

AMG STRATEGIC CARBON STATEMENT March 2022

AMG was built around a series of acquisitions of companies with global leadership in critical materials. The primary strategic driver for these acquisitions was the recognition that major demand shifts would cause increasing criticality for specific materials. These demand shifts are primarily triggered by a wave of new technology applications for clean energy, energy savings, energy storage, and energy transformation. **Clean energy and energy savings are essential to meet global climate targets.** These targets, expressed in terms of CO₂ levels and timeframes for carbon neutrality, have established a powerful, global, long-term framework for political and industrial decisions.

AMG's strategic investments driving earnings growth over the next decade are primarily focused on enabling CO₂ reduction through both its products as well as its technologies.

In 2018, AMG started to conduct **Life Cycle Assessments** (LCA's) for selected AMG products with the assistance of ERM, the global environmental advisory firm. The LCA measures the direct CO₂ emissions caused by the production of a product and its supply lines, and it measures the CO₂ impact the product causes when used by the customer. When we first developed the ECO₂RP concept in 2019, we identified six of our products that enable significant CO₂ reduction. These six products, as verified by the aforementioned independent third-party life-cycle analysis, **enabled 67.8 million tons of CO₂ reduction in 2019.** Together, these six products formed our **"Enabling CO₂ Reduction Portfolio (ECO₂RP)."**

It is important to note that the **ECO₂RP** revenue from these six products in 2019 was 26% of total AMG revenue (compared to 8% ten years ago). The share of gross profit is 33% (compared to 5% ten years ago). The CAGR of the **ECO₂RP** revenue over the last 10 years was 17%, while the CAGR of gross profits over the same period was 24%. In summary, our environmentally focused products have a higher margin and grow faster than the rest of the company.

It is necessary here to clarify that we define "customer" as the end-user or main direct beneficiary of our products and technologies, when we discuss our enabling concept and measure the CO₂ impact of our products and our **ECO₂RP** initiatives. Given AMG's position as a critical supplier within a multiple-stage production chain, we believe that this customer concept is the appropriate method to explain and highlight the CO₂ impact caused by our products.

THREE NEW REPORTING SEGMENTS

As of January 1, 2021, AMG is structured into three reporting segments, Clean Energy Materials (CEM), Critical Minerals (CMI), and Critical Materials Technologies (CMT). Each of these segments address similar markets, apply similar business models, and each segment has its own set of peers. Importantly, each segment has products which enable CO₂ reduction, and each segment is targeting growth in its contribution to **ECO₂RP**.

CLEAN ENERGY MATERIALS

CEM is aiming to be a significant market participant **in energy storage solutions.** We have a global leading recycling technology in vanadium and a large, low-cost tantalum and lithium resource base in Brazil. A major investment is close to completion in Ohio that will double our vanadium recycling capacity. Our lithium concentrate production in Brazil is currently being sold

to our processing partners in China, but these concentrates will ultimately be a strategically important part of the feed for our battery-grade lithium hydroxide refinery in Germany, for which the commissioning of the first module will commence in the third quarter of 2023.

The global expansion of AMG's vanadium recycling services is being executed through our joint venture, Shell & AMG Recycling B.V., which continues to pursue circular refinery residue opportunities globally.

In 2021, CEM had an EBITDA of \$66.6 million and **enabled 10.5 million tons of CO₂ reduction by extracting vanadium from refinery waste (circular economy) and by enabling energy savings through higher quality steel as well as through automotive light-weighting enabled by aluminum alloys. Through CEM, AMG is exposed to the prices of vanadium, aluminum, tantalum, and lithium.**

CRITICAL MINERALS

CMI consists of AMG's graphite, silicon metal, and antimony activities. In all three of these markets, we are a leading participant. This segment provides strong and reliable cash flow.

CMI's expansion plans include its microsilica product line and its energy saving materials for buildings. CMI is also preparing to build a vanadium lithium hybrid battery system at our main graphite processing facility in Hauzenberg, Germany for electricity peak shaving.

