ENABLING
CO_2 REDUCTION

AMG ADVANCED METALLURGICAL GROUP N.V.
ANNUAL REPORT 2018

GLOBAL TRENDS

CO_2 emission reduction, population growth, increasing affluence, and energy efficiency

SUPPLY

AMG sources, processes and supplies the critical materials that the market demands

DEMAND

Innovative new products that are lighter, stronger, and resistant to higher temperatures

CRITICAL MATERIALS COMPANY

AT A GLANCE

AMG is a global critical materials company at the forefront of CO_2 reduction trends. AMG produces highly engineered specialty metals and mineral products and provides vacuum furnace systems and services to the transportation, infrastructure, energy and specialty metals & chemicals end markets.

TRANSPORTATION

Innovation is driving demand for critical materials in the transportation industry. Highly engineered metallurgical solutions are needed to increase operating efficiency, lower aircraft weight and improve economics. AMG's gamma titanium aluminide is a lightweight aerospace alloy which enables aircraft engines to operate at higher temperatures, reducing carbon emissions and improving fuel consumption.

ENERGY

Global energy demand growth is driven by two opposing factors—increased energy usage and improvements in energy efficiency. AMG provides metallurgical technologies to improve energy efficiency and increase energy supply, such as silicon metal used for the production of polysilicon by the solar energy industry.

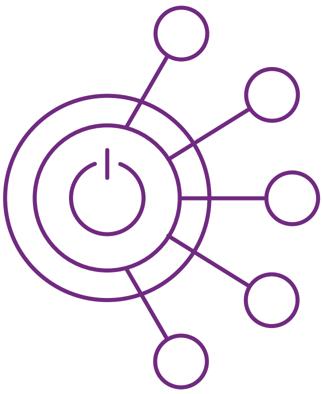
INFRASTRUCTURE

Improvements in infrastructure are essential to growing global GDP and reducing carbon emissions. AMG provides critical materials such as ferrovanadium for high-strength steels, and graphite that is used to improve the insulating performance of homes and buildings. These technologies are deployed in infrastructure projects that are critical to addressing global urbanization trends.

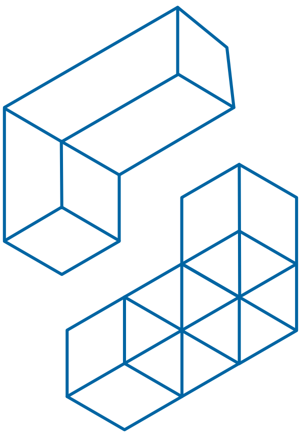
SPECIALTY METALS & CHEMICALS

Specialty metals and chemicals are used to create products that improve global living standards. AMG produces customized metallurgical solutions that meet the market's exacting demands, including tantalum, a material used as a capacitor in electronics, and vanadium-based chemicals which improve the insulating and infrared absorbent properties of structural glass and chemical compounds.

OUR SEGMENTS



AMG CRITICAL MATERIALS



AMG ENGINEERING

GLOBAL CRITICAL MATERIALS FOOTPRINT

V | Ni | Mo | Al

USA
Aluminum Master Alloys
Nickel, Ferrovanadium
Molybdenum

Ta | Al | Nb | Li

Brazil
Tantalum
Aluminum Master Alloys
Niobium
Lithium

C

Czech Republic
Natural Graphite

Al | Cr

United Kingdom
Aluminum Master Alloys
Aluminum Powders
Chrome Metal

Sb

France
Antimony

Ti | Si | C

Germany
Titanium Alloys and Coatings
Natural Graphite
Silicon Metal

Al | C

China
Aluminum Master Alloys
Natural Graphite

C

Sri Lanka
Natural Graphite

C

Mozambique
Natural Graphite

Al

Mexico
Aluminum Master Alloys

REPORT OF THE

MANAGEMENT BOARD

DR. HEINZ SCHIMMELBUSCH

CHAIRMAN & CHIEF EXECUTIVE OFFICER

ERIC JACKSON

CHIEF OPERATING OFFICER

JACKSON DUNCKEL

CHIEF FINANCIAL OFFICER

BORN 1944

Dr. Schimmelbusch was appointed Chief Executive Officer and Chairman of the Management Board on November 21, 2006, and he was re-appointed for a term of two years on May 2, 2018, starting 2019. He has served in a similar capacity for businesses comprising AMG since 1998.

Dr. Schimmelbusch served as Chairman of the Management Board of Metallgesellschaft AG from 1989 to 1993. His directorships have included Allianz Versicherung AG, Mobil Oil AG, Teck Corporation, Methanex Corporation, Metall Mining Corporation and MMC Norilsk Nickel.

Dr. Schimmelbusch served as a member of the Presidency of the Federation of German Industries (BDI) and the Presidency of the International Chamber of Commerce (ICC). Dr. Schimmelbusch received his graduate degree (with distinction) and his doctorate (magna cum laude) from the University of Tübingen, Germany.

BORN 1952

Mr. Jackson was appointed a member of the AMG Management Board on April 1, 2007. He was appointed to the newly created position of Chief Operating Officer on November 9, 2011, and re-appointed to the AMG Management Board for a term of four years on May 4, 2017. Mr. Jackson has served in various senior management positions for businesses now owned by AMG since 1996, most recently as President and Chief Operating Officer of Metallurg, Inc.

He previously held senior management positions at Phibro, a division of Salomon Inc., Louis Dreyfus Corporation and Cargill Incorporated in Canada and the United States. Mr. Jackson received a Bachelor of Science degree in Economics and an MBA, both from the University of Saskatchewan.

BORN 1964

Mr. Dunckel was appointed Chief Financial Officer of AMG on February 1, 2016 and a member of the AMG Management Board on May 4, 2016, when he was appointed for a term of four years. Mr. Dunckel joined AMG from the Macquarie Group Limited where he served as Managing Director and US Head of Chemicals from 2010 to 2015. Prior to this, Mr. Dunckel held various senior level positions at JP Morgan Chase since 1995, including Executive Director, Investment Banking Coverage. Mr. Dunckel graduated, cum laude, with a bachelor's degree in European History from the University of California, Berkeley, and completed his MBA in International Finance at the Leonard Stern School of Business in 1995.

FINANCIAL & OPERATIONAL

HIGHLIGHTS

1,310.3 24%	315.2 47%	217.1 73%
REVENUE $M	GROSS PROFIT $M	EBITDA $M
97.4 24%	38 138%	0.5
CASH FROM OPERATING ACTIVITIES $M	WORKING CAPITAL DAYS	NET CASH $M
0.58 (29%)	1.23 (6%)	2.97 65%
LOST TIME INCIDENT RATE	TOTAL INCIDENT RATE	DILUTED EARNINGS PER SHARE $

AMG CRITICAL MATERIALS	AMG ENGINEERING	AMG GROUP
1,050.5	259.8	1,310.3
REVENUE $M	REVENUE $M	REVENUE $M
190.1	27.0	217.1
EBITDA $M	EBITDA $M	EBITDA $M

AMG CRITICAL MATERIALS

- Increased EBITDA by 90%, from $100.0 million in 2017 to $190.1 million in 2018
- Achieved startup on AMG's first lithium concentrate plant, and made the first shipment of commercial-grade spodumene in September 2018 to AMG's long-term offtake customer
- Entered into an agreement to supply 7 million pounds of vanadium to a US steel producer over a 2-year period, which began on January 1, 2019
- Completed the feasibility study to replicate AMG Vanadium's existing Cambridge, Ohio recycling facility, which will more than double spent catalyst processing capability
- Entered into a multi-year agreement with Ørsted to purchase 100% of AMG Superalloys' power requirements from renewable sources starting in October 2018, covering the full power requirements of its production sites across England and Wales

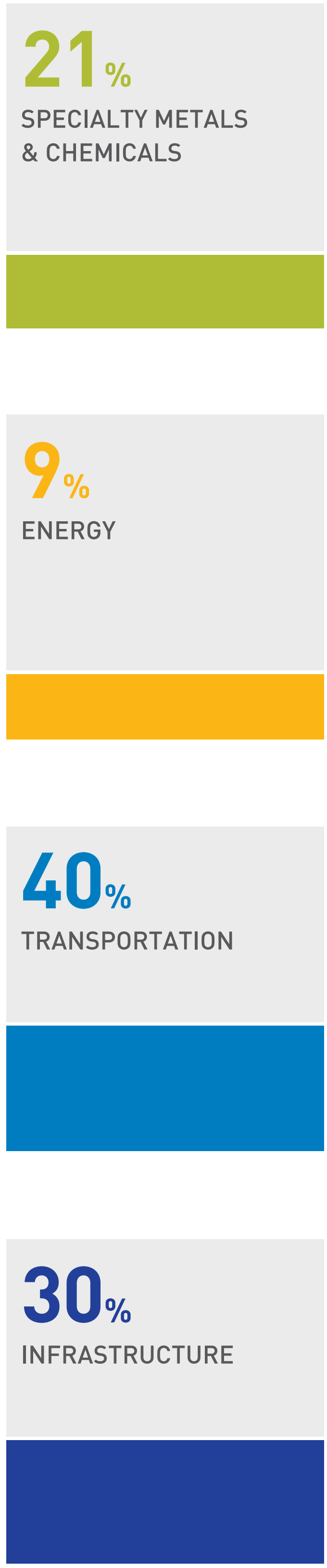
AMG ENGINEERING

- Increased year-end order backlog by 17%, from $207.0 million in 2017 to $241.4 million in 2018
- Launched innovative coating furnace utilizing a chemical vapor deposition process to coat new materials for the aerospace industry

AMG GROUP

- Achieved record profitability, with $217 million in EBITDA and $95 million of net income attributable to shareholders
- Announced the formation of a new division, AMG Technologies, in order to accelerate innovation in advanced metallurgy
- Raised $650 million in total debt facilities to support organic growth

REVENUE BY END MARKET



FROM THE CEO

LETTER TO SHAREHOLDERS

On behalf of the Management Board, I hereby present AMG's 2018 Annual Report. As a summary, we are pleased to declare 2018 the most successful year in AMG's history, measured in a variety of ways.

In 2018, our EBITDA increased from $125 million to $217 million (plus 73%), a record in AMG's history. We also ended the year in a net cash position despite large investments. Surprisingly, the stock price declined in 2018 from €42 per share in the beginning to €28 per share at year-end. Compare that to 2017. In that year, the EBITDA went from $101 million to $125 million (an increase of 24%) and the share price increased from €15 per share to €42 per share. We received the Euronext Award for the all-around best performer. Given our much better earnings performance in 2018, we naively hoped to have the chance to receive that award again. Instead, we are disappointed to report that our excellent results did not translate to a similar degree into our share price.

PROFITABILITY

The 73% EBITDA increase was assisted by certain metal prices, with ferrovanadium in the first place. I want to remind you that in my Letter to Shareholders last year, I went into great detail to explain that vanadium would benefit from several trends. That turned out to be correct. The 2018 EBITDA to sales margin was 17% compared to 12% in 2017. The 5-year EBITDA growth rate was 26%. However, the margin expansion we experienced in 2018 due to the rapid increase in vanadium prices will correct when prices level off.

AMG's 2018 return on capital employed (ROCE) is in record territory above 30%. A ROCE like this is rare in natural resources and difficult to achieve in any industry.

Operating cash flow was $97 million despite working capital investments of $73 million during the year, and this cash flow yielded free cash flow of $26 million after capital expenditures of $73 million. It is interesting to note that the ROCE CAGR rose faster than the EBITDA CAGR. That is difficult to achieve.

Net debt made it to negative territory. We made it to a net cash position despite our high capital expenditures.

Net income increased in 2018 by 66% to $95 million. We determined and announced that our dividend policy should be guided by a corridor of 20-40% of net income. As a result, we raised the dividend to €0.50 per share for 2018.

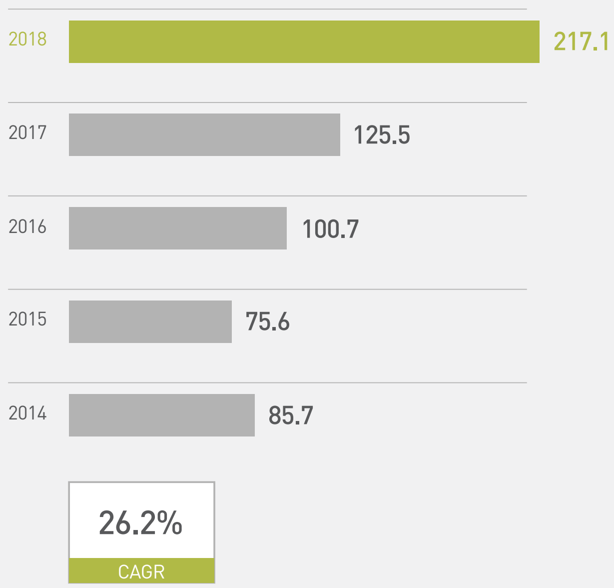
LONG-TERM VALUE CREATION

In my 2018 Letter to Shareholders I elaborated on AMG's strategic framework, its overriding objective to create long-term value and AMG's approach towards its stakeholders. The basic analysis set forth therein is still valid. AMG's Mission Statement and Strategic Objectives are unchanged, and I will explain further in this 2019 Letter how AMG's implementation is progressing, taking into account the current economic environment and AMG's priorities.

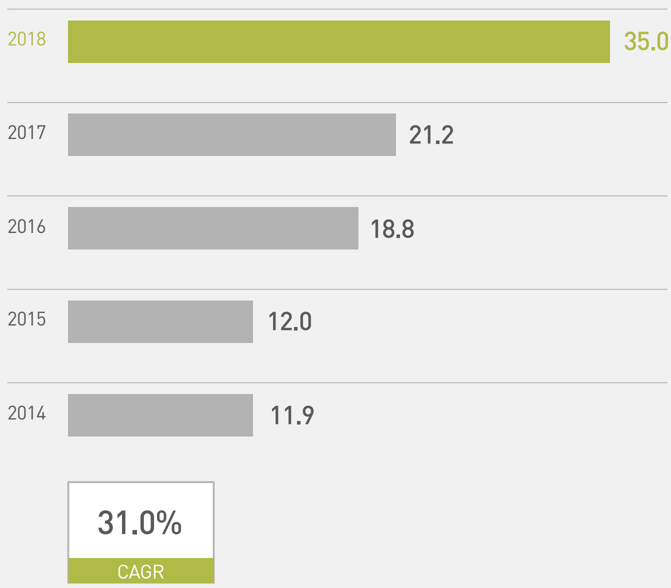
SAFETY

Safety is our main battleground. We operate a lot of furnaces that are at the heart of upgrading metals and minerals. Of course, each year we aim to achieve a "zero"-incident status, but this is a very challenging objective. However, we have achieved remarkable results and have reduced lost time incidents consistently year-over-year.

ANNUAL EBITDA PROGRESSION
(USD millions)



ANNUAL ROCE PROGRESSION
(%)



We assess our safety performance against our peers using the most reliable data available. Namely, we rely on industry injury and illness data published by the United States Department of Labor Bureau of Labor Statistics. According to most current survey data for our industry code (2017-NAICS 331: Primary Metal Manufacturing), our peer performance for total recordable incident rate is 4.4 and lost time rate is 1.1. We are proud to announce that our 2018 performance is 72% better than the published total incident rate of our peers and 47% better than the published lost time rate of our peers.

The better your safety profile gets, the more difficult it is to continue the improvement process with similar reduction rates. Our 9 business units have 29 operating entities, each with an officer dedicated to managing safety. These officers report to AMG's head of safety, who reports to me. 20 of the 29 operating entities achieved zero lost time incident performance in 2018. "Zero" is possible.

CO_2

We feel that our main stakeholder responsibility, after safety for our employees, is to the global community, and that the best way to measure this is in terms of our contribution to global CO_2 reduction. We know our CO_2 emissions in 2018 were about 412 thousand metric tons. In 2014, we introduced a methodology to measure how certain AMG product offerings enable CO_2 reduction when used by our customers. For example, the enabling of higher operating temperatures in jet engines through titanium aluminides and through ceramic coatings of turbine blades for jet engines increases fuel efficiency and therefore reduces CO_2 emissions versus the next best solution. Or, as another example, the doping of insulation materials with natural graphite enables energy saving in buildings, leading to the reduction of CO_2. These and other AMG solutions are embedded in materials science in the search for new materials which are lighter, stronger, more heat resistant, etc. Using this methodology, our total CO_2 reduction impact enabled our customers to save 41 million cumulative metric tons of CO_2 in 2018, as shown in the chart on the next page, offsetting a material impact to the global annual increase of atmospheric CO_2. We have commissioned ERM, a leading sustainability consultant, to sharpen our in-house methodology for the measurement of "enabling" CO_2 savings using our energy-saving materials and technologies. We look forward to the results which will be published in due course.

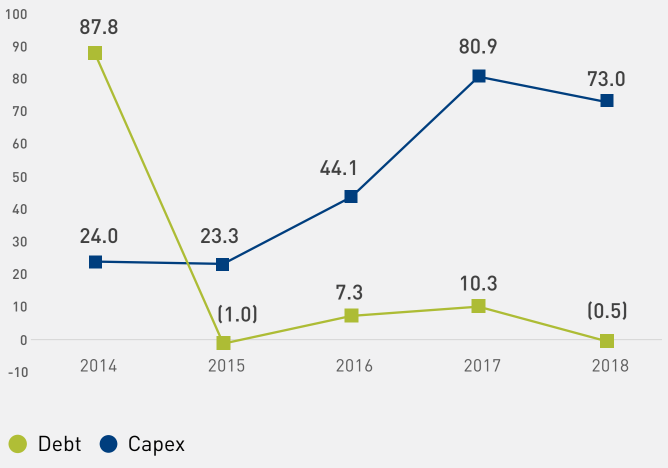
Please allow me to mention that AMG has CO_2 reduction written in its formation documents as critical materials are critical or have become critical primarily as a result of the search for material-science-based solutions to reduce CO_2. We are fortunate because we do not have to dream up a green theory. We were an early mover in our focus on CO_2 reduction.

AMG VANADIUM

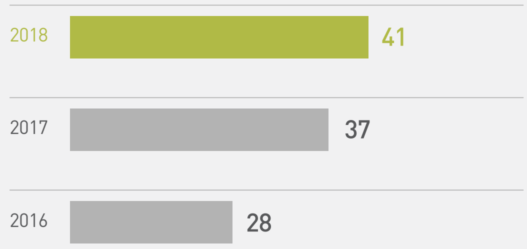
First, we must congratulate our team in Ohio on excellent execution. Prices were high in 2018, but you need to be appropriately positioned when an opportunity presents itself. The financial results were exceptional.

As mentioned in my May 2018 Letter to Shareholders, I extensively elaborated on the trends driving structural vanadium tightness. I listed five "Themes". We now must add another "Theme". The International Maritime Organization

NET (CASH) DEBT & CAPEX
(USD millions)



TOTAL AMG ENABLING TECHNOLOGIES CUMULATIVE CO_2 REDUCTIONS
Million metric tons



(IMO) announced in October 2016 that it was going ahead with a global sulfur cap of 0.5% for marine fuels beginning January 1, 2020. The current cap is 3.5%. The new regulations will, undoubtedly, substantially increase the investment in desulfurization units of refineries as a leading mitigation effort in order to comply with the IMO cap. More desulfurization implies more fresh refinery catalysts. More fresh refinery catalysts imply more spent catalysts. Spent catalysts are the feed for AMG Vanadium's recycling operations, and we are the world's largest recycler of spent catalysts.

AMG has a stated objective to be the world leader in the recycling of catalysts not only now, but in the future, and we intend to build on our leadership. We are presently conducting a feasibility study to double our recycling capacity in Cambridge, Ohio. In addition, we have announced our intention to partner with Royal Dutch Shell's subsidiary, Criterion, to determine a way to offer "end-to-end" solutions to refineries facing the challenge of finding a home for the growing spent catalyst waste. China has closed its doors to all sorts of waste, including this particular refinery waste. We will update on these frontiers as necessary.

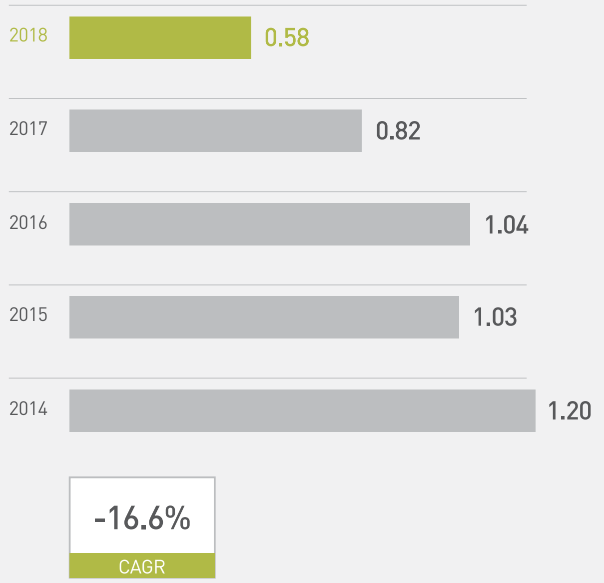
AMG MINERAÇÃO

Despite a slight delay in the ramp-up of our lithium concentrate plant in Brazil, we are shipping high quality, in-spec material which has been well-received by our long-term customer. Our EPC contractor plans to conduct our 100% capacity test at the end of May; this test was previously planned for April. We are evaluating the timing and progress of our plans to move forward with a second lithium concentrate plant in Brazil and are balancing that timing against our plans to move downstream into lithium chemicals. We will continue to evaluate both projects as we consider how to best maximize long-term value for our stakeholders. In addition, as we announced in late February, we are pleased that our lithium management team has been strengthened. On January 1st, 2019, Dr. Stefan Scherer joined us as Chief Commercial Officer of AMG Mineração BV. He has over 20 years of experience in the specialty, fine chemicals and lithium industries.

AMG TECHNOLOGIES

On November 28, 2018, we announced the formation of AMG Technologies, combining AMG Titanium Alloys & Coatings with AMG Engineering under a new operational umbrella. Guido Löber, the CEO of AMG Titanium Alloys & Coatings, will lead AMG Technologies, chairing a newly constituted Management Board. The basic idea of this new entity is to strengthen the interface of engineering know-how and operational know-how, thereby supporting the acceleration of process technology innovations. That has been my experience, and a guiding light, in both the formation of AMG in 2006 as well as in companies I have been involved with in the past. We firmly believe that as the technology development in our main vacuum furnace product lines accelerates, and these high-end metallurgical purification and coating processes applying the latest control and automation technologies reach a considerable degree of complexity, the engineering provider must also provide operating services, including owning and operating plants. We have successfully implemented such business models in vacuum heat treatment services, and we continue to pursue concepts where these developments merge with

LOST TIME INCIDENT RATE



breakthroughs in additive manufacturing technologies. The graphics on the next page show our involvement throughout the sections of the LEAP X engine. AMG Technologies lives within the trend of the aerospace industry's need to increase fuel efficiency.

VALUES

I wish to conclude with a word on AMG's culture and values—safety, value creation, respect and integrity—which form the basis of how we conduct our operations and how we deal with our employees, business partners and stakeholders. Supported by our Code of Business Conduct and Speak Up and Reporting Policy, company-wide communication and training processes have been installed to ensure that these values are better understood, embraced by everyone and applied without exception.

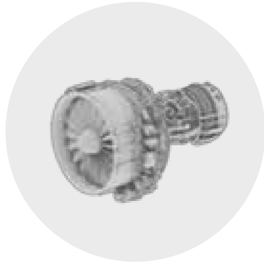
OUTLOOK

As regards outlook, our last long-term guidance at the AGM in May 2018 was that we would reach $200 million of EBITDA, or more, by 2020 or earlier. Obviously, we reached our target earlier—and with record numbers all around. For 2019, our target is to exceed the $200 million mark again.

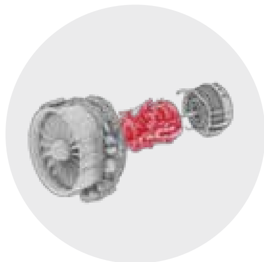
The updated long-term guidance will be published at the AGM on May 1, 2019.

DR. HEINZ C. SCHIMMELBUSCH
CHIEF EXECUTIVE OFFICER

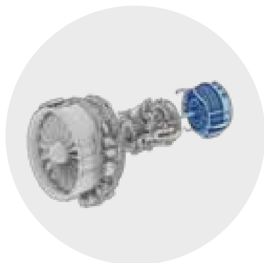
AMG TECHNOLOGIES PRESENCE IN THE LEAP VALUE CHAIN



General Applications
- Remelting Furnaces
- Atomization Furnaces
- Master Alloys for Ti Based Alloys
- Plasma Melting Systems



High-Pressure Applications
- Equipment for CMC Shrouds
- EB-PVD Coaters
- Hot Isothermal Forging Systems
- VIM Furnaces
- Master Alloys for Ni Base Superalloys



Low-Pressure Applications
- Hot Isothermal Forging Systems
- Plasma Melting Systems for Titanium Aluminides
- VAR and VIM Furnaces for Titanium Aluminides
- Titanium Aluminide Feedstock

AMG CRITICAL MATERIALS

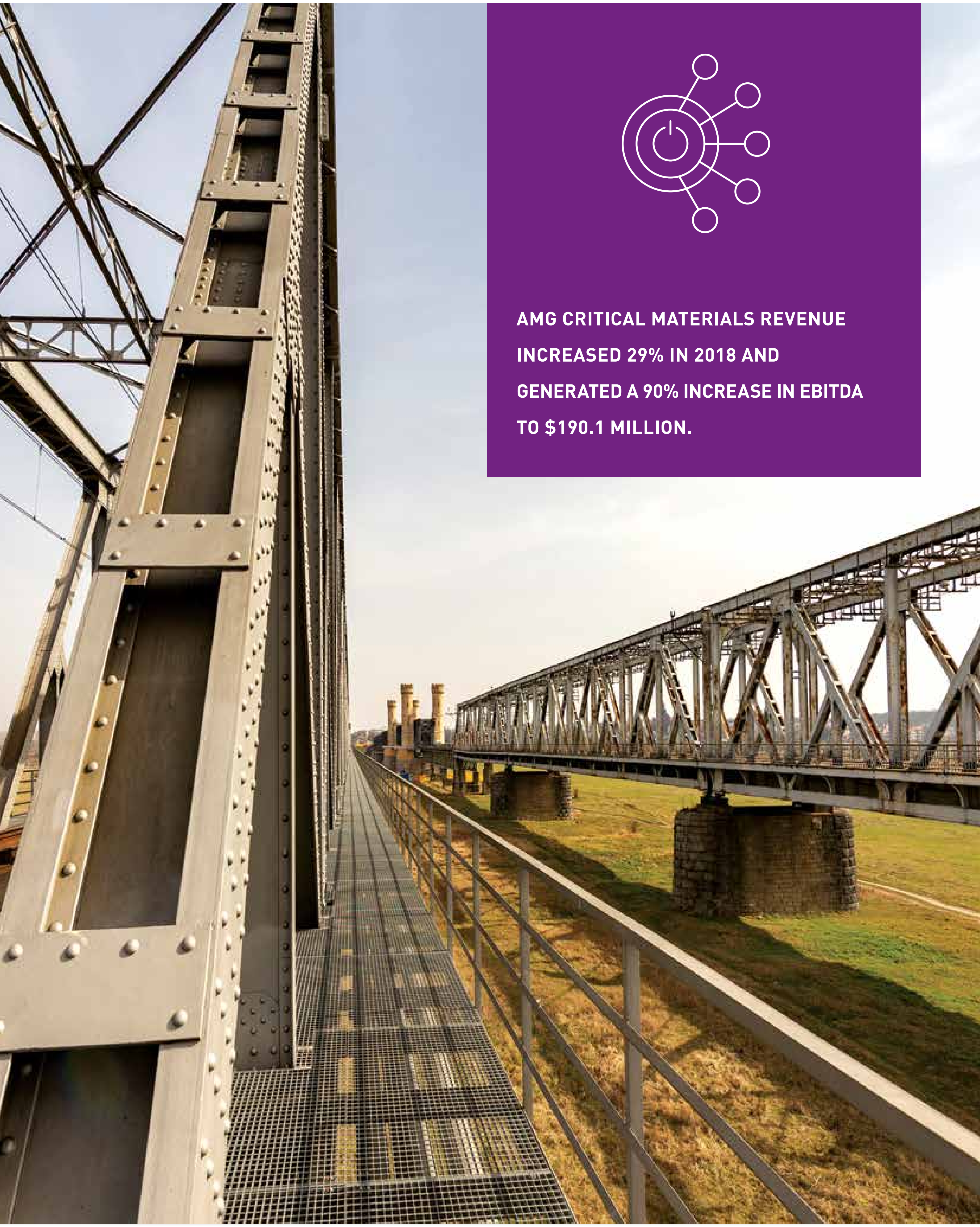
AMG Critical Materials' revenue increased by 29% in 2018, to $1.0 billion, thanks to a combination of improved pricing and higher sales volumes. Within the division, revenue increased in seven of AMG's eight critical materials business units.

Gross profit increased by 61% to $241.5 million in 2018, driven by higher sales volumes across the division, a focus on higher value-added products, and the improvement in vanadium prices. Five of the eight Critical Materials businesses delivered improved gross profit, year over year. The substantial improvement in gross profit during the year drove an improvement in EBITDA of 90%, from $100.0 million in 2017 to $190.1 million in 2018.

AMG Critical Materials working capital days increased from 35 days at the end of 2017 to 63 days at the end of 2018 due to higher prices and increased volumes.

The division also advanced several key strategic and operational initiatives in 2018. AMG's first lithium concentrate plant started up in May 2018, and the first shipment of commercial product was completed in September 2018. In addition, AMG Vanadium entered into an agreement to supply 7 million pounds of Vanadium to a US steel producer over a 2-year period, which began on January 1, 2019. AMG Vanadium has also completed the feasibility study to replicate its existing Cambridge, Ohio recycling facility, which will more than double spent catalyst processing capability. Subject to permitting, construction is expected to commence mid-2019 with a completion date in early 2021.

As demand for our products and services continues to rise due to the associated energy savings and CO_2 reduction trends, AMG Critical Materials is well positioned to deliver improved financial performance in 2019.



AMG CRITICAL MATERIALS REVENUE INCREASED 29% IN 2018 AND GENERATED A 90% INCREASE IN EBITDA TO $190.1 MILLION.

AMG ENGINEERING

Strong demand from the US market-primarily driven by the high order backlog for passenger aircraft and the need for efficient, environmentally friendly aircraft engines- was matched by strong demand from the Asian market and led to the highest order intake since 2008. In addition, orders from AMG Engineering's core markets in Europe strengthened in 2018, driven by the ongoing demand through all industrial sectors and the continued importance of titanium powder production for 3-D printing applications.

The robust order intake in 2018 of $315.9 million resulted in a 17% improvement in year-end order backlog, from $207.0 million as of December 31, 2017, to $241.4 million as of December 31, 2018, the highest level of order backlog since 2008. Sales in our core markets remained robust throughout the year and we expect further growth in 2019.

Favorable product mix resulted in an improvement in gross margin from 26% in 2017 to 28% in 2018, driven by an increase in orders for large, highly technical furnaces for the aerospace market, such as AMG Engineering turbine blade coating furnaces and high-quality metal powder production equipment.

AMG Engineering's focus on product development in recent years has strengthened and broadened the division's product offerings, improved gross margins, increased orders and reduced the division's dependency on certain key product lines and end markets.

EBITDA in 2018 grew by 6% from $25.5 million in 2017 to $27.0 million.

AMG Engineering successfully launched a new product line in 2018, an innovative coating furnace utilizing a chemical vapor deposition process to coat new materials for the aerospace industry. In addition, AMG Engineering continues to implement digital tools and applications ("Industry 4.0"/Internet of Things) in its engineered products and services to enable the highest degree of automated fabrication. In addition, new software solutions for the energy efficient use of casting, coating and heat treatment devices continue to support AMG's goals to reduce CO_2 throughout all industrial processes.

Based on the strong order backlog at the end of 2018 and the ongoing development of new product lines and technology solutions, management expects the business to continue its strong financial performance in 2019.

AMG'S ENGINEERING DIVISION INCREASED GROSS PROFIT BY 14% , FROM $64.8 MILLION IN 2017 TO $73.7 MILLION IN 2018, AND DELIVERED A 17% IMPROVEMENT IN YEAR-END ORDER BACKLOG.

AMG'S

RISK MANAGEMENT AND INTERNAL CONTROLS

AMG employs a risk management approach that identifies and mitigates risk at all levels of the organization.

The Audit & Risk Management Committee is comprised of Steve Hanke (Chairman) and Frank Löhner, and meets on a quarterly basis. In addition to its Audit Committee duties, this committee is responsible for monitoring and advising the Supervisory Board on the risk environment as well as the risk management process of AMG.

RISK MANAGEMENT APPROACH

AMG employs a risk management approach that identifies and mitigates risk at all levels of the organization. The Company analyzes risks in formal settings such as scheduled Management Board and Supervisory Board meetings as well as everyday operational situations faced by its global employee base. AMG has implemented a comprehensive risk management program centered on the Company's Risk Assessment Package (RAP). The RAP includes a "top-down" and "bottom-up" analysis and assessment of the Company's risks. The RAP is a detailed document requiring each business unit to:

(i) identify potential risks and quantify the impact of such risks;

(ii) prioritize the risks using a ranking system to estimate the financial impact, probability and mitigation delay of these risks;

(iii) describe the risk mitigation or transfer procedures in place;

(iv) document the periodic monitoring of the risks;

(v) assign the individuals responsible for monitoring the risks;

(vi) review the trends of the risks identified by the business units; and

(vii) periodically audit previous RAP submissions to evaluate the risk management process.

Each business unit undertakes a full review of its RAP on a quarterly basis. The RAPs are then reviewed and discussed in detail by AMG's risk management function in coordination with the operating managers of the business units. Direct follow-up calls take place by AMG's Chief Financial Officer and his team with the Presidents of the business units. The corporate Legal, Finance and HSE functions also contribute to the quarterly submission of risks identified. Key risks from all business units and functions are then summarized and presented to the Management Board, which reviews them. Any new material risk assessment observed by a business unit or function is reported instantly to the Management Board, while individual risks of special note are regularly discussed at the Management Board's bi-weekly meetings. The Chair of the Audit & Risk Management Committee of the Supervisory Board is informed immediately of any new material risk assessments which have been reported to the Management Board. The Audit & Risk Management Committee of the Supervisory Board formally reviews the consolidated risk package provided by AMG's Management Board during its quarterly meetings. In addition, the Audit & Risk Management Committee of the Supervisory Board supervises, monitors, and reports on the Company's internal control and risk management programs. During 2018, special attention was given to:

- expansion and extension of the Company's syndicated credit facilities;
- managing price and volume risk associated with the volatility of commodities;
- understanding global political and environmental risks; and
- evaluating risks associated with long-term contracts.

Appropriate and diverse lines of property and liability insurance coverage are also an integral part of AMG's risk management program.

In 2018, the Audit & Risk Management Committee requested, and Management Board delivered, a revised evaluation of long-term risks. This new analysis focuses on risks that may affect the company over a five-year time horizon, and complements the next twelve-month risk analysis that the rest of the RAP is based upon.

RISKS

Risks faced by AMG can be broadly categorized as:

Strategic: includes risks related to marketing and sales strategy, product innovation, technology innovation, raw material sourcing, capacity utilization, and acquisitions or divestitures

Operational: includes risks related to executing the strategic direction, production, maintenance of production equipment, distribution of products, labor relations, human resources, IT infrastructure and security, and health, safety and environmental issues

Market and External: includes risks related to global and regional economic conditions, market supply/demand characteristics,competition, metal prices, product substitution, customer and supplier performance and community relations

Financial: includes risks related to compliance with credit facility covenants, currency fluctuations, liquidity, refinancing, budgeting, metal price and currency hedging, treasury and tax functions, accuracy and timeliness of financial reporting, compliance with IFRS-EU accounting standards, compliance with the Netherlands Authority for the Financial Markets (AFM) and Euronext Amsterdam requirements

Legal and Regulatory: includes risks related to the political, environmental, legislative, and corporate governance environment

AMG is subject to a broad array of risks which are inherent to the markets in which it operates. While all risks are important to consider, the following are the principal risks that could have a material impact on results.

METAL PRICE VOLATILITY RISK

AMG is exposed to metal price volatility. AMG is primarily a processor of metals, so risk can arise from short-term changes in price between purchase, process, and sale of the metals or from end-user price risk for metals when raw materials are purchased under fixed-price contracts. The Company hedges exchange-traded metals when possible. In its aluminum business, AMG also sells conversion services with no metal-price risk. Most metals, alloys and chemicals that AMG processes and sells, such as vanadium, chrome metal, tantalum, graphite, niobium, and antimony trioxide, cannot be hedged on an exchange. In addition, due to rising vanadium prices in 2018, and the related increased inventory balances as of year-end, AMG has a higher exposure to lower of cost or market ("LCM") adjustments associated with potential price declines.

To mitigate price risk, AMG takes the following actions:

- Seeks to enter into complementary raw material supply agreements and sales agreements whereby the price is determined by the same index;
- Aligns its raw material purchases with sales orders from customers;
- Establishes low-cost long positions in key raw materials through, for example, ownership positions in mining activities or structured long-term supply contracts;
- Maintains limits on acceptable metals positions, as approved by the Management Board; and
- Enters into long-term fixed-price sales contracts at prices which are expected to be sustainably above the cost of production.

Success of the mitigation plan is dependent on the severity of metal price volatility and on the stability of counterparties performing under their contracts. Despite the mitigation strategies noted above, AMG retains some exposure to price volatility which could have an impact on financial results. Due to the diverse mix of metals that AMG processes and the fact that metal processing has more pass-through risk than long-position risk, this risk is difficult to quantify.

MINING RISK

At its lithium and tantalum mine in Brazil and three graphite mines in Germany, Sri Lanka and Mozambique, AMG is exposed to certain safety, regulatory, geopolitical, environmental, operational and economic risks that are inherent to a mining operation. The profitability and sustainability of the Company's operations in various jurisdictions could be negatively impacted by environmental legislation or political developments, including changes to safety standards and permitting processes. The mining businesses have certain operational risks related to the ability to extract materials, including weather conditions, the performance of key machinery and the ability to maintain appropriate tailings dams. These risks are all mitigated by continuous monitoring and maintenance of all mining activities. Mining is also subject to geological risk relating to the uncertainty of mine resources, and economic risk relating to the uncertainty of future market prices of particular minerals. Geological risk is managed by continuously updating mine maps and plans; however, the profitability of the Company's mining operations is somewhat dependent upon the market price of mineral commodities. Mineral prices fluctuate widely and are affected by numerous factors beyond the control of the Company. The level of interest rates, the rate of inflation, world supply of mineral commodities, consumption patterns, speculative activities and stability of exchange rates can all cause significant fluctuations in prices. The prices of mineral commodities have fluctuated widely in recent years. Continued future price volatility could cause commercial production to be impracticable. Mitigation strategies include managing price risk by entering into long-term fixed-price contracts with customers, and via vertical integration strategies. Other cost-related strategies include continuously reducing cost of production for current products or expanding product lines to enable profitable mine production even in low price environments.

CUSTOMER RISK

Customer concentrations in certain business units amplify the importance of monitoring customer risk. In addition, turbulent economic conditions for commodity producers increase customer risk. Since AMG has a low appetite for customer credit risk, the Company attempts to mitigate this exposure by insuring and monitoring receivables, entering into long-term contracts, maintaining a diversified product portfolio and retaining adequate liquidity. AMG has insured its accounts receivable where economically feasible and has set credit limits on its customers, which are closely tracked. In addition to constant monitoring from business unit leaders, AMG's Management Board reviews accounts receivable balances monthly. Given that the Company has thousands of customers, this risk is difficult to quantify. However, no single customer accounts for more than 10% of AMG's revenues, and therefore, while the impact of a customer failure is manageable, it may have an adverse impact on results. Due to the collection of prepayments from many of its customers, AMG Engineering can mitigate a portion of customer payment and performance risk. In addition to risks associated with collectability of receivables, AMG has long-term contracts with numerous customers that have enabled the Company to solidify relationships and deepen its knowledge of its customer base. If a customer does not perform according to a long-term contract and a replacement customer cannot be immediately found, it could have an adverse impact on results.

SUPPLY RISK

AMG Critical Materials is dependent on supplies of metals and metal-containing raw materials to produce its products. Despite a normally low appetite for risk in most categories, supply risk is more difficult to manage given the limited number of suppliers for certain materials. Some of these raw materials are available from only a few sources or a few countries, including countries that have some amount of political risk. AMG Engineering is dependent on a limited number of suppliers for many of the components of its vacuum furnace systems because of its stringent quality requirements. If the availability of AMG's raw materials or engineering components is limited, the Company could suffer from reduced capacity utilization. This could result in lower economies of scale and higher per-unit costs. If AMG is not able to pass on its increased costs, financial results could be negatively impacted. To mitigate the risk of raw materials and supplies becoming difficult to source, AMG enters into longer-term contracts with its suppliers when practical and has been diversifying its supplier base when alternative suppliers are available. The Company also mitigates the risk by monitoring supplier performance, maintaining a diversified product portfolio and retaining adequate liquidity.

LEGAL AND REGULATORY RISK

AMG must comply with evolving regulatory environments in the countries and regions where it conducts business. Adjustments to environmental policy, as well as governmental restrictions on the flexibility to operate in certain locations, could affect the Company. AMG is required to comply with various international trade laws, including import, export, export control and economic sanctions laws. Failure to comply with any of these regulations could have an adverse effect on the Company's financial results, and AMG's appetite for regulatory compliance risk is very low. Additionally, changes to these laws could limit AMG's ability to conduct certain business. AMG carefully monitors new and upcoming changes in governmental regulations, and has been closely monitoring the potential for a "hard BREXIT," the departure of the UK from the EU customs union without a treaty. A change in regulatory bodies that have jurisdiction over AMG products and facilities could also result in new restrictions, including those relating to the storage or disposal of legacy material at AMG-owned properties. This may result in significantly higher costs to AMG. See note 32 to to the consolidated financial statements for more details on the currently known environmental sites. More stringent regulations may be enacted for air emissions, wastewater discharge or solid waste, which may negatively impact AMG's operations. In addition, international and governmental policies and regulations may restrict AMG's access to key materials or scarce natural resources in certain regions or countries or may limit its ability to operate with respect to certain countries. As regulations change, the Company proactively works to implement any required changes in advance of the deadlines. The REACH Directive is in effect in the European Union, and AMG's business units pre-registered all required materials and made complete registrations for those products. AMG has continuing obligations to comply with international and national regulations and practices concerning corporate organization, business conduct, and corporate governance. For example, in addressing possible conflicts of interest affecting its Management or Supervisory Board members, AMG follows strict rules of procedure, which are described in the Company's Articles of Association and the rules of procedure of the Management Board and Supervisory Board, respectively. Compliance with both legal and regulatory matters is monitored and augmented by the Company's Chief Compliance Officer and the Company's General Counsel who make use of the services of several prominent local and global law firms. The Corporate Code of Business Conduct and AMG's Values have been distributed to all employees and is displayed in all workplace locations in local languages. A Speak Up and Reporting policy is widely available to employees, who are advised to report situations that do not comply with AMG's guidelines and policies on how to deal with its employees, business partners and stakeholders. Continuous mandatory training programs, and updates thereof, are provided by the Company to its management and employees to ensure appropriate business conduct. An estimate of potential impact related to regulatory risk is not possible.

CURRENCY RISK

AMG's global production and sales footprint exposes the Company to potential adverse changes in currency exchange rates, resulting in transaction, translation, and economic foreign exchange risk. These risks arise from operations, investments and financing transactions related to AMG's international business profile. While AMG transacts business in numerous currencies other than its functional currency, the United States dollar, the Company's primary areas of exposure are the euro, Brazilian real, and British pound. Given the location of our operations, it is not possible to mitigate translation risk in a cost-effective manner. AMG has developed a uniform foreign exchange policy that governs the activities of its subsidiaries and corporate headquarters. AMG enters into non-speculative spot and forward hedge transactions to mitigate its transaction risk exposure and employs hedges to limit certain balance sheet translation risks. The Company will also at times hold cash in foreign currencies to naturally hedge certain translation risks. AMG's overall economic foreign exchange risk is somewhat mitigated by the natural hedge provided by its global operations and diversified portfolio of products: namely, a majority of AMG's products are sold in the country in which they are produced. While AMG will continue to manage foreign exchange risk and hedge exposures where appropriate, fundamental changes in exchange rates could have an adverse impact on the Company's financial results.

COMPETITION

AMG's markets are highly competitive. The Company competes domestically and internationally with multinational, regional and local providers. AMG competes primarily on product technology, quality, availability, distribution, price and service. Competition may also arise from alternative materials and the development of new products. Increased competition could lead to higher supply or lower overall pricing. AMG is a leader in many of its key niche markets. The Company strives to be at the forefront of technology and product development. Despite this, there can be no assurance that the Company will not be materially impacted by increased competition.

PRODUCT QUALITY, SAFETY AND LIABILITY

AMG's products are used in various applications including mission critical components. Failure to maintain strict quality control could result in material liabilities and reputational damage. The Company maintains a stringent quality control program to ensure its products meet or exceed customer requirements and regulatory standards. AMG further mitigates this risk via liability insurance.

FINANCING RISK

A prolonged restriction on AMG's ability to access the capital markets and additional financing may negatively affect the Company's ability to fund future innovations and capital projects. AMG's financing risk was mitigated in early 2018 with its expansion and extension of the Company's syndicated credit facilities. It is further mitigated by the year-end 2018 liquidity of $551.5 million. AMG's future liquidity is dependent on the Company's continued compliance with the terms and conditions of its credit facility and its ability to refinance. As of December 31, 2018, the Company was in compliance with all financial covenants.

BUSINESS INTERRUPTION

A significant interruption of a key business operation could have a material impact on results. AMG's operations could be impacted by many factors including a natural disaster, serious incident or labor strike. Key suppliers and customers could also experience business interruption whereby the Company is indirectly impacted. AMG's broadly diversified business model mitigates some of the risk associated with business interruption. The Company's insurance policies also include business interruption coverage subject to certain terms. AMG attempts to further mitigate this risk by actively monitoring the supply chain and maintaining rigorous training programs on operational and safety procedures.

