

# CRITICAL MATERIALS FOR A SUSTAINABLE PLANET

Investor Presentation | Company Description 2023

AMG ADVANCED METALLURGICAL GROUP N.V.



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# AMG: A CRITICAL MATERIALS COMPANY

## GLOBAL TRENDS

CO<sub>2</sub> emission reduction, circular economy, population growth, increasing affluence, and energy efficiency

## DEMAND

Innovative new products that promote CO<sub>2</sub> reduction, including materials with higher energy density and higher temperature resistance, as well as products that are lighter and stronger than competing materials

## SUPPLY

AMG sources, upgrades, purifies, and supplies the critical minerals that the market demands



# AMG PROVIDES CRITICAL MATERIALS AND RELATED PROCESS TECHNOLOGIES TO ADVANCE A LESS CARBON-INTENSIVE WORLD

## A GLOBAL IMPERATIVE FOR THE 21<sup>ST</sup> CENTURY

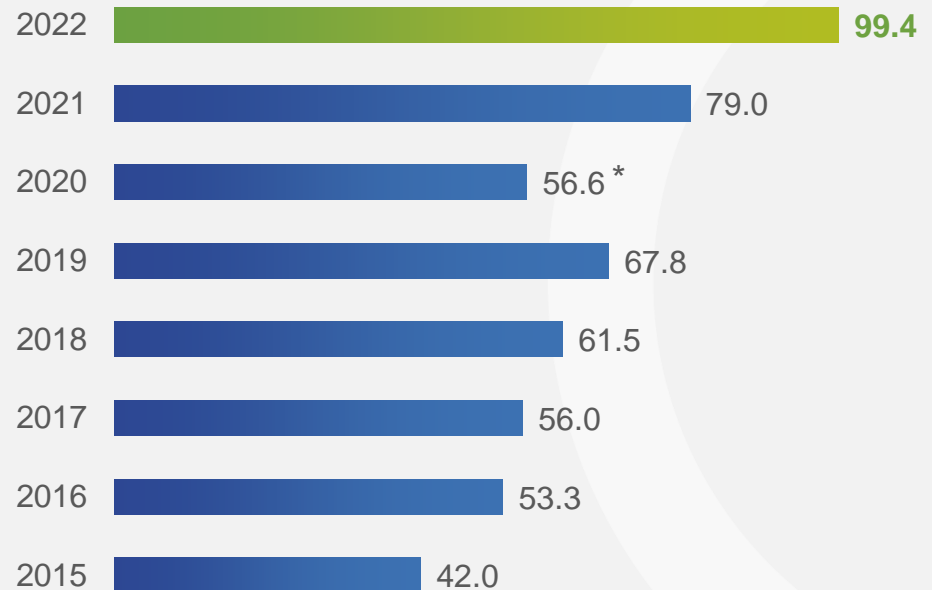
### AMG: ENABLING TECHNOLOGIES

Products and processes saving CO<sub>2</sub> emissions during use (e.g., light-weighting and fuel efficiency in the aerospace and automotive industries)

### AMG: MITIGATING TECHNOLOGIES

Products and processes saving raw minerals, energy and CO<sub>2</sub> emissions during manufacturing (e.g., recycling of ferrovandium)

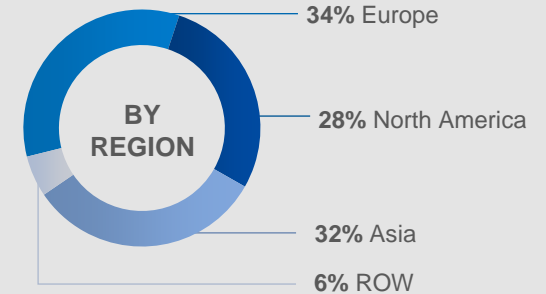
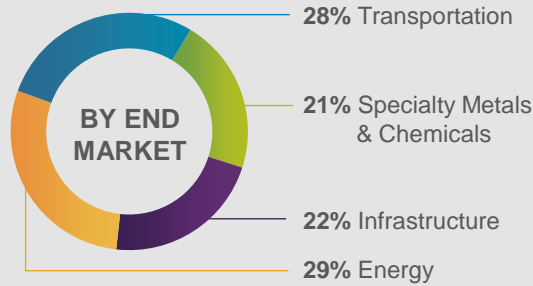
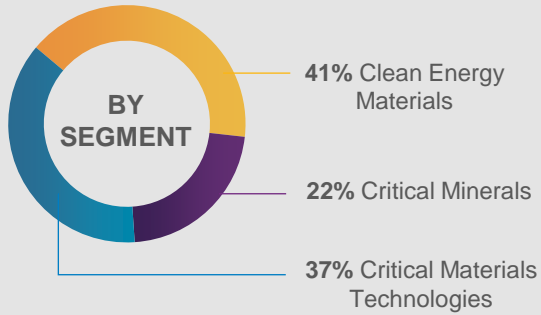
## AMG'S ENABLED CO<sub>2</sub> EMISSION REDUCTIONS (Million MT)



\* 2020 decrease due to the global pandemic significantly impacting volumes in our aerospace exposed businesses

# AMG AT A GLANCE

## FY 2022 REVENUE



AMG IS A GLOBAL SUPPLIER OF CRITICAL MATERIALS TO:



ENERGY



TRANSPORTATION



INFRASTRUCTURE



SPECIALTY METALS AND CHEMICALS

Market leading producer of critical materials and related process technologies

**~3,400**  
Employees

**~\$1.6 billion**  
Annual Revenues

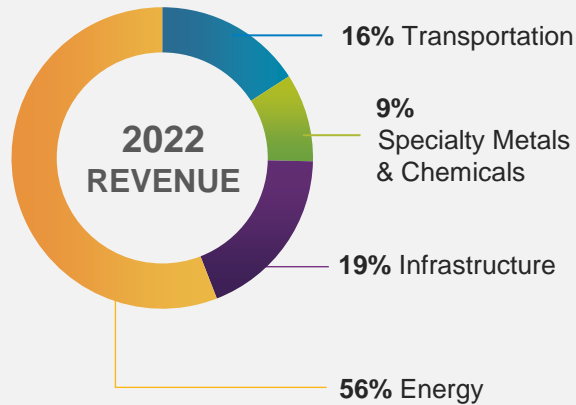
At the forefront of  
**CO<sub>2</sub> Reduction**

# AMG BUSINESS SEGMENTS

## AMG CLEAN ENERGY MATERIALS

AMG's mining and recycling business

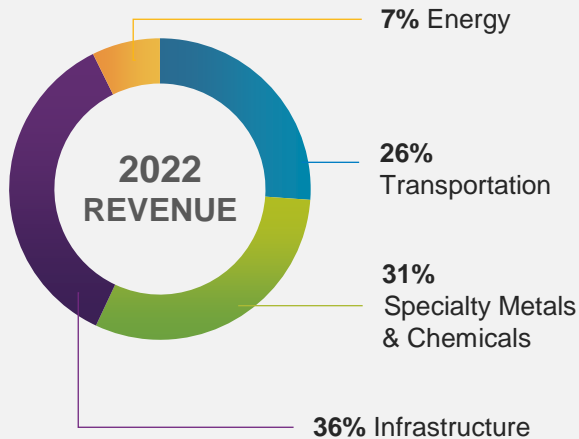
- Vanadium
- Mineração (Tantalum & Lithium)
- Aluminum (Master Alloys)



## AMG CRITICAL MINERALS

AMG's conversion and mining business

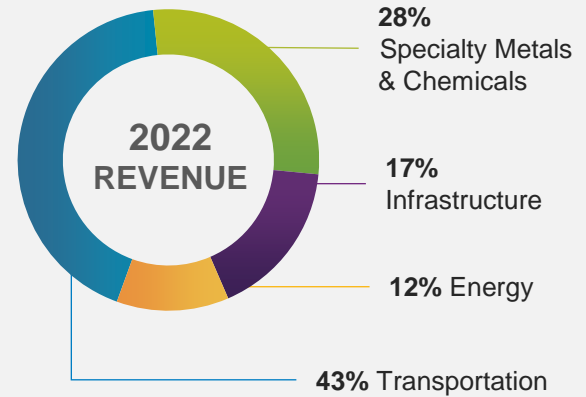
- Silicon Metal
- Graphite
- Antimony



## AMG CRITICAL MATERIALS TECHNOLOGIES

AMG's titanium, vacuum systems and services business

- Titanium
- Furnaces
- Heat treatment services
- Chrome Metal



# STRONG FUNDAMENTALS, ADAPTIVE TO GLOBAL DISRUPTION

## OPTIMIZED CAPITAL STRUCTURE

- In November 2021, AMG entered into a new \$350 million 7-year senior secured term loan B facility (“term loan”) and a \$200 million 5-year senior secured revolving credit facility (“revolver”). The total facility amount of \$550 million replaced AMG’s prior credit facility and extended the term loan maturity from 2025 to 2028 and revolver maturity from 2023 to 2026.
- AMG Engineering entered into €140 million of long-term bilateral unsecured performance-based guarantee facility agreements in January 2022, which replace the existing ones.
- On July 11, 2019, the Company entered into a \$307 million 30-year term municipal bond which finances 100% of the ferrovanadium expansion in Zanesville, Ohio. The bond has a coupon rate of 5.0% and matures on July 1, 2049.

## BUSINESS RESILIENCE

- Focus on operational efficiency
- Reduction of operating costs and capital expenditures
- Momentum on positive business gains, strong backlogs into early 2023

## DISCIPLINED APPROACH TO GROWTH

- AMG Brazil’s spodumene production expansion will solidify AMG’s low-cost position
- AMG Lithium’s refinery, under construction in Germany, is Europe’s first lithium hydroxide refinery
- New vanadium spent catalyst recycling facility in Ohio is a clear manifestation of AMG’s industry leadership in the recycling of hazardous refinery waste globally

○ The fundamental positions of our businesses are sound, and **AMG remains focused on disciplined, sustainable growth**

# STRATEGY

AMG's strategy is to build its critical materials business through industry consolidation, process innovation and product development

## EXPANSION OF EXISTING HIGH-GROWTH BUSINESSES

Pursue opportunities in high-growth areas within the existing product portfolio

## PROCESS INNOVATION & PRODUCT DEVELOPMENT

Continue to focus on process innovation and product development to improve the market position of AMG's businesses

