

Vale Day

New York 2019



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The roadmap for **de-risking** **Vale**

Reparation of Brumadinho

Assuring dam safety and asset integrity

Stabilizing production and leveraging competitiveness

Discipline in capital allocation



Brumadinho reparation



Listening to those affected...



A typical week					
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Conversations with impacted people					
Report to CEO and Executive Board	Meetings with Public Prosecutors and other public authorities / entities	Listening to families of missing people	Meeting with the Commission of Families + Fire Fighters' representatives	Listening to impacted families (individual cases)	Additional demands
Meetings with public authorities		Meeting with water and sanitation company		Internal alignments on recorded demands	
		Meetings with affected communities			

...drives our efforts towards reparation

Vale is committed to the full and effective **reparation of Brumadinho**



Restoring the
livelihood and
dignity
of those affected



Economic and
non-economic
compensation



Restoring the
productive capacity
of affected areas



Restoring the
environment

[Click here](#) to watch a video on
environmental recovery

We are restoring the **livelihood and dignity** of affected people



Medical and psychological support



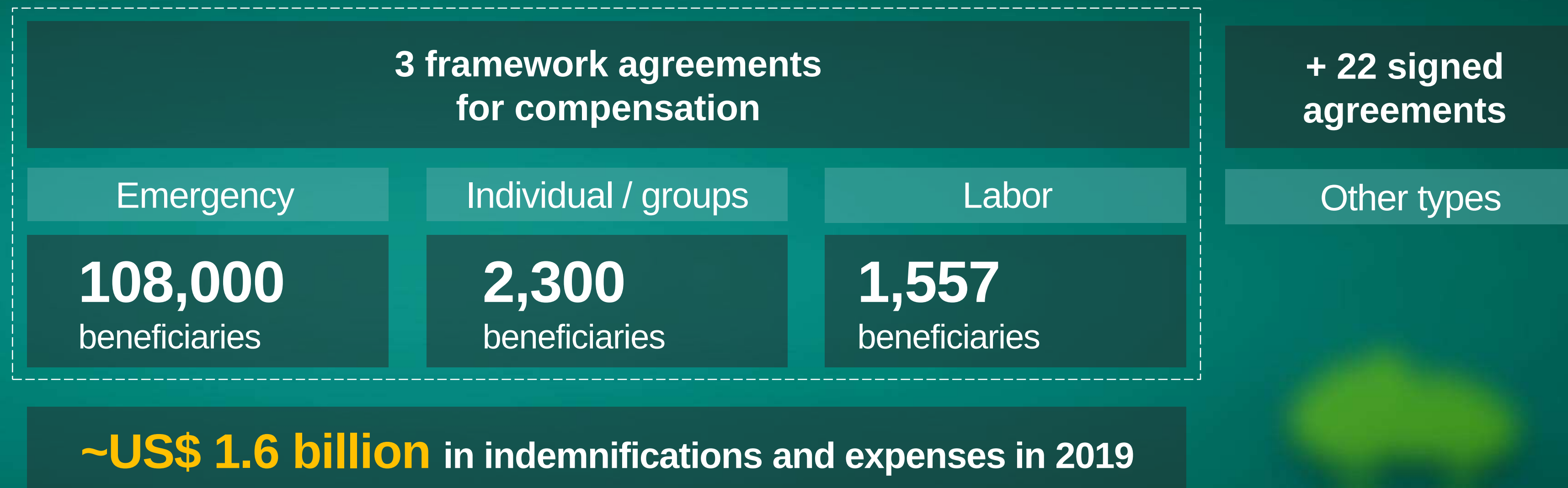
Water supply



Emergency financial support

We are progressing with economic and non-economic compensation

25 signed agreements



We are working to restore and develop **socioeconomic capacity** with...



Individuals



Communities



Entities and
governments



Going beyond restoring Brumadinho to build **a better Vale**

**Safety and
operational
excellence**

**New pact
with society**

Maximize
flight to quality
in Iron Ore

Base Metals
transformation

Discipline in
capital allocation



Safety and Operational Excellence



Safety and Operational Excellence Executive Office composed of **four technical teams**



Tailings



**Asset
Integrity**



**Operational
Excellence**



**Health, Safety and
Operational Risks**



Our dogma: **every accident is preventable**

Cultural
transformation



Global risk assessment

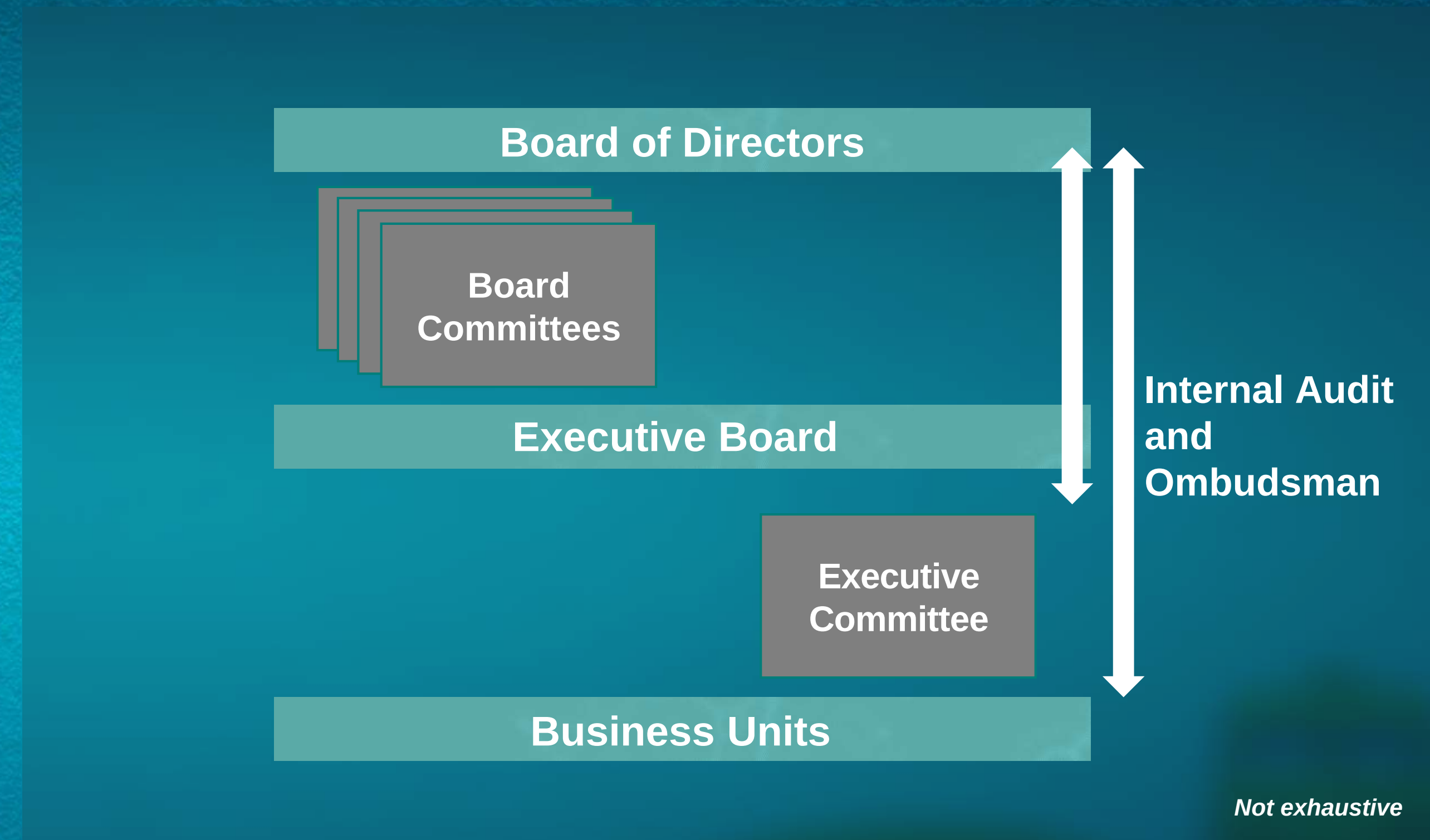
Review Tailings Management System

VPS revised and relaunched

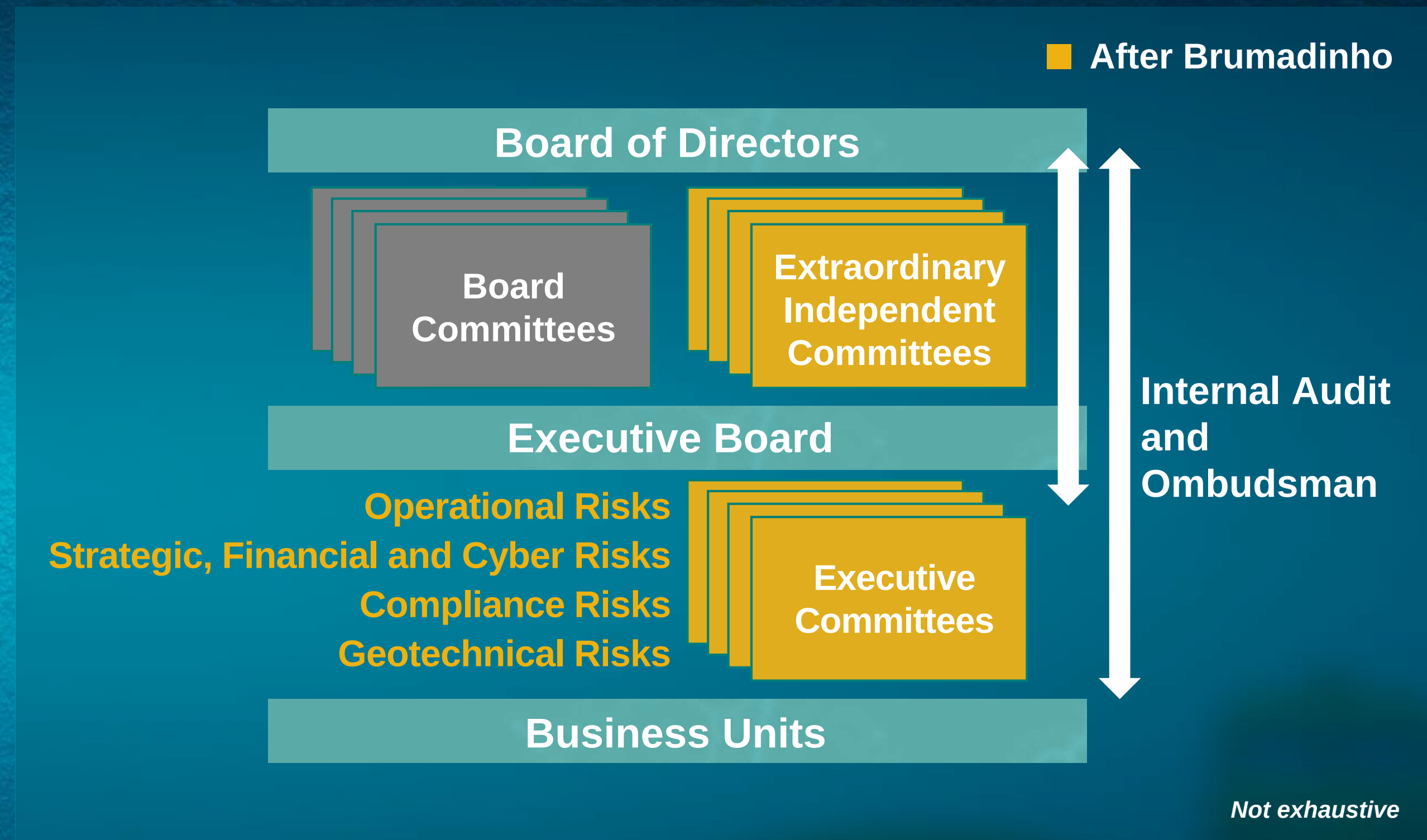
Strengthen our global maintenance structure



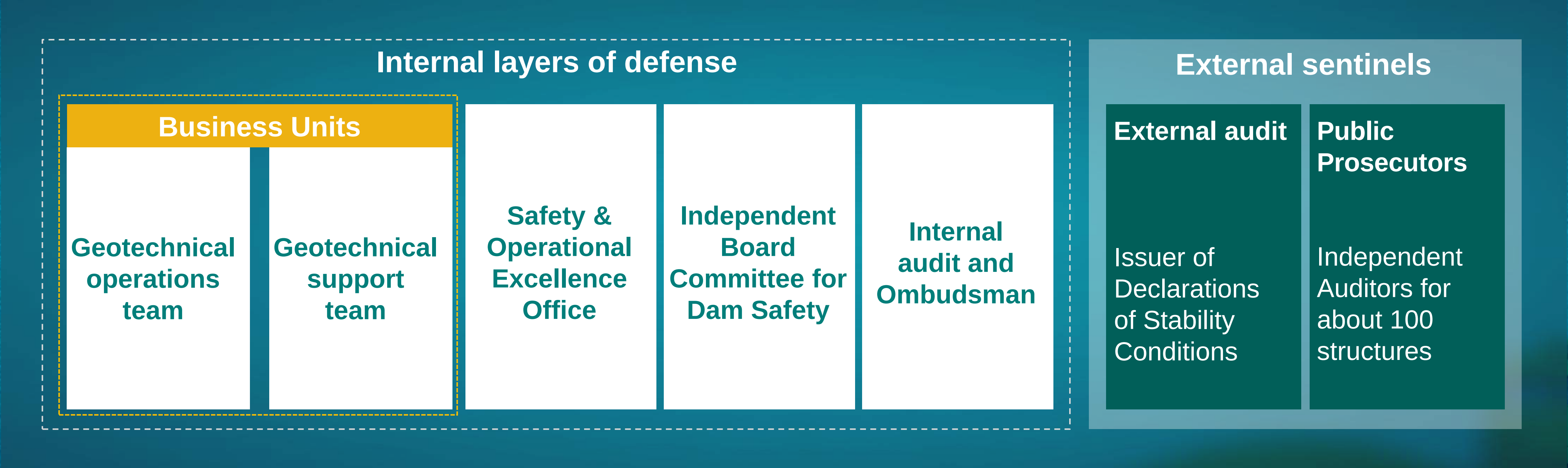
Enhanced **risk** **governance** and information flow



