpy expansion¹**
- 2026: **Serra Sul 120 (expected)**
- 2026: **Compact crusher (expected)**
- 2030+: **S11C (expected)**

Improved orebody knowledge used to minimize the impact of jaspilite waste and to increase iron ore output

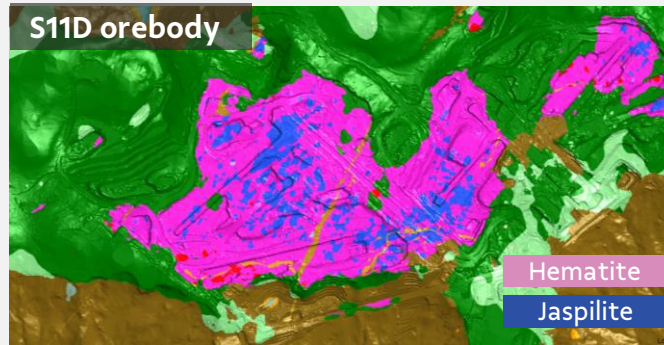
Jaspilite waste

What is it?

- Hard rock from the Carajás formation, containing bands of jasper and iron minerals
- 42% avg. Fe and 36% avg. SiO₂

Operational challenges

- Crushing performance due to jaspilite's high compressive strength and abrasiveness



What are we doing to improve?

Installing new crushers

combined with equipment and improvement in transportation, for greater asset reliability

Enhancing predictability

through short-term drilling sample analysis

Adjusting blasting strategy

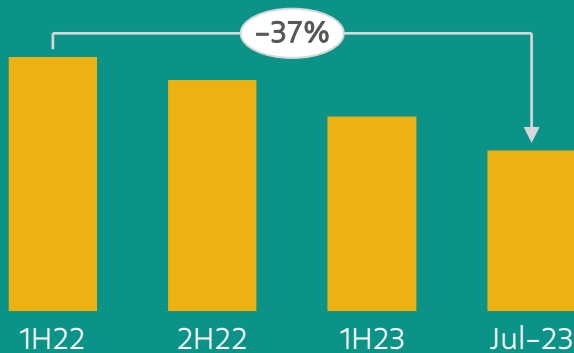
for better operational efficiency

Focusing on asset reliability to improve performance



Serra Sul mine

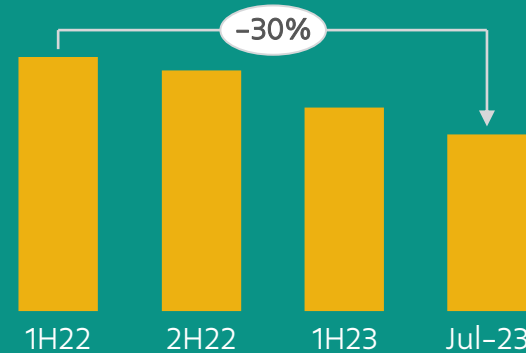
Corrective maintenance ratio¹ (%)



- Adjusted maintenance strategy for more efficient hours between stoppages
- Optimizing stoppages maximize the scope of preventive maintenance activities

Serra Norte mine

Corrective maintenance ratio¹ (%)

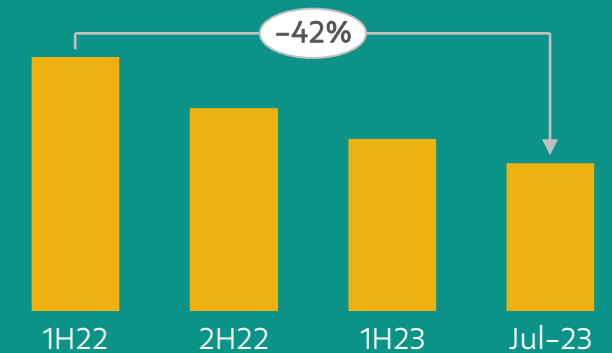


- Addressing critical and chronic failures through engineering enhancements
- Training and exchange of experiences among the maintenance teams



Ponta da Madeira Terminal

Corrective maintenance ratio¹ (%)



- Asset reliability analysis focusing on loading and unloading routes, which represent 70% of the shipping flow
- World-Class maintenance policy adoption

Upgrading logistics capacity to 240 Mtpy

Northern System 240 Mtpy project

- ⚡ Logistics infrastructure optimization, enhancing high-quality production
- ✓ Progressing through EFC's rail line duplication and PDM Terminal's facilities enhancement works

