WE ARE

EFFICIENT

SUSTAINABLE

INNOVATIVE

INTERNATIONAL

EXPERT

VESUVIUS PLC

Annual Report and Financial Statements 2020

Financial performance

Revenue
£1,458.3m
2019: £1,710.4m
–14.7% on a reported basis
–12.7% on an underlying basis[1]

Headline earnings per share[3]
23.2p
2019: 45.1p
48.6% decrease

Trading profit[2]
£101.4m
2019: £181.4m
–44.1% on a reported basis
–43.3% on an underlying basis[1]

Recommended final dividend
14.3p
per share
2019: no final dividend paid

Return on sales[2]
7.0%
2019: 10.6%
–360 basis points
–370 basis points on an underlying basis[1]

Group full-year dividend
17.4p
per share
2019: 6.2p per share

Profit before tax
£64.5m
2019: £118.6m
45.6% decrease

Year-end net debt[2]
£175.1m
1.2x net debt to EBITDA ratio
2019: £245.8m – 1.1x

Revenue £m

2020	1,458.3
2019	1,710.4
2018	1,798.0

Trading profit[2] £m

2020	101.4
2019	181.4
2018	197.2

Operating profit £m

2020	74.3
2019	127.5
2018	164.5

Headline earnings[2,3] £m

2020	62.7
2019	121.4
2018	133.7

Statutory EPS p

2020	15.3
2019	29.8
2018	51.3

Free cash flow[2] £m

2020	113.5
2019	121.5
2018	102.6

1. Underlying basis is at constant currency and excludes separately reported items and the impact of acquisitions and disposals.
2. For definitions of alternative performance measures, refer to Note 4 of the Group Financial Statements.
3. Headline results refer to continuing operations and exclude separately reported items.

Forward-looking statements

This Annual Report contains certain forward-looking statements with respect to the operations, strategy, performance, financial condition and growth opportunities of the Vesuvius Group. By their nature, these statements involve uncertainty and are based on assumptions and involve risks, uncertainties and other factors that could cause actual results and developments to differ materially from those anticipated.
The forward-looking statements reflect knowledge and information available at the date of preparation of this Annual Report and, other than in accordance with its legal and regulatory obligations, the Company undertakes no obligation to update these forward-looking statements. Nothing in this Annual Report should be construed as a profit forecast.

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Imagery

Some of the photographs in this Report were taken before the COVID-19 pandemic began; other images were taken during the year in countries where COVID-19 control measures had been lifted.

OUR PURPOSE

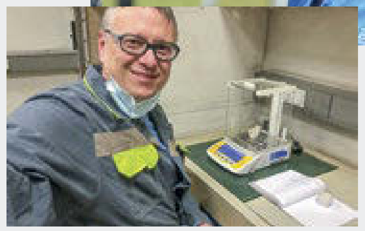
VESUVIUS

A global leader in molten metal flow engineering and technology, serving process industries operating in challenging high-temperature conditions.

We develop innovative solutions that enable our customers to improve their manufacturing costs, quality and safety performance, and help them to become more efficient in their processes.

We aim to deliver sustainable, profitable growth to provide our shareholders with a superior return on their investment, whilst providing each of our employees with a safe workplace where he or she is recognised, developed and properly rewarded.

Find out more about Vesuvius. Visit report2020.vesuvius.com



Vesuvius at a glance
Where we operate
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Business model
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Our strategy
Our aims and execution priorities
See p14

Our external environment
How we are helping to tackle climate change
See p16

Our business

Find out more at
report2020.vesuvius.com

WE ARE

INNOVATIVE

We are **talented people** and specialists working on **new technologies** to keep Vesuvius in pole position.

Jurgen Radstake
R&D Manager, Mould & Core, Foundry Technologies
Enschede, Netherlands

Vesuvius at a glance

Overview

We are a global group with a business model based on offering customised products, solutions and services from production facilities in close proximity to our customers. Our two divisions – Steel and Foundry, mainly serve the global steel and foundry industries.

See our **Business model** on p20

See more about our **Steel** and **Foundry Divisions** on p48-55

Our global presence

41
Countries

10,350
Employees

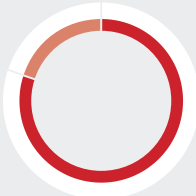
6
Continents

76
Sales offices

53
Production sites

6
R&D centres of excellence

Americas



£437.8m
Revenue
(2019: £530.2m)

80% Steel
20% Foundry

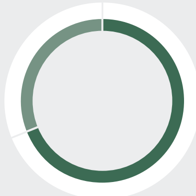
16
Production sites

1
R&D centre of excellence

2,870
Employees

19
Sales offices

EMEA



£578.5m
Revenue
(2019: £699.8m)

69% Steel
31% Foundry

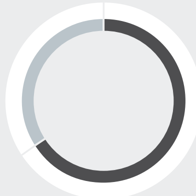
19
Production sites

3
R&D centres of excellence

4,030
Employees

29
Sales offices

Asia-Pacific



£442.0m
Revenue
(2019: £480.4m)

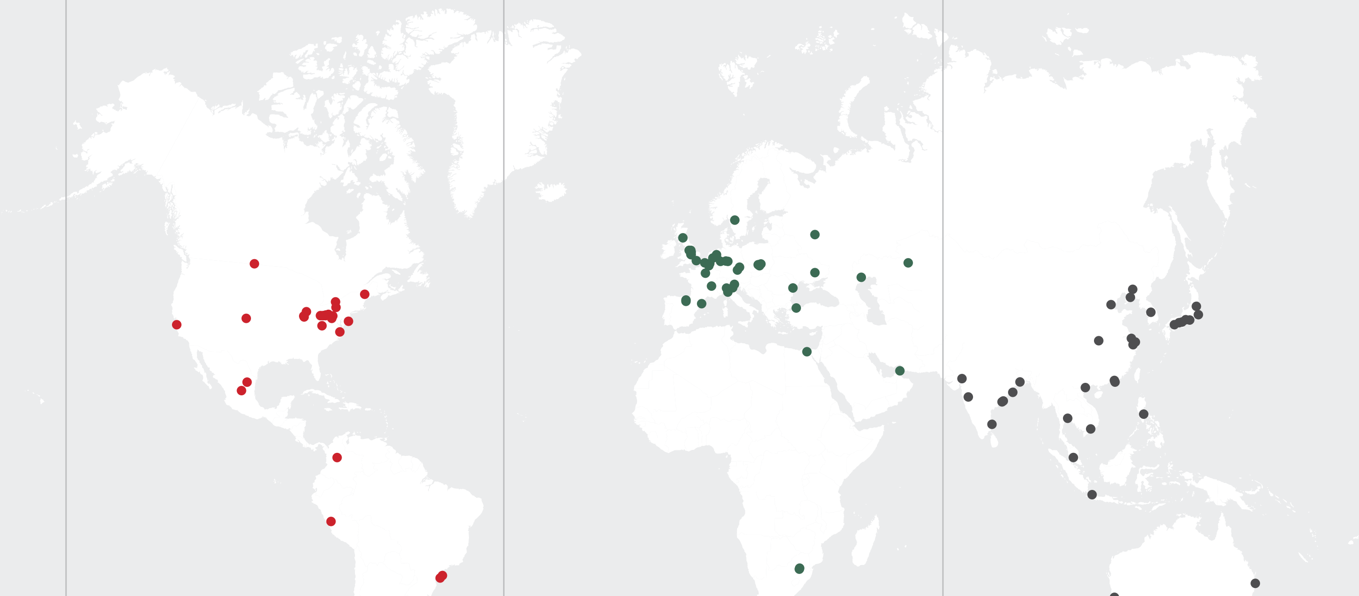
66% Steel
34% Foundry

18
Production sites

2
R&D centres of excellence

3,450
Employees

28
Sales offices



The map shows our production, R&D and commercial sites worldwide

Steel Flow Control
Operating review

See p48

Steel Sensors & Probes
Operating review

See p52

Steel Advanced Refractories
Operating review

See p51

Foundry
Operating review

See p54

Divisional overviews

Steel Division

Revenue	Return on sales
£1,045.4m	7.3%
2019: £1,195.3m	2019: 10.0%

Trading profit
£76.4m
2019: £120.1m

Overview

Our customers are steel producers and other high-temperature industries. Vesuvius is a world leader in the supply of refractory products, systems and solutions. These help our customers increase their efficiency and productivity, enhance quality, improve safety and reduce their costs and their environmental impact.

See **Steel Division Operating review** on p48-52

Business units

Steel Flow Control

What we do

The Vesuvius Flow Control business unit supplies the global steel industry with consumable ceramic products, systems, robotics, digital services and technical services. These products are used to contain, control and monitor the flow of molten steel in the continuous casting process.

