

# AMG Advanced Metallurgical Group Stock Analysis – 5X Potential

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Ok, we have a company with EBITDA of \$66.7 million in 2020. The management expects EBITDA of \$100 million for 2021 and they forecast EBITDA of \$350 million by 2025. If that happens, if EBITDA multiplies by 5 times, so will the stock price – that is how the stock market works.

If there is a bit more exuberance given the lithium, vanadium, specialty metals business, CO2 emission sales etc., the stock might go up even more. So, there is potential and AMG stock deserves a deeper dig, a research analysis and an indication of the risks and potential rewards.

## AMG Advanced Metallurgical Group Stock Price Overview

AMG Advanced Metallurgical Group went public in 2007 during the commodity boom back then (always keep in mind the cycles there, haha). Things turned very bad during the financial crisis but have been improving recently.

### AMG Advanced Metallurgical Group N.V.

28,46 EUR

+0,86 (3,12%) ↑

21 May, 17:35 CEST · Disclaimer

AMS: AMG

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1D | 5D | 1M | 6M | YTD | 1Y | 5Y | Max



Open	28,16	Mkt cap	972,21M	Prev close	27,60
High	28,56	P/E ratio	-	52-wk high	35,24
Low	27,90	Div yield	0,70%	52-wk low	13,62

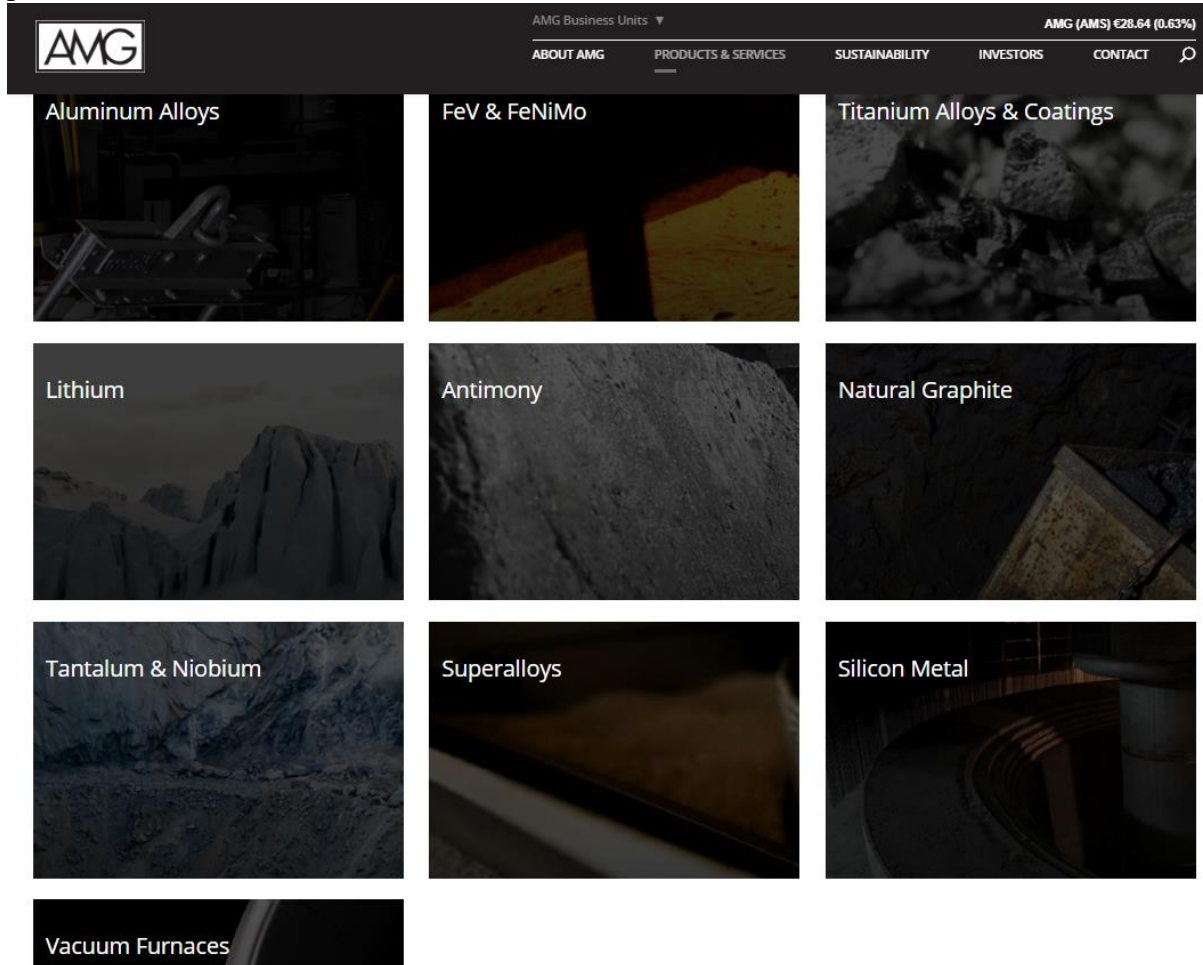
## AMG Advanced Metallurgical Group stock price chart

