



# MASAN HIGH-TECH MATERIALS (UPCOM: MSR)

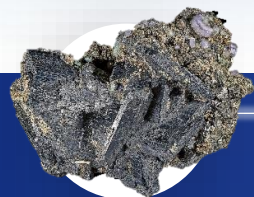
## The Era of Critical Minerals

May 2026





# With the rise of AI, Tungsten becomes more critical than ever



Tungsten



Fluorspar



Tungsten Hexafluoride (WF6)

Integrated Circuit Chip



Semiconductor



AI

The AI revolution

Data center

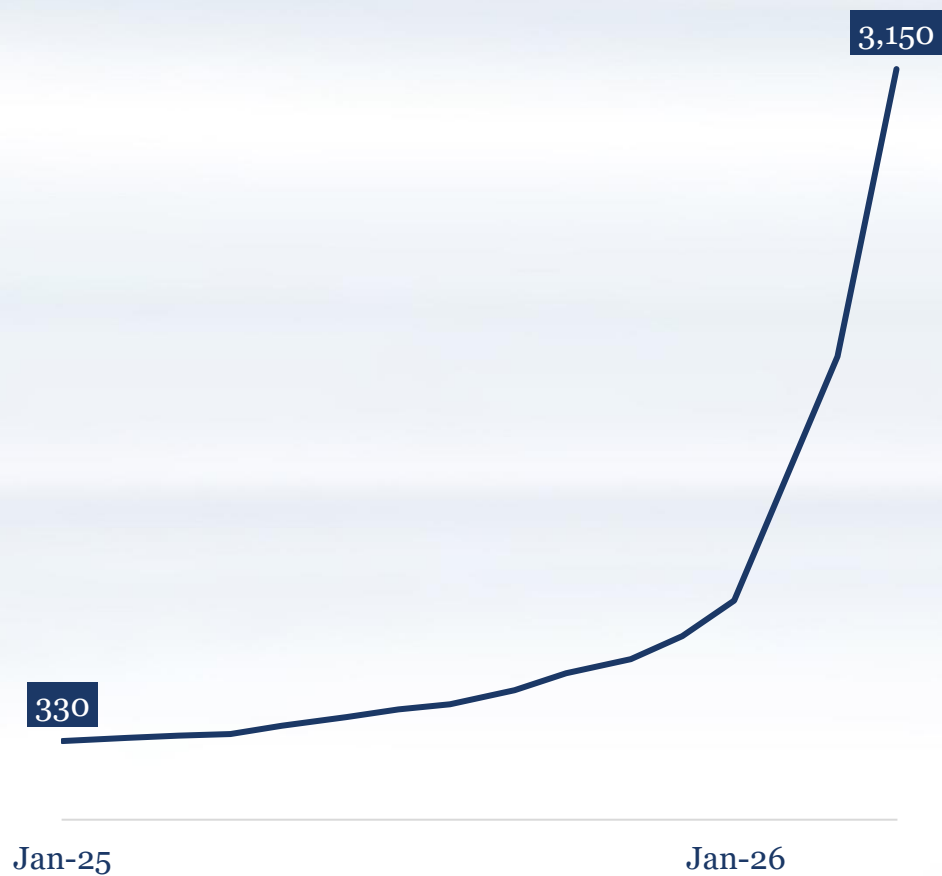


WF6 is an essential input in advanced semiconductor manufacturing —the foundation on which AI is built



# From Tungsten prices to MSR: market is starting to connect the dots

APT (processed Tungsten)



— Ex-China APT price (\$/mtu)

UpCoM: MSR



— MSR Stock Price (VND/share)



**What is  
Tungsten?**

**Why  
Tungsten  
now?**

**Why Masan  
High-Tech  
Materials?**

**What does  
this mean  
investors?**

What is Tungsten?





# What is Tungsten?



**Highest melting  
point**

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**3,420°C**

*More than 3x for gold. At this temperature all other engineering metals have already been vaporized*

**Physical  
properties  
closest to gold**

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**74**  
atomic number

*Closest to gold in the periodic table, extremely hard, high conductivity of heat and electricity,*

**Top critical  
mineral**

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**#9**

*Most critical mineral commodity ranked by US. Geological Survey<sup>1</sup>*



# Why is Tungsten critical?

## An indispensable industrial metal with no substitute

### Tungsten fuels not just essential sectors in the economy...

#### Defence



11.0%

#### Consumer Durables



7.8%

#### Construction



9.7%

#### Petro / Chemicals



8.8%

#### Industrial Processing



13.4%

#### Mining



16.3%

*Note: 2024-2030 tungsten consumption CAGR in end markets*

### ...but also critical to required technologies for tomorrow.

#### Integrated Circuit Chip



*Tungsten is among the most important components in modern integrated circuitry*

#### Fast-Charging Battery



*Tungsten is key component behind fast-charging battery solutions*

#### 3D Printing



*Tungsten carbide-cobalt (WC-Co) (in development) can be ideally suited for high-density 3D printing*



# AI and data centers are reinforcing tungsten demand tailwinds

**\$5–8** trillion



Estimated global AI capex<sup>1</sup> between 2026–2030 to power chip making, semiconductors & advanced tooling.

**Global AI Capex**

**2X** by 2030



The demands for semiconductors and batteries are expected to double by 2030 fueled by the growth of AI and data centers<sup>2</sup>.

**Semis & batteries demand driven by AI**

**▲ 24kt** by 2030



The global tungsten market will grow sustainably from 147k tons in 2024 to 171k tons WO<sub>3</sub> in 2030.