How the process works

The continuous casting process enables steel manufactured from a blast furnace or an electric arc furnace to be cast without interruption, whilst protecting it from the atmosphere. Avoiding atmospheric contact is crucial as it significantly reduces contamination and oxidation of the steel being produced.

Our products

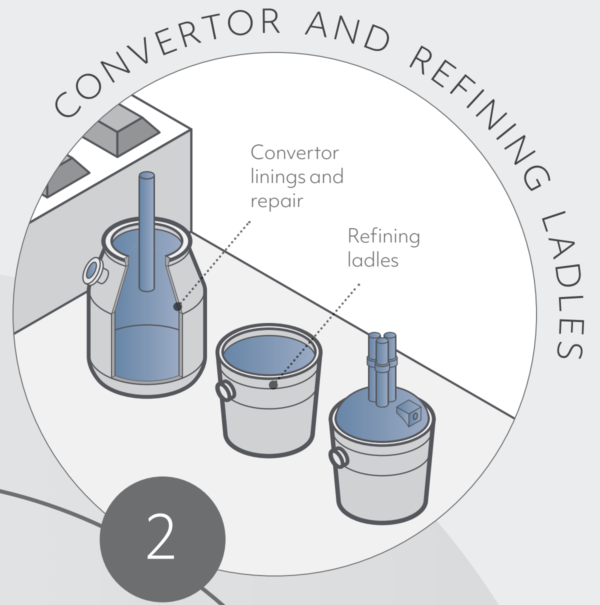
The consumable ceramic products that Vesuvius supplies have a short service life (often a matter of a few hours) due to the significant wear caused by the extremely demanding environment in which they are used. These products must withstand extreme temperature changes, whilst resisting liquid steel and slag corrosion. In addition, the ceramic parts in contact with the liquid steel must not in any way contaminate it. The quality, reliability and consistency of these products and the associated digital services we provide are therefore critical to the quality of the finished metal being produced and the productivity, profitability and safety of our customers' processes.

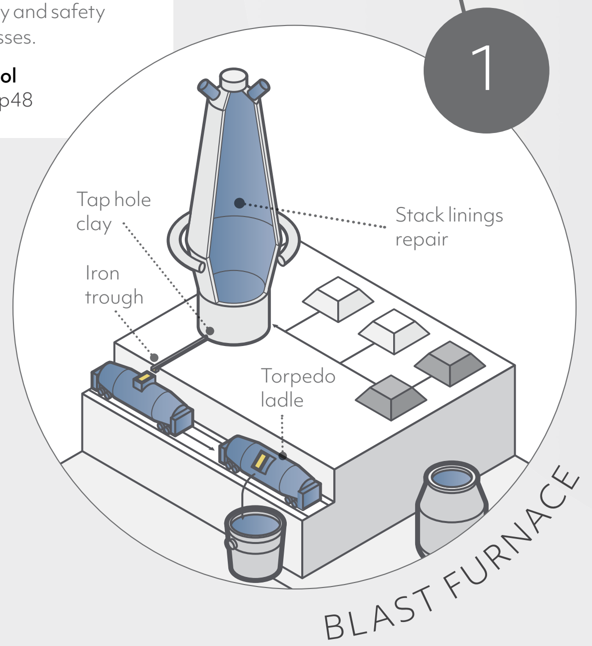
See **Steel Flow Control** Operating review on p48

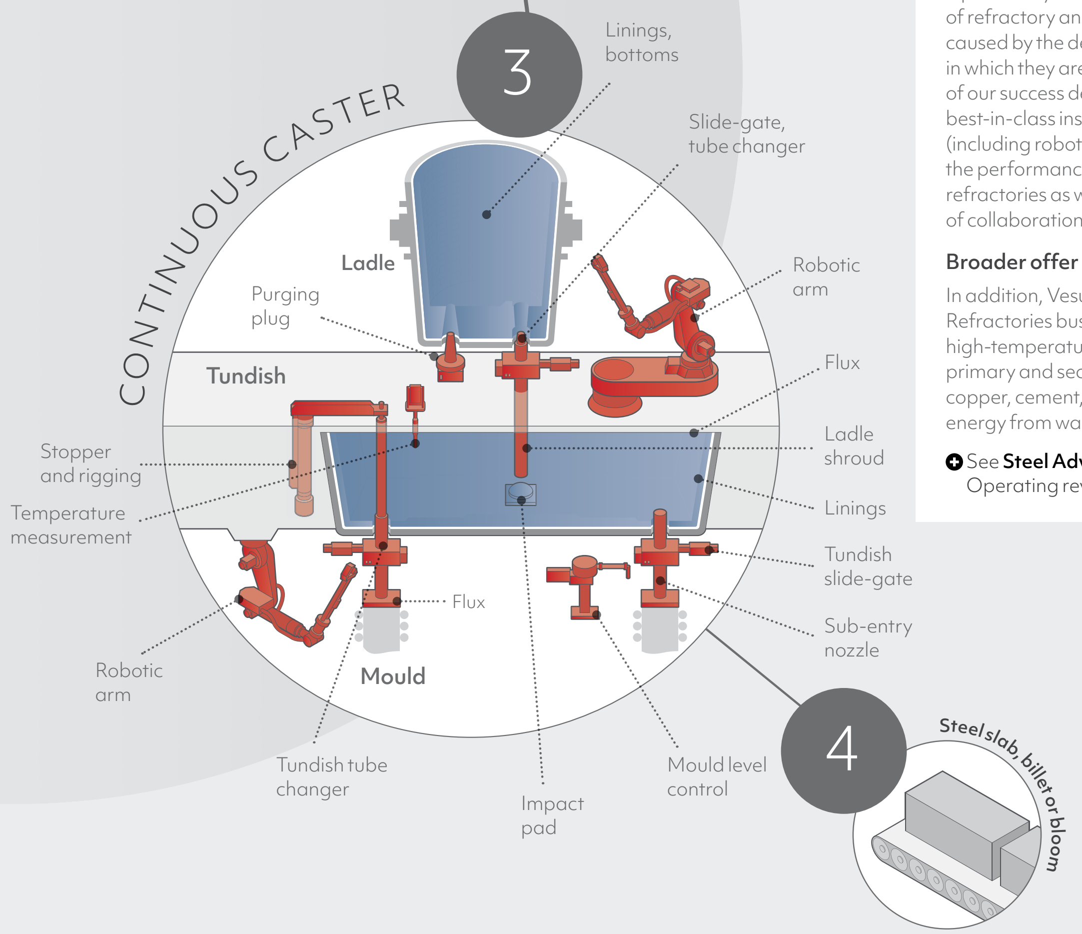
Steel Sensors & Probes

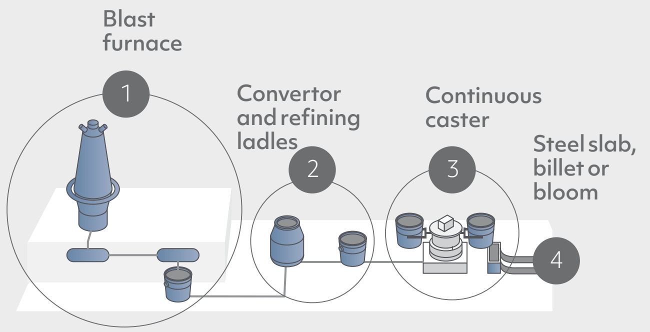
The Sensors and Probes business unit offers digital measurement solutions to our customers to enable them to make their underlying processes more efficient and reliable. The business unit focuses on providing a range of sensors and probes that enhance the control and monitoring of our customers' production processes, complementing Vesuvius' strong presence and expertise in molten metal engineering. These products include temperature sensors, oxygen, hydrogen and sublance probes, iron oxide and metal sampling for the steel, aluminium and foundry industries. By using these technologies, customers can focus on critical parameters within their processes, enabling them to refine their production methods to improve quality, lower production costs and maximise efficiency.

See **Steel Sensors & Probes** Operating review on p52









Steel Advanced Refractories

What we do

Vesuvius' Advanced Refractories business unit supplies complete value-added solutions to its customers, including specialist refractory materials, advanced installation technologies (including robots), computational fluid dynamics capabilities and lasers.

Our customers and the process

Our main customers are steel producers and manufacturers of steel production equipment, where our products accompany the steel-making process from its early steps all the way to the end of production in the rolling mill. The specialist refractory materials are subject to extreme temperatures, corrosion and abrasion, and are in the form of powder mixes, which are spray-applied or cast onto the vessel to be lined ('monolithics') and refractory shapes (e.g. bricks, pads, dams and other larger precast shapes).

