



**HORIZONTE**  
MINERALS PLC

**A NEW LOW-COST NICKEL PRODUCER**

**BMO**



**31<sup>st</sup> Metals & Mining Conference**

**27<sup>th</sup> February – 2<sup>nd</sup> March 2022**

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Unless otherwise indicated, the scientific and technical information contained in this investor presentation has been prepared by or under the supervision of Frank Blanchfield FAusIMM, Andrew Ross FAusIMM of Snowden Mining Industry Consultants, David Haughton MIMM, C Eng of Ausenco, Nic Barcza HLFSAIMM. All are Qualified Persons within the meaning of Canadian National Instrument 43-101 and have acted as consultants to the Company.

# A Significant, Fully Funded, Near-Term Nickel Producer

2

## TIER 1, 100% OWNED PROJECTS



ARAGUAIA FENI PROJECT



In Construction



29,000/t Ni supplying  
stainless steel market



VERMELHO NI CO PROJECT



Feasibility Study



24,000/t Ni & 1,250/t Co  
supplying battery market



~60,000t/pa SCALABLE PRODUCTION PROFILE

EXPERIENCED  BRAZILIAN TEAM



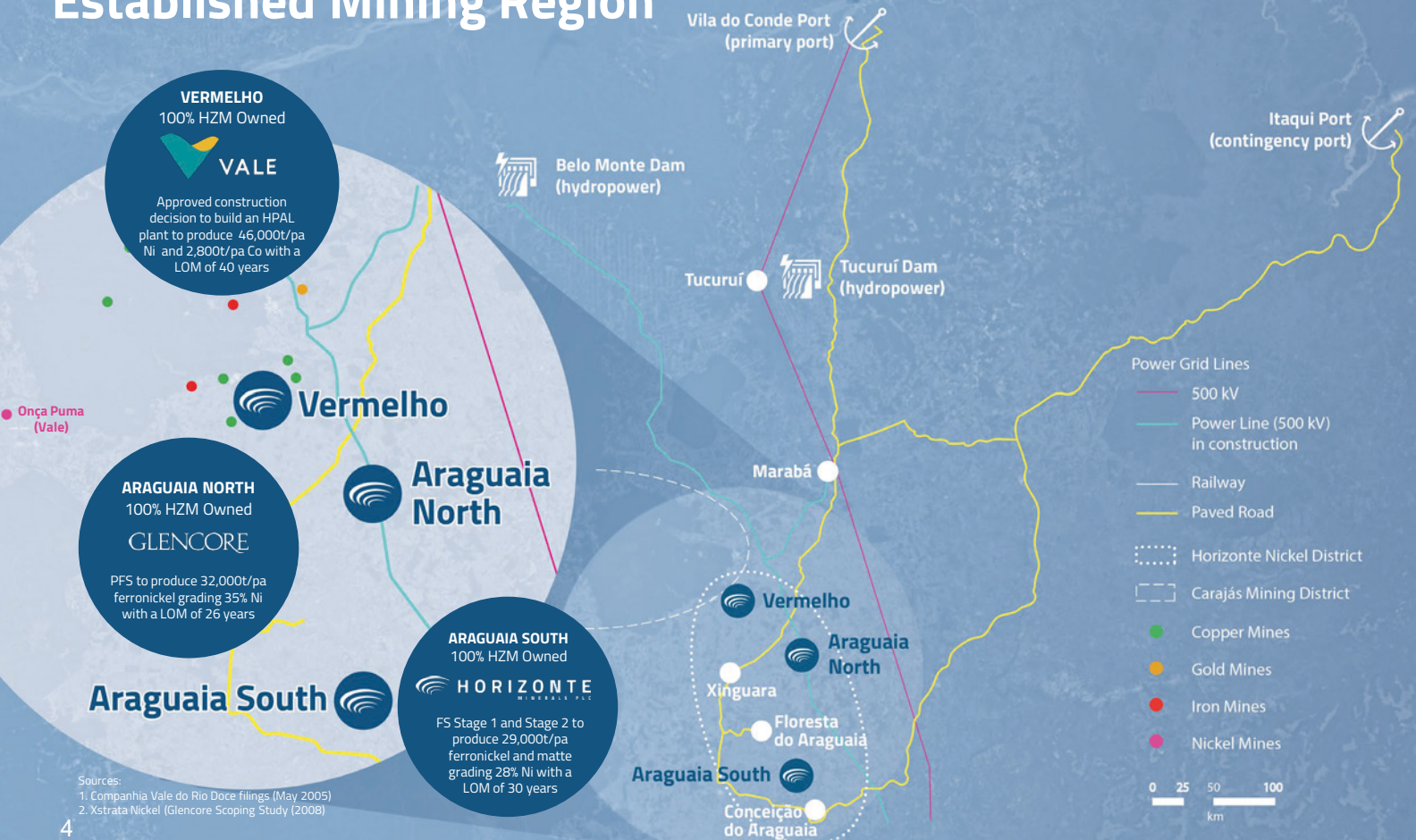
SUSTAINABILITY FOCUSED  
Lowest CO<sub>2</sub> Nickel Projects



NEW NICKEL DISTRICT  
With Established Infrastructure



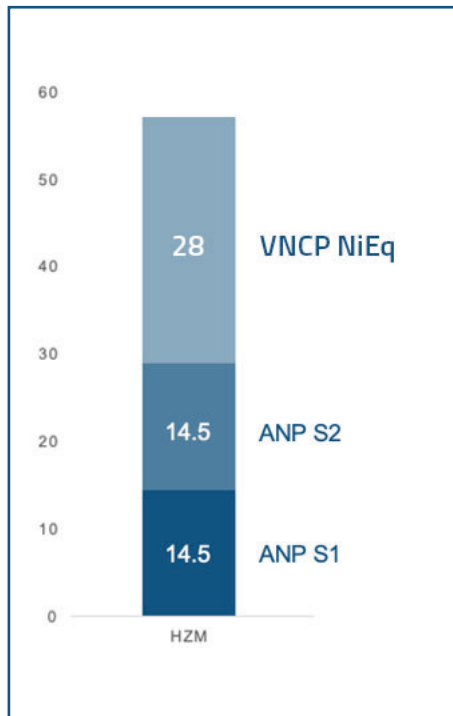
# Developing a New Nickel District in an Established Mining Region



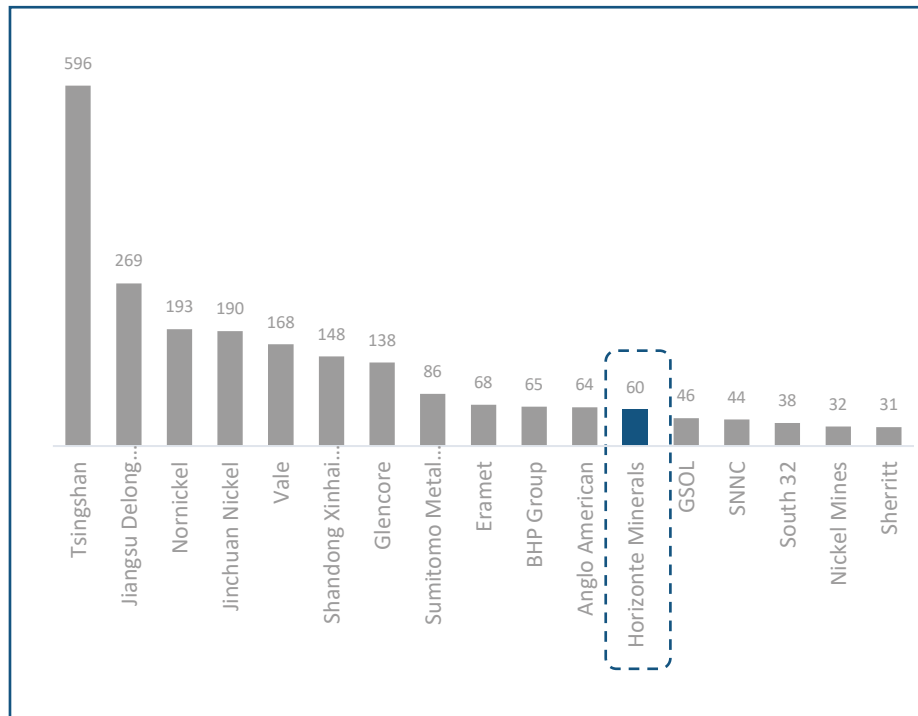


# ~60,000/t pa Scalable Production Profile

**HZM Potential ~60,000 TPA  
Production Profile**



**Global Nickel Production 2021 (kt)**



Source: Wood Mackenzie, Broker Research & Company report

Note: 28,000/t pa nickel equivalent Vermelho production profile includes ~4,000/t of Ni. Eq. from cobalt