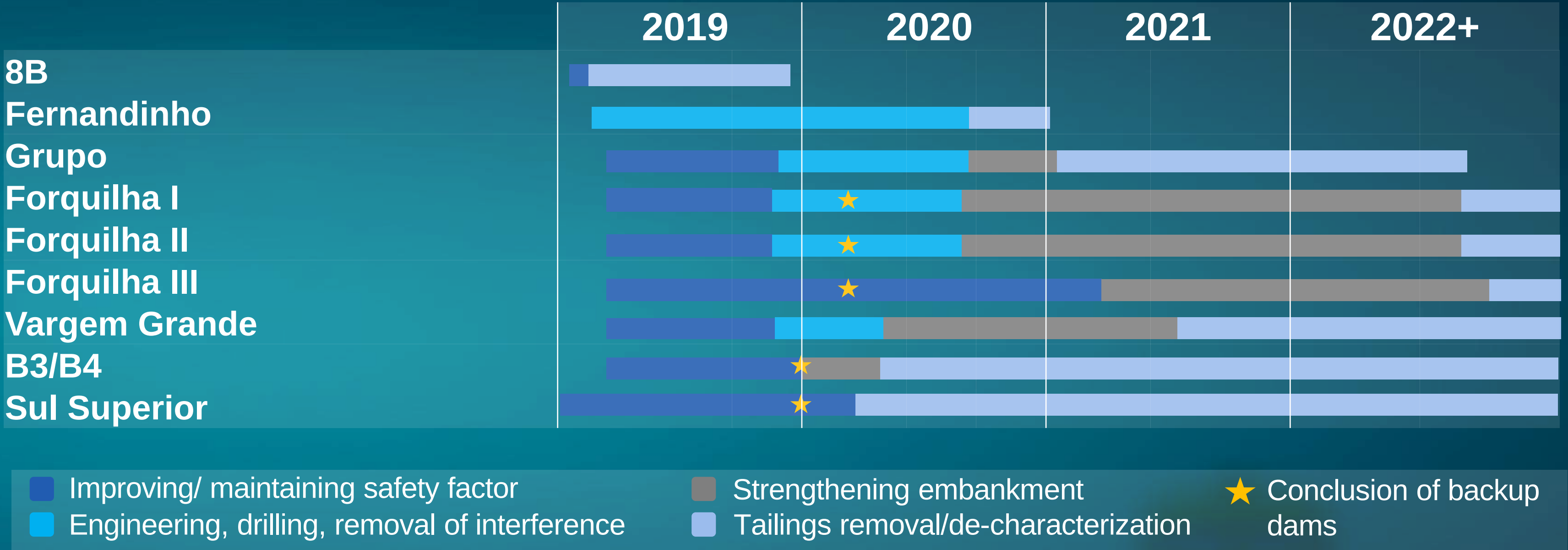
Enhanced **risk** **governance** and information flow



For **tailings dam risk**, Vale reinforced internal layers of defense and external sentinels



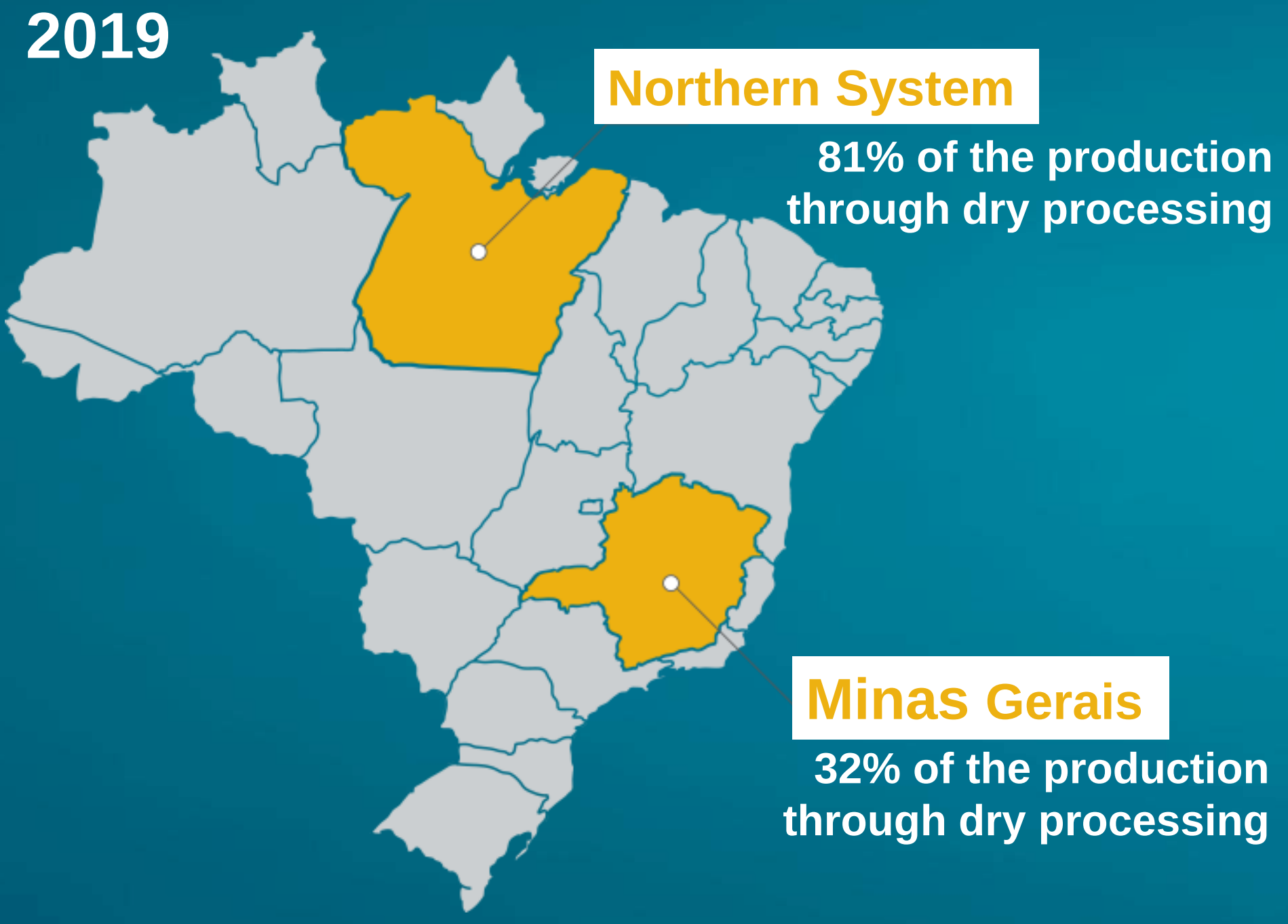
Vale is making progress with the de-characterization of 9 upstream dams



[Click here](#) to watch a video on the decharacterization of 8B dam.

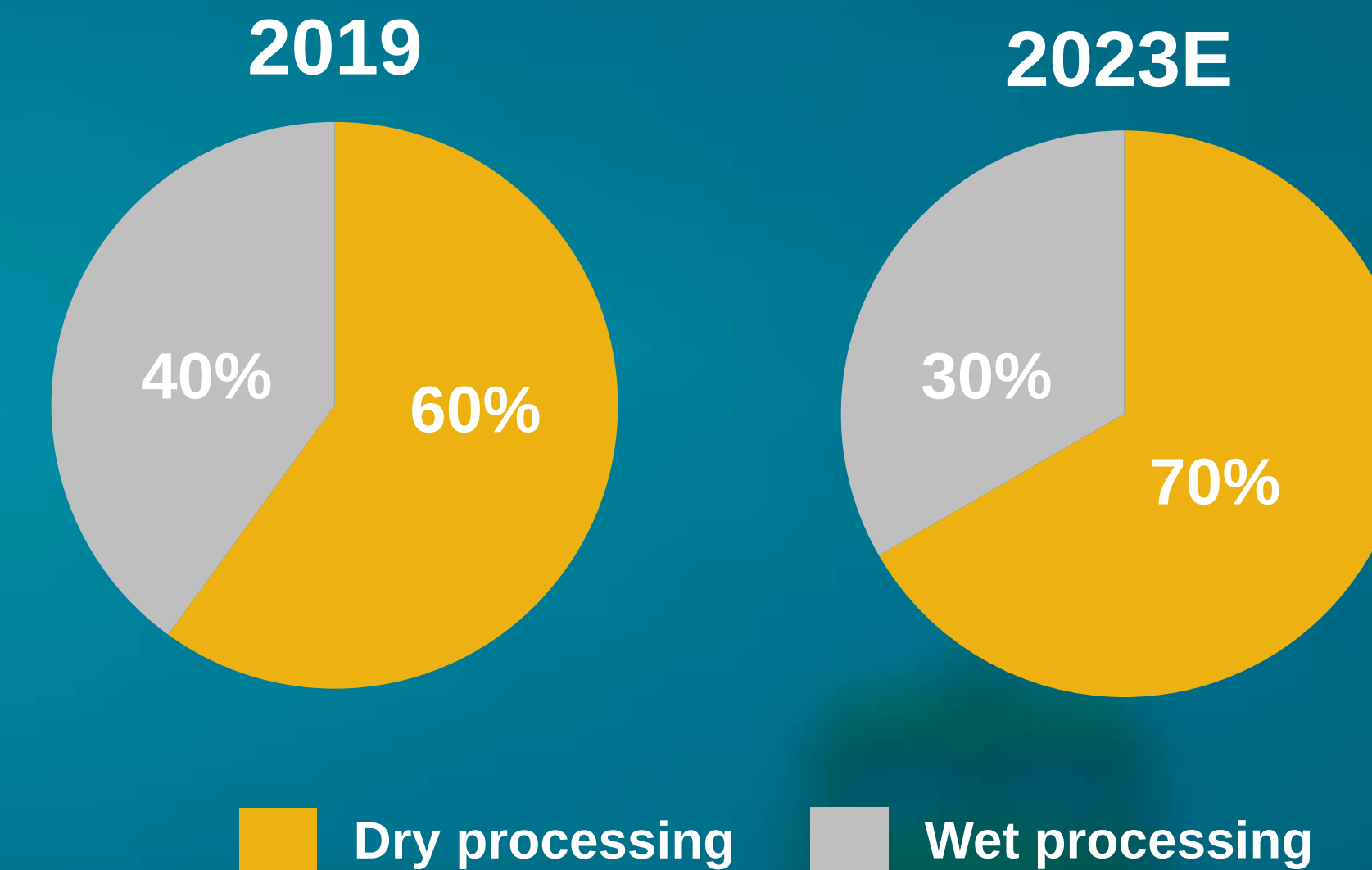
Our goal is to develop
safe and **sustainable** alternatives
to tailings dams





Most of our iron ore production is already through **dry processing**

Ore processing method, % of total volume



Investment in alternative systems to reduce the reliance on tailings dams

Dry stacking

US\$ 1.8 billion to be invested between 2020-2024

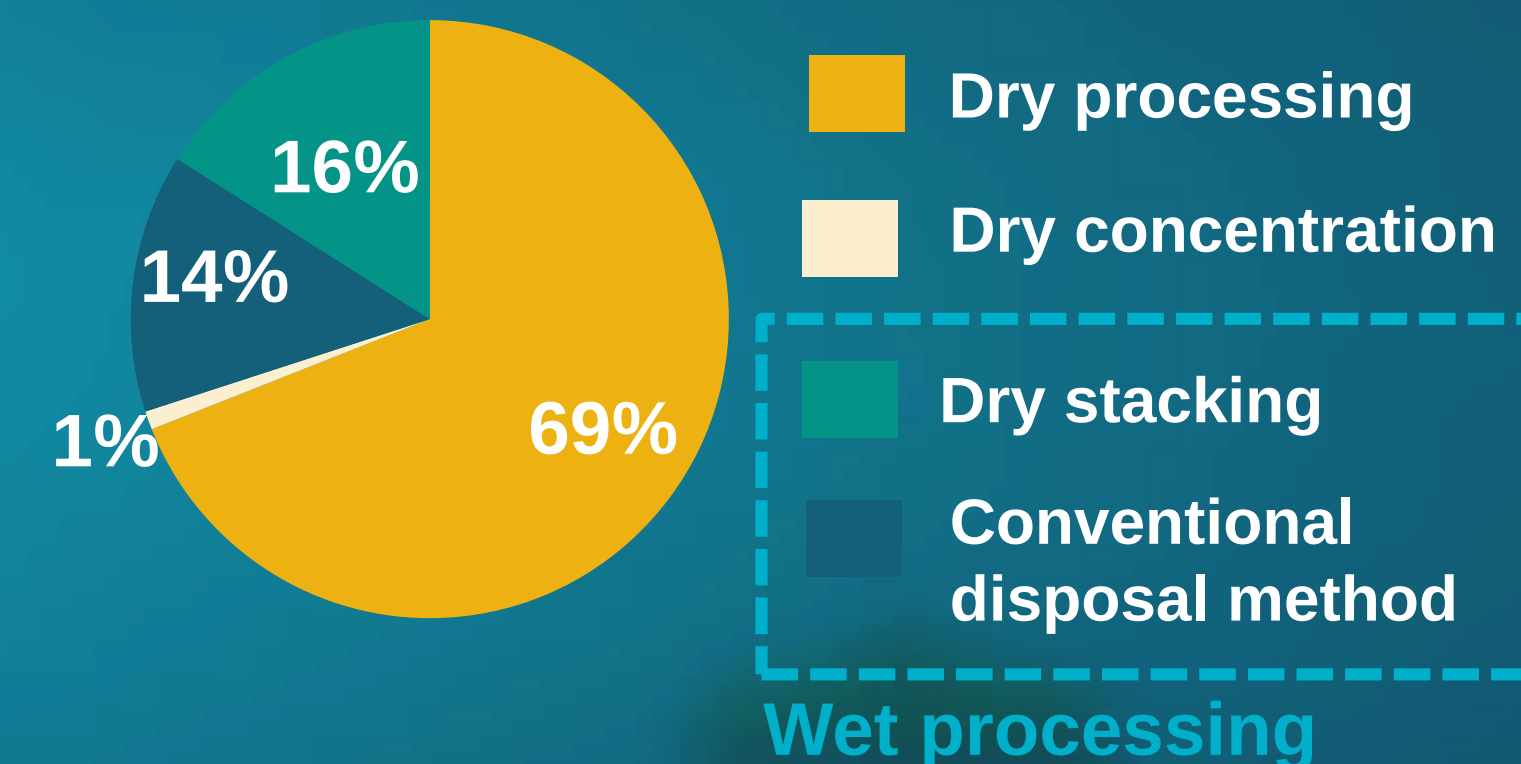
Main sites to operate with dry stacking: Cauê, Conceição and Brucutu