The service life of the products that Advanced Refractories supplies into the steel-making process can vary (some a matter of hours and others for a period of years) based upon the type of refractory and the level of wear caused by the demanding environment in which they are used. An integral part of our success depends upon our best-in-class installation technologies (including robots) and lasers to track the performance of installed Vesuvius refractories as well as the high level of collaboration with our customers.

Broader offer

In addition, Vesuvius' Advanced Refractories business unit supplies other high-temperature industries such as primary and secondary aluminium, copper, cement, petrochemicals and energy from waste.

See **Steel Advanced Refractories** Operating review on p51 and 52

Divisional overviews continued

Foundry Division

Revenue	Return on sales
£412.9m	6.1%
2019: £515.1m	2019: 11.9%

Trading profit
£25.0m
2019: £61.3m

Overview

We are a world leader in the supply of consumable products, technical advice and application support to the global foundry industry, improving casting quality and foundry efficiency. Our primary customers are ferrous and non-ferrous foundries serving various end-markets, from large bespoke castings to high-volume automotive pieces. We operate in the foundry sector under the Foseco brand.

Business units

Foundry

What we do

The casting process is highly sequential and is critically dependent on consistency of product quality and productivity optimisation. Working alongside customers at their sites, our engineers provide on-site technical expertise in addition to advanced computational fluid dynamics capabilities to develop the best customised production solutions.

Our products

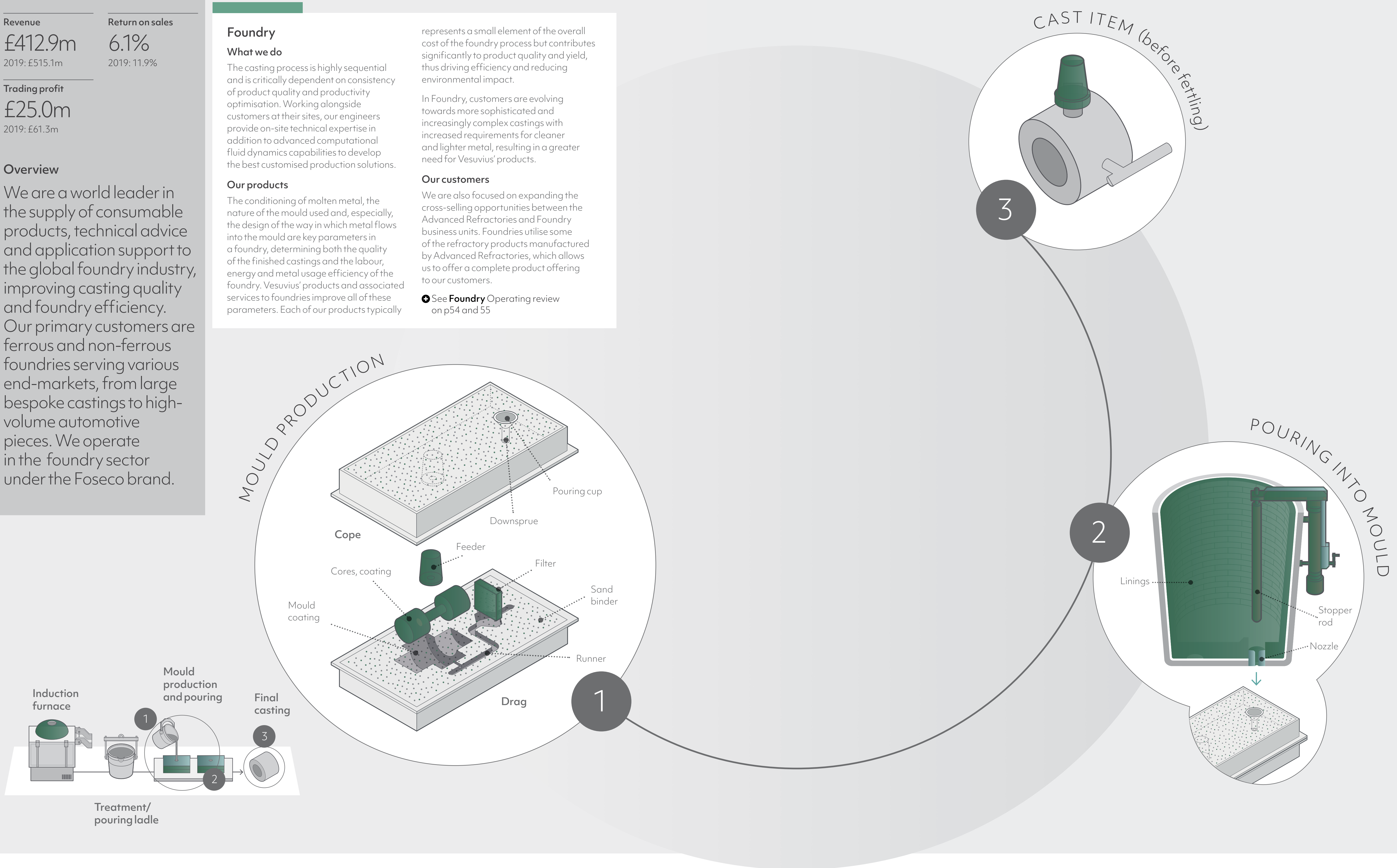
The conditioning of molten metal, the nature of the mould used and, especially, the design of the way in which metal flows into the mould are key parameters in a foundry, determining both the quality of the finished castings and the labour, energy and metal usage efficiency of the foundry. Vesuvius' products and associated services to foundries improve all of these parameters. Each of our products typically represents a small element of the overall cost of the foundry process but contributes significantly to product quality and yield, thus driving efficiency and reducing environmental impact.

In Foundry, customers are evolving towards more sophisticated and increasingly complex castings with increased requirements for cleaner and lighter metal, resulting in a greater need for Vesuvius' products.

Our customers

We are also focused on expanding the cross-selling opportunities between the Advanced Refractories and Foundry business units. Foundries utilise some of the refractory products manufactured by Advanced Refractories, which allows us to offer a complete product offering to our customers.

See **Foundry** Operating review on p54 and 55



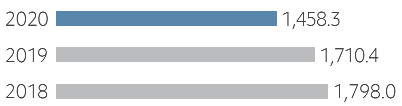
Chairman's statement

Maintaining a strong position during an unprecedented market downturn

The Board remains confident in the execution of the Group's long-term strategy, despite the challenges faced as a result of the COVID-19 pandemic.

Revenue £m

£1,458.3m



John McDonough CBE
Chairman

See our **Financial review** on p42-47

See more about our Governance in the **Governance section** on p90-148

See more about our Sustainability Strategy in our **Sustainability section** on p56-89

2020 was an unprecedented year for the Group and our stakeholders, as the world dealt with a time of great personal and economic hardship. Throughout this period, and now in 2021 as the COVID-19 pandemic continues, protecting the health and safety of our staff and their families, along with our customers, suppliers and other stakeholders remains our top priority. I would like to take this opportunity to reflect, and to thank all of our dedicated staff across the business, for their unwavering determination and support during what has been an extremely difficult time.

The pandemic has affected our business in a wide variety of ways and impacted our employees profoundly. It saddens me to say that we lost a number of valued colleagues in 2020, as well as people from the extended Vesuvius family. My thoughts and condolences go out to all of those who have been touched by loss as a result of the pandemic.

The pandemic has caused widespread global disruption across all our markets. Tight restrictions on the movement of goods and people put pressure on demand in our end markets, impacting our Foundry and Steel divisions significantly. Despite these pressures, we saw demand in our end markets begin to improve, albeit slowly, in both our Steel and Foundry divisions towards the end of Q3 2020. Those trends continued into Q4.

COVID-19 has been Vesuvius plc's most significant test to date and it is a source of pride that the Group has shown itself well able to withstand this existential challenge. Our approach of delegation and regional empowerment has proven its worth, allowing us to respond quickly to the crisis to preserve the fundamentals of the Vesuvius business, as demonstrated by our COVID-19-related cost savings and cash generation this year. At a Group level, we took early action to ensure we maintained liquidity, accessing the Bank of England's Covid Corporate Financing Facility (CCFF) scheme in April – repaying this later in the year – and refinancing expiring debt in the US private placement (USPP) market. The Board and the Group Executive Committee responded to the crisis by sacrificing 20% of their salary and fees for six months, and a further 170 managers also agreed a six-month reduction in salary. We also accessed government employment assistance schemes, repaying the UK Government furlough support received, early in 2021. The pandemic is not yet behind us and there will no doubt be more challenges as we look ahead. Whilst this may mean a slower start to 2021 versus previous years, we entered the year with confidence in not only Vesuvius' strategy but also the determination and capability of all our people to deliver it.