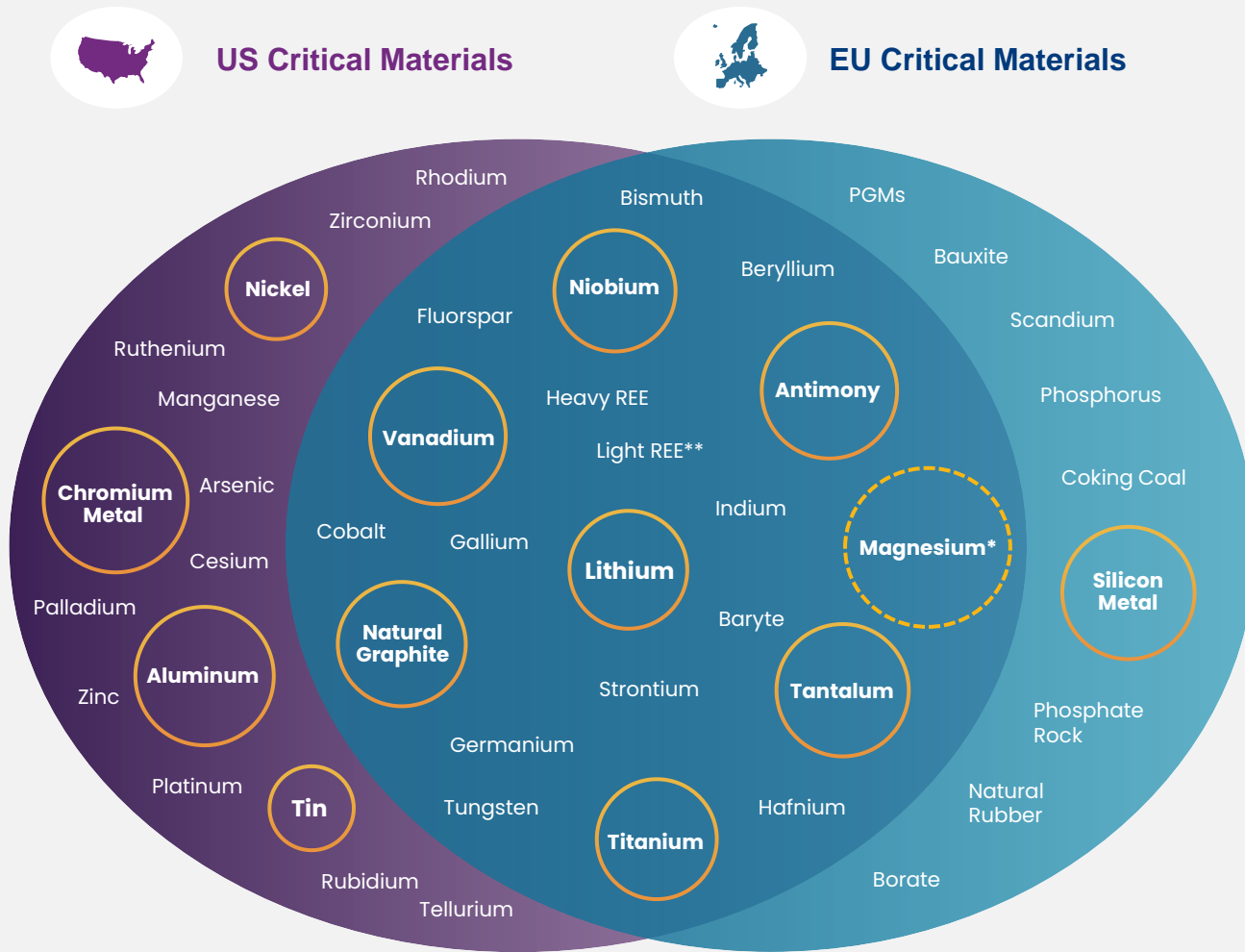
## INDUSTRY CONSOLIDATION

Pursue opportunities for horizontal and vertical industry consolidation across AMG's critical materials portfolio

—○ AMG's overriding strategic objective is to **achieve industry leadership** while being the **low-cost producer**