Other ongoing initiatives

- ⚙ Changes in PDM Terminal's operational strategy to increase safety and productivity
- 📊 Further initiatives to mitigate risks, e.g., the ongoing Rio Tocantins bridge project works

New reclaimer under construction
PDM Terminal, Maranhão, Brazil

Upgrading logistics capacity to 240 Mtpy



3rd loading silo
S11D stockyard



Surge bin under construction
Ponta da Madeira Terminal



Duplication works area
Rio Tocantins Bridge works



New reclaimer under construction
Ponta da Madeira Terminal



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Building Vale of the Future

Gustavo Pimenta, CFO



Vale of the future strategy

promote *sustainable mining*



- *People-driven*
- *Reliable operator*
- *Benchmark in safety and dam management*
- *Shared value*
- *Nature positive*

foster *low carbon solutions*



- *Focused on high quality products and resources*
- *Iron Solutions*
- *Energy transition materials*
- *Circular mining*

stay *disciplined*

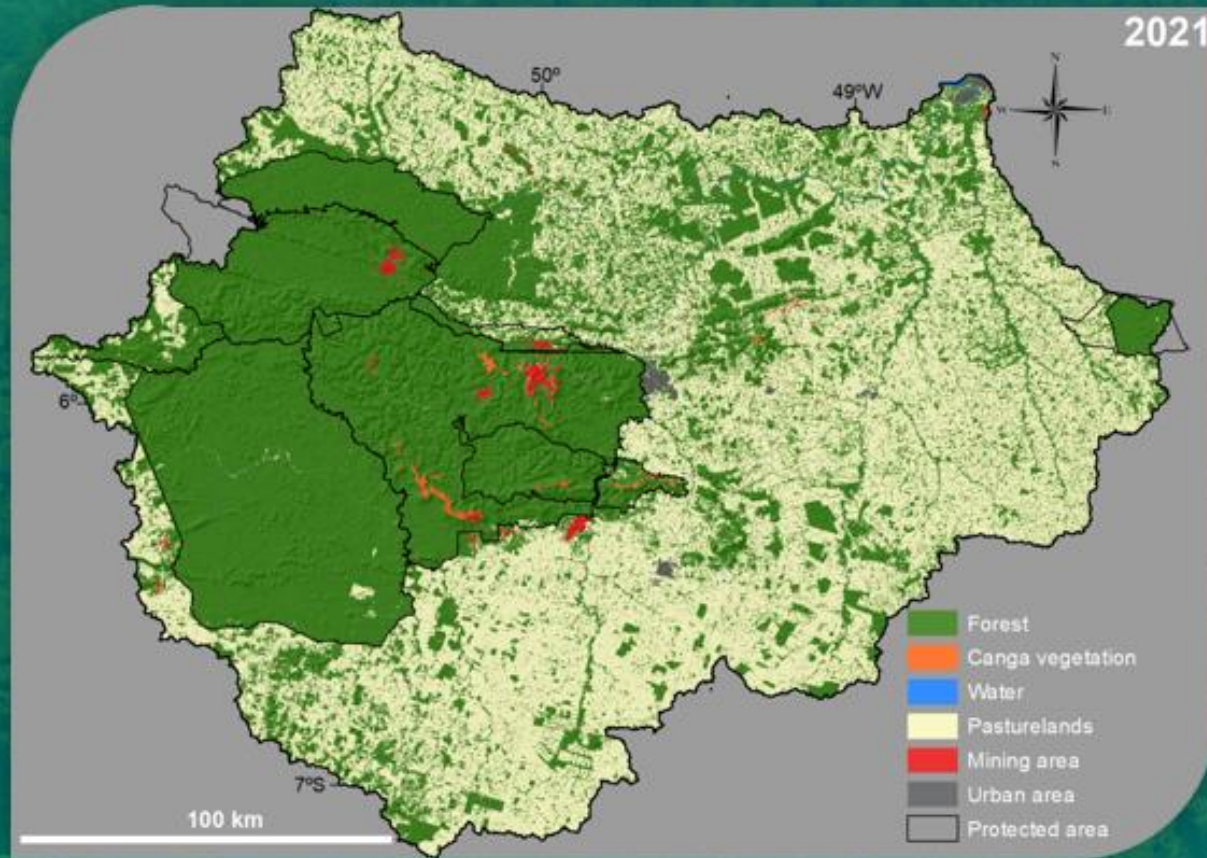


- *Efficient capital allocation*
- *Attractive cash return to shareholders*
- *Strong balance sheet*
- *Cost and capex efficiency*

We exist to improve life and transform the future. Together.