# Committed to Best Practice Sustainability Standards

Environmental Stewardship	Social Investment	
	Our People	Our Communities
Hydroelectric power Lowest quartile CO <sub>2</sub> /t nickel producers	Local employer <b>53% Brazil based employees from Pará</b>	Catalyst for socio-economic change <b>\$700M contribution</b> LOM of Araguaia
Optimised resource efficiency ~90% of water at Araguaia will be recycled	Inclusive employer <b>38% female employees</b>	<b>Local Development Agenda</b> thriving, diversified local economies
<b>Biodiversity</b> Action Plan in place goal of net positive impact	<b>Upskilling</b> partnership with local technical schools	<b>Local supply chain</b> 79 local suppliers
Transparent <b>GHG reporting</b> Brazil GHG Protocol Program & TCFD	Health & Safety is a priority <b>0 fatalities or LTIs</b>	<b>Community support</b> COVID, COPAG, Barong

## Governance



**EQUATOR  
PRINCIPLES**





# Araguaia Ferronickel Project

Status	Construction
Deposit type	Laterite
Mine type	Open pit
Processing technology	RKEF
Average production	29kt Ni/a*
Market	Stainless steel
Mine life	+28 years

\*Line 1 & 2



# \$633M Comprehensive Funding Package Secured

Araguaia Stage 1 **FULLY FUNDED** with support from multiple high quality, long-term financial institutions and leading mining sector investors

**\$346M**  
**Senior Debt**



BNP PARIBAS



NATIXIS



SOCIETE  
GENERALE

**SEK**



EKF

**FINNVERA**

**\$287M**  
**Equity<sup>1</sup>**



orion | RESOURCE  
PARTNERS

**GLENCORE<sup>2</sup>**

**Funding package includes ~US\$100M of contingency, growth allowance and cost overrun funding**

Notes:

1. Includes US\$65m of equity-like convertible loan notes and US\$25m standby cost overrun loan from Orion
2. As part of its investment Glencore also entered in to 10-year vanilla offtake agreement on market-based FeNi pricing terms for 100% of production from ANP Line 1

# Robust Economics

	BASE CASE (FS) US\$14,000/t Ni		SPOT PRICE US\$23,000/t Ni	
	STAGE 1	STAGE 2	STAGE 1	STAGE 2
<b>Capital Cost</b>	US\$443M	US\$251M	US\$443M	US\$251M
<b>Post-Tax IRR</b>	20.10%	23.80%	43.00%	46.00%
<b>Post-Tax NPV<sub>8</sub></b>	US\$401M	US\$741M	US\$1.5B	US\$2.4B
<b>Production Payback</b>	~4 years	~5 years	~2 years	~3 years
<b>Lowest quartile C1 Cash Yr 1-10</b>	US\$6,794/t Ni	US\$6,613/t Ni	US\$6,794/t Ni	US\$6,613/t Ni
<b>Average Production</b>	14.5kt Ni/a	29kt Ni/a	14.5kt Ni/a	29kt Ni/a

Annual **free cash flow** and **EBITDA** in Stage 2 of **US\$379M** and **US\$462M** respectively, at current prices

- *Notes:*
- *All assumptions are as per November 2018 NI 43-101 Technical Report ("Araguaia Technical Report") with outputs shown on the basis of an unlevered cash flow model*
- *The FS economics based on the current spot price are presented for information purposes only to reflect the latest pricing information and are otherwise based on all the same parameters as those underlying the economic analysis presented in the Feasibility Study outlined in the Araguaia Technical Report, which remains current.*
- *Stage 2 annual free cash flow and EBITDA based on first 10 years of steady state operation of stage 2*

# Designed for Scalable Production

RKEF  
Established  
technology

30% Ni  
High grade FeNi  
produced in successful  
pilot plant

Infrastructure  
S1 & S2  
included in  
initial capex

Stage 1  
14.5kt/Ni pa

Stage 2  
Area designated  
29kt/Ni pa  
\$251m funded  
from S1 cashflow

Inert by-product  
Silica slag

Shallow open pit  
-  
topsoil stocked  
for rehabilitation



# Lead Team Mobilised



**Michael Drake**  
**Head of Projects**

Mechanical Engineer with over 25 years experience specialising in large capex project build. A global leader in nickel project implementation. Led the complete furnace rebuild at Cerro Matoso (BHP) in South America & leadership of BHP Nickel West's unit US\$5bn capital investment program in Australia.



**Leo Vianna**  
**Araguaia Project Director**

Mechanical & Mechatronic Engineer with over 24 years experience in project implementation & management. Previously Project Director for Vale's B\$1.9B Bahodopi nickel project in Asia. Additional experience with Vale in Mozambique & Brazil.



**Marcia Weisen**  
**Commissioning & Business Readiness Manager**

Electrical Engineer with over 30 years experience build & commissioning electrical furnaces. Commissioning Manager of Onça Puma FeNi plant. Commissioning Director of Koniambo Nickel FeNi plant.



**Albert Jacobs**  
**Engineering Manager**

Mechanical Engineer with over 30 years experience in pyro & smelting. Held Engineering Manager roles at Anglo American, HATCH and Kumba Iron ore. An extensive career managing small & large scale projects from inception to final handover, developing project plans and ensuring efficient project completion & close-out.



**Leo Pavia**  
**Project Services Manager**

Civil Engineer, with over 16 years experience. Most recently worked as Head of Projects for MRN with its life of mine plan extension project. Worked in Arcadis for 12 years with Project and Program Management of major industrial and infrastructure projects in Brazil, Malaysia, Indonesia, and Peru, with focus on mining industry, from conception to completion.



**Tiago Miranda**  
**Head of Finance**

An experienced finance professional with significant experience in the mining industry. Previously he was Financial Controller for Equinox Gold and Ferrous Resources, both located in Belo Horizonte, Brazil where we was responsible for the reporting, accounting and tax functions.



**Juan Fañas**  
**Furnace Lead**

Chemical Engineer with over 30 years experience in the laterite smelting operation, maintenance, Fe-Ni refining, furnace rebuild, plant start up. Previously Manager of Cerro Matoso (BHP).



**Manuel Rodriguez**  
**Lead Process Engineer**

Metallurgical & Material Engineer, with over 20 years experience. Previously Anglo Process Engineer at Barro Alto (Anglo American) reviewing refractories project for electrical furnace, refinery, workforce training & development, monitoring department of process for ore preparation, rotary kilns, refractories & RKEF.



**Luiz Fernandes**  
**Safety and Health Manager**

Chemical Engineer, post-graduated in Safety Engineering and Quality Engineering, with an international MBA in Environment and Sustainability. 30 years experience leading safety, health, environment disciplines including social affairs, community relations, corporate governance, compliance, risk management and auditing.