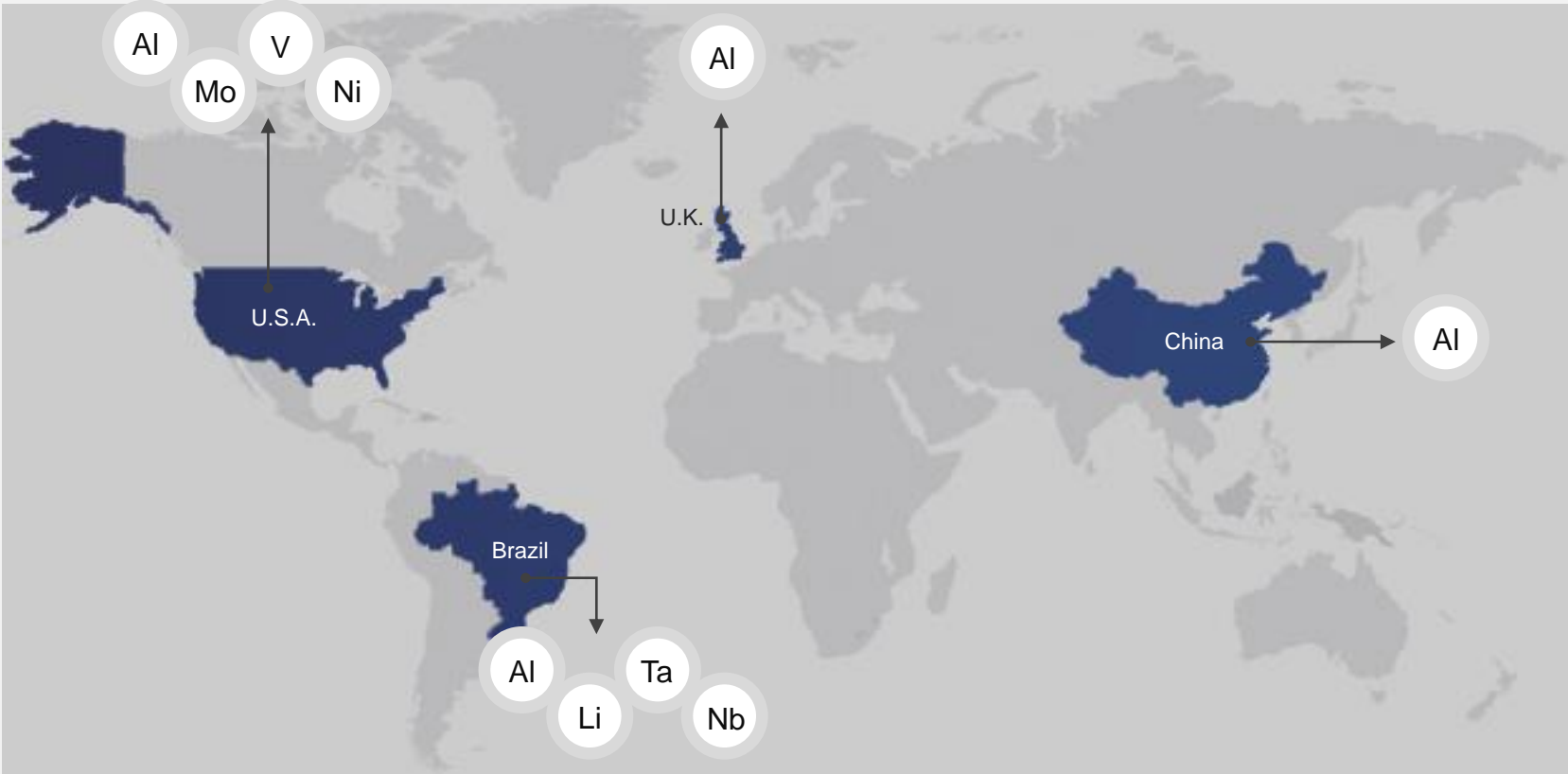
# CRITICAL RAW MATERIALS: AMG PRESENCE



- AMG has a unique critical materials portfolio comprised of 9 EU critical materials and 12 US critical materials
- The EU identifies 30 total critical raw materials, the US 50\*\*

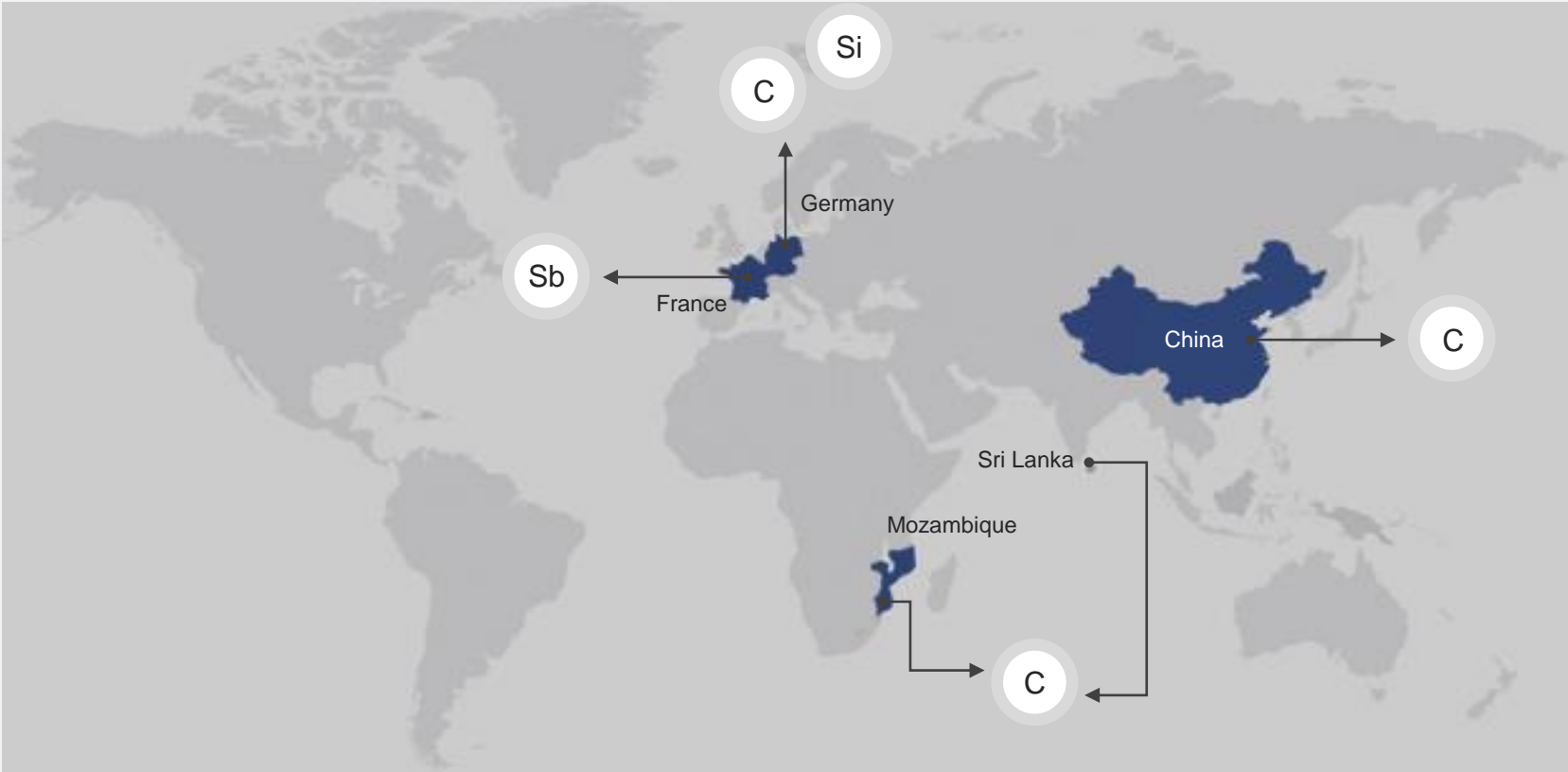
Sources: The 2020 EU Critical Raw Materials List, published September 2020; and the U.S. list of Critical Materials per the February 2022 notice by the Secretary of the Interior, acting through the Director of the U.S. Geological Survey  
 \*AMG possesses technology license patent for production of Magnesium products; \*\*US list includes the rare earth elements except for Promethium