**Sustained multi-year demand outlook**

(1) BlackRock Investment Institute (BII)'s 2026 global outlook materials;  
(2) McKinsey research;  
(3) ITIA

**Why Tungsten now?**





# Without China, there is hardly Tungsten supply in the rest of world...

Limited new primary supply

2-3 years ramp-up

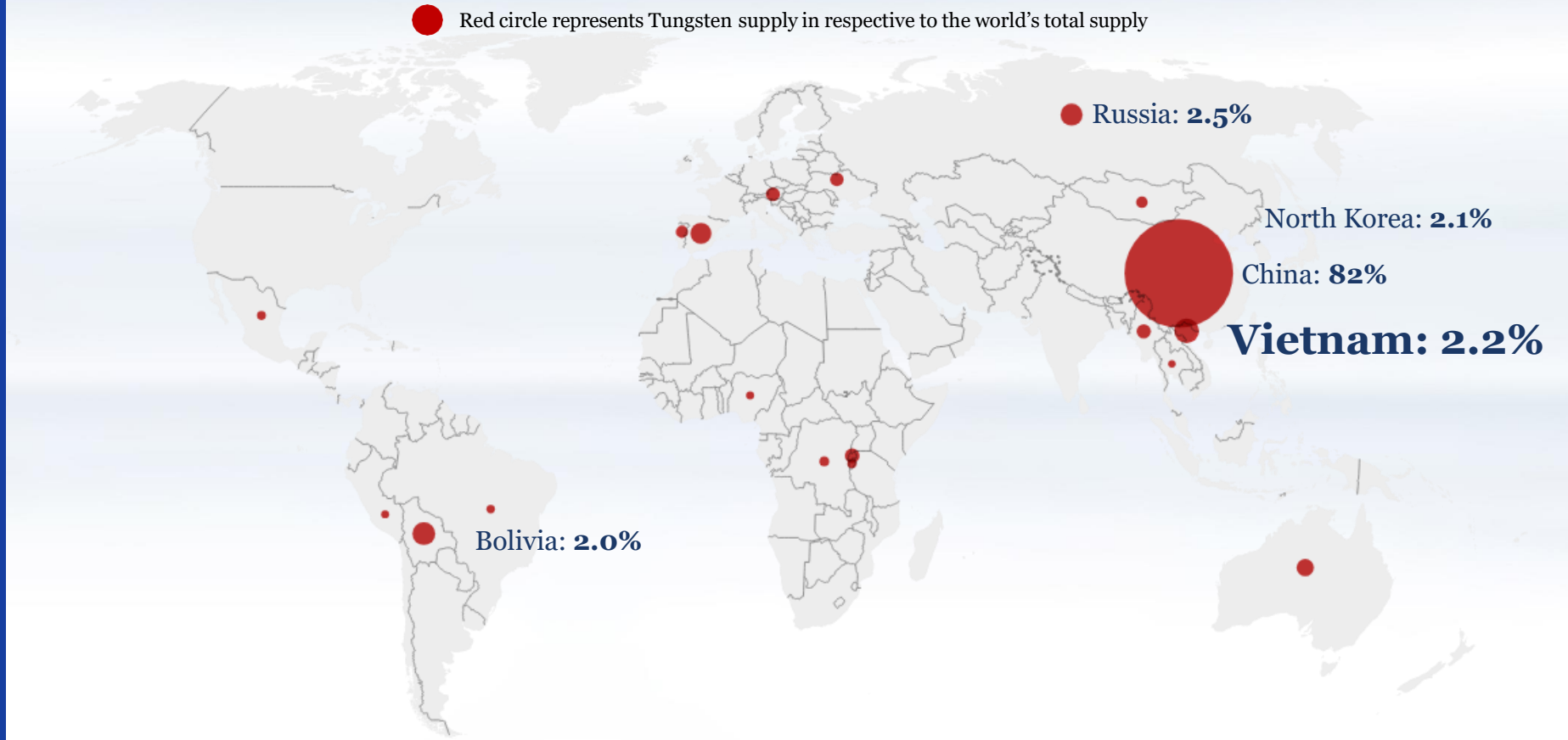
High CAPEX

Regulatory barrier

Geopolitics

Recycling constraints

Most “new tungsten mines” never make it. About 10 projects looked promising on paper, but only a couple has actually started production over the past decade—and several later stalled or shut down





... and they have been providing less.

**China's supply is declining and they are becoming a net importer.**

**Production volume declined**

▼ **6%**

domestic volume<sup>1</sup>

*China's total tungsten mining quota had also been reduced for a third consecutive year, with annual cuts of around 6%*

**Less export from China**

▼ **30%**

export volume<sup>2</sup>

*China has tightened export controls, cutting export volumes since February 2025. China has become a tungsten net importer*

**US-China trade war**

**25% tax**

on Chinese Tungsten bars and powders

*These developments have forced U.S., European, and Japanese corporations to seek alternative supply sources-including Vietnam.*