RISK MONITORING AND PROCEDURES

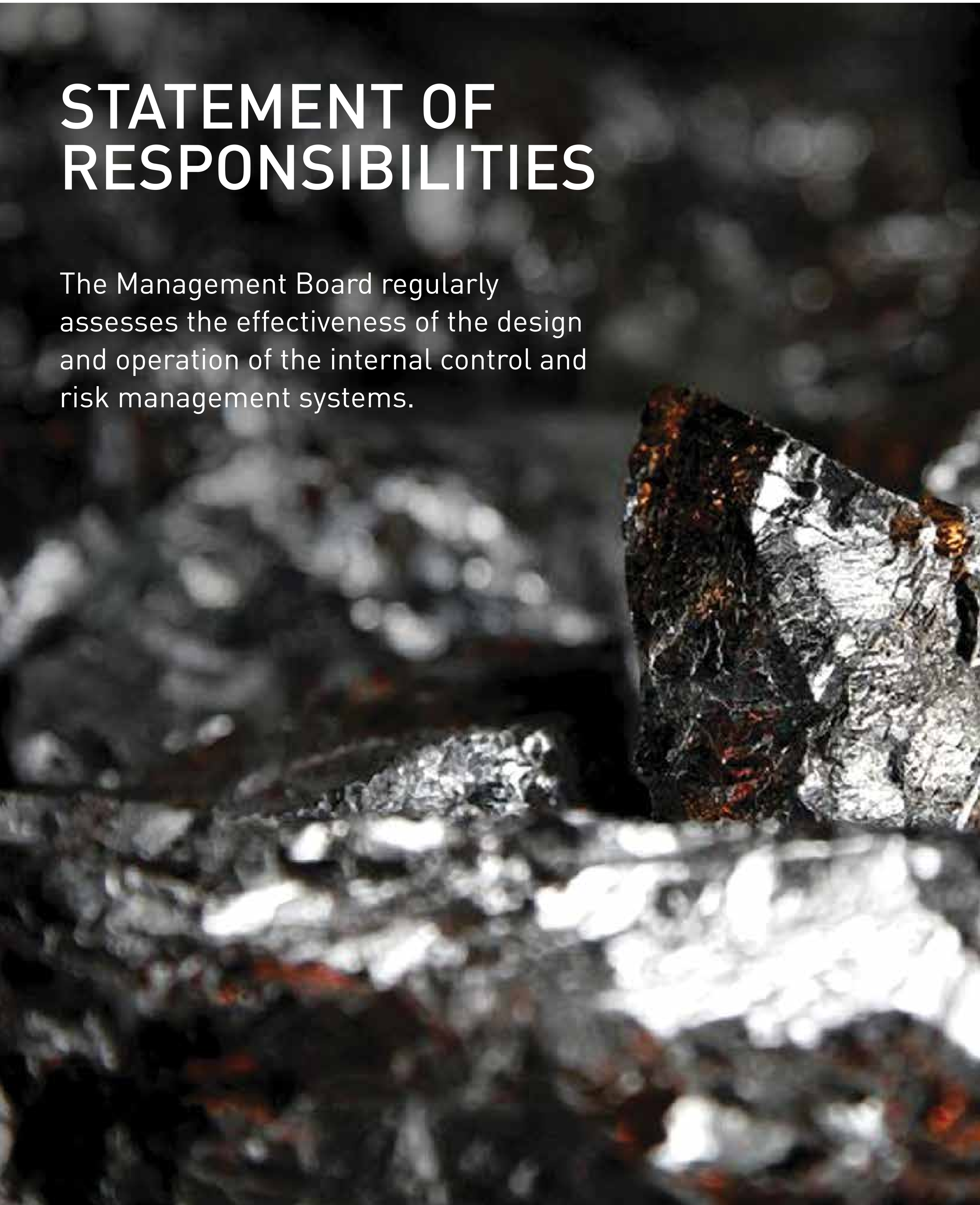
AMG has a strategic risk function that actively monitors and establishes internal controls to mitigate business and financial risks. AMG's strategic risk function is complemented by its Internal Audit function. Through the risk reporting system, the AMG Corporate Risk Committee works with business unit managers to develop risk mitigation strategies, where applicable. The purpose of the risk reporting and monitoring system is to manage, rather than eliminate, the risk of failure to achieve business objectives, and provide only reasonable, not absolute, assurance against material misstatement or loss.

STATEMENT ON INTERNAL CONTROL PURSUANT TO THE DUTCH CORPORATE GOVERNANCE CODE

Risks related to financial reporting include timeliness, accuracy, and implementation of appropriate internal controls to avoid material misstatements. During 2018, the Management Board conducted an evaluation of the structure and operation of the internal risk management and control systems. The Management Board discussed the outcome of such assessment with the Supervisory Board in accordance with the 2016 Dutch Corporate Governance Code. AMG's Management Board believes the internal risk management and control systems in place provide a reasonable level of assurance that AMG's financial reporting does not include material misstatements. In relation to AMG's financial reporting, these systems operated effectively during 2018.

STATEMENT OF RESPONSIBILITIES

The Management Board regularly assesses the effectiveness of the design and operation of the internal control and risk management systems.



Based on this report and in accordance with best practice 1.4.3 of the Dutch corporate governance code as adopted on December 8, 2016, and article 5:25c of the Financial Supervision Act, the aforementioned assessment, the current state of affairs, the Management Board confirms that, to the best of its knowledge:

- the internal risk management and control systems of the Company provide reasonable assurance that financial reporting does not contain any material inaccuracies;
- there have been no material failings in the effectiveness of the internal risk management and control systems of the Company;
- there are no material risks or uncertainties that could reasonably be expected to have a material adverse effect on the continuity of the Company's operations in the coming twelve months; and
- it is appropriate that the financial reporting is prepared on a going concern basis.

It should be noted that the above does not imply that these systems and procedures provide absolute assurance as to the realization of operational and strategic business objectives, or that they can prevent all misstatements, inaccuracies, errors, fraud and non-compliances with legislation, rules and regulations. Nor can they provide certainty that we will achieve our objectives.

In view of all the above, the Management Board confirms that, to the best of its knowledge:

- the financial statements give a true and fair view of the assets, liabilities, financial position and profit or loss of the Company and of companies included in the consolidation;
- the management report provides a fair review of the position at the balance sheet date, the development and performance of the business during the financial year of the Company; and
- the management report describes the principal risks and uncertainties that the Company faces.

DR. HEINZ SCHIMMELBUSCH

ERIC JACKSON

JACKSON DUNCKEL

Management Board
AMG Advanced Metallurgical Group N.V.
March 13, 2019

REPORT OF THE

SUPERVISORY BOARD

JACK L. MESSMAN

CHAIRMAN

Nationality: American

Born: 1940

Date of initial appointment: June 6, 2007

Date of end of term: 2019

Current board position: Lavoro Technologies, Inc. (Non-executive Chairman)

Former positions: Chief Executive Officer, Novell, Inc. and Union Pacific Resources Corporation

WILLEM VAN HASSEL

VICE CHAIRMAN

Nationality: Dutch

Born: 1946

Date of initial appointment: May 4, 2017

Date of end of term: 2021

Current board positions: Investigator/director a.i. by appointment of Enterprise Chamber (Court of Appeals Amsterdam)

Former positions: Attorney-at-law with Trenite van Doorne law firm (Chairman), Dean of the Dutch Bar Association

STEVE HANKE

Nationality: American

Born: 1942

Date of initial appointment: May 3, 2013

Date of end of term: 2019

Professor of Applied Economics and Co-Director of the Institute for Applied Economics, Global Health and the Study of Business Enterprise at The Johns Hopkins University in Baltimore, Maryland, USA, Senior Fellow at the Cato Institute in Washington, D.C., USA, and Chairman Emeritus, the Friedberg Mercantile Group, Inc. (Toronto, Canada)

Former positions: Professor, Colorado School of Mines, Professor, the University of California, Berkeley, and senior economist, President's Council of Economic Advisers (Ronald Reagan)

HERB D. DEPP

Nationality: American

Born: 1944

Date of initial appointment: November 8, 2013

Date of end of term: 2021

Former positions: VP GE Boeing Commercial Aircraft Programs, VP GE Aviation Operations, VP Marketing and Sales GE Aircraft Engines, President General Electric Capital Aviation Services (GECAS)

DONATELLA CECCARELLI

Nationality: Italian

Born: 1959

Date of initial appointment: May 8, 2014

Date of end of term: 2022

Executive Board of the Flick Foundation (Chairwoman)

Former positions: Global Wealth Management Director at Merrill Lynch International Bank Ltd. (Milan, Italy), Executive Director at Lehman Brothers International Europe (Frankfurt, Germany)

FRANK LÖHNER

Nationality: German

Born: 1965

Date of initial appointment: December 18, 2018

Date of end of term: 2022

Director of Montagu Private Equity GmbH in Germany (Frankfurt)

Former positions: Managing Director SEB AG (Head of Corporate Finance Germany), Managing Director Investment Banking Credit Suisse Securities (Europe), Head of Corporate Accounting (Germany) at Celanese AG, Project Leader Mergers & Acquisitions at Hoechst AG (Germany)

The Supervisory Board advises the Management Board and monitors the implementation of AMG's long-term value-creation strategy, ensuring that all stakeholder interests are appropriately considered.

The Supervisory Board supervises the actions taken by the Management Board and the general affairs of AMG. In doing so, the Supervisory Board focuses on the effectiveness of AMG's internal risk management and control system and the integrity and quality of the financial system. The Supervisory Board is also responsible for determining the remuneration of the individual members of the Management Board within the context of the Remuneration Policy as adopted by the General Meeting of Shareholders.

While retaining overall responsibility, it has assigned certain of its preparatory tasks to three committees: the Audit & Risk Management Committee, the Selection & Appointment Committee and the Remuneration Committee, each of which reports on a regular basis to the Supervisory Board. The separate reports of each of these committees are included below.

COMPOSITION OF THE SUPERVISORY BOARD

The Supervisory Board was first established on June 6, 2007, and currently consists of six members, as follows: Jack L. Messman (Chairman), Willem van Hassel (Vice Chairman), Professor Steve Hanke, Herb D. Depp, Donatella Ceccarelli and Frank Löhner (the personal details of each member are included at the beginning of this chapter). During the 2018 financial year, Frank Löhner was elected as a Board member, while the Board said farewell to Norbert Quinkert, Guy de Selliers, Robert Meuter and Suzanne Folsom. Since AMG is active in the supply of critical materials (including specialty metals and alloys), mining and capital goods, and operates in a difficult and unpredictable economic environment, the Supervisory Board believes that diversity in skills and experience is a key prerequisite for the performance of the Supervisory Board going forward. The Supervisory Board believes it has the right skill set in place to take on the challenges of the future. The Supervisory Board aims for an appropriate level of experience i n technological, manufacturing, economic, operational, strategic, social and financial aspects of international business, public administration and corporate governance. The composition of the Supervisory Board must be such that the combined experience, expertise, and independence of its members enable it to carry out its duties. During 2018, all Supervisory Board members qualified as independent, as defined in the Dutch Corporate Governance Code. All current members of the Supervisory Board completed and signed a questionnaire to verify compliance in 2018 with the applicable corporate governance rules, including the Rules of Procedure of the Supervisory Board.

THE RESIGNATION SCHEDULE OF THE MEMBERS OF THE SUPERVISORY BOARD IS AS FOLLOWS:

Jack L. Messman	2019
Willem van Hassel	2021
Prof. Steve Hanke	2019
Herb D. Depp	2021
Donatella Ceccarelli	2022
Frank Löhner	2022

At the Annual General Meeting ("AGM") in May 2019, Mr. Jack Messman will have served twelve years on the Supervisory Board of AMG when his current term ends. Under the term limits imposed by the 2016 Code, Mr. Messman will not stand again for reappointment. Accordingly, Mr. Messman will retire from the Supervisory Board in May 2019. The Supervisory Board is deeply grateful for the long service and dedication to AMG by Mr. Messman. Before becoming Chairman in 2018, Mr. Messman was Vice Chairman and a long-serving member and Chair of AMG's Remuneration Committee and instrumental in shaping and implementing a competitive remuneration structure for the Management and Supervisory Board members. Before that, Mr. Messman was a member of AMG's Audit & Risk Management Committee.

The Supervisory Board thanks Mr. Messman for his invaluable leadership, insights and contributions during his twelve years with AMG and wishes him well in his future endeavors.

Professor Steve Hanke will have served six years on the Supervisory Board in May 2019 when his current term ends. The Supervisory Board is very pleased to announce that Professor Hanke, currently Chair of the Audit & Risk Management Committee, will make himself available for reappointment for a term of four years. The Supervisory Board will nominate Professor Hanke for reappointment by the General Meeting Shareholders on May 1 of this year as independent member of the Supervisory Board for a term of four years.

Given the retirement of Mr. Messman as member and Chairman of the Supervisory Board after the Annual Meeting in May 2019, AMG is pleased to announce that the Supervisory Board plans to appoint Professor Steve Hanke as Chairman of the Supervisory Board as of May 1, 2019 after the Annual Meeting.

Given the vacancy created by the retirement of Mr. Messman, the Supervisory Board is pleased to nominate Ms. Dagmar Bottenbruch, as an independent Supervisory Board member for appointment by the General Meeting of Shareholders on May 1, 2019. Ms. Bottenbruch has the German and US nationality and brings highly relevant experience in the field of financial services, and of public and private equity/venture capital investments. She was Managing Director of Rabobank International in Germany and has worked at Credit Suisse in London and Frankfurt as Director Investment Banking. She currently serves on the Supervisory Board of CFA Society Germany and of Vaamo Finanz AG, Frankfurt. The full curriculum vitae of Ms. Bottenbruch is available for inspection at the offices of the Company.

DIVERSITY

The Supervisory Board recognizes the importance of a diverse composition of the Supervisory Board and the Management Board in general, and in terms of gender in particular. In line with the Diversity Policy of the Company which was adopted in 2017, AMG pursues a policy of having at least 30% of the seats on the Supervisory Board and the Management Board be held by each gender. The company will continue to take its key diversity objectives, including maintaining a proper balance of nationalities to reflect the transatlantic structure of AMG, and the gender allocation of seats as outlined above, into account in connection with recruitment, retention of employees and succession planning for both the Management Board and the Supervisory Board. In 2018, the Management Board deployed measures to attract and maintain a diverse workforce at its units, including linking incentive payments for unit managers to meaningful progress toward diversity targets. In 2018, as detailed in our chapter on Sustainability, across all of our divisions, 30% of AMG's executives were female. At the end of 2018, AMG did not meet its diversity objectives in terms of gender as outlined above, although with regard to the composition of the Supervisory Board after May 1, 2019, its composition is expected to meet the diversity targets regarding gender as outlined above. The Supervisory Board will continue to look for suitable female candidates for both the Management Board and the Supervisory Board in order to meet all of its diversity objectives as outlined in its Diversity Policy as soon as reasonably possible.

SUPERVISORY BOARD MEETINGS

The Supervisory Board held twelve meetings over the course of 2018, including six by telephone conference. Eight of these meetings were held in the presence of the Management Board. All meetings were attended by all members, with the exception of Mr. Messman, Mr. de Selliers, Ms. Folsom and Ms. Ceccarelli, each of whom missed one meeting.

The items discussed in the meetings included recurring subjects, such as AMG's financial position, objectives, results, and more specifically, the operating cash flow (OCF) development as well as the net debt situation of the Company; potential acquisitions and divestments; the business plans of AMG Critical Materials and AMG Engineering; capital expenditure programs; succession planning; legal and compliance review; operations review as well as regular review of the strategic objectives and initiatives of the Company; and the Company's ongoing actions in the field of corporate social responsibility. Financial metrics presented to the Supervisory Board to measure the performance of AMG included

net income, earnings per share, EBITDA, financial leverage (net debt to EBITDA), working capital, liquidity, OCF and return on capital employed (ROCE). The Supervisory Board further discussed the top risks and risk profile of AMG's business and operations and the assessment by the Management Board of the structure of the internal risk management and control systems, and any significant changes thereto, as well as the functioning of the internal audit function and of the external auditor, KPMG Accountants NV ("KPMG"). Besides the scheduled meetings, the Chairman had regular contact with the Chief Executive Officer and the other members of the Management Board as well as senior executives of the Company throughout the year.

Throughout 2018, the Supervisory Board regularly reviewed, and was regularly updated by the Management Board about, the implementation of the long-term strategy of AMG, which was renewed and approved by the Supervisory Board in July 2016 and subsequently fine-tuned in 2017 and 2018. This review took place on a continuous basis, headed by the Chairman of the Management Board, in order to keep the Supervisory Board fully informed on the progress and financing of the strategy, as well as the principal risks related to the strategy. AMG's overriding strategic objective is to achieve industry leadership while being the low cost producer. That resulted in a plan to build and grow its critical materials business with a commitment to doubling AMG's annual EBITDA to a minimum of $200 million by 2020. Over the course of 2017 and 2018, the strategy evolved into a growth-driven approach focusing on three principles: A) process innovation & product development, aimed at improving the market position of AMG's businesses; B) industry consolidation, achieved by pursuing opportunities for horizontal and vertical industry consolidation across AMG's critical materials portfolio; and C) expansion of high-growth businesses within AMG's existing product portfolio. Given the extraordinary results of the Company in 2018, the Supervisory Board wishes to congratulate the Management Board for surpassing its financial target two years ahead of schedule, as the Company has realized EBITDA of $217.1 million in 2018. Please refer to the Chairman of the Management Board's Letter to Shareholders for an overview of AMG's strategy and its implementation thereof (pages 8-11).

On October 31, 2018, the Supervisory Board met at the operational headquarters of AMG in Wayne, Pennsylvania (USA) to receive an extensive briefing from AMG Vanadium's CEO about the business, operations and opportunities of AMG Vanadium, which is based in and operated out of Cambridge, Ohio (USA). AMG Vanadium has achieved record results in 2018, and has made substantial progress in the plans for expansion of its facilities on Ohio.

In 2018, the annual self-evaluation process took place without the assistance of an external facilitator, in line with the Board's policy to use the services of external facilitators for this process once every three years. In 2016, the Supervisory Board had completed a comprehensive self-evaluation process under the guidance and leadership of Professor Jaap van Manen, who acted as external facilitator. In 2018, the Chairman of the Supervisory Board distributed a comprehensive questionnaire to all Supervisory Board members (all of whom responded) which concerned, among other things, the Board members' mutual interaction; their interaction with the Management Board; the functioning of the Supervisory Board Committees; and the desired profile and competencies of the Supervisory Board. During the executive session of the Supervisory Board meeting on October 31, 2018, the Chairman shared and discussed the results with the Board members, and the Supervisory Board concluded that the Board, its Committees and individual members have been functioning well and agreed to maintain its focus on bringing more industry expertise to the Supervisory Board and to continue reviewing the structure of the annual agenda of Board meetings, off-site sessions and strategy discussions.

Also on October 31, 2018, the Supervisory Board (without the presence of the Management Board) met and reviewed the performance of the Management Board and its members over the past twelve months. During this meeting, the Supervisory Board discussed the recommendation of the Selection & Appointment Committee, which had based its findings on the results of the Company and feedback from senior management within the AMG Group. The Committee concluded that the performance of the Management Board and its individual members has been very good, evidenced by, among other things, the extraordinary financial performance by the Company in 2018, the pursuit of growth initiatives in the downstream lithium and vanadium space, and the performance of AMG's share price during 2018 in an unpredictable economic environment, and that no changes in its composition were merited. In particular, the Supervisory Board was impressed by the follow-up on the growth initiatives, and implementation and monitoring by the Management Board members of the strategic objectives which form the basis of AMG's long-term value-creation strategy.

REMUNERATION OF THE SUPERVISORY BOARD IN 2018

At the Annual Meeting of 2013, the General Meeting of Shareholders approved an amendment to the remuneration of the members of the Supervisory Board with effect from January 1, 2013.

The members of the Supervisory Board receive remuneration in the form of a cash component and a share component. No loans, guarantees or the like have been granted to any of the Supervisory Board members.

Cash remuneration: The cash remuneration of the Supervisory Board members was set for 2018 (in thousands) at $95 for the Chairman, $70 for the Vice Chairman and $60 for the other members. Chairpersons of the Remuneration Committee, the Selection & Appointment Committee and the Audit & Risk Management Committee are each paid an additional $20 annually.

Share remuneration: The members of the Supervisory Board do not participate in any of AMG's incentive plans. The allotment of shares to the Supervisory Board as part of their remuneration may either take place by way of (i) an issue of shares with the exclusion of any pre-emptive rights thereon or (ii) the Company purchasing shares on the open market in order to provide the requisite share remuneration amounts. The Management Board, with the approval of the Supervisory Board, may decide in its discretion which method will be used.

FOR THE YEAR ENDED DECEMBER 31, 2018	ROLE	CASH REMUNERATION	SHARE REMUNERATION	# OF SHARES GRANTED
Jack L. Messman	Chairman & Selection & Appointment Committee Chair	$107	$60	1,042
Willem van Hassel	Vice Chairman & Selection & Appointment Committee Member	$68	$50	869
Steve Hanke	Member & Audit & Risk Management Committee Chair	$80	$41	720
Herb D. Depp	Member & Remuneration Committee Chair	$73	$43	747
Donatella Ceccarelli	Member & Selection & Appointment Committee Member	$60	$46	800
Frank Löhner	Member & Audit & Risk Management Committee Member (appointed December 18, 2018)	—	—	—
Norbert Quinkert	Chairman & Selection & Appointment Committee Chair (through May 2, 2018)	$38	$22	384
Guy de Selliers	Member & Audit & Risk Management Committee Member (through May 2, 2018)	$20	$15	267
Robert Meuter	Member & Audit & Risk Management Committee Member (through May 2, 2018)	$20	$15	267
Suzanne Folsom	Member & Remuneration Committee Member (through August 1, 2018)	$60	$27	467

The number of shares given to each member is computed with respect to a specified number of euros for each member. The table above specifies the number of shares awarded to each Supervisory Board member in 2018. Awarded shares may not be disposed of by the relevant member of the Supervisory Board until the earlier of the third anniversary of the grant or the first anniversary of the date on which they cease to be a member of the Supervisory Board.

Best practice provision 3.3.2 of the Corporate Governance Code states that a Supervisory Board member may not be awarded any shares and/or rights to shares in the Company on whose supervisory board they serve. AMG does not comply with best practice provision 3.3.2 for reasons further explained in the Corporate Governance chapter (pages 40-46) of this report and at the Company's website under the heading "Corporate Governance at AMG."

The table above shows the total remuneration of each member of the Supervisory Board for 2018 (in thousands, except number of shares granted).

SHARES HELD BY MEMBERS OF THE SUPERVISORY BOARD

As of December 31, 2018, the members of the Supervisory Board held 93,615 shares in the Company. Out of that number, 80,715 shares were awarded to them between 2007 and 2018 as part of their annual remuneration.

REMUNERATION OF THE SUPERVISORY BOARD IN 2019

The remuneration of the Supervisory Board will not change in 2019 as compared to 2018.

COMMITTEES

The Supervisory Board has three standing committees: the Audit & Risk Management Committee, the Selection & Appointment Committee and the Remuneration Committee.

AUDIT & RISK MANAGEMENT COMMITTEE

COMPOSITION: PROF. STEVE HANKE (CHAIR), MR. FRANK LÖHNER

The Audit & Risk Management Committee is responsible for, among other things, considering matters relating to financial controls and reporting, internal and external audits, the scope and results of audits and the independence and objectivity of auditors as well as the Company's process for monitoring compliance with laws and regulations and its Code of Business Conduct.

It monitors and reviews the Company's internal audit function and, with the involvement of the independent external auditor, focuses on compliance with applicable legal and regulatory requirements and accounting standards.

The Audit & Risk Management Committee met five times during 2018, in addition to its meetings to review and approve annual and interim financial reports and statements of the Company, and reported its findings periodically to the plenary meeting of the Supervisory Board. All members of the Audit & Risk Management Committee attended all meetings, except for Mr. De Selliers and Ms. Folsom, who each missed one meeting. Ms. Folsom was succeeded by Dr. Ceccarelli as member *ad-interim* after her resignation on August 1, 2018 and Mr. Löhner succeeded Dr. Ceccarelli upon his appointment on December 18, 2018.

The structure, process and effectiveness of the Company's internal risk management and control systems and the accompanying risk reports from the Management Board were a regular topic of discussion by the Audit & Risk Management Committee. Topics of discussion at the Audit & Risk Management Committee meetings also included the Internal Audit plan prepared by the Internal Auditor of AMG and the External Audit plan prepared by KPMG Accountants NV ("KPMG") (see further chapter on Corporate Governance). Furthermore discussed were internal audit reports of the various units within the group and the identified risks per entity, summarized in the top risks of the Company; quarterly financial results; liquidity and cash situation; credit facility and arrangement with the Company's major banks; insurance; environmental risk; status of the IT environment within AMG; compliance and Code of Business Conduct review program; foreign currency exposure and hedging policies; tax structuring and spending approval matrices; risk management reports; and litigation reports. The Company's Internal Auditor maintained regular contact with the Audit & Risk Management Committee and the external auditors of the Company. The Audit & Risk Management Committee also met with the external auditors without any member of the Company's Management Board or financial and accounting staff present.

The Audit & Risk Management Committee discussed with KPMG the findings from the 2018 audit and reviewed the contents and key audit matters of the 2018 Independent Auditor's Report of KPMG and reported on this matter to the plenary meeting of the Supervisory Board. In 2018, external audit fees were $1.935 million. Present at all non-executive session meetings of the Audit & Risk Management Committee were the Chief Financial Officer, Chief Controller and the Internal Auditor. KPMG was present at all these meetings, while at certain meetings, the General Counsel was also present.

The Internal Auditor at AMG reports to the Audit & Risk Management Committee and to the Management Board and operates on the basis of an Internal Audit plan approved by the Audit & Risk Management Committee, the Management Board, and the Supervisory Board. The Internal Audit plan is risk-based and comprises all units and subsidiaries of the AMG Group with a focus on operational, financial, strategic and IT risks.

The Internal Audit function closely cooperates with the external auditors of the Company and attends all meetings of the Audit & Risk Management Committee of the Supervisory Board.

During the Annual Meeting on May 2, 2018, the General Meeting of Shareholders reappointed KPMG as external auditors of the Company for a period of two financial years (2018 and 2019).

SELECTION & APPOINTMENT COMMITTEE

COMPOSITION: JACK L. MESSMAN (CHAIR), WILLEM VAN HASSEL

The Selection & Appointment Committee is responsible for: (i) preparing the selection criteria, appointment procedures and leading searches for Management Board and Supervisory Board candidates; (ii) periodically evaluating the scope and composition of the Management Board and the Supervisory Board; (iii) periodically evaluating the functioning of individual members of the Management Board and the Supervisory Board; and (iv) supervising the policy of the Supervisory Board in relation to the selection and appointment criteria for senior management of the Company. The Selection & Appointment Committee held two regular meetings during 2018, in addition to various informal meetings between the Committee members and contacts with the Chairman of the Management Board and other members of the Supervisory Board, and reported its findings to the Supervisory Board. In these meetings, all committee members were present.

In its succession planning for the Management Board and Supervisory Board, the Committee takes into account the profile set for new members as well as the diversity policy of the Company as explained above (page 25), bearing in mind the need to have in place at all times the right skill set and experience on the Board. During 2018, the Committee continued its succession planning process to find adequate candidates for the Supervisory Board, based on the profile which was approved in 2016.

Mr. Norbert Quinkert, Chairman of the Supervisory Board until May 2, 2018, and Mr. Guy de Selliers, member of the Audit &Risk Management Committee, had both served eleven years on the Supervisory Board when their terms ended in May 2018. Given the new term limits imposed by the new 2016 Code in the Netherlands, both gentlemen decided to step down from the Supervisory Board in May 2018. Also, Mr. Robert Meuter, who had joined the Supervisory Board in 2015 as an independent member on the recommendation of RWC, had requested to step down to prioritize other engagements, as he considered his mandate to have ended. The Supervisory Board was very pleased that Dr. Donatella Ceccarelli, whose term ended in May 2018, had made herself available for another four-year term on the Supervisory Board (the General Meeting of Shareholders on May 2, 2018 formalized her reappointment with 100% of the votes in favor).

In July 2018, Ms. Suzanne Folsom indicated to the Chairman that she wished to retire early from the Supervisory Board given her busy schedule. Ms. Folsom had been appointed in 2017 and stepped down on August 1, 2018. The Supervisory Board is grateful for the contributions of Ms. Folsom and wishes her well in her future endeavors. As a result, the Committee had to accelerate its search for a successor, which it found in Mr. Frank Löhner whom the Committee had identified earlier as a potential candidate for the Supervisory Board. Mr. Löhner, who is a financial expert and an accountant by training, and who has extensive experience in the financial and banking industry, was appointed by the Extraordinary General Meeting of Shareholders on December 18, 2018 as member of the Supervisory Board with immediate effect. Mr. Löhner has taken the place of Ms. Folsom on the Audit & Risk Management Committee, a position Dr. Ceccarelli fulfilled on an interim basis.

The Supervisory Board had resolved during its meeting in March 2018, based on the recommendation of the Committee, to reduce the size of the Supervisory Board to six members, as it had concluded that it would continue to be capable of meeting the profile and skills needed within a smaller context. The Supervisory Board further resolved during its March 2018 meeting to appoint Mr. Jack L. Messman as Chairman and Mr. Willem van Hassel as Vice Chairman, after the Annual Meeting on May 2, 2018 when Mr. Quinkert would step down.

Management Board

As extensively explained in the 2017 Annual Report, the Supervisory Board had reviewed the composition of the Management Board and concluded that it was of utmost importance for AMG to secure the leadership of Dr. Heinz Schimmelbusch for the coming years as CEO and Chairman of the Management Board, given the transformational changes affecting the Company by implementing the Company's long-term strategy.

As a result, the Supervisory Board decided to bring forward the reappointment of Dr. Schimmelbusch as CEO and Chairman of the Management Board to the Annual General Meeting in

May 2018. During the Annual General Meeting on May 2, 2018, Dr. Schimmelbusch was reappointed for a term of two years, covering 2020 and 2021, after his current term expires in May 2019.

REMUNERATION COMMITTEE AND REMUNERATION REPORT 2018

COMPOSITION: HERB D. DEPP (CHAIR) AND DONATELLA CECCARELLI

The Remuneration Committee is responsible for establishing and reviewing material aspects of the Company's policy on compensation of members of the Management Board and preparing decisions for the Supervisory Board in relation thereto. This responsibility includes, but is not limited to, the preparation and ongoing review of: (i) the remuneration policy as adopted by the General Meeting of Shareholders; and (ii) proposals concerning the individual remuneration of the members of the Management Board to be determined by the Supervisory Board.

The Remuneration Committee met two times in 2018, in addition to various informal discussions among its members, the other members of the Supervisory Board, the Chairman of the Management Board and the Chief Financial Officer. All members of the Committee attended all the meetings of the Committee.

Topics of discussion at the meetings included the regular items such as the review of the base salary and short-term incentives for members of the Management Board as well as the senior executive team at AMG's divisions; the review of the performance-related compensation of the Management Board members; and the review of the peer group selected for executive remuneration. In addition, the Chair of the Remuneration Committee met with the members of the Management Board regarding their views about the amount and structure of the Management Board's own compensation in view of best practice provision 3.1.2.

THE DUTCH CORPORATE GOVERNANCE CODE

As extensively reported in the Annual Report for 2017, the Committee had reviewed the impact during 2017 of the 2016 Code's principles and provisions on remuneration for the Management Board and Supervisory Board. This review was completed during the first quarter of 2018. As reported in the 2017 Annual Report, AMG's outside executive compensation consultant, Willis Towers Watson (WTW), had concluded in 2016 that based on its review of the remuneration of the Supervisory Board, that such remuneration is generally comparable and in line with that of the Company's peers. Also in 2016, WTW reported that it had not identified any material issues in the current Remuneration Policy of the Management Board, which is unchanged since 2013.

For clarity purposes, AMG hereby partly restates below the relevant sections from its 2017 Annual Report concerning the impact of long-term value creation objectives on the remuneration practices of the Company and the pay ratio analysis which the Committee and Supervisory Board still consider valid and relevant for the pay ratio numbers of 2018:

Long-term value creation: The implementation of the Remuneration Policy contributes to the long-term value-creation objective of AMG as it strikes a balance between the relatively modest base salary level of the Management Board (which has not changed since 2008) and the short-term incentives on the one hand, and the financial reward which can be gained under the applicable stock option and performance share unit plans on the other hand (which carry vesting terms of three to four years). In addition, the Remuneration Policy provides for share retention requirements for the Management Board members. The short-term incentive cash remuneration is calculated and payable on an annual basis and is based on OCF and ROCE targets, which are set annually by the Supervisory Board. The long-term incentive (LTI) remuneration factors in an ROCE hurdle rate set by the Supervisory Board as well as AMG's relative share price performance against its peers, which are important measurements for long-term value creation. The Supervisory Board establishes challenging but realistic targets every year for the short-term incentive remuneration, which includes personal objectives for each Management Board member, along with longer-term elements like improvements in safety, organizational excellence and growth.

Pay ratios: As required under the 2016 Code, the Remuneration Committee had in 2017 initiated the review of the applicable pay ratio within AMG and its group companies. The Supervisory Board, upon recommendation of the Remuneration Committee, has established that the most informative ratio would be one which compares the average Management Board actual compensation with that of the average total employee benefit cost per employee (global workforce). The average Management Board compensation (rather than only CEO compensation) is deemed to be the appropriate parameter, given the collective management responsibility of the Management Board members under the Dutch corporate governance system. It should be noted that pay-ratios are specific to a company's industry, geographic footprint and organizational structure. For example, a large part of AMG's workforce is located in emerging and developing countries, whereas AMG's Management Board members are based in the United States. Compensation packages are designed to be locally competitive. Also, it should be noted that pay ratios can be quite volatile over time, as they can vary with stock market movements (impacting the LTI part of the Management Board compensation), exchange rate movements and actual performance by the Company. In 2016, AMG's pay ratio was 71 (the first year AMG published its pay ratio). AMG's pay ratios for 2017 and 2018 were 72 and 62, respectively. These ratios were impacted by the high Management Board incentive awards which were driven by AMG's strong value creation in 2017 and 2018. The development of this ratio will be monitored and disclosed going forward. If the long-term incentive payments to the Management Board were removed from the calculation, the ratios would be 42 and 40 for 2017 and 2018, respectively. The Remuneration Committee has taken into account these pay ratios in establishing the Management Board compensation for 2018 and 2019 and believes that these ratios are fair and adequate for this purpose.

REPORT ON REMUNERATION OF THE MANAGEMENT BOARD IN 2018

The remuneration of AMG's Management Board for 2018 was based on the Remuneration Policy of the Company. Under the Remuneration Policy, each year the Supervisory Board reviews, confirms and uses an executive compensation peer group for benchmarking purposes. For 2018, the Supervisory Board utilized the peer group established in 2016 with the assistance of Willis Towers Watson, with the exception of Chemtura which was removed due to it being acquired in 2017.

The selected peer group consisted of the following companies (in alphabetical order):

1. Albemarle Corporation
2. Allegheny Technologies Inc.
3. Ametek, Inc.
4. AMAG Austria Metall AG
5. Bodycote plc
6. Cabot Corporation
7. Carpenter Technology Corporation
8. Commercial Metals Company
9. Elementis plc
10. Ferroglobe plc (formerly Globe Specialty Metals Inc.)
11. Hill & Smith Holdings plc
12. Imerys SA
13. Materion Corporation
14. Minerals Technology Inc.
15. Quaker Chemicals Corporation
16. Worthington Industries Inc.

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. In addition, pursuant to the Remuneration Policy, the Remuneration Committee has agreed to honor the existing contractual agreements of the current Management Board members and therefore continues to accept the dual employment contract system as the basis for the remuneration of two of the Management Board members. The main terms and conditions of the employment contracts of the Management Board members are published on the Company's website under the heading "Corporate Governance." In establishing the 2018 remuneration, the Supervisory Board considered multiple scenarios with regards to how the remuneration components would be affected given different sets of circumstances (which related in this year particularly to the level of growth by the Company resulting from the global economy, volatility levels of the financial markets and the EUR:USD exchange rate).

MANAGEMENT BOARD REMUNERATION IN 2018

Certain members of the Management Board have entered into remuneration contracts with companies that are part of the AMG Group. The remuneration levels in the table on the next page show the aggregate values of the contracts per Management Board member. A detailed explanation of the remuneration paid in 2018 is provided in note 33 to the consolidated financial statements.

BASE SALARY

The base salaries of the Management Board members were determined by the Supervisory Board in line with the Remuneration Policy of the Company. Base salary levels have not changed since 2008.

ANNUAL BONUS

In line with the Remuneration Policy, the short-term incentive plan provides for an annual cash bonus, which depends on three key performance metrics:

- 40%: Return on capital employed (ROCE)
- 40%: Operating cash flow (OCF)
- 20%: Individual performance

The Company's ROCE and OCF in 2018 were significantly above the annual targets set by the Supervisory Board, and therefore the financial bonus targets set by the Supervisory Board were exceeded by the Management Board. The individual performance targets set by the Supervisory Board for each Management Board member were also met in 2018.

The table below shows the target and paid-out annual bonus for the year 2018 as a percentage of base salary per Management Board member. The base salary for annual bonus calculation purposes corresponds to full-year base salary.

ANNUAL BONUS AS A % OF BASE SALARY

FOR THE YEAR ENDED DECEMBER 31, 2018	TARGET	PAYOUT
Dr. Heinz Schimmelbusch	85%	255%
Eric Jackson	65%	195%
Jackson Dunckel	65%	195%

LONG-TERM INCENTIVES — STOCK OPTIONS

Dr. Schimmelbusch, Mr. Jackson, and Mr. Dunckel participate in the AMG Management Board Option Plan per the Remuneration Policy. In addition, each member of the Management Board participates in the AMG Performance Share Unit Plan adopted as part of the Remuneration Policy. The table on page 32 provides an overview of the options granted under the AMG Management Board Option Plan that are outstanding as of the end of 2018. In August 2018, options were granted to the Management Board members pursuant to the Remuneration Policy as part of the long-term incentive plan. These options are all conditional and follow the conditions set forth in the Remuneration Policy and are governed by the AMG Management Board Option Plan adopted in 2009.

LONG-TERM INCENTIVES — PERFORMANCE SHARE UNITS

In 2018, the Supervisory Board awarded Performance Share Units to the Management Board pursuant to the Remuneration Policy. The present value of the Performance Share Units (PSU) award for the Management Board members in 2018 is as follows (in thousands):

Heinz Schimmelbusch	€1,360
Eric Jackson	€400
Jackson Dunckel	€400

The present value of the PSUs is calculated as 100% of the fair market value at the grant-date. These PSU awards will vest after three years, in accordance with the Remuneration Policy. Vesting of the PSU is subject to:

(in thousands) FOR THE YEAR ENDED DECEMBER 31, 2018	BASE SALARY	ANNUAL BONUS	OPTION COMPENSATION	PERFORMANCE SHARE UNITS	RETIREMENT BENEFITS & PENSIONS	OTHER REMUNER-ATION[1]	VALUE OF VESTED OPTIONS "IN THE MONEY" AT DEC. 31, 2018
Heinz Schimmelbusch	$1,045	$2,666	$343	$2,373	$292	$71	—
Eric Jackson	$641	$1,250	$101	$698	$160	$34	—
Jackson Dunckel	$641	$1,250	$85	$765	$291	$51	—

Note: These amounts represent the expense recorded by AMG for each component.
(1) "Other Remuneration" includes car expenses and additional car insurance paid for by the Company.

- A three-year vesting period
- A minimum average ROCE over the performance period as established by the Supervisory Board
- The relative Total Shareholder Return (TSR) compared to the Bloomberg World Metal Fabricate/Hardware Index

During 2018, Dr. Heinz Schimmelbusch exercised 77,603 vested stock options and Eric Jackson exercised 22,824 vested stock options. For the 2015 PSU grants, the three-year vesting period was completed in 2018 and the minimum ROCE over the performance period (2015-2017) met the target set by the Supervisory Board. The relative TSR for the Company resulted in a multiplier of 175% which accordingly allowed the entire 2015 PSU award to vest. The Supervisory Board resolved on November 2, 2016, pursuant to the authority granted under the Remuneration Policy, that the PSU awards granted in 2015 and 2016 would be settled in AMG shares rather than cash, subject to vesting of the awards. As a result, in 2018 the following shares were issued to the following Management Board members as settlement of the 2015 PSU awards:

Dr. Heinz Schimmelbusch	295,519 shares AMG
Mr. Eric Jackson	86,917 shares AMG

PENSIONS AND RETIREMENT BENEFITS

The members of the Management Board are members of a defined contribution plan maintained in the United States. All of them receive additional retirement benefits from Metallurg's Supplemental Executive Retirement Plan (SERP). With respect to Heinz Schimmelbusch, the supplemental benefits are payable commencing at the end of his employment with AMG. The benefit to be paid under the AMG retirement plan will be reduced by the amounts received under the normal retirement benefit under the Pension Plan of Metallurg Inc. Pursuant to Eric Jackson's and Jackson Dunckel's SERP, it is provided that if one is employed by AMG or remains in AMG's employment until he is 65, he is entitled, whether or not he has terminated his employment, to receive AMG retirement benefits (reduced by amounts received under Metallurg's other pension plans). As Eric Jackson has reached age 65 and remains in AMG's employment, he has begun receiving AMG retirement benefits. Jackson Dunckel's benefits will be reduced if his employment with AMG ends prior to reaching age 65.

Total costs to AMG with respect to the pension and retirement benefits of the Management Board in 2018 are provided in the table above, which sets forth total expenses incurred in 2018 for Management Board remuneration.

OTHER BENEFITS

All Management Board members receive benefits that are in line with industry and individual country practice. No loans or guarantees are granted to any Management Board members.

Total costs to the Company with respect to other remuneration of the Management Board are provided in the table in note 33 to the consolidated financial statements, which sets forth total costs incurred in 2018 for Management Board remuneration.

CONTRACTS

Dr. Schimmelbusch and Mr. Jackson have management agreements with AMG and employment agreements with one of AMG's US subsidiaries. These employment contracts were entered into before January 1, 2013 for an indefinite period of time. In case AMG terminates the contract(s) of employment without cause, the maximum severance payment is limited to two years' base salary and two years of target annual bonus. Mr. Dunckel has a management agreement with AMG and an employment agreement with one of AMG's US subsidiaries for an indefinite period of time. In case Mr. Dunckel's employment agreement is terminated without cause, the maximum severance payment is limited to two years' base salary. Current agreements with respect to severance payments do not comply with best practice provision 3.2.3 of the Dutch Corporate Governance Code, which is further explained in the chapter on Corporate Governance (page 40), but the Supervisory Board believes they are necessary to attract and retain key senior executives in the countries in which we operate.

As part of the Company's Remuneration Policy, AMG will honor existing contractual agreements for its Management Board members and adapt to individual country practices that deviate from best practice provision 3.2.3 of the Dutch Corporate Governance Code. Key terms of the employment contracts of the Management Board members are provided on the Company's website under the "Corporate Governance" section.

MANAGEMENT BOARD REMUNERATION FOR 2019

The Remuneration Committee has set up the size and structure of the Management Board's remuneration for 2019. The Remuneration Committee has analyzed the possible outcomes of the different remuneration components in view of various economic scenarios and how these may affect the remuneration of Management Board members. The Remuneration Committee has reviewed the executive compensation peer group (listed on page 30) in establishing the compensation for 2019 and has decided that no changes are merited to the peer group. As noted in earlier annual reports, the Company appointed a new

AMG OPTION PLAN		NON-VESTED OPTIONS UNDER THE PLAN				VESTED OPTIONS UNDER THE PLAN		
FOR THE YEAR ENDED DECEMBER 31, 2018	YEAR	DATE OF GRANT	NUMBER OF OPTIONS	PRESENT VALUE AT DATE OF GRANT (€)	VESTING SCHEME	EXERCISE PRICE (€)	NUMBER OF OPTIONS	MARKET VALUE AT 12/31/2018 (€)
Dr. Heinz Schimmelbusch								
	2015	5-7-15	38,171	170,000	50% vested after 3 years, 50% vested after 4 years	8.08	—	n/a
	2016	5-4-16	129,771	340,000	50% vested after 3 years, 50% vested after 4 years	9.78	—	n/a
	2017	5-4-17	47,668	340,000	50% vested after 3 years, 50% vested after 4 years	25.50	—	n/a
	2018	5-2-18	17,086	340,000	50% vested after 3 years, 50% vested after 4 years	44.24	—	n/a
Eric Jackson								
	2015	5-7-15	11,227	50,000	50% vested after 3 years, 50% vested after 4 years	8.08	—	n/a
	2016	5-4-16	38,168	100,000	50% vested after 3 years, 50% vested after 4 years	9.78	—	n/a
	2017	5-4-17	14,020	100,000	50% vested after 3 years, 50% vested after 4 years	25.50	—	n/a
	2018	5-2-18	5,026	100,000	50% vested after 3 years, 50% vested after 4 years	44.24	—	n/a
Jackson Dunckel								
	2016	5-4-16	38,168	100,000	50% vested after 3 years, 50% vested after 4 years	9.78	—	n/a
	2017	5-4-17	14,020	100,000	50% vested after 3 years, 50% vested after 4 years	25.50	—	n/a
	2018	5-2-18	5,026	100,000	50% vested after 3 years, 50% vested after 4 years	44.24	—	n/a

executive remuneration consultant (WTW) in 2016, who proposed the revised executive compensation peer group, which has been used since 2017.

BASE SALARY

The Supervisory Board has decided that the base salary of the Management Board members for 2019 will not change as compared to the base salary levels of 2018, except with respect to Eric Jackson, whose base salary has been increased. The table below shows the base salaries (on an annual basis) for 2018 and 2019 (in thousands):

	2018	2019
Dr. Heinz Schimmelbusch	$1,045	$1,045
Eric Jackson	$641	$741
Jackson Dunckel	$641	$641

ANNUAL BONUS

Each year, a variable cash bonus can be earned based on achievement of challenging targets which, as has been established by the Remuneration Committee, contribute to the long-term value-creation objectives of the Company. The annual bonus criteria are set forth below and relate 80% to financial indicators of the Company and 20% to the individual performance of Management Board members. The Supervisory Board determines ambitious target ranges with respect to each performance metric and with respect to the threshold, target, and maximum payout, and determines whether performance targets have been met. The annual bonus payout in any year relates to achievements realized during the preceding year against the agreed targets. The 2019 annual bonus will be determined as follows:

- 40% from ROCE (against agreed target ranges) realized
- 40% from OCF (against agreed target ranges) realized
- 20% from individual performance—at the discretion of the Supervisory Board

The table below shows the annual bonus for each member of the Management Board as a percentage of base salary, in the case that threshold and target performance levels are reached. Below threshold level, the payout will be 0%. The annual bonus can vary based on actual performance and can range from zero up to three times target in case of superior performance.

The Supervisory Board has the discretion to adjust the bonuses upward or downward if the predetermined performance criteria would produce an unfair result due to incorrect financial data or extraordinary circumstances.

MANAGEMENT BOARD POSITION	TARGET PAYOUT[1]
Chairman and Chief Executive Officer	85%
Chief Operating Officer	65%
Chief Financial Officer	65%

1 Expressed as % of base salary.

LONG-TERM INCENTIVES

Pursuant to the Remuneration Policy, the long-term incentives for the Management Board for 2019 consist of two programs: the Performance Share Unit Plan and the Stock Option Plan.

This year's grant (2019) will be the eleventh grant under the Plan, and vesting will, depending on performance, occur after completion of the performance period that covers the calendar years 2019, 2020 and 2021. Vesting of the Performance Share Units under the 2019 grant is subject to:

- A minimum average ROCE over the performance period
- The relative TSR compared to the Bloomberg World Metal Fabricate/Hardware Index

Each year the Supervisory Board determines the target range with respect to the ROCE performance metric, which sets the threshold and maximum payouts and determines whether such targets have been achieved. In addition, it monitors and establishes the applicable TSR ranking for the relevant PSU period. The TSR ranking used applies the Bloomberg World Metal Fabricate/Hardware Index, as further explained in the Company's Remuneration Policy, which is available under the "Corporate Governance" section of the Company's website. The Supervisory Board has the ability to adjust the value upward or downward if the predetermined performance criteria would produce an unfair result due to incorrect financial data or in case of extraordinary circumstances.

The present values of the PSUs to be granted in 2019 are €1,360,000 for the Chief Executive Officer, €461,000 for the Chief Operating Officer and €400,000 for the Chief Financial Officer. With regards to the Stock Option Plan (SOP), each member of the Management Board will be granted stock options in 2019 in accordance with the Remuneration Policy. Vesting of the stock options is subject to a minimum three-year average ROCE requirement. The stock options will vest half (50%) after the third anniversary and half (50%) after the fourth anniversary. The present values of the stock options under the SOP to be granted in 2019 are €340,000 for the Chief Executive Officer, €115,000 for the Chief Operating Officer and €100,000 for the Chief Financial Officer.