# AMG GLOBAL FOOTPRINT: CLEAN ENERGY MATERIALS



- Al Aluminum Master Alloys, Aluminum Powders
- Mo Molybdenum
- V FeV
- Ni Nickel
- Nb Niobium
- Li Lithium
- Ta Tantalum

# AMG GLOBAL FOOTPRINT: CRITICAL MINERALS

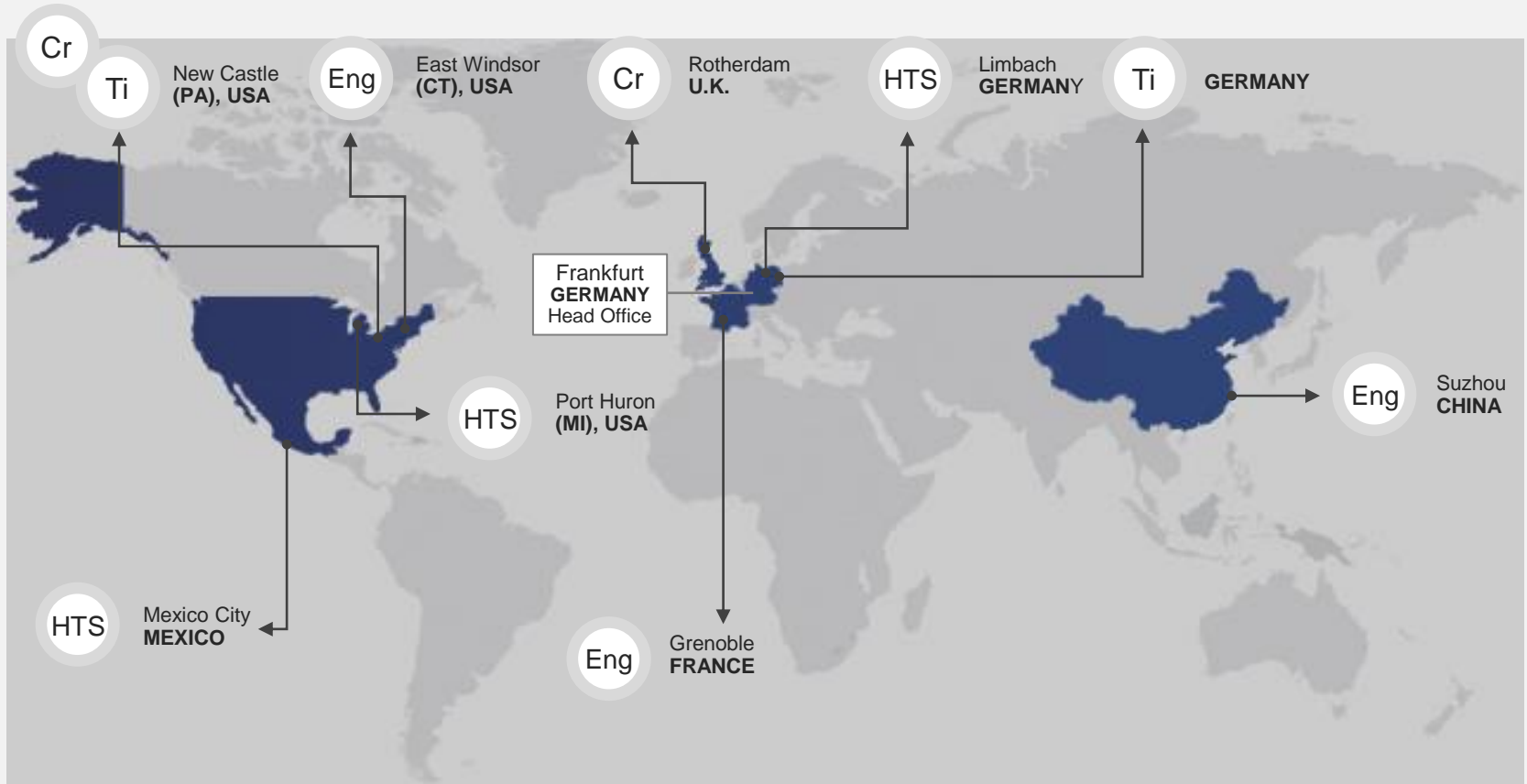


**Sb** Antimony

**C** Natural Graphite

**Si** Silicon Metal

# AMG GLOBAL FOOTPRINT: CRITICAL MATERIALS TECHNOLOGIES



Ti Titanium

Eng Engineering

HTS Heat Treatment Services

Cr Chromium Metal


# HEALTH AND SAFETY FOCUS



## Safety Indicators

AMG compares itself to the industry average for Primary Metal Manufacturing (NAICS 331).

The most recent data provided in 2021 by the United States Bureau of Labor Statistics reports that the Primary Metal Manufacturing industry's total recordable case rate was **4.1** and the lost time rate was **1.2**.





YEAR	LOST TIME INCIDENTS IN THE LAST 12 MONTHS	12 MONTH AVERAGE LOST TIME INCIDENT RATE	12 MONTH AVERAGE TOTAL INCIDENT RATE
2021	11	0.39	1.08
2022	14 	0.46 	0.95 













AMG outperformed the NAICS 331 benchmark by 77% for recordable rate and by 62% for lost time rate.



















# CLEAN ENERGY MATERIALS – MARKET TRENDS

CRITICAL MINERALS	MAJOR END MARKETS	MARKET TRENDS	MAJOR CUSTOMERS
<p><b>AMG VANADIUM</b> FERROVANADIUM FERRONICKEL- MOLYBDENUM</p>	<p><b>INFRASTRUCTURE</b></p>	<p><b>INFRASTRUCTURE GROWTH</b> <b>VANADIUM REDOX FLOW BATTERIES</b></p>	<p><b>NUCOR</b> <b>GO GERDAU</b></p>
<p><b>AMG BRAZIL</b> TANTALUM &amp; NIOBIUM</p>	<p><b>MICRO CAPACITORS, SUPERALLOYS</b></p>	<p><b>COMMUNICATIONS &amp; ELECTRONICS</b> <b>FUEL EFFICIENCY</b></p>	<p><b>ATI</b> <b>H.C. Starck</b> <b>TANiOBIS</b> <small>inspiring metal evolution</small></p>
<p><b>AMG LITHIUM</b> LITHIUM CONCENTRATE (SPODUMENE)</p>	<p><b>BATTERIES</b></p>	<p><b>RENEWABLE ENERGY</b> <b>COMMUNICATIONS &amp; ELECTRONICS</b></p>	<p><b>GENERAL LITHIUM</b></p>
<p><b>AMG ALUMINUM</b> ALUMINUM MASTER ALLOYS ALUMINUM POWDERS</p>	<p><b>AEROSPACE, AUTOMOTIVE</b></p>	<p><b>FUEL EFFICIENCY</b></p>	<p><b>Constellium</b> <b>ALCOA</b> <b>RioTinto</b></p>
<p> <b>ENERGY</b></p>	<p> <b>TRANSPORTATION</b></p>	<p> <b>INFRASTRUCTURE</b></p>	<p> <b>SPEC. METALS AND CHEM.</b></p>

# CRITICAL MINERALS – MARKET TRENDS

CRITICAL MINERALS	MAJOR END MARKETS	MARKET TRENDS	MAJOR CUSTOMERS
<b>AMG GRAPHITE</b> NATURAL GRAPHITE	<b>EXPANDED POLYSTYRENE (EPS), BATTERY ANODES</b>	<b>ENERGY SAVING</b> <b>ENERGY STORAGE</b>	 
<b>AMG ANTIMONY</b> ANTIMONY TRIOXIDE ANTIMONY MASTERBATCHES ANTIMONY PASTES	<b>FLAME RETARDANTS</b>	<b>PLASTICS</b>	 
<b>AMG SILICON</b> SILICON METAL	<b>ALUMINUM ALLOYS, SOLAR</b>	<b>FUEL EFFICIENCY</b> <b>CLEAN ENERGY</b>	 
 ENERGY	 TRANSPORTATION	 INFRASTRUCTURE	 SPEC. METALS AND CHEM.

