Of course, any stock that drops 90% must have significant liabilities and that is the case now too; a key factor to watch.

The market cap is around \$1.2 billion USD, so that is the price we have to use in the valuations. Let's see the business, the financials and make a valuation.









### AMG Advanced Metallurgical Group Business Overview

AMG Group has some interesting business propositions. Over 33 production sites, AMG produces the metals needed in the current industrial environment focused on decarbonisation.



AMG products and services – Source: [AMG Group](#)

All the above fit some of the needs of various sectors today like batteries, EVs or aerospace.

SEGMENTAL OVERVIEW		
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 & chemicals  Infrastructure	 Aerospace  Renewable Energy  Recycling
CHARACTERISTICS		
<ul style="list-style-type: none"> <li>• Energy storage materials</li> <li>• Growth in recycling</li> <li>• Global expansion in vanadium from refinery residues</li> </ul>	<ul style="list-style-type: none"> <li>• Business model similarity</li> <li>• Global leader in graphite processing</li> <li>• Sole silicon metal producer in Germany</li> <li>• Largest provider of antimony flame retardants in Europe</li> </ul>	<ul style="list-style-type: none"> <li>• Traditional focus on aerospace</li> <li>• Project engineering and procurement demand within AMG</li> <li>• US-based critical materials sourcing efforts (titanium alloys and chrome metal)</li> </ul>

Segment overview – Source: [AMG 2020 Annual Report](#)

But perhaps even more interesting is their investing strategy.

They are building recycling centres in Saudi and China.

## AMG Group

AMG and Shell Catalysts & Technologies received all regulatory consents necessary for the formation of the Shell and AMG Recycling B.V. joint venture.

Shell & AMG Recycling B.V. signed a memorandum of understanding with Shandong Yulong Petrochemical Co., Ltd. to enter into exclusive arrangements to evaluate the potential for construction and operation of a spent catalyst recycling facility in Yantai, China.

The Saudi Arabian Oil Company ("Saudi Aramco"), Shell, and AMG Recycling B.V. signed a memorandum of understanding to evaluate the feasibility of building a catalyst manufacturing and recycling "supercenter" in Saudi Arabia.

AMG stock analysis - Source: [AMG 2020 Annual Report](#)

They have plans for recycling, a solid-state battery plant, chrome producing and more lithium production from their tailings plant in Brasil.

## AMG Critical Materials

AMG Vanadium signed a major new long-term, multi-year agreement to process and recycle spent catalysts from a major oil refinery operator in North America.

AMG Lithium GmbH, Frankfurt, invested in a solid state battery (SSB) pilot plant to complement its state-of-the-art battery materials laboratory located in Frankfurt, Germany.