Based on the defined long-term incentive value, the number of share options granted annually will be determined by an option pricing model with appropriate input assumptions.

The input assumptions are reviewed annually. The aggregate number of stock options to be granted under the Remuneration Policy to members of the Management Board shall not exceed 10% of the outstanding share capital of the Company at any time.

PENSION AND OTHER BENEFITS

The pension and other benefits of the members of the Management Board in 2019 will not change compared to 2018.

CONTRACTS

The current contractual agreements will not change compared to 2018. Main elements of the contracts with the Management Board members are published under the "Corporate Governance" section of the Company's website.

SHARES HELD BY MEMBERS OF THE MANAGEMENT BOARD

As of December 31, 2018, Heinz Schimmelbusch held 942,718 AMG shares, Eric Jackson held 296,979 AMG shares and Jackson Dunckel held 17,473 shares.

APPRECIATION FOR THE MANAGEMENT BOARD AND THE EMPLOYEES OF AMG

The Supervisory Board would like to thank the Management Board for its dedication and extraordinary efforts in leading the Company. The Management Board has continued to focus on implementation of its long-term strategy, having achieved in 2018 its goal to double EBITDA to exceed $200 million, two years ahead of schedule. 2018 saw a very good first eight months with the world economy growing strongly and with rising price levels across AMG's businesses, resulting in a share price that reached EUR 52.80 in the summer of 2018, before the global economic environment changed color rapidly, causing subdued investor sentiment throughout world markets, which did affect AMG and its peers. Despite the turbulence affecting AMG during the last months of 2018, the Company realized extraordinary financial results in 2018. The Management Board did an excellent job in keeping the Company focused on not only its operations and financial performance during the year, but also on long-term value creation in an increasingly volatile and uncertain economic environment. The Supervisory Board would also like to thank all the employees of AMG for their continued commitment to the Company's success.

ANNUAL REPORT 2018

The Annual Report and the 2018 Annual Accounts, audited by KPMG, have been presented to the Supervisory Board. The 2018 Annual Accounts and the report of the external auditor with respect to the audit of the annual accounts were discussed with the Audit & Risk Management Committee in the presence of the Management Board and the external auditor. The Supervisory Board endorses the Annual Report and recommends that the General Meeting of Shareholders adopt the 2018 Annual Accounts.

SUPERVISORY BOARD
AMG ADVANCED METALLURGICAL GROUP N.V.

Jack L. Messman, Chairman

Willem van Hassel, Vice Chairman

Steve Hanke

Herb D. Depp

Donatella Ceccarelli

Frank Löhner

March 13, 2019

SUSTAINABLE DEVELOPMENT

This section provides our eleventh annual sustainability report, which evaluates AMG's social and environmental performance.

SITE NAME[1]	LOCATION	COUNTRY	DIVISION
AMG Headquarters[2]	Amsterdam	Netherlands	AMG Corporate
AMG USA Headquarters[2]	Pennsylvania	USA	AMG Corporate
ALD USA[2]	Connecticut	USA	AMG Engineering
ALD France	Grenoble	France	AMG Engineering
ALD Vacuum Technologies[2]	Hanau	Germany	AMG Engineering
ALD Vacuheat	Limbach	Germany	AMG Engineering
ALD TT USA	Michigan	USA	AMG Engineering
ALD Dynatech	Mumbai	India	AMG Engineering
ALD TT Mexico	Ramos Arizpe	Mexico	AMG Engineering
ALD Japan[2]	Shinjuku-ku	Japan	AMG Engineering
ALD C&K[2]	Suzho	China	AMG Engineering
AMG Antimony	Chauny	France	AMG Critical Materials
Bogala Graphite Lanka	Colombo	Sri Lanka	AMG Critical Materials
AMG Graphite	Kropfmühl	Germany	AMG Critical Materials
AMG Antimony	Lucette	France	AMG Critical Materials
AMG Mineração	Nazareno	Brazil	AMG Critical Materials
AMG Silicon	Pocking	Germany	AMG Critical Materials
AMG Graphite	Qingdao	China	AMG Critical Materials
AMG Graphite Tyn	Tyn	Czech Republic	AMG Critical Materials
AMG Alpoco	Anglesey	UK	AMG Critical Materials
AMG Titanium Alloys and Coatings[2]	Brand Erbisdorf	Germany	AMG Critical Materials
AMG Aluminum	Jiaxing	China	AMG Critical Materials
AMG Aluminum	Kentucky	USA	AMG Critical Materials
AMG Alpoco	Minworth	UK	AMG Critical Materials
AMG Titanium Alloys and Coatings	Nürnberg	Germany	AMG Critical Materials
AMG Vanadium	Ohio	USA	AMG Critical Materials
AMG Superalloys and AMG Aluminum	Rotherham	UK	AMG Critical Materials
AMG Superalloys	São João del Rei	Brazil	AMG Critical Materials
AMG Aluminum	Washington	USA	AMG Critical Materials

1 The chart indicates which facilities were included in the scope of the sustainable development data. Only data from these facilities are included in this section, which may therefore show inconsistency with other section of this annual report covering all facilities.

2 Minor or office facilities with estimated data

The reporting boundaries have not changed significantly since 2017. The 29 locations reporting in 2018 (in which AMG has a 51% or greater stockholding) are detailed in the table on the previous page. AMG will continue to assess the boundaries of this report based on the corporate ownership structure on an ongoing basis.

AMG reporting locations include mining, manufacturing, sales, and administrative offices in 12 countries across four continents. This report covers the same two segments as described in 2017: AMG Critical Materials and AMG Engineering.

All locations report their performance at the end of the fourth quarter and no forecast data is used. However, sales and administrative offices and some smaller engineering sites (typically with less than 10 employees or with environmental impacts <1% in all aspects) have been determined to be non-material to the report, and therefore estimated data has been used for these sites in 2018. The sites utilizing estimated data are indicated in the table on page 34.

For the 2018 reporting year, AMG engaged ERM as its sustainability consultant. ERM assisted AMG in executing a materiality assessment and refining its data collection process. AMG anticipates engaging ERM as its primary sustainability consultant for the 2019 reporting year.

AMG's refined data collection process in 2018 represented a shift in methodology that in some cases made reliable comparison to data from former years difficult. For example, in 2018 AMG applied conversion factors that represent local power grids for Scope 2 emissions. In that respect, 2018 will be a baseline year for some of AMG's data using the more reliable methodology.

SCOPE OF THIS REPORT

AMG utilizes the Global Reporting Initiative (GRI) as a basis for this report and includes those aspects which are material to its business units. The report covers aspects that are material based on the following two dimensions:

- The significance of the organization's economic, environmental, and social impacts;
- Their substantive influence on the assessments and decisions of stakeholders.[3]

In order to ensure consistency in the interpretation of definitions of the key indicators, AMG utilizes a standard template which sites use to report their data. The environmental key performance data for both segments are summarized in the table on page 39.

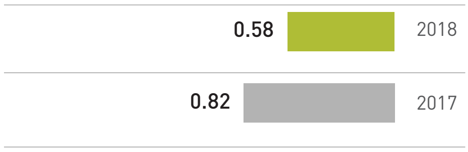
MEMBERSHIPS AND ASSOCIATIONS

United Nations Global Compact

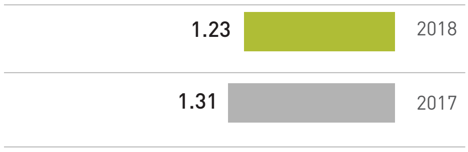
AMG commits its support to the principles of the United Nations Global Compact. The Global Compact, which is overseen by the United Nations, is a strategic policy initiative for businesses that are committed to aligning their operations

3 GRI, GRI Standards, GRI 101: Foundation 2016, 2016, p.18.

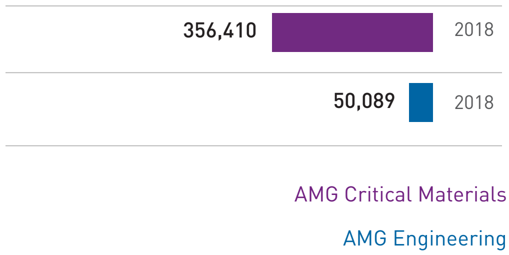
LOST TIME INCIDENT RATE



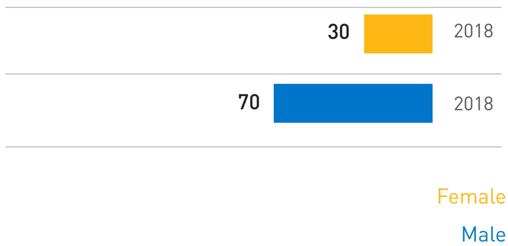
TOTAL INCIDENT RATE



AIR EMISSIONS CO_2E
('000 MT)



DIVERSITY AND INCLUSION-MANAGEMENT EMPLOYEES
(%)



and strategies with ten universally accepted principles in the areas of human rights, labor, the environment, and anti-corruption. In 2009, the AMG Management Board approved its commitment to the Global Compact and the intent of AMG to support the ten principles of the Global Compact. AMG will reaffirm its support and submit its sixth Communication on Progress in April 2019.

Extractive Industries Transparency Initiative

AMG continues its support of the Extractive Industries Transparency Initiative (EITI), a global initiative to improve governance in resource-rich countries through the verification and full publication of Company payments and government revenues from oil, gas, and mining. EITI works to build multi-stakeholder partnerships in developing countries to increase the accountability of governments. Over 30 countries have now committed to the EITI principles and criteria. As of today, AMG has one extractive operation in one EITI-implementing country: Mozambique.

Further information on AMG Sustainable Development and our commitments to these organizations, including our United Nations Global Compact Communication on Progress, can be found on the AMG website (sustainability.amg-nv.com).

ENVIRONMENT

Air Emissions

GRI STANDARDS 305-1 AND 305-2

AMG facilities emit and report upon both direct ("Scope 1") and indirect ("Scope 2") greenhouse gas ("GHG"). Electricity used for the generation of heat for metallurgical processing is the most significant source of GHG emissions for AMG. Electricity use gives rise to Scope 2 GHG emissions of carbon dioxide equivalent (CO_2e), which are dependent on the nature of its generation. Emissions have been calculated using local emission factors.

Scope 1 GHG emissions result primarily from the combustion of carbon-containing materials as part of the metallurgical process such as using coke as a reductant, but also for the generation of heat, such as burning natural gas in a boiler. Other GHGs occurring from processes other than combustion are minimal for AMG business units.

AMG Critical Materials' GHG emissions (Scope 1 and Scope 2) in 2018 were 356,410 mt of CO_2e. 78% of these emissions are attributed to indirect sources (electricity). Emissions are dominated by the silicon metal production activities which account for 207,695 mt of CO_2e. This activity also dominates AMG's overall GHG emissions, accounting for half of total group emissions.

AMG Engineering GHG emissions (Scope 1 and Scope 2) in 2018 were 56,089 mt of CO_2e. 99% of these emissions are indirect and associated with electricity usage.

Normalized to a revenue basis, AMG Critical Materials emitted 356,410 mt CO_2e, with revenue of $1,050.5 million, equivalent to 339 mt CO_2e per million USD revenue. AMG Engineering generated 56,089 mt CO_2e and $259.8 million in revenue, or 217 mt CO_2e per million USD revenue. This wide range reflects the diversity of AMG but also guides focus on reduction opportunities.

Total AMG GHG emissions were 412,499 mt CO_2e in 2018 with revenue of $1,310.3 million, resulting in a GHG intensity of 315 mt CO_2e per million USD revenue.

GRI STANDARDS 305-6 AND 305-7

Emissions of ozone-depleting substances remain *de minimis* for AMG. AMG Engineering also has *de minimis* air emissions for other pollutants resulting from only small sources such as heating and hot water boilers. AMG Critical Materials' production facilities do have some other air emissions, including SOx (618 mt), NOx (198 mt) and particulate materials (105 mt). Data is only available for regulated sources where measurements have been made.

Energy

GRI STANDARDS 302-1 AND 302-2

High-temperature metallurgical processes and mining operations utilized in AMG Critical Materials are energy intensive and improving energy efficiency is an operational priority at AMG that results in both environmental and economic benefit. The two most significant energy carriers are electricity and natural gas.[4]

The reported electricity use of AMG in 2018 was 2,740 terajoules (TJ), of which direct energy use was 72 TJ and indirect was 2,595 TJ.

Across AMG, the split between renewable and non-renewable indirect energy sources is difficult to determine because utilities do not generally publish this information. However, AMG does generate its own renewable energy. In 2018, AMG's hydroelectric generating facility near São João del Rei, Brazil generated 71.77 TJ and AMG Vanadium's solar power system generated 0.65 TJ.

The reported fuel use of AMG in 2018 was 25,880 cubic meters, of which 99% is natural gas.

Resource Efficiency

GRI STANDARDS 301-1 AND 301-2

Resource use varies between AMG business units. Examples include local mining, primary raw material purchase, secondary metal and alloy production from recycled resources, and engineering services.

Furnace technology and engineering services provided by AMG Engineering results in this segment utilizing limited resources. Resources used are mainly complex component parts for furnaces which are routinely measured in units rather than by mass. Unlike the chemicals and alloys business units, this means only limited data are available on resource mass.

AMG Critical Materials uses a much more diverse range of resources including mined ores for tantalum, lithium and graphite production, power plant wastes and spent refinery catalysts to produce vanadium alloys, and metal salts for aluminum alloy production. The segment uses recycled iron, steel, aluminum, and titanium in processes when possible.

4 Indirect energy consumption does not include the energy consumed by electricity producers to generate the electricity or transmission losses.

Wastewater

GRI STANDARDS 306-1 AND 306-3

AMG facilities record the volumes of aqueous effluents including process water and non-sanitary sewer discharges to local water courses. Clean water (typically freshwater used for cooling purposes) is included in the figures given below. Chemical analysis of the effluent is utilized to determine the total mass of primary constituents of the water emissions.

In 2018, 2,366,000 cubic meters of water were disposed to water courses by AMG compared to 1,984,000 cubic meters in 2017. Of the total amount, 61% was discharged at the Mineracao, Brazil mine site and 17% was discharged at the Kropfmuhl, Germany mine site.

After mining activities, most of AMG's water is used for cooling purposes and therefore produces clean water discharges. Some wet chemical processes generate aqueous waste streams, including cooling water used by the silicon metal furnaces and mine water from dewatering pumps. In several locations, mine water is utilized for process water before final discharge.

In 2018, there were no significant spills (defined as one which would affect the Company's financial statements because of the ensuing liability or is recorded as a spill) at any AMG site.

SOCIAL

HEALTH AND SAFETY

AMG is pleased to report that no fatal incidents occurred at its operations in 2018. AMG's medium-term aspirational goal is to become a zero lost time incidents workplace—we cannot accept that any incident is inevitable. Since 2008, there has been year-over-year safety improvement across AMG. For AMG, the total Lost Time Incident Rate[5] improved 29% from 0.82 in 2017 to 0.58 in 2018. Of the 29 locations included in this report, 20 achieved zero lost-time incidents in 2018. The total incident rate[6] improved 6% from 1.31 in 2017 to 1.23 in 2018. Formal safety management systems continue to be important to achieving zero harm to employees and 15 of AMG's larger sites are OHSAS 18001 certified.

Diversity and Inclusion

GRI STANDARDS 102-8, 102-41, 403-1, 403-2, AND 404-1

The size of AMG's workforce has been relatively stable over the last year and at year-end 2018 AMG Critical Materials had 2,346 employees and AMG Engineering had 862. For the facilities covered by this report, the total AMG workforce was 3,208 (other facilities not yet covered in this section employ a further 121 people). Geographically, these employees were located in Asia (315), Europe (1,777), North America (434) and South America (682).

AMG assesses the diversity of its workforce in terms of gender and age, but not ethnicity. The multinational, and therefore multicultural, nature of AMG's business means that ethnic diversity is significant, but it is not possible to define minority employees in such an environment.

In 2017, the Management Board deployed measures to attract and maintain a diverse workforce at its units by, among other things, linking incentives for unit managers to meaningful results in diversity targets. AMG has also adopted a Diversity Policy in relation to the composition of its Management Board and Supervisory Board. AMG will continue to take its key diversity objectives, including maintaining a proper balance of nationalities and the gender allocation of seats, into account in connection with recruitment, retention of employees, and succession planning.

Of the total employees, 19% are female; 81% are male; 18% are under 30 years of age, 54% are between thirty and fifty, and 28% are over fifty. Of management employees, 30% are female and 70% are male. The Management Board's composition is 100% male. The Supervisory Board's composition is 83% male and 17% female as of the end of 2018.

The rights and freedoms for individual employees to join, or choose not to join, unions, as described in Article 23 of the Universal Declaration of Human Rights, are fully respected by AMG. Once again in 2018, AMG facilities had no strikes or lockouts.

GOVERNANCE

Business Ethics

GRI STANDARDS 205-2, 407-1, 408-1, AND 412-2

Protection of internationally proclaimed human rights is an area in which AMG is both highly aware and fully committed. The Company strives to make sure it is not complicit in human rights abuses. Each AMG site is assessed during site visits and with internal audits to identify if there is the possibility of freedom of association or collective bargaining being put at risk because of political or business factors. In 2018, it was found that no sites were at risk, with the exception of China, where the formation of unions remains restricted. Similarly, the Company has reviewed sites to ensure that they are not at risk for employing child labor or exposing young workers to hazards. No sites have been identified that pose a risk at this time. AMG also aims to ensure rights are protected in our supply chain through its Supplier Code of Conduct. Our policy on human rights is included in the AMG Code of Business Conduct and Ethics and detailed in the Company's human rights policy; all are available on the AMG website.

5 Lost time incident frequency rate equals the number of lost time incidents multiplied by 200,000 divided by the total hours worked. Lost time injury was defined using local regulations.

6 Total incident frequency rate equals the number of incidents (including all medically treated injuries) multiplied for 200,000 divided by the total hours worked.

The AMG Values and the AMG Code of Business Conduct

We act Safely

We aim to create Value

We respect People

We act with Integrity

These are AMG's Values and they enable AMG's ambition of being a leader in the field of critical materials and engineering services. These values apply to how AMG conducts its operations and how it deals with its employees, business partners, and stakeholders. The AMG Code of Business Conduct and the Speak Up and Reporting Policy, which reference the AMG Values, are prominently displayed in the local language at each place where the AMG companies carry out their operations and where AMG staff are employed.

In 2019, AMG will deploy its online general ethics training for all employees who are not involved in manual labor activities. A general ethics training program for employees who are involved in manual labour activities was rolled out again in 2018 (after its first deployment in 2015). In 2018, AMG also completed its online general antitrust and competition law principles training for designated staff. The general ethics training, anti-bribery training, and general antitrust and competition law trainings are repeated in three-year cycles.

A network of compliance officers located at all major sites oversees deployment of AMG's ethics training programs and distribution of information concerning AMG's Values and Code of Business Conduct. In February 2019, AMG's Chief Compliance Officer reported to the Management Board and the Supervisory Board about applicable compliance and incident trends at AMG during the year 2018.

During 2018, the number of complaints received under AMG's Speak Up and Reporting policy was well below the available benchmark as published by NAVEX Global (2017 Ethics & Compliance Hotline & Incident Management Benchmark report). No incidents or complaints have been reported to AMG or any public authorities in 2018 to date which would implicate AMG or any of its staff in any bribery scheme involving public officials or agencies.

Compliance

GRI STANDARDS 307-1

No AMG facility received any significant fine or equivalent penalty for non-compliance with environmental laws in 2018.

PRODUCTS

Product Quality and Safety

GRI STANDARD G4-DMA

AMG continues its progress regarding its responsibilities under the REACH regulations in Europe and is continuing to prepare for its 2018 registrations for products with volumes greater than 1 mt. European operations are working with Consortia in developing the health, safety and environmental data required for these registrations and have taken on the role as lead registrant in several cases. Industry groups continue to focus on developing health and safety knowledge of their products as the

SOCIAL AND ENVIRONMENTAL KEY PERFORMANCE INDICATORS AND GRI CONTENT INDEX

SELECTED SOCIAL AND ENVIRONMENTAL KEY PERFORMANCE INDICATORS*

GRI INDICATOR	DESCRIPTION	UNITS	AMG CRITICAL MATERIALS	AMG ENGINEERING	AMG GROUP
			2018	2018	2018
102-8	Total workforce	Total	2,346	862	3,208
403-2	Lost Time Accident Rates	Rate	0.55	0.14	0.58
403-2	Total Incident Rates	Rate	1.37	0.86	1.23
302-1	Direct Electricity Consumption	TJ	37	0	37
302-2	Indirect Electricity Consumption	TJ	2,485	146	2,631
303-1	Water consumption	'000 cubic meters	7,785	52	7,837
305-1	CO_2 equivalent emissions	mt	356,410	56,089	412,499
305-7	SOx emissions	mt	618	0	618
305-7	NOx emissions	mt	183	15	198
305-7	Particulates discharged to air	mt	105	0	105
306-1	Metals discharged	mt	11	0	11
306-2	Hazardous waste (including recycled)	mt	1,740	36	1,776
306-2	Non-hazardous waste (including recycled)	mt	36,570	458	37,028
306-2	Percent of waste recycled	%	25	43	25
306-2	Waste disposed to landfill	mt	28,671	272	28,943
306-3	Spills	L	0	0	0
307-1	Environmental Fines	'000 USD	0	0	0
205-1	Fines for non-compliance with laws	'000 USD	17	0	17

*2018 is a baseline year and therefore no comparison data is provided. The 2019 reporting year will compare data to 2018.

regulatory framework grows and expands across the world. AMG units are involved in, among others, the Vanadium International Technical Committee and the International Antimony Association.

RESPONSIBILITIES

AMG's environmental, health, safety and social performance reporting has been prepared by the management of AMG who are responsible for the collection and presentation of the information.

AMG Advanced Metallurgical Group N.V.

sustainability.amg-nv.com

Contact: **global.sustainability@amg-nv.com**

AMG'S

CORPORATE GOVERNANCE

AMG Advanced Metallurgical Group N.V. is a Dutch company located in the Netherlands which was established in 2006 as the holding company for the AMG group companies. Its shares were first listed on Euronext Amsterdam in July 2007.

In this report, the Company, as a Dutch listed company, sets forth its overall corporate governance structure and the extent to which it applies the provisions of the Dutch Corporate Governance Code, as recently amended and issued on December 8, 2016 (the "2016 Code"). The Dutch Corporate Governance Code can be downloaded at www.mccg.nl. As of January 1, 2017, the 2016 Code is effective in the Netherlands, replacing the 2008 Code. In this annual report, the Company will report on the compliance by the Company with the 2016 Code, as further elaborated in this chapter on Corporate Governance and in the corresponding chapter on the Company's website (amg-nv.com).

The Supervisory Board and the Management Board, which are responsible for the corporate governance structure of the Company, hold the view that the vast majority of principles and best practice provisions set forth in the 2016 Code, as applicable during 2018, are being applied, while certain deviations are discussed and explained hereunder. A full and detailed description of AMG's Corporate Governance structure and AMG's compliance with the Dutch Corporate Governance Code can further be found on AMG's website (amg-nv.com).

AMG Advanced Metallurgical Group N.V., located in the Netherlands, is a company organized under Dutch law that has various subsidiaries in multiple jurisdictions to enable efficient business operations.

The Management Board is responsible for maintaining a culture that is conducive to achieving its strategic objectives with a focus on long-term value creation, as further explained in this chapter as well as other sections of the report of the Management Board.

2018 ANNUAL ACCOUNTS AND DIVIDENDS

The Management Board and the Supervisory Board have approved AMG's audited consolidated financial statements for 2018. KPMG audited these financial statements, which will be submitted for adoption to the General Meeting of Shareholders in May 2019.

The Management Board is authorized, subject to approval by the Supervisory Board, to reserve profits wholly or partly. The General Meeting is authorized to distribute and/or reserve any remaining part of the profits. The General Meeting may decide on the disposition of reserves only after a proposal by the Management Board, which must have been approved by the Supervisory Board.

AMG's dividend policy was first revised by the Management Board back in 2015 when AMG started paying dividends to its shareholders. For 2017, a total dividend of EUR 0.28 per ordinary AMG share was paid, half in August 2017 and the other half in May 2018. In August 2018, the Management Board, upon approval of the Supervisory Board, decided to implement a change in dividend policy which targets an annual dividend payout of between 20-40% of net income attributable to shareholders. In line with Dutch corporate governance best practices, the change will be discussed during AMG's 2019 Annual General Meeting.

The Company intends to propose a full year dividend for 2018 of €0.50 to the General Meeting of Shareholders for approval as part of the adoption of the 2018 Annual Accounts. The interim dividend of €0.20 per ordinary AMG share paid in August 2018 will be deducted from this amount. Future dividend payments to shareholders will be at the discretion of the Management Board subject to the approval of the Supervisory Board after taking into account various factors, including business prospects, cash requirements, financial performance, expansion plans, the terms of the Company's financing facilities and the compliance with applicable statutory and regulatory requirements.

Additionally, any payment of dividends (whether interim or after adoption of the annual accounts) or other distributions to shareholders may be made only if the Company's shareholders' equity exceeds the sum of the issued share capital plus the reserves required to be maintained by law.

SHARES AND SHAREHOLDERS' RIGHTS

As of December 31, 2018, the total issued share capital of AMG amounted to €611,627.54 consisting of 30,581,377 ordinary shares of €0.02 each. Each ordinary share carries one vote. The ordinary shares are listed on Euronext Amsterdam and are freely transferable.

Pursuant to the Financial Markets Supervision Act (Wet op het financieel toezicht) and the Decree on Disclosure of Major Holdings and Capital Interests in Securities-Issuing Institutions (Besluit melding zeggenschap en kapitaalbelang in uitgevende instellingen), the Netherlands Authority for the Financial Markets (Stichting Autoriteit Financiële Markten) has informed the Company that it was notified of the following substantial holdings (>3%) in ordinary shares of AMG by institutional investors. The information below is based on publications registered with the AFM register before February 28, 2019 (unless otherwise annotated) and therefore may not necessarily reflect the actual holdings as of that date.

AS OF FEBRUARY 28	2019
OppenheimerFunds, Inc.	**5.1%**
Norges Bank	**3.2%**
NN Group N.V.	**3.1%**
Acadian Asset Management	**3.0%**
Sycomore Asset Management	**3.0%**

SHAREHOLDING	2018	2017
Number of ordinary shares issued	**30,581,377**	28,908,047
Average daily turnover	**292,886**	218,809
Highest Closing Price	**€52.80**	€42.01
Lowest Closing Price	**€26.74**	€15.24

PREFERENCE SHARES

The General Meeting of Shareholders approved in its meetings of May 12, 2010 and July 6, 2010 that the Articles of Association of the Company would be changed in order to introduce a new class of preference shares, which may be issued and used as a response device in order to safeguard the interests of the Company and its stakeholders in all those situations where the Company's interests and those of its stakeholders are at stake, including but not limited to situations in which non-solicited public offers are made.

The preference shares carry equal voting rights as ordinary shares and are entitled, if distribution to shareholders is permitted, to a fixed dividend equal to the Euro Interbank Offered Rate for deposit loans of one year, increased with a maximum of 400 basis points as determined by the Management Board of the Company and subject to approval by the Supervisory Board. The Articles of Association of the Company were amended on July 6, 2010 to provide for an authorized share capital of 65.0 million ordinary shares and 65.0 million preference shares. Contrary to ordinary shares, preference shares may be issued against partial payment thereon, provided that at least one quarter of the nominal amount is paid-up in full upon subscription. The preference shares are not freely transferable; any transfer thereof is subject to the approval of the Supervisory Board.

STICHTING CONTINUÏTEIT AMG

In line with Dutch law and corporate practice, on July 6, 2010, the Stichting Continuïteit AMG (the Foundation) was established in Amsterdam, having as its main objective to safeguard the interests of the Company and its stakeholders.

The Board of the Foundation is independent from the Company and currently consists of Mr. H. de Munnik, Chairman, and Mr. H. Borggreve and Mr. H. Reumkens as members. The main objective of the Foundation is to represent the interests of the Company and of the enterprises maintained by the Company and the companies affiliated with the Company in a group, in such a way that the interests of the Company and of those enterprises and of all parties involved in this are safeguarded in the best possible way, and that influences which could affect the independence and/or continuity and/or identity of the Company and those enterprises in breach of those interests are deterred to the best of the Foundation's ability.

Under the terms of an option agreement dated December 22, 2010 between the Company and the Foundation, the Foundation has been granted an option pursuant to which it may purchase a number of preference shares up to a maximum of the total number of ordinary shares outstanding at any given time in the event of a threat to the continuity or strategy of AMG.

VOTING RIGHTS

There are no restrictions on voting rights of ordinary and preference shares. Shareholders who hold shares on April 3, 2019 (mandated as the 28th day prior to the day of the General Meeting of Shareholders) are entitled to attend and vote at the General Meeting of Shareholders regardless of a sale of shares after such date.

MANAGEMENT BOARD

The executive management of AMG is entrusted to its Management Board, which is chaired by the Chief Executive Officer. The Articles of Association provide that the number of members of the Management Board shall be determined by the Supervisory Board. The members of the Management Board are appointed by the General Meeting of Shareholders for a maximum term of four years and may be reappointed for additional terms not to exceed four years.

The Management Board members are collectively responsible for creating a culture within the AMG Group that is focused on long-term value creation. Each Management Board member shall serve the best interests of the Company with a view to creating long-term value, while carrying out his responsibilities and will take into account the interests of all the Company's stakeholders.

The Management Board has drawn up a code of business conduct, monitors its effectiveness and has established a procedure for reporting actual or suspected irregularities within the Company or its group companies. The Management Board has further adopted values for the Company and the AMG Group ("AMG Values") and is responsible for maintenance of the AMG Values within the Company and its group companies by encouraging behavior that is in keeping with the AMG Values and by leading by example. In this regard, specific attention shall be given to the strategy and the business model, the environment in which the Company and the AMG Group operate and the existing culture within the Company and the AMG Group. See page 38 of the Sustainability Report for a further review of the application of the AMG Values within the AMG Group and compliance with the AMG Code of Business Conduct during 2018.

The Management Board is responsible for the internal audit function of the AMG Group and the Management Board appoints and dismisses the senior internal auditor upon approval of the Supervisory Board, along with the recommendation of the Audit & Risk Management Committee.

The Supervisory Board is authorized to make a non-binding or binding nomination regarding the appointment of members of the Management Board. A binding nomination means that the General Meeting of Shareholders may appoint the nominated persons, unless the General Meeting of Shareholders rejects the nomination by an absolute majority (more than 50% of the votes cast) representing at least one-third of the issued share capital. In case the absolute majority is reached, however, not representing one-third of issued share capital, a second meeting will be convened in which the resolution may be adopted without a quorum applying. If the Supervisory Board has not made a nomination, the appointment of the members of the Management Board is at the full discretion of the General Meeting of Shareholders. The General Meeting of Shareholders and the Supervisory Board may suspend a member of the Management Board at any time.

A resolution of the General Meeting of Shareholders to suspend or dismiss a member of the Management Board requires an absolute majority (more than 50% of the votes cast), representing at least one-third of the issued share capital, unless the Supervisory Board has proposed the suspension or dismissal to the General Meeting of Shareholders, in which case an absolute majority is required but without any quorum requirement. The Management Board follows its own rules of procedure concerning meetings, resolutions and similar matters. These rules of procedure are published on the Company's website. The Company has rules to avoid and deal with conflicts of interest between the Company and members of the Management Board.

The Articles of Association state that in the event of a direct or indirect personal conflict of interest between the Company and any of the members of the Management Board, the relevant member of the Management Board shall not participate in the deliberations and decision-making process concerned. If all members of the Management Board are conflicted, and, as a result, no Management Board resolution can be adopted, the Supervisory Board shall adopt the resolution. In addition, it is provided in the rules of procedure of the Management Board that the respective member of the Management Board shall not take part in any decision-making that involves a subject or transaction to which he or she has a conflict of interest with the Company. Such transaction must be concluded on market practice terms and approved by the Supervisory Board. The rules of procedure of the Management Board establish further rules on the reporting of (potential) conflicts of interest.

SUPERVISORY BOARD

The Supervisory Board supervises the general course of business of the Company and the way the Management Board implements the long-term value-creation strategy of the Company. The Supervisory Board regularly discusses the strategy, the implementation of the strategy and the principal risks associated with it. The Supervisory Board assists the Management Board by providing advice. In fulfilling their duties, the Supervisory Directors shall act in the interest of the Company and its affiliated enterprises and the Supervisory Board shall take into account the stakeholder interests that are relevant in this context. The Supervisory Board is responsible for the quality of its own performance and evaluates its own performance and that of the Management Board once per year.

Under the two-tier corporate structure pursuant to Dutch law, the Supervisory Board is a separate body that is independent of the Management Board. Members of the Supervisory Board can be neither members of the Management Board nor employees of the Company.

The Supervisory Board discusses and approves major management decisions as well as the strategy that is developed and implemented by the Management Board. The Supervisory Board has adopted its own rules of procedure concerning its own governance, committees, conflicts of interest, etc. The rules of procedure are published on the Company's website and include the charters of the committees to which the Supervisory Board has assigned certain preparatory tasks, while retaining overall responsibility.

These committees are the Remuneration Committee, the Selection & Appointment Committee and the Audit & Risk Management Committee. The Supervisory Board shall be assisted by the Secretary of the Company, who shall be appointed by the Management Board after approval of the Supervisory Board has been obtained. The number of members of the Supervisory Board will be determined by the General Meeting of Shareholders with a minimum of three members.

A Supervisory Director is appointed for a maximum period of four years and may then be reappointed once for another maximum four-year period. The Supervisory Director may then subsequently be reappointed again for a period of two years, after which point the appointment may be extended by at most two years. In the event of a reappointment after an eight-year period, reasons shall be given in the (annual) report of the Supervisory Board. For any appointment or reappointment, the profile for Supervisory Board candidates, which was drawn up by the Supervisory Board, will be observed.

The Supervisory Board prepares a rotation schedule, which is made generally available and is posted on the Company's website.

The Supervisory Board is authorized to make a binding or non-binding nomination regarding the appointment of the members of the Supervisory Board. In the event of a binding nomination, the General Meeting of Shareholders appoints the members of the Supervisory Board from a nomination made by the Supervisory Board.

A binding nomination means that the General Meeting of Shareholders may appoint the nominated person, unless the General Meeting of Shareholders rejects the nomination by an absolute majority (more than 50% of the votes cast) representing at least one-third of the issued share capital.

In case the absolute majority is reached, however, not representing one-third of issued share capital, a second meeting of record will be convened in which the resolution may be adopted with normal majority, without a quorum applying.

If the Supervisory Board has not made a nomination, the appointment of the members of the Supervisory Board is at the full discretion of the General Meeting of Shareholders. The General Meeting of Shareholders may, at any time, suspend or remove members of the Supervisory Board. A resolution of the General Meeting of Shareholders to suspend or remove members of the Supervisory Board requires an absolute majority (more than 50% of the votes cast) representing at least one-third of the issued share capital, unless the Supervisory Board has proposed the suspension or dismissal, in which case an absolute majority is required, without any quorum requirement.

As required under the 2016 Code and Dutch law, the Company has formalized strict rules to avoid and deal with conflicts of interest between the Company and the members of the Supervisory Board, as further described in the rules of procedure of the Supervisory Board. Further information on the Supervisory Board and its activities is included in the Report of the Supervisory Board (pages 22-33).

Each of the current members of the Supervisory Board is obliged not to transfer or otherwise dispose of any shares awarded as part of their annual remuneration until the earlier of the third anniversary of the date of the award or the first anniversary of the date on which he or she ceases to be a member of the Supervisory Board. Shares in the Company held by the Supervisory Directors shall be held only as long-term investments.

GENERAL MEETING OF SHAREHOLDERS

A General Meeting of Shareholders is held at least once per year. During the Annual Meeting, the Annual Report, including the Report of the Management Board, the annual (consolidated) financial statements, the implementation of the remuneration policy for the Management Board and the Report of the Supervisory Board, are discussed, as well as other matters pursuant to Dutch law or the Company's Articles of Association.

As a separate item on the agenda, the General Meeting of Shareholders is entrusted with the discharge of the members of the Management Board and the Supervisory Board from responsibility for the performance of their duties during the preceding financial year. The General Meeting of Shareholders is held in Amsterdam or Haarlemmermeer (Schiphol Airport) and takes place within six months following the end of the preceding financial year.

Meetings are convened by public notice on the website of the Company and by letter, or by use of electronic means of communication, to registered shareholders. Notice is given at least 42 days prior to the date of the General Meeting of Shareholders. The main powers of the General Meeting of Shareholders are set forth in the Company's Articles of Association, which are published on the Company's website, and the applicable provisions of Dutch law.

On May 2, 2018, the General Meeting of Shareholders resolved to authorize the Management Board for a period of eighteen months from that date (until November 1, 2019) as the corporate body, which, subject to approval by the Supervisory Board, is authorized (i) to issue shares, including any grant of rights to subscribe to shares up to a maximum of 10% of the Company's issued share capital as per December 31, 2017, for the purpose of mergers and acquisitions and financial support arrangements relating to the Company and/or participations (deelnemingen) of the Company and (ii) issue shares, including any grant of rights to subscribe to shares, up to a maximum of 10% of the Company's issued share capital as per December 31, 2017 for general corporate purposes. Both authorizations also include the power to restrict or exclude preemptive rights. On May 2, 2018, the General Meeting of Shareholders resolved to authorize the Management Board for a period of 18 months from that date (until November 1, 2019) as the corporate body which, subject to approval by the Supervisory Board, is authorized to effect acquisitions of its own shares by AMG. The number of shares to be acquired is limited to 10% of the Company's issued share capital as of December 31, 2017, taking into account the shares previously acquired and disposed of at the time of any new acquisition. Shares may be acquired through the stock exchange or otherwise, at a price between par value and 110% of the average stock exchange price for a five-day period prior to the date of acquisition. The stock exchange price referred to in the previous sentence is the average closing price of the shares at Euronext Amsterdam on the five consecutive trading days immediately preceding the day of purchase by, or for, the account of the Company.

ARTICLES OF ASSOCIATION

The Company's Articles of Association can be amended by a resolution of the General Meeting of Shareholders on a proposal from the Management Board that has been approved by the Supervisory Board. A resolution of the General Meeting of Shareholders to amend the Articles of Association that has not been taken on the proposal from the Management Board and the approval of the Supervisory Board, should be adopted by a majority of at least two-thirds of the votes cast in a meeting in which at least 50% of the issued share capital is represented. The Articles of Association have last been amended on June 24, 2015 following approval by the General Meeting of Shareholders in its Extraordinary General Meeting held on June 18, 2015 and are published on the Company's website (amg-nv.com).

CORPORATE SOCIAL RESPONSIBILITY

AMG's Values (safety, value creation, integrity, and respect for people) form the core foundation of AMG's ambition to be a leader in the fields of critical materials and engineering services and to achieve excellence in all that it does. They apply to how AMG and its group companies conduct their operations and how they deal with their employees, business partners and stakeholders.

In being a responsible corporate citizen, AMG endorses and supports the definition of corporate social responsibility as set by the World Business Council for Sustainable Development, being: "...the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large." For AMG and its affiliated companies, this translates into three main sustainable development objectives that the Company has formulated in connection with its financial objectives, technological capabilities and its leading position at the heart of the global metallurgical industry: 1) to provide safe working conditions for our employees and to be responsible stewards of the environment; 2) to meet or exceed regulatory standards by engaging in ethical business practices; and 3) to be a valued member of the local economy, community and society at large by contributing to solutions for addressing some of the fundamental environmental and social challenges facing society today. The Supervisory Board and the Management Board of the Company take continued guidance from these objectives when defining and implementing the Company's strategic objectives.

The Sustainable Development section in this Annual Report (pages 34-39) further elaborates on the application of AMG's Code of Business Conduct and its Speak Up and Reporting Policy.

DECREE ON ARTICLE 10 OF THE TAKEOVER DIRECTIVE

The information required by the Decree on Article 10 of the Takeover Directive is included in this Corporate Governance section and the Report of the Supervisory Board, whose information is incorporated by reference in this Corporate Governance report.

Below is an overview of the significant agreements to which the Company is a party, which are affected, changed or terminated subject to the condition of a change of control, or which contain new restrictions on voting rights attached to shares.

The Company is a party to the following agreements that will be terminated under the condition of a change of control over the Company as a result of a public takeover offer.

The Company has entered into a new credit agreement dated February 1, 2018, which has a provision that requires the Company to repay the entire outstanding amount under its Credit Agreement upon a change of control, as defined therein. The Company is also a party to the following agreements that will come into force upon a change of control pursuant to a public offer. All members of the Management Board have provisions in their contracts that pertain to a change of control. Additionally, the AMG Option Plan and the AMG Performance Share Unit Plan have provisions that permit the Supervisory Board to cancel or modify the options granted or performance share units awarded to Management Board members and other employees, upon a change of control.

The Company is a party to an option agreement entered into with the Stichting Continuïteit AMG as further explained on page 41.

Other than the above-mentioned agreements, the Company is not party to any other important agreements that will come into force or be amended or terminated upon a change of control pursuant to a public takeover offer.

RISK MANAGEMENT AND INTERNAL CONTROLS

AMG employs a risk management approach that identifies and mitigates risk at all levels of the organization. The Company analyzes risks in formal settings such as scheduled Management Board and Supervisory Board meetings as well as everyday operational situations faced by its global employee base. AMG has implemented a comprehensive risk management program centered on the Company's Risk Assessment Package (RAP), as further explained in detail on page 16 of the chapter on Risk Management and Internal Controls.

As stated above, the Management Board is responsible for the internal audit function of the Company. The Internal Auditor at AMG reports to the Audit & Risk Management Committee and to the Management Board and operates on the basis of an Internal Audit plan approved annually by the Supervisory Board and the Management Board. The Internal Audit plan is risk-based and comprises all units and subsidiaries of the AMG Group with a focus on financial control, IT risks and compliance.

The Internal Audit function closely cooperates with the external auditors of the Company and attends all meetings of the Audit & Risk Management Committee of the Supervisory Board.

INVESTOR RELATIONS

The Company highly values good relations with its shareholders and is compliant with applicable rules and regulations on non-selective and timely disclosure and equal treatment of shareholders. Apart from communication at the Annual General Meeting of Shareholders, the Company explains its financial results during public quarterly conference calls. Further, the Company publishes annual, semi-annual and quarterly reports and press releases and makes information available through its public website (amg-nv.com).

The Company also engages in bilateral communications with investors and, in doing so, adheres to its policy on bilateral contacts, which is published on the Company's website. During these communications, the Company is, in general, represented by the Chief Financial Officer, occasionally accompanied by another member of the Management Board.

COMPLIANCE WITH THE DUTCH CORPORATE GOVERNANCE CODE 2016

As stated above, AMG is subject to the 2016 Code for the 2018 financial year. Reference is made to the Company's website (amg-nv.com) under the heading Corporate Governance, where the Company has published an extensive discussion on its compliance during 2018 with the principles and provisions set forth in the 2016 Code, as these became effective on January 1, 2017.

As a general statement, the Company fully endorses the new Code's principles and believes that virtually all best practice provisions as included in the 2016 Code are complied with. On certain matters involving the remuneration policy of the Company, specifically b.p.p. 3.2.3 concerning severance payments and b.p.p. 3.3.2 concerning remuneration of the Supervisory Board members in the form of AMG shares, the Company does not comply with the best practice provisions and it believes that it has sound reasons for doing so, which are explained on the Company's website as referred to above.

CONFLICTS OF INTEREST

No conflicts of interest that were of material significance to the Company and/or members of the Management Board and Supervisory Board were reported in the period starting January 1, 2018, up to and including March 13, 2019.

During the period starting January 1, 2018 up to and including March 13, 2019, the Company did not enter into any material transaction with a shareholder holding an interest of 10% or more in the Company's share capital.

Accordingly, the Company has complied with best practice provisions 2.7.3 and 2.7.4 of the 2016 Code.

CORPORATE GOVERNANCE STATEMENT

The Decree of December 23, 2004, adopting further rules regarding the contents of the annual report, most recently amended and extended as of January 1, 2018 ("the Decree"), requires that a statement is published annually by the Company on its compliance with Corporate Governance regulations in the Netherlands. The Company hereby submits that it has fully complied with this requirement by way of publication of this Annual Report and the specific references therein, notably the Report of the Management Board, the Report of the Supervisory Board and the chapters on Risk Management and Internal Controls, Sustainable Development and Corporate Governance, all of which are deemed to be incorporated by reference into the Company's statement on corporate governance as required by the Decree.

FINANCIALS

FINANCIAL REVIEW

Amounts in tables in thousands of US dollars

For the year ended December 31	2018	2017
Revenue and expenses		
AMG Critical Materials revenue	1,050,460	814,446
AMG Engineering revenue	259,828	245,205
Total revenue	1,310,288	1,059,651
Cost of sales	995,113	845,024
Gross profit	315,175	214,627
Selling, general and administrative expenses	143,581	132,294
Environmental	8,757	3,092
Other income, net	(424)	(511)
Operating profit	163,261	79,752

REVENUE

Full year 2018 revenue increased 24% to $1,310.3 million, from $1,059.7 million in 2017. AMG Critical Materials' 2018 revenue increased by $236.0 million, or 29%, from 2017, to $1,050.5 million. The increase in Critical Materials' revenue is due to a combination of higher vanadium prices, as well as improved product mix and strong sales volumes across much of the Critical Materials portfolio. AMG Engineering's 2018 revenue increased 6% to $259.8 million from $245.2 million due to higher profitability generated from the delivery of turbine blade coating furnaces, casting furnaces and increased after-sales services during the year. The order backlog as of December 31, 2018 was $241.4 million. This is a 17% increase from an order backlog of $207.0 million as of December 31, 2017.

GROSS PROFIT

AMG's gross profit improved by $100.5 million to $315.2 million in the year ended December 31, 2018, a 47% increase. As a percentage of revenue, gross margin increased from 20% to 24%.

AMG Critical Materials' gross margin was 23% as of December 31, 2018, up from 18% in 2017. Strong financial performances in vanadium, titanium alloys, chrome metal, and aluminum were partially offset by lower gross profit in silicon metal. This strong performance was driven by higher vanadium prices, improved chrome metal product mix effects and strong sales volumes of aluminum products. Titanium alloys benefited from a payment associated with the early termination of a customer contract. The reduction in gross profit in silicon metal was primarily driven by the repayment of a subsidy granted by the German government in 2012 and 2013. Furthermore, AMG Silicon gross profit was adversely affected by additional furnace maintenance due to residual production issues associated with low quality graphite electrodes. The 2018 gross margin for AMG Engineering improved from 2017, increasing from 26% to 28% due to a greater proportion of revenue being generated from high margin, aerospace market facing products in the year.

SELLING, GENERAL AND ADMINISTRATIVE EXPENSES

Selling, general and administrative costs were $143.6 million in the year ended December 31, 2018, as compared to $132.3 million in the year ended December 31, 2017, an increase of 9%.