# CRITICAL MATERIALS TECHNOLOGIES – MARKET TRENDS

CRITICAL MINERALS	MAJOR END MARKETS	MARKET TRENDS	MAJOR CUSTOMERS
<b>AMG TITANIUM</b> TITANIUM ALLOYS	<b>AEROSPACE</b>	<b>FUEL EFFICIENCY</b> <b>ENERGY SAVING</b>	 
<b>AMG ENGINEERING</b> CAPITAL GOODS (VACUUM FURNACES)	<b>AEROSPACE,                      AUTOMOTIVE</b>	<b>FUEL EFFICIENCY</b> <b>ELECTRONICS</b>	   
<b>AMG ENGINEERING</b> VACUUM HEAT TREATMENT SERVICES	<b>AEROSPACE,                      AUTOMOTIVE</b>	<b>FUEL EFFICIENCY</b>	  
<b>AMG CHROME</b> CHROMIUM METAL	<b>AEROSPACE,                      DISTRIBUTED ENERGY,                      FUEL CELLS</b>	<b>FUEL EFFICIENCY</b>	  
 ENERGY	 TRANSPORTATION	 INFRASTRUCTURE	 SPEC. METALS AND CHEM.

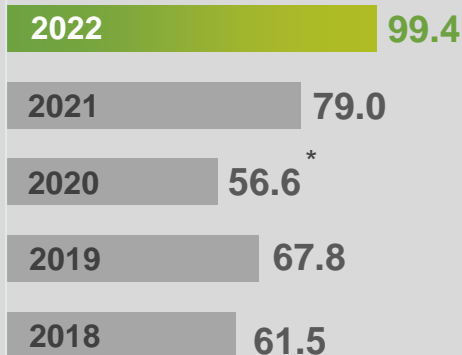
# ECO<sub>2</sub>RP IS THE PORTFOLIO OF AMG'S PRODUCTS ENABLING CO<sub>2</sub> REDUCTION

## Strict selection criteria

Products are accepted in **ECO<sub>2</sub>RP** only when the **enabled CO<sub>2</sub> reduction** effect has been established by an LCA performed by a leading third-party expert

 71.77	1	<b>Thermal barrier coatings, enabling fuel savings</b> through higher operating temperatures in aircraft engines	
 1.96	2	<b>Aluminum alloys, enabling reduced fuel consumption</b> by light weighting	
 6.43	3	<b>Light weighting leading to fuel savings</b>	
 2.86	4	<b>Ferrovandium</b> , alloy for rebar steel, reducing quantity required for construction, and mitigation from recycling	
 1.28	5	<b>Graphite</b> , as insulation in buildings, <b>enabling</b> lower domestic heating requirements	
 0.06	6	<b>Turbocharger wheel casting</b> , turbochargers in vehicle engines <b>enable</b> engine downsizing fuel efficiency	
 0.02	7	<b>Glass coating, enabling lower cooling requirements</b>	
 8.78	8	<b>Automotive transmission heat treatment, enabling vehicle fuel savings</b>	
 6.03	9	<b>Titanium aluminides, enabling fuel savings</b> and use of hotter temperatures	
 0.24	10	<b>Nickel based super alloys, recycling production scrap</b> instead of primary mining	
 0.03	11	<b>Vanadium Pentoxide (V<sub>2</sub>O<sub>5</sub>)</b>	
 0.01	12	<b>Microsilica</b>	

AMG'S enabled CO<sub>2</sub> emission reductions (Million MT)



**CO<sub>2</sub> reduction** enabled by AMG's products based on the LCAs of 2018-2022

\*2020 decrease due to the global pandemic significantly impacting volumes in our aerospace exposed businesses



# FINANCIAL HIGHLIGHTS





## FY 2022 AT A GLANCE

AMOUNTS IN \$M (EXCEPT EARNINGS PER SHARE)	FY 2022	FY 2021	% CHANGE
Revenue	\$1,642.8	\$1,204.7	36%
Gross Profit	\$409.5	\$208.2	97%
Gross Margin %	24.9%	17.3%	44%
Profit before Income Taxes	\$274.9	\$22.5	1,122%
EBITDA	\$342.6	\$136.7	151%
EBITDA Margin %	20.9%	11.3%	85%
Net Debt	\$329.9	\$284.5	16%
Return On Capital Employed (ROCE)	30.8%	11.9%	159%
Net Income Attributable to Shareholders	\$187.6	\$13.8	1,259%
Diluted Earnings per Share	\$5.73	\$0.44	1,202%

- AMG's results have trended positively since Q2 2020

- AMG management believes that this positive trend will continue and expects EBITDA for 2023 to exceed \$400 million

# CONSOLIDATED BALANCE SHEET

<b>AS OF</b> <i>IN MILLIONS OF US DOLLARS</i>	<b>DECEMBER 31, 2022</b>	<b>DECEMBER 31, 2021</b>
Fixed assets	\$797.6	\$693.6
Goodwill and intangibles	41.4	44.7
Other non-current assets	108.2	91.3
Restricted cash	6.9	93.4
Inventories	277.3	218.3
Receivables	162.5	145.4
Other current assets	132.7	75.1
Cash	346.0	337.9
<b>TOTAL ASSETS</b>	<b>1,872.6</b>	<b>1,699.7</b>
<b>TOTAL EQUITY</b>	<b>517.8</b>	<b>294.2</b>
Long-term debt	661.3	675.4
Long-term lease liabilities	44.2	45.7
Employee benefits	117.2	162.6
Other long-term liabilities	74.9	55.4
Current debt	21.6	40.4
Current lease liabilities	4.7	4.9
Accounts payable and accruals	310.0	333.5
Advance payments	51.1	35.1
Other current liabilities	69.8	52.5
<b>TOTAL LIABILITIES</b>	<b>1,354.8</b>	<b>1,405.5</b>
<b>TOTAL EQUITY AND LIABILITIES</b>	<b>1,872.6</b>	<b>1,699.7</b>