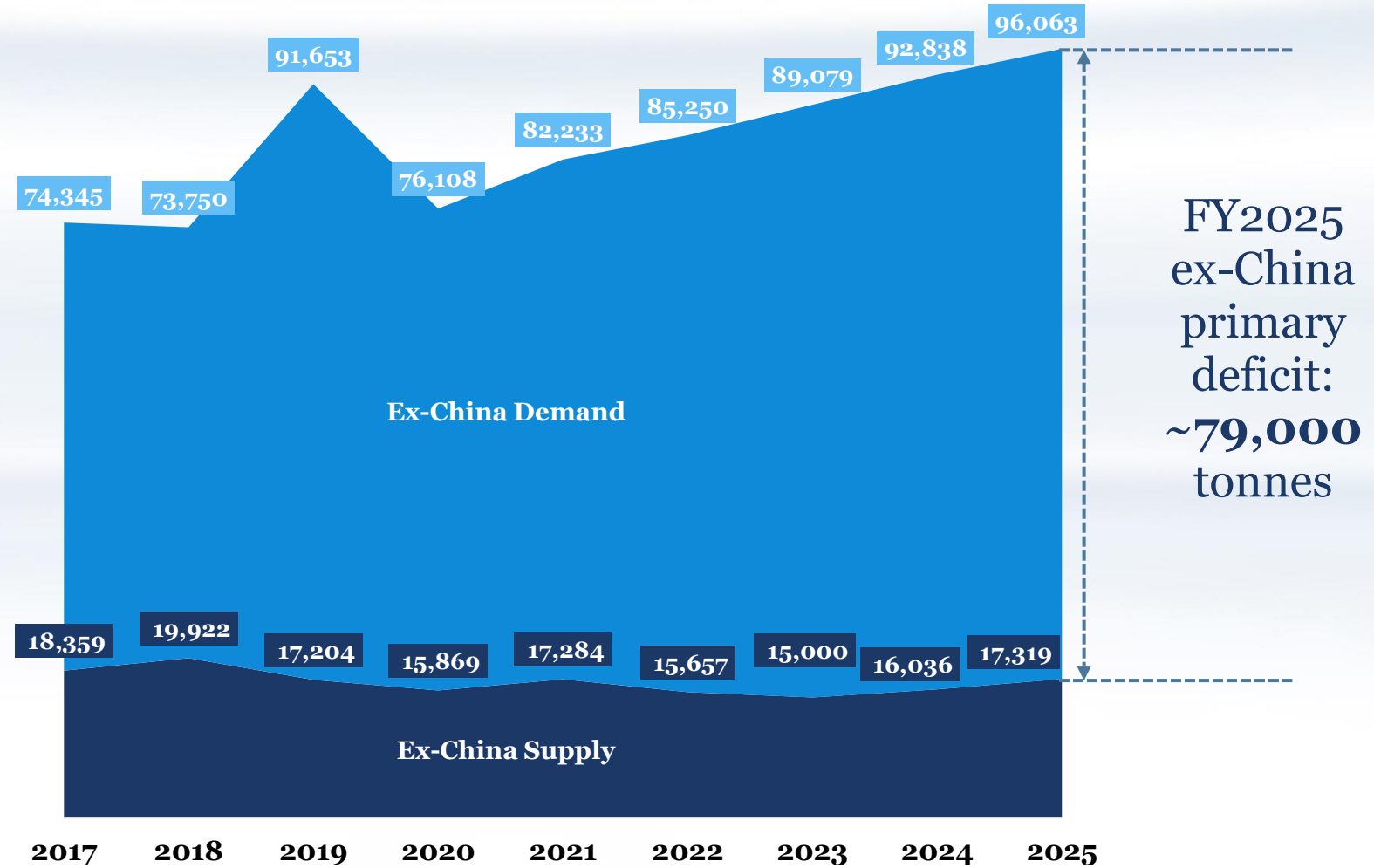


# This results in a growing structural deficit of Tungsten for the rest of the world

## Ex-China Supply Deficit

**80%**  
unmet demand

*Rest-of-the-world's demand would require an additional ~79,000 tonnes in supply<sup>1</sup>.*

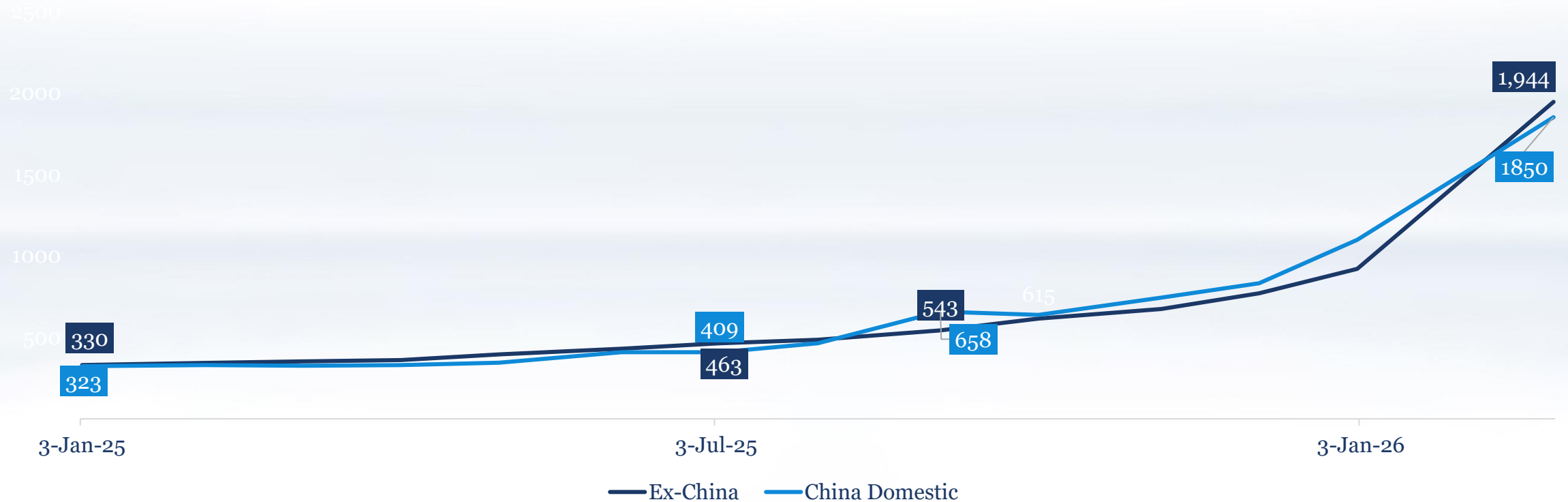




# China has been a net importer of Tungsten concentrate, resulting in a higher global prices, especially in China

China's domestic prices are now broadly aligned with ex-China prices, driven by tightening domestic supply and import pull. Remarkably, even tungsten scrap prices in China have risen above USD 1,600/mtu.

Unit: APT price in \$/mtu





# Today, Tungsten is not just important for industrial customers but is becoming critical for major developed countries...

## Policy-backed demand

# \$12bn commitment<sup>2</sup>

*Critical minerals such as Tungsten are increasingly treated as national-security assets under The U.S. government's List of Critical Minerals and EU's Critical Raw Materials framework.*

### Reuters: China expands key mineral export control after US imposes tariffs

Reuters World Business Markets Sustainability Legal Breakingviews Techno

#### China expands key mineral export controls after US imposes tariffs

By Amy Lv, Lewis Jackson and Ashitha Shivaprasad

February 4, 2025 7:07 PM GMT+7 · Updated 18 days ago



BEIJING, Feb 4 (Reuters) - China said on Tuesday it would restrict exports of five metals used in defence, clean energy and other industries in response to fresh U.S. tariffs, refraining from the outright export bans Beijing has previously used against Washington.

The restrictions were the latest attempt by China since 2023 to leverage its dominance in mining and processing critical minerals used in everything from smartphones and electric car batteries to infrared missiles and ammunition.

Licences will now be required to export 20 tungsten, tellurium, bismuth, indium and molybdenum-related products to "safeguard national security interests", the Commerce Ministry said. Uses for the metals range from solar panels to artillery shells.

### Euronews: EU, US and Japan to cooperate on critical raw materials supply chains

#### EU, US and Japan to cooperate on critical raw materials supply chains

**The joint arrangement will focus on boosting demand and diversifying the supply of critical raw materials by identifying and backing projects in mining, refining, and recycling, all with the goal of reducing reliance on China.**

The European Union is one step closer to agreeing on joint efforts with the United States and Japan to "increase economic security and national security" by securing the supply of critical raw materials, according to a statement.

### Reuters: Australia to create \$1.3 bn fund to invest in Southeast Asian's [infrastructure] projects

#### Australia to create \$1.3 bln fund to invest in Southeast Asian projects

By Lewis Jackson and Renju Jose

March 5, 2024 11:21 AM GMT+8 · Updated a month ago



SYDNEY, March 5 (Reuters) - Australia said on Tuesday it would set up a A\$2 billion (\$1.3 billion) finance facility to boost trade and investment in Southeast Asia as it looks to deepen ties in a region where many are also searching for ways to live with a more assertive China.

