

AMG STRATEGIC ESG STATEMENT January 2021

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.

We have initially identified 6 of our products that enable significant CO₂ reduction. These 6 products, as verified by independent third-party life-cycle analysis, **enabled 67.8 million tons of CO₂ reduction in 2019.** Together, these 6 products form our “**Enabling CO₂ Reduction Portfolio (ECO2RP)**”.

It is important to note that the **ECO2RP** revenue from these 6 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.

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 the **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 underway 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 hydroxide refinery in Germany (which is approaching the final investment decision at the end of Q1 2021).

The global expansion of AMG's vanadium recycling services is being executed through our joint venture, Shell & AMG Recycling B.V., with major projects, as recently announced, in the Kingdom of Saudi Arabia and in China.

Pro forma 2019, CEM had an EBITDA of \$27.4M and enabled 7.3 million tons of CO2 reduction by extracting vanadium from refinery waste (circular economy) and by enabling energy savings through higher quality steel. Through CEM, AMG is exposed to the prices of vanadium, 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.

Pro forma, in 2019 CMI had an EBITDA of \$18.5 million and enabled 1 million tons of CO2 reduction by enabling reduced fuel consumption by light-weighting aluminum alloys with silicon metal and by energy savings in buildings from graphite-infused insulation materials.

CRITICAL MATERIALS TECHNOLOGIES

CMT consists of AMG Engineering, Titanium Alloys and 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**. Pro forma, in 2019 CMT had an EBITDA of \$75.5 million and **enabled 59.5 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. 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 and we have not yet calculated the total CO2 reduction figures for 2020. 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 is likely to have reduced the 2020 total enabled CO2 reduction figure.

Fundamentally, however, 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 2021.

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.

In addition, we are working to register an ECO2RP pilot product on a carbon exchange to gain experience with potentially monetizing our CO2 reduction achievements.

AMG AND THE EU TAXONOMY

In the September 2020, presentation “ECO2RP: ENABLING CO2 REDUCTION PORTFOLIO AT THE HEART OF OUR ESG APPROACH,” we stated our belief that the EU Taxonomy framework to facilitate sustainable investments is a big step on the way to realizing the ambitious EU climate targets.

The Taxonomy Regulation recognizes **2 distinct types** of economic activities which contribute to their environmental objectives:

“Economic activities that make a substantial contribution based on their own performance,”

and

“**Enabling Activities**” (defined in Article 16 of the EU Regulation 2020/852).

“An economic activity 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.

All of our 6 ECO2RP products fit in the second category, in the definition of enabling activities; and all of these products have been independently verified by a third-party expert-conducted life-cycle analysis. One activity, the extraction of vanadium from waste, also fits in the first category, making a substantial “circular economy” contribution on a self-standing basis. That is likewise the area of our **biggest expansion project** to double the vanadium recycling capacity in Ohio.

CONCLUSION

AMG was founded on the principle that CO2 abatement targets would create increased criticality for specialty materials. This strategic focus is encapsulated in the ECO2RP and will continue to drive AMG’s strategy and capital investment program across its three new reporting segments. Our strategic focus is fully aligned with – and in support of – the EU Taxonomy initiative on sustainability and its climate objectives.