

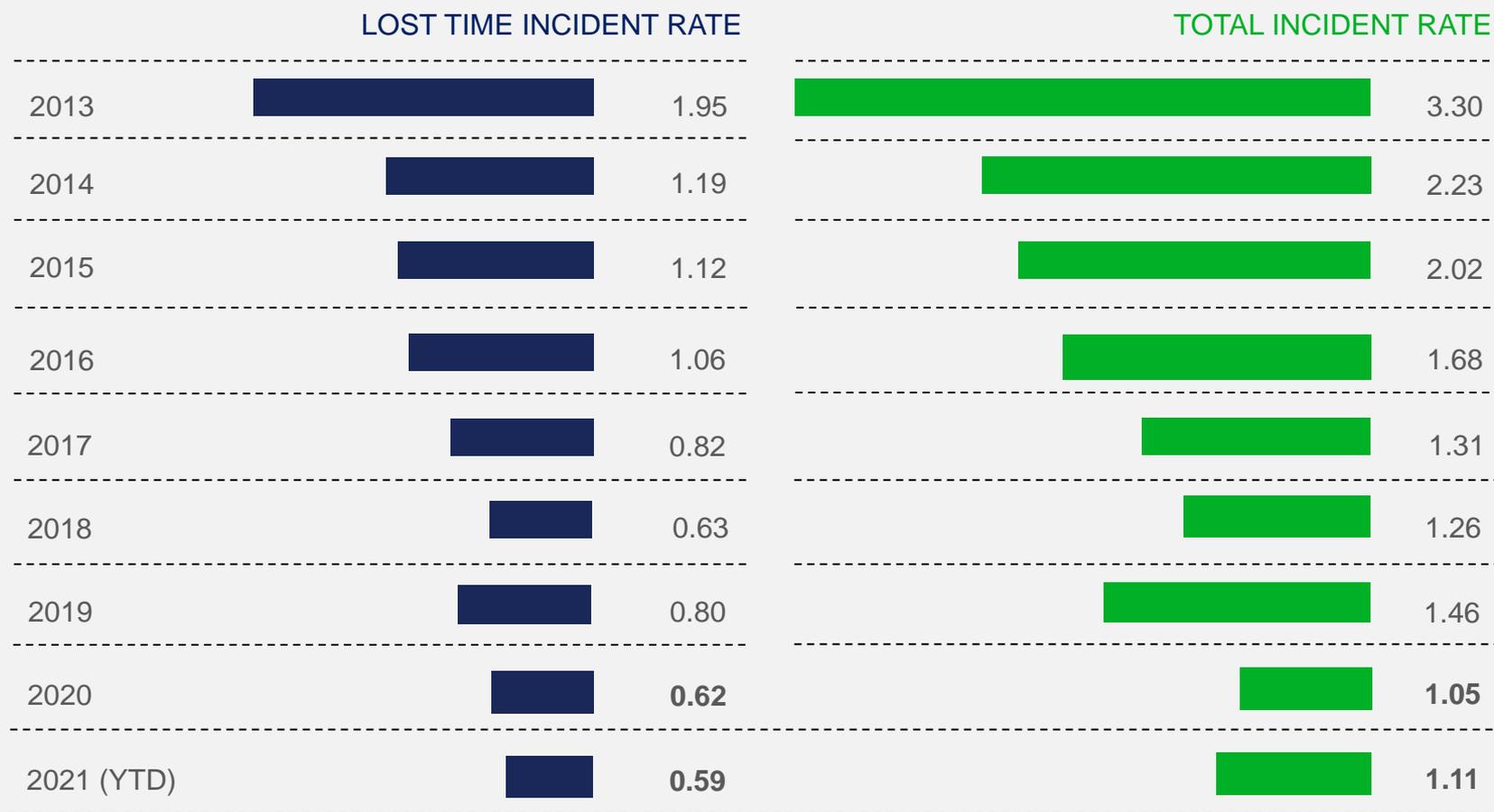
# ENABLING THE CIRCULAR ECONOMY

CEO UPDATE | ANNUAL GENERAL MEETING MAY 6, 2021



AMG ADVANCED  
METALLURGICAL GROUP N.V.