The fund will focus on clean energy and infrastructure and provide loans, guarantees, equity and insurance. Australia will also tip in an extra A\$140 million to extend an existing programme which advises the region on infrastructure projects.

### Fortune: New 'Project Vault' critical minerals stockpile is 'first step of many' needed for U.S. to break China's supply-chain chokehold

The plans for the emergency national stockpile of certain critical minerals, announced Feb. 2, comes after the Trump administration already has taken the unusual step of making direct investments in several U.S. and Canadian critical minerals mining and processing companies over the past 10 months.

While supply-chain disruptions began showing up during the COVID-19 pandemic, the beginning of a tariff trade war with China last year triggered the "weaponization" of the dominance it had built up over several decades in critical minerals mining, processing, and magnet-manufacturing supply chains. Specific minerals, especially the 17 rare earths metals, are vital to manufacturing everything from military equipment to cars to high-powered computing and data centers, said Charles Boakye, energy sustainability and transition analyst at Jefferies.



... and they will need to buy in the market for their stockpiles.

Developed nations have committed investment in critical mineral

**\$12bn**

Project Vault



**\$3.5bn**

RESourceEU



**\$1.2bn**

Critical Minerals Strategic Reserve



# Why Masan High-Tech Materials? (UpCOM: MSR)

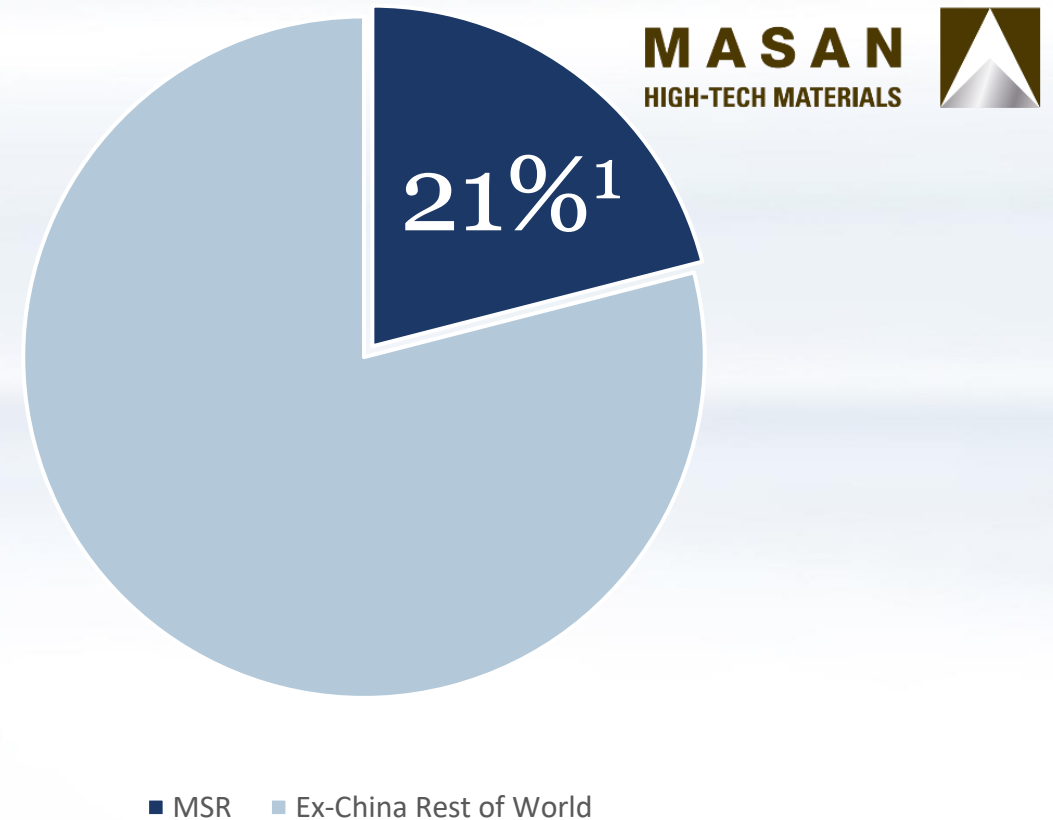




# Why Masan High-Tech Materials (UpCOM: MSR)?

MSR has dominant market share of Tungsten's ex-China global supply market

Masan High-Tech Materials is the world's **strategic tungsten supplier.**



(1) Based on average of FY2020 – FY2025.



# MSR is the only scaled, ready-built ex-China tungsten platform

**M A S A N**  
HIGH-TECH MATERIALS



## Resource

### Nui Phao Mining Company ("NPMC")

- Largest ex-China Tungsten mine
- **Main ore:** Tungsten concentrate
- **Byproduct:** Fluorspar, Copper, Bismuth



Tungsten concentrate



Fluorspar



Copper



Bismuth

## Processing

### Masan Tungsten Ltd Co ("MTC")

- Processing tungsten concentrate into tungsten chemical (APT & oxide)
- **9,345 tonnes p.a. capacity**
- **Flexible feed:** own ore from NPMC + third-party concentrates



APT<sup>1</sup>



YTO<sup>2</sup>



BTO<sup>3</sup>

## Products

### Applications:

- AI application (chip making/ semiconductor),
- Data centers
- Defense
- Mobility/EV and Energy.



Integrated supply chain enables **security of supply, customer retention, and better margin control** versus standalone miners.

**Note:** (1) APT: Ammonium Paratungstate; (2) YTO: Yellow Tungsten Oxide; (3) BTO: Blue Tungsten Oxide  
Masan Group ("MSN") has 95% ownership of Masan High-Tech ("MSR"), which owns 100% of NPMC and MTC



# MSR owns the largest ex-China tungsten mine, Nui Phao Mine

## Nui Phao mine's overview

10+  
years

*Operating since  
2014*

Up to  
3.5m  
tonnes p.a.