Personnel expenses increased to $85.7 million in the year ended December 31, 2018, from $79.8 million in the year ended December 31, 2017. The most significant driver of this increase was salary and bonus costs which increased to $61.3 million in 2018 from $56.8 million in 2017 as a result of higher variable compensation expense, increased headcount, and exchange rate impacts. The Company incurs professional fees from global service providers for services including audit, tax planning and compliance and legal consultation. Professional fees were $21.5 million in 2018 as compared to $21.6 million in 2017. Research and development expense increased to $6.6 million in the year ended December 31, 2018, as compared to $4.8 million in the year ended December 31, 2017. Other SG&A expenses, such as travel and entertainment, insurance, occupancy, communication and bank fees increased to $29.8 million in the year ended December 31, 2018, from $26.1 million in the year ended December 31, 2017.

NON-RECURRING ITEMS

A summary of non-recurring items affecting the 2018 and 2017 results is presented below:

For the year ended December 31	2018	2017
Non-recurring items included in operating profit:		
Restructuring expense	2,052	2,547
Asset impairment expense	3,333	1,160
Environmental expense	8,757	3,092
Total non-recurring items included in operating profit	14,142	6,799

The increase in environmental expenses in 2018 were driven by an increase to the overall scope of remediation efforts related to a closed facility in the US.

Restructuring expense in 2018 was related to expenses incurred within the AMG Critical Materials segment due to the continued reorganization in Germany and China and the early termination of a customer contract. In 2017, restructuring expense was primarily related to AMG Critical Materials segment as well as AMG Engineering from the reorganization of operations in Germany, France and China. The 2018 asset impairment expense was primarily related to assets associated with a customer contract early termination offset by additional recoveries related to the fire at the Company's Mibra mine in 2017. The 2017 asset impairment expense was primarily related to the fire at the Company's mine in Brazil.

OPERATING PROFIT

AMG's operating profit of $163.3 million for the year ended December 31, 2018, was an increase of $83.5 million from the operating profit of $79.8 million reported for the year ended December 31, 2017. The increase in operating profit was the result of the increase in gross profit which was partially offset by increased selling general and administrative expenses.

NET FINANCE COST

The table below sets forth AMG's net finance costs for the years ended December 31, 2018 and 2017. Finance cost increased over the prior year due to increased levels of gross debt and higher interest rates associated with AMG's new, long-term credit facility.

For the year ended December 31	2018	2017
Finance income	(3,721)	(1,766)
Finance cost	27,230	10,160
Net finance cost	23,509	8,394

INCOME TAXES

The Company recorded an income tax expense of $45.0 million for the year ended December 31, 2018, compared to an income tax expense of $13.9 million for the year ended December 31, 2017. The tax expense in the current year is driven by higher levels of profitability, the full recognition of AMG's US operating loss carryforwards in 2017, and the revaluation of AMG's Brazilian tax balances, offset slightly by the lower US tax rate. The effective tax rate for 2018 was 32%, as compared to the 19% effective tax rate for 2017.

NET INCOME

The Company recorded net income attributable to shareholders of $94.6 million in the year ended December 31, 2018, as compared to $57.0 million in the year ended December 31, 2017.

EQUITY ATTRIBUTABLE TO SHAREHOLDERS

The Company's equity attributable to shareholders increased 24% during the year from $258.0 million as of December 31, 2017 to $319.9 million as of December 31, 2018. This increase was mainly driven by the Company's net income attributable to shareholders of $94.6 million in the year ended December 31, 2018, offset slightly by movements in other reserves related to foreign currency translation, investments, and cash flow hedges as well as the issuance of shares during the year for share-based compensation.

WORKING CAPITAL

The Company's working capital increased significantly during the year driven by higher raw material pricing and increased revenues. Specifically, higher raw material prices, especially for vanadium, resulted in an inventory increase of 95% from $162.5 million as of December 31, 2017 to $316.7 million as of December 31, 2018.

LIQUIDITY AND CAPITAL RESOURCES

SOURCES OF LIQUIDITY

The Company's sources of liquidity include cash and cash equivalents, cash from operations and amounts available under credit facilities. At December 31, 2018, the Company had $381.9 million in cash and cash equivalents and $169.6 million available on its revolving credit facility. Changes in the Company's liquidity were due primarily to AMG's new, long-term credit facility, changes in cash from operations during the year, and capital investments in Brazil for the lithium project.

	2018	2017
Non-current loans and borrowings	356,997	164,788
Current loans and borrowings	24,447	24,320
Total debt	381,444	189,108
Cash and cash equivalents	381,900	178,800
Net (cash) debt	(456)	10,308

The Company was subject to one main debt covenant in its current credit facility. Violating a covenant would limit the Company's access to liquidity. See note 21 of the financial statements for additional information.

The table below summarizes the Company's net cash provided by or used in its operating activities, investing activities and financing activities for the years ended December 31, 2018 and 2017.

For the year ended December 31	2018	2017
Net cash from operating activities	97,422	78,525
Net cash used in investing activities	(71,319)	(77,220)
Net cash from financing activities	182,699	5,490

Cash from operating activities was $97.4 million for the year ended December 31, 2018, compared to cash from operating activities of $78.5 million in 2017. The increase is primarily attributable to higher profitability in 2018, offset partially by higher working capital levels.

Cash used in investing activities was $71.3 million for the year ended December 31, 2018. The largest growth capital expenditures were related to the lithium project in Brazil. Maintenance capital spending was $27.9 million for the year.

Cash from financing activities was $182.7 million for the year ended December 31, 2018, as the Company had net proceeds from debt of $188.4 million associated with the loan agreements established in 2018, offset partially by dividends paid during the year.

OUTLOOK

AMG's target for full year 2019 EBITDA is to exceed $200 million.

Updated long-term guidance will be published at the AGM on May 1, 2019.

CONSOLIDATED INCOME STATEMENT

For the year ended December 31	Note	2018	2017
In thousands of US dollars			
Continuing operations			
Revenue	5	1,310,288	1,059,651
Cost of sales		995,113	845,024
Gross profit		315,175	214,627
Selling, general and administrative expenses		143,581	132,294
Environmental	6, 25	8,757	3,092
Other expenses	6	20	45
Other income	6	(444)	(556)
Net other operating expense	6	8,333	2,581
Operating profit		163,261	79,752
Finance income	8	(3,721)	(1,766)
Finance cost	8, 21	27,230	10,160
Net finance cost	8	23,509	8,394
Profit before income tax		139,752	71,358
Income tax expense	9	44,971	13,905
Profit for the year		94,781	57,453
Profit attributable to:			
Shareholders of the Company		94,616	56,965
Non-controlling interests		165	488
Profit for the year		94,781	57,453
Earnings per share			
Basic earnings per share	19	3.12	1.95
Diluted earnings per share	19	2.97	1.80

The notes are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF COMPREHENSIVE INCOME

For the year ended December 31	Note	2018	2017
In thousands of US dollars			
Profit for the year		94,781	57,453
Other comprehensive income			
Items of other comprehensive (loss) income to be reclassified to profit or loss in subsequent periods:			
Exchange differences on translation of foreign operations		(4,826)	8,243
Cash flow hedges, effective portion of changes in fair value		(26,150)	12,887
Cash flow hedges reclassified to profit or loss		10,745	(4,359)
Cost of hedging reserve, changes in fair value		(1,659)	—
Income tax benefit (expense) on cash flow hedges	9	3,588	(2,024)
Net (decrease) increase on cash flow hedges		(13,476)	6,504
Net other comprehensive (loss) income to be reclassified to profit or loss in subsequent periods		(18,302)	14,747
Items of other comprehensive (loss) income not to be reclassified to profit or loss in subsequent periods:			
Exchange difference on translation of foreign operations – non-controlling interest		(1,334)	2,744
Actuarial (losses) gains on defined benefit plans	23	(3,374)	5,341
Income tax benefit on actuarial (losses) gains	9	433	2,968
Net (loss) gain on defined benefit plans		(2,941)	8,309
Change in fair value of equity investments classified as fair value through other comprehensive income	12, 18	(8,513)	1,141
Net other comprehensive (loss) income not being reclassified to profit or loss in subsequent periods		(12,788)	12,194
Other comprehensive (loss) income for the year, net of tax		(31,090)	26,941
Total comprehensive income for the year, net of tax		63,691	84,394
Total comprehensive income (loss) attributable to:			
Shareholders of the Company		64,790	81,925
Non-controlling interest		(1,099)	2,469

The notes are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF FINANCIAL POSITION

As of December 31 In thousands of US dollars	Note	2018	2017
Assets			
Property, plant and equipment	10	327,951	298,540
Goodwill and other intangible assets	11	35,130	38,110
Derivative financial instruments	29	7,592	636
Other investments	12, 29	21,452	30,562
Deferred tax assets	9	34,112	40,108
Restricted cash	16	1,715	829
Non-current tax asset	9	—	2,488
Other assets	15	11,266	17,729
Total non-current assets		439,218	429,002
Inventories	13	316,715	162,505
Derivative financial instruments	29	1,335	6,372
Trade and other receivables	14	138,530	137,174
Other assets	15	39,426	37,547
Current tax assets	9	3,668	3,147
Cash and cash equivalents	17	381,900	178,800
Assets held for sale	10	144	2,056
Total current assets		881,718	527,601
Total assets		1,320,936	956,603
Equity			
Issued capital	18	812	796
Share premium		462,891	432,844
Treasury shares		(347)	(3,461)
Other reserves	18	(104,274)	(72,880)
Retained earnings (deficit)		(39,158)	(99,343)
Equity attributable to shareholders of the Company		319,924	257,956
Non-controlling interests	20	24,119	24,633
Total equity		344,043	282,589
Liabilities			
Loans and borrowings	21	356,997	164,788
Employee benefits	23	149,217	156,193
Provisions	25	32,527	35,887
Other liabilities	26	4,371	4,011
Derivative financial instruments	29	5,148	—
Deferred tax liabilities	9	7,930	7,888
Total non-current liabilities		556,190	368,767
Loans and borrowings	21	8,947	8,820
Short-term bank debt	22	15,500	15,500
Other liabilities	26	61,120	61,836
Trade and other payables	27	230,939	155,115
Derivative financial instruments	29	8,267	1,415
Advance payments from customers	5	50,210	33,025
Current tax liability	9	19,675	9,155
Provisions	25	26,045	20,381
Total current liabilities		420,703	305,247
Total liabilities		976,893	674,014
Total equity and liabilities		1,320,936	956,603

The notes are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF CHANGES IN EQUITY

In thousands of US dollars	Issued capital (note 18)	Share premium	Treasury shares	Other reserves (note 18)	Retained deficit	Total	Non-controlling interests	Total equity
	Equity attributable to shareholders of the Company							
Balance at January 1, 2017	760	389,066	(570)	(97,085)	(116,457)	175,714	22,073	197,787
Foreign currency translation	—	—	—	6,708	1,535	8,243	2,744	10,987
Change in fair value of available for sale investment	—	—	—	1,141	—	1,141	—	1,141
Gain on cash flow hedges, net of tax	—	—	—	6,510	—	6,510	(6)	6,504
Actuarial gains, net of tax	—	—	—	9,066	—	9,066	(757)	8,309
Net profit recognized through other comprehensive income	—	—	—	23,425	1,535	24,960	1,981	26,941
Profit for the year	—	—	—	—	56,965	56,965	488	57,453
Total comprehensive income for the year	—	—	—	23,425	58,500	81,925	2,469	84,394
Issuance of common shares	36	43,778	—	—	—	43,814	—	43,814
Purchase of common shares	—	—	(12,190)	—	—	(12,190)	—	(12,190)
Re-issuance of treasury shares	—	—	—	—	1,830	1,830	—	1,830
Transfer to retained deficit (note 18)	—	—	—	780	(780)	—	—	—
Change in non-controlling interests	—	—	—	—	(1,350)	(1,350)	91	(1,259)
Equity-settled share-based payments, net of tax	—	—	9,299	—	(31,793)	(22,494)	—	(22,494)
Dividend	—	—	—	—	(9,293)	(9,293)	—	(9,293)
Balance at December 31, 2017	796	432,844	(3,461)	(72,880)	(99,343)	257,956	24,633	282,589
Adjustment on initial application of IFRS 15 (net of tax)	—	—	—	—	(771)	(771)	—	(771)
Adjusted balance at January 1, 2018	796	432,844	(3,461)	(72,880)	(100,114)	257,185	24,633	281,818
Foreign currency translation	—	—	—	(4,826)	—	(4,826)	(1,334)	(6,160)
Change in fair value of equity investments classified as fair value through other comprehensive income	—	—	—	(8,513)	—	(8,513)	—	(8,513)
Loss on cash flow hedges, net of tax	—	—	—	(13,474)	—	(13,474)	(2)	(13,476)
Actuarial losses, net of tax	—	—	—	(3,013)	—	(3,013)	72	(2,941)
Net loss recognized through other comprehensive income	—	—	—	(29,826)	—	(29,826)	(1,264)	(31,090)
Profit for the year	—	—	—	—	94,616	94,616	165	94,781
Total comprehensive income for the year	—	—	—	(29,826)	94,616	64,790	(1,099)	63,691
Issuance of common shares	16	30,047	—	—	—	30,063	—	30,063
Purchase of common shares	—	—	(12,388)	—	—	(12,388)	—	(12,388)
Re-issuance of treasury shares	—	—	12,268	—	—	12,268	—	12,268
Equity-settled share-based payments, net of tax	—	—	3,234	—	(22,567)	(19,333)	—	(19,333)
Transfer to retained deficit (note 18)	—	—	—	(1,568)	1,568	—	—	—
Change in non-controlling interests	—	—	—	—	(569)	(569)	585	16
Dividend	—	—	—	—	(12,092)	(12,092)	—	(12,092)
Balance at December 31, 2018	812	462,891	(347)	(104,274)	(39,158)	319,924	24,119	344,043

The notes are an integral part of these consolidated financial statements.

CONSOLIDATED STATEMENT OF CASH FLOWS

For the year ended December 31	Note	2018	2017
In thousands of US dollars			
Cash from operating activities			
Profit for the year		94,781	57,453
Adjustments to reconcile profit to net cash flows:			
Non-cash:			
Income tax expense	9	44,971	13,905
Depreciation and amortization	10, 11	33,034	30,899
Asset impairment expense	10, 11, 13	3,333	1,160
Net finance cost	8	23,509	8,394
(Gain) loss on sale or disposal of property, plant and equipment	10	(720)	75
Equity-settled share-based payment transactions	24	7,499	8,697
Movement in provisions, pensions and government grants	23, 25	3,724	(3,016)
Working capital and deferred revenue adjustments			
Change in inventories		(164,446)	(8,504)
Change in trade and other receivables		(11,314)	5,988
Change in prepayments		4,121	(12,798)
Change in trade payables and other liabilities		97,998	4,680
Change in deferred revenue		(286)	(11,396)
Other		820	722
Cash generated from operating activities		137,024	96,259
Finance cost paid	8	(21,545)	(8,103)
Finance income received	8	3,272	660
Income tax paid, net	9	(21,329)	(10,291)
Net cash from operating activities		97,422	78,525
Cash used in investing activities			
Proceeds from sale of property, plant and equipment	10	1,660	254
Insurance proceeds on property, plant and equipment	10	1,300	1,516
Acquisition of property, plant and equipment and intangibles	10, 11	(73,031)	(80,904)
Change in restricted cash	16	(923)	1,911
Other		(325)	3
Net cash used in investing activities		(71,319)	(77,220)
Cash from financing activities			
Proceeds from issuance of debt	21, 22	353,087	30,000
Transaction costs related to the issuance of debt	21	(9,238)	—
Repayment of borrowings	21, 22	(155,423)	(17,153)
Proceeds from issuance of common shares	18	15,923	14,370
Net repurchase of common shares	18	(9,558)	(12,434)
Dividends paid	18	(12,092)	(9,293)
Net cash from financing activities		182,699	5,490
Net increase in cash and cash equivalents		208,802	6,795
Cash and cash equivalents at January 1		178,800	160,744
Effect of exchange rate fluctuations on cash held		(5,702)	11,261
Cash and cash equivalents at December 31	17	381,900	178,800

The notes are an integral part of these consolidated financial statements.

NOTES TO THE CONSOLIDATED FINANCIAL STATEMENTS

1. REPORTING ENTITY

The consolidated financial statements of AMG Advanced Metallurgical Group N.V. (herein referred to as "the Company", "AMG NV" or "AMG") for the year ended December 31, 2018, were authorized for issuance in accordance with a resolution of the Supervisory Board on March 13, 2019.

AMG is domiciled in the Netherlands. The address of the Company's registered office is WTC Amsterdam, Toren C, Strawinskylaan 1343, 1077 XX Amsterdam. The consolidated financial statements of the Company as of and for the year ended December 31, 2018, comprise the Company and the companies that comprise its subsidiaries (together referred to as the "Group") and the Company's interest in associates and jointly controlled entities.

AMG was incorporated in the Netherlands as a public limited liability company and its outstanding shares are listed on Euronext, Amsterdam, the Netherlands.

The parent company financial statements are prepared in accordance with part 9, Book 2, article 362.8 of the Netherlands Civil Code.

The consolidated financial statements of the Company include the accounts of all entities in which a direct or indirect controlling interest exists through voting rights or qualifying joint ventures and associates at the reporting dates. No entities in which the Company has less than a 50% interest are consolidated in the Company's financial statements. The following table includes all material operating entities in which AMG has an ownership interest. The Company has filed a complete list of entities in which AMG has an ownership interest with the Dutch Chamber of Commerce.

		Percentage held (directly or indirectly) by the Company	
Name	Country of incorporation	**December 31, 2018**	December 31, 2017
ALD Thermal Treatment, Inc.	United States	100	100
ALD Tratamientos Termicos S.A.	Mexico	100	100
ALD Vacuum Technologies GmbH	Germany	100	100
AMG Aluminum UK Limited	United Kingdom	100	100
AMG Mining GmbH	Germany	100	100
AMG Vanadium, LLC	United States	100	100
AMG Mineracao S.A.	Brazil	100	100
GfE Gesellschaft für Elektrometallurgie GmbH	Germany	100	100
GfE Metalle und Materialien GmbH	Germany	100	100
AMG Graphit Kropfmühl GmbH	Germany	60	60
AMG Aluminum North America, LLC	United States	100	100
AMG Superalloys UK Limited	United Kingdom	100	100
LSM Brasil S.A.	Brazil	100	100
RW Silicium GmbH	Germany	100	100
Société Industrielle et Chimique de l'Aisne S.A.S.	France	100	100
VACUHEAT GmbH	Germany	100	100

AMG Mining GmbH, Graphit Kropfmühl GmbH, GK Bergbau GmbH, RW Silicium GmbH, AMG Invest GmbH, ALD Vacuum Technologies GmbH, VACUHEAT GmbH and VACUHEAT Verwaltungs GmbH exercise the exemption of Sec. 264 (3) HGB "Handelsgesetzbuch".

As of December 31, 2018, there were 3,329 employees at the Company (2017: 3,133). There were 3 employees located in the Netherlands as of December 31, 2018 (2017: 3). All other employees are located outside the Netherlands.

2. BASIS OF PREPARATION

(A) STATEMENT OF COMPLIANCE

EU law (IAS Regulation EC 1606/2002) requires that the annual Consolidated Financial Statements of the Company for the year ending December 31, 2018, be prepared in accordance with accounting standards adopted and endorsed by the European Union ("EU") further to the IAS Regulation (EC 1606/2002) (further referred to as "IFRS, as endorsed by the EU").

The consolidated financial statements of AMG NV and its subsidiaries have been prepared in accordance with International Financial Reporting Standards ("IFRS") as of December 31, 2018, as endorsed by the EU and article 2.362.9 of the Netherlands Civil Code.

(B) BASIS OF MEASUREMENT

The consolidated financial statements have been prepared on the historical cost basis except for the following items, which are measured on an alternative basis on each reporting date. The methods used to measure fair values are discussed further in note 3.

Derivative financial instruments	Fair value
Non-derivative financial instruments at fair value through profit or loss	Fair value
Equity investments at fair value through other comprehensive income	Fair value
Contingent consideration assumed in a business combination	Fair value
Net defined benefit (asset) liability	Fair value of plan assets less the present value of the defined benefit obligation, limited as explained in note 3

(C) MEASUREMENT OF FAIR VALUES

A number of the Company's accounting policies and disclosures require the measurement of fair values, for both financial and non-financial assets and liabilities. The Company has an established control framework with respect to the measurement of fair values. This includes overseeing all significant fair value measurements, including Level 3 fair values.

The Company regularly reviews significant unobservable inputs and valuation adjustments. If third party information, such as broker quotes or pricing services, is used to measure fair values, then the Company assesses the evidence obtained from the third parties to support the conclusion that these valuations meet the requirements of IFRS, including the level in the fair value hierarchy in which the valuations should be classified.

Significant valuation issues are reported to the Company's audit committee.

When measuring the fair value of an asset or a liability, the Company uses observable market data as far as possible. Fair values are categorized into different levels in a fair value hierarchy based on the inputs used in the valuation techniques as follows:

Level 1: quoted prices (unadjusted) in active markets for identical assets or liabilities;

Level 2: inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (i.e. as prices) or indirectly (i.e. derived from prices); and

Level 3: inputs for the asset or liability that are not based on observable market data (unobservable inputs).

If the inputs used to measure the fair value of an asset or a liability fall into different levels of the fair value hierarchy, then the fair value measurement is categorized in its entirety in the same level of the fair value hierarchy as the lowest level input that is significant to the entire measurement.

The Company recognizes transfers between levels of the fair value hierarchy at the end of the reporting period during which the change has occurred.

Further information about the assumptions made in measuring fair values is included in the following notes:

- note 12 – measurement of other investments
- note 29 – measurement of financial instruments

(D) USE OF ESTIMATES AND JUDGMENTS

The preparation of financial statements requires management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses. Actual results may differ from these estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the period in which the estimate is revised and in any future periods affected.

Key uses of judgments

Information related to critical judgments made in applying accounting policies that have the most significant effects on the amounts recognized in the Company's consolidated financial statements are included in the following notes:

- notes 3 and 5 – Revenue from contracts with customers: determination of revenue recognition from furnace construction contracts
- note 30 – Leases: classification of lease as capital or operating

Assumptions and estimation uncertainty

Information about assumptions and estimation uncertainties that may have a significant risk of resulting in a material adjustment to the carrying amounts of assets and liabilities within the next financial year are included in the following notes:

- note 9 – Income tax: recognition of income taxes and deferred tax assets
- note 10 – Property, plant and equipment: determination of useful lives of mining related assets
- note 11 – Impairment testing: measurement of the recoverable amounts of assets and cash-generating units
- note 12 – Other investments; the assumptions and model used to determine fair value

- note 23 – Defined benefit plans: measurement of obligations and actuarial assumptions
- note 24 – Share-based payments: the assumptions and model used to determine fair value
- note 25 – Provisions: determination of amounts recorded based on expected payments and any regulatory framework
- note 29 – Financial instruments: fair value determination based on present value of future cash flows

3. SIGNIFICANT ACCOUNTING POLICIES

These consolidated financial statements as of December 31, 2018, present the consolidated financial position, results of operations and cash flows of the Company and its subsidiaries. The Company has consistently applied the following accounting policies to all periods presented in these consolidated financial statements.

(A) BASIS OF CONSOLIDATION

(i) Business combinations

The Company accounts for business combinations using the acquisition method once control is gained by the Company. Consideration transferred and separately identifiable net assets acquired in the acquisition are measured at fair value. Consideration transferred does not include amounts related to the settlement of pre-existing relationships, which are recognized in profit or loss. Any goodwill that arises is tested annually for impairment. In the event of a bargain purchase, any gain is recognized in profit or loss immediately. Transaction costs are expensed as incurred, unless related to the issuance of debt or equity securities.

Contingent consideration is measured at fair value at the date of acquisition. If an obligation to pay contingent consideration meets the definition of a financial instrument classified as equity, then it is not remeasured, and settlement is accounted for within equity. Other contingent consideration is remeasured at fair value at each reporting date, with subsequent changes in the fair value of the contingency being recognized through profit or loss.

If share-based payment awards are required to be exchanged for awards held by the acquiree's employees, then all or a portion of the amount of the acquirer's replacement awards is included in measuring the consideration transferred in the business combination. This determination is based on the market-based measure of replacement awards compared with the market-based measure of the acquiree's awards and the extent to which the replacement awards relate to pre-combination service.

(ii) Subsidiaries

Subsidiaries are entities controlled by the Company. The Company controls an entity when it is exposed to, or has rights to, variable returns from its involvement with the entity and has the ability to affect those returns through its power over the entity. The financial statements of subsidiaries are included in the consolidated financial statements from the date on which control commences until the date on which control ceases.

(iii) Non-controlling interests

Non-controlling interests are measured at their proportionate share of the acquiree's identifiable net assets at the date of acquisition.

Changes in the Company's interest in a subsidiary that do not result in a loss of control are accounted for as equity transactions.

(iv) Loss of control

When the Company loses control over a subsidiary, it derecognizes the assets and liabilities of the subsidiary, and any related non-controlling interest and other components of equity. Any resulting gain or loss is recognized in profit or loss. Any interest retained in the former subsidiary is measured at fair value when control is lost.

(v) Interests in equity-accounted investees

The Company's interests in equity-accounted investees comprise interests in associates and joint ventures.

Associates are those entities in which the Company has significant influence, but not control or joint control, over the financial and operating policies. A joint venture is an arrangement in which the Company has joint control, whereby the Company has rights to the net assets of the arrangement, rather than rights to its assets and obligations for its liabilities.

Interests in associates and joint ventures are accounted for using the equity method. They are initially recognized at cost, including transaction costs. Subsequent to initial recognition, the consolidated financial statements include the Company's share of the profit or loss and OCI of equity-accounted investees, until the date on which significant influence or joint control ceases.

(vi) Transactions eliminated on consolidation

Intergroup balances and transactions, and any unrealized income and expenses arising from intergroup transactions, are eliminated. Unrealized gains arising from transactions with equity-accounted investees are eliminated against the investment to the extent of the Company's interest in the investee. Unrealized losses are eliminated similarly, to the extent there is no evidence of impairment.

(B) FOREIGN CURRENCY

(i) Functional and presentation currency

These consolidated financial statements are presented in US dollars ($), which is the Company's functional and presentation currency.

All financial information is presented in US dollars and has been rounded to the nearest thousand, unless otherwise stated.

The local currency is the functional currency for the Company's significant operations outside the United States (US), except certain operations in the UK and Brazil, where the US dollar is used as the functional currency. The determination of functional currency is based on appropriate economic and management indicators.

(ii) Foreign currency transactions

Transactions in foreign currencies are translated to the respective functional currencies of the Company's entities at exchange rates at the dates of the transactions. Monetary assets and liabilities denominated in foreign currencies are retranslated at the functional currency rate of exchange at the reporting date. Non-monetary assets and liabilities that are measured at fair value in a foreign currency are translated into the functional currency at the exchange rate when the fair value was determined. Non-monetary items that are measured based on historical cost in a foreign currency are translated at the exchange rate at the date of the transaction. Foreign currency differences are generally recognized in profit or loss.

Foreign currency differences arising from the translation of the following items are recognized in other comprehensive income:

- Equity investments classified as fair value through other comprehensive income (except on impairment, in which case foreign currency differences that have been recognized in other comprehensive income are reclassified to profit or loss);
- A financial liability designated as a hedge of the net investment in a foreign operation to the extent that the hedge is effective; and
- Qualifying cash flow hedges to the extent that the hedges are effective.

(iii) Foreign operations

The assets and liabilities of foreign operations, including goodwill and fair value adjustments arising on acquisition, are translated to US dollars at exchange rates at the reporting date. The income and expenses of foreign operations are translated to US dollars at the average exchange rates calculated at the reporting date.

Foreign currency differences are recognized in other comprehensive income and accumulated in the translation reserve, except to the extent that the translation difference is allocated to non-controlling interest. When a foreign operation is disposed of, in its entirety or partially such that control, significant influence, or joint control is lost, the cumulative amount in the translation reserve related to that foreign operation is reclassified to profit or loss as part of the gain or loss on disposal. If the Company disposes of part of its interest in a subsidiary but retains control, then the relevant proportion of the cumulative amount is reattributed to non-controlling interest. When the Company disposes of only part of an associate or joint venture while retaining significant influence or joint control, the relevant proportion of the cumulative amount is reclassified to profit or loss.

(C) REVENUE FROM CONTRACTS WITH CUSTOMERS

(i) Goods sold

The Company's contracts for goods sold typically contain a single performance obligation. The timing of when a customer obtains control over goods sold varies depending on the individual terms of the sales agreement. In satisfying the Company's performance obligation to its customers, transfer of control typically occurs when title and risk of loss pass to the customer. In the case of export sales, control of the goods sold may pass when the product reaches a foreign port. Invoices are generally issued according to contractual terms and are usually payable within 30-90 days. The transaction price of goods sold is typically based on contractual terms or market pricing and is not subject to variable consideration.

IFRS 15 became effective for the Company on January 1, 2018. The impact of adopting IFRS 15 is discussed in detail in note 3(p). Prior to the adoption of IFRS 15, revenue was recognized when the significant risks and rewards of ownership had been transferred to the customer, recovery of the consideration was probable, the associated costs and possible returns of goods could be estimated reliably, there was no continuing management involvement with the goods and the amount of revenue could be measured reliably. Revenue was measured net of returns, trade discounts and volume rebates. Under IFRS 15, revenue is measured based on the total consideration specified in a contract with a customer, and revenue is recognized when control over a good is transferred to the Company's customers. Under IFRS 15, the timing and amount of revenue recognized for goods sold is largely consistent with the Company's historical practices.

(ii) Furnace construction contracts

Furnace construction contract revenue results from the development of furnaces for some of the Company's customers in the Engineering segment. These furnaces are constructed based on specifically negotiated contracts with customers. Contract revenue includes the initial amount agreed in the contract plus any variations in contract work, claims and incentive payments, to the extent that it is probable that they will result in revenue and can be measured reliably. Invoices are generally issued according to contractual terms and are usually payable within 30-90 days.

The performance obligations in the Company's construction contracts mainly continue to be recognized over time. The Company's furnace construction contracts require the Company to develop highly specialized assets that meet the customer's specific needs. The assets do not have an alternative use to the Company, and the Company has a legal right to payment for its services rendered to date for all furnace construction arrangements. The Company recognizes contract revenue over time in proportion to the stage of completion of the contract. The stage of completion is assessed with reference to costs incurred to date and estimated total cost. Otherwise, contract revenue is recognized only to the extent of contract costs incurred that are likely to be recoverable. Prior to the adoption of IFRS 15, the Company recognized revenue if the outcome of a construction contract could be estimated reliably. The adoption of IFRS 15 has not materially impacted the amount and timing of revenue recognition for furnace construction contracts.

Contract expenses are recognized as incurred unless they create an asset related to future contract activity. An expected loss on a contract is recognized immediately in profit or loss.

Amounts expected to be collected from customers for contract work performed is measured at costs incurred plus profits recognized to date, less progress billings and recognized losses.

In the statement of financial position, construction contracts in progress for which costs incurred plus recognized profits exceed progress billings and recognized losses are presented as trade and other receivables. Contracts for which progress billings and recognized losses exceed costs incurred plus recognized profits are presented as deferred revenues and included with advanced payments.

(iii) Heat treatment services

The Company offers heat treatment services on a tolling basis using its internally developed furnace and process technology that is owned and operated by the Engineering segment. The Company's performance obligations under these tolling contracts require the Company to apply this technology to the customer's materials at a contractually agreed upon cost per unit. The Company recognizes revenues for heat treatment services completed to date that the Company has a contractual right to invoice its customers for the related services. The method and timing of revenue recognition was consistent both before and after the adoption of IFRS 15.

(iv) Commissions

If the Company acts in the capacity of an agent rather than as the principal in a transaction, then the revenue recognized is the net amount of commission made by the Company.

(v) Warranty obligations

The Company typically provides warranties for general repairs of defects that existed at the time of sale, as required by law. These assurance-type warranties are not considered to be separate performance obligations and are accounted for under IAS 37 Provisions, Contingent Liabilities and Contingent Assets as described in our accounting policy for provisions.

(vi) Variable consideration

If the consideration in a contract includes a variable amount, the Company estimates the amount of consideration to which it will be entitled in exchange for transferring the goods to the customer. The variable consideration is estimated at contract inception and constrained until it is highly probable that a significant revenue reversal in the amount of cumulative revenue recognized will not occur when the associated uncertainty with the variable consideration is subsequently resolved.

(D) FINANCE INCOME AND COST

Finance income comprises interest income on funds invested, changes in the discount on provisions, foreign currency gains and gains on derivatives and hedging instruments. Interest income is recognized as it is earned, using the effective interest method.

Finance cost comprise interest expense on borrowings and interest rate caps and swaps, amendment fees on borrowings, amortization of loan issuance costs, finance charges on finance leases, commitment fees on borrowings, changes in the discount on provisions, interest on tax liabilities, foreign currency losses, losses on derivatives and hedging instruments, fees for letters of credit/guarantees, interest for accounts receivable factoring and any loss recorded on debt extinguishment. All transaction costs are recognized in profit or loss using the effective interest method when the costs are related to actual borrowings on the facility or using the straight-line method when they are related to the revolving credit facility.

(E) INCOME TAX EXPENSE

Income tax expense comprises current and deferred tax. It is recognized in profit or loss except to the extent that it relates to a business combination, or items recognized directly in equity or in other comprehensive income.

Interest and penalties related to income taxes, including uncertain tax treatments, are accounted for under IAS 37 Provisions, Contingent Liabilities and Contingent Assets.

(i) Current tax

Current tax comprises the expected tax payable or receivable on the taxable income or loss for the year and any adjustment to the tax payable or receivable in respect of previous years. The amount of current tax payable or receivable is the best estimate of the tax amount expected to be paid or received that reflects uncertainty related to income taxes, if any. It is measured using tax rates enacted or substantively enacted at the reporting date. Current tax also includes any tax arising from dividends.

Current tax assets and liabilities are offset only if certain criteria are met.

(ii) Deferred tax

Deferred tax is recognized in respect of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for taxation purposes. Deferred tax is not recognized for:

- temporary differences on the initial recognition of assets or liabilities in a transaction that is not a business combination and that affects neither accounting nor taxable profit or loss;
- temporary differences related to investments in subsidiaries, associates and joint ventures to the extent that the Company is able to control the timing of the reversal of the temporary differences and it is probable that they will not reverse in the foreseeable future; and
- taxable temporary differences arising on the initial recognition of goodwill.

Deferred tax assets are recognized for unused tax losses, unused tax credits and deductible temporary differences to the extent that it is probable that future taxable profits will be available against which they can be used. Future taxable profits are determined based on business plans for individual subsidiaries in the Company and the reversal of temporary differences. If the amount of taxable temporary differences is insufficient to recognize a deferred tax asset in full, then future taxable profits, adjusted for reversals of existing temporary differences, are considered, based on the business plans for individual subsidiaries in the Company. Deferred tax assets are reviewed at each reporting date and are reduced to the extent that it is no longer probable that the related tax benefit will be realized; such reductions are reversed when the probability of future taxable profits improves.

Unrecognized deferred tax assets are reassessed at each reporting date and recognized to the extent that it has become probable that future taxable profits will be available against which they can be used.

Deferred tax is measured at the tax rates that are expected to be applied to temporary differences when they reverse, using tax rates enacted or substantively enacted at the reporting date.

The measurement of deferred tax reflects the tax consequences that would follow from the manner in which the Company expects, at the reporting date, to recover or settle the carrying amount of its assets and liabilities. For this purpose, the carrying amount of investment property measured at fair value is presumed to be recovered through sale, and the Company has not rebutted this presumption.

Deferred tax assets and liabilities are offset only if certain criteria are met.

(iii) Sales tax

Revenues, expenses and assets are recognized net of the amount of sales tax except:

- where the sales tax incurred on a purchase of assets or services is not recoverable from the taxation authority, in which case the sales tax is recognized as part of the cost of acquisition of the asset or as part of the expense item as applicable; and
- receivables and payables that are stated with the amount of sales tax included.

The net amount of sales tax recoverable from, or payable to, the taxation authority is included as part of receivables or payables in the statement of financial position.

Additional income taxes that arise from the distribution of dividends are recognized at the same time as the liability to pay the related dividend is recognized.

(F) FINANCIAL INSTRUMENTS

The Company adopted IFRS 9 on January 1, 2018. The adoption, which is discussed in note 3(p), did not have a material impact on the Company. Under IFRS 9, the previous categories of financial assets including held to maturity, loans and receivables and available for sale have changed to measure at amortized cost, fair value through other comprehensive income and fair value through profit and loss. The classification of financial assets under IFRS 9 is generally based on the business model in which a financial instrument is managed and its contractual cash flow characteristics. Derivatives that are embedded into a contract where the host is a financial asset are never separated under IFRS 9, and the overall instrument is assessed as a whole for classification.

Under IFRS 9, the Company classifies non-derivative financial assets into the following categories: financial assets measured at amortized cost, financial assets at fair value through other comprehensive income and financial assets at fair value through profit or loss.

IFRS 9 largely retains the existing requirements in IAS 39 for the classification and measurement of financial liabilities. The adoption of IFRS 9 has not had a significant effect on the Company's accounting policies and classification of financial liabilities.

(i) Non-derivative financial assets and financial liabilities – Recognition and derecognition

The Company initially recognizes financial assets including loans and receivables and debt securities issued on the date when they are originated. All other financial assets and financial liabilities are initially recognized on the trade date when the entity becomes a party to the contractual provisions of the instrument.

The Company derecognizes a financial asset when the contractual rights to the cash flows from the asset expire, or it transfers the rights to receive the contractual cash flows in a transaction in which substantially all of the risks and rewards of ownership of the financial asset are transferred, or it neither transfers nor retains substantially all of the risks and rewards of ownership and does not retain control over the transferred asset. Any interest in such derecognized financial assets that is created or retained by the Company is recognized as a separate asset or liability.

The Company derecognizes a financial liability when its contractual obligations are discharged, cancelled, or expire.

Financial assets and financial liabilities are offset, and the net amount presented in the statement of financial position when, and only when, the Company currently has a legally enforceable right to offset the amounts and intends either to settle them on a net basis or to realize the asset and settle the liability simultaneously.

(ii) Non-derivative financial assets – Measurement

- Financial assets measured at amortized cost: These assets are initially measured at fair value plus any directly attributable transaction costs. Subsequent to initial recognition, they are measured at amortized cost using the effective interest method.
- Financial assets at fair value through other comprehensive income (FVOCI): These assets are initially measured at fair value plus any directly attributable transaction costs. Subsequent to initial recognition, they are measured at fair value and changes therein, other than impairment losses, interest income and foreign currency difference on debt instruments, are recognized in OCI and accumulated in the fair value reserve. When these assets are derecognized, the gain or loss accumulated in equity is reclassified to profit or loss.
- Financial assets at fair value through profit or loss (FVTPL): all financial assets not classified as measured at amortized cost or FVOCI as described above are measured at fair value through profit or loss. On initial recognition, the Company may irrevocably designate a financial asset that otherwise meets the requirements to be measured at amortized cost or FVOCI as FVTPL if doing so eliminates or significantly reduces an accounting mismatch that would otherwise arise.

(iii) Non-derivative financial liabilities – Measurement

A financial liability is classified as fair value through profit or loss if it is classified as held for trading or is designated as such on initial recognition. Directly attributable transaction costs are recognized in profit or loss as incurred. Financial liabilities at fair value through profit or loss are measured at fair value and changes therein, including any interest expense, are recognized in profit or loss.

Other non-derivative financial liabilities are initially measured at fair value less any directly attributable transaction costs. Subsequent to initial recognition, these liabilities are measured at amortized cost using the effective interest method.

(iv) Derivative financial instruments and hedge accounting

The Company holds derivative financial instruments to hedge its foreign currency, commodity price, and interest rate risk exposures. Embedded derivatives are separated from the host contract and accounted for separately if certain criteria are met.

Derivatives are initially measured at fair value; any directly attributable transaction costs are recognized in profit or loss as incurred. Subsequent to initial recognition, derivatives are measured at fair value, and changes therein are generally recognized in profit or loss.

Cash flow hedges

When a derivative is designated as a cash flow hedging instrument, the effective portion of changes in the fair value of the derivative is recognized in other comprehensive income and accumulated in the hedging reserve. Any ineffective portion of changes in the fair value of the derivative is recognized immediately in the income statement.

The Company designates only the change in fair value of the spot element of forward exchange contracts as the hedging instrument in cash flow hedging relationships. The change in fair value of the forward element of forward exchange contracts is separately accounted for as a cost of hedging and recognized in a cost of hedging reserve within equity.

The amount accumulated in equity is retained in other comprehensive income and reclassified to the income statement in the same period or periods during which the hedged forecast cash flow affects the income statement or the hedged item affects the income statement.

If the forecast transaction is no longer expected to occur, the hedge no longer meets the criteria for hedge accounting, the hedging instrument expires or is sold, terminated, or exercised, or the designation is revoked, then hedge accounting is discontinued prospectively. When the Company discontinues hedge accounting for a cash flow hedge the amount accumulated in equity will remain in the cash flow hedge reserve if the forecast transaction is still expected to occur, only if the forecast transaction is no longer expected to occur will the amount accumulated in equity be reclassified to profit or loss as a reclassification adjustment.

(G) EMPLOYEE BENEFITS

(i) Short-term benefits

Short-term employee benefits are expensed as the related service is provided. A liability is recognized for the amount expected to be paid if the Company has a present legal or constructive obligation to pay this amount as a result of past service provided by the employee and the obligation can be estimated reliably.

(ii) Share-based payment transactions

The grant-date fair value of equity-settled share-based payment arrangements granted to employees is generally recognized as an expense, with a corresponding increase in equity, over the vesting period of the awards. The amount recognized as an expense is adjusted to reflect the number of awards for which the related service and non-market performance conditions are expected to be met, such that the amount ultimately recognized is based on the number of awards that meet the related service and non-market performance conditions at the vesting date. For share-based payment awards with non-vesting conditions, the grant-date fair value of the share-based payment is measured to reflect such conditions and there is no true-up for differences between expected and actual outcomes.

The fair value of the amount payable to employees in respect of share appreciation rights, which are settled in cash, is recognized as an expense with a corresponding increase in liabilities, over the period during which the employees become unconditionally entitled to payment. The liability is remeasured at each reporting date and at settlement date based on the fair value of the share appreciation rights. Any changes in the liability are recognized in the income statement.

(iii) Defined contribution plans

Obligations for contributions to defined contribution plans are expensed as the related service is provided. Prepaid contributions are recognized as an asset to the extent that a cash refund or a reduction in future payments is available.

(iv) Defined benefit plans

The Company's net obligation in respect of defined benefit plans is calculated separately for each plan by estimating the amount of future benefit that employees have earned in the current and prior periods, discounting that amount and deducting the fair value of any plan assets.

The calculation of defined benefit obligations is performed annually by a qualified actuary using the projected unit credit method. When the calculation results in a potential asset for the Company, the recognized asset is limited to the present value of economic benefits available in the form of any future refunds from the plan or reductions in future contributions to the plan. To calculate the present value of economic benefits, consideration is given to any applicable minimum funding requirements.

Remeasurements of the net defined benefit liability, which comprise actuarial gains and losses, the return on plan assets (excluding interest) and the effect of the asset ceiling (if any, excluding interest), are recognized immediately in other comprehensive income. The Company determines the net interest expense (income) on the net defined benefit liability (asset) for the period by applying the discount rate used to measure the defined benefit obligation at the beginning of the annual period to the then-net defined benefit liability (asset), taking into account any changes in the net defined benefit liability (asset) during the period as a result of contributions and benefit payments. Net interest expense and other expenses related to defined benefit plans are recognized in profit or loss.

When the benefits of a plan are changed or when a plan is curtailed, the resulting change in benefit that relates to past service or the gain or loss on curtailment is recognized immediately in profit or loss. The Company recognizes gains and losses on the settlement of a defined benefit plan when the settlement occurs.

(v) Other long-term employee benefits

The Company's net obligation in respect of long-term employee benefits is the amount of future benefit that employees have earned in return for their service in the current and prior periods. That benefit is discounted to determine its present value. Remeasurements are recognized in profit or loss in the period in which they arise.

(vi) Termination benefits

Termination benefits are expensed at the earlier of when the Company can no longer withdraw the offer of those benefits and when the Company recognizes costs for a restructuring. If benefits are not expected to be settled wholly within 12 months of the reporting date, then they are discounted.

(H) PROPERTY, PLANT AND EQUIPMENT

(i) Recognition and measurement

Items of property, plant and equipment are measured at cost, which includes capitalized borrowing costs, less accumulated depreciation and any accumulated impairment losses.

Costs associated with developing mine reserves are recognized in property, plant and equipment when they are established as commercially viable. These costs can include amounts that were previously recognized as intangible assets during the evaluation phase of the mine development.

Borrowing costs directly attributable to the acquisition, construction or production of an asset that necessarily takes a substantial period of time to get ready for its intended use or sale are capitalized as part of the cost of the respective assets. All other borrowing costs are expensed in the period they occur. Borrowing costs consist of interest and other costs that an entity incurs in connection with the borrowing of funds.

If significant parts of an item of property, plant and equipment have different useful lives, then they are accounted for as separate items (major components) of property, plant and equipment.

Any gain or loss on disposal of an item of property, plant and equipment is recognized in profit or loss.

(ii) Subsequent expenditures

Subsequent expenditure is capitalized only if it is probable that the future economic benefits associated with the expenditure will flow to the Company.

(iii) Depreciation

Depreciation is calculated to write-off the cost of items of property, plant and equipment less their estimated residual values using the straight-line method over their estimated useful lives, and is generally recognized in the income statement. Leased assets are depreciated over the shorter of the lease term and their useful lives unless it is reasonably certain that the Company will obtain ownership by the end of the lease term. Land is not depreciated.

The estimated useful lives of property, plant and equipment for current and comparative periods are as follows:

• mining costs	3-15 years
• land, buildings and improvements	2-50 years
• machinery and equipment	2-20 years
• furniture and fixtures	3-15 years
• finance leases	5-14 years

Depreciation methods, useful lives and residual values are reviewed at each reporting date and adjusted if appropriate.

The depreciation of certain mining costs is linked to production levels. Therefore, these assets are amortized using a units of production basis. The Company's mine in Brazil is currently the only mine asset being depreciated using this basis and approximates a 15-year remaining life of the mine based on updated geology studies. Other mining assets are depreciated on a straight-line basis ranging from 3-15 years, depending on useful life.

(I) INTANGIBLE ASSETS

(i) Goodwill

Goodwill arising on the acquisition of subsidiaries is measured at cost less accumulated impairment losses.

(ii) Research and development

Expenditure on research activities is recognized in profit or loss when incurred.

Development expenditures are capitalized if and only if the following criteria are met:

- the expenditure can be measured reliably;
- the product or process is technically and commercially feasible;
- future economic benefits are probable;
- the Company intends to, and has sufficient resources to complete development and to use or sell the asset.

Research and development costs that do not qualify as assets are shown within selling, general and administrative expenses in the consolidated income statement. Subsequent to initial recognition, development expenditure is measured at cost less accumulated amortization and any accumulated impairment losses.

(iii) Mining assets

Mining assets which are included in intangible assets include exploration, evaluation and development expenditures. See significant accounting policies section (k) for additional information on the accounting for mining assets.

(iv) Other intangible assets

Other intangible assets, including customer relationships, patents and trademarks that are acquired by the Company and have finite useful lives are measured at cost less accumulated amortization and any accumulated impairment losses.

(v) Subsequent expenditure

Subsequent expenditure is capitalized only when it increases the future economic benefits embodied in the specific asset to which it relates. All other expenditure, including expenditure on internally generated goodwill, is recognized in the income statement as incurred.