# SAFETY PERFORMANCE



- 2021 year-to-date results demonstrate a 5% improvement in lost time rate and a 6% weakening in total incident rate from 2020 year-end.

# SAFETY FOCUS Q1 2021

## SAFETY INDICATORS

At the end of Q1 2021, lost time incident rate was down 38% while total incident rate is down 20% from Q1 2020.

YEAR	LOST TIME INCIDENTS IN THE LAST 12 MONTHS	12 MONTH AVERAGE LOST TIME INCIDENT RATE	12 MONTH AVERAGE TOTAL INCIDENT RATE
2020 TTM March	24	0.89	1.39
2021 TTM March	15 	0.59 	1.11 



Rigorous commitment to safety reflected in continually improving safety records

# NEW SEGMENTS

## CLEAN ENERGY MATERIALS

## CRITICAL MINERALS

## CRITICAL MATERIALS TECHNOLOGIES

### BUSINESS UNITS

**Lithium**  
**Tantalum**  
**Vanadium**

**Silicon**  
**Antimony**  
**Graphite**

**Titanium Alloys**  
**Engineering**  
**Superalloys**

### PRIMARY MARKETS



Energy Storage



Recycling



Infrastructure



Specialty metals and chemicals



Infrastructure



Aerospace



Renewable Energy



Recycling

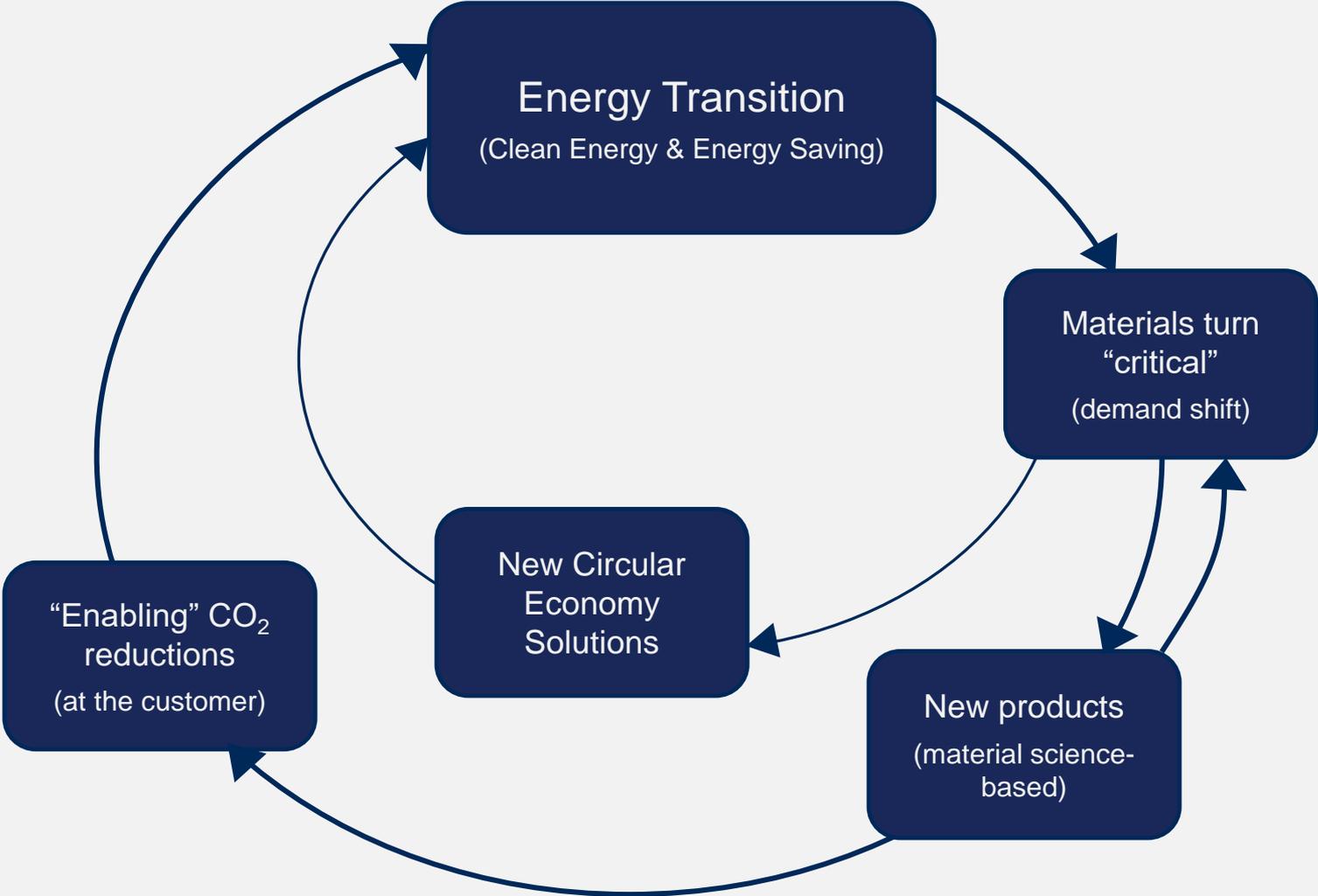
### CHARACTERISTICS

- Energy storage materials
- Growth in recycling
- Global expansion in vanadium from refinery residues

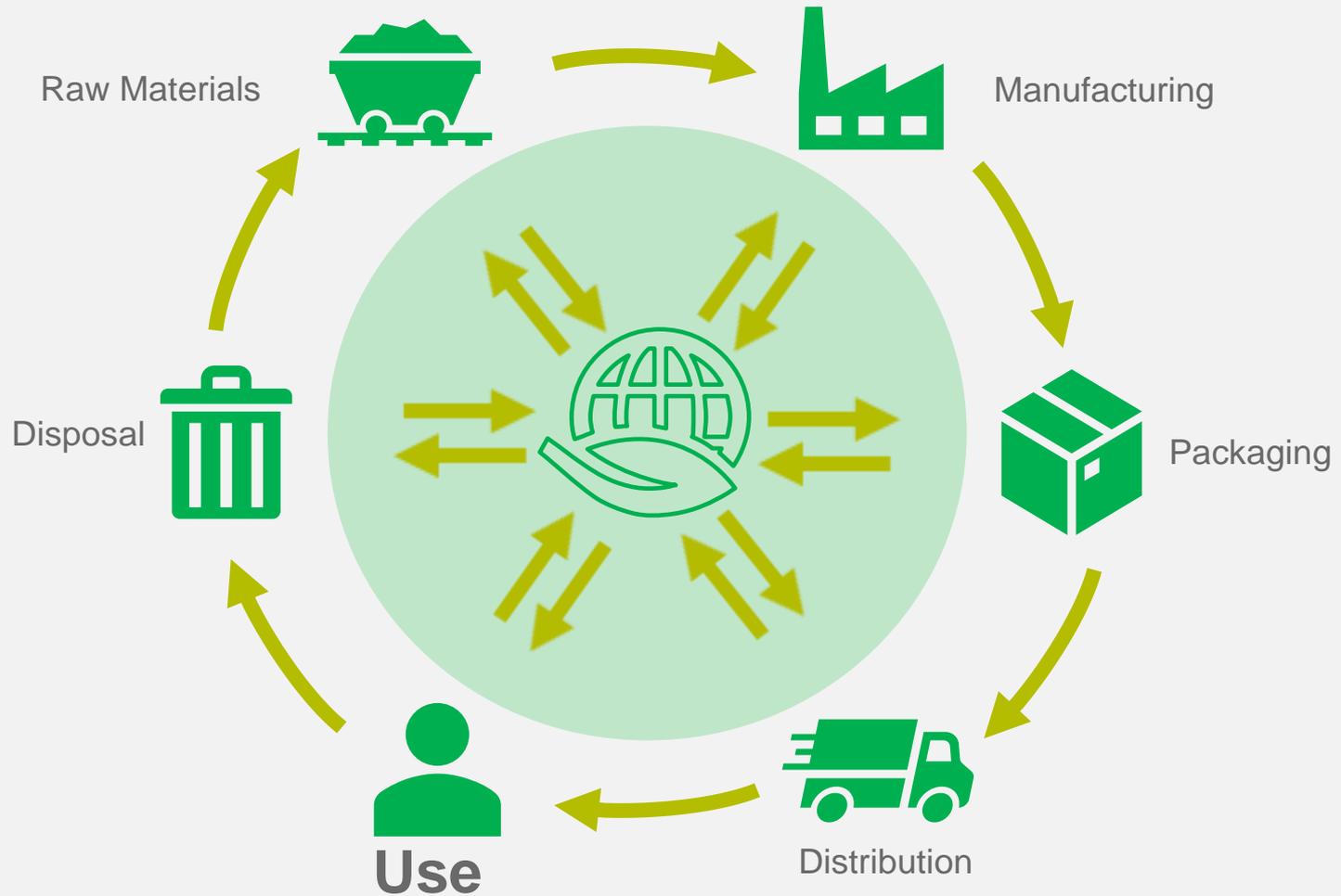
- Business model similarity
- Global leader in graphite processing
- Sole silicon metal producer in Germany
- Largest provider of antimony flame retardants in Europe