AMG formed AMG Chrome US LLC ("US Chrome"). US Chrome will manufacture

chrome metal products in New Castle, PA, and will be the only producer of chrome metal in the United States.

AMG Aluminum's Henderson, Kentucky Plant completed over 6 years without a Lost Time Incident. As a result of this achievement, the Henderson plant and all its employees have received the Governor's Safety Award from Governor Andy Beshear and the Kentucky Labor Cabinet.

AMG stock analysis - Source: [AMG 2020 Annual Report](#)

Higher metal prices should support the business.

### METAL PRICES: 10-YEAR AVG, 2020 LOW, AND SPOT

Materials	10-YEAR AVG <sup>4</sup>	2020 LOW	FEBRUARY 28, 2021 SPOT
Ferrovandium (\$/lb)	\$16.23	\$9.55	\$16.10
Molybdenum (\$/lb)	\$10.33	\$7.08	\$12.40
Nickel (\$/MT)	\$14,491	\$11,055	\$18,607
Vanadium Oxide (\$/lb V <sub>2</sub> O <sub>5</sub> )	\$7.11	\$5.10	\$7.63
Lithium Carbonate (\$/MT) <sup>1</sup>	\$11,570	\$5,658	\$12,502
Spodumene (\$/MT) <sup>2</sup>	\$638	\$390	\$445
Aluminum (\$/MT)	\$1,897	\$1,422	\$2,203
Antimony (\$/MT)	\$9,050	\$5,275	\$9,900
Chrome (\$/MT)	\$10,237	\$6,460	\$7,716
Tantalum (\$/lb)	\$86.09	\$49.00	\$66.00
Graphite (\$/MT) <sup>3</sup>	\$962	\$830	\$1,000
Silicon Metal (€/MT)	€2,032	€1,585	€2,135

1 Lithium Carbonate pricing (Asian Metal) was not published prior to June 2011

2 Spodumene Concentrate pricing (Asian Metal) was not published prior to January 2018

3 Graphite pricing (Benchmark Minerals) was not published prior to January 2013

4 10-year average price defined as the average of the monthly prices from January 1, 2011 through December 31, 2020

AMG stock analysis - Source: [AMG 2020 Annual Report](#)

Lithium is produced from tailings in Brazil and 90% of capex is going for growth projects.

## STRATEGY

Reflecting thoroughly on our critical materials portfolio, we concluded that a re-segmentation was in order. The focus of the new segment **Clean Energy Materials (CEM)** is energy storage materials. **More than 90% of AMG's capital expenditures are going to CEM and therefore CEM is at the center of AMG's growth strategy.** The Critical Minerals segment (CMI) represents a portfolio of stable conversion businesses. **Critical Materials Technologies (CMT)** is a technology partner to the aerospace engine industry and is enabling the circular economy through the high-performance metals produced and recycled in our vacuum furnaces.

ECO<sub>2</sub>RP, the Enabling CO<sub>2</sub> Reduction Portfolio, is a virtual portfolio tracing enabled CO<sub>2</sub> reduction and financial performance. We are accelerating our innovation drive to allocate capital to new **ECO<sub>2</sub>RP candidates.** Some significant candidates are undergoing Life Cycle Analysis right now. Irrespective of our big projects, that is AMG's base.

## LITHIUM

**When we built the 90,000 ton per annum lithium concentrate plant in Brazil, we were seeking an optimal way to go**

downstream while assembling what we believe is a world-class lithium management team. We finally decided that the next step should **be building a 20,000 ton per annum battery-grade hydroxide refinery in Germany—our first module.** After that, we are developing plans to build a **lithium chemical plant in Brazil and,** if the expected demand proves tangible, a second module in Germany. All of that is being handled by our battery materials management and technology center in Frankfurt. AMG's Supervisory Board approved moving ahead with the detailed engineering for the battery-grade hydroxide module, as well as the purchase of long lead-time items and the site. **Our lithium production in Brazil is partially based on existing tailings waste and provides a less carbon-intensive process compared to mineral lithium mining.**

It should not be overlooked that we have allocated considerable resources in commissioning a pilot plant for solid-state electrolyte materials in our Frankfurt laboratory facilities. This pilot plant is based on materials and process patent applications, and the material it produces will be purchased by the top solid-state battery manufacturers globally. If we are successful in this field—and we believe we are included in the "short list" of solid-state materials providers—this could shift the future of AMG.