*Mining capacity*

94%

*Plant availability*

4 in 1

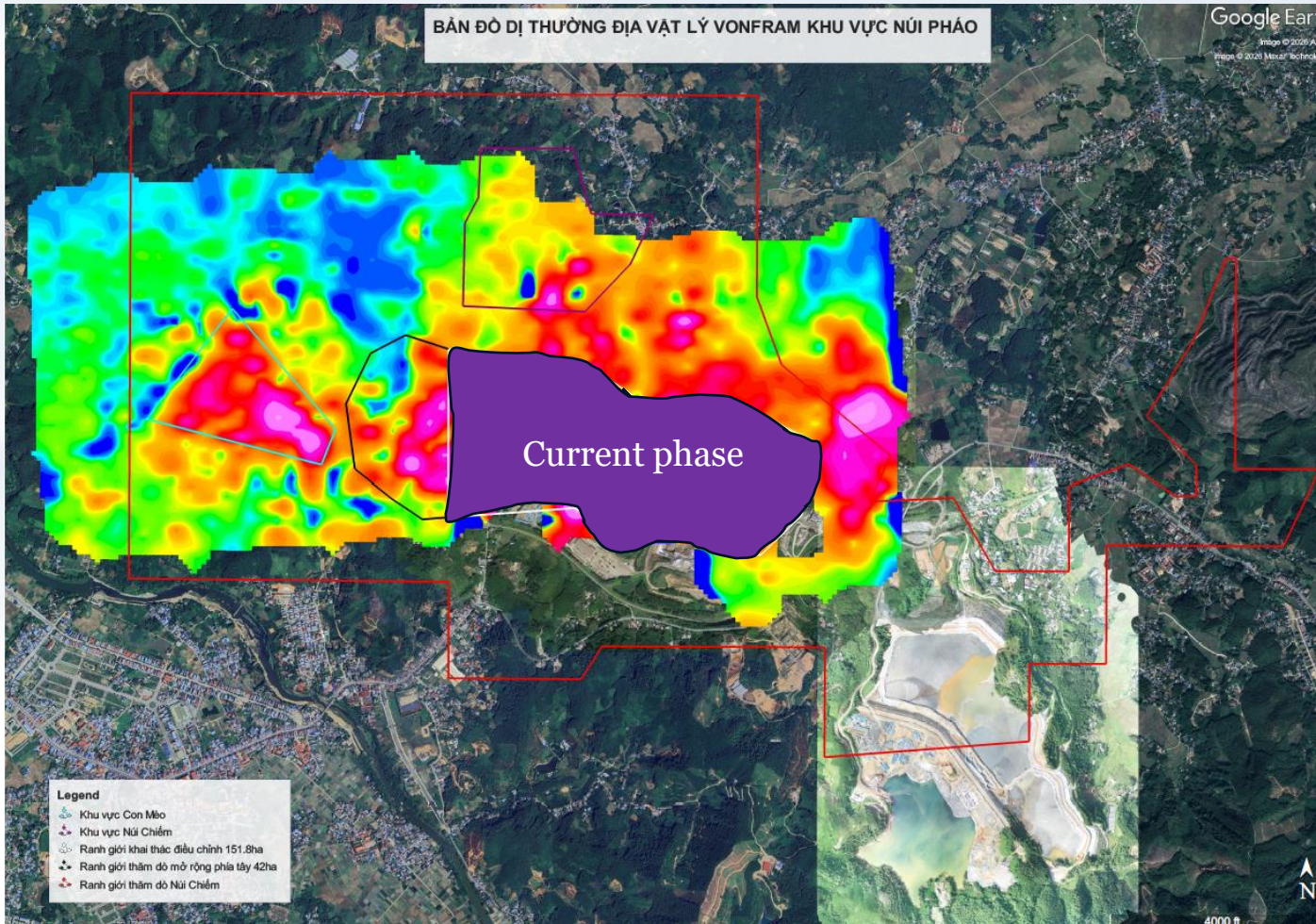
*Polymetallic*





# Our mine life and plans for extension make us a trusted long-term supplier for the world

Nui Phao has 9.21 km<sup>2</sup> of high-density tungsten–polymetallic mineralization, supporting near-term and long-term resource upside



## 1) Proximal ore bodies for multi decades of explorations<sup>1</sup>

- **Nui Phao expansion:** 42.9ha with a potential reserve of 55 million tons
- **Proximal areas:** potentially sufficient for more than 10 years of exploration

## 2) Supportive legal framework

- The amended 2025 Law on Geology and Minerals prioritizes deeper exploration and the expansion of mining boundaries for intercalated and satellite mineral deposits.
- The master plan for Nui Phao area has been approved by the prime minister

## 3) High barrier-to-entry

- MHT has invested \$730mn of capex for the production facilities in Nui Phao area, thus replacing MHT is not economically viable

(1) Based on appendix 01 of the decision no 2581/QĐ/TTg dated on 24 November 2025



# We have already invested \$700m+ and have been operating for more than a decade

## Mining & Processing facility



- Capital invested (Capex): US\$630 million
- Milling capacity: up to 3.8 million tpa
- Availability: ~94%
- Output: Polymetallic ore (Tungsten, Fluorspar, Copper, Bismuth)

## Refinery facility



- Capex invested (Capex): US\$100 million
- Processing capacity: 9,345 tpa
- Feed flexibility: Nui Phao's internal + external tungsten concentrates
- Output: APT & oxides (BTO, YTO)