- Traditional focus on aerospace
- Project engineering and procurement demand within AMG
- US-based critical materials sourcing efforts (titanium alloys and chrome metal)

# AMG'S STRATEGIC SPACE



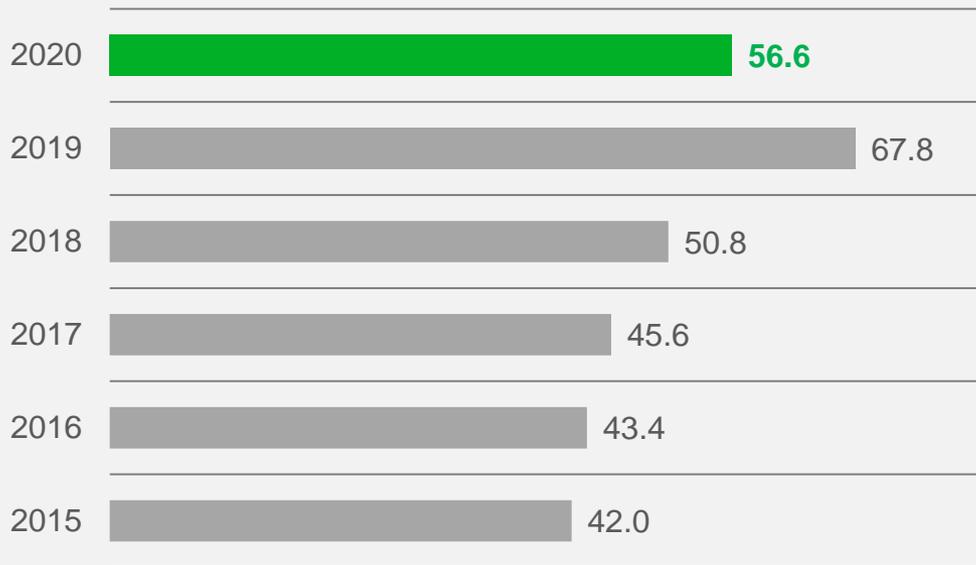
# LIFE CYCLE ANALYSIS (LCA) IN CIRCULAR ECONOMY