Sustainability

Vesuvius has also been focusing on the long-term prospects for the business. In 2020, we enhanced our activities in sustainability, launching a new consolidated initiative, more explicitly to focus and communicate the part Vesuvius is playing in creating a better tomorrow for our customers, our planet, our people, our communities, and all our stakeholders. We became signatories to the United Nations (UN) Global Compact committing to support its Principles on human rights, labour, environment and anti-corruption, and to engage in activities which advance the development of the UN's Sustainable Development Goals. We see sustainability as central to our identity, strategy and the way we conduct business.

In terms of our environmental initiatives, as well as setting several new internal environmental targets, we have set ourselves the goal of reaching a net zero carbon footprint at the latest by 2050. Internally, this will lead to an investment in new equipment to reduce energy consumption, the replacement of high-CO_2 electricity with greener electricity, the reduction of energy waste through the recuperation of heat to power and lastly, the generation of our own clean energy through the installation of solar panels or rods.

We are a responsible business and want to be a part of the solution to climate change. We already take significant action in this area, and this new initiative has been established to focus us on doing more. We want our people to be proud of the work Vesuvius does, and extending our global sustainability agenda is a way of reinforcing this.

Stakeholders

We continue to promote the success of Vesuvius for the benefit of all stakeholders. In a year of particular challenges, our Section 172(1) Statement on pages 22-29 details the variety of ways in which we have considered the interests of our wider group of stakeholders and interacted with them during the year.

In previous years the Board, both collectively and individually, visited Vesuvius operations around the world, meeting colleagues and deepening our knowledge and understanding of the business. In 2020 the Board's travel schedule was severely restricted. We conducted video calls with management in China and North Asia, which we considered to be 'remote' site visits. We also carried out in-person site visits where Board members were located in the relevant geography. We are looking forward to recommencing a comprehensive programme of site visits to meet with management and employees in person as soon as possible.

Following the roll-out of our CORE Values in 2018, we again conducted an employee engagement survey in 2020 through our I-Engage programme. We had a participation rate of 92% of staff worldwide and almost universally improved results in terms of engagement. As in 2020, 2021 will see Board oversight of the action plans established to respond to the survey's findings.

People

Our priority as a business has been the health and safety of our people and other stakeholders. At the start of the pandemic, to protect our employees and prevent the spread of infection, we adopted specific site-by-site actions in accordance with best practices and advice from the governments and health authorities in the countries in which we operate. In a year of such great uncertainty, I have been extremely impressed by all our management and employees across Vesuvius and their commitment to our business and our customers. My thanks, and those of the Board, are extended to them all. Our Sustainability initiative will increase our people focus, championing diversity and investing in talent development and safety.

Corporate governance

The pandemic had a significant impact on Board practices in 2020. As restrictions began to impact travel, we swiftly switched to a system of virtual Board meetings, holding meetings more frequently to support management in what has been a constantly changing environment. Although this format is not without its challenges, we have reaped the benefits in terms of shorter, more focused meetings, and more flexibility in timetabling. In 2021 we expect this hybrid approach to meetings to continue, with physical meetings held once Government regulations allow and we assess it to be safe to do so.

We were pleased to be able to meet together in October 2020 for our annual strategy review. Although travel restrictions prevented the physical attendance of three Directors, they participated virtually from their locations around the world. The remainder of the Board and senior management attended in person, whilst observing social distancing procedures. This review emphasised the focus of the Group on sustainability, a key theme in the delivery of our strategy for 2021 and beyond.

During 2020, the Board has continued to adopt the 2018 UK Corporate Governance Code. The Board recognises that a sound governance structure is vital to support the Group's long-term sustainable growth.

We were delighted to welcome Kath Durrant as an Independent Non-executive Director in December. Kath serves on the Audit, Remuneration and Nomination Committees and will succeed Jane Hinkley as Remuneration Committee Chair at the close of the 2021 AGM. Holly Koeppel and Hock Goh will be standing down at the close of the 2021 AGM, following 4 years and 6 years of service as Non-executive Directors, respectively. I would like to thank Hock and Holly for their outstanding contributions to the Vesuvius Board, and I wish them good fortune in their future endeavours. The Nomination Committee will continue to address succession issues in 2021 in line with director rotation requirements, including the Senior Independent Director commencing a process for my succession as Chairman. The Company is committed to ensuring that the Board membership continues to reflect the diversity, breadth of skills and experience required to drive and support the business strategy going forward.

Dividend

Our dividend policy aims to deliver long-term dividend growth, provided this is supported by cash flow and underlying earnings, and is justified in the context of our capital expenditure requirements and the prevailing market outlook. We recognise the importance of dividend payments to our shareholders, but in 2020 had to balance this with the liquidity and prospects of the business. In April 2020, as the full effects of the pandemic were beginning to be felt and in light of uncertainty about the business environment, the Board took the difficult decision to withdraw its recommendation to pay the final dividend of 14.3 pence per share for 2019 which had been announced with the publication of the full-year 2019 results. At the same time the Group implemented a number of other cost reduction and cash preservation measures. As the year progressed, management's swift actions in the face of the pandemic coupled with early signs of marginally improving levels of business activity, generated a clearer picture of the security of the Group's financial position. Therefore in October, the Board declared the payment of an interim dividend of 3.1 pence per share (2019: 6.2 pence per share), which was paid in December 2020. Given the continued improving trend in our end markets and management's robust action to control ongoing costs, which give a more stable outlook for Group performance, the Board has recommended a final dividend of 14.3 pence per share (2019: no final dividend paid). If approved at the Annual General Meeting, this final dividend will be paid on 21 May 2021.

Annual General Meeting

The Annual General Meeting will be held on 12 May 2021. The Notice of Meeting and explanatory notes containing details of the resolutions to be put to the meeting accompany this Annual Report and are available on our website (www.vesuvius.com).

John McDonough CBE
Chairman

3 March 2021

Chief Executive's strategic review

Vesuvius' decisive response and strong cash generation during the COVID-19 crisis demonstrates the resilience of our flexible, low capital intensive, entrepreneurial and decentralised business model

Our 2020 results also reflected the excellent performance of our teams.

Cash conversion rate[1] %

173%

2020 173
2019 120
2018 91

Patrick André
Chief Executive

See our **Financial review** on p42-47

See **Our strategy** on p14 and 15

See more in the **Our people** section on p74-83

Vesuvius reacted rapidly to the unprecedented downturn brought on by the COVID-19 pandemic.

By the end of the first quarter, we had established and implemented an action plan, with three key priorities to protect our staff and the business: preserving the health and morale of our employees; maintaining the security of supply for our customers worldwide; and preserving the cash and liquidity[2] of the Group.

As part of this plan, we rapidly implemented all the changes to the layouts of our manufacturing network that were necessary to protect our staff and, where permitted, to keep all our manufacturing sites open, operating and delivering to our customers safely.

We also swiftly implemented strong, temporary cost reduction measures that delivered savings of £39.0m for the full year 2020 (£18.6m in Q2, £20.3m in H2). These measures included a reduction of £15.9m in employment costs and £11.8m in discretionary spend, as well as an £11.3m reduction in planned employee incentives. Thanks to changes to working practices which will be maintained beyond the end of the pandemic, and together with reductions in operating expenses in EMEA undertaken in Q4, we expect more than £8m of these savings to become permanent.

In parallel, to preserve cash, we reduced our net capital expenditure by £21m when compared to 2019, prioritising strategic growth investments, without taking any risks in the ongoing overall maintenance and safety of our operations.

Strong cash generation, solid financial position and resilient results

Thanks to this decisive action, Vesuvius remained free cash flow positive in every quarter of 2020, even before accounting for the positive cash flows generated by reducing working capital. We achieved an adjusted operating cash flow of £175.2m, with a cash conversion rate of 173%, up significantly from 120% in 2019.

Our cash generation enabled us to reduce net debt to £175.1m at the end of 2020 from £245.8m at the end of 2019. At the end of 2020, Group liquidity stood at £437.3m, significantly higher than the £354.4m at the beginning of the year.

Despite a significant revenue decline of £252.1m in 2020 to £1,458.3m (2019: £1,710.4m), on a reported basis, as a result of the swift actions that we took, we achieved a trading profit in 2020 of £101.4m (2019: £181.4m). Our return on sales was 7.0% in 2020, compared with 10.6% in 2019.

This progress in conserving cash, adjusting our cost base, focusing on working capital and implementing temporary savings positioned the Group well as our end markets improved towards the end of Q3 and into Q4. This performance by our management teams meant that, by October, the Group's liquidity was above where it had been prior to the COVID-19 crisis impacting our results. Consequently, having withdrawn the 2019 final dividend in April 2020, the Group was able to announce the return to the payment of dividends in October 2020, whilst continuing to maintain the financial flexibility required to fund our growth opportunities.