**Flávia Veronese**  
**Sustainability Manager**

Brazilian social & environmental permitting specialist. Significant experience working in the mining sector in Pará. Previously a consultant for ERM working on projects across Brazil.



**André Vasconcelos,**  
**Community Relations Manager**

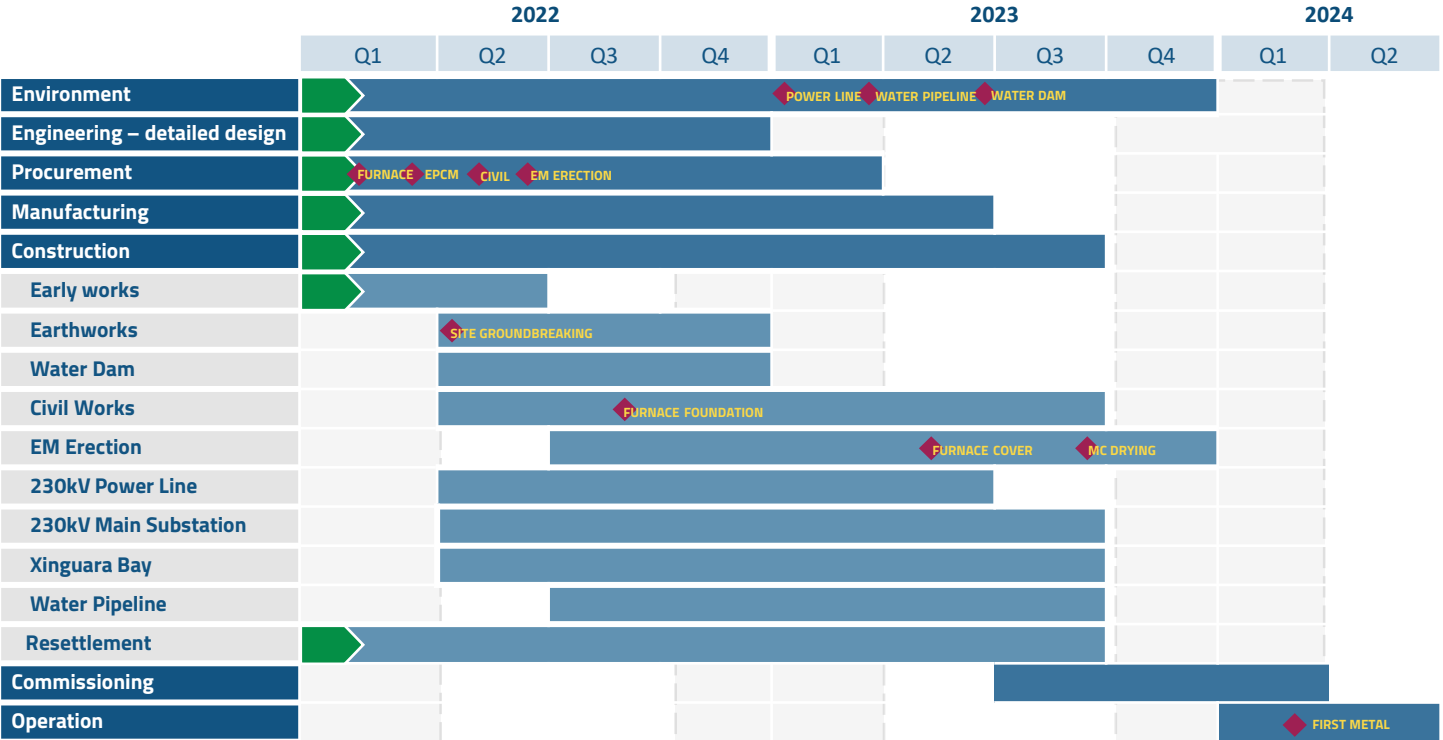
Over 20 years experience in community and institutional relations, social development programmes, acting in large multinational mining companies in Brazil and abroad, especially in greenfield projects. Previous roles include Community, Health and Safety Manager for Vale and Sustainability Consultant for Nexa Resources.



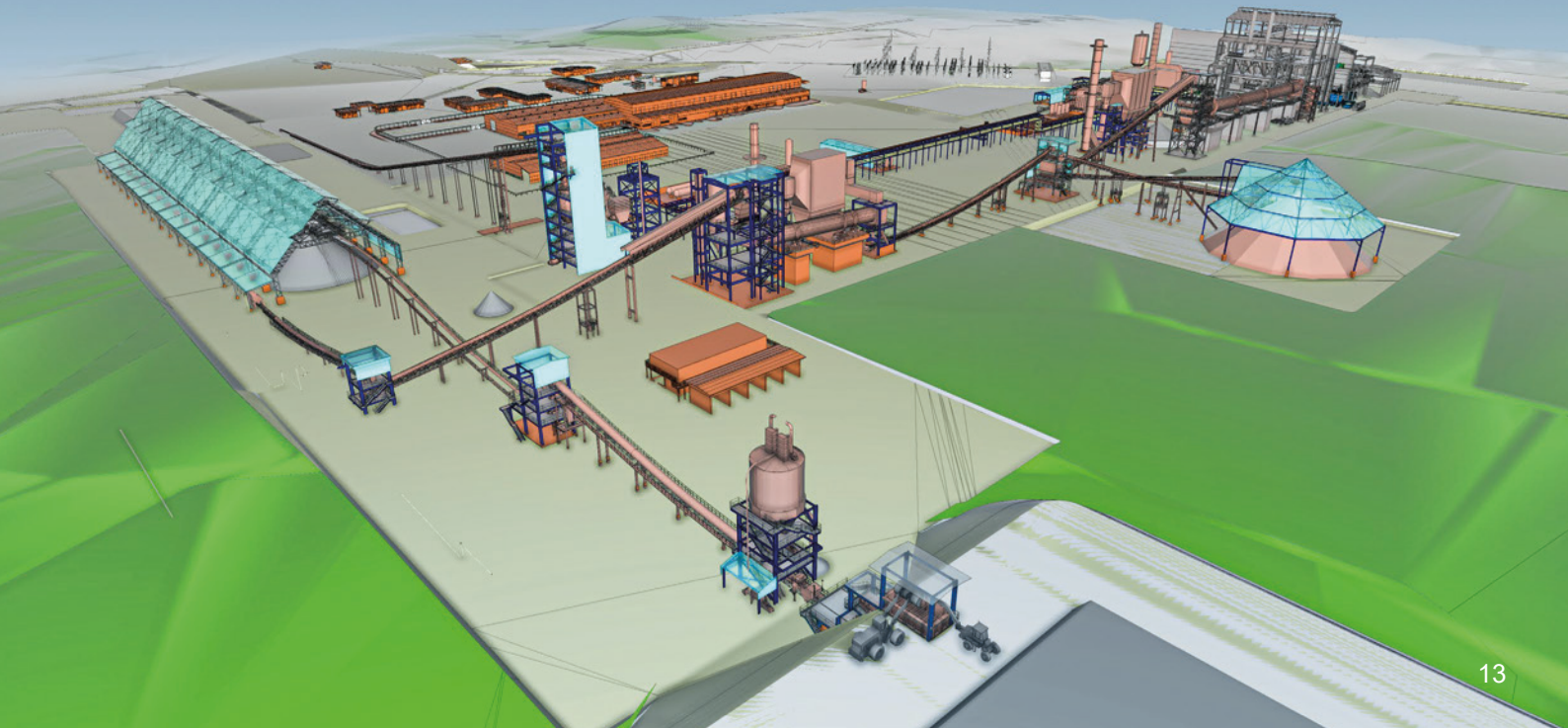
**Rinaldo Dantas, HR and Industrial Relations Manager**

Over 13 years experience in implementing strategic programs of people management, organisational design, cultural transformation, compensation rules, benefits, people development, job evaluation, career program, succession mapping, performance KPIs and wellness programmes. Previously HR Manager for Oz Minerals and HR and Communications Manager for AngloGold Ashanti.