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

## AMG'S ENABLED CO<sub>2</sub> EMISSION REDUCTIONS

(Million MT)



**6.1%**  
**CAGR**

**23%** revenue contribution  
by **ECO<sub>2</sub>RP** products in **2020**  
(up from **8%** in **2010**)

**28%** gross profit contribution  
by **ECO<sub>2</sub>RP** products in **2020**  
(up from **5%** in **2010**)

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

# THE *ECO<sub>2</sub>RP* "LOBBY"

A **STRONG PIPELINE** OF LCA CANDIDATES TO BE ADDED TO THE *ECO<sub>2</sub>RP* WILL ENABLE **FURTHER CO<sub>2</sub> EMISSION REDUCTION**...

## LCA candidates enabling further CO<sub>2</sub> reduction

(Million MT)

**ECO<sub>2</sub>RP pipeline  
of LCA candidates**

9



**MOx Fuels**, nuclear power to **replace coal** in China

12



10



**Titanium aluminides**, enabling **fuel savings** (higher operating temperatures)



11



**Nickel based super alloys** (recycling production scrap)



12



**Vanadium Pentoxide (V<sub>2</sub>O<sub>5</sub>)**



13



**Lithium Tailings**



14



**Microsilica in high-quality cement**

15



**Scrap Revert Titanium**



# VERIFIED CARBON STANDARD METHODOLOGY DEVELOPMENT

- AMG is in the final stages of publishing a Verified Carbon Standard (VCS) methodology, which would allow certified AMG projects to turn their greenhouse gas emission reductions into tradeable carbon credits
- AMG is working in conjunction with Verra, a global leader in the development of standards and frameworks, for achieving sustainable development targets
  - To date, Verra has worked with over 1,600 registered projects in over 82 countries, generating more than 450 million carbon credits