In 2021, CMI had an EBITDA of \$31.2 million and **enabled 1.3 million tons of CO₂ reduction by energy savings in buildings from graphite-infused insulation materials.**

CRITICAL MATERIALS TECHNOLOGIES

CMT consists of AMG Engineering, AMG Titanium Alloys and AMG Chrome. AMG Engineering, with its technology center in Hanau, is the industry leader in vacuum furnace systems. Vacuum furnaces are essential for the production of the highest quality metal alloys, and AMG Engineering, through its "ALD" branded vacuum furnace systems, is the focal point of **AMG's highest-end metallurgical process technology.**

In 2021 CMT had an EBITDA of \$38.9 million and **enabled 67.2 million tons of CO₂ reduction by enabling increased fuel efficiency of aerospace engines through light-weighting technologies such as titanium alloys, and by the thermal barrier coating of turbine blades, heat treatment of transmission parts, vacuum casting of turbocharger wheels, lightweighting through aerospace titanium alloys, recycling through revert furnaces, building efficiency through low-emissivity glass coatings, and vanadium pentoxide production.** Through its critical material and global furnace offerings, CMT is serving the high-performance steel, aerospace, and automotive sectors.

THE ECO₂RP DYNAMICS

Over the last 5 years, the Enabling CO₂ Reduction Portfolio has grown steadily. The coronavirus crisis has interrupted this process which led to lower CO₂ reduction figures for 2020 of 56.6 million tons. As energy saving through enabling higher operating temperatures (thermal barrier coating of turbine blades) and through light weighting (titanium alloys) are large components of the ECO₂RP, the aerospace crisis did impact the 2020 total enabled CO₂ reduction figure. However, 2021 saw a strong recovery, resulting in 79.0 million tons of enabled CO₂ reduction.

Fundamentally, the ECO₂RP is on a long-term growth path. We are investing in the ECO₂RP, including the doubling of the vanadium recycling production in Ohio and additional capacity for the steady growth of graphite-based insulation materials. We are also pursuing life-cycle analysis on several candidates to be accepted in the ECO₂RP. The most promising candidates reside in the CMT segment. This will be more transparent throughout 2022.

We expect the ECO₂RP growth and profitability to continuously outperform the other AMG products.

We are also working to link our electricity storage materials (vanadium, lithium and tantalum) to the CO₂ reduction enabled by grid stabilization batteries which will remove the electricity storage bottleneck that is holding back higher capacity utilization and more efficient use of renewable energy.

AMG AND THE EU TAXONOMY

In earlier presentations, we stated our belief that the EU Taxonomy framework as published in 2020 to facilitate sustainable investments, would be an important development on the way to realizing the ambitious EU climate targets.

We are pleased that The Taxonomy Regulation recognizes **2 distinct types** of economic activities which contribute to their environmental objectives and hence specifically recognizes the concept of enabling CO₂ reduction:

“Economic activities that make a substantial contribution to one or more of the environmental objectives set out in Article 9 based on their own performance,”

and

“**Enabling Activities**” (defined in Article 16 of the EU Regulation 2020/852) that shall qualify as contributing substantially to one or more of the environmental objectives set out in Article 9 by directly enabling other activities to make a substantial contribution to one or more of those objectives,” provided that the substantial positive environmental impact is based on life-cycle considerations.

We view the EU Taxonomy project as an important first step in defining environmentally sustainable activities and are looking forward to the accelerated adoption and implementation of further complementing regulations that have been announced like the EU Taxonomy Delegated Acts and disclosure regulations (CSRD and SFRD).

AMG’s COMMITMENT to CO₂ REDUCTION

Our substantive contribution to enable customers to significantly reduce atmospheric CO₂ levels *as used in our ECO₂RP concept*, is much larger than the direct CO₂ reduction caused by our own operations.

The majority of our critical material products are enabling customers to reduce CO₂ at a multiple of the direct CO₂ emissions due to the production of these products. The LCA’s have provided ample proof of that concept. **If AMG had not existed, the global CO₂ emissions in 2021 would have been higher by 78.5 million tons (79.0 million tons enabled CO₂ reduction adjusted for 0.55 million direct CO₂ emissions).**

On shutdowns: AMG's leading CO₂ emitters are the silicon metal operations in Bavaria (Germany) and the vanadium recycling operations in Ohio (United States). Silicon metal is critical for the solar industry and in future for **anode materials for lithium batteries**. A closure would be irresponsible, especially since we are one of the last producers in Europe and the Chinese exports are erratic. The vanadium operation in Ohio is a **shining example for the circular economy**. **We don't shut down; we double the capacity** with significant government support.

2030 COMMITMENT

Our long-term direct Scope 1 and Scope 2 CO₂ reduction targets are twofold:

One: AMG commits to reduce its direct CO₂ emissions by 20% by 2030 from a baseline of 2019 (i.e., pre COVID-19) adjusted for the startup of our Zanesville facility. This is a total reduction of 125,000 tons of CO₂.

Two: AMG commits to increase its enabled CO₂ reduction by 10% per year from 2021 levels through 2030. Substantive contributions will come from what we refer to as "Circular Economy" projects.