Almost 40 years protecting the Amazon forest



Vale protects

~1.1 million hectares¹

of forest area. Of this area, **800,000 ha** are in the Amazon, which Vale has been protecting in partnership with ICMBIO.

Our goal is to protect

1.5 million hectares by 2030



Shared value: investing in Pará state for sustainable socioeconomic development

Building infrastructure



4 year program¹ **1,565** workers at peak

Community centers, bridges, parks, hospitals, schools and the port region

Building the infrastructure for growth and wellness

Programs to improve public health & education



32k children **1.8k** teachers

220 participating public schools **8** municipalities

Developing resilient communities

Fighting against extreme poverty



9 concept tests in **6** municipalities in Pará State

Commitment to remove 500k people from extreme poverty in Brazil by 2030

Tackling poverty using a multidimensional approach

¹ Initial 4-year commitment as part of the "Estrutura Para" (Pará Structure) Program whereby payments that would have been paid in Mineral Resource Taxes (TFRM) to the state will be redirected to these infrastructure projects. The total amount to be paid is equivalent to 50% of the total TFRM. ² Community Center built by Vale in 2021 – this photo is illustrative of the community centers to be built in Pará.



Vale Base Metals: partnerships to accelerate growth and support the global energy transition



Single entity with a leaner structure: **more focused, agile and efficient company**



Fully **dedicated governance** with **industry expertise**

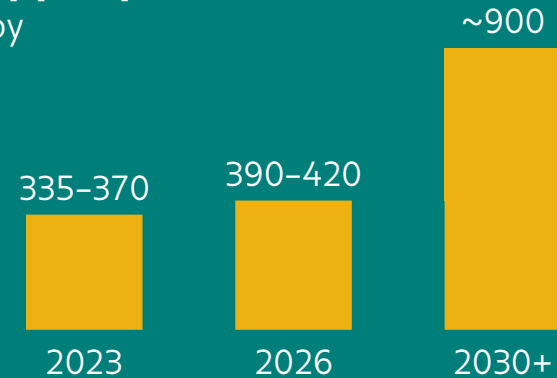


Access to **competitive capital** to fund **US\$ 25–30 bn capex** over the next decade



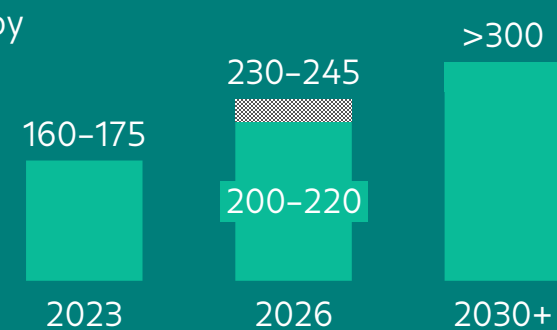
Partnerships for 13% equity at an **implied EV of US\$ 26 bn** (US\$3.4 bn net proceeds)

Copper production ktpy



Tier 1 mining complex in Carajas
World-class Hu'u project

Nickel production ktpy



Strong nickel resources in key jurisdictions
Indonesia exposure



Accelerating gains in productivity and cost efficiency

Vale's productivity journey

7 work fronts focused on

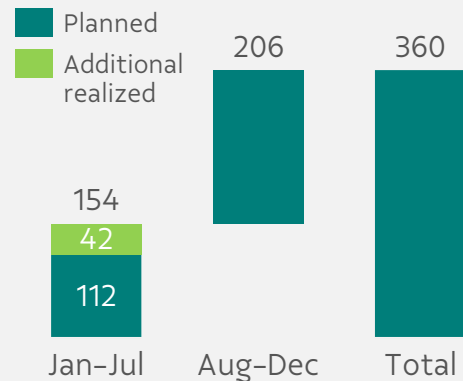
- Cost efficiency
- Productivity improvement
- Freight competitiveness

62 squads

431 initiatives

Cost efficiency front

Fixed & variable cost savings (2023, US\$ million)



Success cases (non-exhaustive)