AMG stock analysis - Source: [AMG 2020 Annual Report](#)

Of course, new projects into new technologies are also risky as you don't know how the samples will be accepted and what will be the trend onward.

## BATTERY MATERIALS PILOT PLANT

The most exciting development in energy storage materials is the search for a solid-state electrolyte for use in next generation batteries. AMG Lithium GmbH has invested in a solid-state battery material pilot plant within its state-of-the-art battery materials laboratory located in Frankfurt, Germany.

According to Dr. Vera Nickel, project lead of the solid electrolyte research at AMG Lithium, "The annual production capacity of one metric ton allows us to send samples to key customers with tailor-made solid electrolytes. Pilot plant operations will pave the way to scale up production according to market needs."

AMG stock analysis - Source: [AMG 2020 Annual Report](#)

The major investment is in Vanadium, which was a very hot commodity in 2018, then crashed (I received so many emails about vanadium in 2018 – good that I didn't invest) but prices have rebounded a bit.

#### VANADIUM

Regarding the spent catalyst recycling project in Ohio, AMG's largest investment allocation to date, we are very pleased that we are currently on time and on budget despite the challenges of COVID-19. Through its conversion of waste products into ferrovanadium, AMG provides a substantially less carbon-intensive process than primary mining.

In Nuremberg, Germany, AMG produces vanadium pentoxide from combustion and gasification waste residues. Vanadium pentoxide is used as an electrolyte in vanadium redox batteries, enabling a higher efficiency of renewable energy production by "buffering" intermittency issues through stationary electricity storage.

The platform for AMG's global strategy to offer its superior recycling technology to the spent refinery catalyst market is Shell AMG Recycling B.V. The JV has announced a project to explore the feasibility of building a recycling "Supercenter" with Saudi Aramco in the Kingdom of Saudi Arabia. Also, the JV has signed an agreement with Shandong Yulong Petrochemical company to evaluate building a spent catalyst recycling facility in Yantai, China. We have recognized that our environmentally-proven technology combined with the CO<sub>2</sub> reduction of the recycling route is very attractive to our potential refinery suppliers and partners.

We are active in vanadium battery technology development. The vanadium battery industry is very fragmented and still at an early stage. Through our battery materials technology center in Frankfurt, intertwined with AMG Engineering and our vanadium recycling activities in Ohio and Nuremberg, we feel we have a strategic advantage in the rollout of the stationary vanadium battery. We have allocated considerable resources to advance on that front.

#### ESG STATEMENT

AMG was founded on the basis of a key global trend of energy transformation: clean energy and energy saving demands

Since 2012, AMG has developed a methodology to measure the CO<sub>2</sub> reduction enabled by its activities. In 2018, we further refined the methodology to measure our enabled CO<sub>2</sub> reduction, in partnership with ERM, by conducting Life Cycle Analysis. As a result, ECO<sub>2</sub>RP delivered a combined CO<sub>2</sub> reduction of 67 million tons in 2019, an amazing figure. In 2020 the same methodology resulted in 54 million tons. The decrease in the CO<sub>2</sub> reduction impact was a net result of reduced aerospace activity, compensated partly by two new entrants into ECO<sub>2</sub>RP. It is important to note that, consistently over the past ten years, ECO<sub>2</sub>RP key highlights include higher growth in revenue and gross profit than AMG in total, with gross margin growing faster than related revenues, and gross margin higher than that of the group as a whole.