# Project Schedule



# ANP Plant Layout





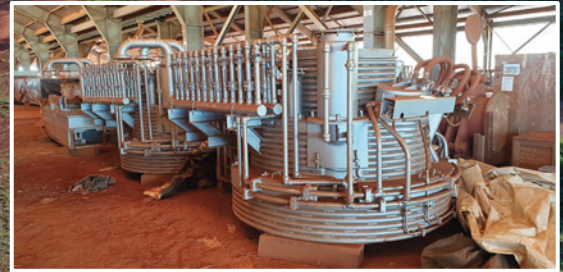
# Fast Tracking Stage 2 Development to Double Production

- ☞ Processing equipment comprising key components of a conventional RKEF (excluding the furnace) acquired in December 2021

- ☞ Designed and manufactured by leading international vendors with similar capacity & technical specifications to Araguaia
- ☞ Already located in Brazil
- ☞ Low upfront cost

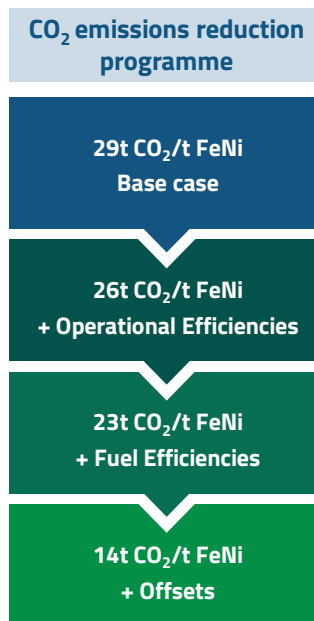
- ☞ Key value o in utilising some of the large-scale equipment, including the rotary kiln, to fast-track and lower the cost of development of a second RKEF line at Araguaia

- ☞ Use of the Processing Equipment will be integrated into a new study on the development of a second RKEF line at Araguaia
- ☞ \$7M vs ~\$60M original purchase cost
- ☞ Also evaluating the use of selected components as spares and back up as part of the development of the first RKEF line at Araguaia

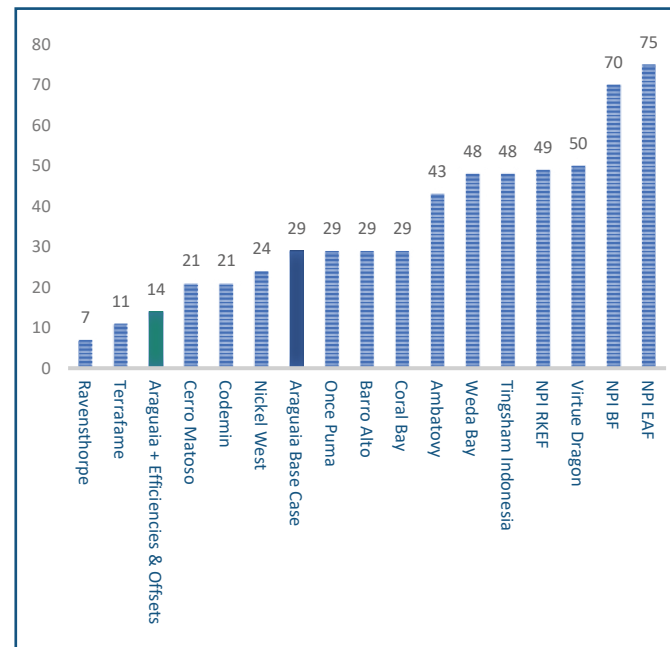


# Pathway to Become One of the Lowest Carbon Projects Globally

- Commence operating Araguaia using the lowest-risk and most efficient route to produce ferro-nickel
- Will evolve Araguaia to becoming one of the lowest carbon footprint producers per tonne of nickel within our FeNi peer group
- Estimate possibilities to reduce up to 70kt of CO<sub>2</sub> per annum, ~16% of total footprint once in operation
- Proven operational efficiencies such as heat transfer capture combined with efficient fuel substitutes in the dryer and reductant processes
- HZM has committed to reporting & transparency measures, including monitoring GHG and reporting to the Brazilian GHG Protocol programme



**Global CO<sub>2</sub>/t Ni Eq comparisons**



# Vermelho Nickel Cobalt Project



<b>Status</b>	Feasibility Study
<b>Deposit type</b>	Laterite
<b>Mine type</b>	Open pit
<b>Processing technology</b>	HPAL
<b>Average production</b>	24kt Ni/a 1.2kt Co/a
<b>Market</b>	Battery
<b>Mine life</b>	38 years



# Mineral Resources

(Estimated as at 31 October 2019)

Cut-off grade: 0.7% Ni

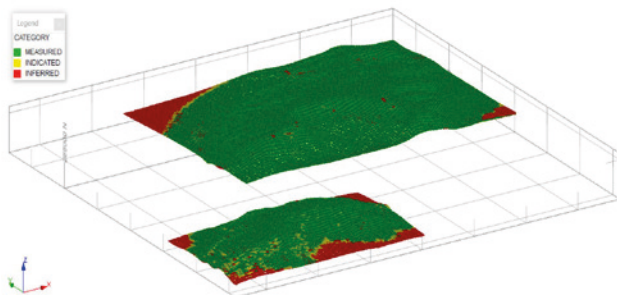
Category	Tonnage (Mt)	Ni %	Ni metal (kt)	Co %	Co metal (kt)	Fe <sub>2</sub> O <sub>3</sub> %	MgO %	SiO <sub>2</sub> %
Measured	140.8	1.05	1,477	0.05	74.6	31.1	11.3	41.0
Indicated	5.0	0.99	49	0.06	2.8	26.3	8.6	49.0
Measured + Indicated	145.7	1.05	1,526	0.05	77.3	30.9	11.2	41.3
Inferred	3.1	0.96	29	0.04	1.4	24.0	15.5	42.2

Notes: Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability. All figures are rounded to reflect the relative accuracy of the estimate and have been used to derive subtotals, totals and weighted averages. Such calculations inherently involve a degree of rounding and consequently introduce a margin of error. Where these occur, Snowden does not consider them to be material.

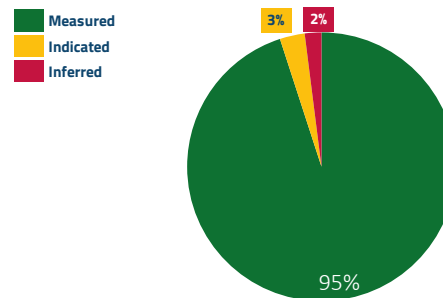
Mineral Resources are reported inclusive of Mineral Reserves.

The reporting standard adopted for the reporting of the Mineral Resource estimate uses the terminology, definitions and guidelines given in the CIM Definition Standards on Mineral Resources and Mineral Reserves (May 2014) as required by NI 43-101 (Source: NI 43-101 Technical Report – Vermelho Project, Pará State, Brazil 31 October 2019).