Successful completion of our restructuring programmes

Despite the significant disruption in activities due to the pandemic, in 2020, we successfully completed our planned restructuring programmes and achieved

Adjusted operating cash flow[1] £

£175.2m

2020 175.2
2019 217.7
2018 179.4

Return on sales[1] %

7.0%

2020 7.0
2019 10.6
2018 11.0

£20.6m of recurring restructuring savings, ahead of the £19.4m we had targeted for the year. Further recurring restructuring savings of £4.3m will be realised in 2021, as we benefit from the full year impact of restructuring actions taken during 2020.

At the same time as concentrating our manufacturing footprint on a reduced number of manufacturing locations, we have preserved our production capacity through targeted investments and debottlenecking initiatives at our remaining plants. As a result, we are confident that our current manufacturing footprint is more than sufficient for the economic rebound from the pandemic and ensuing structural growth we expect in our end markets over the coming years.

R&D effort preserved to support future organic growth

Despite the challenging operating environment, we chose to maintain our R&D effort in 2020, maintaining our investment in R&D at c. 2% of revenue, to reinforce our product pipeline with new innovative products and solutions which will support our future organic growth.

The Group launched ten new products during 2020 and 22 new product launches are planned for 2021.

As well as continuing to invest in R&D capability worldwide, we also completed the expansion and modernisation of our Centre of Excellence for mechatronics and commissioned our new VISO research centre, both in Ghlin, Belgium.

Best safety performance in 2020

I am very proud and would like to thank all Vesuvius employees for our success in meeting all the pandemic challenges while at the same time achieving the best safety performance of Vesuvius since we became an independent company in 2012. Despite the heightened health and safety risks of the pandemic, we reduced our Lost Time Injury Frequency Rate (LTIFR) to 1.12 in 2020 versus 1.55 in 2019.

We remain committed to continuing our journey towards our ultimate goal of zero accidents and will carry this aspiration into 2021 with the further development of our safety programmes.

New Vesuvius sustainability initiative

In 2020, Vesuvius launched a new Sustainability initiative to accelerate our efforts in contributing to the fight against climate change, championing our people, and contributing to the well-being and development of our surrounding communities. Sustainability is central to our identity, our strategy and the way we conduct business.

We are embarking on a journey which will progressively transform many aspects of the way we run our business, including investment decisions, product development priorities, supplier management, communication, and our engagement with our people and communities – thereby incorporating sustainability more deeply into the strategy and business model of Vesuvius.

As a company, we do not have a significant environmental footprint due to the low energy intensity of our manufacturing processes and our strategy of not being integrated upstream in mining. We, however, have a significant opportunity to help our steel and foundry customers drive improvements in their environmental performance. More information can be found on page 16.

Our environmental objectives revolve around fighting climate change by reducing our own CO_2 emissions and helping our customers reduce their own CO_2 footprints. In particular we have set ourselves the goal of reaching a net zero carbon footprint at the latest by 2050.

We will also renew our focus on achieving best-in-class safety and well-being at work, both for our employees and for our customers. We have set a new gender diversity target, and will invest further in the development of our employees and ensuring our ethical business conduct at all times.

For 2020, we set ourselves eight intermediate targets across all areas of the sustainability agenda (with a ninth added for 2021), against which we will monitor and report our progress. We are also measuring a significantly larger number of sustainability indicators on an ongoing basis. With the full support of the Board, we have established a new governance structure, constituting a Sustainability Council with membership drawn from across the business to oversee our performance and support our efforts.

Furthermore, we have signed up to the UN Global Compact as a demonstration of our commitment to support the Ten Principles on human rights, labour, environment and anti-corruption, as well as the UN's Sustainable Development Goals. See the Vesuvius Sustainability section on pages 56-89 for further information.

Further strengthening of the senior management team

In early 2021 we further strengthened our senior management team with the addition of Pascal Genest as President of the Group's Steel Flow Control business unit. Pascal's experience spans international leadership roles in different sectors, including 15 years' experience in the steel industry working for some of our largest customers.

Outlook

Clear signs of recovery are now apparent in both our Steel and Foundry end markets. We believe that this recovery should accelerate in the second half of 2021, supported by the lifting of most pandemic-related restrictions by then.

Vesuvius is emerging from this difficult period stronger than before. We have low leverage and an optimised manufacturing footprint as a result of our successfully completed restructuring programmes. We also benefit from our flexible and low capital intensive, entrepreneurial and decentralised business model, which has proven its value during 2020.

We are confident that the Group will deliver a meaningful improvement in financial performance in 2021.

Patrick André
Chief Executive

3 March 2021

1. This Review contains alternative performance measures. For definitions and reconciliations of alternative performance measures, refer to Note 4 of the Group Financial Statements.
2. For definition of liquidity see Note 4.20 of the Group Financial Statements.

Our strategy

Strategic Objectives

We are dedicated to accelerating the delivery of our Strategic Objectives. In particular, speeding up growth by focusing our efforts on the high-quality, high-end segments of the steel and foundry markets, increasing the automation and efficiency of our manufacturing base and driving this change with a team of skilful, motivated and talented people.

- Deliver growth
- Generate sustainable profitability and create shareholder value
- Maintain strong cash generation and an efficient capital structure
- Provide a safe working environment for our people
- Be at the forefront of innovation
- Run top-quality, cost-efficient and sustainable operations
- Foster talent, skill and motivation in our people

Vesuvius measures and monitors its performance against these Strategic Objectives through its Key Performance Indicators (KPIs).

See our **Key Performance Indicators** on p40 and 41

Execution priorities

Vesuvius has articulated a number of key execution priorities. These enable us to achieve our core Strategic Objectives of delivering long-term sustainable profitability, creating shareholder value and delivering a better tomorrow for our stakeholders.

Reinforce our technology leadership

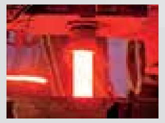
Description

Vesuvius was built and grew on technology breakthroughs. These enabled the steel continuous casting and foundry industries to improve their efficiency and quality substantially. Focusing on technology leadership continues to drive our unique value proposition and underpins our ability to deliver ongoing value enhancement to our customers.

Progress in 2020

In 2020, we commissioned our new VISO research centre and completed the expansion of our mechatronics competence centre, both in Belgium. We maintained our focus on combining developments in robotics, automation and data analytics capabilities with our well-established material science research. Increasing our R&D efficiency is an ongoing process, whereby we intend to focus our efforts on the most high-impact projects. During the year we maintained our industry-leading level of R&D spend as a percentage of revenue at 1.9%. Going forward we remain committed to spending c.2% of sales on R&D.

Develop our technical service offering and increase penetration of value-creating solutions



Description

Our technology has been widely adopted by the most sophisticated producers in the most developed markets. However, marked differences remain in the penetration of our solutions within the industry. Consequently, there is a wider audience of customers who we believe can benefit from those solutions. As steel and foundry markets in developing markets become more quality focused, we have the opportunity to significantly increase our penetration of these markets through offering our value-creating solutions.

Progress in 2020

We launched ten new products in 2020, despite challenging market conditions, including the following highlights by business unit:

> Flow Control: launch of Duraflex L*, a breakthrough generation of ladle shroud offering multiple new value-creating features including increased operator safety and extended life, reducing waste by a factor of up to 4x

> Advanced Refractories: roll-out of the Next Generation Tundish Spray Robot, a fully integrated spray application system solution that reduces waste, improves quality and operator safety

> Foundry: launch of Diamant*, a new suite of degassing consumables with patented rotor design that increases service life by up to 200%, and reduces cost per treatment

During the year we installed three mechatronics systems at customer locations in Asia and have five further active projects for customers in the pipeline.

In 2021, we plan to launch 22 new products.

Capture growth in developing markets

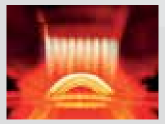
Description

Building on our long-standing presence in all markets, we can leverage the high growth enjoyed by our customers' industries in emerging markets, which are large consumers of steel goods and foundry castings.

Progress in 2020

The sales volume of the Steel division in 2020 outperformed steel production in the world (excluding China and Iran) by 1.1%, with particularly strong performance in the growing markets of India, Vietnam, Turkey, Russia, Ukraine and South America. In China, underlying revenue in our Foundry division grew by 10.5% during the year, continuing our track record of growth in this important market.

Improve cost leadership and margins



Description

We continuously pursue initiatives throughout the Group to adapt our business and our cost base to the changing trading environment. This is central to our efforts to improve profitability. Furthermore, we have embedded the principles of lean manufacturing across all our sites, continuously focusing on quality and productivity.