## Methodology Development Timeline



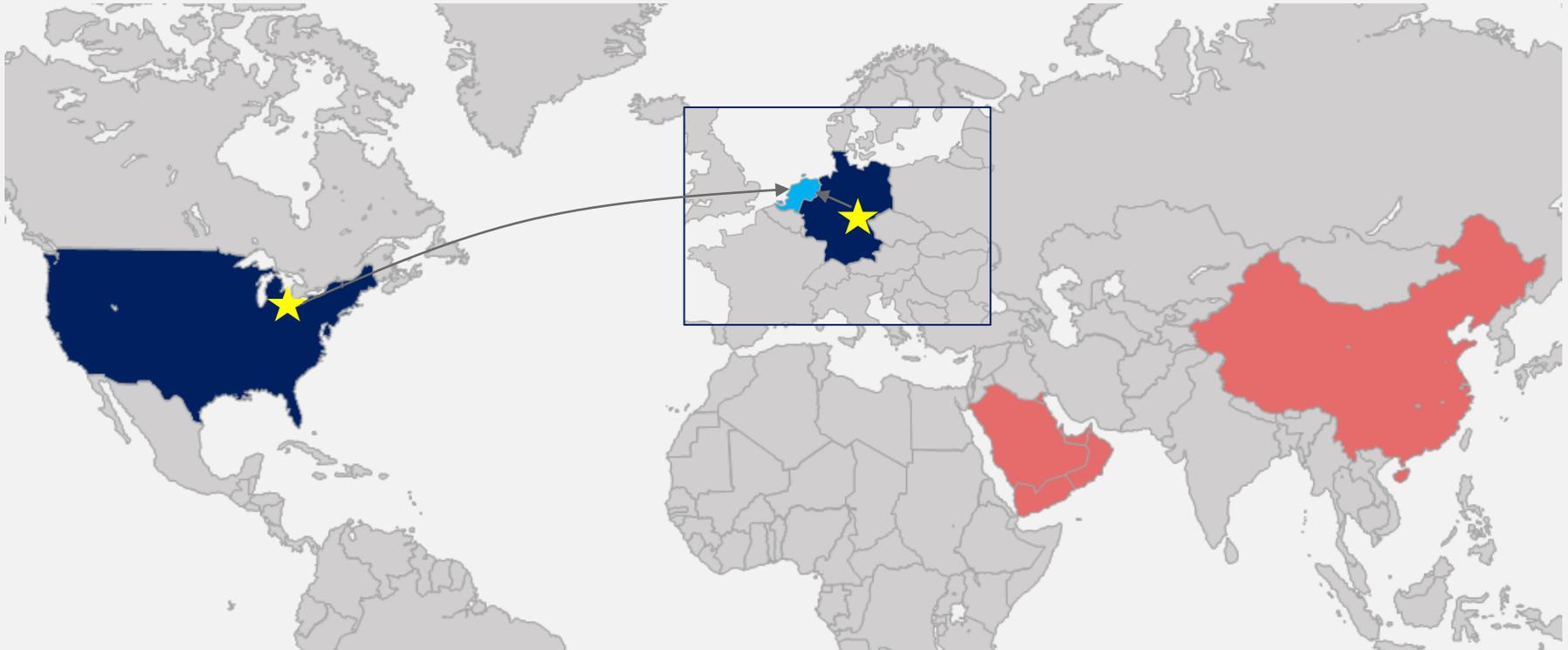
# 2020: VANADIUM EXPANSION



# SHELL AMG RECYCLING (SAR) PROJECTS



**SHELL & AMG RECYCLING**  
VALUE THROUGH SUSTAINABILITY



 Technology License

# 2020: LITHIUM VALUE CHAIN EXPANSION



# AMG LITHIUM GMBH

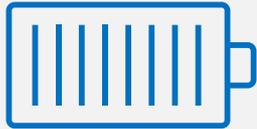


# AMG CAPITAL RAISE

**€100M+**

AMG raised in excess of €100M to fund environmentally sustainable projects in the Clean Energy Materials business

## Next Generation Battery Technologies



Building commercial-scale Vanadium Redox Flow Batteries (VRFBs) to support lower, more stable electricity usage at 2 sites



Building a battery grade lithium hydroxide plant in Bitterfeld, Germany to supply the European EV battery market

## Circular Economies

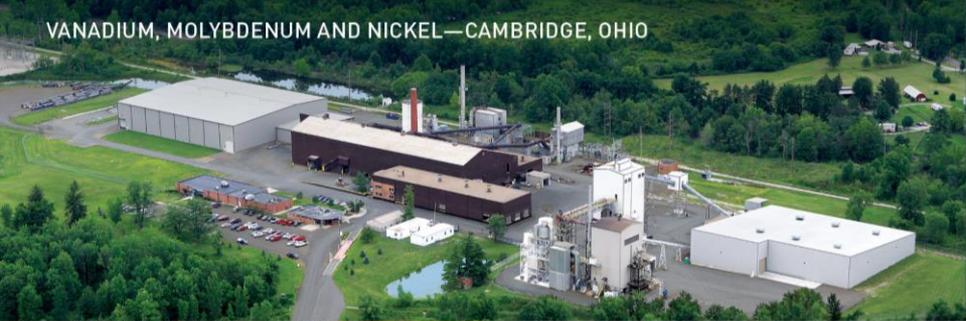


Additional spent catalyst recycling capacity to produce ferrovandium, supporting Green infrastructure

# LONG-TERM GUIDANCE



Despite the recent macroeconomic challenges, steady execution of our strategic growth plan allows us to reaffirm our long-term EBITDA target of \$350M, or more, within the next five years



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



LI PROCESSING, AMG BRAZIL



TANTALUM, NIOBIUM, AND HAFNIUM



PLUTONIUM

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



NIOBIUM



LITHIUM TAILINGS



TITANIUM



CHROMIUM