Dry concentration (New Steel)

Capex of ~US\$ 100 MM for 1.5 Mt of product per year, start-up in 2022

World's first industrial-scale dry magnetic fines concentration

Ore processing and disposal method (2024E)



Vale is committed to becoming one of the
safest and most **reliable** mining
companies in the world



New pact with society



2030 commitments as previously announced



Climate change

Reduce greenhouse gas emissions by 16%



Energy

100% self-generation of clean energy in Brazil



Water

Reduce new water collection by 10%



Forest

Recover and protect 100,000 ha of degraded land beyond our boundaries



Socioeconomic contribution

Health care, education and income generation



2030 commitments reviewed for **more ambitious goals**

New targets



Climate change

Reduce greenhouse gas emissions by ~~16%~~ **aligned with the Paris Agreement** and be carbon neutral by 2050

New targets



Energy

100% self-generation of clean energy in ~~Brazil~~ **globally**



Water

Reduce new water collection by 10%

New targets



Forest

Recover and protect ~~100,000 ha~~ **500,000 ha** of degraded land beyond our boundaries



Socioeconomic contribution

Health care, education and income generation

New targets



ESG gaps

Eliminate main ESG gaps in relation to best practices

Lead the transition to a carbon neutral mining



Vale's ambition is to
become **carbon neutral**
and to induce the **value chain**



Where we are:

- ✓ Alignment with the Paris Agreement
- ✓ Carbon pricing USD 50/t
- ✓ Carbon neutrality in scope 1 and 2 by 2050
- ✓ High grade Iron Ore, pellets
- ✓ Class I Nickel

Where we are going:

- 🎯 Scope 3 (shipping, steelmaking) target
- 🎯 Metallics

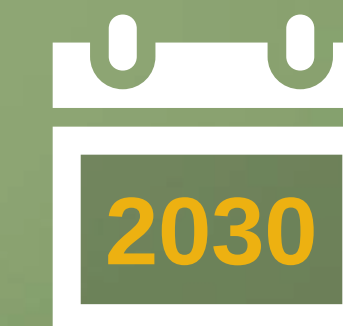


Self-generation from **clean sources** already represents **60%** of Vale's energy consumption in Brazil

Brazil



Globally

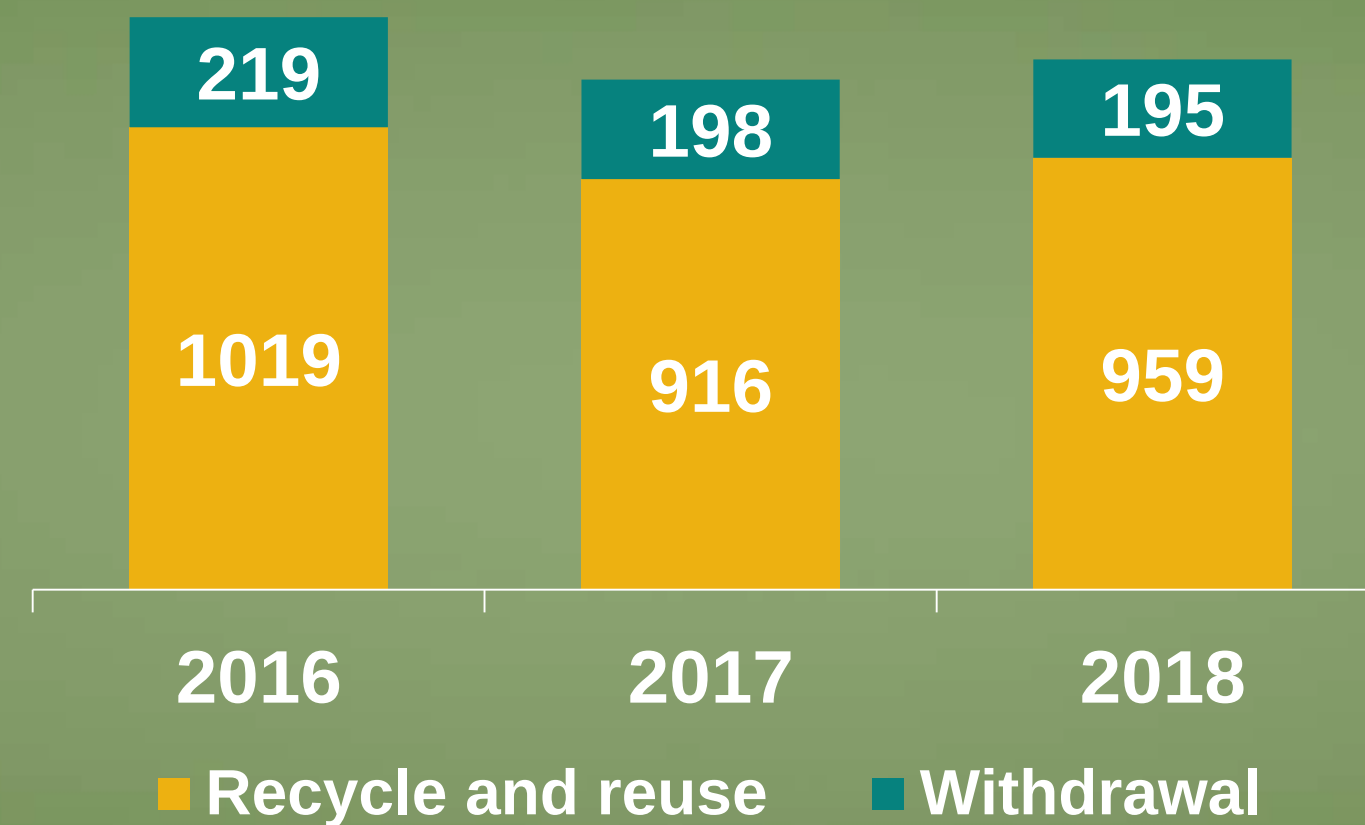


Acquisitions and partnerships will lead to **100% self-generation**



Vale's water reuse
represents **83% of
total production
demand**

Water total demand (in million m³)



Dry processing
reduces water
consumption
by **93%¹**

¹ When compared to wet processing.



1,018,405 ha

already protected as a result of compensation measures, voluntary initiatives and partnerships

+500,000 ha

to be restored and protected by 2030



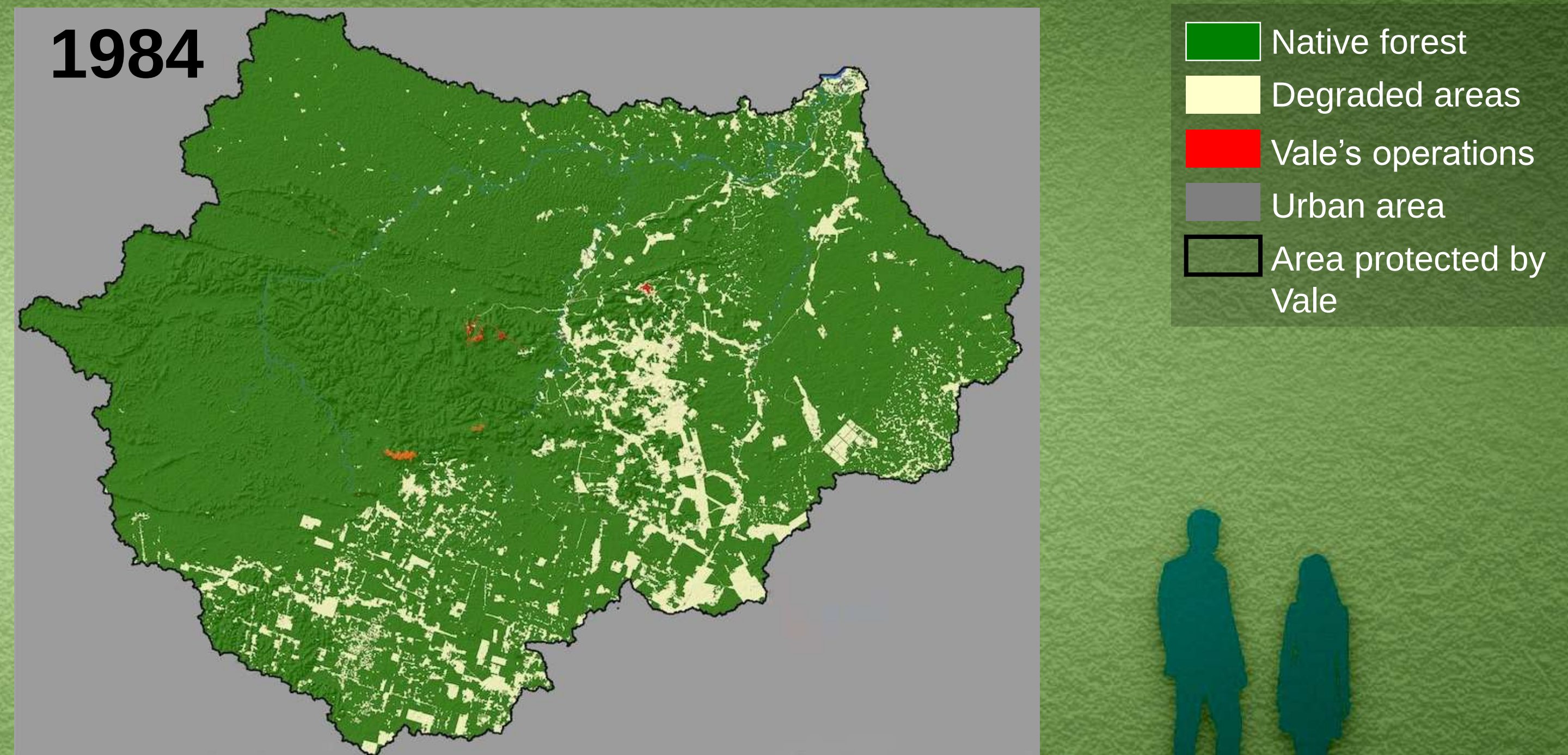
Vale:

protecting

the Amazon forest

while mining the largest

iron ore mine in the world





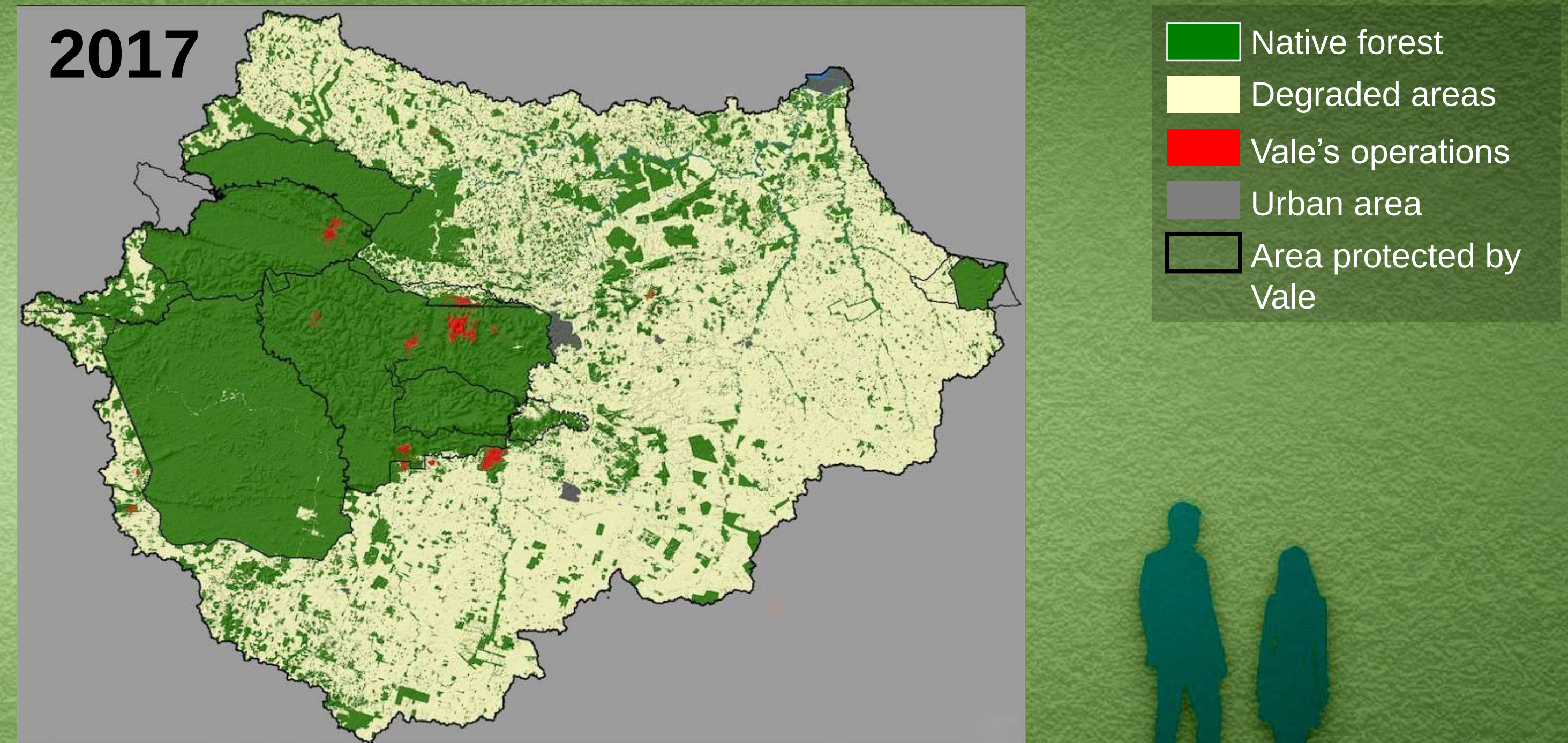
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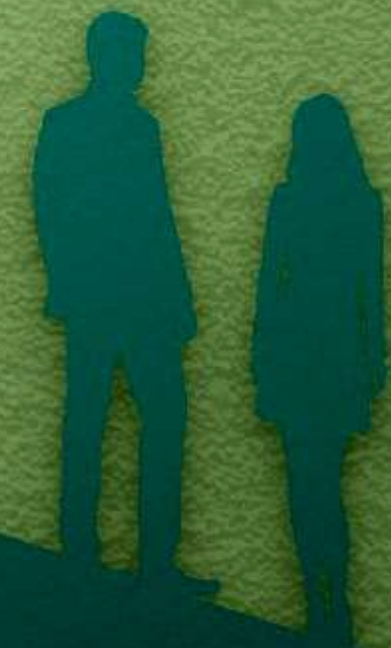