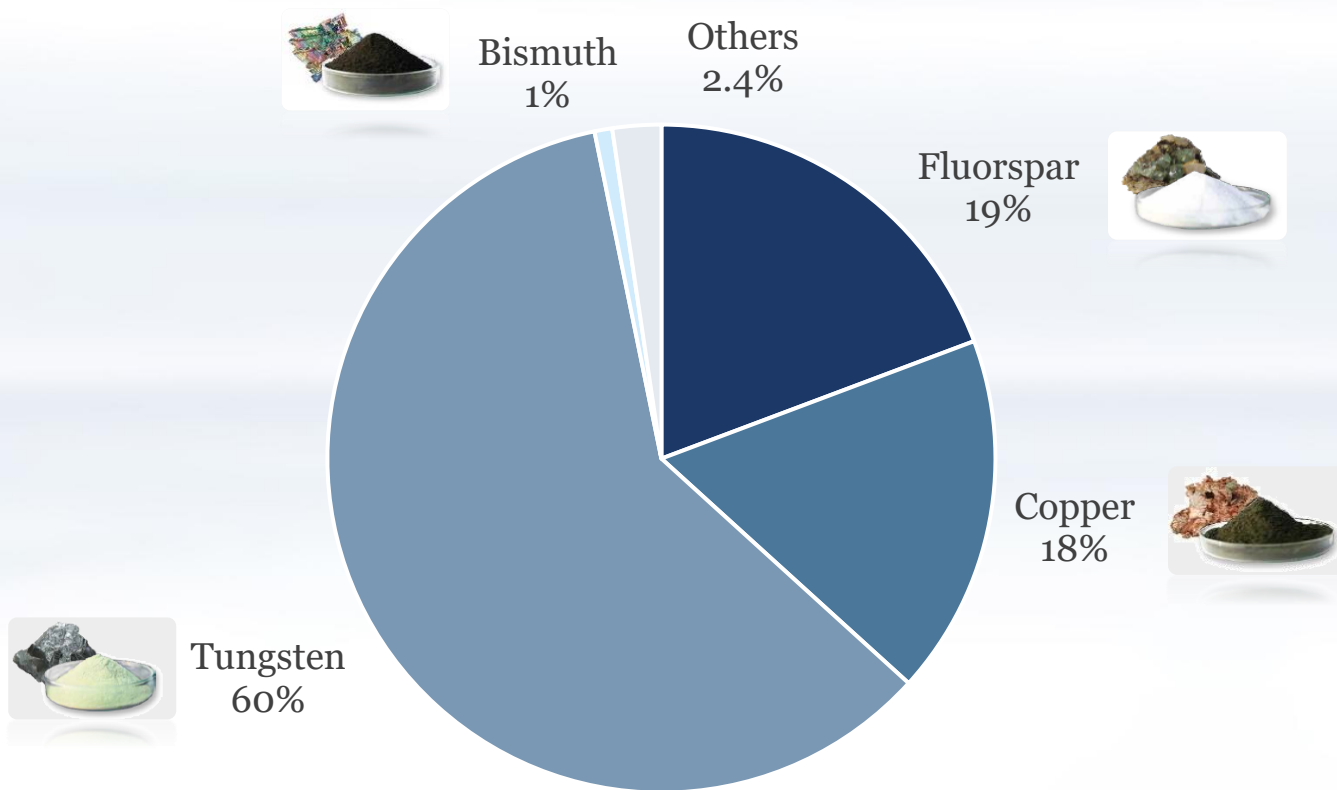


# Our ore produces 3 other critical minerals, providing a competitive cost structure

The 4-in-1 polymetallic ore allows...

... benefits tungsten concentrate unit production cost<sup>2</sup>

MSR polymetallic revenue mix<sup>1</sup> (%)



■ Unit cost of Tungsten  
 ■ Unit cost of Tungsten offset by polymetal byproducts

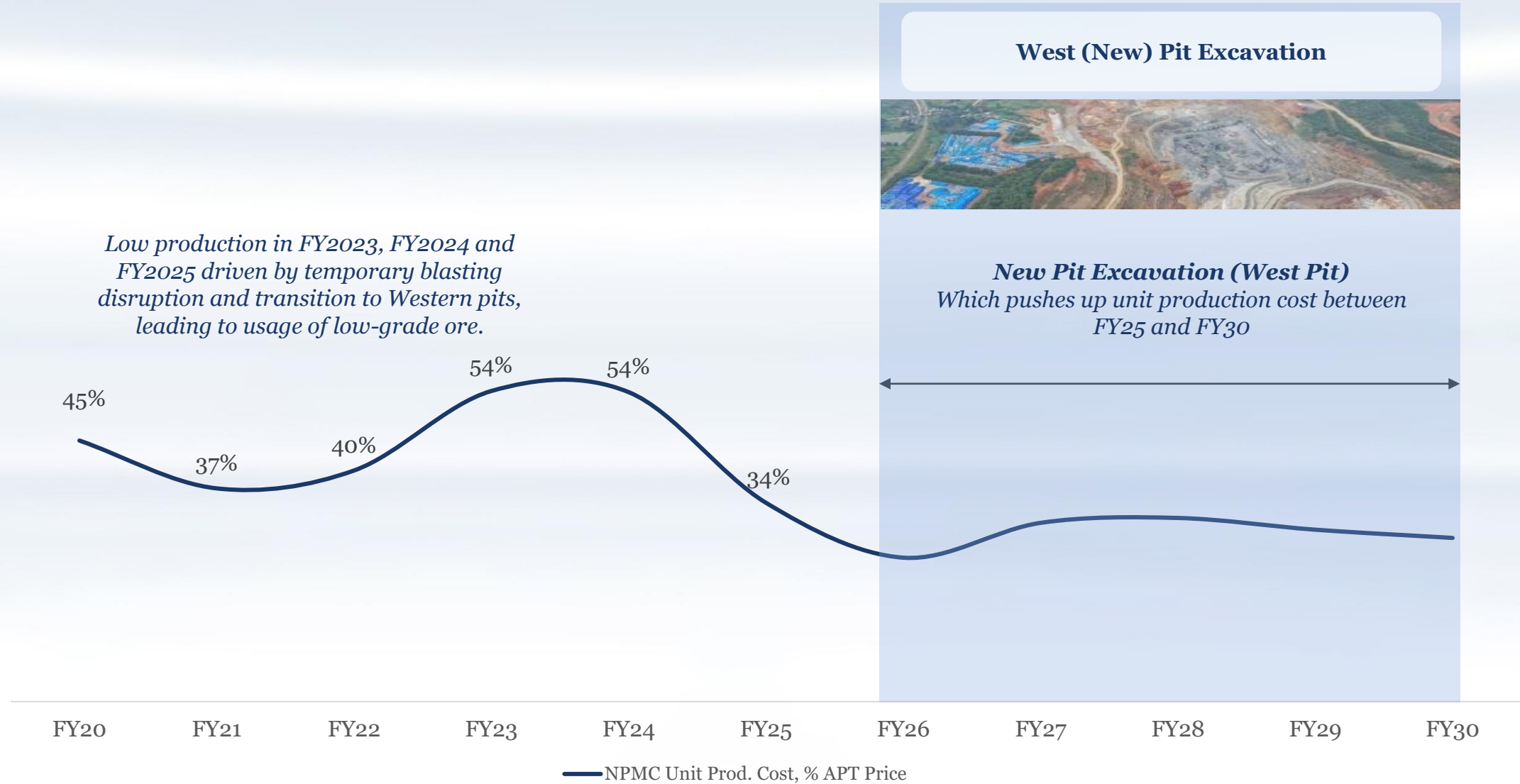
**▲ 25%**  
 Tungsten's profit margin uplift<sup>1</sup>

(1) This FY2025 figures  
 (2) Based on NPMC historical data from FY2020 – FY2025.  
 (3) Based on APT price of \$1,500/mtu.