OEM strategy

- Enhanced technical support
- Cost optimization



Business process outsourcing in Belém

- Up to 500 FTEs
- Digital transformation

US\$ 154 million cost savings to date

Maintaining tier-1 cost competitiveness

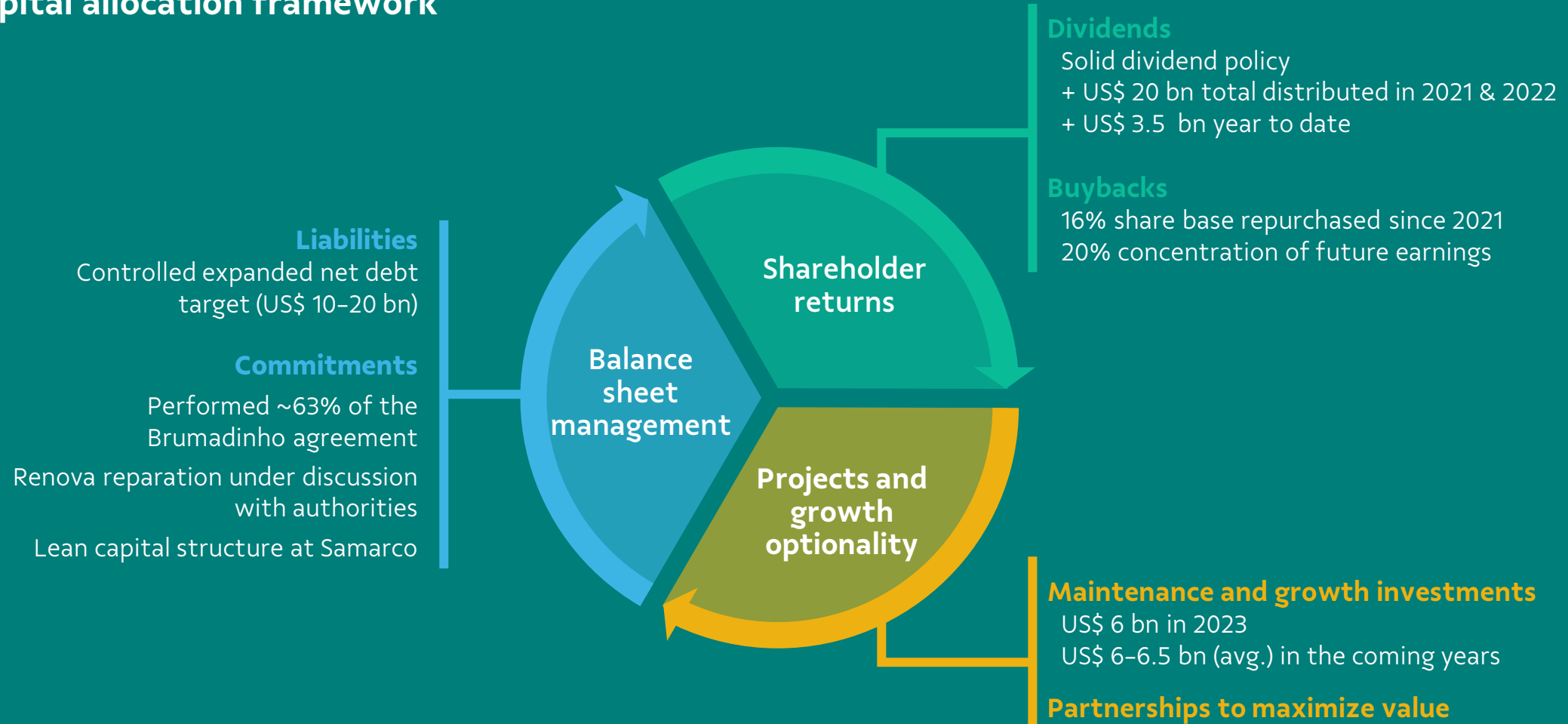
All-in costs¹

	2023	2026	Main improvements in the coming years
Iron Ore	US\$ 52-54/t	US\$ 42/t	<ul style="list-style-type: none"> Higher volumes: dilution of fixed costs and expenses High-quality portfolio: all-in premiums of US\$8-12/t by 2026
Nickel²	US\$ 15,500- 16,000/t	US\$ 10,000/t	<ul style="list-style-type: none"> Lower than expected by-product prices and volumes in 2023 All-in costs to decrease with increase in production
Copper^{2 3}	US\$ 3,200/t	US\$ 2,600/t	<ul style="list-style-type: none"> Higher volumes and fixed cost dilution, Salobo 3 ramp-up and productivity improvements



Efficient capital allocation to maximize value creation

Capital allocation framework



Key messages

Uniquely positioned considering the decarbonization trends

Highly focused on operational performance

Accretive growth opportunities

High capital allocation and cost discipline



VALE