## Geological Model - coloured by category



## Proportion of Categories



	BASE CASE US\$16,400/t Ni	SPOT PRICE US\$23,000/t Ni
<b>Capital Cost</b>	US\$652M	US\$652M
<b>Net Cash Flow</b>	US\$7.3B	US\$12.9B
<b>Post-Tax IRR</b>	26.3%	38.6%
<b>Post-Tax NPV<sub>8</sub></b>	US\$1.7B	US\$3.4B
<b>Production Payback</b>	~4 years	~3 years
<b>Lowest quartile C1 Cash Yr 1-10 (Ni Laterite)</b>	US\$7,286/t Ni	US\$7,286/t Ni
<b>All In Sustaining Costs</b>	US\$7,933/t Ni	US\$7,933/t Ni
<b>Average Production</b>	24kt Ni/a	24kt Ni/a

**Notes:**

- All assumptions are as per October 2019 NI 43-101 Technical Report ("Vermelho Technical Report") with outputs shown on the basis of an unlevered cash flow model
- The PFS economics based on the current spot price are presented for information purposes only to reflect the latest pricing information and are otherwise based on all the same parameters as those underlying the economic analysis presented in the Preliminary Feasibility Study outlined in the Vermelho Technical Report, which remains current.
- Current spot price case assumes cobalt price of US\$70,000/t

# Feasibility Stage Funded

## COMPLETED

Acquisition  
from Vale

Update N1 43-  
101 Mineral  
Resource  
Estimate

Test work to  
produce  
battery grade  
product

Pre-Feasibility  
Study

## IN PROGRESS

Advance  
permitting

Feasibility  
Study

## FUTURE WORKSTREAMS

Value  
engineering &  
early works

Secure funding  
& start  
construction

**RAMBOLL**

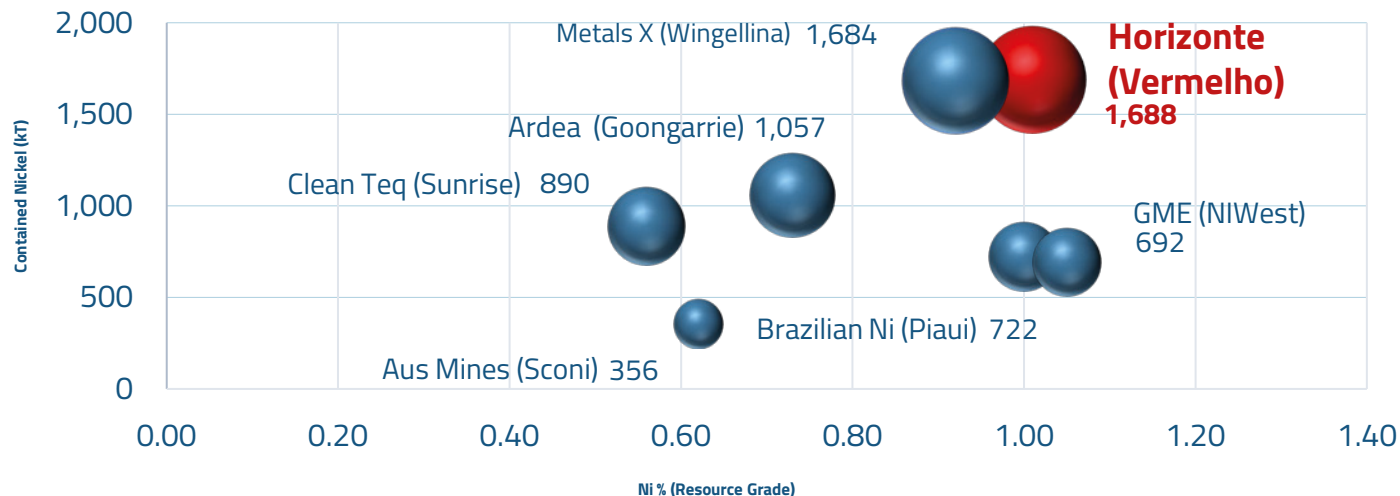
Completing ESIA

FS funded through US\$25M  
Royalty Financing from Orion  
over and above funding for  
Araguaia



# A Globally Competitive Project

## Contained Nickel



### Sources:

- Vermelho Technical Report
- Clean TeQ ASX announcement 28 Sept. 2020 (Sunrise Project)
- Ardea Resources 2019 Annual Report, ASX announcement 24 Oct. 2019 (Goongarrie Project)
- Australian Mines 2020 Annual Report (Sconi Project)
- Brazilian Nickel Piaui fact sheet 2021 (Piaui Project)
- Metals X Limited Annual Report June 2020 (Wingellina Project)
- GME Resources Press Release on NIWest PFS August 2018, Website Deb. 20021 (NIWest Project).

### Notes:

- Resources based on published reports in 2018, for Measured and Indicated resources.
- The category(s) of the MRE for Metals X Limited - Wingellina Project has not been presented in Measured, Indicated and Inferred categories so is unknown if includes Inferred resources.
- Information about comparables was obtained from public sources and has not been verified by the issuer or the agents. If the comparables contain a misrepresentation, the investor does not have a remedy under securities legislation.



# Unique Investment Opportunity



**World class portfolio** of **100% owned** projects in **established mining jurisdiction**



**~60kt Ni pa** of low cost, long-life and scalable production = 'major' quality and scale



Leveraging **existing infrastructure** to develop a **new nickel district**



**Fully funded** for Araguaia Stage 1 with clear path to cash flow and strategic shareholders onboard



**Funds secured** to progress Vermelho to a **construction decision**



**Low carbon footprint** with further reduction initiatives embedded in operating model



Exposure to robust **stainless steel** and high-growth **battery markets**



Clean Energy Transition driving **significant nickel deficit**

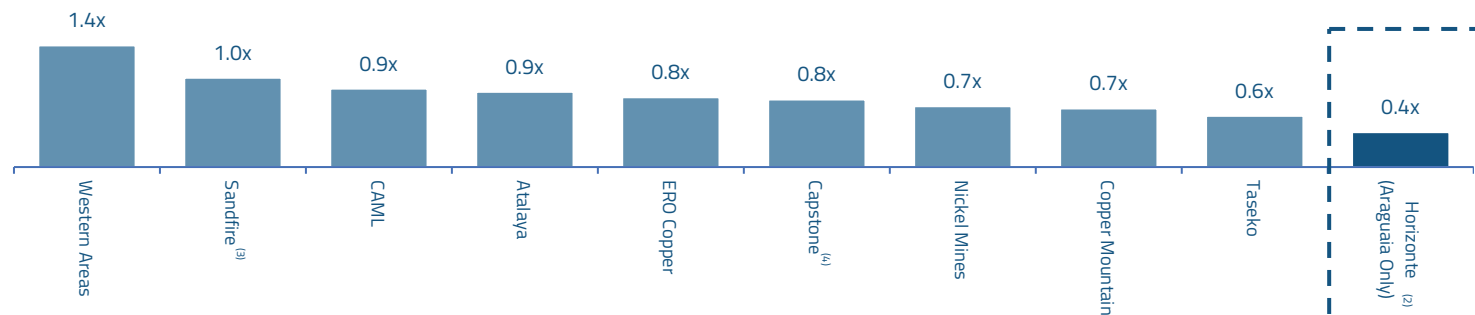


**Significant scarcity** of near-term, tier 1 nickel production projects – **increase in M&A** evident

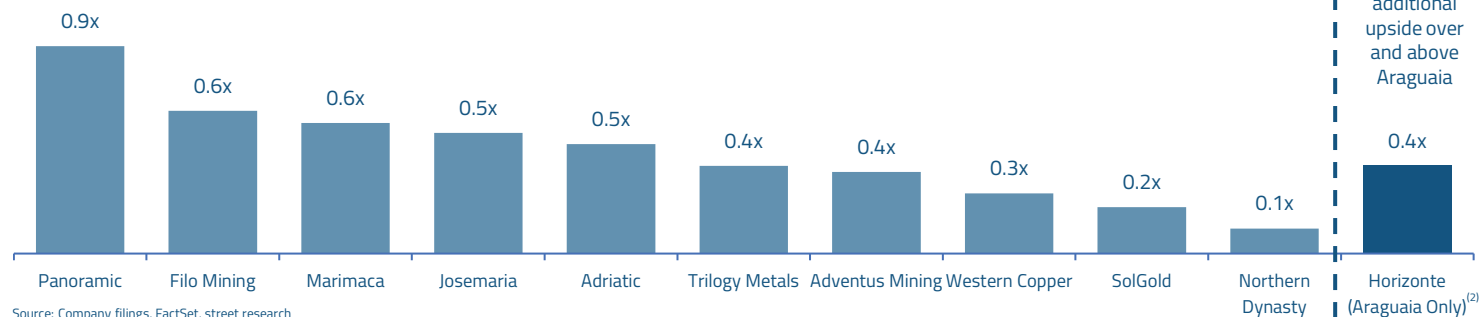
# Valuation vs. Peers

Horizonte trades at a discount to other base metals development companies and junior base metals producers

## Junior Base Metal Producers P / NAV (x)<sup>(1)</sup>



## Base Metal Developers P / NAV (x)<sup>(1)</sup>



Attractively valued with significant additional upside over and above Araguaia

Source: Company filings, FactSet, street research

1. Data as of 19 February 2022

2. Represents broker consensus NAV excluding any value attributable to Vermelho

3. Shown proforma MATSA transaction

4. Shown proforma Mantos transaction

Note: Information about comparables was obtained from public sources and has not been verified by the issuer or the agents. If the comparables contain a misrepresentation, the investor does not have a remedy under securities legislation.