Positively impact society by becoming a development enabler

Going beyond taxes, social
projects and reparation

[Click here](#) to watch a video





**Delivering 2030's
commitments will make Vale a
more **sustainable** company**

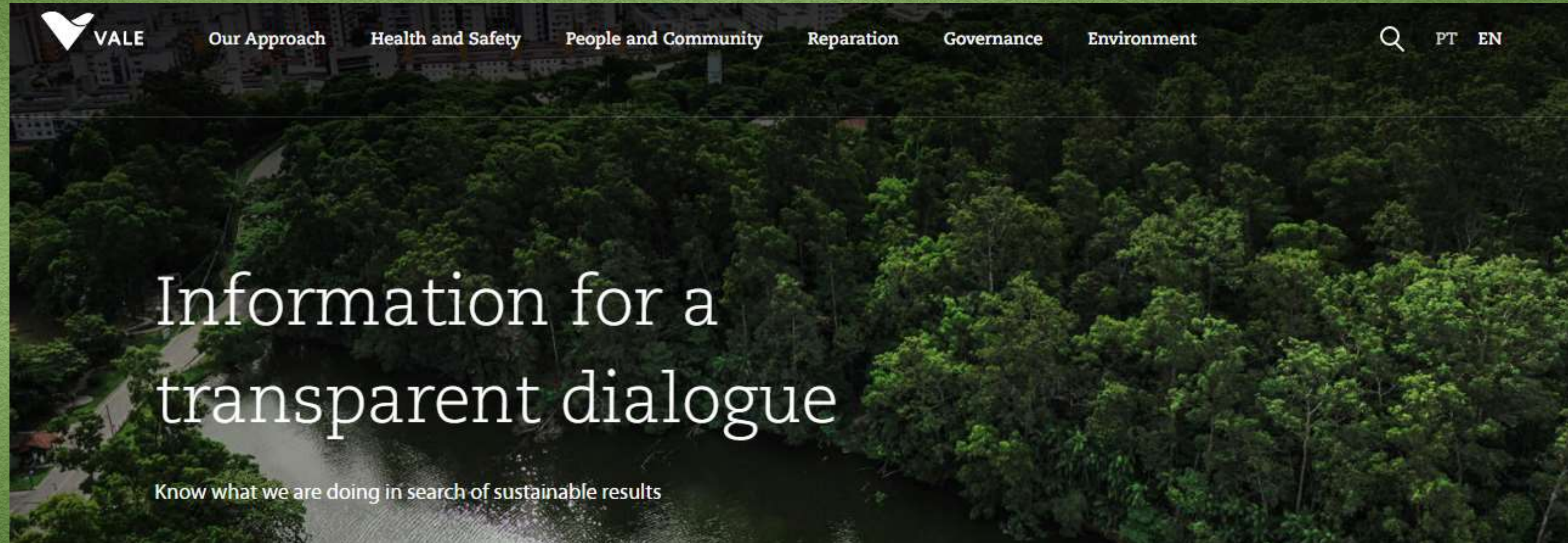
ESG gap analysis

- ✓ **New gender balance target**
Double female workforce by 2030, from 13% to 26%
- ✓ **ISO 14001 certification:** for all operations by 2022
- ✓ **Audit Committee:** To be established in 2020
- ✓ **Human Rights Policy revision**
Public consultation with the main stakeholders
- ✓ **Long term compensation linked to ESG**
From 100% based on TSR, to 80% TSR and 20% ESG metrics

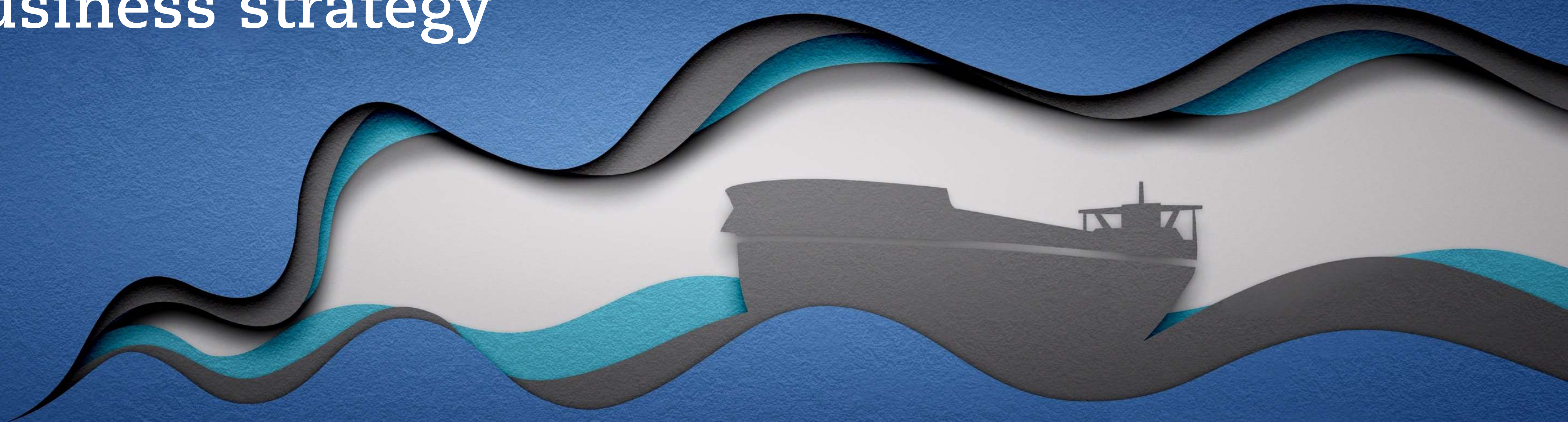
Full plan disclosed in our new ESG Portal

New ESG Portal will increase transparency of our sustainability approach

[Click here](#)
to access the
new ESG Portal



Business strategy



De-risking in iron ore
business also means
return to 2018 volumes
and breakeven cost levels

Resumption of halted iron ore capacity is on track

■ ■ ■ Brucutu

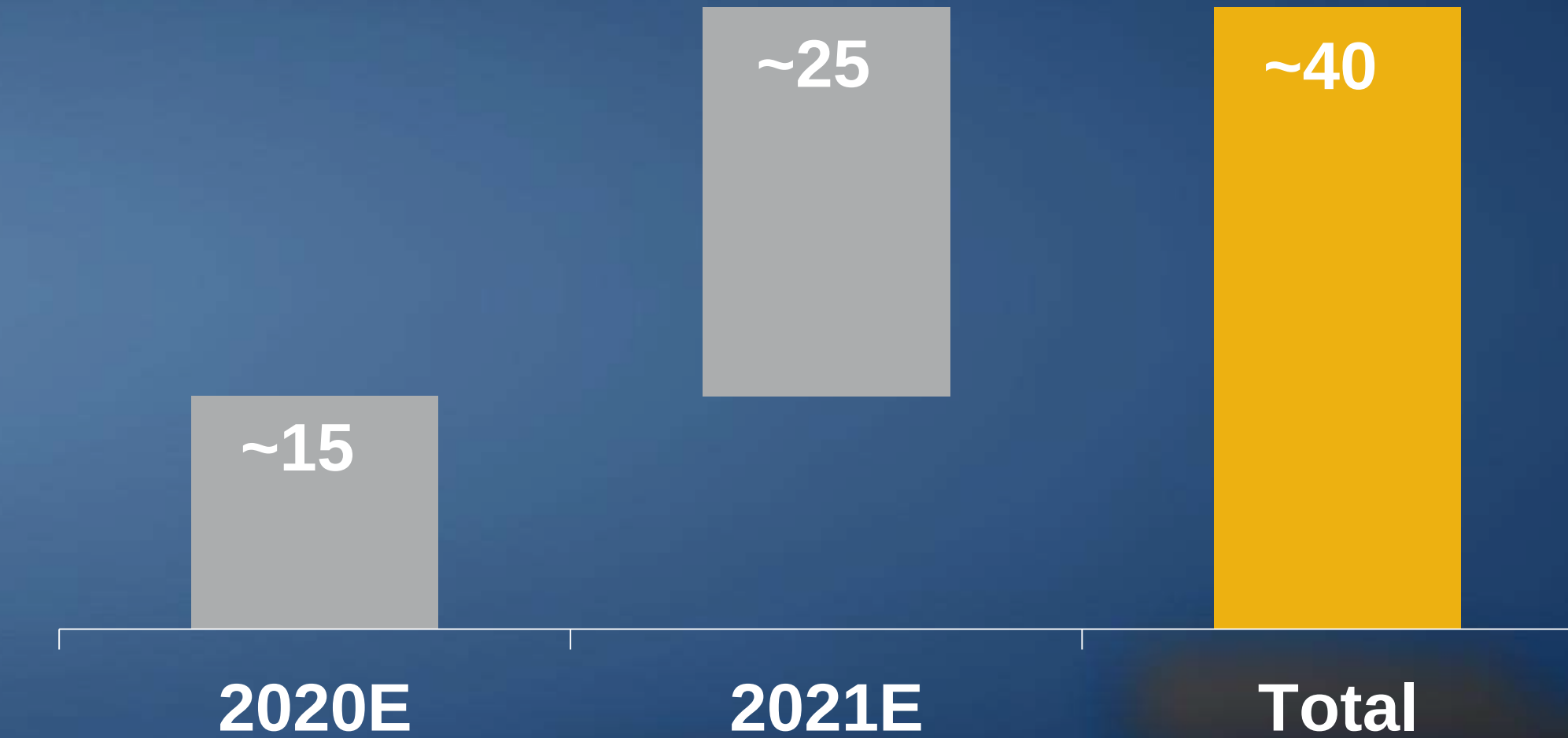
■ ■ ■ Alegria

■ ■ ■ Vargem Grande complex

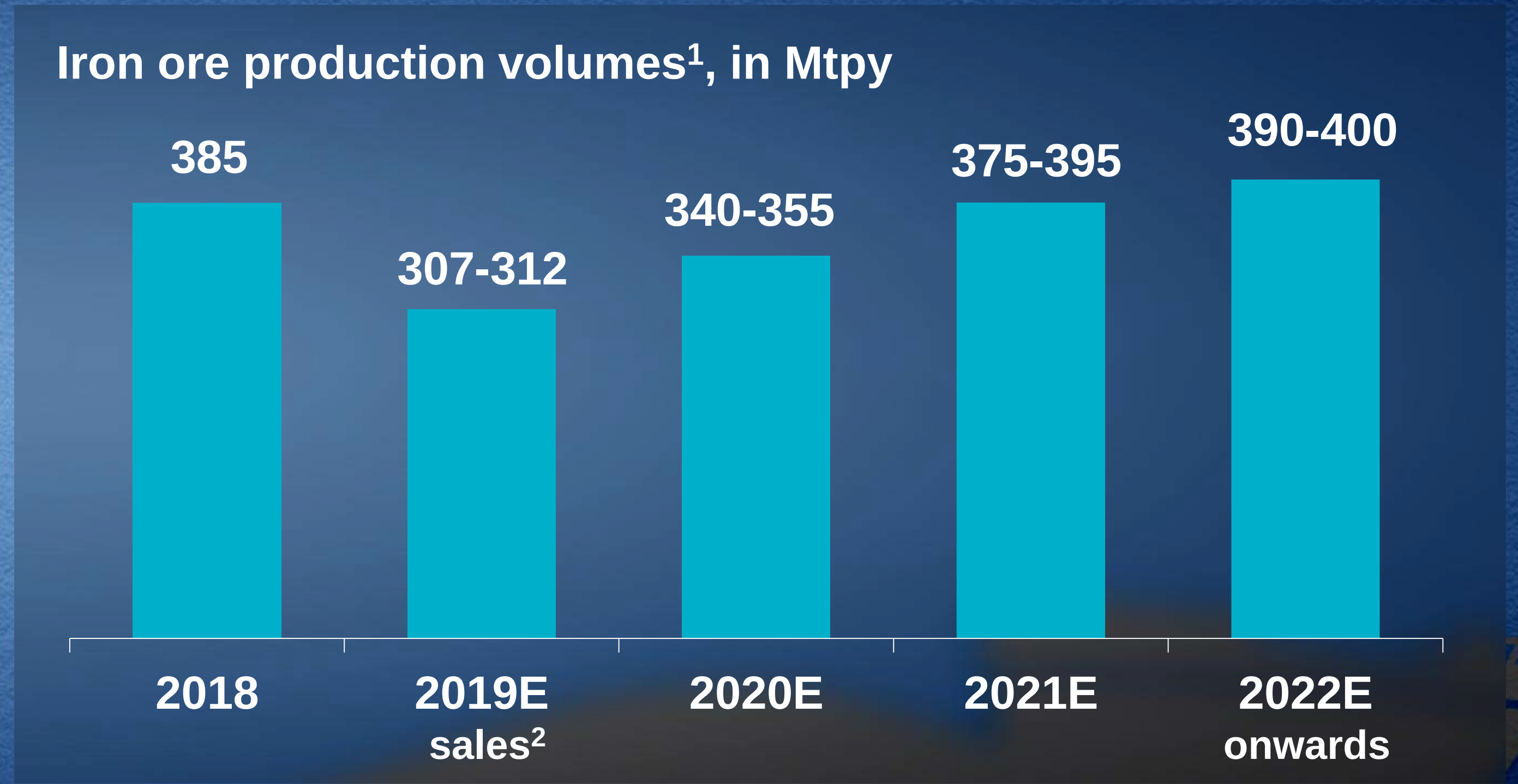
□ □ □ Timbopeba (expected to restart in 2020)