(vi) Amortization

Amortization is calculated to write-off the cost of intangible assets less their estimated residual values using the straight-line method over their estimated useful lives, and is generally recognized in profit or loss. Goodwill is not amortized. Amortization methods, useful lives and residual values are reviewed at each reporting date and adjusted if appropriate.

The estimated useful lives for current and comparative periods are based on expected futures sales for the related asset and are as follows:

- customer relationships 5-20 years
- development costs 5-20 years
- mining assets 3-15 years
- other intangibles 3-10 years

(J) INVENTORIES

Inventories are measured at the lower of cost and net realizable value. The cost of inventories is determined based on the average cost and specific identification methods, and includes expenditures incurred in acquiring the inventories and bringing them to their existing location and condition. In the case of finished goods inventory and work in process, cost includes materials and labor as well as an appropriate share of production overhead based on normal operating capacity.

(K) MINING ASSETS

(i) Exploration, evaluation and development expenditures

Exploration and evaluation expenditures relate to costs incurred on the exploration and evaluation of potential mineral resources. These costs are recorded as intangible assets while exploration is in progress. When commercially recoverable reserves are determined, and such development receives the appropriate approvals, capitalized exploration and evaluation expenditures are transferred to construction in progress. Upon completion of development and commencement of production, capitalized development costs as well as exploration and evaluation expenditures are transferred to mining assets in property, plant and equipment and depreciated using the units of production method.

(ii) Mineral rights

Mineral reserves, resources and rights (together mineral rights) which can be reasonably valued, are recognized in the assessment of fair values on acquisition. Mineral rights for which values cannot be reasonably determined are not recognized. Exploitable mineral rights are amortized using the units of production method over the commercially recoverable reserves.

(iii) Deferred stripping costs

The Company is following IFRIC 20 for all surface mine accounting. The Interpretation only applies to stripping costs incurred during the production phase of a surface mine (production stripping costs). Costs incurred in undertaking stripping activities are considered to create two possible benefits – the production of inventory in the current period and/or improved access to ore to be mined in a future period. Where the benefits are realized in the form of inventory produced, the production stripping costs are to be accounted for in accordance with IAS 2. Where the benefit is improved access to ore to be mined in the future, these costs are to be recognized as a non-current asset.

Production stripping costs are capitalized as part of an asset when the Company can demonstrate: a) it is probable that future economic benefit associated with the stripping activity will flow to the entity; b) the entity can identify the component of an ore body for which access has been improved; and c) the costs can be reliably measured. These costs are amortized over the life of the component ore body identified.

(L) LEASES

(i) Determining whether an arrangement contains a lease

At inception of an arrangement, the Company determines whether the arrangement is or contains a lease.

At inceptions or on reassessment of an arrangement that contains a lease, the Company separates payments and other consideration required by the arrangement into those for the lease and those for other elements on the basis of their relative fair values. If the Company concludes for a finance lease that it is impracticable to separate the payments reliably, then an asset and a liability are recognized at an amount equal to the fair value of the underlying asset; subsequently, the liability is reduced as payments are made and an imputed finance cost on the liability is recognized using the Company's incremental borrowing rate.

(ii) Leased assets

Leases of property, plant and equipment that transfer to the Company substantially all of the risks and rewards of ownership are classified as finance leases. The leased assets are measured initially at an amount equal to the lower of their fair value and the present value of the minimum lease payments. Subsequent to initial recognition, the assets are accounted for in accordance with the accounting policy applicable to that asset.

Assets held under other leases are classified as operating leases and are not recognized in the Company's statement of financial position.

(iii) Lease payments

Payments made under operating leases are recognized in the income statement on a straight-line basis over the term of the lease. Lease incentives received are recognized as an integral part of the total lease expense, over the term of the lease.

Minimum lease payments made under finance leases are apportioned between the finance cost and the reduction of the outstanding liability. The finance cost is allocated to each period during the lease term so as to produce a constant periodic rate of interest on the remaining balance of the liability.

(M) ASSETS HELD FOR SALE

Non-current assets, or disposal groups comprising assets and liabilities, are classified as held for sale if it is highly probable that they will be recovered primarily through sale rather than through continuing use.

Such assets, or disposal groups, are generally measured at the lower of their carrying amount and fair value less costs to sell. Any impairment loss on a disposal group is allocated first to goodwill, and then to the remaining assets and liabilities on a pro rate basis, except that no loss is allocated to inventories, financial assets, deferred tax assets, employee benefit assets, investment property or biological assets, which continue to be measured in accordance with the Company's other accounting policies. Impairment losses on initial classification as held for sale or held for distribution and subsequent gains and losses on remeasurement are recognized in the income statement.

Once classified as held for sale, intangible assets and property, plant and equipment are no longer amortized or depreciated, and any equity-accounted investee is no longer equity accounted.

(N) IMPAIRMENT

(i) Non-derivative financial assets

Financial assets not classified as fair value through profit and loss are assessed at each reporting date to determine whether there is objective evidence of impairment.

Objective evidence that financial assets are impaired includes:

- default or delinquency by a debtor;
- restructuring of an amount due to the Company on terms that the Company would not consider otherwise;
- indications that a debtor or issuer will enter bankruptcy;
- adverse changes in the payment status of borrowers or issuers;
- the disappearance of an active market for a security because of financial difficulties; or
- observable data indicating that there is a measurable decrease in the expected cash flows from a group of financial assets.

Financial assets measured at amortized cost

The company considers evidence of impairment for these assets at both an individual asset and a collective level. All individually significant assets are individually assessed for impairment. Those found not to be impaired are then collectively assessed for any impairment that had been incurred but not yet individually identified. Assets that are not individually significant are collectively assessed for impairment. Collective assessment is carried out by grouping together assets with similar risk characteristics.

In assessing collective impairment, the Company uses historical information on the timing of recoveries and the amount of loss incurred, and makes an adjustment if current economic and credit conditions are such that the actual losses are likely to be greater or lesser than suggested by historical trends.

An impairment loss is calculated as the difference between an asset's carrying amount and the present value of the estimated future cash flows discounted at the asset's original effective interest rate. Losses are recognized in the income statement and reflected in an allowance account. When the Company considers that there are no realistic prospects of recovery of the asset, the relevant amounts are written-off. If the amount of impairment loss subsequently decreases and the decrease can be related objectively to an event occurring after the impairment was recognized, then the previously recognized impairment loss is reversed through the income statement.

Financial assets at fair value through other comprehensive income

Impairment losses on financial assets at fair value through other comprehensive income are recognized by reclassifying the losses accumulated in the fair value reserve to the income statement. The amount reclassified is the difference between the acquisition cost (net of any principal repayment and amortization) and the current fair value, less any impairment loss previously recognized in the income statement. If the fair value of an impaired FVOCI debt security subsequently increases and the increase can be related objectively to an event occurring after the impairment loss was recognized, then the impairment loss is reversed through the income statement. Impairment losses recognized in the income statement for an investment in an equity instrument classified as FVOCI are not reversed through the income statement.

IFRS 9 permits an entity to make an irrevocable election to present in other comprehensive income changes in the fair value of an investment in an equity instrument that is not held for trading. This election is made on an instrument-by-instrument basis. Amounts presented in other comprehensive income shall not be subsequently transferred to profit or loss, including impairments. However, the entity may transfer the cumulative gain or loss within equity. The Company has applied this election to its current equity investments (note 12) upon adoption of IFRS 9.

Equity-accounted investees

An impairment loss in respect of an equity-accounted investee is measured by comparing the recoverable amount of the investment with its carrying amount. An impairment loss is recognized in the income statement, and is reversed if there has been a favorable change in the estimates used to determine the recoverable amount.

(ii) Non-financial assets

At each reporting date, the Company reviews the carrying amounts of its non-financial assets (other than inventories and deferred tax assets) to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated. Goodwill is tested annually for impairment.

For impairment testing, assets are grouped together into the smallest group of assets that generates cash inflows from continuing use that are largely independent of the cash inflows of other assets or cash generating units. Goodwill arising from a business combination is allocated to cash generating units or groups of cash generating units that are expected to benefit from the synergies of the combination.

The recoverable amount of an asset or cash generating unit is the greater of its value in use and its fair value less costs to sell. Value in use is based on the estimated future cash flows, discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset or cash generating unit.

An impairment loss is recognized if the carrying amount of an asset or cash generating unit exceeds its recoverable amount.

Impairment losses are recognized in the income statement. They are allocated first to reduce the carrying amount of any goodwill allocated to the cash generating unit, and then to reduce the carrying amounts of the other assets in the cash generating unit on a pro rata basis.

An impairment loss in respect of goodwill is not reversed. For other assets, an impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortization, if no impairment loss had been recognized.

(O) PROVISIONS

Provisions are recognized when:

- the Company has a present obligation (legal or constructive) as a result of a past event;
- it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation; and
- a reliable estimate can be made for the amount of the obligation.

If the effect of the time value of money is material, provisions are discounted using a current pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability. The unwinding of the discount is recognized as finance cost.

(i) Environmental remediation costs and recoveries

Certain subsidiaries of the Company are faced with a number of issues relating to environmental clean-up requirements, largely resulting from historical solid and hazardous waste handling and disposal practices at their facilities. In accordance with the Company's environmental policy and applicable legal requirements, provisions associated with environmental remediation obligations are accrued when such losses are deemed probable and reasonably estimable. Such accruals generally are recognized no later than the completion of the remedial feasibility study and are adjusted as further information develops or circumstances change.

A provision is made for shutdown, restoration and environmental rehabilitation costs in the financial period when the related environmental disturbance occurs, based on the estimated future costs using information available at the reporting date. The provision is discounted using a current market-based pre-tax discount rate and any change in the discount is included in finance cost. The provision is reviewed on an annual basis for changes to obligations, legislation or discount rates that may lead to changes in cost estimates or the expected timeline for payments.

Where the Company expects some or all of an environmental provision to be reimbursed, for example using a trust account, the reimbursement is recognized as a separate asset but only when the reimbursement is virtually certain. The expense relating to any provision is presented in the income statement net of any reimbursement. The subsidiaries of the Company have been required, in certain instances, to create trust funds for the environmental rehabilitation. Once established, the subsidiaries have a 100% interest in these funds. Rehabilitation and restoration trust funds holding monies committed for use in satisfying environmental obligations are included on a discounted basis within other non-current assets on the statement of financial position, only to the extent that a liability exists for these obligations.

Environmental expense recoveries are generally recognized in profit upon final settlement with the Company's insurance carriers.

Additional environmental remediation costs and provisions may be required if the Company were to decide to close certain of its sites. Certain of the Company's restructuring programs have involved closure of sites. Remediation liabilities are recognized when the site closure has been announced. In the opinion of the Company, it is not possible to estimate reliably the costs that would be incurred on the eventual closure of its continuing sites, where there is no present obligation to remediate, because it is neither possible to determine a time limit beyond which the sites will no longer be operated, nor what remediation costs may be required on their eventual closure.

(ii) Restructuring

A provision for restructuring is recognized when the Company or a subsidiary of the Company has approved a detailed and formal restructuring plan, and the restructuring either has commenced or has been announced publicly. Provisions are not made for future operating costs. The timing of recording of portions of the restructuring provision is dependent on receiving social plan approval in certain jurisdictions. Changes in the estimate of costs related to restructuring plans are included in profit or loss in the period when the change is identified.

(iii) Warranty

A provision for warranty is recognized when the Company or a subsidiary of the Company has determined that it has a basis for recording a warranty provision based on historical returns for warranty work. The estimate of warranty-related costs is updated and revised at each reporting date.

(iv) Partial retirement

In an effort to reduce unemployment and create jobs for younger job-seekers, Germany implemented certain regulations in 1996 to enable employees to take early retirement. Although the law is no longer in effect, the Company's German subsidiaries have made provisions for those employees who are eligible per their employment contracts. According to German law, the Company is required to pay a deposit for partial retirements to secure payments to the employees in the case of insolvency. The Company records the related deposits and provisions on a net basis.

(v) Cost estimates

As part of its process to provide reliable estimations of profitability for long-term contracts, the Company makes provisions for cost estimates for completed contracts. These provisions are developed on a contract by contract basis and are based on contractor estimates and are utilized or derecognized depending on actual performance of the contracts. The cost estimates are updated and revised at each reporting date.

(vi) Restoration, rehabilitation and decommissioning costs

Restoration, rehabilitation and decommissioning costs arising from the installation of plant and other site preparation work, discounted to their net present value, are provided for and capitalized at the time such an obligation arises. The costs are charged to the income statement over the life of the operation through depreciation of the asset and the unwinding of the discount on the provision.

Mine rehabilitation costs will be incurred by the Company at the end of the operating life of some of the Company's facilities and mine properties. The Company assesses its mine rehabilitation provision at each reporting date. The ultimate rehabilitation costs are uncertain, and cost estimates can vary in response to many factors, including estimates of the extent and costs of rehabilitation activities, technological changes, regulatory changes, cost increases as compared to the inflation rates, and changes in discount rates. The provision recorded at each reporting date represents management's best estimate of the present value of the future rehabilitation costs required.

Costs for restoration of subsequent site disturbance, which is created on an ongoing basis during production, are provided for at their net present values and charged to the income statement as extraction progresses.

(P) NEW AND AMENDED STANDARDS AND INTERPRETATIONS

The Company applied for the first time certain standards and amendments, which are effective for annual periods beginning on or after January 1, 2018.

The nature and the impact of each new standard and amendment is described below:

IFRS 15 *Revenue from Contracts with Customers*

IFRS 15 establishes a comprehensive framework for determining whether, how much and when revenue is recognized. It replaced IAS 18 Revenue, IAS 11 Construction Contracts and related interpretations.

The Company has adopted IFRS 15 using the cumulative effect method, with the effect of initially applying this standard recognized at the date of initial application (i.e. January 1, 2018). Accordingly, the information presented for 2017 has not been restated – i.e. it is presented, as previously reported, under IAS 18, IAS 11 and related interpretations.

The following table summarizes the impact, net of tax, of transition to IFRS 15 on retained earnings at January 1, 2018.

In thousands of US dollars	Impact of adopting IFRS 15 at January 1, 2018
Retained earnings	
Furnace construction contracts	(1,191)
Consignment inventory sales	85
Related tax	335
Impact at January 1, 2018	(771)

The following table summarizes the impacts of adopting IFRS 15 on the Company's consolidated statement of financial position as of December 31, 2018, and its consolidated statement of income and other comprehensive income for the year then ended for each of the line items affected. There was no material impact on the Company's consolidated statement of cash flows for the year ended December 31, 2018.

Impact on the consolidated statement of financial position as of December 31, 2018	As reported	Adjustments	Amounts without adoption of IFRS 15
Assets			
Inventories	316,715	(13,774)	302,941
Trade and other receivables	138,530	14,181	152,711
Total current assets	881,718	407	882,125
Total assets	1,320,936	407	1,321,343
Equity			
Other reserves	(104,274)	364	(103,910)
Retained earnings (deficit)	(39,158)	1,263	(37,895)
Equity attributable to shareholders of the Company	319,924	1,627	321,551
Total equity	344,043	1,627	345,670
Liabilities			
Deferred tax liabilities	7,930	—	7,930
Total non-current liabilities	556,190	—	556,190
Trade and other payables	230,939	(774)	230,165
Advanced payments from customers	50,210	(330)	49,880
Current tax liability	26,045	(116)	25,929
Total current liabilities	420,703	(1,220)	419,483
Total liabilities	976,893	(1,220)	975,673
Total equity and liabilities	1,320,936	407	1,321,343

Impact on the consolidated income statement and comprehensive income for the year ended December 31, 2018	As reported	Adjustments	Amounts without adoption of IFRS 15
Continuing operations			
Revenue	1,310,288	9,693	1,319,981
Cost of sales	995,113	9,225	1,004,388
Gross profit	315,175	468	315,643
Operating profit	163,261	468	163,729
Profit before income tax	139,752	468	140,220
Income tax expense	44,971	119	45,090
Profit for the year	94,781	349	95,130
Total comprehensive income for the year, net of tax	63,691	349	64,040

IFRS 9 *Financial Instruments*

On January 1, 2018, the Company adopted IFRS 9 'Financial Instruments', which replaced IAS 39 'Financial Instruments – Recognition and Measurement'. The Company has not restated comparative information for prior periods.

- Classification and Measurement: On January 1, 2018, we assessed the new classification requirements prescribed under IFRS 9 related to the Company's reason for holding the assets and the nature of the cash flows from the assets. On January 1, 2018, we reclassified our financial assets to the new categories based on these new requirements. Additionally, there were no changes to the carrying values of the Company's financial assets and liabilities from adopting the new classification model.
- Impairment: From January 1, 2018, the Company implemented an expected credit loss impairment model for financial assets. For trade receivables, our calculation methodology has been updated to consider expected losses based on aging profile. The adoption of the expected loss approach has not resulted in any material change in impairment provision for any financial asset.
- Hedge accounting: The Company applied the hedge accounting requirements of IFRS 9 prospectively. At the date of initial application, all of the Company's existing hedging relationships were eligible to be treated as continuing hedge relationships.

(Q) STANDARDS ISSUED BUT NOT YET EFFECTIVE

Several new standards and amendments to standards are effective for annual periods beginning after January 1, 2019, and earlier application is permitted; however, the Company has not early adopted the following new or amended standards in preparing these consolidated financial statements.

IFRS 16 *Leases*

IFRS 16 requires lessees to account for all leases under a single on-balance sheet model in a similar way to finance leases under IAS 17 with recognition exemptions for leases of 'low-value' assets and short-term leases. Lessees recognize a liability to pay rentals with a corresponding asset and recognize interest expense and depreciation separately. Reassessment of certain key considerations (i.e. lease term, variable rents based on an index or rate, discount rate) by the lessee is required upon certain events. IFRS 16 also requires lessees and lessors to make more extensive disclosures than under IAS 17.

The new standard is effective for the Company on January 1, 2019. The Company has assessed the estimated impact that initial application of IFRS 16 will have on its consolidated financial statements, as discussed below. The actual impact related to the implementation of the standard is subject to change until the Company presents its first financial statements that include the date of adoption.

The Company will recognize new assets and liabilities for its operating leases which are primarily comprised of buildings, equipment, machinery and automobiles. Right of use assets will be included within property, plant and equipment and classified in the same manner as if the underlying assets were owned by the Company. The lease liabilities will be presented as a separate line item on the consolidated statement of financial position. The nature and pattern of expense recognition in relation to these leases will change upon adoption of the standard. The Company will recognize depreciation on the right of use assets on a straight-line basis over the expected term of the lease. Interest expense related to the lease liabilities will be recognized over the expected term of the lease using the effective interest method.

Previously, the Company recognized operating lease expense on a straight-line basis over the term of the lease, and recognized assets and liabilities only to the extent that there was a timing difference between actual lease payments and the expense recognized.

No significant impact is expected for the Company's finance leases.

Based on information that is currently available, the Company estimates that it will recognize additional lease liabilities of approximately $40,000 at January 1, 2019, with a corresponding right of use asset recognized as well. The Company has limited leasing arrangements with the exceptions of certain building leases related to its Corporate headquarters and offices within the Engineering segment. These building leases comprise the majority of the expected right of use assets and lease liabilities to be recorded. The impact to the consolidated income statement and consolidated statement of cash flows is not expected to be significant on an annual basis given the extended term of the underlying building leases. The Company does not expect the adoption of IFRS 16 to impact its ability to comply with the loan covenants on its credit facility as described in note 21.

The Company intends to apply the modified retrospective approach upon initial adoption of IFRS 16 on January 1, 2019. Under this approach, the cumulative effect of adopting IFRS 16 will be recognized as an adjustment to the opening balance of retained earnings on that date. Comparative information will not be restated to conform to the provisions of the standard, which is permitted under the modified retrospective approach. The Company will elect to apply the standard to contracts that were previously identified as leases applying IAS 17 and IFRIC 4. The Company will therefore not apply the standard to contracts that were not previously identified as containing a lease as defined by IAS 17 and IFRIC 4. The Company will elect to use the exemptions proposed by the standard on lease contracts for which the lease terms ends within 12 months as of the date of initial application, and lease contracts for which the underlying asset is of low value. The Company will also elect to utilize the practical expedient that allows it to rely on previous assessments and determinations of onerous leases. The value of any leases that were deemed to be onerous will be offset against the right of use asset at the date of adoption.

Other Amendments

In addition to the above, the adoption of the following new or amended standards have also been considered:

- IFRIC 23 Uncertainty over Tax Treatments
- Prepayment Features with Negative Compensation (Amendments to IFRS 9)
- Long-term Interests in Associates and Joint Ventures (Amendments to IAS 28)
- Plan Amendment, Curtailment or Settlement (Amendments to IAS 19)
- Annual Improvements to IFRS Standards 2015–2017 Cycle – various standards
- Amendments to References to Conceptual Framework in IFRS Standards
- IFRS 17 Insurance Contracts.

The Company has assessed these standards and does not anticipate a significant impact to the financial statements as a result of adoption.

4. SEGMENT REPORTING

For management purposes, the Company is organized under two operating segments: AMG Critical Materials and AMG Engineering. Each segment offers different products and services and are managed separately due to different technology and marketing requirements.

Management monitors the operating results of its segments separately for the purpose of making decisions about resource allocation and performance assessment. Segment performance is evaluated based on operating profit or loss and is measured consistently with operating profit or loss in the consolidated financial statements. The Company's headquarters costs, financing (including finance cost and finance income) and assets are managed on a group basis and are allocated to operating segments. Transfer prices between operating segments are on an arm's length basis in a manner similar to transactions with third parties.

AMG Critical Materials

AMG Critical Materials develops and produces specialty metals, alloys, chemicals and high performance materials. AMG Critical Materials is a significant producer of specialty metals, such as ferrovanadium, ferronickel-molybdenum, aluminum master alloys and additives, chromium metal, tantalum, antimony, lithium, natural graphite, silicon metal and titanium master alloys for energy, aerospace, infrastructure and specialty metal and chemicals applications. Other key products include specialty alloys, coating materials and vanadium chemicals. AMG Critical Materials has major production facilities in the UK, the US, Germany, France, China, and Brazil.

AMG Engineering

AMG Engineering designs, engineers and produces advanced vacuum furnace systems and operates vacuum heat treatment facilities, primarily for the aerospace and energy (including solar and nuclear) industries. Furnace systems produced by AMG Engineering include vacuum remelting, vacuum induction melting, vacuum heat treatment and high pressure gas quenching, turbine blade coating and sintering. AMG Engineering also provides vacuum case-hardening heat treatment services on a tolling basis. AMG Engineering has production facilities that are located in Germany, France, Mexico, India, China and the US.

AMG Corporate headquarters costs and assets are allocated seventy percent to AMG Critical Materials and thirty percent to AMG Engineering in 2018 and 2017 based on an estimation of services provided to the operating segments.

Year ended December 31, 2018	AMG Critical Materials	AMG Engineering	Eliminations[a]	Total
Revenue				
Revenue from external customers	1,050,460	259,828	—	1,310,288
Intersegment revenue	—	3,157	(3,157)	—
Total revenue	1,050,460	262,985	(3,157)	1,310,288
Segment results				
Depreciation and amortization	28,007	5,027	—	33,034
Restructuring	2,052	—	—	2,052
Asset impairment	3,333	—	—	3,333
Environmental	8,757	—	—	8,757
Operating profit	143,089	20,172	—	163,261
Statement of financial position				
Segment assets	1,079,430	220,054	—	1,299,484
Other investments	21,452	—	—	21,452
Total assets	1,100,882	220,054	—	1,320,936
Segment liabilities	573,139	195,965	—	769,104
Employee benefits	82,759	66,458	—	149,217
Provisions	44,751	13,821	—	58,572
Total liabilities	700,649	276,244	—	976,893
Other information				
Capital expenditures for expansion – tangible assets	42,682	2,420	—	45,102
Capital expenditures for maintenance – tangible assets	24,344	2,270	—	26,614
Capital expenditures – intangible assets	849	466	—	1,315

Year ended December 31, 2017	AMG Critical Materials	AMG Engineering	Eliminations[a]	Total
Revenue				
Revenue from external customers	814,446	245,205	—	1,059,651
Intersegment revenue	—	3,070	(3,070)	—
Total revenue	814,446	248,275	(3,070)	1,059,651
Segment results				
Depreciation and amortization	25,745	5,154	—	30,899
Restructuring	1,906	641	—	2,547
Asset impairment	1,048	112	—	1,160
Environmental	3,092	—	—	3,092
Operating profit	62,608	17,144	—	79,752
Statement of financial position				
Segment assets	753,344	172,697	—	926,041
Other investments	30,562	—	—	30,562
Total assets	783,906	172,697	—	956,603
Segment liabilities	326,112	135,441	—	461,553
Employee benefits	89,732	66,461	—	156,193
Provisions	40,129	16,139	—	56,268
Total liabilities	455,973	218,041	—	674,014
Other information				
Capital expenditures for expansion – tangible assets	45,348	3,551	—	48,899
Capital expenditures for maintenance – tangible assets	27,425	2,087	—	29,512
Capital expenditures – intangible assets	2,092	401	—	2,493

[a] Eliminations column includes intersegment trade eliminations. The intersegment revenue eliminates against the intersegment cost of sales.

GEOGRAPHICAL INFORMATION

Geographical information for the Company is provided below. Revenues are based on the shipping location of the customer while non-current assets are based on the physical location of the assets.

	Year ended December 31, 2018		Year ended December 31, 2017	
	Revenues	Non-current assets	Revenues	Non-current assets
United States	453,113	63,434	324,527	63,824
Germany	264,085	120,752	221,517	122,378
China	78,743	1,209	70,684	1,051
United Kingdom	55,613	16,520	49,204	17,711
France	52,375	21,890	53,136	19,077
Japan	42,237	18	36,987	18
Brazil	42,174	131,352	33,547	107,018
Italy	38,798	—	38,042	—
Austria	34,757	—	25,721	—
South Korea	22,906	—	28,352	—
India	20,936	88	12,343	96
Mexico	16,359	5,213	15,315	4,758
Belgium	16,068	—	15,475	—
Sweden	13,329	—	8,698	—
Turkey	12,027	—	10,260	—
Canada	11,822	—	11,774	—
Spain	9,589	208	10,783	—
Kazakhstan	9,449	—	5,584	—
Poland	8,903	—	5,016	—
Netherlands	8,828	—	7,138	—
Australia	8,250	—	6,194	—
Taiwan	5,326	—	3,590	—
Czech Republic	5,177	1,531	5,711	1,903
Switzerland	4,836	—	4,244	—
Russia	4,147	8	3,002	—
Thailand	2,485	—	3,984	—
Argentina	2,047	—	1,391	—
Singapore	1,377	—	2,773	—
Mozambique	—	10,412	—	14,942
Other	64,532	1,712	44,659	4,091
Total	1,310,288	374,347	1,059,651	356,867

Non-current assets for this purpose consist of property, plant and equipment; goodwill and other intangible assets; other assets; and non-current tax assets.

5. REVENUE

Revenue from sales of goods, furnace construction contracts and heat treatment services during the year ended December 31, 2018 was $1,310,288 (2017: $1,059,651). For revenue by segment and by geographical basis, see note 4.

Timing of revenue recognition	Critical Materials	Engineering	Total
Products transferred at a point in time	1,050,460	66,683	1,117,143
Products and services transferred over time	—	193,145	193,145
Total Revenue	1,050,460	259,828	1,310,288

The following table includes revenues recognized over time as well as the related contract assets and liabilities for furnace construction contracts:

	2018	2017
Contract revenue recognized	193,145	180,201
Contract expenses recognized	152,301	139,803
Recognized profits	40,844	40,398
Contract costs incurred and recognized profits	222,923	239,055
Progress billings and advances received	248,974	243,158
Net amount due to customers	(26,051)	(4,103)
Gross amount due from customers for contract work (note 14)	24,159	28,922
Gross amount due to customers for contract work (shown as advance payments in consolidated statement of financial position)	(50,210)	(33,025)
Net amount due to customers	(26,051)	(4,103)

The Company recognized revenues of $84,396 that were included in the balance of contract liabilities as of January 1, 2018. There were no revenues recognized during the year that pertained to performance obligations that were satisfied in a previous year.

The transaction price allocated to the remaining performance obligations (unsatisfied or partially satisfied) as of December 31, 2018 are as follows:

	2018
Within one year	174,523
More than one year*	51,261
FY 2020	35,998
FY 2021	15,264

* The remaining performance obligations expected to be recognized in more than one year relate to the construction of furnaces.

6. OTHER INCOME AND EXPENSE

	2018	2017
Other miscellaneous income	285	201
Grant income	73	73
Income from sale of asset	72	29
Insurance proceeds	14	78
Sale of scrap	—	175
Other income	444	556
Other expense	20	45
Environmental expenses	8,757	3,092
Net other operating expense	8,333	2,581

7. PERSONNEL EXPENSES

	Note	2018	2017
Wages and salaries		183,152	165,875
Contributions to defined contribution plans	23	4,212	3,831
Expenses related to defined benefit plans	23	6,326	6,711
Social security and other benefits		40,608	34,524
Performance share units	24	6,903	8,068
Stock options	24	529	503
Restricted stock awards	24	67	126
Total		241,797	219,638
Included in the following lines of the consolidated income statement:			
Cost of sales		156,090	139,803
Selling, general and administrative expenses		85,707	79,835
Total		241,797	219,638

8. FINANCE INCOME AND COST

	2018	2017
Interest income on bank deposits	3,229	680
Interest income on tax refunds	72	363
Interest income on escrow deposits	1	85
Discounting on provisions	7	253
Other	412	385
Finance income	3,721	1,766
Interest expense on loans and borrowings	21,306	5,110
Amortization of loan issuance costs	1,640	802
Discount on long-term assets, provisions and retirement obligations	1,044	640
Guarantees	392	934
Commitment/unutilized fees	968	1,300
Interest expense on accounts receivable factoring	683	446
Other	637	327
Foreign exchange loss	560	601
Finance cost	27,230	10,160
Net finance cost	23,509	8,394

See note 21 for additional information on loans and borrowings as well as related fees. See note 32 for additional information on bank charges for guarantees.

9. INCOME TAX

Significant components of income tax expense for the years ended:

CONSOLIDATED INCOME STATEMENT

	2018	2017
Current tax expense		
Current period	35,198	11,859
Adjustment for prior periods	11	(958)
Total current taxation charges for the year	35,209	10,901
Deferred tax expense		
Origination and reversal of temporary differences	5,641	8,610
Changes in previously unrecognized tax losses, tax credits and unrecognized temporary differences	(4,458)	(9,679)
Changes in previously recognized tax losses, tax credits and recognized temporary differences for changes in enacted tax rates and currency effects	8,187	3,860
Derecognition of previously recognized tax losses, tax credits and temporary differences	303	—
Adjustment for prior period	89	213
Total deferred taxation for the year	9,762	3,004
Total income tax expense reported in consolidated income statement	44,971	13,905
Consolidated statement of comprehensive income		
Income tax related to items recognized in OCI in the year:		
Cash flow hedges, effective portion of changes in fair value	3,588	(2,024)
Actuarial losses on defined benefit plans	433	2,968
Income tax benefit charged to OCI	4,021	944

RECONCILIATION OF EFFECTIVE TAX RATE

A reconciliation of income tax expense applicable to accounting profit before income tax at the weighted average statutory income tax rate of 24.34% (2017: 29.73%) to the Company's effective income tax rate for the years ended is as follows:

	2018	2017
Profit before income tax from continuing operations	139,752	71,358
Income tax using the Company's weighted average tax rate	34,016	21,216
Non-deductible expenses	3,740	1,833
Tax exempt income	(2,184)	(2,563)
Current year losses for which no deferred tax asset was recognized and changes in unrecognized temporary differences	4,978	2,527
Recognition of previously unrecognized tax losses, tax credits and temporary differences of a prior year	(4,648)	(12,466)
Derecognition of previously recognized tax losses, tax credits and temporary differences	303	—
Changes in previously recognized tax losses, tax credits and recognized temporary differences for changes in enacted tax rates	41	1,199
Changes in previously recognized tax losses, tax credits and recognized temporary differences for changes in currency effects	6,706	267
Over provided in prior periods	105	(741)
State and local taxes	2,537	640
Other	(623)	1,993
Income tax expense reported in consolidated income statement	44,971	13,905

The weighted average statutory income tax rate is the average of the statutory income tax rates applicable in the countries in which the Company operates, weighted by the profit (loss) before income tax of the subsidiaries in the respective countries as included in the consolidated accounts. Some entities have losses for which no deferred tax assets have been recognized.

During the years ended December 31, 2018 and 2017, the income tax benefits related to the current year losses of certain US, Dutch, French, Belgian, and German entities were not recognized. In total, $4,978 and $2,527 were not recognized in 2018 and 2017, respectively, as it is not probable that these amounts will be realized.

During the years ended December 31, 2018 and 2017, certain income tax benefits related to previously unrecognized tax losses and temporary differences related to certain US, Mexican and French entities were recognized. In total, $4,648 and $12,466 were recognized in 2018 and 2017, respectively, through an increase to the net deferred tax asset. Of the total benefit recognized, $3,569 (2017: $10,810) related to the French jurisdictions. These benefits were recognized due to financial performance in recent years and forecasted taxable profits.

The main factors considered in assessing the realizability of deferred tax benefits were improved profitability, higher forecasted taxable profitability and carry forward period of the tax losses. After assessing these factors, the Company determined that it is probable that the deferred tax benefit of the tax losses and temporary differences will be realized in the foreseeable future.

On December 22, 2017, the President of the United States signed into law the tax legislation commonly known as the Tax Cuts and Jobs Act (the "Act"). The effects of new legislation are recognized upon enactment, which (for federal legislation) is the date the President signs a bill into law. Accordingly, recognition by AMG of the tax effects of the Act is required in the annual period that includes December 22, 2017. The primary provision of the Act impacting AMG in 2018 was the reduction of the US corporate income tax rate from 35% to 21%.

Also, during the years ended December 31, 2018, the net recognized deferred tax assets (liabilities) were adjusted for changes in the enacted tax rates in the UK, France and Germany. The net impact of the tax rate changes was an increase to income tax expense of $41. The net recognized deferred tax assets (liabilities) were also adjusted to reflect changes in currency rates in Brazil. The impact of the tax rate changes and currency rates was an increase to income tax expense of $6,706 (2017: $267).

During the year 2018, an income tax benefit of $623 was recorded to other in the effective tax rate reconciliation. Of this total benefit, $589 related to additional tax credits received in France for prior years.

There were no income tax consequences attached to the payment of dividends in either 2018 or 2017 by AMG to its shareholders.

DEFERRED TAX ASSETS AND LIABILITIES

Deferred income taxes reflect the net tax effects of temporary differences between the carrying amounts of assets and liabilities for financial reporting purposes and the amounts used for income tax purposes, as well as tax loss and tax credit carry forwards.

Deferred tax assets are recognized to the extent it is probable that the temporary differences, unused tax losses and unused tax credits will be realized. The realization of deferred tax assets is reviewed each reporting period and includes the consideration of historical operating results, projected future taxable income exclusive of reversing temporary differences and carry forwards, the scheduled reversal of deferred tax liabilities and potential tax planning strategies.

RECOGNIZED DEFERRED TAX ASSETS AND LIABILITIES

Deferred tax assets and liabilities have been recognized in respect of the following roll forward:

		2018 Activity			December 31, 2018		
	December 31, 2017 Net tax asset and liability	Deferred benefit (expense)	Other comprehensive income	Currency translation adjustment/other	Net tax asset and liability	Assets	Liabilities
Inventories	1,146	772	—	(951)	967	1,617	650
Long-term contracts	(13,604)	495	—	1,260	(11,849)	—	11,849
Prepaids and other current assets	(2)	(17)	—	(92)	(111)	—	111
Property, plant, and equipment	(5,821)	(967)	—	1,276	(5,512)	1,943	7,455
Deferred charges and non-current assets	(7,171)	(5,904)	—	2,838	(10,237)	1,928	12,165
Accruals and reserves	2,744	236	3,442	(497)	5,925	6,305	380
Environmental liabilities	5,334	1,699	—	(642)	6,391	6,646	255
Retirement benefits	34,400	(81)	433	(4,801)	29,951	29,951	—
Tax loss and tax credit carryforwards	15,194	(5,995)	—	1,458	10,657	10,657	—
Total	32,220	(9,762)	3,875	(151)	26,182	59,047	32,865
Set off of tax						(24,935)	(24,935)
Net tax assets and liabilities						34,112	7,930

During the year ended December 31, 2018, the Company recorded income tax benefit (expense) of $3,442 (2017: ($2,024)) related to cash flow hedges and $433 (2017: $2,968) related to actuarial (losses) gains on defined benefit plans to other comprehensive income.

UNRECOGNIZED DEFERRED TAX ASSETS

The net deferred tax assets are fully recognized for each of the jurisdictions in which we operate with the exception of the following: (1) a German entity did not recognize the specific deferred tax asset recorded for the impact of assets impaired for book purposes; (2) a US entity did not recognize a portion of their state tax loss carry forwards; (3) certain Dutch holding companies and operating companies in the UK, France, Belgium and Mexico do not recognize benefits for their loss carry forward deferred tax assets because management has determined that they will not be able to generate future taxable profits in the foreseeable future for these respective entities.

Certain deferred tax assets have not been recognized in respect of tax loss carry forwards and temporary differences as they may not be used to offset taxable profits elsewhere in the Company and they have arisen in subsidiaries that have been loss-making for some time.

Deferred tax assets and liabilities have not been recognized in respect of the following items:

	Assets	
	2018	2017
Deferred charges and non-current assets	9,127	9,553
Environmental liabilities	1,022	—
Tax loss and tax credit carry forwards	30,685	25,941
Net tax assets – unrecognized	40,834	35,494

At December 31, 2018, net operating loss and tax credit carry forwards for which no deferred tax assets have been recognized in the balance sheet, expire as follows:

2019	7,601
2020	8,999
2021	5,995
2022	7,332
2023	6,118
2024-2027	67,459
Unlimited	8,199
Total	111,703

10. PROPERTY, PLANT AND EQUIPMENT

COST	Mining costs	Land, buildings and improvements	Machinery and equipment	Furniture and fixtures	Construction in progress	Finance leases	Total
Balance at January 1, 2017	29,031	132,391	350,742	20,274	19,556	2,792	554,786
Additions	5,137	1,941	6,488	3,764	73,091	—	90,421
Retirements and transfers	2,133	6,252	997	65	(22,600)	—	(13,153)
Effect of movements in exchange rates	1,772	9,346	18,815	2,056	1,198	162	33,349
Balance at December 31, 2017	38,073	149,930	377,042	26,159	71,245	2,954	665,403
Balance at January 1, 2018	38,073	149,930	377,042	26,159	71,245	2,954	665,403
Additions	653	8,558	11,066	3,012	43,695	—	66,984
Retirements and transfers	5,281	22,024	53,521	175	(87,431)	—	(6,430)
Impairments	—	—	(2,797)	(42)	(259)	—	(3,098)
Effect of movements in exchange rates	(877)	(3,681)	(7,572)	(1,008)	(199)	(113)	(13,450)
Balance at December 31, 2018	43,130	176,831	431,260	28,296	27,051	2,841	709,409
DEPRECIATION							
Balance at January 1, 2017	(13,294)	(52,582)	(249,438)	(11,707)	(143)	(1,524)	(328,688)
Depreciation for the year	(1,427)	(4,076)	(20,987)	(2,398)	—	(346)	(29,234)
Retirements and transfers	(5)	550	9,358	676	143	—	10,722
Impairments	—	—	(2,676)	—	—	—	(2,676)
Effect of movements in exchange rates	(566)	(3,492)	(11,916)	(904)	—	(109)	(16,987)
Balance at December 31, 2017	(15,292)	(59,600)	(275,659)	(14,333)	—	(1,979)	(366,863)
Balance at January 1, 2018	(15,292)	(59,600)	(275,659)	(14,333)	—	(1,979)	(366,863)
Depreciation for the year	(1,050)	(5,009)	(21,584)	(3,394)	—	(352)	(31,389)
Retirements and transfers	—	2,233	6,038	1,255	—	—	9,526
Effect of movements in exchange rates	385	1,326	4,987	490	—	80	7,268
Balance at December 31, 2018	(15,957)	(61,050)	(286,218)	(15,982)	—	(2,251)	(381,458)
Carrying amounts							
At January 1, 2017	15,737	79,809	101,304	8,567	19,413	1,268	226,098
At December 31, 2017	22,781	90,330	101,383	11,826	71,245	975	298,540
At January 1, 2018	22,781	90,330	101,383	11,826	71,245	975	298,540
At December 31, 2018	27,173	115,781	145,042	12,314	27,051	590	327,951

MINING COSTS

Mining costs include assets related to the Company's mines. During the years ended December 31, 2018, $1,050 (2017: $1,427) of these costs have been depreciated.

PROPERTY, PLANT AND EQUIPMENT UNDER CONSTRUCTION

During the years ended December 31, 2018 and 2017, the subsidiaries of the Company embarked on several different expansion projects as well as certain required maintenance projects. The largest of these expansion projects currently underway is the Company's lithium expansion in Brazil. Costs incurred up to December 31, 2018, which are included in construction in progress, totalled $27,051 (2017: $71,245).

BORROWING COSTS

The Company did not capitalize any borrowing costs during 2018 or 2017.

PROPERTY, PLANT AND EQUIPMENT ADDITIONS

At December 31, 2018, the Company had $66,984 in additions, including $6,288 in accounts payable and a non-cash transfer of $173 from the provision for restoration costs related to asset retirement obligations. At December 31, 2017, the Company had $90,421 in additions, including $11,193 in accounts payable and a non-cash transfer of $4,329 from the provision for restoration costs related to asset retirement obligation.

FINANCE LEASES

At December 31, 2018, the Company had $590 (2017: $975) of finance leases for equipment and software.

DEPRECIATION OF PROPERTY, PLANT AND EQUIPMENT

Depreciation expense for the year ended December 31, 2018 was $31,389 (2017: $29,234). Depreciation expense is recorded in the following line items in the consolidated income statement:

	2018	2017
Cost of sales	29,785	28,192
Selling, general and administrative expenses	1,604	1,042
Total	31,389	29,234

ASSETS HELD FOR SALE

As of December 31, 2018, the Company identified $144 (2017: $2,056) related to properties held for sale.

SALE OF PROPERTY, PLANT AND EQUIPMENT

Certain land and equipment was sold in the years ended December 31, 2018 and 2017. In those years, the Company received proceeds of $1,660 and $254, respectively. In 2018, the proceeds were more than the book value of the assets and a gain of $720 was recognized during the year. In 2017, the proceeds were less than the book value of the assets and a loss of $75 was recognized during the year.

IMPAIRMENT TESTING

IAS 36 requires that assets be carried at a value no greater than their recoverable amount. To meet this standard, the Company is required to test tangible and intangible assets for impairment when indicators of impairment exist, or at least annually, for goodwill and intangible assets with indefinite useful lives. During the year ended December 31, 2018, the Company recorded $3,098 of asset impairments on property, plant and equipment primarily related to a payment associated with the early termination of a customer contract in the amount of $2,839 and other impairment expenses of $259. Impairment expense was partially offset by insurance proceeds of $1,000. During the year ended December 31, 2017, the Company recorded $2,676 of asset impairments related to property, plant and equipment of which $2,217 were a result of a fire at the Company's Mibra mine in Brazil. Impairment expense was partly offset by insurance proceeds of $1,516. The remaining impairment of $459 was due to restructuring which occurred during the period at subsidiaries in France, Germany, and the United States. See note 25 for additional information on these restructuring expenses.

SECURITY

At December 31, 2018, properties with a carrying amount of $122,908 (2017: $128,778) are pledged as collateral to secure certain bank loans.

11. GOODWILL AND INTANGIBLE ASSETS

COST	Goodwill	Customer relationships	Capitalized development costs	Mining assets	Other intangible assets	Total goodwill and intangible assets
Balance at January 1, 2017	31,611	9,593	4,662	4,700	23,527	74,093
Additions	—	—	912	711	870	2,493
Disposals, reversals and transfers	—	—	—	461	—	461
Effect of movements in exchange rates	3,367	1,019	511	715	2,839	8,451
Balance at December 31, 2017	34,978	10,612	6,085	6,587	27,236	85,498
Balance at January 1, 2018	34,978	10,612	6,085	6,587	27,236	85,498
Additions	—	—	177	138	1,000	1,315
Effect of movements in exchange rates	(1,248)	(378)	(218)	(298)	(1,101)	(3,243)
Balance at December 31, 2018	33,730	10,234	6,044	6,427	27,135	83,570
AMORTIZATION AND IMPAIRMENT						
Balance at January 1, 2017	(8,882)	(8,016)	(2,492)	(1,771)	(19,717)	(40,878)
Amortization	—	(155)	(286)	(409)	(815)	(1,665)
Effect of movements in exchange rates	(1,059)	(812)	(181)	(268)	(2,525)	(4,845)
Balance at December 31, 2017	(9,941)	(8,983)	(2,959)	(2,448)	(23,057)	(47,388)
Balance at January 1, 2018	(9,941)	(8,983)	(2,959)	(2,448)	(23,057)	(47,388)
Amortization	—	(176)	(442)	(78)	(949)	(1,645)
Impairment	—	—	(1,318)	—	—	(1,318)
Effect of movements in exchange rates	393	327	130	83	978	1,911
Balance at December 31, 2018	(9,548)	(8,832)	(4,589)	(2,443)	(23,028)	(48,440)
Carrying amounts						
At January 1, 2017	22,729	1,577	2,170	2,929	3,810	33,215
At December 31, 2017	25,037	1,629	3,126	4,139	4,179	38,110
At January 1, 2018	25,037	1,629	3,126	4,139	4,179	38,110
At December 31, 2018	24,182	1,402	1,455	3,984	4,107	35,130

AMORTIZATION OF INTANGIBLE ASSETS

Amortization expense for the year ended December 31, 2018 was $1,645 (2017: $1,665). Amortization expense is recorded in the following line items in the consolidated income statement:

	2018	2017
Cost of sales	289	473
Selling, general and administrative expenses	1,356	1,192
Total	1,645	1,665

RESEARCH COSTS

Research costs are expensed as incurred. Development costs are expensed until they meet the following criteria: technical feasibility; both the intention and ability to complete for internal use or as an external sale; probable generation of future economic benefits; and marketability existence. Research and development expenses are included in selling, general and administrative expenses and were $6,572 and $4,846 in the years ended December 31, 2018 and 2017, respectively.

IMPAIRMENT TESTING FOR INTANGIBLE ASSETS

(i) Goodwill

For the purposes of impairment testing, goodwill has been allocated to the Company's cash-generating units as follows:

	Segment	2018	2017
AMG Antimony cash-generating unit	Critical Materials	9,053	9,476
AMG Superalloys UK cash-generating unit	Critical Materials	1,510	1,510
ALD cash-generating unit	Engineering	13,619	14,051
Goodwill at cash-generating units		24,182	25,037

Key assumptions

The calculations of value in use are most sensitive to the following assumptions:

- Global metals pricing - Estimates are obtained from published indices. The estimates are evaluated and are generally used as a guideline for future pricing.
- Discount rate - Discount rates reflect the current market assessment of the time value of money and the risks specific to the asset, based on a comparable peer group.
- Expected future cash flows - Expected future cash flows are based on management's best estimates of future business conditions but cannot be guaranteed as the Company does not have fixed revenues or costs.
- Growth rate – Growth rates are based on management's interpretation of published industry research in order to extrapolate cash flows beyond the business plan period. As most businesses follow economic trends, an inflationary factor of 1% was utilized.