ACAI  
*Euterpe oleracea*

MOGNO  
*Swietenia macrophylla*

GRAVIOLA  
*Plinia*



# Corporate Snapshot

## Top Shareholders

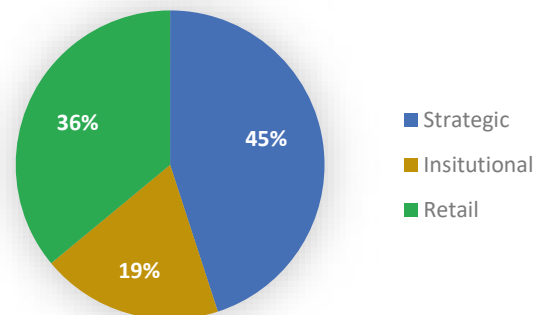
Shareholder	Number of shares	% of issued capital
La Mancha	759,128,764	19.96%
Orion Resource Partners	565,845,825	14.88%
Canaccord Genuity WM	283,215,714	7.45%
Hargreaves Lansdown	277,092,053	7.29%
Interactive Investor	219,523,914	5.77%
Teck Resources	210,207,179	5.53%
Glencore	163,101,098	4.29%
Condire Investors	128,122,998	3.37%

## Capital Markets Data

Ticker	AIM: HZM	TSX: HZM
Share price	GBP6.20p*	C\$0.14*
Shares in issue	3,802,365,590	3,802,365,590
Market Cap	£239M	C\$410M
52 week trading	AIM: 5.80p – 10.19p	(C\$0.10 – C\$0.18)

\*As of 23 February 2022

## Shareholder Structure



## Analyst Coverage

<b>BMO</b> , Alex Pearce	Outperform, <b>£0.13</b>
<b>Peel Hunt</b> , Tim Huff	Buy, <b>£0.14</b>
<b>Paradigm</b> , Geoff Woolley	Buy, <b>C\$0.50</b>
<b>Cantor Fitzgerald</b> , Matt O'Keefe	Buy, <b>\$0.21 / C\$0.35</b>
<b>Cormark</b> , Stefan Ioannou	Buy, <b>C\$0.70</b>

# Board of Directors



## **David Hall, Chairman**

- ☞ 40 years experience in exploration, projects and operations in 50 countries with extensive South America and Brazil experience.
- ☞ Major company experience with Anglo American, Minorco and AngloGold Ashanti.
- ☞ Established AngloGold in South America leading to major discoveries in Colombia.



## **Owen Bavinton, Non-Executive Director**

- ☞ Previously Group Head of Exploration and Geosciences at Anglo American Plc.
- ☞ Extensive nickel experience both in Brazil and internationally.
- ☞ Notable resource projects include: Lisheen (zinc in Ireland); Skorpion (zinc in Namibia); Loma de Niquel / Barro Alto (nickel in Venezuela/Brazil).



## **Sepanta Dorri, Non-Executive Director**

- ☞ 15 years of experience in mining & metals in the areas of corporate development, financial & investment banking.
- ☞ VP, Corporate Development of Teck Resources since 2018.
- ☞ Canadian Chartered Professional Accountant and holds a Bachelor of Accountancy and a Master of Accountancy, from the University of Waterloo.



## **Jeremy Martin, CEO**

- ☞ Over 21 years experience as corporate geologist with demonstrable track record across Latin America and Europe.
- ☞ Strong technical experience across early-stage exploration, feasibility study, project evaluation, permitting through to project development and mine operation.
- ☞ Diverse exposure across capital markets, M&A, funding on AIM, the TSX, IPO's, RTO's and established JVs with a number of major mining companies.



## **Allan Walker, Non-Executive Director**

- ☞ Over 35 years experience in investment banking and funds management focussed mainly on energy and natural resources project finance and private equity in emerging markets.
- ☞ Previously held leadership positions with Masdar Capital in Abu Dhabi, Black River AM, ING Barings and Credit Suisse First Boston in London and Brazil. Received financial training with JP Morgan in New York.



## **William Fisher, Non-Executive Director**

- ☞ Geologist with extensive experience including VP Exploration for base metals major, Boliden, managing 35 projects in nine countries.
- ☞ Previously, CEO and Executive Chair of GoldQuest, CEO of GlobeStar Mining, which built the Cerro de Maimon copper-gold mine and Chair of Aurelian Resources Inc., which was acquired by Kinross in 2008 for \$1.2 Billion.



**Simon Retter**  
**Chief Financial Officer**

- ☞ Chartered Accountant
- ☞ Director on a number of listed Resources Companies.
- ☞ Experience in public markets, mining sector, reverse takeovers.
- ☞ Previously Deloitte and Touche LLP.



**Guy de Freitas**  
**Head of Business Development**

- ☞ Demonstrable track record in private equity, investment banking and industry with US\$1.5 billion of completed transaction experience.
- ☞ Significant exposure to Brazil and base metals having played a lead role in managing Appian Capital's Brazilian portfolio which included Atlantic Nickel (brownfield nickel sulphide restart).



**Katie Millar**  
**Head of ESG & Communications**

- ☞ Corporate Social Responsibility specialist with experience in Brazilian & Australian mining sectors.
- ☞ Significant resource experience at Anglo American in Brazil: Niobium Feasibility and \$400M construction project, Phosphates Feasibility and Nickel, Niobium & Phosphates operations.



**Anthony Finch**  
**Studies Manager**

- ☞ Over 30 years experience in mining engineering, mining operations and consulting.
- ☞ Extensive nickel sulphide and laterite experience
- ☞ Other resource experience includes FS's for : Syrah Resources (Graphite in Mozambique) - Sunridge (Copper Lead Zinc ), La Mancha (Gold - Sudan), Uranium One (Tanzania)



# Nickel is a Critical Metal

~323M EVs expected to be in operation globally by 2040 <sup>(2)</sup>

A 60kwh NMC battery needs 39kg of nickel <sup>(3)</sup>

Nickel alloys play an important role in ensuring the integrity, durability & long-term performance of nuclear power stations <sup>(5)</sup>

Global expansion plans:  
50 under construction <sup>(6)</sup>  
100 on order/planned  
300 proposed