# Cost advantage further widens profit margin through the life of mine

Unit Production Cost<sup>1</sup> of Tungsten Concentrate  
(% APT Market Price)



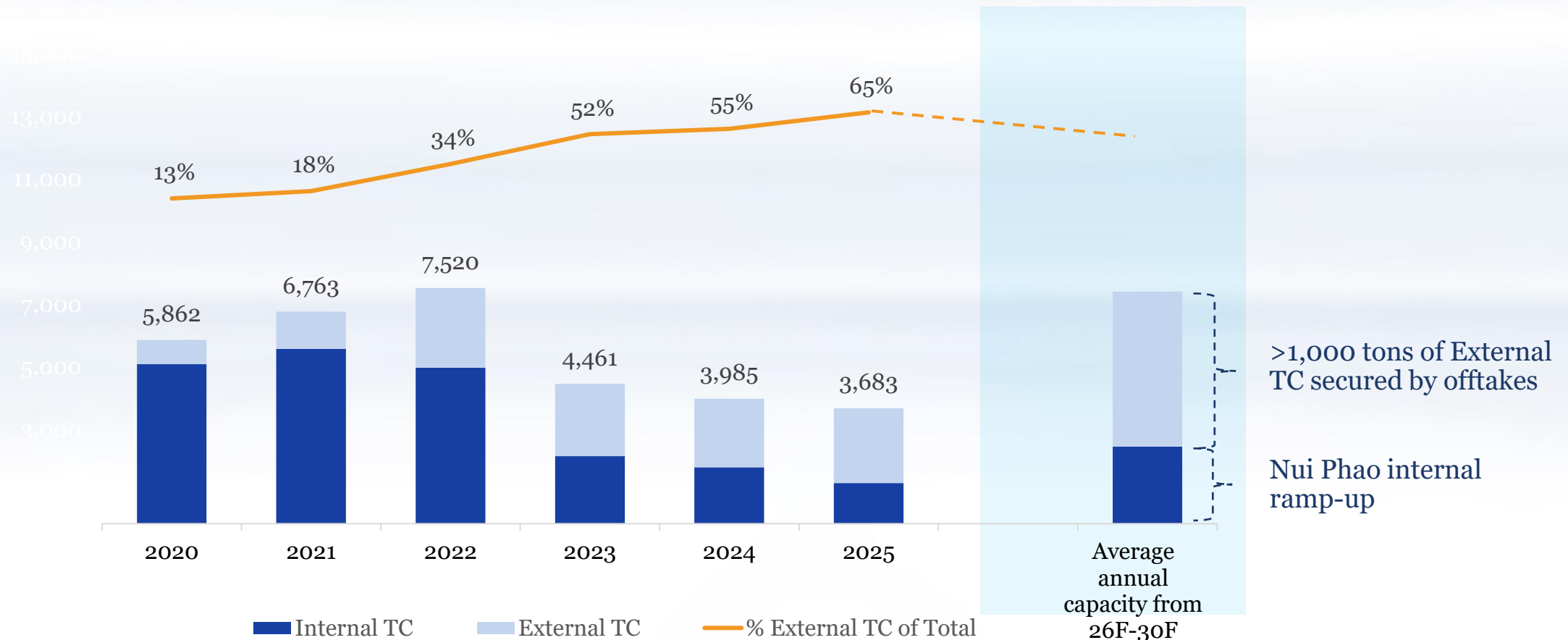
(1) TC Unit Production Cost from NPMC is calculated based on Tungsten-Equivalent-Unit (TEU) approach taking into account other auxiliary metals mined at Nui Phao mine. The APT price is conservatively assumed at \$1,500/mtu compared to \$2,000/mtu market price in Feb 2026



# In addition to internal TC, MSR procures external TC to stabilize operation

## Internal and external Tungsten Concentrate (“TC”) sourcing mix

Unit: in tons (left-hand), in % (right-hand)



Note: 2026F – 2030F average annual capacity forecast is based on internal management forecast. Subject to change by market conditions and Nui Phao pipeline.