It is possible that the key assumptions used in the business plan will differ from actual results. However, management does not believe that any possible changes will cause the carrying amount to exceed the recoverable amount. The values assigned to the key assumptions represent management's assessment of future trends in the metallurgical industry and are based on both external sources and internal sources (historical data).

For the impairment tests for AMG Antimony, AMG Superalloys UK and ALD's cash-generating units, the recoverable amounts are the value in use. The value in use was determined using the discounted cash flow method. In 2018 and 2017, the carrying amounts of the AMG Antimony and AMG Superalloys, and ALD's cash-generating units were determined to be lower than their recoverable amounts and no impairment losses were recognized.

[1] AMG Antimony's value in use was determined by discounting the future cash flows generated from the continuing use of the unit and was based on the following key assumptions:

- Cash flows were projected based on actual operating results and the 3-year business plan, which covers the next three calendar years following the impairment test date. Metal prices used in the projections are generally at current market prices at the time the plan is prepared.
- The growth rate of 1% was used to extrapolate cash flow projections beyond the period covered by the most recent business plans. Management believes that this growth rate does not exceed the long-term average growth rate for the metallurgical industry in Europe.
- Revenue projections were based on an internal 3-year business plan.
- Pre-tax discount rates of 13.94% and 14.23% were applied in determining the recoverable amount of the unit for the years ended December 31, 2018 and 2017, respectively. The discount rates were derived from a group of comparable companies (peer group) and have been compared to external advisor reports for reasonableness.

Sensitivities related to the value in use calculation for AMG Antimony would imply that a 1% increase in the discount rate or using a 0% growth rate would not have created an impairment.

[2] AMG Superalloys UK's value in use was determined by discounting the future cash flows generated from the continuing use of the unit and was based on the following key assumptions:

- Cash flows were projected based on actual operating results and the 3-year business plan, which covers the next three calendar years following the impairment test date. Metal prices used in the projections are generally at current market prices at the time the plan is prepared.
- The growth rate of 1% was used to extrapolate cash flow projections beyond the period covered by the most recent business plans. Management believes that this growth rate does not exceed the long-term average growth rate for the metallurgical industry in Europe.
- Revenue projections were based on an internal 3-year business plan.
- Pre-tax discount rates of 11.44% and 12.45% were applied in determining the recoverable amount of the unit for the years ended December 31, 2018 and 2017, respectively. The discount rates were derived from a group of comparable companies (peer group) and have been compared to external advisor reports for reasonableness.

Sensitivities related to the value in use calculation for AMG Superalloys UK would imply that a 1% increase in the discount rate or using a 0% growth rate would not have created an impairment.

[3] ALD's value in use was determined by discounting the future cash flows generated from the continuing use of the unit and was based on the following key assumptions:

- Cash flows were projected based on actual operating results and the 3-year business plan, which covers the next three calendar years following the impairment test date.
- The growth rate of 1% was used to extrapolate cash flow projections beyond the period covered by the most recent business plans. Management believes that this growth rate does not exceed the long-term average growth rate for the capital equipment sector of the metallurgical industry.
- Revenue projections were based on an internal 3-year business plan.
- Pre-tax discount rates of 14.47% and 14.80% were applied in determining the recoverable amount of the unit for the years ended December 31, 2018 and 2017, respectively. The discount rates were derived from a group of comparable companies

(peer group) and have been compared to external advisor reports for reasonableness.

Sensitivities related to the value in use calculation for ALD would imply that a 1% increase in the discount rate or using a 0% growth rate would not have created an impairment.

(ii) Intangibles with finite lives

The determination of whether long-lived assets are impaired requires an estimate of the recoverable amount of the cash-generating unit or group of cash-generating units to which the long-lived assets have been allocated. The recoverable amount is defined as the higher of a cash-generating unit's fair value less costs of disposal and its value in use. For each of the cash-generating units which tested long-lived assets for recoverability, the recoverable amount was determined as the value in use or fair value less costs to sell as appropriate. The value in use requires the entity to estimate the future cash flows expected to arise from the cash-generating units or group of cash-generating units and to discount these cash flows with a risk adjusted discount rate. Expected future cash flows are based on management's best estimates of future business conditions but cannot be guaranteed as the Company does not have fixed revenues or costs. The risk adjusted discount rate is estimated using a comparison of peers but can vary based on changes in the debt or equity markets or risk premiums assigned to countries or industries.

There were intangible asset impairments of $1,318 during the year ended December 31, 2018 (2017: nil) related to development costs associated with a specific product from an early termination of a customer contract during the year.

12. ASSOCIATES AND JOINT VENTURES AND OTHER INVESTMENTS

The Company's share of gain, net of tax, in associates and joint ventures for 2018 was nil (2017: nil). In 2017, the Company owned a 50% share in Silmag DA which was an inactive Norwegian company. Silmag DA was dissolved in 2018. AMG does not maintain any balances in its financial statements related to Silmag DA.

OTHER INVESTMENTS

During the year ended December 31, 2015, the Company amended a contract with one of its customers, Global Advanced Metals U.S.A., Inc. ("GAM"). As part of the amendment, the Company received a 10% ownership interest in GAM. During the year ended December 31, 2016, the Company purchased an additional 4% ownership interest in GAM. The investment is being designated as a financial instrument measured at fair value through other comprehensive income because the Company has not gained significant influence over GAM through the 13.3% (2017: 13.5%) ownership interest.

The investment had a value of $7,002 at December 31, 2018 (2017: $15,047). The fair value of this investment is estimated by management with reference to the relevant available information which is limited due to legal disputes between the Companies. The Company relied on the current financial results of the investment including the current financial statements and current year revenue estimates to determine a fair value for the investment. The Company did not have the relevant data to complete a discounted cash flow model. There was a lack of marketability discount applied of 17.5%. Changes in the valuation methodologies or assumptions could lead to different measurements of fair value. The Company recorded investment loss of $8,045 and nil related to the investment during the years ended December 31, 2018 and 2017, respectively, which is included in other comprehensive income.

Also included in other investments are assets of $14,450 (2017: $15,515) which are designated to fund the non-qualified pension liability. These assets consist of debt securities, equity securities, and insurance contracts which are held at fair value. These assets have been designated as Level 1 and partially Level 3 financial instruments on the fair value hierarchy. The Level 3 investments consist of insurance contracts valued at $3,417 (2017: $2,410). These insurance contracts have been valued using unobservable inputs based on the best available information in the circumstances. The investments are held in a Rabbi Trust and are restricted for use in pension funding. The Company recorded an investment (loss) gain of ($468) (2017: $1,141) related to the investment during the year ended December 31, 2018, which is included in other comprehensive income. See notes 23 and 29 for additional information.

13. INVENTORIES

	2018	2017
Raw materials	133,556	57,876
Work in process	46,434	22,761
Finished goods	126,339	74,666
Other	10,386	7,202
Total	316,715	162,505

Other inventory primarily includes spare parts that are maintained for operations.

In 2018 raw materials, changes in finished goods and work in process contributed to cost of sales by $703,157 (2017: $584,442). In the year ended December 31, 2018, the net adjustment to net realizable value amounted to a write-down of $5,782 (2017: $864) and was included in cost of sales. The net realizable value write-downs were primarily related to a payment associated with the early termination of a customer contract in the amount of $2,885, and inventory costing adjustments due to variability in metals pricing in the amount of $2,897. Additionally, AMG incurred $217 of asset impairment expense on inventory during the year ended December 31, 2018 (2017: nil).

Due to rising vanadium prices in 2018, and the related increased inventory balances as of year-end, AMG has a higher exposure to lower of cost or market ("LCM") adjustments associated with potential price declines. There are no financial instruments to hedge the volatility of vanadium prices.

Inventory in the amount of $214,077 (2017: $92,513) is pledged as collateral to secure the bank loans of certain subsidiaries (see note 21).

14. TRADE AND OTHER RECEIVABLES

	2018	2017
Trade receivables, net of allowance for doubtful accounts	114,371	108,252
Gross amount due from customers for contract work	191,700	222,247
Less: progress payments received	(167,541)	(193,325)
Net receivable from contract work (note 5)	24,159	28,922
Total	138,530	137,174

At December 31, 2018 and 2017, trade receivables include receivables from customers who have received direct shipments or services from the Company and receivables from customers who have utilized inventory on consignment. Amounts billed to furnace construction contracts customers are also included in the trade and other receivables line item in the statement of financial position. The carrying amount of trade receivables approximates their fair value due to their short-term nature. Trade receivables are generally non-interest bearing and are generally on 30-90 day terms.

At December 31, 2018, receivables in the amount of $56,836 (2017: $39,978) are pledged as collateral to secure the term loan credit facility of the Company (see note 21).

As of December 31, the analysis of trade receivables that were past due but not impaired is as follows:

		Neither past due nor	Past due but not impaired				
	Total	impaired	<30 days	30-60 days	60-90 days	90-120 days	>120 days
2018	138,530	116,065	19,739	1,656	171	326	573
2017	137,174	123,534	11,775	939	728	136	62

At December 31, 2018, trade receivables are shown net of expected credit losses of $3,031 (2017: $3,404) arising from customer unwillingness or inability to pay. Bad debt charges in the amount of $46 and $1,415 were recorded in the years ended December 31, 2018 and December 31, 2017, respectively. These charges are recorded in selling, general and administrative expenses in the consolidated income statement.

Movements in the provision for impairment of receivables were as follows:

	2018	2017
At January 1	3,404	2,083
Charge for the year	46	1,415
Amounts written-off	(179)	(19)
Amounts recovered/collected	(114)	(282)
Foreign currency adjustments	(126)	207
At December 31	3,031	3,404

FACTORING OF RECEIVABLES

As of December 31, 2018 and 2017, the Company had total receivables factored and outstanding of $38,220 and $30,122, respectively. The Company maintains accounts receivable facilities with banks and credit insurance companies in Germany, France and the US. The Company sold receivables in the amount of $202,166 throughout the year which includes security deposits of $3,194 and cash proceeds of $193,578. During 2018, the Company incurred costs of $918 in conjunction with the sale of these receivables of which $683 were included in finance cost, $58 were recorded to selling, general and administrative expenses and $177 were recorded to sales on the consolidated income statement. This activity is included in cash from operating activities during the year ended December 31, 2018. In 2017 the Company sold receivables in the amount $100,539 throughout the year which includes security deposits of $605 and cash proceeds of $91,406. During 2017, the Company incurred costs of $868 in conjunction with the sale of these receivables of which $446 were included in finance cost $163 were recorded to selling, general and administrative expenses and $259 were recorded to sales on the consolidated income statement. This activity is included in cash from operating activities during the year ended December 31, 2017.

15. OTHER ASSETS

Other assets are comprised of the following:

	2018	2017
Prepaid taxes (indirect)	18,473	21,586
Prepaid inventory	17,028	10,834
Deposits	4,122	1,868
Insurance	2,776	4,836
Environmental trusts	2,336	2,494
Debt issuance cost	1,606	2,731
Pension assets	429	3,596
Other miscellaneous assets	3,922	7,331
Total	50,692	55,276
Thereof:		
Current	39,426	37,547
Non-current	11,266	17,729

Prepaid inventory includes inventory purchased for specific furnace construction contracts.

In the year ended December 31, 2018, $3,194 (2017: $605) was included in deposits related to factoring agreements as discussed in note 14.

As of December 31, 2018, there was an outstanding receivable of nil (2017: $2,700) related to a fire at the Company's Mibra mine in Brazil damaging one of two tantalum production lines in 2017. Related to this incident, we recovered $7,439 from business interruption insurance, of which we have received $2,700 during 2018 (2017: $4,739).

16. RESTRICTED CASH

Restricted cash at December 31, 2018, is $1,715 (2017: $829) which provides security to financial institutions who issue letters of credit or other forms of credit on behalf of the Company. These letters of credit serve two primary purposes: to provide financial backing for advance payments made by our customers of the Engineering segment and to provide financial assurance to banks, vendors and regulatory agencies to whom the Company is obligated.

17. CASH AND CASH EQUIVALENTS

The Company had bank balances at December 31, 2018 of $381,900 (2017: $178,800). Bank balances earn interest at floating rates based on daily bank deposit rates. The Company periodically utilizes time deposits; they have maturities of approximately three months or less depending on the immediate cash needs of the Company and earn interest at the respective short-term rates. At December 31, 2018, the Company had $30,408 of time deposits (2017: nil).

At December 31, 2018, the Company had $169,605 available liquidity (2017: $150,591) on undrawn committed borrowing facilities.

18. CAPITAL AND RESERVES

SHARE CAPITAL

At December 31, 2018, the Company's authorized share capital was comprised of 65,000,000 ordinary shares (2017: 65,000,000) with a nominal share value of €0.02 (2017: €0.02) and 65,000,000 preference shares (2017: 65,000,000) with a nominal share value of €0.02 (2017: €0.02).

At December 31, 2018, the issued and outstanding share capital was comprised of 30,573,597 ordinary shares (2017: 29,784,516), with a nominal value of €0.02 (2017: €0.02) which were fully paid. No preference shares were outstanding at December 31, 2018 (2017: nil). The nominal value of the outstanding shares as of December 31, 2018, was $700 (2017: $714) as compared to the value using historical exchange rates which was $812 (2017: $796).

The preference shares carry equal voting rights as ordinary shares and are entitled, if distribution to shareholders is permitted, to a fixed dividend equal to EURIBOR for deposit loans of one year increased with maximum of 400 basis points as determined by the Management Board of the Company and subject to approval by the Supervisory Board. AMG's dividend policy is to evaluate liquidity needs for alternative uses including funding growth opportunities and funding dividend payments to shareholders. Payment of future dividends to shareholders will be at the discretion of the Management Board subject to the approval of the Supervisory Board after taking into account various factors and is subject to limitations based on the Company's revolving credit facility. Additionally, payment of future dividends or other distributions to shareholders may be made only if the Company's shareholders' equity exceeds the sum of the issued share capital plus the reserves required to be maintained by law.

A roll forward of the total shares outstanding is noted below:

Balance at January 1, 2017	28,195,363
Shares issued for share-based compensation	1,655,628
Shares repurchased	(474,708)
Treasury shares delivered for share-based compensation	392,494
Treasury shares delivered to Supervisory Board	15,739
Balance at December 31, 2017	29,784,516
Shares issued for share-based compensation	673,330
Shares repurchased	(277,446)
Re-issuance of treasury shares	277,446
Treasury shares delivered for share-based compensation	108,222
Treasury shares delivered to Supervisory Board	7,529
Balance at December 31, 2018	30,573,597

SHARES ISSUED OR DELIVERED FOR SHARE-BASED COMPENSATION

During the year ended December 31, 2018, 781,552 (2017: 2,048,122) shares were issued or delivered related to share-based compensation to management. Refer to note 24 for details regarding these plans.

TREASURY SHARES

The Company repurchased shares which are held in treasury for the delivery upon exercise of options and performance share programs and are accounted for as a reduction of shareholders' equity. Treasury shares are recorded at cost, representing the market price on the acquisition date. When issued, shares are removed from treasury shares on a first-in, first-out (FIFO) basis. When treasury shares are reissued under the Company's option plans, the difference between the cost and the cash received is recorded in retained earnings. When treasury shares are reissued under the Company's share plans, the difference between the market price of the shares issued and the cost is recorded in retained earnings. The following table shows the movements in the outstanding number of shares over the last two years:

A roll forward of the treasury share balance is noted below:

Balance at January 1, 2017	57,056
Shares repurchased	474,708
Re-issuance of treasury shares	(392,494)
Treasury shares delivered for share-based compensation	(15,739)
Treasury shares delivered to Supervisory Board	123,531
Balance at December 31, 2017	123,531
Shares repurchased	277,446
Re-issuance of treasury shares	(277,446)
Treasury shares delivered for share-based compensation	(108,222)
Treasury shares delivered to Supervisory Board	(7,529)
Balance at December 31, 2018	7,780

SUPERVISORY BOARD REMUNERATION

During the years ended December 31, 2018 and 2017, 7,529 and 15,739 shares were delivered, respectively, as compensation to its Supervisory Board members for services provided in 2018 and 2017. These shares were awarded as part of the remuneration policy approved by the Annual General Meeting.

OTHER RESERVES

	Foreign currency translation reserve	Hedging reserve	Cost of hedging reserve	Capitalized development expenditures reserve	Defined benefit obligation reserve	Fair value reserve	Total
Balance at January 1, 2017	(33,385)	(2,581)	—	2,348	(63,714)	247	(97,085)
Currency translation differences	11,998	—	—	—	(5,290)	—	6,708
Gain on available for sale investment	—	—	—	—	—	1,141	1,141
Movement on cash flow hedges	—	8,534	—	—	—	—	8,534
Tax effect on net movement on cash flow hedges	—	(2,024)	—	—	—	—	(2,024)
Actuarial gains on defined benefit plans	—	—	—	—	6,098	—	6,098
Tax effect on net movement on defined benefit plans	—	—	—	—	2,968	—	2,968
Transfer from retained deficit	—	—	—	780	—	—	780
Balance at January 1, 2018	(21,387)	3,929	—	3,128	(59,938)	1,388	(72,880)
Currency translation differences	(6,671)	—	—	—	1,845	—	(4,826)
Loss on FVOCI investments	—	—	—	—	—	(8,513)	(8,513)
Movement on cash flow hedges	—	(15,403)	(1,659)	—	—	—	(17,062)
Tax effect on net movement on cash flow hedges	—	3,239	349	—	—	—	3,588
Actuarial losses on defined benefit plans	—	—	—	—	(3,446)	—	(3,446)
Tax effect on net movement on defined benefit plans	—	—	—	—	433	—	433
Transfer to retained deficit	—	—	—	(1,568)	—	—	(1,568)
Balance at December 31, 2018	(28,058)	(8,235)	(1,310)	1,560	(61,106)	(7,125)	(104,274)

FOREIGN CURRENCY TRANSLATION RESERVE

The translation reserve comprises all foreign currency differences arising from the translation of the financial statements of foreign subsidiaries. There are two primary functional currencies used within the Company: the US dollar and the euro.

Resulting translation adjustments were reported in foreign currency translation reserve through other comprehensive income.

The Company did not record any share of comprehensive income related to associates or joint ventures in the years ended December 31, 2018 and 2017.

The movement in the foreign currency translation reserve was largely driven by the strengthening of the USD in relation to the euro over the year. The euro to USD exchange rate decreased 4.5% from 1.1979 at December 31, 2017 to 1.1444 at December 31, 2018.

HEDGING RESERVE

The hedging reserve comprises the effective portion of the cumulative net change in the fair value of cash flow hedging instruments related to hedged transactions that have not yet occurred. For further discussion of the cash flow hedges and the amounts that were realized in the income statement, see note 29.

COST OF HEDGING RESERVE

The cost of hedging reserve reflects gain or loss on the portion excluded from the designated hedging instrument that relates to the forward element of forward contracts. It is initially recognized in OCI and accounted for similarly to gains or losses in the hedging reserve.

DEFINED BENEFIT OBLIGATION RESERVE

The obligation reserve for defined benefit plans for the year ended December 31, 2018, decreased other reserves ($1,168) while the obligation reserve for defined benefit plans increased other reserves $3,776 in the year ended December 31, 2017.

FAIR VALUE RESERVE

The fair value reserve decreased ($8,513) and increased $1,141 for the years ended December 31, 2018 and 2017, respectively, as a result of gains and losses on equity investments through other comprehensive income during the year.

RESTRICTIONS ON DISTRIBUTIONS

Certain restrictions apply on equity of the Company due to Dutch legal requirements. Please see note 12 in the parent company financial statements for additional details.

DIVIDENDS

Dividends of $12,092, or $0.40 per share, were paid during the year ended December 31, 2018. Dividends of $9,293, or $0.32 per share, were paid during the year ended December 31, 2017.

19. EARNINGS PER SHARE

BASIC EARNINGS PER SHARE

Basic earnings per share amounts are calculated by dividing net profits for the year attributable to ordinary equity holders of the parent by the weighted average of ordinary shares outstanding during the year. As of December 31, 2018 and 2017, the calculation of basic earnings per share is performed using the weighted average shares outstanding for 2018 and 2017, respectively.

DILUTED EARNINGS PER SHARE

Diluted earnings per share are calculated by dividing the net profit attributable to the ordinary equity holders of the parent by the weighted average number of ordinary shares outstanding during the year plus the weighted average number of ordinary shares that would be issued on the conversion of all the dilutive potential ordinary shares into ordinary shares. The only category of potentially dilutive shares at December 31, 2018 and 2017 are AMG's share options, AMG's performance share unit plans and other share based compensation plans. The diluted earnings per share calculation includes the number of shares that could have been acquired at fair value given the exercise price attached to the outstanding options. The calculated number of shares is then compared with the number of shares that would have been issued assuming the exercise of the share options.

Earnings	2018	2017
Net profit attributable to equity holders for basic and diluted earnings per share	94,616	56,965
Number of shares (in 000's)		
Weighted average number of ordinary shares for basic earnings per share	30,307	29,250
Dilutive effect of stock options and other share based compensation	278	569
Dilutive effect of performance share units	1,263	1,895
Weighted average number of ordinary shares adjusted for effect of dilution	31,848	31,714
Basic earnings per share	3.12	1.95
Diluted earnings per share	2.97	1.80

In 2018 and 2017, respectively, 11 and 245 shares that could potentially dilute basic EPS were not included in the computation of dilutive EPS because the effect would have been anti-dilutive for the periods presented.

20. NON-CONTROLLING INTERESTS

As of December 31, 2018, non-controlling interests was $24,119 (2017: $24,633).

On March 30, 2015, the Company sold a 40% equity interest in a German subsidiary, AMG Graphit Kropfmühl GmbH ("AMG Graphite"). This sale resulted in the Company owning 60% of this subsidiary and a non-controlling interest of 40%. The Company has maintained control of the subsidiary and continues to consolidate the financial results. The non-controlling interest has rights to the financial position and results of AMG Graphite in proportion with their ownership. The non-controlling interest also has certain protective rights which prevent fundamental changes to AMG Graphite as well as restrictions on the ability to transfer cash out of the subsidiary.

The summarized financial information of this subsidiary is provided below. This information is based on amounts before intercompany eliminations:

Summarized financial information as of December 31:	2018	2017
Revenues	69,504	62,103
Current assets	53,149	54,875
Non-current assets	43,643	34,551
Current liabilities	17,233	15,658
Non-current liabilities	14,719	13,451
Total equity	64,840	60,317
Attributable to:		
Equity holders of parent	40,482	35,443
Non-controlling interest	24,358	24,874

The Company has additional non-controlling interest as of December 31, 2018, included in equity attributable to non-controlling interest of ($239) (2017: $241). No dividends were paid to non-controlling interest during the years ended December 31, 2018 and 2017.

21. LOANS AND BORROWINGS

This note provides information about the contractual terms of the Company's interest-bearing loans and borrowings. For more information about the Company's exposure to interest rate and foreign currency risk, see note 28.

Non-current	Effective interest rate	Maturity	**2018**	2017
Term Loan B	LIBOR +3.0%	2/1/2025	335,258	—
USD Term Loan	LIBOR +2.0%	—	—	89,284
EURO Term Loan	EURIBOR +2.0%	—	—	53,474
Subsidiary debt	4.1% - 8.5%	7/2020 - 8/2023	21,731	22,000
Finance lease obligations	3.0% - 12.0%	3/2019 - 12/2020	8	30
Total			356,997	164,788

Current	Effective interest rate	Maturity	**2018**	2017
Term Loan B	LIBOR +3.0%	2/1/2025	3,500	—
USD Term Loan	LIBOR +2.0%	—	—	5,000
EURO Term Loan	EURIBOR +2.0%	—	—	2,995
Subsidiary debt	4.1% - 8.5%	7/2020 - 8/2023	5,432	797
Finance lease obligations	3.0% - 12.0%	3/2019 - 12/2020	15	28
Total			8,947	8,820

TERM LOAN AND REVOLVING CREDIT FACILITY

As of February 1, 2018, the Company entered into a new $350,000, seven-year senior secured term loan B facility and a $200,000 five-year senior secured revolving credit facility. Proceeds from the facility were used to repay AMG's previous credit facility. In addition, AMG Engineering entered into €85,000 of bilateral letter of credit facilities which replaced its letter of credit facilities under the previous syndicated credit facility. AMG will use the excess proceeds of the new term loan to provide capital to fund strategic expansion projects.

As of December 31, 2018, the total balance outstanding on the term loans was $346,500. As of December 31, 2018, available revolver capacity was $169,605. Interest on the Revolving Credit Facility is based on current LIBOR (or in the case of any loans denominated in euros, EURIBOR) plus a margin that is dependent on AMG's corporate credit rating. At December 31, 2018 the margin was 2.5%. As part of obtaining the revolving credit facility the Company is responsible for maintaining Net Debt to EBITDA not to exceed 3.5:1.0. Interest on the Term Loan is based on current LIBOR plus a margin of 3.0%.

To mitigate interest rate risk the Company has entered into interest rate caps totaling $250,000, and interest rate swaps totaling $100,000. See note 29 for additional information on the interest rate hedging activities.

The credit facility is subject to several affirmative and negative covenants including, but not limited to, the following: Net Debt to EBITDA not to exceed 3.5:1.0. EBITDA and Net Debt are defined in the credit facility agreement. The definitions per the credit facility agreement may be different from management definitions. The credit facility limits the amount of cash that can be included in the calculation of net debt. AMG's current cash balance is significantly in excess of the credit facility limit. As a result, the Net Debt to EBITDA ratio as defined by the credit facility as of December 31, 2018 was 1.0:1.0. As of December 31, 2018, the Company was in compliance with all its debt covenants.

Mandatory repayment of the credit facility is required upon the occurrence of (i) a change of control or (ii) the sale of all or substantially all of the business and/or assets of the Company whether in a single transaction or a series of related transactions. If the Company were not in compliance with all covenants under the credit facility, the loan could become due in full or the Company could be subject to significant amendment fees.

DEBT ISSUANCE COSTS

In connection with the term loan and revolving credit facility that were refinanced in 2018, the Company incurred issuance costs of $9,238, which were deducted from the proceeds of the debt from the term loan or paid by the Company. The amounts have been allocated to the term loans and revolving credit facility based on the amount which would have been incurred if the facilities were obtained separately.

The amount allocated to the term loans of $7,155 are shown net against the outstanding term loan balance and are amortized using the effective interest method. The Company recorded amortization expense of $934 during the year ended December 31, 2018 related to these costs. The balance of unamortized costs net against the book value of the term loan was $6,221 as of December 31, 2018.

The amount allocated to the revolving credit facility of $2,083 is included in other assets because there were no borrowings outstanding. This amount is being amortized on a straight-line basis over the life of the facility. The Company has recorded amortization expense of $477 during 2018 related to these costs. The balance of unamortized costs recorded in other assets related to the revolving credit facility was $1,606 as of December 31, 2018.

Additionally, the Company recorded amortization of $2,886 related to issuance cost from the previous credit facility during 2018.

ORIGINAL ISSUE DISCOUNT

The new term loan included an original issue discount (OID) of 50 basis points of $1,750 which is shown net against the outstanding term loan balance and is amortized using the effective interest method. The Company has recorded amortization expense of $229 during the year ended December 31, 2018. The balance of unamortized costs recorded was $1,521 as of December 31, 2018.

SUBSIDIARY DEBT

During 2017, a Brazilian subsidiary obtained financing arrangements for a total of $22,000 of debt. These arrangements consist of loans which carry a fixed interest rate of 4.1% and mature in 2020. The borrowings under these facilities reduce the Company's borrowing capacity on its revolving credit facility.

In 2018, a Brazilian subsidiary obtained an additional financing arrangement for $4,837. This arrangement is denominated in Brazilian reais, carries a variable interest rate and matures in 2023. To mitigate currency exposure and interest rate risk the Company entered into a USD cross-currency interest rate swap which fixed the interest rate at 8.5%. See note 29 for additional information on hedging activities. The balance outstanding on this arrangement was $5,163 as of December 31, 2018.

On September 24, 2015, a German subsidiary obtained an additional financing arrangement with a bank in Germany. The arrangement consisted of an €8,500 term loan which carried an interest rate of EURIBOR plus 3.8%. This loan was fully repaid in 2017. Additionally, the subsidiary had two additional loans with a balance of $797 as of December 31, 2017, which carried an interest rate of 2.0%. These loans were fully repaid during the year ended December 31, 2018.

FINANCE LEASE OBLIGATIONS

As of December 31, 2018, AMG subsidiaries had finance leases outstanding to finance machinery. The Company had finance lease obligations of $23 (2017: $58) related to this machinery. See note 30 for additional information.

DEBT REPAYMENTS

The Company made finance lease and debt repayments of $155,423 during 2018. The payments included $154,612 repayment of the term loans and additional payments of $811 made to various banks related to finance leases and other debt repayments. During 2017, the Company made finance lease and debt repayments of $17,153. The payments included $7,824 repayment of term loans and additional payments of $9,329 made on the revolving credit facility and to various banks related to finance leases and other debt repayments.

RECONCILIATION OF MOVEMENTS OF LIABILITIES TO CASH FLOWS ARISING FROM FINANCING ACTIVITIES

	Loans and borrowings	Finance lease liabilities	Total
Balance at January 1, 2017	160,163	417	160,580
Changes from financing cash flows:			
Proceeds from loans and borrowings	22,000	—	22,000
Repayment of borrowings	(16,789)	—	(16,789)
Payment of finance lease liabilities	—	(364)	(364)
Total changes from financing cash flows	5,211	(364)	4,847
The effect of changes in foreign exchange rates	7,673	5	7,678
Amortization of transaction costs related to loans and borrowings	503	—	503
Balance at December 31, 2017	173,550	58	173,608
Balance at January 1, 2018	173,550	58	173,608
Changes from financing cash flows:			
Proceeds from loans and borrowings	353,087	—	353,087
Transaction costs related to loans and borrowings	(7,155)	—	(7,155)
Repayment of borrowings	(155,397)	—	(155,397)
Payment of finance lease liabilities	—	(26)	(26)
Total changes from financing cash flows	190,535	(26)	190,509
The effect of changes in foreign exchange rates	(469)	(9)	(478)
Amortization of transaction costs related to loans and borrowings	2,305	—	2,305
Balance at December 31, 2018	365,921	23	365,944

22. SHORT-TERM BANK DEBT

The Company's Brazilian subsidiaries maintain short-term borrowing arrangements with various banks. Borrowings under these arrangements are recognized as short-term debt on the consolidated statement of financial position when it is due to be settled within 12 months from inception and aggregated $15,500 at December 31, 2018, (2017: $15,500) at a weighted-average interest rate of 4.3% (2017: 4.0%). During the year ended December 31, 2017, the Company borrowed additional short-term debt of $8,000.

23. EMPLOYEE BENEFITS

DEFINED CONTRIBUTION PLANS

Tax qualified defined contribution plans are offered which cover substantially all of the Company's salaried and hourly employees at US subsidiaries. All contributions, including a portion that represents a company match, are made in cash into mutual fund accounts in accordance with the participants' investment elections. The assets of the plans are held separately, under the control of trustees, from the assets of the subsidiaries. When employees leave the plans prior to vesting fully in the Company contributions, the contributions or fees payable by the Company are reduced by the forfeited contributions.

In Europe, the employees are members of state-managed retirement benefit plans operated by the governments in the countries where the employees work. The subsidiaries are required to contribute a specified percentage of payroll costs to the retirement benefit scheme to fund the benefits. The only obligation of the subsidiaries with respect to the retirement benefit plan is to make the specified contributions.

The total expense as of December 31, 2018, recognized in the consolidated income statement of $4,212 (2017: $3,831) represents contributions paid and payable to these plans.

DEFINED BENEFIT PLANS

North America plans

The Company offers tax-qualified, non-contributory defined benefit pension plans for certain salaried and hourly employees at US subsidiaries. The plans generally provide benefit payments using a formula based on an employee's compensation and length of service. These plans are funded in amounts at least equal to the minimum funding requirements of the US Employee Retirement Income Security Act.

Non-qualified additional supplemental executive retirement plans (SERPs) also cover four of the Company's current and former executive officers. Pursuant to the terms of the agreements, these officers earn additional retirement benefits for continued service with the Company. The amounts payable under the SERPs are guaranteed by AMG.

Actuarial assumptions

A majority of the North America plans are frozen to new entrants. As a result, the principal actuarial assumptions for these plans are the rate of discount and mortality rates. The rate of discount utilized as of December 31, 2018 (expressed as a weighted average) was 4.03% (2017: 3.43%). The SERP plan assumptions are developed using specific assumptions about the individual participants.

Assumptions regarding future mortality are based on published statistics and the mortality tables including RP-2016 Combined Healthy mortality table and the IRS 2016 Generational mortality table. The valuation was prepared on a going-plan basis. The valuation was based on members in the Plan as of the valuation date and did not take future members into account. No provisions for future expenses were made.

Medical cost trend rates are not applicable to these plans.

The best estimate of contributions to be paid to the plans for the year ending December 31, 2019 is 1,000.

European plans

The Company's European plans include qualified defined benefit plans in Germany, the UK, and France. The plans in Germany and France are partially funded or unfunded while the UK plan is partially funded. Benefits under these plans are based on years of service and the employee's compensation. Benefits are paid either from plan assets or, in certain instances, directly by AMG. Substantially all plan assets are invested in listed stocks and bonds.

Non-qualified additional supplemental executive retirement plan (SERP) also cover one of the Company's current executive officers. Pursuant to the terms of the agreement, this officer earns additional retirement benefits for continued service with the Company. The amounts payable under the SERP are guaranteed by AMG.

Actuarial assumptions

Principal actuarial assumptions at the reporting date (expressed as weighted averages) are presented below.

	2018	2017
	% per annum	% per annum
Salary increases	1.26	1.19
Rate of discount at December 31	2.23	2.10
Pension payments increases	2.41	2.46

Assumptions regarding future mortality are based on published statistics and mortality tables including the RT 2018G and S2PxA mortality tables.

The best estimate of contributions to be paid to the primary plans for the year ending December 31, 2019 is $5,869.

Presented below are employee benefits disclosures for plans aggregated by geographical location into the North American and European groups.

2018 changes in the defined benefit obligation and fair value of plan assets:

	North America			Europe			Total		
	Fair Value of Plan Assets	Defined Benefit Obligation	Total	Fair Value of Plan Assets	Defined Benefit Obligation	Total	Fair Value of Plan Assets	Defined Benefit Obligation	Total
January 1, 2018	37,874	(57,455)	(19,581)	106,017	(242,629)	(136,612)	143,891	(300,084)	(156,193)
Service costs	—	(477)	(477)	—	(2,012)	(2,012)	—	(2,489)	(2,489)
Net interest	1,138	(1,907)	(769)	2,509	(5,577)	(3,068)	3,647	(7,484)	(3,837)
Subtotal included in profit or loss	1,138	(2,384)	(1,246)	2,509	(7,589)	(5,080)	3,647	(9,973)	(6,326)
Benefits paid	(3,224)	3,224	—	(7,419)	11,330	3,911	(10,643)	14,554	3,911
Amounts included in OCI (see following table)	(2,952)	4,779	1,827	(7,414)	2,213	(5,201)	(10,366)	6,992	(3,374)
Contributions by employer	1,282	—	1,282	2,096	—	2,096	3,378	—	3,378
Effect of movements in foreign exchange rates	—	—	—	(6,049)	12,185	6,136	(6,049)	12,185	6,136
Change in the fair value of Defined Benefit Plans that are in net asset position as of December 31,2018 [a]	841	—	841	2,410	—	2,410	3,251	—	3,251
Net liability for defined benefits obligations at December 31, 2018	34,959	(51,836)	(16,877)	92,150	(224,490)	(132,340)	127,109	(276,326)	(149,217)

(a) $184 included in non-currrent assets in the Statement of Financial Position.

2018 subtotal included in OCI:

	North America			Europe			Total		
	Fair Value of Plan Assets	Defined Benefit Obligation	Total	Fair Value of Plan Assets	Defined Benefit Obligation	Total	Fair Value of Plan Assets	Defined Benefit Obligation	Total
Return on plan assets (excluding amounts included in net interest expense)	(2,952)	—	(2,952)	(7,414)	—	(7,414)	(10,366)	—	(10,366)
Actuarial changes arising from changes in demographic assumptions	—	1,634	1,634	—	(1,873)	(1,873)	—	(239)	(239)
Actuarial changes arising from changes in financial assumptions	—	3,231	3,231	—	4,119	4,119	—	7,350	7,350
Experience adjustments	—	(86)	(86)	—	(33)	(33)	—	(119)	(119)
Subtotal included in OCI	(2,952)	4,779	1,827	(7,414)	2,213	(5,201)	(10,366)	6,992	(3,374)

2017 changes in the defined benefit obligation and fair value of plan assets:

	North America			Europe			Total		
	Fair Value of Plan Assets	Defined Benefit Obligation	Total	Fair Value of Plan Assets	Defined Benefit Obligation	Total	Fair Value of Plan Assets	Defined Benefit Obligation	Total
January 1, 2017	35,849	(55,117)	(19,268)	96,795	(219,115)	(122,320)	132,644	(274,232)	(141,588)
Service costs	—	(454)	(454)	—	(2,282)	(2,282)	—	(2,736)	(2,736)
Net interest	1,283	(2,155)	(872)	2,378	(5,481)	(3,103)	3,661	(7,636)	(3,975)
Subtotal included in profit or loss	1,283	(2,609)	(1,326)	2,378	(7,763)	(5,385)	3,661	(10,372)	(6,711)
Benefits paid	(3,044)	3,044	—	(6,474)	10,110	3,636	(9,518)	13,154	3,636
Amounts included in OCI (see following table)	3,906	(2,773)	1,133	4,238	(30)	4,208	8,144	(2,803)	5,341
Contributions by employer	905	—	905	2,008	—	2,008	2,913	—	2,913
Effect of movements in foreign exchange rates	—	—	—	9,482	(25,831)	(16,349)	9,482	(25,831)	(16,349)
Net liability for defined benefits obligations at December 31, 2017	38,899	(57,455)	(18,556)	108,427	(242,629)	(134,202)	147,326	(300,084)	(152,758)
Asset for defined benefit obligations at December 31, 2017 [a]	(1,025)	—	(1,025)	(2,410)	—	(2,410)	(3,435)	—	(3,435)
December 31, 2017	37,874	(57,455)	(19,581)	106,017	(242,629)	(136,612)	143,891	(300,084)	(156,193)

(a) Included in non-currrent assets in the Statement of Financial Position.

2017 subtotal included in OCI:

	North America			Europe			Total		
	Fair Value of Plan Assets	Defined Benefit Obligation	Total	Fair Value of Plan Assets	Defined Benefit Obligation	Total	Fair Value of Plan Assets	Defined Benefit Obligation	Total
Return on plan assets (excluding amounts included in net interest expense)	3,906	—	3,906	4,238	—	4,238	8,144	—	8,144
Actuarial changes arising from changes in demographic assumptions	—	(239)	(239)	—	260	260	—	21	21
Actuarial changes arising from changes in financial assumptions	—	(3,476)	(3,476)	—	(183)	(183)	—	(3,659)	(3,659)
Experience adjustments	—	942	942	—	(107)	(107)	—	835	835
Subtotal included in OCI	3,906	(2,773)	1,133	4,238	(30)	4,208	8,144	(2,803)	5,341

Plan assets consist of the following:

	North America plans		European plans		Total	
	2018	2017	**2018**	2017	**2018**	2017
Equity securities and ownership of equity funds	6,199	8,775	49,494	66,500	55,693	75,275
Fixed Income	28,289	27,736	—	5,661	28,289	33,397
Cash and equivalents	—	—	(134)	273	(134)	273
Insurance contracts and other	655	2,388	42,790	35,993	43,445	38,381
Total	35,143	38,899	92,150	108,427	127,293	147,326

The assets of funded plans are generally held in separately administered trusts, either as specific assets or as a proportion of a general fund or insurance contracts. Assets are invested in different classes in order to maintain a balance between risk and return. Investments are diversified to limit the financial effect of the failure on any individual investment. For many of the funded plans, asset-liability matching strategies are not in place, however the fixed income assets are held in investments with varying term lengths.

The assets included in equity securities in the table above consists of securities held at market value. The fixed income assets consist primarily of investment grade and corporate bonds at market value. The insurance contracts and other consist of insurance contracts and other investment vehicles held at market value.

The expense is recognized in the following line items in the income statement:

	North America plans		European plans		Total	
	2018	2017	**2018**	2017	**2018**	2017
Cost of sales	405	423	2,014	1,878	2,419	2,301
Selling, general and administrative expenses	841	903	3,066	3,507	3,907	4,410
Total	1,246	1,326	5,080	5,385	6,326	6,711

A quantitative sensitivity analysis for significant assumptions as of December 31, 2018 is as shown below:

Assumptions	Discount rate		Future salary increases		Future pension cost increase	
Sensitivity level	**1% increase**	1% decrease	**1% increase**	1% decrease	**0.5% increase**	0.5% decrease
Impact on the net defined benefit obligation North American Plans	(4,832)	5,726	59	(64)	117	(108)
Impact on the net defined benefit obligation European Plans	(32,440)	37,957	4,212	(3,691)	9,106	(8,399)
Total impact on the net defined benefit obligation	(37,272)	43,683	4,271	(3,755)	9,223	(8,507)

The sensitivity analyses above have been determined based on a method that extrapolates the impact on net defined benefit obligation as a result of reasonable changes in key assumptions occurring at the end of the reporting period.

The following payments are expected to be made in the future years out of the defined benefit plan obligation for the year ending December 31:

	North America Plans	European Plans	Total
2019	3,040	8,924	11,964
2020	3,050	9,273	12,323
2021	3,110	9,421	12,531
2022	3,710	9,588	13,298
2023	3,710	9,752	13,462
2024-2028	18,230	53,280	71,510

The average duration of the defined benefit plan obligation at the end of the reporting period is 16 years (2017: 16 years).

These defined benefit plans expose the Company to actuarial risks, such as longevity risk, currency risk, interest rate risk and market (investment) risk.

24. SHARE-BASED PAYMENTS

EQUITY-SETTLED STOCK OPTIONS

On June 26, 2007, the Management Board established the AMG Option Plan ("2007 Plan"), which is eligible to members of the Management Board, Supervisory Board, employees, and consultants of the Company. Each option issued under the plan entitles the holder to acquire shares at a future date at a price equal to the fair market value of the share at the date on which the option was granted. All outstanding options granted under this plan are fully vested. This vesting is not subject to any performance conditions. The options expire on the tenth anniversary of their grant date.

During the year ended December 31, 2018, options exercised were 145,000 (2017: 902,976) under the 2007 Plan. Expired or forfeited options under this plan were 90,000 (2017: 25,425). All options under the 2007 Plan are equity-settled, in accordance with IFRS 2, by award of options to acquire ordinary shares or award of ordinary shares.

On May 13, 2009, the Annual General Meeting approved an option plan for the Management Board, the 2009 AMG Option Plan ("2009 Plan"). Each option issued under the 2009 Plan entitles the holder to acquire shares at a future date at a price equal to the fair market value of the share at the date on which the option was granted. One half of the options granted to each option holder on any date will vest on each of the third and fourth anniversaries of the grant-date. The vesting is subject to performance conditions related to return on capital employed and share price appreciation. The options expire on the tenth anniversary of their grant-date.

During the year ended December 31, 2018, options exercised were 100,426 (2017: 658,442) under the 2009 Plan. Total grants under the 2009 Plan during 2018 were 27,136 (2017: 75,707). During the year ended December 31, 2018, there were no grants expired or forfeited (2017: nil). All options under the 2009 Plan are equity-settled, in accordance with IFRS 2, by award of options to acquire ordinary shares or award of ordinary shares. The fair value of these awards has been calculated at the date of grant of the award. The fair value, adjusted for an estimate of the number of awards that will eventually vest, is expensed using a graded vesting methodology. The fair value of the options granted was calculated using a Black-Scholes model. Changes in the assumptions can affect the fair value estimate of a Black-Scholes model. The assumptions used in the calculation are set out below.

During the year ended December 31, 2018, AMG recorded compensation expense from equity-settled option transactions of $529 (2017: $503) which is included in selling, general and administrative expenses in the income statement.

Movements

	2018		2017	
In thousands of options	Number of options (in 000s)	Weighted average exercise price (in €)	Number of options (in 000s)	Weighted average exercise price (in €)
Outstanding at January 1	667	21.95	2,178	15.75
Granted during the year	27	44.24	76	25.50
Exercised during the year	(246)	27.14	(1,561)	13.43
Forfeited or expired during the year	(90)	40.28	(25)	25.16
Outstanding at December 31	358	15.48	668	21.95
Exercisable at December 31	—	—	235	40.37

No outstanding options were exercisable as of December 31, 2018 (2017: 235,000).

At December 31, 2018, the number of common shares subject to options outstanding and exercisable was as follows:

Price range	Outstanding options	Weighted average exercise price (in €)	Weighted average remaining life (in years)	Exercisable options	Weighted average exercise price (in €)
€8.08 to €9.78	255,505	9.45	7.15	—	—
€25.50	75,707	25.50	8.34	—	—
€44.24	27,136	44.24	9.34	—	—

At December 31, 2017, the number of common shares subject to options outstanding and exercisable was as follows:

Price range	Outstanding options	Weighted average exercise price (in €)	Weighted average remaining life (in years)	Exercisable options	Weighted average exercise price (in €)
€7.82 to €9.78	355,931	9.03	7.76	—	—
€25.50	75,707	25.50	9.34	—	—
€40.00 to €40.50	235,000	40.37	0.55	235,000	40.37

The maximum number of options that can be granted under either the 2007 Plan or the 2009 Plan is 10% of total shares outstanding up to a maximum of 50,000,000. As of December 31, 2018, there were no options outstanding under the 2007 Plan (2017: 235,000) and the total options outstanding under the 2009 Plan were 358,348 (2017: 431,638).

Assumptions

The following table lists the inputs into the model used to calculate the fair value of the share-based payment options that were granted in 2018 and 2017 under the 2009 Plan:

	2018	2017
Exercise price	€44.24	€25.50
Share price at date of grant	€44.24	€25.50
Contractual life (years)	10	10
Expected volatility	44.25%	37.93%
Risk-free interest rate	1.02%	(0.23%)
Life of option (years)	10	10
Weighted average fair value	€19.90	€7.13

The expected volatility was calculated using the average share volatility of the Company (over a period equal to the expected term of the options). The life of the options is ten years, and they are valued as Bermudan options. The 2009 Plan options vest 50% each on the third and fourth anniversary of the grant-date. There are performance requirements for vesting of these options. The risk-free rate of return is the yield on zero coupon two and five-year Dutch government bonds.

AMG's option expense is recorded in equity (refer to note 18).

Performance share units

In May 2009, the Annual General Meeting approved a remuneration policy that utilizes share-based payments as a part of compensation. As of November 3, 2016, the Company elected to settle any future amounts paid for the performance share units ("PSUs") awards with AMG shares. In the year ended December 31, 2018, the Company issued 117,498 (2017: 165,131) PSUs to certain employees which are share-settled. As these awards will be equity settled, the balance is recorded in equity rather than as a liability in accordance with IFRS 2.