A handwritten signature in black ink, which appears to read "H. Schimmelbusch". The signature is written in a cursive, slightly stylized font.

**DR. HEINZ SCHIMMELBUSCH**  
CHIEF EXECUTIVE OFFICER

AMG stock analysis - Source: [AMG 2020 Annual Report](#)

Vanadium Pentoxide 98% min Europe USD/lb



Vanadium price – Source: [Vanadium price](#)

The company is doing what it does, but also betting heavily on Vanadium and recycling.

So, Sven goes learnings about Vanadium:

From [Forbes](#):

- Better for long-run batteries as there is no degradation.
- There is plenty of vanadium, even more than there is copper. No supply issues long term there. 13th most abundant metallic element in the earth's crust, 90% of the supply goes into steel manufacture. So, steel-producing regions like China are currently the largest producers of vanadium.

[CleanTechnica](#): Vanadium batteries have relatively low energy density, but very long cycle life, and they are also easily recyclable.

A lot of people are working on this, but we are still far from a solution and we still don't know what will happen. [Energy-storage](#) shows how Largo Resources is also launching the same and other in Germany are too working on the above. [Labnews](#), vanadium batteries all over the place.

AMG has already invested \$206 million into the business.

double its recycling capacity for refinery residues, is proceeding as planned. As of December 31, 2020, AMG had committed \$206 million in construction and engineering contracts for the project, utilizing the funds raised from its municipal bond. In addition, the lithium hydroxide upgrader project has commenced in Germany, and AMG's Supervisory Board approved moving ahead with the detailed engineering as well as the purchase of long lead-time items and the site.

Shell & AMG Recycling B.V. continues to pursue refinery residue recycling opportunities globally with a focus on the Middle East and China, including the signed MOU with Shandong Yulong Petrochemical Co., Ltd. to enter into exclusive arrangements to

evaluate the potential for construction and operation of a spent catalyst recycling facility in Yantai, China. In addition, Saudi Aramco, Shell & AMG Recycling B.V. signed an MOU to evaluate the feasibility of creating a venture in support of Saudi Arabia's vision to maximize value from its vast natural resources. Shell & AMG Recycling B.V., along with Shell Catalysts & Technologies, will explore the feasibility of building a catalyst manufacturing and recycling "supercenter" in Saudi Arabia.

All in all, it is risky from an investing perspective looking for a margin of safety and a moat. For investing in something like this, the base of the business has to be sound where you get the upside for free, perhaps I'll find a good business that is also investing and where the upside is free for you as an investor – if it happens good, if it doesn't, also good – that is the best way to be exposed to positive long-term structural trends. We'll see about that as we continue with AMG.

AMG Engineering is servicing to the aerospace business that is in a pickle now, but should hopefully rebound at some point in time.

**AMG Engineering's order intake in 2020 exceeded \$200 million for the year due to significant orders in market segments outside aerospace, including strong orders from specialty steel producers.**

AMG Technologies' revenue during 2020 decreased by 15% due to reduced aerospace activity and volumes due to the pandemic, as well as lower profitability associated with metal price declines for the Titanium Alloys business. Consequently, gross profit for the year decreased by \$42.6 million to \$56.3 million.

EBITDA in 2020 decreased 54%, from \$56.0 million in 2019 to \$25.8 million, due to lower profitability related to the challenging economic environment.

They expect all of the above to lead to significant EBITDA, from the current \$66.7 million to \$350 million.



## LONG-TERM GUIDANCE



### [AMG investor presentation](#)

Let's check how the financials fit the above but before let me show you why it is so important to read the annual report. In the remuneration section I found all the competitors the company has which is probably the best list to start with if you wished to dig even deeper into a sector.

In establishing the 2020 remuneration, the Supervisory Board considered multiple scenarios of how the remuneration components would be affected given different sets of circumstances, including one in which incentive plan thresholds were not achieved.