Progress in 2020

Despite the significant disruption in activities, we delivered £20.6m of restructuring savings ahead of the planned £19.4m we had targeted for the year. In addition, we implemented several cost-reduction measures to mitigate the impact of the crisis and delivered £39.0m of temporary COVID-19-related savings from reduced employee costs, discretionary spending and planned incentives. Further restructuring savings of £4.3m will be realised in 2021, as we benefit from the full year impact of restructuring actions taken during 2020. We also expect to deliver additional recurring annual savings of more than £8m in 2021 as we retain some of the efficiencies from changes to working practices that were achieved during the pandemic, plus savings from a permanent reduction in operating expenses.

Drive sustainability

See our **Sustainability** section on p56 to 88

Description

In line with our updated Sustainability initiative, we are taking steps within the organisation to create a better future for our planet, our customers, our people and our communities. We develop products that seek to help our customers drive efficiency and reduce their environmental footprint, and we are focusing on our own operations to reduce our environmental impact. We will champion our employees to ensure that they receive opportunities for growth and development, and will support wider and deeper engagement with our communities.

Progress in 2020

In 2020, we engaged with our key internal and external stakeholders to develop and launch the Vesuvius Sustainability initiative.

Our sustainability strategy now incorporates all our business' Environmental, Social and Governance dimensions and sets a roadmap for the integration of our sustainability objectives into our strategy and business model, thereby progressively transforming many aspects of the way we run our business. It is underpinned by a comprehensive set of metrics and nine key strategic targets.

As part of this commitment, in October 2020, Vesuvius became a signatory to the UN Global Compact and has committed to base our business approach on its Ten Principles on human rights, labour, environment and anti-corruption, and to engage in activities which advance the development of the UN's Sustainable Development Goals.

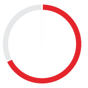
* Trademark of the Vesuvius Group of companies, unregistered or registered in certain countries, used under license.

Our external environment

Solutions for the changing demands of business

Climate change and the Vesuvius proposition

Steel



Two thirds of Vesuvius' revenue comes from providing goods and services to the steel industry.

Steel production is a highly energy-intensive process. The World Steel Association has estimated that the steel industry generates between 7% and 9% of global direct emissions from the use of fossil fuel. However, steel continues to play an integral part in the modern world and remains crucial for many end products. It is infinitely recyclable and the by-products created during steel-making, along with the waste energies, are valuable resources. Vesuvius' consumables enable our customers to increase manufacturing throughput whilst lowering energy consumption. For several decades, Vesuvius' products have been assisting the steel industry in reducing greenhouse gas (GHG) emissions by increasing yields and end-product consistency, therefore improving the energy efficiency of production.

Foundry

The remaining one third of Vesuvius' revenue is generated from the provision of products and solutions to the foundry industry.

Foundries consume large amounts of energy in heating metals, generating significant amounts of CO_2. For the past 80 years, Vesuvius' feeding systems, filters, coatings, crucibles and other products have been helping our Foundry customers to maximise their energy efficiency and minimise wastage, increasing the ratio of metal melted to finished end castings. We systematically monitor the positive CO_2 impact of our products.

The future

- The pressure on the steel and foundry industries to reduce GHG emissions, particularly CO_2, is increasing significantly, with energy price increases used to compel change.
- Failing to introduce a 'CO_2 border tax' in the EU is likely to accelerate the de-localisation of steel production.
- Our customers will continue to focus on reducing absolute energy consumption and CO_2 emissions (through the elimination of higher emission processes) and reducing normalised energy consumption and CO_2 emissions (via increased efficiency).
- A rise in scrap availability and its recycling will reduce CO_2 emissions. For the steel industry, this will result in a shift to electric arc furnaces away from blast furnaces – in particular, in the US and the EU.
- The use of hydrogen in steel production in the EU27+UK to manufacture 'Green Steel' is gaining traction and more and more steel producers are exploring this innovative and sustainable path.
- As the move to electric vehicles and low-carbon forms of transport accelerates, the foundry industry will shift away from manufacturing internal combustion engines. We expect aluminium foundries to grow at a higher rate to support the manufacture of lighter-weight components for vehicles. Governmental funding to support economic recovery following the COVID-19 crisis is expected to accelerate this trend, through subsidies to stimulate demand for electric vehicles.
- In construction, we see a continued trend of using lighter-weight steel and glass to replace concrete.

How Vesuvius will respond

Vesuvius' application engineers and marketing teams are already working closely with our customers to develop new products and technologies to meet the challenges that lie ahead.

Our Foundry Division teams are developing new filtration, feeding, mould coating and molten metal treatment products to support the manufacture of lighter-weight, higher-performance metals and components. As a result of the accelerating importance of lighter-weight components in automotive, Vesuvius is increasing its efforts to address this growing market.

Our Steel Division is participating in hydrogen R&D projects with steel partners in Europe to develop solutions for the future of steel-making. Additionally, we continue to develop product offerings with superior sustainability characteristics.

Technical upgrade of steel and foundry

What's happening

The long-term growth forecast for steel and foundry markets remains unchanged and the importance of technology to differentiate steel and foundry producers continues to grow.

Steel producers are increasingly focused on higher-quality steel grades where the consistency of the finished steel is fundamental in driving an above-market growth forecast for high technology steel in all regions. The COVID-19 crisis has resulted in higher relative growth in lower-quality steels used in construction, fuelled by government spending programmes and a drop in automotive production. We expect this is to be a temporary phenomenon.

Similarly, in foundries, metal quality is paramount as higher strength is demanded from thinner and lighter castings.

How we are responding

- Vesuvius is strongly positioned to facilitate this upgrade and benefit from its development. We have a wide product and service offering designed to support the production of high-technology steel across our broad, global customer base.
- We continue to invest heavily in R&D with dedicated Centres of Excellence to maintain our technology leadership across our products and across all regions in which we operate.
- Vesuvius' innovative portfolio of products and services, together with its global footprint, enable us to provide high-technology solutions to our worldwide customers.

+5%

Our internal annual growth forecast for aluminium foundries

Improving quality with our new products

In Flow Control, we launched the ATOM (Advanced Tundish Outlet Modifier)* in 2020. ATOM has been designed to satisfy the need to improve quality and productivity at our increasingly demanding technical steel customers. The ATOM is installed inside the tundish, protecting the casting channel inlet and consequently improving the quality of steel reaching the mould.

Our Foundry technology solution for aluminium melt degassing continues to develop. We have launched the 'Diamond Degasser*' that allows our customers to achieve the highest-quality standards in their metal while at the same time increasing the durability and flexibility of the process.

Automation – safety and efficiency

What's happening

Companies face ever-increasing regulation and scrutiny to ensure safety and reduce emissions from their operations and products.

New technologies, such as advancements in automation, can help transform production, bringing greater flexibility and lower costs, whilst also delivering significantly improved safety performance in a plant.

Robotics can support or even substitute operators in hazardous production areas, thus lowering the safety risk and increasing the consistency of the process.

Market volatility is increasing, creating more uncertainty and requiring even more flexibility. Automation can create more flexible operations to enable customers to respond more rapidly to changing market conditions.

How we are responding

- Vesuvius has the global, in-depth capability to combine know-how in steel mills and foundries with robotic capabilities: delivering superior safety performance in hazardous areas of production.
- We provide laser technology to assess refractory wear, allowing targeted repair with our broad range of refractory consumables – for efficient and safe operation.
- We invest significant resources into the scale-up of our mechatronics capabilities to maintain our leadership in Tundish and Continuous Casting robotics and to expand our automation capabilities in other areas.
- We are upgrading our own operations to continuously improve our safety performance and lower our LTIFR.

Leaving the most hazardous work to robots

Vesuvius installs fully automated robots for large steel customers to execute safety-critical activities, removing operators from the hazardous production area. Thanks to Vesuvius' leading capabilities and our ability to provide a combination of refractories, robotics and slide-gates, we see a strong pipeline for these projects.

By 2025, the time spent on current tasks at work by humans and machines will be equal

(as estimated by the World Economic Forum).

* Trademark of the Vesuvius Group of companies, unregistered or registered in certain countries, used under license.

Our markets

Steel Division

Business units

Flow Control

Crude steel production is the primary driver of demand for Flow Control's products, whilst the trend for 'high-technology steel' allows us to leverage our advanced solutions and achieve above-market growth rates.

Advanced Refractories

Crude steel production and the level of activity in other high-temperature industries, such as aluminium, copper, cement, petrochemical and energy from waste, are the drivers for the Advanced Refractories business unit product demand.

Sensors & Probes

Crude steel production and the need to increase the quality and consistency of cast steel drives demand for our Sensors & Probes business.