AMG utilized a Monte Carlo simulation to develop a valuation of the PSU awards upon modification. This calculation was performed on the date of issuance. The following table lists the inputs into the model used to calculate the fair value of the equity-settled performance share units that were granted 2016 through 2018:

	2018 Grant	2017 Grant	2016 Grant
Share price at date of grant	€37.72	€24.70	€8.95
Fair value at conversion date	—	—	€19.80
Share price at date of conversion	—	—	€16.53
Contractual life at issuance (years)	3.0	3.0	3.0
Remaining life at conversion (years)	—	—	2.16
Expected volatility	38.04%	35.57%	34.90%
Risk-free interest rate	0.03%	(0.01%)	(0.15%)
Expected departures at grant	16%	16%	16%

The expected volatility was calculated using the average share volatility of the Company (over a period equal to the expected term of the shares). The expected life is the time at which shares will vest. For the risk-free rate, the Company utilizes the three-year zero rate from the EURIBOR swap curve as of the valuation date.

The Company recorded expense of $6,903 (2017: $8,068) related to these awards during the year. AMG's expense related to equity-settled awards is recorded in equity (refer to note 18). In the year ended December 31, 2018, 6,506 PSUs were forfeited (2017: 44,677). The total number of equity-settled PSUs outstanding as of December 31, 2018 was 707,171 (2017: 963,765).

The expected departures for the 2018 and 2017 awards were adjusted from 16% and 12%, respectively, to 8% as of December 31, 2018, as a result of actual departures less than the expectation to date. The actual departures for the 2016 awards were adjusted from 12% to 6%, which approximates the actual departures to date. The impact on the income statement as a result of these adjustments was an increase in stock-based compensation expense of $889 (2017: ($141)) during the year ended December 31, 2018.

The PSU awards include a performance multiplier which can range from 0x – 1.75x the target award based on the Company's share price performance relative to its peers. The Company achieved 1.75x for the 2015 grant which was settled in 2018 (2017: 1.75x). During the year ended December 31, 2018, 673,330 shares (2017: 787,678) were paid out with respect to the vesting of equity-settled performance share units granted in 2015.

Other share-based compensation

During the year ended December 31, 2016, the Company awarded the Chief Financial Officer restricted share based compensation as part of his initial compensation package. These shares are expensed using a graded vesting methodology. The total expense recognized in 2018 was $67 (2017: $126).

25. PROVISIONS

	Environmental remediation costs and recoveries	Restructuring	Warranty	Cost estimates	Partial retirement	Restoration costs	Other	Total
Balance at January 1, 2017	24,044	4,130	6,674	5,935	1,206	6,803	2,863	51,655
Provisions made during the period	3,092	2,547	4,703	3,431	—	4,329	502	18,604
Provisions reversed during the period	—	—	(2,604)	(2,040)	—	(1,420)	(2,466)	(8,530)
Provisions used during the period	(751)	(4,882)	(921)	(2,275)	(106)	—	(202)	(9,137)
(Decrease)/increase due to discounting	(48)	—	—	—	—	318	—	270
Currency and transfers	205	439	985	762	159	598	258	3,406
Balance at December 31, 2017	26,542	2,234	8,837	5,813	1,259	10,628	955	56,268
Balance at January 1, 2018	26,542	2,234	8,837	5,813	1,259	10,628	955	56,268
Provisions made during the period	8,757	2,052	2,996	5,266	1	10	5,576	24,658
Provisions reversed during the period	—	—	(5,540)	(2,338)	(14)	—	(537)	(8,429)
Provisions used during the period	(3,178)	(1,929)	(655)	(1,027)	(77)	—	(4,603)	(11,469)
Increase due to discounting	244	—	—	—	—	200	—	444
Currency and transfers	(175)	(1,102)	(364)	(316)	(51)	(838)	(54)	(2,900)
Balance at December 31, 2018	32,190	1,255	5,274	7,398	1,118	10,000	1,337	58,572
Non-current	23,499	—	—	—	1,259	10,628	501	35,887
Current	3,043	2,234	8,837	5,813	—	—	454	20,381
Balance at December 31, 2017	26,542	2,234	8,837	5,813	1,259	10,628	955	56,268
Non-current	20,948	—	—	—	1,118	10,000	461	32,527
Current	11,242	1,255	5,274	7,398	—	—	876	26,045
Balance at December 31, 2018	32,190	1,255	5,274	7,398	1,118	10,000	1,337	58,572

ENVIRONMENTAL REMEDIATION COSTS AND RECOVERIES

The Company makes provisions for environmental clean-up requirements, largely resulting from historical solid and hazardous waste handling and disposal practices at its facilities. Environmental remediation provisions exist at the following sites and are discounted according to the timeline of expected payments. Due to timing and low interest rates, the undiscounted and discounted liability amounts do not differ significantly, except for with respect to the liabilities in the US.

Cambridge, OH USA

The most significant items at the Cambridge, Ohio site relate to a 1997 permanent injunction consent order ("PICO") entered into with the State of Ohio and Cyprus Foote Mineral Company, the former owner of the site. While AMG's US subsidiary and Cyprus Foote are jointly liable, the Company has agreed to perform and be liable for the remedial obligations. The site contains two on-site slag piles that are the result of many years of production. These slag piles were capped in 2009, in accordance with the PICO requirements, thereby lowering the radioactive emissions from the piles.

The PICO also required 1,000 years of operations and maintenance expenses ("O&M") through the year 3009 at the site. The Company has reserved for ongoing O&M which is expected to cost $43,965 on an undiscounted basis and $1,722 on a discounted basis. Annual payments for O&M are expected to be $59 for the next 18 years, declining from that point on. These amounts will be paid out of an environmental trust and annuity which have already been established by the Company. The total value of these trust and annuity assets is $4,120 of which $2,398 has not been recognized due to the liability amount recorded being less than the value of the assets. One additional provision relates to groundwater monitoring. This project is expected to create cash outflows of $148, on an undiscounted basis, and is expected to be completed within the next 17 years. Discount rates of 2.63% - 2.87% (depending on the expected timing of payments) were used in determining the liabilities recorded.

There were no environmental expenses recorded in the years ended December 31, 2018 and 2017 related to the Cambridge site.

Newfield, NJ USA

Another one of the Company's US subsidiaries has entered into administrative consent orders with the New Jersey Department of Environmental Protection ("NJDEP") under which the US subsidiary must conduct remediation activities at its Newfield facility. Since the initial administrative consent order was signed in 1997, many of the obligations have been completed.

Similar to the Cambridge, Ohio facility, Newfield conducted operations that created a substantial slag pile with low-level radioactive materials. AMG has completed negotiations with the NJDEP regarding a removal plan for the Newfield Site. The plan consists of both the removal and transportation of the material to a proper disposal site. Management has recorded an accrual for $28,250 ($29,846 on an undiscounted basis) which represents its best estimate of the cost of removal, at this stage. The estimated amounts have also been reviewed and approved by the NJDEP. These costs would be paid over the next five years, subject to negotiations with the NJDEP. AMG recorded environmental expense of $8,012 related to the Newfield site during the year ended December 31, 2018 (2017: $3,092).

In addition to the removal of the slag pile the Company has agreed to an operations and maintenance agreement. An additional provision for O&M of $134 was recorded in the year ended December 31, 2018 (2017: $150) related to this agreement.

Remediation trust funds

The Company's US subsidiaries have established trust funds for future environmental remediation payments. The amounts are kept by commercial banks, which are responsible for making investments in equity and money market instruments. The trust funds are to be used according to the terms of the trust deed which require that these funds be used for O&M at the two US sites. Amounts are paid out following completion and approval of rehabilitation work. The assets are not available for general use. The trust funds are discounted and are shown within other non-current assets in the consolidated statement of financial position. The recognized values of the trust funds at December 31, 2018 were $2,336 (2017: $2,494). The total amount of the trusts as of December 31, 2018 were $4,733 (2017: $4,541).

Pocking, Germany

An environmental remediation liability exists with respect to the silicon metal operation and its waste storage. As of December 31, 2018, the liability for the remediation of this site is valued at $452 (2017: $594). There were payments of $6 (2017: nil) made during 2018. There are expected payments in 2019 of $452. A discount rate of 0.00% was used to determine the liability recorded.

Nuremberg, Germany

Over time, damage to the sewer lines from the plant in Nuremberg, Germany has occurred. Management is working with German authorities in order to clean up the leakage from the sewer and repair the sewer lines to eliminate any future leakage. In the year ended December 31, 2018, there was an expense of $745 (2017: nil). The expected liability for continued work on the sewer rehabilitation project is $1,516 (2017: $1,221). Payments for this project are expected to occur over the next six years with spending taking place in a relatively consistent pattern over those years. Discount rates of 0.82% - 1.40% (depending on the expected timing of payments) were used in determining the liabilities recorded.

RESTRUCTURING

During the year ended December 31, 2018, the Company recorded a restructuring expense made of an additional provision of $2,052 (2017: $2,547) and reversal of nil (2017: nil). The largest portion of the expense by the amount of $1,580 related to severance in one of our European operations, the continued relocation of a chemical lab in Germany and restructuring costs due to an early termination of a customer contract. Additional expenses of $472 included the reorganization of a Chinese operation and relocation of two plants to Germany to have centralized production operations.

WARRANTY

The Company's Engineering segment offers certain warranties related to their furnace operations. These warranties are only provided on certain contracts and the provisions are made on a contract by contract basis. Each contractual warranty is expected to be utilized or derecognized within twelve months. The provisions for these warranties are based on the historical return percentages. Warranty payments of $619 were made and warranty provisions included an expense of $2,952 and reversal of ($5,540) recorded in the year ended December 31, 2018. The additional provisions were primarily related to new projects in the turbine blade coating field, heat treatment, plasma melting technologies as well as several special furnaces for various heat treatment and metallurgy applications. During 2018, the significant increase in reversal related to expired warranty periods. Warranty payments of $906 were made and warranty provisions included an expense of $4,606 and reversal of ($2,604) recorded during the year ended December 31, 2017. The additional provisions were primarily related to the new projects for heat treatment technology on power supply, induction and melting furnaces projects. The Company has limited warranties for certain other products.

Two other German subsidiaries provide for warranties for certain products. The provisions are based on actual claims made by customers. There were provisions made of an additional expense of $44 (2017: $97) recorded during 2018 and payments of $36 (2017: $15).

COST ESTIMATES

AMG Engineering builds a project cost provision for long-term contracts that are completed. The provision is developed on a contract by contract basis and is based on contractor estimates. The provision is utilized or derecognized depending on actual performance of the contracts and expected total of project costs. A provision made of an additional expense of $5,266 (2017: $3,431) and reversal of ($2,338) (2017: ($2,040)) was recorded in 2018 related to new projects related to the turbine blade coating field, heat treatment, plasma melting technologies as well as several special furnaces for various heat treatment and metallurgy applications while $1,027 (2017: $2,275) of provisions were used.

PARTIAL RETIREMENT

In an effort to reduce unemployment and create jobs for younger job-seekers, Germany implemented certain regulations in 1996 to enable employees to take early retirement. Although the law is no longer in effect, the Company's German subsidiaries have made provisions for those employees who are eligible per their employment contracts. During 2018, there was an additional expense recorded of $1 (2017: nil), reversal of ($14) (2017: (nil)) and payments of $77 (2017: $106). Additional payments of approximately $1,609 are expected to occur over the next six years. Discount rate of 0.18% was used by the Company's German subsidiary to determine the liabilities recorded. Two of our partial retirement obligations expired during 2018.

RESTORATION, REHABILITATION AND DECOMMISSIONING COSTS

Decommissioning provisions represent the accrued cost required to provide adequate restoration and rehabilitation upon the completion of extraction activities. These amounts will be settled when rehabilitation is undertaken, generally at the end of the project's life.

Hauzenberg, Germany

The Company maintains a recultivation provision related to its graphite mine in Germany. There were no provisions recorded in 2018 (2017: nil). The total restoration liability for this mine was $5,345 as of December 31, 2018 (2017: $5,592). A discount rate of 0.5% was used to determine the liability recorded.

Nazareno, Brazil

During the year ended December 31, 2018, there was a net decrease in the liability of $381, which totalled to $4,655 as of December 31, 2018 (2017: $5,036). A discount rate of 8.0% was used to determine the liability recorded. The following table summarizes the activity as of December 31, 2018:

	Brazil restoration costs
Balance at January 1, 2017	1,911
Provisions made during the period	—
Provisions reversed during the period	(1,420)
Increase in fixed assets	4,329
Increase due to discounting	294
Translation loss	(78)
Balance at December 31, 2017	5,036
Balance at January 1, 2018	5,036
Provisions made during the period	10
Provisions reversed during the period	—
Increase in fixed assets	173
Increase due to discounting	198
Translation loss	(762)
Balance at December 31, 2018	4,655
Non-current	5,036
Current	—
Balance at December 31, 2017	5,036
Non-current	4,655
Current	—
Balance at December 31, 2018	4,655

OTHER

Other is comprised of additional accruals including certain guarantees made to various customers. The majority of the other provision was related to an additional expense related to a provision for the repayment of a subsidy granted by the German government in 2012 and 2013, following the completion of negotiations which was paid in full as of December 31, 2018.

26. OTHER LIABILITIES

Other liabilities are comprised of the following:

	2018	2017
Accrued bonus	14,310	13,201
Accruals for operational costs	9,820	11,242
Other benefits and compensation	9,171	8,686
Accrued employee payroll expenses	6,683	6,992
Accrued professional fees	5,824	6,911
Taxes, other than income	3,381	4,216
Accrued interest	3,025	614
Fiscal contingency	2,686	3,016
Non-controlling interest dividend	1,438	1,506
Deferred revenue	1,338	1,624
Claims	1,132	1,105
Sales commission	1,012	1,146
Government grants	311	428
Accrued debt issuance cost	—	992
Other miscellaneous liabilities	5,360	4,168
Total	65,491	65,847
Thereof:		
Non-current	4,371	4,011
Current	61,120	61,836

27. TRADE AND OTHER PAYABLES

	2018	2017
Trade payables	218,210	140,763
Trade payables – contract work	12,729	14,352
Total	230,939	155,115

The Company has limited exposure to payables denominated in currencies other than the functional currency, and where significant exposure exists enters into appropriate foreign exchange contracts.

- Trade payables are generally non-interest bearing and are normally settled on 30 or 60 day terms except for payables related to furnace construction contracts that settle between one month and twelve months. Other payables are non-interest bearing and have an average term of six months.
- Interest payable is normally settled quarterly or semi-annually throughout the financial year.
- For terms and conditions relating to related parties, refer to note 33.

As of December 31, 2018, the Company has outstanding supply chain financing of $7,260 (2017: $5,123).

28. FINANCIAL RISK MANAGEMENT OBJECTIVES AND POLICIES

The Company's principal financial liabilities, other than derivatives, are comprised of loans and borrowings, short-term bank debt and trade payables. The main purpose of these financial instruments is to provide capital for the Company's operations, including funding working capital, capital maintenance and expansion. The Company has various financial assets such as trade and other receivables, and (restricted) cash, which arise directly from its operations.

The Company enters into derivative financial instruments, primarily interest rate swaps, interest rate caps, cross currency interest rate swaps, foreign exchange forward contracts and commodity forward contracts. The purpose of these instruments is to manage interest rate, currency and commodity price risks. The Company does not enter into any contracts for speculative purposes.

The Supervisory Board has overall responsibility for the establishment of the Company's risk management framework while the Management Board is responsible for oversight and compliance within this framework. The Company's risk management policies are established to identify and analyze the risks faced by the Company, to set appropriate risk limits and controls, and to monitor risks and adherence to limits. Risk management policies and systems are reviewed regularly to reflect changes in market conditions and the Company's activities.

The main risks arising from the Company's financial instruments are: credit, liquidity and market risks.

CREDIT RISK

Credit risk is the risk of financial loss to the Company if a customer or counterparty to a financial instrument fails to meet its contractual obligations, and arises principally from the Company's receivables from customers.

The Company's exposure to credit risk with respect to trade and other receivables is influenced mainly by the individual characteristics of each customer. The demographics of the Company's customer base, including the default risk of the industry and country in which customers operate, has less of an influence on credit risk. No single customer accounts for more than 10% of the Company's revenue. There are no geographic concentrations of credit risk. It is the Company's policy that all customers who wish to trade on credit terms are subject to credit verification procedures which ensure their creditworthiness. In addition, receivable balances are monitored on an ongoing basis to ensure that the Company's exposure to impairment losses is not significant. Collateral is generally not required for trade receivables, although the Company's furnace construction contracts do often require advance payments. The Company's maximum exposure is the carrying amount as discussed in note 14.

With respect to credit risk arising from the other financial assets of the Company, which comprise cash and cash equivalents and certain derivative instruments, the Company's exposure to credit risk arises from the default of the counterparty, with a maximum exposure equal to the carrying amount of the instruments. The Company's treasury function monitors the location of cash and cash equivalents and the counterparties to hedges and monitors the strength of those banks.

The Company's maximum exposure is the carrying amounts as discussed in notes 16, 17 and 29.

LIQUIDITY RISK

Liquidity risk is the risk that the Company will not be able to meet its financial obligations as they fall due. The Company's approach to managing liquidity is to ensure, as far as possible, that it will always have sufficient liquidity to meet its liabilities when due, under both normal and stressed conditions, without incurring unacceptable losses or risking damage to the Company's reputation.

The Company monitors cash flows at varying levels. At the Company level, this monitoring is done on a bi-weekly basis. However, at certain subsidiaries, this type of monitoring is done daily. Typically, the Company ensures that it has sufficient cash on demand to meet expected operational expenses for a period of eight weeks, including the servicing of financial obligations. In addition, the Company maintains various borrowing facilities for working capital and general corporate purposes. The Company's primary facility includes the following:

- $350,000 term loan B facility and a $200,000 revolving credit facility with a syndicate of banks that is secured by certain assets of the material subsidiaries of the Company. Interest is payable at a base rate plus a spread based on a leverage ratio.

The table below summarizes the maturity profile of the Company's financial liabilities at December 31, 2018, based on contractual undiscounted payments. The financial derivatives obligations are presented on a net basis for balances where it is appropriate to net the obligation position within a subsidiary for the respective period.

2018	Contractual cash flows	< 3 months	3-12 months	2020	2021	2022	2023	>2023
Term loan/revolver	346,500	—	3,500	3,500	3,500	3,500	3,500	329,000
Cash interest on term loan	104,715	—	17,039	17,904	16,860	16,587	16,315	20,010
Other loans and borrowings	27,163	—	5,431	18,290	1,290	1,290	862	—
Financial derivatives	13,415	2,692	5,770	2,590	1,167	—	1,196	—
Financial lease liabilities	25	7	10	8	—	—	—	—
Trade and other payables	230,939	207,833	23,106	—	—	—	—	—
Short-term bank debt	15,500	—	15,500	—	—	—	—	—
Total	738,257	210,532	70,356	42,292	22,817	21,377	21,873	349,010

The table below summarizes the maturity profile of the Company's financial liabilities at December 31, 2017 based on contractual undiscounted payments.

2017	Contractual cash flows	< 3 months	3-12 months	2019	2020	2021	2022	>2022
Term loan/revolver	151,900	749	6,908	7,428	7,210	129,605	—	—
Cash interest on term loan	14,664	—	4,225	4,136	4,071	2,232	—	—
Other loans and borrowings	22,797	797	—	5,000	17,000	—	—	—
Cash interest on loans and borrowings	425	10	188	42	185	—	—	—
Financial derivatives	1,415	725	678	—	—	12	—	—
Financial lease liabilities	58	7	22	19	10	—	—	—
Trade and other payables	155,115	132,700	22,415	—	—	—	—	—
Short-term bank debt	15,500	—	15,500	—	—	—	—	—
Total	361,874	134,988	49,936	16,625	28,476	131,849	—	—

Interest on financial instruments classified as floating rate is generally repriced at intervals of less than one year. Interest on financial instruments classified as fixed rate is fixed until the maturity of the instrument.

The difference between the contractual cash flows and the carrying amount of the term loan noted above is attributable to issuance costs and an original issue discount in the amount of $7,742 and $1,146 as of December 31, 2018 and 2017, respectively, which are offset against the carrying amount of the debt.

MARKET RISK

Market risk is the risk that the fair value of future cash flows of a financial instrument will fluctuate because of changes in market prices. Market prices comprise three types of risk: interest rate, foreign currency, and commodity price risk. Financial instruments affected by market risk include loans and borrowings, derivative financial instruments, trade and other receivables, and trade and other payables.

The sensitivity analyses in the following sections relate to the positions as of December 31, 2018 and 2017.

The sensitivity analyses have been prepared on the basis that the amount of net debt, the ratio of fixed to floating interest rates of the debt and derivatives and the proportion of financial instruments in foreign currencies are all constant and on the basis of the hedge designations in place at December 31, 2018.

The analyses exclude the impact of movements in market variables on the carrying value of pension and other post-retirement obligations, provisions and on the non-financial assets and liabilities of foreign operations.

The following assumptions have been made in calculating the sensitivity analyses:

- The statement of financial position sensitivity relates to derivatives.
- The sensitivity of the relevant income statement item is the effect of the assumed changes in respective market risks.

This is based on the financial assets and financial liabilities held at December 31, 2018 and 2017, including the effect of hedge accounting.

INTEREST RATE RISK

Interest rate risk is the risk that changes in interest rates will affect the Company's income or the value of its holdings of financial instruments. The Company's fixed rate borrowings are exposed to a risk of change in their fair value due to changes in interest rates. The Company's floating rate borrowings are exposed to a risk of change in cash flows due to changes in interest rates. Short-term receivables and payables are not exposed to interest rate risk.

The Company's policy is to maintain approximately 75% of its borrowings as fixed or capped rate borrowings. The Company either enters into fixed rate debt or strives to limit the variability of certain floating rate instruments through the use of interest rate swaps or caps. These are designed to hedge underlying debt obligations. At December 31, 2018, after considering the effect of interest rate swaps and caps, all of the Company's borrowings are at a fixed or capped rate of interest (2017: 70%).

The following table demonstrates the sensitivity to a reasonably possible change in interest rates adjusting for multiple interest rate caps and swaps effective as of December 31, 2018 and 2017, with all other variables held constant, of the Company's profit before tax (through the impact on floating rate borrowings). Changes in sensitivity rates reflect various changes in the economy year-over-year. There is no impact on the Company's equity.

2018	Increase/decrease in basis points	Effect on profit before tax
US dollar ***		(369)
Brazilian reais	+10	(5)
US dollar ***		369
Brazilian reais	–10	5

2017	Increase/decrease in basis points	Effect on profit before tax
US dollar ***		(95)
Euro	+10	(57)
US dollar ***		95
Euro	–10	57

*** Historic volatility on certain USD short-term debt varies across a wide range from +25 basis points to -25 basis points. Sensitivities are calculated on the actual volatility for each debt instrument.

See note 21 for loans and borrowings explanations.

At December 31, 2018, the Company's interest rate derivatives had a fair value of $5,068 (2017: $44). Per the interest rate cap agreements, the Company has capped the variable rate of interest for a $250,000 notional value of debt at 3%. The Company's interest rate swaps having a notional value of $100,000 effectively swap the variable rate of interest to a fixed rate interest. A 10 basis point increase or decrease will not have a significant impact on the value of the interest rate derivatives.

FOREIGN CURRENCY RISK

Foreign currency risk is the risk that changes in foreign exchange rates will affect the Company's income or the value of its holdings of financial instruments. Many of the Company's subsidiaries are located outside the US. Individual subsidiaries execute their operating activities in their respective functional currencies which are primarily comprised of the US dollar and euro. Since the financial reporting currency of the Company is the US dollar, the financial statements of those non-US dollar operating subsidiaries are translated so that the financial results can be presented in the Company's consolidated financial statements.

Each subsidiary conducting business with third parties that leads to future cash flows denominated in a currency other than its functional currency is exposed to the risk from changes in foreign exchange rates. It is the Company's policy to use forward currency contracts to minimize the currency exposures on net cash flows. For certain subsidiaries, this includes managing balance sheet positions in addition to forecast and committed transactions. For these contracts, maturity dates are established at the end of each month matching the net cash flows expected for that month. Another subsidiary hedges all sales transactions in excess of a certain threshold. For this subsidiary, the contracts mature at the anticipated cash requirement date. Most forward exchange contracts mature within twelve months and are predominantly denominated in US dollars, euros, British pound sterling and Brazilian reais. When established, the forward currency contract must be in the same currency as the hedged item. It is the Company's policy to negotiate the terms of the hedge derivatives to closely match the terms of the hedged item to maximize hedge effectiveness. The Company seeks to mitigate this risk by hedging a range of 60% to 90% of transactions that occur in a currency other than the functional currency.

In respect of monetary assets and liabilities denominated in foreign currencies, the Company ensures that its net exposure is kept to an acceptable level by buying or selling foreign currencies at spot rates when necessary to address short-term imbalances.

The Company deems its primary currency exposures to be in US dollars and euros. The following table demonstrates the sensitivity to a reasonably possible change in the two primary functional currencies of the Company: US dollar and euro exchange rates with all other variables held constant, of the Company's profit before tax (due to changes in the fair value of monetary assets and liabilities) and the Company's equity (due to changes in the fair value of forward exchange contracts). Changes in sensitivity rates reflect various changes in the economy year-over-year.

2018	Strengthening/ weakening in functional rate	Effect on profit before tax	Effect on equity before tax
US dollar	+5%	2,136	2,348
Euro	+5%	(2,370)	(113)
US dollar	–5%	(1,715)	(2,348)
Euro	–5%	2,370	113

2017	Strengthening/ weakening in functional rate	Effect on profit before tax	Effect on equity before tax
US dollar	+5%	983	804
Euro	+5%	(2,051)	(232)
US dollar	–5%	(983)	(804)
Euro	–5%	2,051	232

COMMODITY PRICE RISK

Commodity price risk is the risk that certain raw materials prices will increase and negatively impact the gross margins and operating results of the Company. The Company is exposed to volatility in the prices of raw materials used in some products and uses forward contracts to manage these exposures. For certain metals, the Company aims to maintain a greater than 50% hedged position in order to avoid undue volatility in the sales prices and purchase costs attained in the normal course of business. Commodity forward contracts are generally settled within twelve months of the reporting date. Changes in sensitivity rates reflect various changes in the economy year-over-year.

2018	Change in price	Effect on profit before tax	Effect on equity before tax
Aluminum	+10%	1,680	(451)
Aluminum	–10%	(1,680)	451

2017	Change in price	Effect on profit before tax	Effect on equity before tax
Aluminum	+10%	168	317
Aluminum	–10%	(168)	(317)

CAPITAL MANAGEMENT

The primary objective of the Company is to maintain strong capital ratios in order to support its business and maximize shareholder value.

The Company manages its capital structure and makes adjustments to it, in light of economic conditions. Its policy is to ensure that the debt levels are manageable to the Company and that they are not increasing at a level that is in excess of the increases that occur within equity. During the planning process, the expected cash flows of the Company are evaluated and the debt to equity and debt to total capital ratios are evaluated in order to ensure that levels are improving year-over-year. Debt to total capital is a more appropriate measure for the Company due to its initial equity values of the subsidiaries from the combination in 2007. Management deems total capital to include all debt (including short-term and long-term) as well as the total of the equity of the Company, including non-controlling interests.

	2018	2017
Loans and borrowings	365,944	173,608
Short-term bank debt	15,500	15,500
Less: cash and cash equivalents	381,900	178,800
Net (cash) debt	(456)	10,308
Net (cash) debt	(456)	10,308
Total equity	344,043	282,589
Total capital	343,587	292,897
Debt to total capital ratio	(0.1%)	4%

29. FINANCIAL INSTRUMENTS

FAIR VALUES

Fixed rate loans and borrowings includes long-term finance leases. The carrying amounts presented in the financial statements approximate the fair values for all of the Company's financial instruments.

The fair value of the financial assets and liabilities are included at the price that would be received to sell the instrument in an orderly transaction in the principal (or most advantageous) market at the measurement date under current market conditions.

- Short-term assets and liabilities approximate their carrying amounts largely due to the short-term maturities of these instruments.
- The calculation of fair value for derivative financial instruments depends on the type of instruments: Derivative interest rate contracts are estimated by discounting expected future cash flows using current market interest rates and yield curves over the remaining term of the instrument; Derivative currency and commodity contracts are based on quoted forward exchange rates and commodity prices respectively.
- Floating and fixed rate loans and borrowings and notes receivable maintain a floating interest rate and approximate fair value. Fair value of the Company's floating rate loans and borrowings are estimated by discounting expected future cash flows using a discount rate that reflects the Company's borrowing rate at December 31, 2018.
- The consideration of non-performance risk did not significantly impact the fair values for fixed and floating rate loans and borrowings.

FAIR VALUE HIERARCHY

The Company uses the following hierarchy for determining and disclosing the fair value of financial instruments by valuation technique:

Level 1: quoted (unadjusted) prices in active markets for identical assets or liabilities

Level 2: other techniques for which all inputs which have a significant effect on the recorded fair value are observable, either directly or indirectly

Level 3: techniques which use inputs which have a significant effect on the recorded fair value that are not based on observable market data

As of December 31, 2018, the Company held the following financial instruments measured at fair value:

Assets measured at fair value

December 31, 2018		Level 1	Level 2	Level 3
Non-current financial assets				
Forward contracts – hedged	1,184	—	1,184	—
Equity investments classified as FVOCI (note 12)	7,002	—	—	7,002
Other investments (note 12)	14,450	11,033	—	3,417
Interest rate derivatives	6,408	—	6,408	—
Current financial assets				
Forward contracts - hedged	1,335	—	1,335	—

Liabilities measured at fair value

December 31, 2018		Level 1	Level 2	Level 3
Non-current financial liabilities				
Forward contracts – hedged	3,905	—	3,905	—
Interest rate derivatives	1,243	—	1,243	—
Current financial liabilities				
Forward contracts – hedged	8,170	—	8,170	—
Interest rate derivatives	97	—	97	—

As of December 31, 2017, the Company held the following financial instruments measured at fair value:

Assets measured at fair value

December 31, 2017		Level 1	Level 2	Level 3
Non-current financial assets				
Forward contracts – hedged	592	—	592	—
Investments recognized as available for sale (note 12)	15,047	—	—	15,047
Other investments (note 12)	15,515	13,105	—	2,410
Interest rate caps	44	—	44	—
Current financial assets				
Forward contracts - hedged	6,372	—	6,372	—

Liabilities measured at fair value

December 31, 2017		Level 1	Level 2	Level 3
Non-current financial liabilities				
Forward contracts – hedged	1,404	—	1,404	—
Interest rate swaps and caps	11	—	11	—

During the years ended December 31, 2018 and 2017, there were no transfers between Level 1, Level 2, and Level 3 fair value measurements.

The following table shows a reconciliation from the opening balances to the closing balances for Level 3 fair values.

	Other investments	Equity investments at FVOCI
Balance at January 1, 2017	1,390	15,047
Purchase of other investments	1,020	—
Change in fair value of available for sale investment	—	—
Balance at December 31, 2017	2,410	15,047
Purchase of other investments	990	—
Change in fair value of FVOCI investment	17	(8,045)
Balance at December 31, 2018	3,417	7,002

HEDGING ACTIVITIES

Interest rate hedges

In February of 2018, the Company entered into derivative contracts with two financial institutions in connection with the execution of its new credit facility. The contracts include interest rate caps, interest rate swaps, and a cross currency interest rate swap. The interest rate caps related to the prior credit facility were unwound and replaced by these contracts. The interest rate cap and swaps were executed so that the Company could hedge its exposure to changes in the benchmark interest rate on the term loan B facility as well as fluctuations in the exchange rate between the euro and the US dollar. The Company has designated the interest rate swaps and the cross currency interest rate swap as effective cash flow hedges. The amount from interest rate hedges included in equity was ($1,733) and nil in the years ended December 31, 2018 and 2017, respectively. The amount included in equity is anticipated to impact the income statement through February 2023, which is the term of the contracts. During the year ended December 31, 2018, $7,681 was transferred from equity to the income statement as a decrease to finance costs. There was no ineffectiveness for contracts designated as cash flow hedges during the years ended December 31, 2018 and 2017, respectively. The Company did not designate the interest rate caps for hedge accounting. During the year ended December 31, 2018, $988 of expense related to these instruments was recorded as finance cost in the consolidated statement of income.

Commodity forward contracts

The Company is exposed to volatility in the prices of raw materials used in some products and uses commodity forward contracts to manage these exposures. Such contracts generally mature within twelve months. Certain commodity forward contracts have been designated as cash flow hedges and contracts not designated as cash flow hedges are immediately recognized in cost of sales.

The open commodity forward contracts as of December 31, 2018 are as follows:

	Metric tons	Average price	Fair value assets	Fair value liabilities
US dollar denominated contracts to purchase commodities:				
Aluminum forwards	4,900	1,994	—	(526)

The open commodity forward contracts as of December 31, 2017 are as follows:

	Metric tons	Average price	Fair value assets	Fair value liabilities
US dollar denominated contracts to purchase commodities:				
Aluminum forwards	5,025	2,081	815	(5)

The amount from the commodity cash flow hedges included in equity was ($438) and $603 in the years ended December 31, 2018 and 2017, respectively. The amount included in equity is anticipated to impact the income statement over the next 12 months. During the years ended December 31, 2018 and 2017, ($20) and ($629), respectively, were transferred from equity to the income statement as decreases to cost of sales. There was no ineffectiveness for contracts designated as cash flow hedges during the years ended December 31, 2018 and 2017.

Foreign currency forward contracts

At any point in time, the Company also uses foreign exchange forward contracts to hedge a portion of its estimated foreign currency exposure in respect of forecasted sales and purchases, and intergroup loans that will be repaid in different functional currencies. The Company has also hedged significant capital expenditure projects in Brazil which will be settled in different functional currencies. These contracts are negotiated to match the terms of the commitments and generally mature within one year. When necessary, these contracts are rolled over at maturity. Foreign exchange forward contracts that are not part of a hedge relationship are held at fair value with fair value changes recognized through profit and loss.

The open foreign exchange forward sales contracts as of December 31, 2018 are as follows:

Exposure	Notional amount	Contract rate	Fair value assets	Fair value liabilities
Cash Flow Hedges				
Euro (versus USD)	€20.7 million	0.855	356	(73)
USD (versus Euro)	$58.4 million	1.212	143	(2,267)

The open foreign exchange forward sales contracts as of December 31, 2017 are as follows:

Exposure	Notional amount	Contract rate	Fair value assets	Fair value liabilities
Cash Flow Hedges				
Euro (versus USD)	€22.5 million	0.850	—	(702)
USD (versus Euro)	$51 million	1.111	3,508	—
Fair Value Hedges				
Euro (versus USD)	€1.0 million	0.833	—	(10)

The open foreign exchange forward purchase contracts as of December 31, 2018 are as follows:

Exposure	Notional amount	Contract rate	Fair value assets	Fair value liabilities
Cash Flow Hedges				
USD (versus Euro)	$22.9 million	1.149	137	(40)
GBP (versus USD)	£21.7 million	1.350	13	(1,389)
BRL (versus USD)	R$404.4 million	3.791	1,869	(7,776)
CNY (versus USD)	¥7.6 million	0.127	—	(3)

The open foreign exchange forward purchase contracts as of December 31, 2017 are as follows:

Exposure	Notional amount	Contract rate	Fair value assets	Fair value liabilities
Cash Flow Hedges				
USD (versus Euro)	$18.7 million	1.181	12	(309)
GBP (versus USD)	£19.3 million	1.326	655	(29)
BRL (versus USD)	R$138.1 million	3.515	1,974	(359)

The amounts from the foreign currency cash flow hedges included in equity were ($7,373) and $3,326 in the years ended December 31, 2018 and 2017, respectively. The amount included in equity is anticipated to impact the income statement over the next three years. During the years ended December 31, 2018 and 2017, $3,193 and ($3,730), respectively, were transferred from equity to the income statement as increases (decreases) to cost of sales and selling, general, and administrative expenses. There was no expense (2017: $310) recognized in profit or loss during the year ended December 31, 2018 due to ineffectiveness.

30. LEASES

OPERATING LEASES AS LESSEE

The Company has entered into leases for office space, facilities and equipment. The leases generally provide that the Company pays the tax, insurance and maintenance expenses related to the leased assets. These leases have an average life of 5-7 years with renewal terms at the option of the lessee and lease payments based on market prices at the time of renewal. There are no restrictions placed upon the lessee by entering into these leases.

Future minimum lease payments under non-cancellable operating leases as of December 31, are as follows:

	2018	2017
Less than one year	5,825	7,025
Between one and five years	18,298	18,661
More than five years	20,064	22,820
Total	44,187	48,506

During the year ended December 31, 2018, $7,085 (2017: $6,621) was recognized as an expense in the income statement in respect of operating leases.

FINANCE LEASES AS LESSEE

Certain subsidiaries of the Company have finance leases for equipment and software. These non-cancellable leases have remaining terms between one and five years. Future minimum lease payments under finance leases are as follows:

	2018	2017
Less than one year	15	28
Between one and five years	8	30
Total minimum lease payments	23	58
Less amounts representing finance charges	—	—
Present value of minimum lease payments	23	58

31. CAPITAL COMMITMENTS

The Company's capital expenditures include projects to improve the Company's operations and productivity, replacement projects and ongoing environmental requirements (which are in addition to expenditures discussed in note 25). As of December 31, 2018, the Company had committed to capital requirements in the amount of $18,648 (2017: $60,504). These capital commitments relate primarily to projects in Brazil.

32. CONTINGENCIES

GUARANTEES

The following table outlines the Company's off-balance sheet credit-related guarantees and business-related guarantees for the benefit of third parties as of December 31, 2018 and 2017:

	Business-related guarantees	Credit-related guarantees	Letters of credit	Total
2018				
Total amounts committed:	72,740	149	4,529	77,418
Less than 1 year	47,452	149	—	47,601
2–5 years	20,307	—	—	20,307
After 5 years	4,981	—	4,529	9,510
2017				
Total amounts committed:	67,006	134	4,365	71,505
Less than 1 year	46,904	134	—	47,038
2–5 years	6,111	—	—	6,111
After 5 years	13,991	—	4,365	18,356

In the normal course of business, the Company has provided indemnifications in various commercial agreements which may require payment by the Company for breach of contractual terms of the agreement. Counterparties to these agreements provide the Company with comparable indemnifications. The indemnification period generally covers, at maximum, the period of the applicable agreement plus the applicable limitations period under law. The maximum potential amount of future payments that the Company would be required to make under these indemnification agreements is not reasonably quantifiable as certain indemnifications are not subject to limitation. However, the Company enters into indemnification agreements only when an assessment of the business circumstances would indicate that the risk of loss is remote.

The Company has agreed to indemnify its current and former directors and officers to the extent permitted by law against any and all charges, costs, expenses, amounts paid in settlement and damages incurred by the directors and officers as a result of any lawsuit or any other judicial administrative or investigative proceeding in which the directors and officers are sued as a result of their service. These indemnification claims will be subject to any statutory or other legal limitation period. The nature of such indemnification prevents the Company from making a reasonable estimate of the maximum potential amount it could be required to pay to counter parties. The Company has $125,000 in directors' and officers' liability insurance coverage.

ENVIRONMENTAL

In 2006, a US subsidiary of the Company entered into a fixed price remediation contract with an environmental consultant, whereby that consultant became primarily responsible for certain aspects of the environmental remediation. This subsidiary of the Company is still a secondary obligor for this remediation, in the event that the consultant does not perform. The US subsidiary is also still subject to remediate any contamination associated with perchlorate contamination work to resume in 2019.

The Company has other contingent liabilities related to certain environmental regulations at certain locations. Environmental regulations in France require monitoring of wastewater and potential clean up to be performed at one of the French subsidiary's plant sites in Chauny. Although the extent of these issues is not yet known, there is a possibility that the Company could incur remediation costs. At a US subsidiary, a provision has been recorded for the low-level radioactive slag pile (see note 25) which we expect will be removed within the next five years. In 2016, the Company reached an agreement on a removal plan with the NJDEP for this removal. The estimated accrual for $28,250 represents the discounted amount of anticipated remediation costs, and has been approved by the NJDEP.

As discussed in note 25, a German subsidiary of the Company has a sewer system liability, which is in the process of being resolved via a sewer replacement project. Based on the liability associated with the sewer, it is also believed that there may be a groundwater contamination issue. This German subsidiary has performed remediation feasibility trials but has not received a demand from the government with respect to any potential wider groundwater treatment and it has recorded no provision for this, but it is possible that some remediation will eventually be required. The Company believes that the maximum exposure related to this contamination is $10,000.

TAXATION

There are two outstanding sales tax cases with a subsidiary in Brazil whereby the authorities allege that $8,063, inclusive of new period taxes, monetary updates and certain administrative requirements is due as of year-end 2018. The Company has not accrued any amount as of December 31, 2018, as the probability to pay these amounts is remote.

The $3,143 of ICMS credits reported in 2017 was paid in May 2018. The company has vacated the ICMS lawsuit between AMG and the State Government tax authority and settled the amount due by enrolling in a Tax Debit Program. In exchange for enrolling in the Program the company received a tax exemption of ICMS credits for its expansion projects in Brazil.

LITIGATION

One of the Company's subsidiaries in Germany entered into a joint venture in 1999 for the purpose of extracting vanadium from the residues of oil refineries in Italy. During the first half of 2018, an appeals court in Sicily ruled in favor of AMG in the court case claimed by Aita. In the meantime, Aita has filed an appeal to Italy's Supreme Court. Our counsel has advised that, for various legal reasons, it appears most likely that Aita´s appeal will be dismissed as being without merits, i.e. that the Supreme Court will confirm the decision of the appeals court favorable for AMG.

On January 14, 2014, the German subsidiary received an Italian court ruling in the matter to pay the amount of $770 as a preliminary execution of the first instance judgment. Upon the objection filed by the German subsidiary such execution was set aside. Based on the confirmation of legal counsel, the requested commission fee would only have been payable if public funding for the project would have been obtained and the plant for the project would have been built. As neither condition was met, the subsidiary would have no legal or contractual obligation to pay the commission fee. Following the appellate court hearing on October 27, 2017, a judgment was issued on May 31, 2018, rejecting the former partner's claims for a commission fee.

Since, for reasons outside of the responsibility of the German subsidiary, the project has never been started and therefore has not been realized by the subsidiary, they would have no legal or contractual obligation to compensate for unrealized estimated earnings. Therefore, the first instance judgment in favor of the subsidiary is correct and, following the appellate court hearing on October 27, 2017, a judgment was issued on May 31, 2018, rejecting the former partner's claims for unrealized estimated earnings.

In August, the former joint venture partner filed an appeal of the above-identified judgments with the Italian Supreme Court. Our legal counsel has confirmed the likelihood of more than 50% that the appellate court's judgments will be upheld by the Italian Supreme Court. Therefore, the Company has not recognized a provision related to these claims as of December 31, 2018.

On March 28, 2017, AMG Vanadium LLC filed a complaint for breach of contract against Global Advanced Metals U.S.A., Inc. ("GAM") in the Complex Commercial Division of the Delaware Superior Court, alleging that GAM breached a multi-year contract by which GAM agreed to purchase from AMG Vanadium 100% of the tantalum concentrate output produced from a mine in Brazil operated by AMG Mineração S.A. ("AMG Mineração"), an affiliate of AMG Vanadium (the "Supply Agreement").

GAM has filed an answer and four counterclaims (the "Counterclaims") against AMG Vanadium, the Company and AMG Mineração (collectively "AMG"). The first counterclaim seeks a declaratory judgment that AMG breached the Supply Agreement by failing to provide adequate assurances of future performance following a fire at one of the tantalum processing plants operated by AMG Mineração. The second counterclaim alleges that GAM is owed unspecified damages as a result of AMG's purported failure to provide adequate assurances of future performance and repudiation of the Supply Agreement. The third counterclaim alleges that GAM is owed a portion ($14,847) of the consideration it provided to AMG in connection with the Third Amendment to the Supply Agreement, and that AMG has been unjustly enriched by retaining the same portion of the cash and equity transfers. The fourth counterclaim alleges that AMG overcharged GAM for tantalum concentrate sold under the Supply Agreement, and that GAM is entitled to recover such amounts ($1,399).

AMG Vanadium, the Company, and AMG Mineracao intend to vigorously pursue its claims and defend against GAM's counterclaims and believe that it is not likely that GAM will prevail in its counterclaims. The Company has not recognized a provision related to GAM's counterclaims as of December 31, 2018.

OTHER

One of the Company's subsidiaries closed a pension plan in 2005, prior to becoming part of AMG. The Company has been made aware that there are potential flaws in the paperwork which substantiates the closure, which could make this closure invalid. If a claim was made on this basis, the potential liability could approximate $10,000. Due to the length of time since the closure, the Company does not believe that any claim is likely, and no provision has been made for this contingency.

The Company has an interest in the Somikivu mine in the Democratic Republic of the Congo which has not been operated by the Company since the 1990s as a result of political instability in the country. The former mining license has expired effective April 30, 2017 and the company is dormant.

33. RELATED PARTIES

TRANSACTIONS WITH KEY MANAGEMENT PERSONNEL

Key management personnel compensation

The Company considers the members of the Management Board and the Supervisory Board to be the key management personnel as defined in IAS 24 Related parties. For remuneration details of the Management Board and the Supervisory Board see below.

The compensation of the Management Board of the Company comprised:

For the year ended December 31, 2018	Salaries and bonus	Share-based compensation	Post-employment benefits including contributions to defined contribution plans	Other remuneration [a]	Total
Heinz Schimmelbusch	3,711	2,716	292	71	6,790
Eric Jackson	1,891	799	160	34	2,884
Jackson Dunckel[b]	1,891	850	291	51	3,083
Total	7,493	4,365	743	156	12,757

[a] Other remuneration includes car expenses and additional insurance paid for by the Company.
[b] Share-based compensation includes $67 of expense related to a share-based signing bonus.

For the year ended December 31, 2017	Salaries and bonus	Share-based compensation	Post-employment benefits including contributions to defined contribution plans	Other remuneration [a]	Total
Heinz Schimmelbusch	3,490	4,182	318	145	8,135
Eric Jackson	1,793	1,231	185	48	3,257
Jackson Dunckel[b]	1,793	675	242	49	2,759
Total	7,076	6,088	745	242	14,151

[a] Other remuneration includes car expenses, country club dues and additional insurance paid for by the Company.
[b] Share-based compensation includes $127 of expense related to a share-based signing bonus.

Each member of the management board has an employment contract with the Company which provides for severance in the event of termination without cause. The maximum severance payout is limited to two years base salary and two years of target annual bonus.

The compensation of the Supervisory Board of the Company comprised:

For the year ended December 31, 2018	Cash remuneration	Share-based remuneration	Total compensation
Jack L. Messman	107	60	167
Norbert Quinkert[1]	38	22	60
Guy de Selliers[1]	20	15	35
Steve Hanke	80	41	121
Herb Depp	73	43	116
Donatella Ceccarelli	60	46	106
Robert Meuter[1] [4]	20	15	35
Suzanne Folsom[2]	60	27	87
Willem Van Hassel	68	50	118
Total	526	319	845

For the year ended December 31, 2017	Cash remuneration	Share-based remuneration	Total compensation
Jack L. Messman	90	45	135
Norbert Quinkert	115	63	178
Guy de Selliers	80	43	123
Martin Hoyos[3]	28	—	28
Steve Hanke	60	41	101
Herb Depp	60	44	104
Donatella Ceccarelli	60	44	104
Robert Meuter	60	44	104
Suzanne Folsom	40	29	69
Willem Van Hassel	40	29	69
Petteri Soininen[3]	—	—	—
Total	633	382	1,015

[1] Norbert Quinkert, Guy de Selliers and Robert Meuter stepped down from the Supervisory Board effective May 7, 2018.
[2] Suzanne Folsom stepped down from the Supervisory Board effective August 2, 2018.
[3] Martin Hoyos and Petteri Soininen stepped down from the Supervisory Board effective May 4, 2017.
[4] Robert Meuter received $111 during 2018 related to a consulting agreement with the Company.