Every year, the Remuneration Committee of the Supervisory Board reviews, confirms and uses an executive compensation peer group for benchmarking purposes. During 2020, the Supervisory Board utilized a peer group that was established with the assistance of Mercer. This peer group features 12 of 17 peers which are listed and domiciled in Europe and has been used for the basis of reviewing our Remuneration Policy and how we will implement it in 2021.

The revised peer group consists of the following companies:

1. Allegheny Technologies Inc*	6. Commercial Metals*
2. AMAG	7. Constellium*
3. Aperam	8. Elementis
4. Bodycote	9. Eramet
5. Carpenter Technologies*	10. Ferrexpo
	11. Hill & Smith
	12. Materion*
	13. OCI N.V.
	14. Outokumpu
	15. Salzgitter
	16. SGL Carbon
	17. Vallourec

\*Denotes a US Listed Peer

This peer group is an important yardstick for the Supervisory Board in determining performance by the Company and setting compensation for the Company's Management Board.

AMG stock analysis - Source: [AMG 2020 Annual Report](#)

### AMG financials

The company has not been operating profitably for the last two years but things have been improving as metal prices exploded in the last quarter.

# Advanced Metallurgical Group NV AMG

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## Financials

Export

Ascending

	2011-12	2012-12	2013-12	2014-12	2015-12	2016-12	2017-12	2018-12	2019-12	2020-12	TTM
Revenue USD Mil	1,351	1,216	1,158	1,094	977	971	1,060	1,310	1,189	937	923
Gross Margin %	17.6	16.2	15.3	16.8	16.4	19.2	20.3	24.1	10.0	12.0	12.6
Operating Income USD Mil	70	49	37	46	39	55	80	163	-26	-9	-4
Operating Margin %	5.2	4.1	3.2	4.2	4.0	5.6	7.5	12.5	-2.2	-1.0	-0.4
Net Income USD Mil	8	2	-42	22	11	41	57	95	-48	-42	-23
Earnings Per Share USD	0.19	0.10	-1.51	0.79	0.40	1.32	1.80	2.97	-1.64	-1.47	-0.81
Dividends USD	—	—	—	—	0.11	0.27	0.32	0.40	0.56	0.34	0.34
Payout Ratio % *	—	—	—	—	16.7	26.3	19.8	16.0	—	—	—
Shares Mil	28	28	28	28	27	31	32	32	29	28	28
Book Value Per Share * EUR	6.27	5.78	3.58	3.83	4.21	4.62	6.67	8.50	5.55	3.06	3.07
Operating Cash Flow USD Mil	45	66	70	95	76	56	79	97	47	20	43
Cap Spending USD Mil	-52	-48	-32	-24	-23	-44	-81	-73	-79	-124	-144
Free Cash Flow USD Mil	-7	18	38	71	53	12	-2	24	-33	-104	-101
Free Cash Flow Per Share * EUR	-0.65	0.48	1.39	1.74	1.53	1.33	-0.34	-0.09	-0.43	-1.56	—
Working Capital USD Mil	228	263	196	159	159	189	222	461	239	196	—

\* Indicates calendar year-end data information

Advanced Metallurgical Group financials – Source: [Morningstar](#)

On top of the negative net income, capital expenditures have been increasing over the last years as the company is investing into the new projects. This has created a significant burden on the balance sheet and is the second key risk when it comes to investing into Advanced Metallurgical Group stock – the first being technology trends.