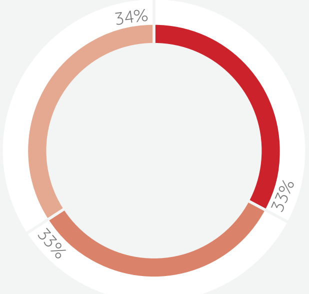
'High-technology steel'

'High-technology steel' is our internal marketing segmentation that describes steel which is either high performing e.g. high-strength steel for wind turbines, and/or where the production process to produce the steel is complex, e.g. the near net shape production process, which is a continuous casting process that produces steel in very thin slabs near to its final required thickness.

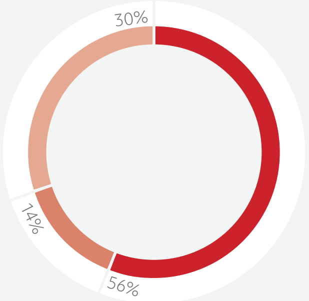
Complex production processes and the need for higher-quality steel grades, where the consistency of the finished steel is paramount, are gaining momentum worldwide because they provide steel producers with differentiated products and significant benefits in terms of cost savings and a reduced environmental footprint.

Advanced steel cans are produced from 'high-technology steel' because of the need to achieve a challenging combination of thin gauge and high rigidity/strength.

Vesuvius' internal segmentation of global crude steel production



Flow Control business unit end-markets



High-technology steel
- Near net shape production process
- Stainless steel
- Engineering steel: bearing, shafts, tools, etc.
- Automotive steel

Medium-technology steel
- Construction sheets: roofing, cladding, etc.
- Heavy plates for ship building, pipe

Commodity steel
- Basic rebar for concrete reinforcement

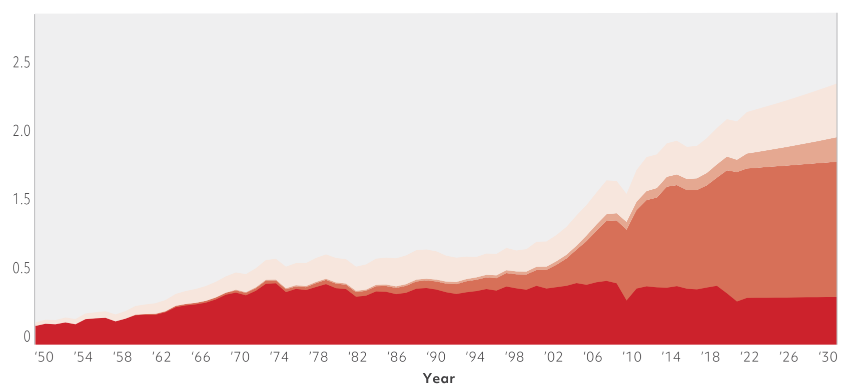
Crude steel production is a structurally growing market

The COVID-19 crisis disrupted the global demand and supply chains across all industries, pushing down crude steel production in the world, excluding China, by 8.2% in 2020 compared to the previous year. Including China, which was the only market where steel production increased compared to 2019, (+5.2%), global crude steel production fell 0.9% in 2020, according to the World Steel Association (WSA).

Whilst the growth in crude steel production in the past 20 years has been mostly driven by China, this trend is now likely to decelerate, and the WSA expects Chinese crude steel production in 2021 to remain stable at the 2020 level. We believe that the majority of the growth in crude steel production going forward will come from India and other emerging markets, mostly the Middle East, Africa, South East Asia and Latin America.

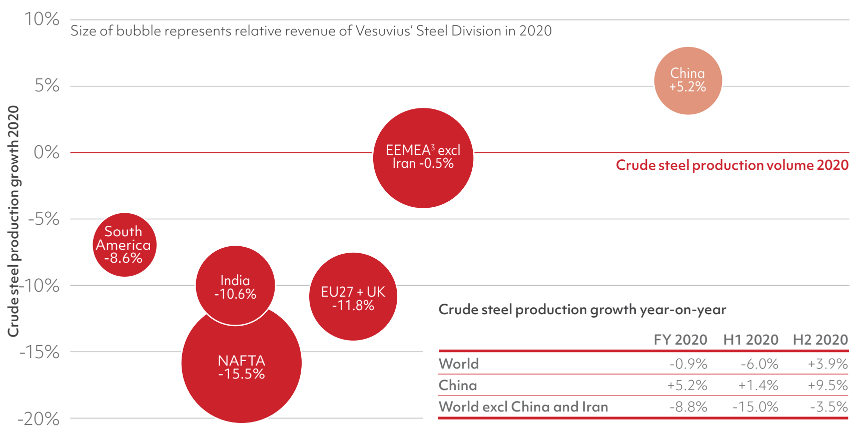
Longer term, we expect global crude steel production to grow at a rate of 1.3% per annum and the world, excluding China, at a rate of 2%.

World crude steel production (mt)



Sources: Historical data from World Steel Association. Forecasts are management estimates.

Challenging environment in the steel markets outside China



Crude steel production growth year-on-year

	FY 2020	H1 2020	H2 2020
World	-0.9%	-6.0%	+3.9%
China	+5.2%	+1.4%	+9.5%
World excl China and Iran	-8.8%	-15.0%	-3.5%

Notes to the above charts:
1. Eastern Europe, Middle East (incl. Turkey), Africa, Latin America and South East Asia.
2. EU27, UK, USA, Canada and North Asia.
3. Eastern Europe, Middle East (incl. Turkey) and Africa.

Foundry Division

Higher sophistication, demanding higher-quality metal and increasingly complex castings, is the long-term driver for product demand for the Foundry Division.

Foundry industry end-markets

The most important end-markets for the foundry industry are general engineering, light vehicles, including passenger cars and light commercial vehicles (LVs), medium and heavy commercial vehicles (MHCVs), construction, agriculture and mining equipment, power-generation equipment and railroad.

As a result of the COVID-19 crisis, Foundry end markets declined significantly across all regions, with the exception of the general engineering end market in China. Production output in vehicle (light, medium and heavy vehicles) and, the mining and construction equipment sectors, which together make up 53% of our Foundry end-market, fell 16.5% and 8.0%, respectively during 2020. Whilst most markets saw a strong rebound in the second half of the year, volumes for the full year 2020 were well below 2019 levels.

Above-average market growth for highly sophisticated and complex castings

The Foundry Division benefits from its capabilities to improve highly sophisticated and complex castings, which are the segments of the foundry market growing the fastest. Foundry customers are evolving towards these types of castings because of increased requirements for cleaner metal to deliver complex shapes with thinner sections.

Whilst Foundry Division products typically represent less than 5% of a foundry's production costs, they contribute significantly to the improvement of product quality and manufacturing efficiency, whilst reducing the environmental impact of the casting process and improving the ratio of finished castings to the amount of metal poured, which is a key parameter for foundry efficiency.

Technology changes and environmental drivers

New technologies, such as 3D printing, are expected to continue to influence the metal casting industry, allowing for faster prototyping and production of smaller volume parts. Environmental regulations, driven by the desire to reduce volatile organic compound emissions and the use of silica within the industry, are also expected to continue to tighten. This will drive the trend to find processes and consumable products which support production efficiency and reduce a foundry's impact on the environment.

Iron casting

Iron casting is split between grey and ductile iron, with grey iron representing the majority of metal being cast. This is a cost-efficient and robust process producing components that do not need to tolerate extreme mechanical stress. All iron castings require filters and coatings, but grey iron is not as reliant on feeding system utilisation due to its lower shrinkage on solidification. Conversely, ductile iron production requires more sophisticated consumable products to cope with the high shrinkages of metal whilst solidifying.

Steel casting

Steel is used in castings for manufacturing components with very high mechanical performance. Steel casting is the most demanding casting process due to higher melting temperatures and greater tendency for shrinkage. This drives greater demand for products and technical expertise in this segment.

Aluminium/Non-ferrous casting

Aluminium casting is the segment of the foundry market growing the fastest. It has captured a significant share of the LV market. Being molten below 700°C, aluminium can be cast in iron moulds which can then be reused. Vesuvius concentrates on supplying fluxes, filters and machines that refine the composition and cleanliness of the metal.

Business model

A profitable, flexible, cash-generative model focused on sustainable growth

Strategic alignment

- Deliver growth
- Generate sustainable profitability and create shareholder value
- Maintain strong cash generation and an efficient capital structure
- Provide a safe working environment for our people
- Be at the forefront of innovation
- Run top-quality, cost-efficient and sustainable operations
- Foster talent, skill and motivation in our people

What we do

We develop and manufacture high-technology products and solutions predominantly for supply to the steel and foundry casting industries, operating a profitable, flexible, cash-generative and growth-building business model. Over many years, we have built the brand equity of our Vesuvius and Foseco products through technology leadership, reliability and service.