# CONSOLIDATED INCOME STATEMENT

FOR THE YEAR ENDED <i>IN MILLIONS OF US DOLLARS</i>	DECEMBER 31, 2022	DECEMBER 31, 2021
Revenue	\$1,642.8	\$1,204.7
Cost of sales	(1,233.3)	(996.5)
<b>Gross profit</b>	<b>409.5</b>	<b>208.2</b>
Selling, general & administrative	(148.0)	(139.6)
Environmental expense	(0.1)	(11.9)
Other income, net	45.7	0.4
<b>Operating profit</b>	<b>307.1</b>	<b>57.1</b>
Net finance costs	(30.9)	(33.6)
Share of loss of associates	(1.3)	(1.0)
<b>Profit before income tax</b>	<b>274.9</b>	<b>22.5</b>
Income tax expense	(84.1)	(8.7)
<b>Profit for the year</b>	<b>190.8</b>	<b>13.8</b>
Shareholders of the Company	187.6	13.8
Non-controlling interest	3.2	–
<b>ADJUSTED EBITDA</b>	<b>342.6</b>	<b>136.7</b>

# CONSOLIDATED STATEMENT OF CASH FLOWS

FOR THE YEAR ENDED <i>IN MILLIONS OF US DOLLARS</i>	DECEMBER 31, 2022	DECEMBER 31, 2021
EBITDA	\$342.6	\$136.7
Change in working capital and deferred revenue	(123.3)	22.7
Other operating cash flow	13.4	(36.8)
<b>Cash generated from operating activities</b>	<b>232.7</b>	<b>122.6</b>
Finance costs paid, net	(23.3)	(21.9)
Income tax paid	(41.8)	(9.9)
<b>Net cash from operating activities</b>	<b>167.6</b>	<b>90.8</b>
Capital expenditures	(191.2)	(178.0)
Use of restricted cash	86.5	115.5
Other investing activities	1.6	(0.5)
<b>Net cash used in investing activities</b>	<b>(103.1)</b>	<b>(63.0)</b>
<b>Net cash (used in) from financing activities</b>	<b>(49.3)</b>	<b>111.1</b>
Net increase in cash and equivalents	15.2	138.9
<b>Cash and equivalents at January 1</b>	<b>337.8</b>	<b>207.4</b>
Effect of exchange rate fluctuations on cash held	(7.0)	(8.4)
<b>CASH AND EQUIVALENTS AT DECEMBER 31</b>	<b>346.0</b>	<b>337.9</b>

# PROFIT TO EBITDA RECONCILIATION

FOR THE YEAR ENDED (000's USD)	DECEMBER 31, 2022	DECEMBER 31, 2021
Profit for the period	\$190,771	\$13,779
Income tax expense	84,097	8,707
Net finance cost	30,941	33,602
Equity-settled share-based payment transactions	5,552	10,206
Restructuring expense	582	522
Net contract settlements <sup>(1)</sup>	(45,436)	–
Inventory cost adjustment	1,589	1,164
Asset impairment expense (reversal) <sup>(1)</sup>	10,597	(711)
Environmental provision	133	11,941
Strategic project expense <sup>(2)</sup>	17,070	12,157
Share of loss of associates	1,250	1,053
Others	105	571
<b>EBIT</b>	<b>297,251</b>	<b>92,991</b>
Depreciation and amortization	45,299	43,685
<b>EBITDA</b>	<b>342,550</b>	<b>136,676</b>

(1) Associated with the silicon metal shutdown, AMG recorded income from the sale of an existing supply contract which positively impacted operating profit for the year. This income was offset by a settlement with a major customer and an impairment of existing assets.

(2) The Company is in the initial development and ramp-up phases for several strategic expansion projects, including the joint venture with Shell, Hybrid Lithium Vanadium Redox Flow Battery System, and the lithium expansion in Germany, which incurred project expenses during the year but are not yet operational. AMG is adjusting EBITDA for these exceptional charges.





LITHIUM LAB



LITHIUM HYDROXIDE - BITTERFELD, GERMANY



LIVA BATTERY



LI PROCESSING, AMG BRAZIL



TITANIUM



PLUTONIUM



TANTALUM, NIOBIUM, AND HAFNIUM

This announcement appears as a matter of record.



AMG's LAW:

“Everything that can be recycled will be recycled.”

AMG ADVANCED METALLURGICAL GROUP N.V.

[amg-nv.com](http://amg-nv.com)



LITHIUM TAILINGS



ENGINEERING - HANAU, GERMANY



MELTSHOP - ZANESVILLE, OHIO



V<sub>2</sub>O<sub>5</sub>



VANADIUM, MOLYBDENUM AND NICKEL - CAMBRIDGE, OHIO



VANADIUM, MOLYBDENUM AND NICKEL - ZANESVILLE, OHIO