



## **AMG UPDATE ON ENERGY TRANSFORMATION: LIVA BATTERIES**

**Amsterdam, 21 November 2022** --- AMG Advanced Metallurgical Group N.V. ("AMG", Euronext Amsterdam: "AMG") announces that its subsidiary, AMG LIVA, has put its first battery Hybrid Energy Storage System ("HESS") into fully automatic operation mode in Hauzenberg, Germany. The HESS battery system is an ecosystem combining Lithium-Ion and Vanadium Redox Flow batteries with artificial intelligence routines and self-learning algorithms to maximize efficiency, safety and lifetime of the batteries, integrating the HESS with the facility's power system, renewable energy sources, and the electrical grid.

The HESS system is being used at AMG Graphite's Hauzenberg facility to flatten production-driven spikes in electricity demand, known as "Peak Shaving." This industrial application reduces CO<sub>2</sub> emissions and energy costs. The system is also used for emergency power supply and has black-start capabilities in case of full power failure. AMG LIVA intends to expand the HESS system at Hauzenberg to include a large-scale solar power plant integration to further reduce facility energy costs. Further development will include utilizing the HESS for service with the electrical grid ("Frequency Containment Reserve").

LIVA hybrid energy storage systems are important elements of AMG's strategy to enable energy efficiency and CO<sub>2</sub> reduction for its customers in industrial operations. Presently, within the AMG Group, there are three additional LIVA batteries under construction. One, at AMG Titanium Alloys' plant in Nuremberg, Germany, will address peak-shaving, integration of solar power and the production of "green" hydrogen. Another, at AMG Chrome in Rotherham, UK, is intended for solar power integration. And the one at AMG Engineering in Hanau, Germany, will be used as a demonstration facility for various applications.

AMG LIVA is a new growth platform for industrial battery installations worldwide, with AMG Engineering providing the engineering and project management services and AMG Titanium Alloys producing the vanadium electrolyte from gasification residues, adding a circular economy dimension.

As recently announced, as part of the agreement with ARAMCO to recycle vanadium from gasification residues, the Shell-AMG-UCI Joint Venture will also install a LIVA battery and a vanadium electrolyte facility as important steps in the development of the market of vanadium redox and LIVA batteries in the Kingdom of Saudi Arabia.

## About AMG

AMG is a global critical materials company at the forefront of CO<sub>2</sub> reduction trends. AMG produces highly engineered specialty metals and mineral products and provides related vacuum furnace systems and services to the transportation, infrastructure, energy, and specialty metals & chemicals end markets.

AMG Clean Energy Materials segment combines AMG's recycling and mining operations, producing materials for infrastructure and energy storage solutions while reducing the CO<sub>2</sub> footprint of both suppliers and customers. AMG Clean Energy Materials segment spans the vanadium, lithium, and tantalum value chains. AMG Critical Materials Technologies segment combines AMG's leading vacuum furnace technology line with high-purity materials serving global leaders in the aerospace sector. AMG Critical Minerals segment consists of AMG's mineral processing operations in antimony, graphite, and silicon metal.

With approximately 3,300 employees, AMG operates globally with production facilities in Germany, the United Kingdom, France, the United States, China, Mexico, Brazil, India, Sri Lanka, and Mozambique, and has sales and customer service offices in Japan ([www.amg-nv.com](http://www.amg-nv.com)).

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