Total Management Board and Supervisory Board Compensation for the year ended:	Cash remuneration	Share-based compensation	Post-employment benefits including contributions to defined contribution plans	Other remuneration (a)	Total
December 31, 2018	8,019	4,684	743	156	13,602
December 31, 2017	7,709	6,470	745	242	15,166

ENTITIES WITH SIGNIFICANT INFLUENCE OVER THE COMPANY

Foundation

In July 2010, the foundation "Stichting Continuiteit AMG" ("Foundation") was established following the resolution adopted at its Annual Meeting on May 12, 2010. The board of the Foundation consists of three members, all of whom are independent of AMG. The purpose of the Foundation is to safeguard the interests of the parent company, the enterprise connected therewith and all the parties having an interest therein and to exclude as much as possible influences which could threaten, amongst other things, the continuity, independence and identity of the parent company contrary to such interests.

By agreement on December 22, 2010, between the parent company and the Foundation, the Foundation has been granted a call option pursuant to which it may purchase a number of preference shares up to a maximum of the number of ordinary shares issued and outstanding with third parties at the time of exercise of the option. The agreement cannot be terminated by the Company as long as the Company has not cancelled, or repurchased preferences shares acquired by the Foundation.

The Company entered into a cost compensation agreement with the Foundation dated December 22, 2010. As per the agreement, the Company is required to provide funds to the Foundation for the costs incurred in connection with the fulfilment of the objectives of the Foundation. These costs include costs for establishing the Foundation, remuneration and out of pocket expenses for the members of the board of the Foundation, commitment fees, advisory fees and certain other costs. During the year ended December 31, 2018, the amounts paid by the Company to or on behalf of the Foundation were $57 (2017: $109).

34. SUBSEQUENT EVENTS

Effective January 1, 2019, the Company will change its organizational structure. This change will result in two new strategic operating divisions, AMG Technologies and AMG Critical Materials. AMG's new operating division, AMG Technologies, will be comprised of AMG's existing Engineering and Titanium Alloys businesses and will be a reportable segment replacing AMG Engineering. AMG Critical Materials will consist of seven operating units, namely Vanadium, Superalloys, Tantalum & Lithium, Graphite, Silicon, Aluminum and Antimony.

AMG ADVANCED METALLURGICAL GROUP, N.V. — PARENT COMPANY STATEMENT OF FINANCIAL POSITION
(AFTER PROFIT APPROPRIATION)

For the year ended December 31	Note	2018	2017
In thousands of US dollars			
Fixed assets			
Intangible assets	6	163	142
Tangible fixed assets	5	240	273
Financial fixed assets			
Investments in subsidiaries	7	321,063	268,613
Loans due from subsidiaries	7	176,678	3,000
Deposits and other assets	8	1,231	1,823
Derivative financial instruments	16	6,156	44
Financial fixed assets		505,128	273,480
Total fixed assets		505,531	273,895
Related party receivables	9	7,311	6,770
Loans due from subsidiaries	7	1,000	97,895
Prepayments and other assets	10	279	2,047
Cash and cash equivalents	11	56,261	8,896
Total current assets		64,851	115,608
Total assets		570,382	389,503
Equity			
Issued capital	12	812	796
Share premium	12	462,891	432,844
Foreign currency translation reserve	12	(28,058)	(21,387)
Unrealized losses reserve	12	(8,235)	3,929
Capitalized development expenditures reserve	12	1,560	3,128
Defined benefit obligation reserve	12	(61,106)	(59,938)
Fair value reserve	12	(7,125)	1,388
Cost of hedging reserve	12	(1,310)	—
Treasury shares	12	(347)	(3,461)
Retained earnings (deficit)	12	(39,158)	(99,343)
Total equity attributable to shareholders of the Company		319,924	257,956
Long-term liabilities			
Long-term debt	13	240,272	89,284
Loans due to subsidiaries	13	—	16,330
Derivative financial instruments	16	801	—
Long-term liabilities		241,073	105,614
Short-term liabilities			
Current portion long-term debt	13	2,100	5,000
Amounts due to subsidiaries	15	311	13,749
Other payables	14	6,974	7,173
Derivative financial instruments	16	—	11
Short-term liabilities		9,385	25,933
Total liabilities		250,458	131,547
Total equity and liabilities		570,382	389,503

The notes are an integral part of these financial statements.

AMG ADVANCED METALLURGICAL GROUP, N.V. — PARENT COMPANY INCOME STATEMENT

For the year ended December 31	Note	2018	2017
In thousands of US dollars			
General and administrative expenses		29,619	29,239
Other income	2	(13,148)	(19,810)
Net other operating income		(13,148)	(19,810)
Operating loss		(16,471)	(9,429)
Finance income	3	(8,680)	(5,871)
Finance cost	3	16,276	5,632
Net finance cost		7,596	(239)
Loss before income tax		(24,067)	(9,190)
Income tax expense	4	—	—
Loss after tax		(24,067)	(9,190)
Income from subsidiaries		118,683	66,155
Net income		94,616	56,965

The notes are an integral part of these financial statements.

1. SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES

For details of the Company and its principal activities, reference is made to the consolidated financial statements.

The parent company financial statements have been prepared in accordance with Part 9 of Book 2 of the Netherlands Civil Code, as generally accepted in the Netherlands. In accordance with the provisions of article 362.8 of Book 2 of the Netherlands Civil Code, the accounting policies used in the financial statements are the same as the accounting policies used in the notes to the consolidated financial statements, prepared under IFRS as endorsed by the European Union. Investments in subsidiaries are valued at their net equity value including allocated goodwill.

For a listing of all material operating entities in which the Company has an ownership interest, please refer to note 1 in the consolidated financial statements. The Company has filed a complete list of entities in which AMG has an ownership interest, with the Dutch Chamber of Commerce.

PARTICIPATING INTERESTS IN GROUP COMPANIES

Group companies are all entities in which the Company has direct or indirect control. The Company controls an entity when it is exposed, or has rights, to variable returns from its involvement with the group company and has the ability to affect those returns through its power over the group company. Group companies are recognized from the date on which control is obtained by the Company and derecognized from the date that control by the Company over the group company ceases. Participating interests in group companies are accounted for in the separate financial statements according to the equity method, with the principles for the recognition and measurement of assets and liabilities and determination of results as set out in the notes to the consolidated financial statements.

Participating interests with a negative net asset value are valued at nil. This measurement also covers any receivables provided to the participating interests that are, in substance, an extension of the net investment. In particular, this relates to loans for which settlement is neither planned nor likely to occur in the foreseeable future. A share in the profits of the participating interest in subsequent years will only be recognized if and to the extent that the cumulative unrecognized share of loss has been absorbed. If the Company fully or partially guarantees the debts of the relevant participating interest, or if it has the constructive obligation to enable the participating interest to pay its debts (for its share therein), then a provision is recognized accordingly to the amount of the estimated payments by the Company on behalf of the participating interest.

SHARE OF RESULT OF PARTICIPATING INTERESTS

The share in the result of participating interests consists of the share of the Company in the result of these participating interests. Results on transactions involving the transfer of assets and liabilities between the Company and its participating interests and mutually between participating interests themselves, are eliminated to the extent that they can be considered as not realized.

The Company makes use of the option to eliminate intragroup expected credit losses against the book value of loans and receivables from the Company to participating interests, instead of elimination against the equity value / net asset value of the participating interests.

As of December 31, 2018, non-monetary assets and liabilities have been converted to USD using a conversion rate of EUR:USD of 1.1444 (2017: 1.1979).

2. OTHER INCOME AND EXPENSES

Other income during the year ended December 31, 2018, includes income from management fees charged to subsidiaries of $13,148 (2017: $19,810). The services provided for these fees include general management services and other professional services.

3. FINANCE INCOME AND COST

Finance income during the year ended December 31, 2018, includes interest income from loans to subsidiaries of $8,618 (2017: $5,420) and other items of $62 (2017: $451). See note 7 for additional details. Finance cost during the year ended December 31, 2018, includes interest expense on loans due to subsidiaries of $64 (2017: $597), interest expense on external debt of $15,728 (2017: $5,035) and other items of $484 (2017: nil). See note 8 in the consolidated financial statements for additional details.

4. INCOME TAXES

AMG Advanced Metallurgical Group N.V. is head of the fiscal unity that exists for Dutch corporate income tax purposes. In the income statement in 2018 and 2017, the Company reported an income tax expense of nil. The taxable loss is reduced by non-deductible expenses of $8,017 and $6,316 in 2018 and 2017, respectively, and is primarily related to share-based compensation expenses.

During the years ended December 31, 2018 and 2017, the income tax benefits related to the current year losses of the fiscal unity were not recognized. In total, $3,947 and $2,467 were not recognized in 2018 and 2017, respectively, as it is not probable that these amounts will be realized.

Deferred tax assets are recognized to the extent it is probable that the temporary differences, unused tax losses and unused tax credits will be realized. The realization of deferred tax assets is reviewed each reporting period and includes the consideration of historical operating results, projected future taxable income and potential tax planning strategies. At December 31, 2018, net operating loss and tax credit carry forwards for which no deferred tax assets have been recognized in the balance sheet amount to $99,288 (2017: $83,752).

5. TANGIBLE FIXED ASSETS

Tangible fixed assets of $240 (2017: $273) consists primarily of leasehold improvements and office furniture and fixtures. These are carried at cost less accumulated depreciation and are depreciated over their anticipated useful life. The depreciation during the year ended December 31, 2018, was $91 (2017: $67). All tangible fixed assets are pledged as collateral under the AMG Credit Facility. Refer to note 10 of the consolidated financial statements for additional information.

6. INTANGIBLE ASSETS

Intangible assets of $163 (2017: $142) includes computer and software licenses. They are carried at cost less accumulated amortization and are amortized over their anticipated useful life. The amortization during the year ended December 31, 2018 was $56 (2017: $16).

7. FINANCIAL FIXED ASSETS

INVESTMENTS IN SUBSIDIARIES

The movement in subsidiaries was as follows:

	Investment in subsidiaries
Balance at January 1, 2017	135,070
Investment in companies	71,459
Profit for the period	66,155
Change in non-controlling interest	(1,350)
Changes in hedges and fair value hedges	6,510
Gain (loss) on available for sale investments	1,141
Actuarial gains (losses)	3,776
Effect of movements in exchange rates	11,998
Equity settled share-based payments	(2,451)
Movement of negative participation to loans	(23,695)
Balance at December 31, 2017	268,613
Adjustment on initial application of IFRS 15 (net of tax)	(771)
Adjusted balance at January 1, 2018	267,842
Investment in companies	578
Profit for the period	118,683
Change in non-controlling interest	(569)
Changes in hedges and fair value hedges	(11,741)
(Loss) gain on FVOCI investments	(8,513)
Actuarial (losses) gains	(1,168)
Effect of movements in exchange rates	(6,671)
Non-cash dividend declared	(26,500)
Equity settled share-based payments	(7,804)
Movement of negative participation to loans	(3,074)
Balance at December 31, 2018	321,063

CHANGES IN HEDGES AND FAIR VALUE HEDGES

This represents the effect of the Company's subsidiaries recording the changes in their equity from the effective portion of the cumulative net change in the fair value of cash flow hedging instruments related to hedged transactions that have not yet occurred.

EQUITY SETTLED SHARE-BASED PAYMENTS

Subsidiaries are locally recording the effect of share-based payments for their employees in their equity. The equity balance of the subsidiaries is comprised of the value of equity-settled share-based payments provided to employees (and outside consultants), including key management personnel, as part of their remuneration. The change in the Company's investment in subsidiary balance is equal to the change recognized in retained earnings at the subsidiaries.

LOANS DUE FROM SUBSIDIARIES

	Non-current loans due from subsidiaries	Current loans due from subsidiaries	Total
Balance at January 1, 2017	5,500	69,200	74,700
Loans	—	5,000	5,000
Repayments	(1,000)	—	(1,000)
Reclassification to investment in subsidiaries	(1,500)	—	(1,500)
Movement of negative participation	—	23,695	23,695
Currency translation adjustment	—	—	—
Balance at December 31, 2017	3,000	97,895	100,895
Balance at January 1, 2018	3,000	97,895	100,895
Loans	95,008	—	95,008
Repayments	(17,330)	—	(17,330)
Loan reclassification	99,969	(99,969)	—
Accrual of interest	(561)	—	(561)
Movement of negative participation	—	3,074	3,074
Currency translation adjustment	(3,408)	—	(3,408)
Balance at December 31, 2018	176,678	1,000	177,678

There were three non-current loans due from subsidiaries of the Company as of December 31, 2018. Two of the non-current loans were due from two subsidiaries in Brazil, totalling $42,000 and one loan classified as current loan in 2018 by the amount of $1,000 (2017: $3,000). The third non-current loan is due from a subsidiary in Germany, with a loan amount of $38,709 (2017: nil). There was a current loan due in the United States with a loan amount of $95,969 (2017: $97,895), which was extended in 2018 for a period greater than one year and reclassified as non-current as of December 31, 2018. All loans had an interest rate range of 4.5% - 6.0% at December 31, 2018 (4.5% - 5.45% at December 31, 2017).

LOANS DUE TO SUBSIDIARIES

The non-current loan due to a German subsidiary, which is a holding company for several German companies within the group, had an interest rate of 4.65% in 2017. During the year ended December 31, 2018 the Company paid this loan in full to the subsidiary.

8. DEPOSITS AND OTHER ASSETS

The deposit and other assets account include debt issuance costs related to the undrawn amounts on the revolving credit facility and security deposits for the Amsterdam and Frankfurt office locations of the Company. See note 13 for additional information.

9. RELATED PARTY RECEIVABLES

Related party receivables of $7,311 (2017: $6,770) primarily represents interest owed to the Company on loans due from subsidiaries $1,399 (2017: $104), management fees owed of $3,539 (2017: $3,795) and amounts owed by subsidiaries that represent expenses paid for by AMG and billed back to the subsidiaries of $2,374 (2017: $2,871).

10. PREPAYMENTS AND OTHER ASSETS

At December 31, 2018 and 2017, prepayments primarily represent prepaid insurance for the Company. At December 31, 2018, the Company had a Dutch tax receivable of nil (2017: $687) and other receivables of $76 (2017: $86).

11. CASH AND CASH EQUIVALENTS

Bank balances earn interest at floating rates based on daily bank deposit rates.

12. SHAREHOLDERS' EQUITY AND OTHER CAPITAL RESERVES

	Equity attributable to shareholders of the parent					
	Issued capital	Share premium	Treasury shares	Other reserves	Retained deficit	Total
Balance at January 1, 2017	760	389,066	(570)	(97,085)	(116,457)	175,714
Foreign currency translation	—	—	—	6,708	1,535	8,243
Change in fair value of available for sale investments	—	—	—	1,141	—	1,141
Gain on cash flow hedges, net of tax	—	—	—	6,510	—	6,510
Actuarial gains, net of tax	—	—	—	9,066	—	9,066
Net profit recognized through other comprehensive income	—	—	—	23,425	1,535	24,960
Profit for the year	—	—	—	—	56,965	56,965
Total comprehensive income for the year	—	—	—	23,425	58,500	81,925
Issuance of common shares	36	43,778	—	—	—	43,814
Purchase of common shares	—	—	(12,190)	—	—	(12,190)
Re-issuance of treasury shares	—	—	—	—	1,830	1,830
Transfer to retained deficit	—	—	—	780	(780)	—
Change in non-controlling interests	—	—	—	—	(1,350)	(1,350)
Equity-settled share-based payments, net of tax	—	—	9,299	—	(31,793)	(22,494)
Dividend	—	—	—	—	(9,293)	(9,293)
Balance at December 31, 2017	796	432,844	(3,461)	(72,880)	(99,343)	257,956
Adjustment on initial application of IFRS 15 (net of tax)	—	—	—	—	(771)	(771)
Adjusted balance at January 1, 2018	796	432,844	(3,461)	(72,880)	(100,114)	257,185
Foreign currency translation	—	—	—	(4,826)	—	(4,826)
Change in fair value of equity investments classified as fair value through other comprehensive income	—	—	—	(8,513)	—	(8,513)
Loss on cash flow hedges, net of tax	—	—	—	(13,474)	—	(13,474)
Actuarial losses, net of tax	—	—	—	(3,013)	—	(3,013)
Net loss recognized through other comprehensive income	—	—	—	(29,826)	—	(29,826)
Profit for the year	—	—	—	—	94,616	94,616
Total comprehensive income for the year	—	—	—	(29,826)	94,616	64,790
Issuance of common shares	16	30,047	—	—	—	30,063
Purchase of common shares	—	—	(12,388)	—	—	(12,388)
Re-issuance of treasury shares	—	—	12,268	—	—	12,268
Equity-settled share-based payments, net of tax	—	—	3,234	—	(22,567)	(19,333)
Transfer to retained deficit	—	—	—	(1,568)	1,568	—
Change in non-controlling interests	—	—	—	—	(569)	(569)
Dividend	—	—	—	—	(12,092)	(12,092)
Balance at December 31, 2018	812	462,891	(347)	(104,274)	(39,158)	319,924

OTHER RESERVES

	Legal reserves						
	Foreign currency translation reserve	Unrealized losses reserve	Cost of hedging reserve	Capitalized development expenditures reserve	Fair value reserve	Defined benefit obligation reserve	Total
Balance at January 1, 2017	(33,385)	(2,581)	—	2,348	247	(63,714)	(97,085)
Currency translation differences	11,998	—	—	—	—	(5,290)	6,708
Gain on available for sale investment	—	—	—	—	1,141	—	1,141
Movement on cash flow hedges	—	8,534	—	—	—	—	8,534
Tax effect on net movement on cash flow hedges	—	(2,024)	—	—	—	—	(2,024)
Actuarial gains on defined benefit plans	—	—	—	—	—	6,098	6,098
Tax effect on net movement on defined benefit plans	—	—	—	—	—	2,968	2,968
Transfer from retained deficit	—	—	—	780	—	—	780
Balance at December 31, 2017	(21,387)	3,929	—	3,128	1,388	(59,938)	(72,880)
Balance at January 1, 2018	(21,387)	3,929	—	3,128	1,388	(59,938)	(72,880)
Currency translation differences	(6,671)	—	—	—	—	1,845	(4,826)
Loss on FVOCI investment	—	—	—	—	(8,513)	—	(8,513)
Movement on cash flow hedges	—	(15,403)	(1,659)	—	—	—	(17,062)
Tax effect on net movement on cash flow hedges	—	3,239	349	—	—	—	3,588
Actuarial losses on defined benefit plans	—	—	—	—	—	(3,446)	(3,446)
Tax effect on net movement on defined benefit plans	—	—	—	—	—	433	433
Transfer to retained deficit	—	—	—	(1,568)	—	—	(1,568)
Balance at December 31, 2018	(28,058)	(8,235)	(1,310)	1,560	(7,125)	(61,106)	(104,274)

EQUITY SETTLED SHARE-BASED PAYMENTS

The value of equity-settled share-based payments provided to employees, including key management personnel, as part of their remuneration is recognized in equity. The amount reserved for share-based payments is recorded within retained earnings.

LEGAL RESERVES

AMG is a company incorporated under Dutch law. In accordance with the Dutch Civil Code, legal reserves have to be established in certain circumstances. The legal reserves consisted of the cumulative translation adjustment reserve, the unrealized losses on derivatives reserve, the legal participation reserve, the investment reserve and the capitalized development expenditures reserve. Legal reserves are non-distributable to the Company's shareholders.

DEFINED BENEFIT OBLIGATION RESERVE

The obligation reserve for defined benefit plans for the year ended December 31, 2018, decreased other reserves ($1,168) while the obligation reserve for defined benefit plans for the year ended December 31, 2017, increased other reserves $3,776.

DIVIDENDS

Dividends of $12,092 have been declared and paid during the year ended December 31, 2018. Dividends of $9,293 have been declared and paid during the year ended December 31, 2017.

APPROPRIATION OF NET PROFIT

Pursuant to section 26 of the Articles of Association, the Management Board shall, subject to the approval of the Supervisory Board, be authorized to reserve the profits in whole or in part. The General Meeting is authorized to distribute and/or reserve any remaining part of the profits.

Effective August 2, 2018, AMG's Supervisory Board has approved a change in dividend policy which targets an annual dividend payout of between 20-40% of net income attributable to shareholders. In line with Dutch corporate governance best practices, the change will be discussed during AMG's 2019 Annual General Meeting. AMG intends to declare a dividend of €0.50 per ordinary share over the financial year 2018. The interim dividend of €0.20, paid on August 14, 2018, will be deducted from the amount to be distributed to shareholders. The proposed final dividend per ordinary share therefore amounts to €0.30.

Preference shares

In July 2010, the foundation "Stichting Continuiteit AMG" ("Foundation") was established following the resolution adopted at its Annual Meeting on May 12, 2010. The board of the Foundation consists of three members, all of whom are independent of AMG. The purpose of the Foundation is to safeguard the interests of the parent company, the enterprise connected therewith and all the parties having an interest therein and to exclude as much as possible influences which could threaten, amongst other things, the continuity, independence and identity of the parent company contrary to such interests.

By agreement on December 22, 2010, between the parent company and the Foundation, the Foundation has been granted a call option pursuant to which it may purchase a number of preference shares up to a maximum of the number of ordinary shares issued and outstanding with third parties at the time of exercise of the option. The agreement cannot be terminated by the Company as long as the Company has not cancelled, or repurchased preferences shares acquired by the Foundation.

13. LONG-TERM DEBT

As of February 1, 2018, the Company, Metallurg, Inc. and AMG Invest GmbH entered into a new $350,000, seven-year senior secured term loan B facility and a $200,000 five-year senior secured revolving credit facility. Proceeds from the facility were used to repay AMG's previous credit facility. In addition, AMG Engineering entered into €85,000 of bilateral letter of credit facilities which replaced its letter of credit facilities under the previous syndicated credit facility. As of December 31, 2018, the total balance on the term loans was $242,372 (2017: $94,284).

AMG Advanced Metallurgical Group N.V. is a borrower under the revolving facility. Refer to note 21 in the consolidated financial statements for additional information relating to the long-term debt.

As of December 31, 2018, there was an asset of $1,147 (2017: $1,738) related to debt issuance costs incurred on the undrawn portion of the revolving credit facility. This is included deposits and other assets on the statement of financial position. See note 8 for additional details.

The Company borrowed $250,000 of the $350,000 senior secured term loan B facility. To mitigate interest rate risk, the Company entered into interest rate caps totaling $150,000 and interest rate swaps totaling $100,000. See note 29 in the consolidated financial statements for additional information on the interest rate swaps and interest rate caps.

LOANS DUE TO SUBSIDIARIES

	Non-current loans due to subsidiaries	Current loans due to subsidiaries	Total
Balance at January 1, 2017	6,655	—	6,655
Loans	9,711	—	9,711
Repayments	—	—	—
Accrual of interest	—	—	—
Currency translation adjustment	(36)	—	(36)
Balance at December 31, 2017	16,330	—	16,330
Balance at January 1, 2018	16,330	—	16,330
Loans	—	—	—
Repayments	(16,330)	—	(16,330)
Accrual of interest	—	—	—
Currency translation adjustment	—	—	—
Balance at December 31, 2018	—	—	—

The non-current loan due to a German subsidiary, which is a holding company for several German companies within the group, had an interest rate of 4.65% in 2018 (2017: 4.65%). During the year ended December 31, 2018 the Company paid this loan in full to the subsidiary.

14. OTHER PAYABLES

Trade and other payables represent amounts owed to professional service firms, accrued employee costs and accrued interest. There was $184 payable to Dutch tax authorities for wage taxes as of December 31, 2018 (2017: $587).

15. AMOUNTS DUE TO SUBSIDIARIES

Certain payroll, travel and entertainment and other expenses are paid directly by three subsidiaries and billed to the Company at cost. As of December 31, 2018 and 2017, these amounted to $311 and $13,253, respectively. There was interest due to a subsidiary of nil as of December 31, 2018 (2017: $496).

16. DERIVATIVE FINANCIAL INSTRUMENTS

Please refer to notes 28 and 29 in the consolidated financial statements for more information on financial instruments and risk management policies.

INTEREST RATE HEDGES

In February of 2018, the Company entered into derivative contracts with two financial institutions in connection with the execution of its new credit facility. The contracts include interest rate caps, interest rate swaps, and a cross currency interest rate swap. The interest rate caps related to the prior credit facility were unwound and replaced by these contracts. The interest rate cap and swaps were executed so that the Company could hedge its exposure to changes in the benchmark interest rate on the term loan B facility as well as fluctuations in the exchange rate between the euro and the US dollar. The Company has designated the interest rate swaps and the cross currency interest rate swap as effective cash flow hedges. The amount from interest rate hedges included in equity was ($1,733) and nil in the years ended December 31, 2018 and 2017, respectively. The amount included in equity is anticipated to impact the income statement through February 2023, which is the term of the contracts. During the year ended December 31, 2018, $7,681 was transferred from equity to the income statement as a decrease to finance costs. There was no ineffectiveness for contracts designated as cash flow hedges during the years ended December 31, 2018 and 2017, respectively. The Company did not designate the interest rate caps for hedge accounting. During the year ended December 31, 2018, $593 of expense related to these instruments was recorded as finance cost in the parent company statement of income. At December 31, 2018 $6,156 related to the cross currency interest rate swap was recorded as a non-current derivative asset, and $801 related to the interest rate caps and swaps was recorded as a non-current derivative liability. At December 31, 2017, there was a current derivative liability of $11.

17. COMMITMENTS AND CONTINGENCIES

The Company has entered into leases for office space in Amsterdam and Frankfurt. The Amsterdam lease term originally had a termination date of March 31, 2013, but it has since been extended through March 2023. The Frankfurt lease term has an unlimited term but can be cancelled with six months' notice beginning December 31, 2012.

Future minimum lease payments under these leases as of December 31 are payable as follows:

	2018	2017
Less than one year	647	659
Between one and five years	1,594	1,888
More than five years	—	—
Total	2,241	2,547

18. RELATED PARTIES

Key management compensation data is disclosed in note 33 of the consolidated financial statements.

The Company entered into a cost compensation agreement with the Foundation dated December 22, 2010 (see note 12). As per the agreement, the Company is required to provide funds to the Foundation for the costs incurred in connection with the fulfilment of the objectives of the Foundation. These costs include costs for establishing the Foundation, remuneration and out of pocket expenses for the members of the board of the Foundation, commitment fees, advisory fees and certain other costs. During the year ended December 31, 2018, the Company funded $57 (2017: $109).

19. EMPLOYEES

At December 31, 2018, the Company had 27 employees (2017: 26), of which 3 are employed in the Netherlands.

20. AUDIT FEES

KPMG has served as our independent auditor for the year ending December 31, 2018 and 2017. The following table sets out the aggregate fees for professional audit services and other services rendered by KPMG and their member firms and/or affiliates in 2018:

			2018			2017
	KPMG Accountants N.V. USD' 000	KPMG Network USD' 000	Total	KPMG Accountants N.V. USD' 000	KPMG Network USD' 000	Total
Group financial statements	798	868	1,666	667	725	1,392
Audit of statutory financial statements	—	269	269	—	288	288
Other service	—	—	—	17	—	17
Total	798	1,137	1,935	684	1,013	1,697

AMSTERDAM, MARCH 13, 2019

MANAGEMENT BOARD
AMG ADVANCED METALLURGICAL
MARCH 13, 2019

Dr. Heinz Schimmelbusch
Eric Jackson
Jackson Dunckel

AMSTERDAM, MARCH 13, 2019

SUPERVISORY BOARD
AMG ADVANCED METALLURGICAL
MARCH 13, 2019

Jack L. Messman, Chairman
Willem Van Hassel, Vice Chariman
Steve Hanke
Herb Depp
Donatella Ceccarelli
Frank Loehner

OTHER INFORMATION

Article 25 and 26 of the Articles of Association

25. Adoption of Annual Accounts

25.1 The annual accounts shall be adopted by the general meeting.

25.2 Without prejudice to the provisions of article 23.2, the Company shall ensure that the annual accounts, the annual report and the additional information that should be made generally available together with the annual accounts pursuant to or in accordance with the law, are made generally available from the day of the convocation of the general meeting at which they are to be dealt with.

25.3 The annual accounts cannot be adopted if the general meeting has not been able to take notice of the auditor's report, unless a valid ground for the absence of the auditor's report is given under the other additional information referred to in article 25.2.

26.1 The management board shall, subject to the approval of the supervisory board, be authorized to reserve the profits wholly or partly.

Independent Auditor's Report

To: the General Meeting of Shareholders and the Supervisory Board of AMG Advanced Metallurgical Group N.V.

Report on the audit of the financial statements 2018 included in the annual report

Our opinion

In our opinion:

— the accompanying consolidated financial statements give a true and fair view of the financial position of AMG Advanced Metallurgical Group N.V. as at December 31, 2018 and of its result and its cash flows for the year then ended, in accordance with International Financial Reporting Standards as adopted by the European Union (EU-IFRS) and with Part 9 of Book 2 of the Dutch Civil Code;

— the accompanying company financial statements give a true and fair view of the financial position of AMG Advanced Metallurgical Group N.V. as at December 31, 2018 and of its result for the year then ended in accordance with Part 9 of Book 2 of the Dutch Civil Code.

What we have audited

We have audited the financial statements 2018 of AMG Advanced Metallurgical Group N.V. ("the Company") based in Amsterdam. The financial statements include the consolidated financial statements and the company financial statements.

The consolidated financial statements comprise:

1 the consolidated statement of financial position as at December 31, 2018;

2 the following consolidated statements for the year 2018: the income statement, the statements of comprehensive income, changes in equity and cash flows; and

3 the notes comprising a summary of the significant accounting policies and other explanatory information.

The company financial statements comprise:

1 the parent company statement of financial position as at December 31, 2018;

2 the parent company income statement for the year 2018; and

3 the notes comprising a summary of the accounting policies and other explanatory information.

Basis for our opinion

We conducted our audit in accordance with Dutch law, including the Dutch Standards on Auditing. Our responsibilities under those standards are further described in the 'Our responsibilities for the audit of the financial statements' section of our report.

We are independent of AMG Advanced Metallurgical Group N.V. in accordance with the EU Regulation on specific requirements regarding statutory audits of public-interest entities, the 'Wet toezicht accountantsorganisaties' (Wta, Audit firms supervision act), the 'Verordening inzake de onafhankelijkheid van accountants bij assurance-opdrachten' (ViO, Code of Ethics for Professional Accountants, a regulation with respect to independence) and other relevant independence regulations in the Netherlands. Furthermore, we have complied with the 'Verordening gedrags- en beroepsregels accountants' (VGBA, Dutch Code of Ethics).

We believe the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Audit approach

Summary

Materiality

— Materiality of $5 million

— 3.6% of profit before income tax

Group audit

— 96% coverage of total assets with audit of the complete reporting package and audit of specific items.

— 97% coverage of revenue with audit of the complete reporting package and audit of specific items

— All significant components have been in scope for audit procedures

Key audit matters

— Investments in and valuation of lithium concentrate plant

— Inventory valuation vanadium

— Revenue recognition for sale of goods and projects

Opinion

— Unqualified

KPMG

Materiality

Based on our professional judgement we determined the materiality for the financial statements as a whole at $5 million (2017: $3 million). The materiality is determined with reference to profit before income tax of which it represents 3.6% (2017: 4.2%). We consider profit before income tax, which increased from $71 million to $140 million, as the most appropriate benchmark because the main stakeholders are primarily focused on profit before tax. We have also taken into account misstatements and/or possible misstatements that in our opinion are material for the users of the financial statements for qualitative reasons.

We agreed with the Supervisory Board that unadjusted misstatements in excess of $250 thousand (2017: $125 thousand) which are identified during the audit, would be reported to them, as well as smaller misstatements that in our view must be reported on qualitative grounds.

Scope of the group audit

AMG Advanced Metallurgical Group N.V. is at the head of a group of components. The financial information of this group is included in the financial statements of AMG Advanced Metallurgical Group N.V..

Our group audit mainly focused on significant components that are (i) of individual financial significance to the group, or (ii) that, due to their specific nature or circumstances, are likely to include significant risks of material misstatement of the group financial statements.

We have considered in this respect AMG's business volatility and geographical presence. Our group audit covered AMG's business segments AMG Critical Materials, AMG Engineering, and the corporate entities.

We have selected 11 components where we performed an audit of the complete reporting package (10 components) and audit of specific items (1 component and corporate entities).

We have:

— performed audit procedures at group level in respect of the valuation of goodwill, US and Netherlands tax position, other investments, US environmental provisions, share-based payments and loans and borrowings. In addition, we performed audit of specific items for corporate entities in the Netherlands and the United States of America;

— made use of the work of other KPMG auditors for the audit of components and corporate entities in Germany, France, the United Kingdom, the United States of America, and Brazil. We have sent detailed instructions to all component auditors, covering significant areas including the relevant risks of material misstatement and set out the information required to be reported to the group audit team. For all components in scope of the group audit, we held conference calls and/or physical meetings with the auditors of the components. We visited component locations and we performed reviews of the audit files of the local KPMG auditors in Germany, the United States of America, the United Kingdom, and Brazil. During these meetings and calls, the planning, risk assessment, procedures performed, findings and observations reported to the group auditor were discussed in more detail and any further work deemed necessary by the group audit team was then performed by the component auditor;

— for the remaining components, we performed desktop analytical procedures in order to corroborate our assessment that there are no risks of material misstatements.

By performing the procedures mentioned above at group components, together with additional procedures at group level, we have been able to obtain sufficient and appropriate audit evidence about the group's financial information to provide an opinion about the financial statements.

The audit coverage as stated in the section summary can be further specified as follows:

Total assets

70%	26%
Audit of the complete reporting package	Audit of specific items

Revenue

87%	10%
Audit of the complete reporting package	Audit of specific items

Audit scope in relation to fraud

In accordance with the Dutch Standards on Auditing we are responsible for obtaining reasonable assurance that the financial statements taken as a whole are free from material misstatement, whether caused by fraud or error. In determining the audit procedures we will make use of the evaluation of management in relation to fraud risk management (prevention, detections and response), including ethical standards to create a culture of honesty.

In our process of identifying fraud risks we assessed fraud risk factors, which we discussed with management and the Supervisory Board. Fraud risk factors are events or conditions that indicate an incentive or pressure to commit fraud or provide an opportunity to commit fraud. In our risk assessment we made use of a forensic specialist.

We identified and addressed the following fraud risks that were relevant to our audit:

— fraud risk in relation to the revenue recognition in respect of incorrect cut-off at period end; and

— fraud risk in relation to management override of controls.

Our audit procedures included:

— an evaluation of the design and implementation of internal controls relevant to mitigate these risks; and

— supplementary substantive audit procedures and data-analytics, including detailed testing of journal entries in:

  — revenue accounts; and

  — non-routine transactions

  which included verification of source documentation.

Our audit procedures differ from a specific forensic fraud investigation, which investigation often has a more in-depth character.

For details on our audit procedures and observations regarding revenue recognition in respect of incorrect cut-off at period, we refer to the key audit matter on this topic as included in this auditor's report.

Audit scope in relation to laws and regulations

We identified laws and regulations that could reasonably be expected to have a material effect on the financial statements from our general and sector experience, through discussions with management and those charged with governance, and discussed the company's policies and procedures regarding compliance with laws and regulations. We communicated identified laws and regulations within our audit team and remained alert to any indications of non-compliance throughout the audit. This included communication from the group to component audit teams of relevant laws and regulations identified at group level.

The potential effect of these laws and regulations on the financial statements varies:

— AMG Advanced Metallurgical Group N.V. is subject to laws and regulations that directly affect the financial statements including taxation and financial reporting standards and we assessed the extent of compliance with these laws and regulations as part of our procedures on the related financial statements items; and

— AMG Advanced Metallurgical Group N.V. is subject to other laws and regulations where the consequences of non-compliance could have a material impact on amounts or disclosures in the financial statements, for instance through the imposition of fines or litigation. We identified the following areas of laws and regulations as those most likely to have such an effect: competition legislation, employment legislation, health and safety regulation, contract legislation and environmental regulation. Auditing standards limit the required audit procedures to identify non-compliance with these laws and regulations to inquiry of management and those charged with governance and inspection of board minutes and regulatory and legal correspondence, if any. These are part of our procedures on the related financial statement items.

Our key audit matters

Key audit matters are those matters that, in our professional judgement, were of most significance in our audit of the financial statements. We have communicated the key audit matters to the Supervisory Board. The key audit matters are not a comprehensive reflection of all matters discussed.

These matters were addressed in the context of our audit of the financial statements as a whole and in forming our opinion thereon, and we do not provide a separate opinion on these matters.

Investments in and valuation of lithium concentrate plant

Description

Since 2016 the Company invested $80 million in the expansion of the Mibra mine, including the construction and maintenance of the lithium concentrate plant in Brazil. The Company announced the start-up of the plant in May 2018 and the first shipment of lithium concentrate occurred in September 2018. The ramp-up and commissioning of the lithium concentrate plant is ongoing and the plant is expected to be fully operational in 2019. The additions and the valuation of property, plant and equipment in AMG Mineracao are considered to be significant to our audit and contain a significant risk of error.

Our response

With involvement of our local KPMG auditor our audit approach included obtaining an understanding of the process related to the additions and valuation of property, plant and equipment in AMG Mineracao.

Furthermore we performed detailed audit procedures as follows:

— We have inspected a sample of documents to verify that the additions to the lithium concentrate plant exist, are accurate and are eligible for capitalization;

— We have evaluated and challenged management's assessment for existence of impairment indicators with a focus on the current progress of ramp-up based on technical reports, the contracted sales and external market expectations; and

— We have evaluated the related disclosure (note 10) against the requirements of EU-IFRS.

Our observation

No impairment indicators were identified. Based on our procedures performed we consider that the accounting for property, plant and equipment in AMG Mineracao is satisfactory. We determined that the related disclosure (note 10) meets the requirements of EU-IFRS.

Inventory valuation vanadium

Description

During 2018 the value of inventory increased by $154 million to $317 million. The increase in inventory is caused mainly by higher prices and partly due to higher volumes, in particular in relation to vanadium. The volatility of vanadium prices can result in inventory write-downs if the net realizable value of the inventory is lower than its cost. The valuation of inventory is considered to be significant to our audit due to size of the inventory balance and contains a significant risk of error in combination with decreasing vanadium prices at year-end.

Our response

With involvement of our local KPMG auditors, our procedures for inventory included, amongst others:

— the evaluation of controls set up by management to determine the inventory reserve at AMG Vanadium;

— verification of the existence of inventory by observing inventory counts performed on locations with significant inventory balances and performing test counts;

— verification of the accuracy of inventory recorded by inspection of documents related to raw material purchases;

— verification of the inventory costing methods applied by recalculation. We determined that the inventory is valued at the lower of cost or net realizable value by assessing the net realizable value of inventory based on market data and most recent sales prices available; and

— We have evaluated the related disclosure (note 13 and 28) against the requirements of EU IFRS.

Our observation

At year-end, there was no significant risk of error because the sales prices for vanadium exceeded the cost of inventory. Based on our procedures performed on inventory balances we consider that the accounting for inventory (note 13 and 28) is satisfactory and in accordance with EU-IFRS.

Revenue recognition for sale of goods and projects

Description

Revenue for sales of goods is recognized at the amount of the consideration to which the Company expects to be entitled at the point in time at which it transfers control of the good to the customer. Revenue related to furnace construction contracts is recorded over time based on the progress made towards complete satisfaction of the contract as determined by the management. Revenue is recognized based on an overall engineering design plan and management's estimate of the progress made over time towards complete satisfaction of the project, based on work performed in-house and by sub-suppliers. The determination of the progress made or whether the control of the good transferred to the customer requires additional judgement. Revenue recognition, including cut-off at period-end, is significant to our audit and contains a risk of fraud in respect of cut-off at period-end.

Our response

With involvement of our local KPMG auditors, our procedures for revenue included, amongst others, assessment of the revenue recognition method per revenue category based on IFRS 15, including the transitional impact per January 1, 2018, which has been adopted by the Company in 2018. We evaluated the controls set up by management surrounding the determination of the progress made for furnace contracts and the transfer of control of the goods sold in respect of cut-off. Detailed procedures were performed, including testing on a sample basis underlying evidence of revenue recognized. Both contracts and other documentation (amongst others sales orders, shipping documents, third party confirmations) were assessed to determine accurate revenue recognition in relation to existence of revenue. Sales transactions taking place before and/or after year-end were assessed to ensure that revenue was recognized in the appropriate period.

Our observation

Based on our procedures performed for revenue recognition we consider that the accounting for revenue is satisfactory and in accordance with EU-IFRS including the transitioning guidance for IFRS 15.

Matters not considered key audit matters anymore

In comparison to prior year's audit the following matters are no longer considered key audit matters:

Valuation of investments

The Company's other investments includes one investment of which the fair value is determined using a market approach.

The valuation was significant to our audit due to the change in valuation methodology used as at December 31, 2017 and management's judgements of assumptions therein. The methodology used has been consistently applied and comparable market data is used to support the assumptions which resulted in the conclusion that it is no longer considered a key audit matter.

Valuation of deferred tax assets

The Group has recognized deferred tax assets for deductible temporary differences and unused net operating losses in various countries. Due to the operating results and the resulting taxable income in various countries, and primarily the United States of America, the majority of the previously recognized unused net operating losses have been utilized during the year 2018. The above developments resulted in the conclusion that the valuation of deferred tax assets is no longer considered a key audit matter.

Business interruption

The Group experienced a partial business interruption of its operations in Brazil due to a fire at the mine in the beginning of 2017. During 2018 the settlement with regard to the insurance proceeds has been finalized and no further business interruptions have been experienced. The settlement of the insurance proceeds resulted in the conclusion that the matter is no longer considered a key audit matter.

Report on the other information included in the annual report

In addition to the financial statements and our auditor's report thereon, the annual report contains other information that consists of:

— the Report of the Management Board;

— the other information pursuant to Part 9 of Book 2 of the Dutch Civil Code;

— Risk Management & Internal Controls;

— Statement of Responsibilities;

— Report of the Supervisory Board;

— Sustainable Development;

— Corporate Governance; and

— Financial Review.

Based on the following procedures performed, we conclude that the other information:

— is consistent with the financial statements and does not contain material misstatements; and

— contains the information as required by Part 9 of Book 2 of the Dutch Civil Code.

We have read the other information. Based on our knowledge and understanding obtained through our audit of the financial statements or otherwise, we have considered whether the other information contains material misstatements.

By performing these procedures, we comply with the requirements of Part 9 of Book 2 of the Dutch Civil Code and the Dutch Standard 720. The scope of the procedures performed is substantially less than the scope of those performed in our audit of the financial statements.

The Board of Management is responsible for the preparation of the other information, including the information as required by Part 9 of Book 2 of the Dutch Civil Code.

Report on other legal and regulatory requirements

Engagement

We were engaged by the Annual General Meeting of Shareholders as auditor of AMG Advanced Metallurgical Group N.V. on May 4, 2016, as of the audit for the year 2016 and have operated as statutory auditor ever since that financial year.

No prohibited non-audit services

We have not provided prohibited non-audit services as referred to in Article 5(1) of the EU Regulation on specific requirements regarding statutory audits of public-interest entities.

Description of responsibilities regarding the financial statements

Responsibilities of the Board of Management and the Supervisory Board for the financial statements

The Board of Management is responsible for the preparation and fair presentation of the financial statements in accordance with EU-IFRS and Part 9 of Book 2 of the Dutch Civil Code. Furthermore, the Board of Management is responsible for such internal control as management determines is necessary to enable the preparation of the financial statements that are free from material misstatement, whether due to fraud or error.

As part of the preparation of the financial statements, the Board of Management is responsible for assessing the AMG Advanced Metallurgical Group N.V.'s ability to continue as a going concern. Based on the financial reporting frameworks mentioned, the Board of Management should prepare the financial statements using the going concern basis of accounting unless the Board of Management either intends to liquidate the AMG Advanced Metallurgical Group N.V. or to cease operations, or has no realistic alternative but to do so. the Board of Management should disclose events and circumstances that may cast significant doubt on the company's ability to continue as a going concern in the financial statements.

The Supervisory Board is responsible for overseeing the AMG Advanced Metallurgical Group N.V.'s financial reporting process.

Our responsibilities for the audit of the financial statements

Our objective is to plan and perform the audit engagement in a manner that allows us to obtain sufficient and appropriate audit evidence for our opinion.

Our audit has been performed with a high, but not absolute, level of assurance, which means we may not detect all material errors and fraud during our audit.

Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these financial statements. The materiality affects the nature, timing and extent of our audit procedures and the evaluation of the effect of identified misstatements on our opinion.

A further description of our responsibilities for the audit of the financial statements is included in the appendix of this auditor's report. This description forms part of our auditor's report.

Amstelveen, March 13, 2019
KPMG Accountants N.V.

T. van der Heijden RA

Appendix: Description of our responsibilities for the audit of the financial statements.

We have exercised professional judgement and have maintained professional skepticism throughout the audit, in accordance with Dutch Standards on Auditing, ethical requirements and independence requirements. Our audit included among others:

- identifying and assessing the risks of material misstatement of the financial statements, whether due to fraud or error, designing and performing audit procedures responsive to those risks, and obtaining audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than the risk resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control;
- obtaining an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the AMG Advanced Metallurgical Group N.V.'s internal control;
- evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by The Board of Management;
- concluding on the appropriateness of The Board of Management's use of the going concern basis of accounting, and based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on AMG Advanced Metallurgical Group N.V.'s ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause a company to cease to continue as a going concern;
- evaluating the overall presentation, structure and content of the financial statements, including the disclosures; and
- evaluating whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

Because we are ultimately responsible for the opinion, we are also responsible for directing, supervising and performing the group audit. In this respect we have determined the nature and extent of the audit procedures to be carried out for group components. Decisive were the size and/or the risk profile of the group components or operations. On this basis, we selected group components for which an audit or review had to be carried out on the complete set of financial information or specific items.

We communicate with the Supervisory Board regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant findings in internal control that we identify during our audit. In this respect we also submit an additional report to the Supervisory Board in accordance with Article 11 of the EU Regulation on specific requirements regarding statutory audits of public-interest entities. The information included in this additional report is consistent with our audit opinion in this auditor's report.

We provide the Supervisory Board with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with the Supervisory Board, we determine the key audit matters: those matters that were of most significance in the audit of the financial statements. We describe these matters in our auditor's report unless law or regulation precludes public disclosure about the matter or when, in extremely rare circumstances, not communicating the matter is in the public interest.

SHAREHOLDER INFORMATION

MANAGEMENT BOARD

Dr. Heinz Schimmelbusch

Chairman and Chief Executive Officer

Eric Jackson

Chief Operating Officer

Jackson Dunckel

Chief Financial Officer

SUPERVISORY BOARD

Jack L. Messman

Chairman

Selection & Appointment Committee (Chair)

Willem van Hassel

Vice Chairman

Selection & Appointment Committee

Steve Hanke

Audit & Risk Management Committee (Chair)

Herb D. Depp

Remuneration Committee (Chair)

Donatella Ceccarelli

Remuneration Committee

Frank Löhner

Audit & Risk Management Committee

LISTING AGENT

ABN AMRO

PAYING AGENT

ABN AMRO

EURONEXT: AMG

Trade Register

TRADE REGISTER

AMG Advanced Metallurgical Group N.V. is registered with the trade register in the Netherlands under no. 34261128

COPIES OF THE ANNUAL REPORT

and further information can be obtained from the Investor Relations Department of the Company or by accessing the Company's website:

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WEBSITE

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