## CONSOLIDATED STATEMENT OF FINANCIAL POSITION

As at December 31	Note	2020	2019
In thousands of US dollars			
<b>Assets</b>			
Property, plant and equipment	10	551,926	429,993
Goodwill and other intangible assets	11	43,207	41,923
Derivative financial instruments	29	1,894	922
Other investments	12, 29	27,527	23,565
Deferred tax assets	9	58,081	60,945
Restricted cash	16, 29	208,919	309,581
Other assets	15	8,496	11,072
<b>Total non-current assets</b>		<b>900,050</b>	<b>878,001</b>
Inventories	13	152,306	204,152
Derivative financial instruments	29	5,961	2,693
Trade and other receivables	14	122,369	119,052
Other assets	15	44,821	33,720
Current tax assets	9	5,108	7,980
Cash and cash equivalents	17	207,366	226,218
Assets held for sale		1,005	140
<b>Total current assets</b>		<b>538,936</b>	<b>593,955</b>
<b>Total assets</b>		<b>1,438,986</b>	<b>1,471,956</b>
<b>Equity</b>			
Issued capital	18	831	831
Share premium		489,546	489,546
Treasury shares	18	[80,165]	[83,880]
Other reserves	18	[110,593]	[116,358]
<b>Retained earnings (deficit)</b>		<b>[184,139]</b>	<b>[129,626]</b>
Equity attributable to shareholders of the Company		115,480	160,513
Non-controlling interests	20	25,790	23,893
<b>Total equity</b>		<b>141,270</b>	<b>184,406</b>
<b>Liabilities</b>			
<b>Loans and borrowings</b>	21	<b>673,262</b>	<b>669,497</b>
Lease liabilities	31	47,092	46,490
<b>Employee benefits</b>	23	<b>197,158</b>	<b>175,870</b>
Provisions	25	15,322	28,984
Other liabilities	26	12,598	3,629
Derivative financial instruments	29	4,389	4,289
Deferred tax liabilities	9	5,398	4,300
<b>Total non-current liabilities</b>		<b>955,219</b>	<b>933,059</b>
Loans and borrowings	21	23,392	21,740
Lease liabilities	31	4,789	4,227
Short-term bank debt	22	7,561	7,500
Other liabilities	26	67,805	61,479
Trade and other payables	27	164,999	157,108
Derivative financial instruments	29	10,264	4,037
Advance payments from customers	5	29,885	57,650
Current tax liability	9	7,480	18,299
Provisions	25	26,322	22,451
<b>Total current liabilities</b>		<b>342,497</b>	<b>354,491</b>
<b>Total liabilities</b>		<b>1,297,716</b>	<b>1,287,550</b>
<b>Total equity and liabilities</b>		<b>1,438,986</b>	<b>1,471,956</b>

AMG stock analysis – balance sheet - Source: [AMG 2020 Annual Report](#)

The problem is that when you have \$673 million in debt on \$115 million of equity attributable to shareholders of the company, if the projects you are investing in don't work as planned, and that might be just because of a market delay where, for example, vanadium prices don't go up as expected, or there is a recession or something, then the company is owned by the bond holders, not the shareholders anymore.

They have \$200 million in cash and another \$200 million in restricted cash, but that will be used for growth and is needed to do business so it makes the situation look better, but when things turn ugly in such industries, it gets very ugly. Wondering how ugly? 94% in 9 months.

AMG Advanced Metallurgical Group N.V.

28,74 EUR

+0,28 (0,98%) ↑

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### AMG Advanced Metallurgical Group stock crash

On the other hand, if they reach \$350 million in EBITDA on metal prices going up, debt covenants are not an issue anymore, things get solved and the stock rises fast.

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### AMG Advanced Metallurgical Group stock boom

#### AMG Advanced Metallurgical Group stock investment thesis

The above two charts perfectly explain the risks and rewards of investing in AMG. For me personally things are a bit too risky as I simply don't like taking those debt risks and especially not when the key ingredient is future technology adoption.

I'll keep looking for businesses that offer similar potential upside but where the upside is based on some kind of competitive advantage on something that works already and where the balance sheet looks good. Sounds too rosy? I am ready to look at thousands of businesses like I just did with AMG to find the right ones. AMG is under Wall Street's radar, so I just need to keep doing what I am doing and something will come up. Consequently, I am also ready to wait for as long as necessary for such businesses to become great buys.