□ □ □ Fábrica (expected to restart in 2020)

Resumption of halted capacity, in Mt

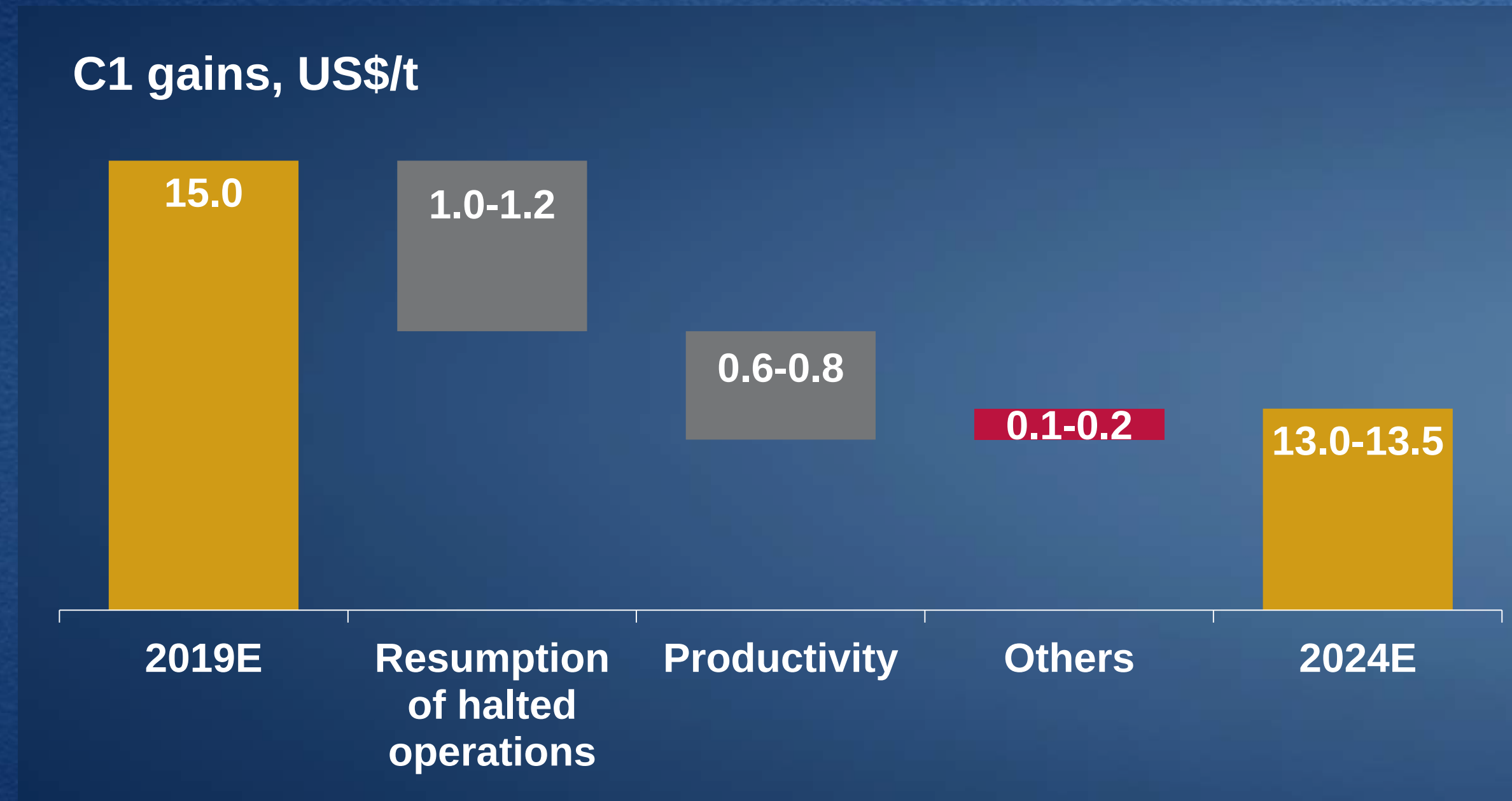


Production level relies on
 market conditions and
 value over volume approach



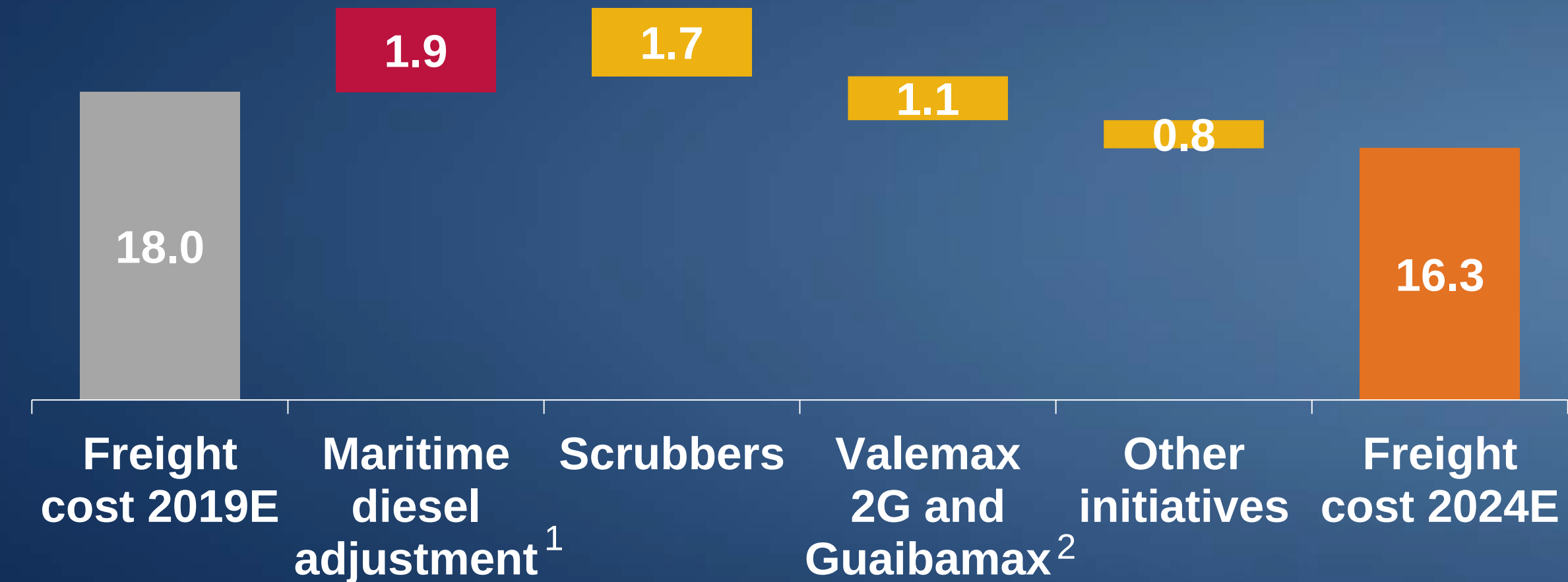
¹ Including third party purchases, run-of-mine and feed for pelletizing plant.
² Vale expects its iron ore and pellets sales range between 307-312 Mt in 2019.

Decrease of C1 will come with the resumption of halted operations and productivity gains



Scrubber strategy and new generation of vessels offset freight costs increase

Freight cost, US\$/t



76% of contracted fleet with scrubbers installed by end of 2020 and 95% by end of 2022



Additional 82Mt of new shipping capacity of Valemax 2G and Guaibamax by 2022

¹ Based on HSFO of US\$ 376/t in 2019 and US\$ 368/t in 2024 and LSFO of US\$ 575/t in 2019 and US\$ 537/t in 2024.

² Based on ~82 Mt new shipping capacity for Valemax 2G and Guaibamax.

Premiums recovery will occur when market returns to equilibrium

65% Fe Index vs 62% Fe Index

Coking coal, in \$/t	250	200	150	100
	12	11	9	7
	15	13	12	10
	18	16	15	13
	22	20	19	17
	0	50	100	150
Steel margins, in \$/t				

What happened in 2019?



IO supply disruption

increased steel raw materials costs



Entrance of high quality concentrate with high cost

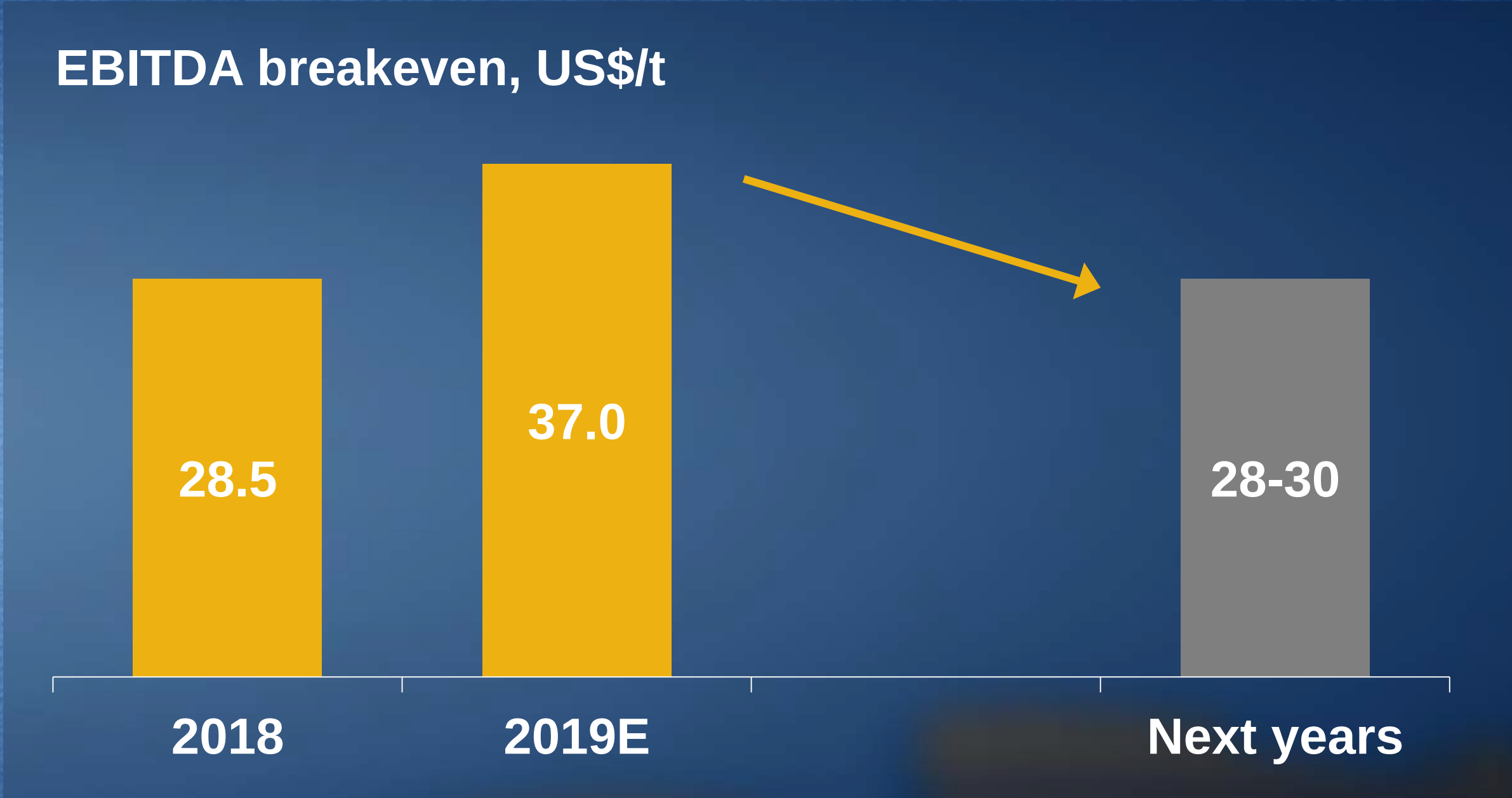
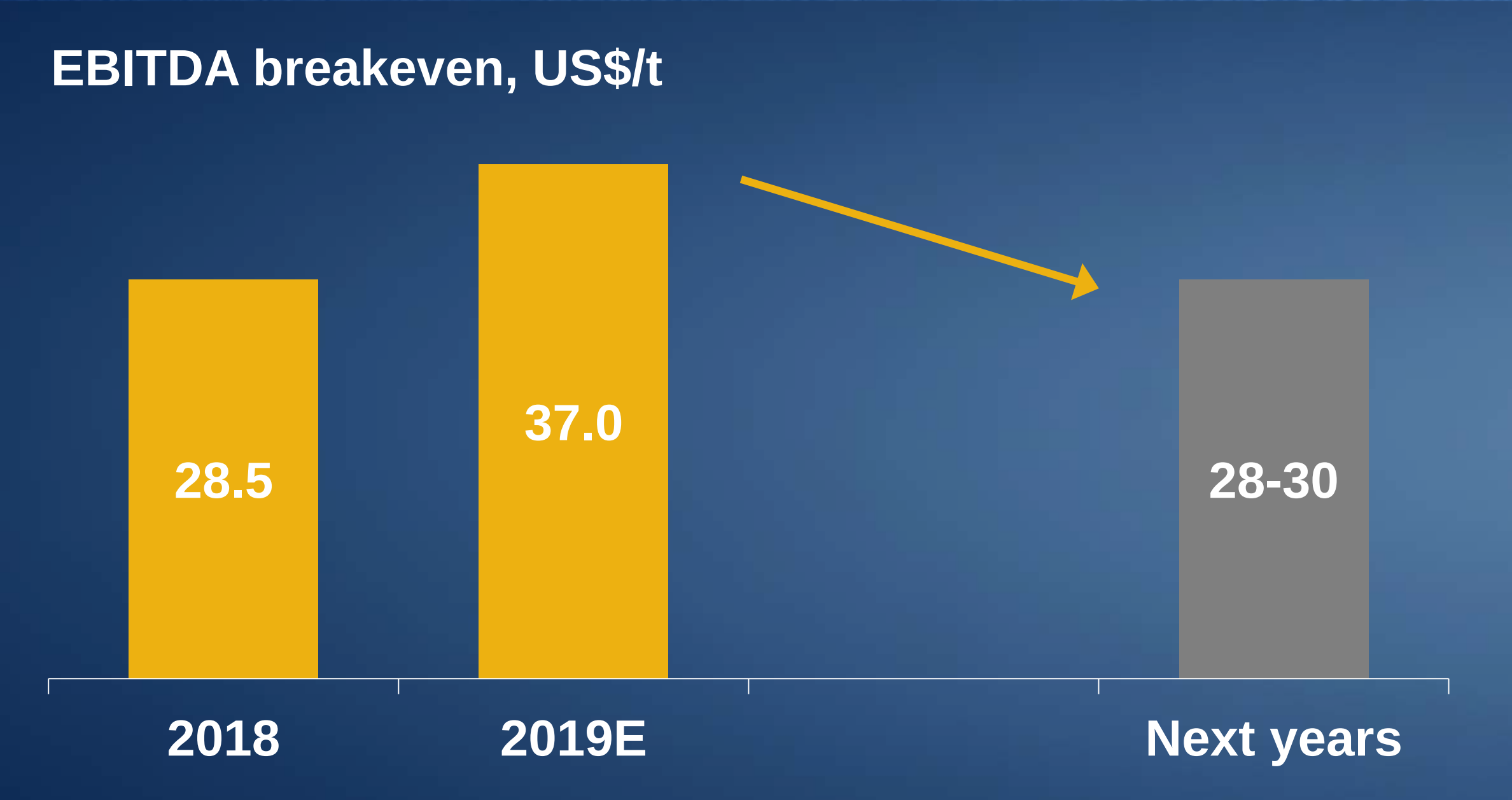