# MSR is a trusted supplier in the global marketplace



MHT is qualified and trusted by Tier 1 global customers



# ESG pillar amplifies the sustainable growth of MSR

## Sustainable mining and processing

Recovery rate improvement, resource optimization



## Circular economy

**~79.5% (8.3 million m<sup>3</sup>)**

Total water use from recycled sources

**Net Zero** by 2050



## Environmental sustainability

ISO 50001:2018 & ISO 14001:2015

**63.9ha**

Land at the Nui Phao Mine replanted and rehabilitated



## Social responsibility

**VND 1,028 billion (2025)**

Contribution to the State Budget, #1 in Thai Nguyen Province

**VND30 billion/year**

To support the development of local communities

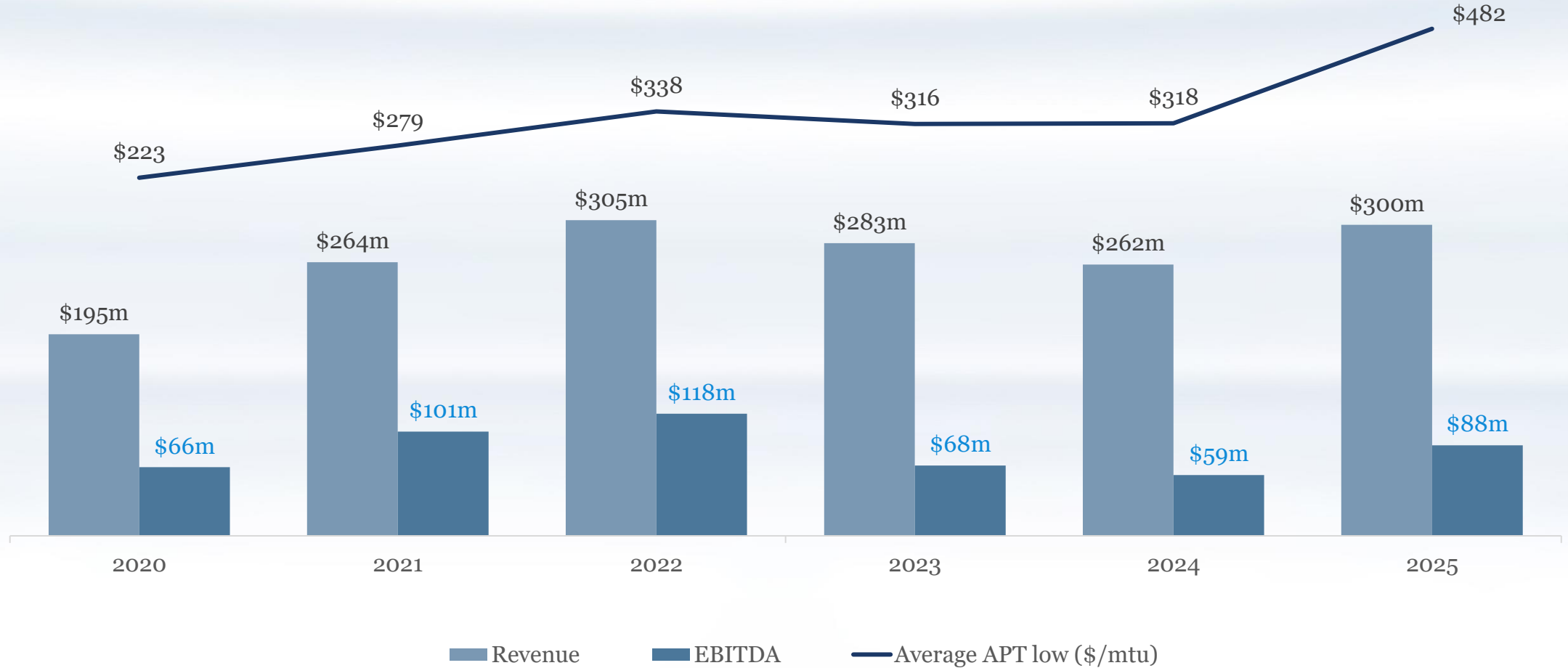


What does this mean  
for MSR's investors?





# MSR is inherently a strong EBITDA generator, constrained primarily by high financing costs



Note: Numbers excluding HCS



# Now, Tungsten prices have since multiplied...

The 2026 plan is based on an APT price of USD 1,164/mtu, while current prices are ~USD 3,200/mtu



## Sensitivity table<sup>1</sup>

	2026F management's guidance	2026F at ~\$1,500/mtu	2026F at ~\$3,000/mtu
<b>Implied APT price</b>	\$1,164/mtu	\$1,538/mtu (▲ ~30%)	\$2,663/mtu (▲ ~130%)
<b>2026F Revenue</b>	\$598m-\$759m	~\$900m (▲ ~20%-50%)	~\$1,400m (▲ ~90%-135%)
<b>2026F NPAT</b>	\$64m-\$93m	~\$120m (▲ ~26%-85%)	~\$220m (▲ ~130%-220%)

Note: The sensitivity is assumed steady volumes/utilization, constant product mix and costs; excludes FX, working capital, and one-offs. FY26 APT Price Assumptions from April onwards



## ...enable earning inflections and deleveraging for MHT

MSR's projected financial performance in FY2026 at APT price of \$1,160/mtu

**FY2026F  
Revenue**

**\$759m**

**FY2026F  
NPAT**

**\$93m**

**FY2026F  
Net debt/EBITDA**

**1.7X**




# MSR delivered record results in Q1 2026, exceeding its full-year 2025 profit...

MSR's financial performance in Q1'FY26

Profit & Loss	31/03/2025 (\$m)	31/03/2026 (\$m)	Y-o-Y Change (%)
Net Revenue	52.1	111.9	115%
Cost of Sales	(46.6)	(77.6)	67%
<b>Gross Profit</b>	5.5	34.3	<b>526%</b>
<i>Gross Profit Margin</i>	11%	31%	
Net Operating Profit / (Loss)	(7.0)	22.2	N/A
<b>Net Profit / (Loss) After Tax</b>	<b>(8.3)</b>	20.1	N/A

 **115%** YoY  
1Q26 Revenue increased to **\$112m**

 **154%** YoY  
1Q26 EBITDA increased to **\$39m**


 **\$28m** YoY  
1Q26 NPAT increased to **\$20m**



# The Company's cash flow and balance sheet have strengthened significantly

MSR's financial performance in Q1'FY26

Balance Sheet		31/03/2026 (\$m)
<b>Current Assets</b>		
Cash and Cash Equivalents		27.4
Short-Term Financial Investments <sup>(1)</sup>		69.5
Accounts Receivable		82.0
Inventories		137.5
Other Current Assets		33.9
<b>Total Current Assets</b>		<b>350.2</b>
<b>Long Term Assets</b>		
Fixed Assets		521.2
Long Term Work in Progress		5.2
Accounts Receivable		43.2
Other Long-Term Assets		143.1
<b>Total Long-Term Assets</b>		<b>712.6</b>
<b>Total Equity</b>		<b>475.6</b>
<b>Cash Flow</b>		
	1Q25 (\$m)	1Q26 (\$m)
FCFF	(0.5)	40.1

 **3.5x**  
Net leverage improved from 4.8x at the end of 2025

 **\$46m**  
1Q26 Operating Cash Flow compared to negative Operating Cash Flow in 1Q25

 **\$40m**  
1Q26 Net Cash Flow compared to negative Net Cash Flow in 1Q25



# MSR currently trades below international peers

						
<b>Market Cap<sup>1</sup></b>	\$1.9bn	\$5.7bn	\$7.1bn	\$1.1bn	\$12.7bn	\$10.7bn
<b>TTM Revenue</b>	\$281mn	\$22mn	\$16mn	\$43mn	\$369mn	\$224mn
<b>TTM NPAT<sup>2</sup></b>	\$0.4mn	(\$47mn)	(\$15mn)	(\$26mn)	\$5.2mn	(\$85.9)
<b>Forward P/E</b>	8x <sup>3</sup>	51x	29x	n/a	54x	171x

(1) As of Mar 2026

(2) Source: Latest reported figures as per Bloomberg

(3) MHT's 2026 NPAT are estimated at \$220mn (APT price: \$3,000/mtu)



# Based on current outlook, the foundation is in place for strong value creations and cash dividends

**Higher  
EBITDA  
margin**

*MSR's profitability is expected to improve significantly, driven by higher APT prices, the ramp-up of new reserves, and improved production cost efficiency*

**Lower  
leverage**

*MSR's earning inflection, combined with limited capex requirement, will generate sustainable cash flow for deleveraging by 2027-28...*

**Dividend**

*...and eventually, unlock dividend from 2028 onwards.*

**Strategic  
partners  
and/or  
IPO**

*MSR is exploring multiple strategic options for partnerships and listing on the HOSE/overseas exchange to realize value for all stakeholders*



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