Hydro-electric plants need durable nickel-rich stainless steel turbines

Global hydro-electric capacity expected to grow 70% by 2040 <sup>(7)</sup>

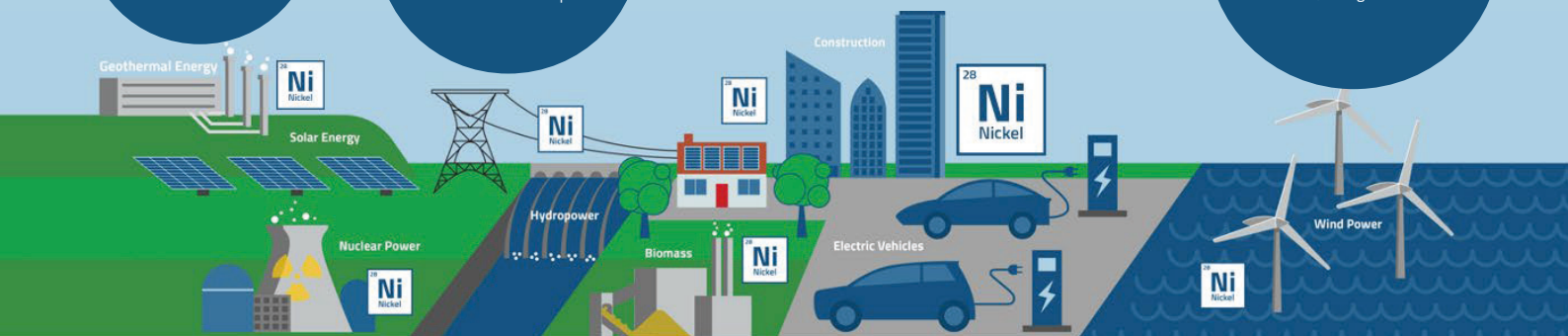
Nickel-containing alloys prevent corrosion in geothermal energy generation <sup>(1)</sup>

Carbon capture & storage

~200t of nickel required to capture & store 1.5Mt CO<sub>2</sub> /pa <sup>(4)</sup>

Nickel improves strength & toughness of wind turbines

Each turbine requires ~2,000kg nickel <sup>(8)</sup>



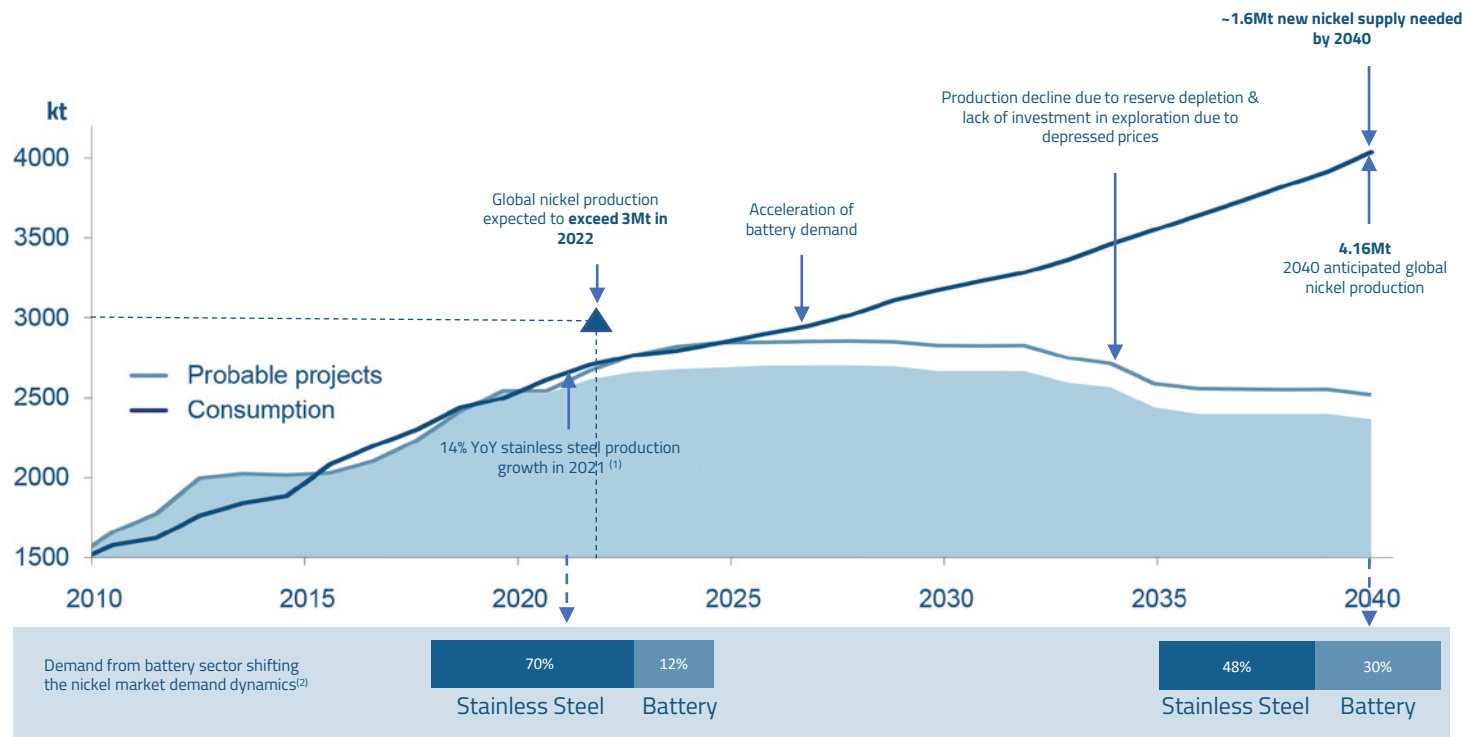
Sources:

1. Nickel Institute, Nickel Magazine Vol 36 (2021)
2. Wood Mackenzie (August 2020)
3. BHP, [www.bhp.com](http://www.bhp.com)

4. Nickel Institute, Nickel Magazine Vol 36 (2021)
5. Nickel Institute, Nickel Alloys in Energy and Power
6. World Nuclear Org., Plan for New Reactors Worldwide (2021)

7. Nickel Institute, Nickel Magazine Vol 36 (2021)
8. Nickel Institute, Nickel Magazine Vol 36 (2021)

# Clean Energy Transition Driving Nickel Deficit



Source: Wood Mackenzie  
1. Macquarie, Commodities Comment (Jan 2022)  
2. Reuters

# Araguaia Mineral Resources & Ore Reserves Statement

Resources	Category	Tonnage (kT)	Contained Ni metal (kT)	Ni (%)	Co (%)	Fe (%)	MgO (%)	SiO <sub>2</sub> (%)
	Measured	18,168	261	1.44	0.05	16.26	17.51	39.91
	Indicated	101,169	1,264	1.25	0.06	19.39	16.90	36.26
	<b>Measured + Indicated</b>	<b>119,337</b>	<b>1,525</b>	<b>1.27</b>	<b>0.06</b>	<b>18.91</b>	<b>16.99</b>	<b>36.81</b>
	Inferred	12,920	154	1.19	0.06	20.21	14.90	36.77

Reserves		Proved	Probable	TOTAL
	<b>Ore (Mt)</b>	<b>7.33</b>	<b>19.96</b>	<b>27.29</b>
	<b>Ni (%)</b>	<b>1.72</b>	<b>1.68</b>	<b>1.69</b>
	Fe (%)	16.01	17.57	17.15
	SiO <sub>2</sub> :MgO	3.01	2.36	2.52
	Al <sub>2</sub> O <sub>3</sub> (%)	6.00	4.56	4.94

Source: Araguaia Technical Report

## Notes

- Totals may not add due to rounding.
- Mineral Resources are inclusive of Mineral Reserves.
- Mineral resource estimate at 0.9% nickel cut-off
- All economic Indicated Resources within the pit designs were classified as Probable Reserves and all Measured Resources at Pequizeiro were classified as Proved Reserves. Measured Resources at Vale dos Sonhos were classified as Probable Reserves due to higher levels of uncertainty around the modifying factors for this pit.
- Resource estimate effective February 2017 as disclosed in Araguaia Technical Report
- Reserves estimate date of 30 November 2018 as disclosed in the Araguaia Technical Report