Steel prices decline due to economic growth concerns



Reduction of steel margins, **squeezing iron ore premiums**

Vale's competitiveness will return to 2018 levels



Note: Considers FX BRL/USD of 4.00 and bunker prices between US\$ 430/t and US\$ 460/t.

High quality iron ore

supports global

development towards a

greener future

Premium products reduce emissions in steelmaking and fulfill regional needs

9%

of Vale's scope 3 is
avoided by
premium portfolio

>85%

share of high quality
products in
portfolio

BRBF

Consolidated product as base load of Asian steel mills

IOCJ

Global reference for high grade sinter feed

GF88

Great solution for the growth of pellet production in China

Pellets

Essential to increase productivity and reduce emissions

But we are **looking beyond** for a greener portfolio in the long term

Introducing **HBI** and “**Green**” **Pig Iron** could...



...be an alternative for clients to achieve CO₂ reduction goals

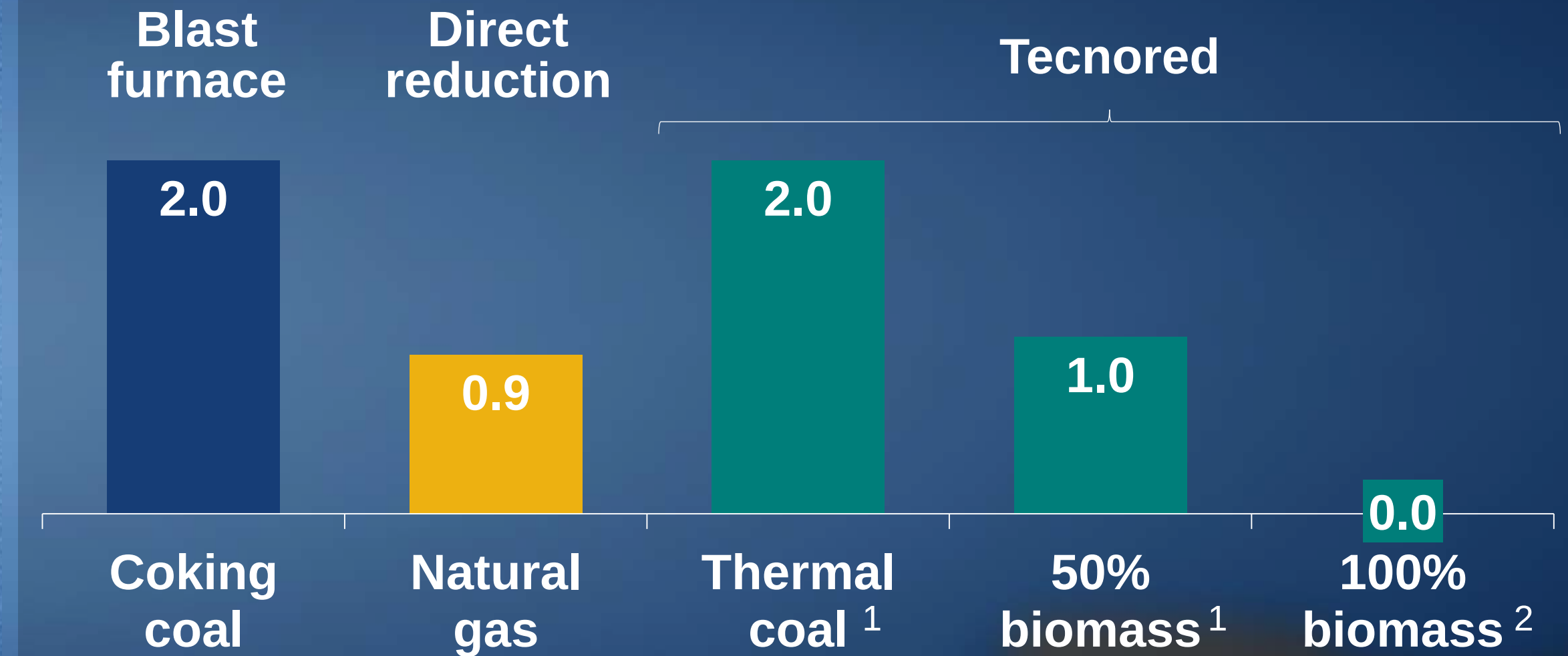


...be an opportunity to explore new markets and regions



...lever Vale's competitive advantages

CO₂e intensity, t CO₂e/t of product

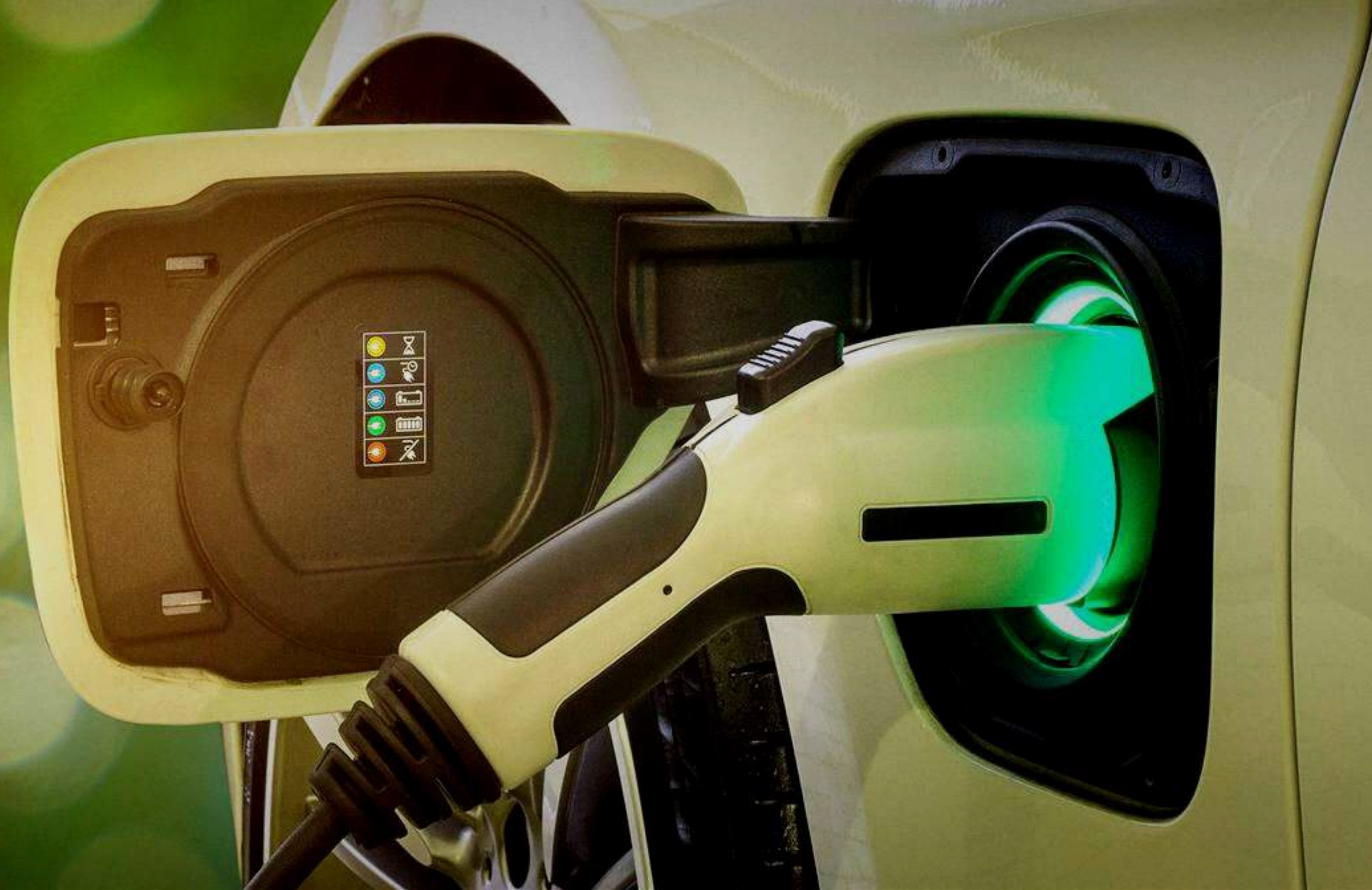


¹ Tested in industrial scale and proved by Tecnored technology.

² To be tested by Tecnored technology.

Source: IPCC, Material Economics and Vale analysis.

Nickel has a **key role**
in an **EV and**
renewable energy
driven world



Future EVs demand is **unfolding new market dynamics**



Overall tightening of supply/demand **across all three markets**

The effect on our product portfolio is a **new commercial strategy**

Upper Class 1

Recover market share in a tightening scenario

Lower Class 1

Increase presence in niche markets

To **protect and recover market share** in the high value segments

Class 2

Benefit from prices and maintain presence in stainless steel globally

Intermediates

Reduce exposure to intermediate products

Maintain product portfolio optionality for the upcoming surge in EV battery demand

Base Metals **will generate robust cash flow** after 2022



Investments in replacement projects in the short term: VBME and Copper Cliff Mine



Nickel hedging strategy to guarantee stability of cashflow in a period of heavier investments



Growth optionality through Indonesian JVs

Our **divestment in PTVI** will be completed in two stages



Extension of the
Contract of Work
beyond 2025

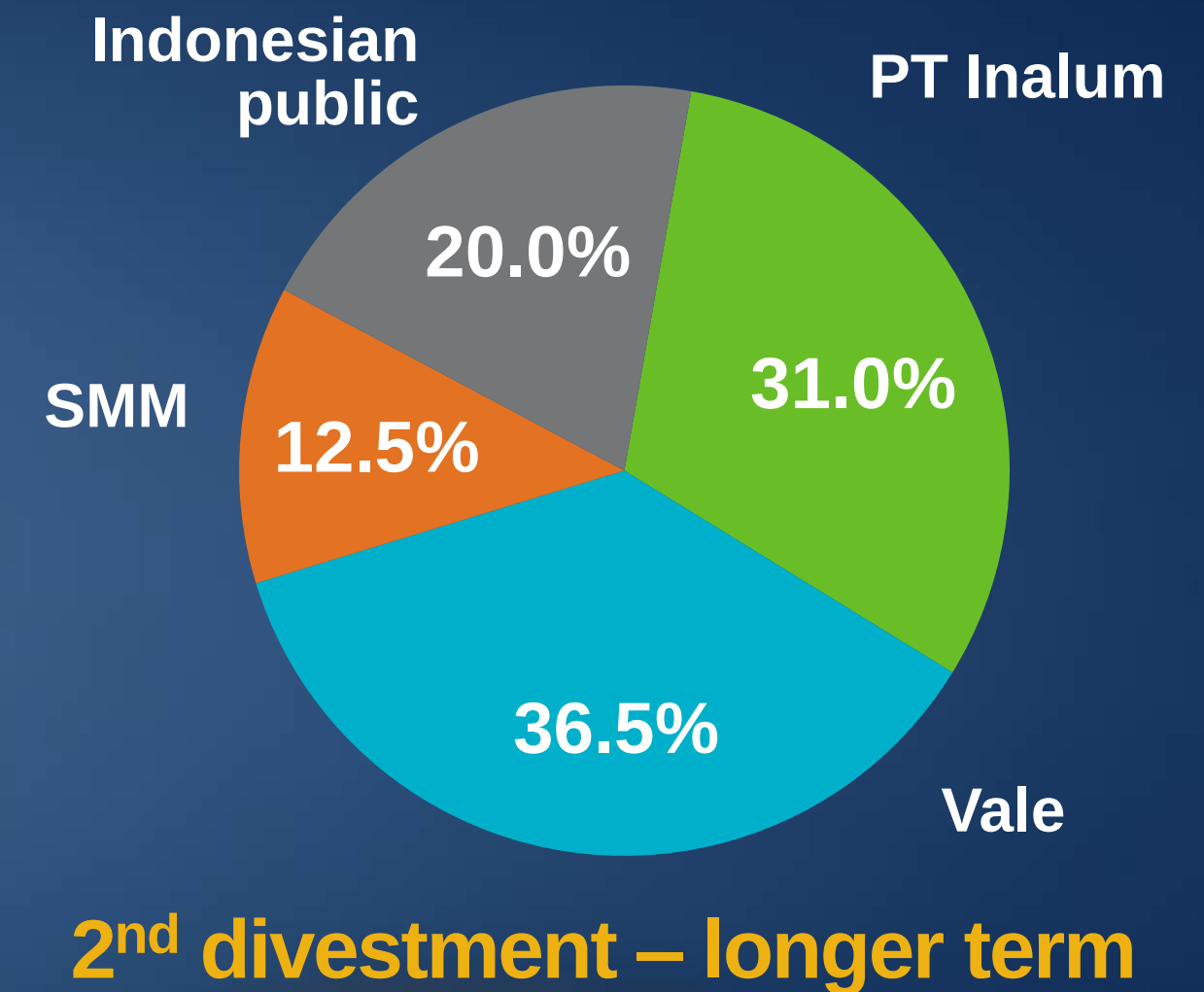
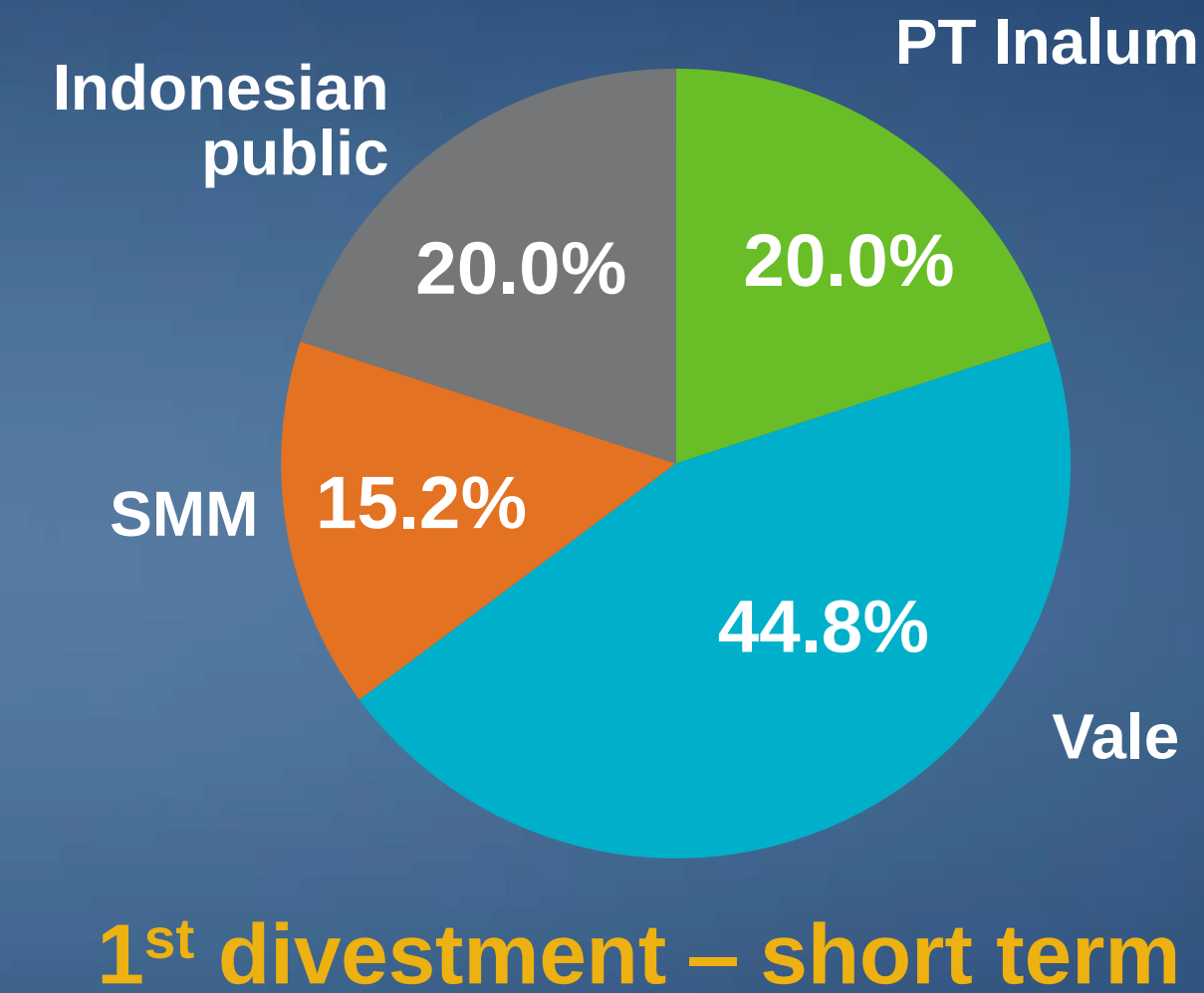
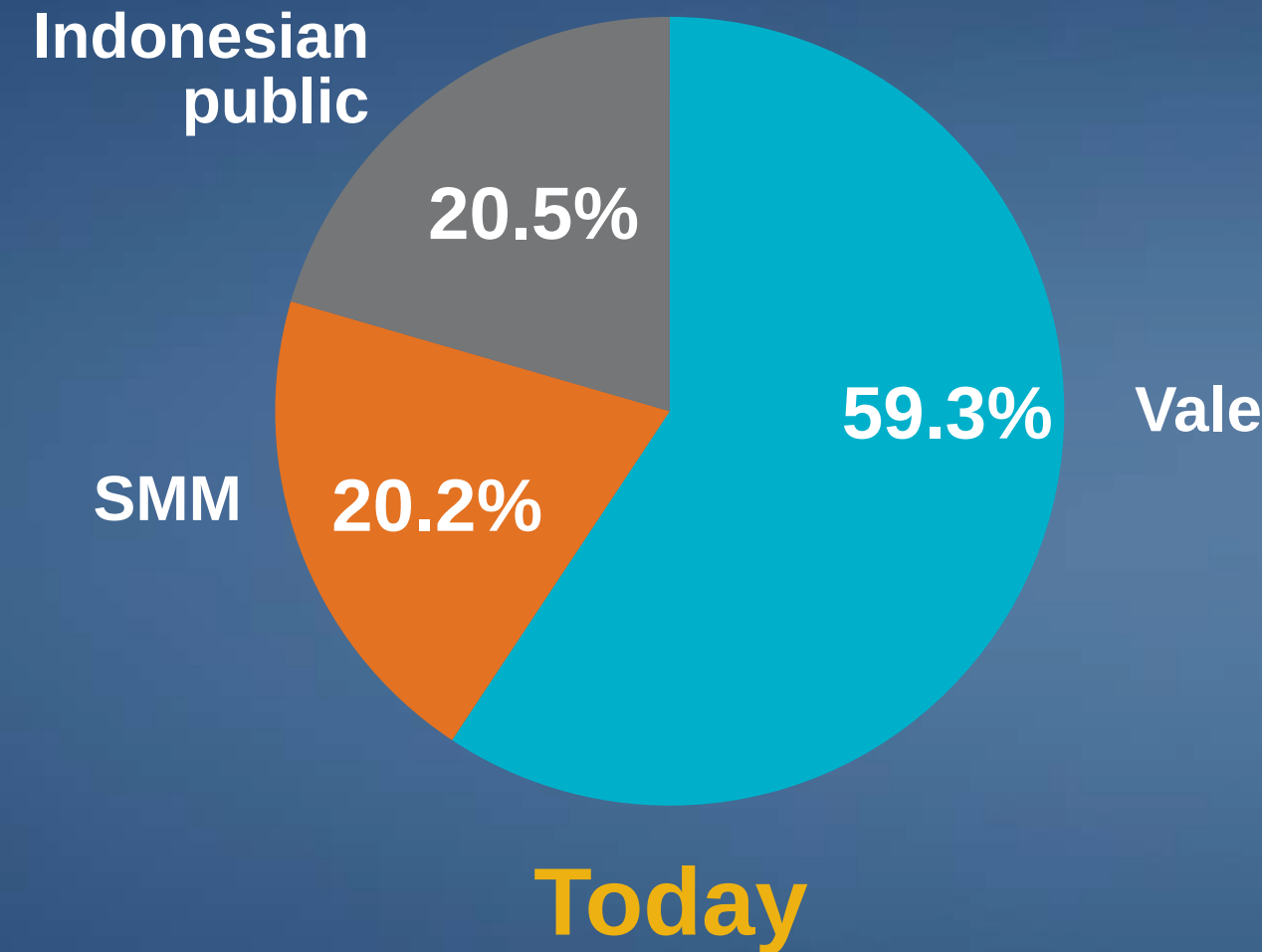


First divestment to be
completed in the
following months



Second divestment in
the longer term

PTVI shareholding structure



Indonesian projects **self-funded through partnerships and JVs**



Bahodopi

70 ktpy of FeNi
100% mine ownership
49% plant ownership through JV

Pomalaa

40 ktpy battery-suitable nickel HPAL
100% mine ownership
25% plant ownership through JV

Sorowako

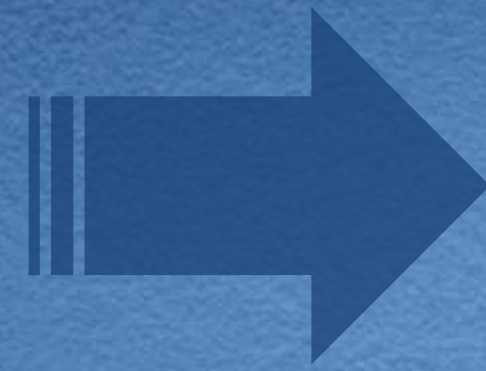
New RKEF line to produce 10 ktpy FeNi
Improvement in the smelter plant
100% mine and plant ownership

Focus on nickel **production reliability** in the short term **with optionality** for the future



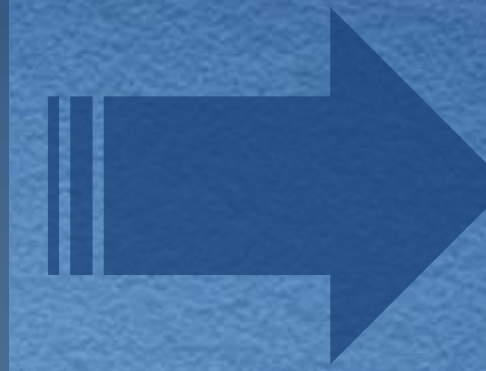
210 kt

current production rate



240 kt

with improvements in the
North Atlantic and restart
of Onça Puma 2nd Furnace



360 kt¹

with increases of production
in Asia-Pacific operations

Focus on preventive maintenance
and higher asset reliability

Short time response to increase
volumes

PTVI mine operation with Sorowako
and JVs in Pomalaa and Bahodopi

¹ Considers full equity in PTVI and associates for Pomalaa and Bahodopi projects.