# Mineral Reserves and Resources

High confidence and large-scale mineral resource with 95% in the measured category and substantial reserve conversion

## Mineral Reserve (estimated as at 31 October 2019)

Category	Tonnage (Mt)	Ni %	Co %	Fe %	Mg %	Al %
Probable	141.3	0.91	0.05	23.1	3.81	0.79

### Notes:

- Cut-off varies by resource model block depending on individual block geochemistry, however, as a guide the cut-off is approximately 0.5% Ni.
- Dilution was modelled as part of re-blocking, ore losses applied are 2%

## Mineral Resource (estimated as at 31 October 2019)

Cut-off grade: 0.7% Ni

Category	Tonnage (Mt)	Ni %	Ni metal (kt)	Co %	Co metal (kt)	Fe <sub>2</sub> O <sub>3</sub> %	MgO %	SiO <sub>2</sub> %
Measured	140.8	1.05	1,477	0.05	74.6	31.1	11.3	41.0
Indicated	5.0	0.99	49	0.06	2.8	26.3	8.6	49.0
Measured + Indicated	145.7	1.05	1,526	0.05	77.3	30.9	11.2	41.3
Inferred	3.1	0.96	29	0.04	1.4	24.0	15.5	42.2

### Notes:

- Mineral Resources are not Mineral Reserves and do not have demonstrated economic viability.
- Totals may not add due to rounding
- Mineral Resources are reported inclusive of Mineral Reserves.
- The reporting standard adopted for the reporting of the Mineral Resource estimate uses the terminology, definitions and guidelines given in the CIM Definition Standards on Mineral Resources and Mineral Reserves (May 2014) as required by NI 43-101 (Source: NI 43-101 Technical Report – Vermelho Project, Pará State, Brazil 31 October 2019).

# ANP Plant Layout

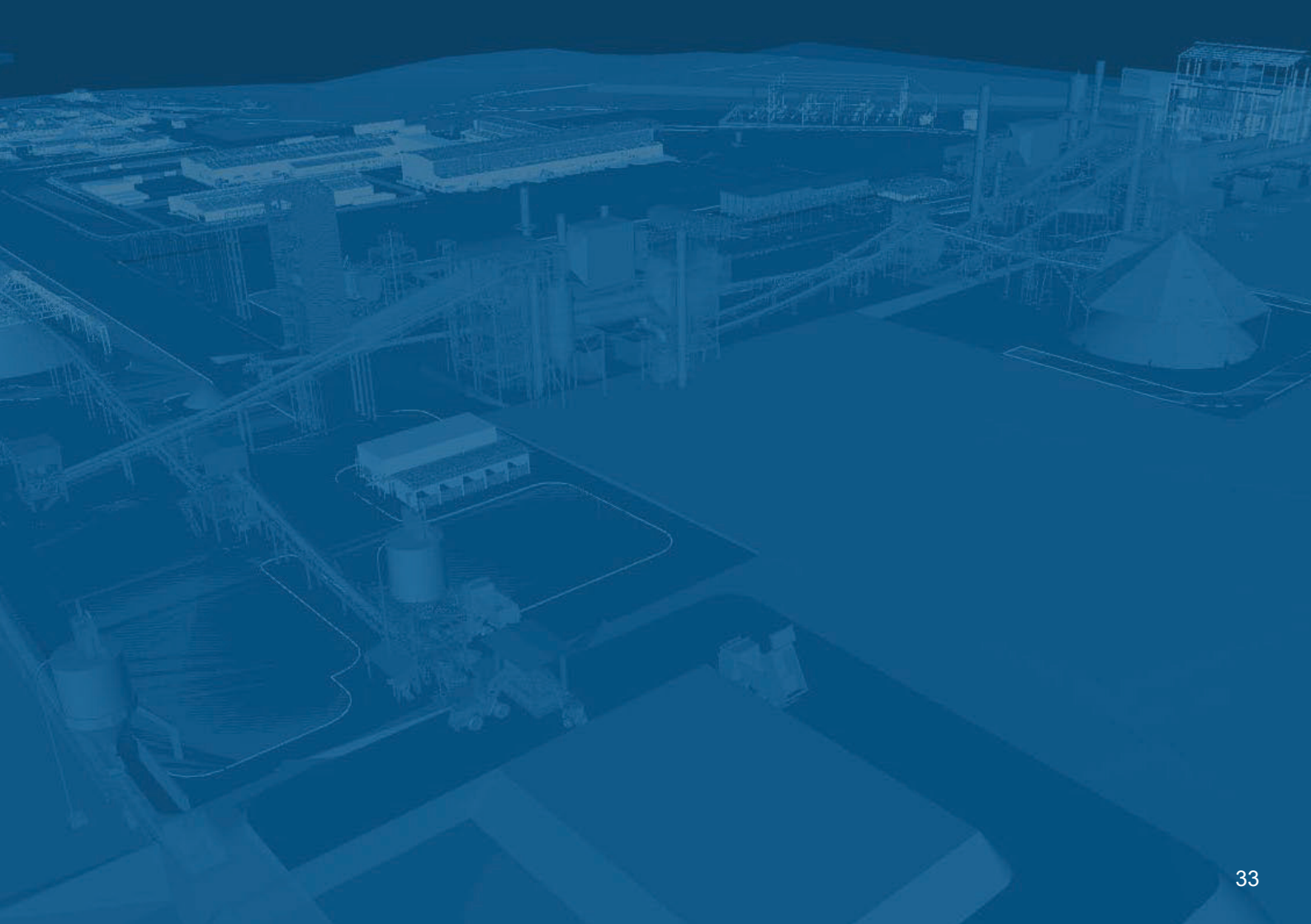


# International Sustainability Standards

Annual Sustainability Report published in accordance with Global Reporting Initiative (GRI) standards 'core' option

<b>Environment</b>	<ul style="list-style-type: none"> <li>☞ Equator Principles 4, principles 1-10 applied</li> <li>☞ CONAMA Brazilian Environmental Legislation</li> <li>☞ Brazil Greenhouse Gases Protocol Programme</li> <li>☞ The World Bank Group Environmental Health and Safety Guidelines</li> <li>☞ International Finance Corporation EHS Guidelines for Mining</li> </ul>
<b>Stakeholder engagement</b>	<ul style="list-style-type: none"> <li>☞ IFC Sustainability Framework – IFC Performance Standards</li> <li>☞ International Council of Mining &amp; Metals Stakeholder Research Toolkit</li> <li>☞ International Organization for Standardization (14001:2015) (45001:2018)</li> <li>☞ Equator Principles IV</li> <li>☞ IFC/EBRD Works Accommodation</li> </ul>
<b>Resettlement</b>	<ul style="list-style-type: none"> <li>☞ IFC Performance Standard 5: Land Acquisition &amp; Involuntary Resettlement</li> <li>☞ Equator Principles III &amp; IV</li> <li>☞ Brazilian land acquisition regulations</li> </ul>
<b>Human rights</b>	<ul style="list-style-type: none"> <li>☞ United Nations Guiding Principles on Business &amp; Human Rights -UN Declaration on Human Rights</li> <li>☞ International Labour Organisation Declaration on Fundamental Principles &amp; Rights at Work</li> <li>☞ UN Global Compact</li> <li>☞ Organisation for Economic Co-operation &amp; Development Guidelines for Multinational Enterprises</li> </ul>
<b>Health and safety</b>	<ul style="list-style-type: none"> <li>☞ WBG EHS Guidelines</li> <li>☞ IFC Environmental Health &amp; Safety Guidelines for Mining</li> <li>☞ CONAMA Brazilian H&amp;S Legislation</li> <li>☞ IFC Performance Standard 4: Community, health, Safety &amp; Security</li> <li>☞ ISO 24001:2018</li> </ul>







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