Copper is core to the urban infrastructure of a developing world

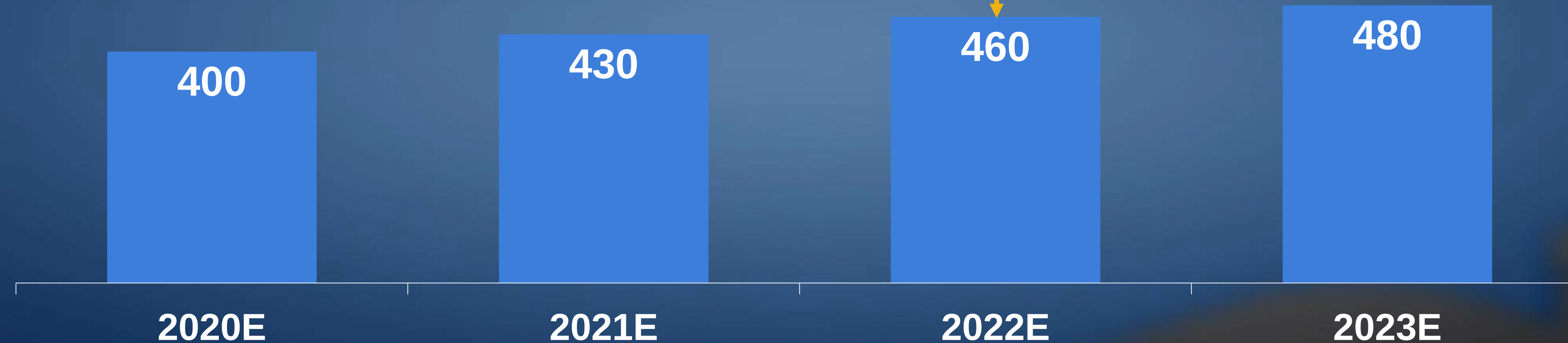
It electrifies our vehicles, renews our energy, cleans our air, advances our medicine, lowers CO2 emissions, and is part of mobile phones and technologies that keep us connected with each another

Vale has the potential to **increase** its **copper production**

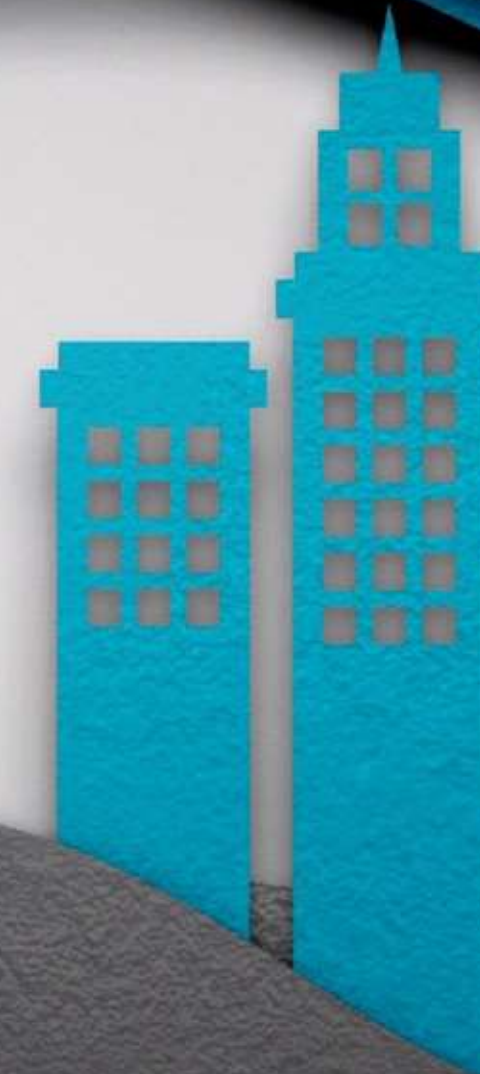
Copper production, in kt

Victor (30 ktpy), Alemão (60 ktpy) and Hu'u (250 ktpy) ---->

Salobo 3 start-up ----->



Capital allocation



Production is set to **grow 10% to 30%** from 2019 to 2022 in our **core business**



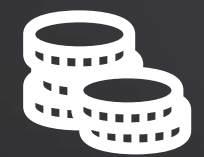
Iron Ore



Production capacity restored to 390-400Mtpy



C1 cost and freight reduction



Back to 2018 EBITDA breakeven

Nickel



Increase to 240 kt



Market share increase for premium products



Potential price increase

Copper



Increase to 460 kt

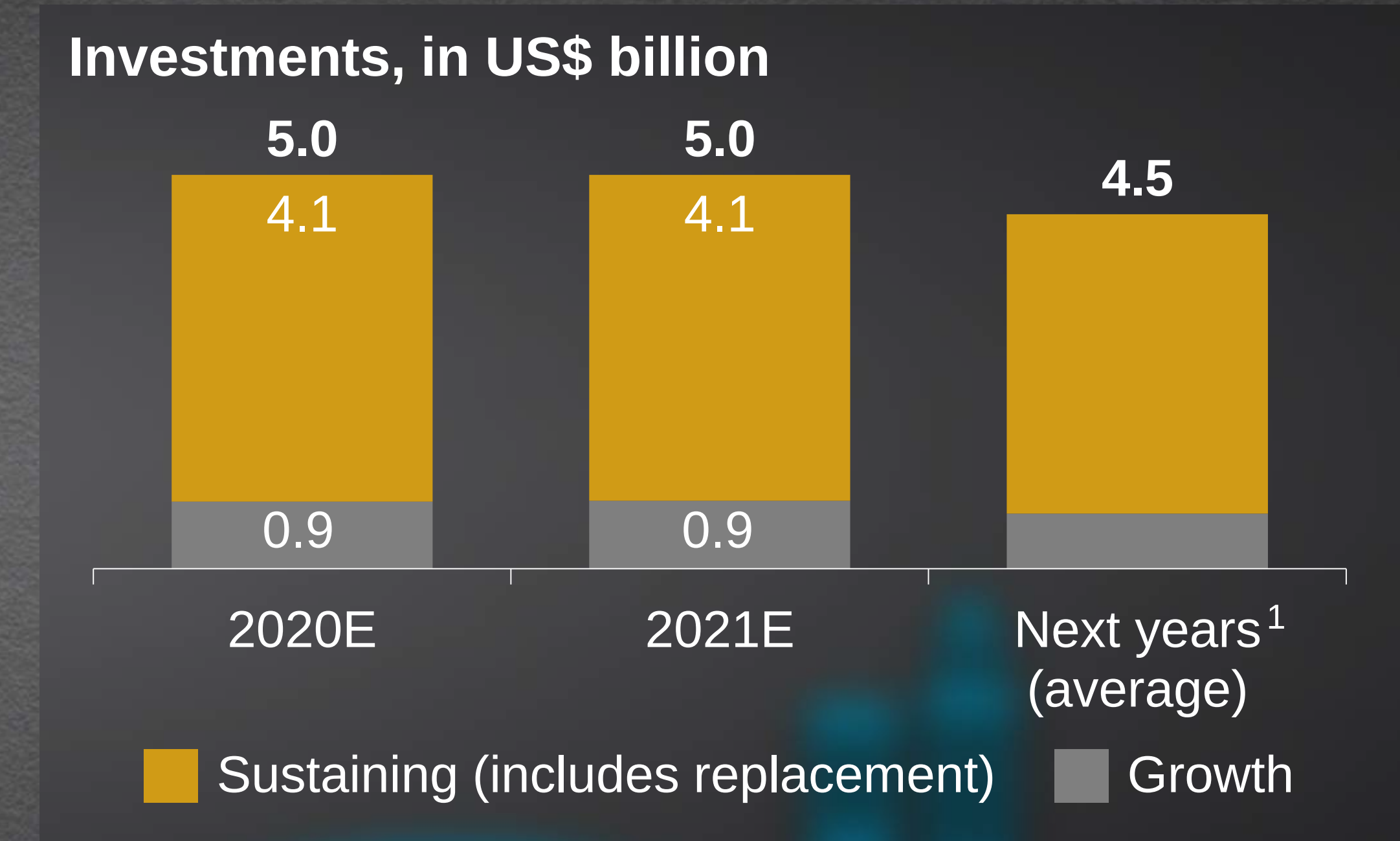
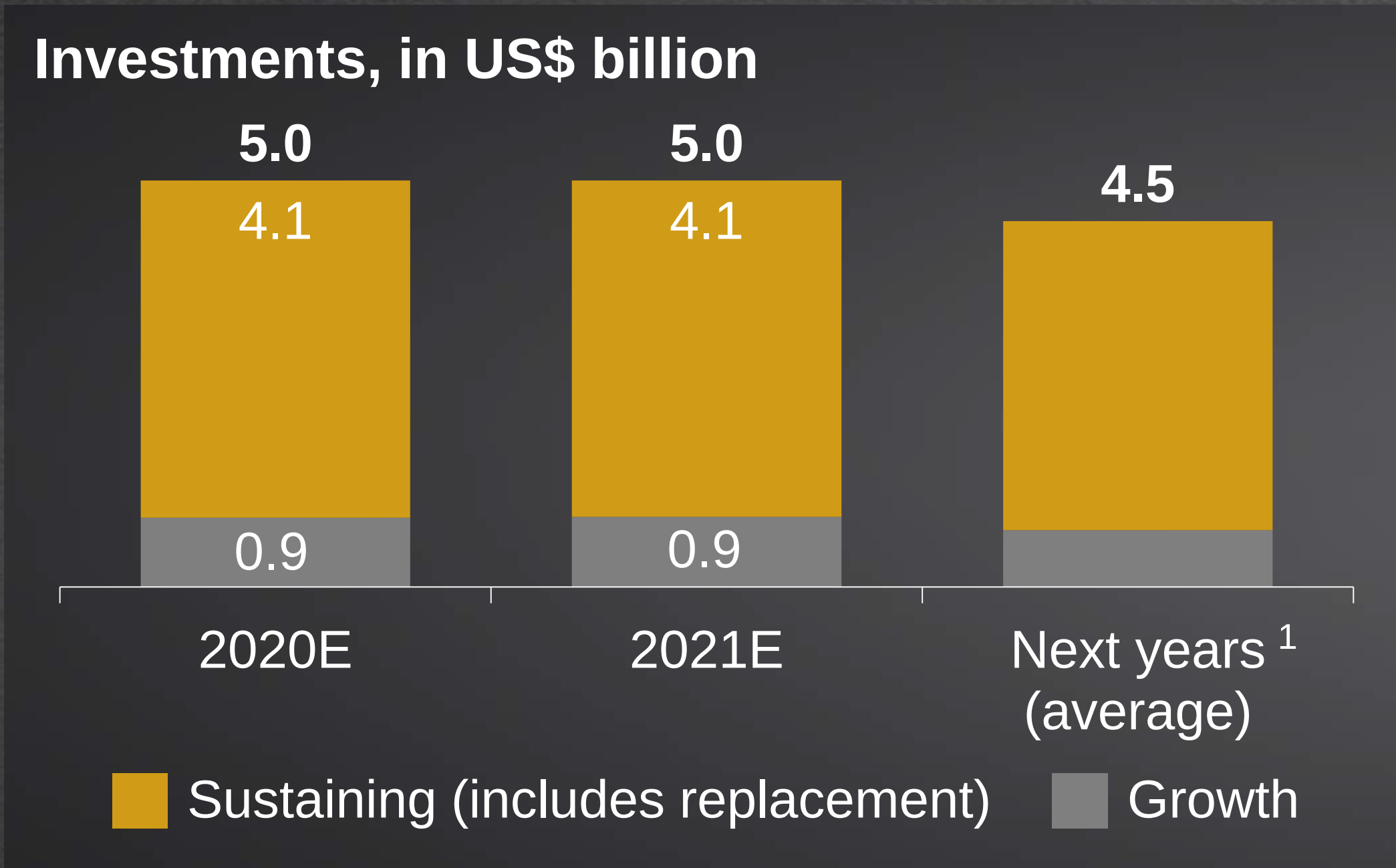


Potential price increase



Bonus: Salobo III gold stream

Investments in filtration and dry stacking will be brought forward



¹ Average 2022-2024.

Other assets are **under evaluation...**

Moatize



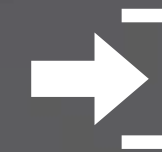
Strong action for
a sustainable
ramp-up

VNC



Analyzing
different
scenarios

Steel JVs and others



Coordinated
exit

...as we move towards a
leaner portfolio



In Moatize, a short-term shock will lead to **strong gains in near term cash flows**



¹ Starting in March, 2020.

We are working on different scenarios for exiting VNC

**All options are
on the table**

Final decision will be taken in 2020

Additionally, we are analyzing operational and commercial alternatives to improve short-term cash flow

- Significant simplification of operational flowsheet
- Nickel hydroxide cake is becoming increasingly demanded by battery nickel sulfate makers



Cash flow drags are expected to decline

<i>US\$ million</i>	2019E	2020E	2021E	2022E
Moatize and VNC	1,100	680	500	-
Stoppage expenses	900	500	180	-
Samarco ¹	400	900	500	160
MBR (dividends)	200	-	-	-
Others	300	550	50	-

¹ Includes expenses related to the Renova Foundation.

75% of Brumadinho's disbursements are expected to be made by 2022

US\$ million

Disbursements ¹	2019E	2020E	2021E	2022E	2023-2031E
Provisions	1,000 – 1,100	1,000 – 1,400	1,050 – 1,450	500 – 900	Up to the limit of 5.4 billion ²
Incurred expenses	650 – 750	500 – 600	350 – 450	250 – 350	<100/year
Total	1,650 – 1,850	1,500 – 2,000	1,400 – 1,900	750 – 1,250	~8 billion ³

¹ Expenses with reparation and decharacterization projects.

² In the period of 2023-2031, the estimated amount of provision disbursements is equivalent to the difference between the initial provision (US\$ 5.4 billion) and the accumulated disbursements in the 2019-2022 period.

³ The estimate for disbursements of provisions and incurred expenses in 2019-2031 totals US\$ 8 billion, approximately.

Cash flow generation tends to be robust in any price scenario

EBITDA 2022, in US\$ billion

		Nickel price (US\$/t)		
Iron ore price (US\$/t)		15,000	17,500	20,000
	65	~15.5	~16.0	~16.5
	75	~19.0	~19.5	~20.0
	85	~22.5	~23.0	~23.5

Free cash flow 2022¹, in US\$ billion

		Nickel price (US\$/t)		
Iron ore price (US\$/t)		15,000	17,500	20,000
	65	~7.0	~7.5	~8.0
	75	~10.0	~10.5	~11.0
	85	~13.0	~13.5	~14.0

Note: BRL/USD exchange rate of 4.00 in 2022.

¹ The 2022 Free cash flow estimated does not consider dividends, buybacks and bolt-on acquisitions. It considers the inflow derived from the Salobo III gold stream completion in 2022.

We are in a solid position to deliver significant shareholder return

		US\$ billion		
EBITDA 2022		15.5	19.5	23.5
EV multiple	5.5x	85	107	129
	6.0x	93	117	141
		-		
Net debt		10		
		=		
Market cap		75 - 83	97 - 107	119 - 131
		+		
FCF 2020 - 2022 (accumulated ¹)		17	26	36
		=		
Potential shareholder return p.a. ² (%)		14 - 17	25 - 29	35 - 39

Note: EBITDA and Free cash flow as per scenarios from previous slide. BRL/USD exchange rate of 3.92 in 2019 (average) and 4.00 between 2020 and 2022.

¹ Includes 2019 cash surplus of ~US\$ 6 billion and the additional Gold stream inflow related to Salobo III in 2022.

² Total shareholder return per annum measured as the gain between the market cap on November 20th, 2019 and the market cap in 2022 increased by the free cash flow accumulated between 2020 and 2022.

The roadmap for **de-risking** **Vale**

Reparation of Brumadinho

Assuring dam safety and asset integrity

Stabilizing production and leveraging competitiveness

Discipline in capital allocation