The sustainability of our model

The items we have now formalised in our Sustainability initiative have long been at the heart of Vesuvius' value proposition. We act as a responsible corporate citizen, developing products that help our customers to improve their efficiency and reduce their environmental impact.

Our key resources

Financial capital

We use the cash generated by our business to invest in innovation, people, operating assets, technology and sales to generate further growth.

Manufacturing capital

We have a global footprint, with 53 production sites on six continents, giving us proximity to our customers.

Intellectual capital

We have six R&D centres of excellence with dedicated R&D staff worldwide, generating innovative products and solutions for our customers.

Human capital

We invest in developing our skilled and motivated workforce of more than 10,000 people and provide them with a safe environment in which to work.

Social capital

We champion our Values and our ethical conduct. We maintain strong relationships with customers and our wider stakeholder groups.

Natural capital

We utilise high-quality raw materials, secured through reliable and well-developed and sustainable supply chains.

6
R&D centres of excellence

10,350
Employees

53
Production sites

How we deliver

> Our industry experts are embedded at many customer locations and are therefore ideally placed to collaborate with customers to identify their needs, and potential service and process improvements. This also enables us to grow our solutions and service portfolio.

> We develop high-technology products that deliver quality enhancement, efficiency gains and energy savings to our customers. We focus on sustainability in our own business through the efficient use of energy and natural resources.

> Our model is profitable by allowing value pricing for bespoke products and services. It generates growth as we enlarge our market with additional innovative products and solutions.

> Our model is resilient to end-market volatility due to the flexibility of our diversified manufacturing footprint and adjustable cost base.

> Our commitment to ethical business delivers strong, long-term, sustainable commercial relationships.

The value we create

Our investors

Strategic alignment

Our cash generative and low capital intensity business, provides returns to our shareholders and underpins sustainable growth.

Our customers

Strategic alignment

Our investment in innovation creates cutting-edge products and solutions, delivering enhanced value for our customers and differentiating us from our competitors. Our technology solutions improve customer safety and remove operators from the most dangerous parts of our customers' processes. We embed technical experts within our customers, giving us a fundamental understanding of their needs and delivering them access to our global network of highly skilled individuals.

Our suppliers

Strategic alignment

Maintaining cost-effective access to high-quality raw materials is vital to our success. Our suppliers are critical to our business.

Our people

Strategic alignment

We focus on the health and safety of all our staff. We engage with our people, encouraging and rewarding high performance to create an environment where all can realise their individual potential.

Our communities

Strategic alignment

We are committed to maintaining positive relationships with the communities in which we operate. Our social responsibility activities complement our Values and we encourage our employees to engage with communities and groups local to our operations.

Students and graduates

Strategic alignment

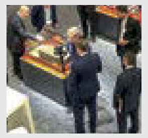
Attracting new talent to Vesuvius is vital for the Group's continuing success. Recruiting new students and graduates feeds the talent pipeline and allows us to tap into new sources of up-to-date business ideas and R&D capability.

Our sustainable competitive advantages

Global presence

Using our global expertise to identify and create market opportunities

Vesuvius is present on six continents, supporting the development of global steel and foundry manufacturing processes with new technologies. We have manufacturing capability in all the main steel and foundry markets and hire and train local engineers. Our local manufacturing, local expertise and global knowledge of customers' processes give us a special relationship with our customers.

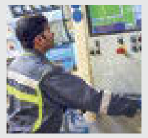


See more about **Our global presence** on p4 and 5

Optimised manufacturing

Low-cost lean manufacturing provides reliable 'just-in-time' products

Our successfully tested products can be produced at high volumes across all of our manufacturing footprint, guaranteeing cost-competitive and time-efficient delivery. We optimise our cost-competitiveness by investing in low-cost production sites and increasing production automation – and have established manufacturing facilities to support our expansion in emerging markets.

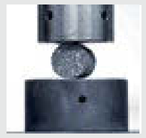


See more about **Our operations** on p48-55

Advanced technology

Our technology centres develop value-adding solutions involving engineered systems and high-value consumables

Our continuing investment in Vesuvius' R&D centres of excellence is reflected in all areas of our offering. We have knowledge of the most advanced ceramic and metallurgical techniques using state-of-the-art equipment and the most advanced technologies of flow simulation and finite element analysis. We are therefore able to provide our customers with sophisticated, innovative, custom-designed solutions.



Read more about our **Value-added solutions** on p14 and 15

Service and consistency

Serving our customers reliably, competitively and consistently with consumables critical for their manufacturing processes

Alongside our global presence, we ensure a local service to our customers, from inventory management to high-quality technical support at their sites and the ability to swiftly modify production and supply to reflect changes in customer requirements. Our knowledge of end-market processes, specifications and techniques around the world gives our experts an unparalleled ability to support our customers.

Read more about **Our Operations** on p48-55

Section 172(1) Statement

Effective engagement with stakeholders promotes the long-term sustainability of the Group

Under Section 172 of the Companies Act 2006, the Directors have a duty to promote the success of the Company over the long term for the benefit of shareholders as a whole, having regard to a range of other key stakeholders and interests.

The Directors must have regard (amongst other matters) to the:

- Likely consequences of any decision in the long term
- Impact of the Company's operations on the community and the environment
- Interests of the Company's employees
- Desirability of the Company maintaining a reputation for high standards of business conduct
- Need to foster the Company's business relationships with suppliers, customers and others
- Need to act fairly as between members of the Company

The Board is responsible for the overall direction of the Group. It focuses primarily upon strategic and policy issues and is responsible for the Group's long-term success. It sets the Group's strategy, oversees the allocation of resources and monitors the performance of the Group, to ensure that the Group is structured appropriately for the challenges and opportunities of the future. In performance of these duties, the Board is focused on the sustainable success of the Group in the long term, and the existence of a culture that supports this success. The Board recognises the need for the Group to have effective engagement with, and encourage participation from, all key stakeholders to promote these long-term interests. The Group's key stakeholder groups, reflecting those who have the biggest impact on the business and modes of engagement, are outlined in the table on pages 28 and 29. The Board has regard to the activities undertaken throughout the Group in considering its own Section 172 responsibilities.

WE ARE

EFFICIENT

Vesuvius is focused on running an **efficient business**, which delivers better results for our **customers**.

Marie Schmaenk
Apprentice, Foundry Technologies
Borken, Germany

Likely consequences of any decision in the long term

Throughout the year, the Board considered the long-term consequences of the decisions it made, focusing on the interests of relevant stakeholders as appropriate.

Examples of how these activities impacted some of the key decisions taken by the Board during 2020 are given in the table below.

Operational response to the COVID-19 pandemic

Stakeholder alignment
- Employees
- Customers
- Suppliers

Strategic alignment

The Board oversaw the Group's operational response to the COVID-19 pandemic. Throughout the year the Group's primary focus was on protecting the health and safety of employees and their families, together with that of our customers, suppliers and other stakeholders. Immediately as the threat from the pandemic became apparent, the Board ensured that the Group adopted specific site-by-site actions to protect our employees and all those entering our sites, to prevent the spread of infection. The Group made the necessary changes to manufacturing layouts, aligning with best practice and the requirements of local governments and health authorities.

The Board was also committed to securing continuity of production to meet the needs of customers and delivering to them safely. Consequently, throughout 2020 only eight sites were subject to full temporary closures.

Preservation of liquidity and conservation of cash

Stakeholder alignment
- Shareholders
- Employees
- Lenders

Strategic alignment

The Board took difficult decisions to preserve the Group's liquidity and conserve cash in 2020. In April, in light of uncertainty about the business environment, the Board withdrew its recommendation to pay the final dividend for 2019 of 14.3 pence per share which had been announced with the publication of the full year 2019 results. At the same time, the Board oversaw the implementation of a number of cost reduction and cash preservation measures, including employee-related savings and restricting capital and operational expenditure wherever possible, whilst still seeking to execute the strategy of the Group and without taking risks on the maintenance and safety of our operations.

To lead by example and show solidarity with the Group's employees, the Board, in conjunction with the Group Executive Committee, elected to reduce their fees and salary by 20% for six months. The Board also approved the accessing of a number of government funding facilities, including the Bank of England's Covid Corporate Finance Facility (CCFF), which was initially used to protect liquidity. The Board took the decision to repay this funding in September 2020, as soon as it became clear that the Group's financial position was improving and the funds were no longer required. The following month, the Board declared the reinstatement of dividends with the announcement of an interim dividend of 3.1 pence per share, which was paid in December 2020.

Launch of Sustainability initiative

Stakeholder alignment
- Customers
- Communities
- Employees

Strategic alignment

The Board launched a new Sustainability initiative in 2020 to explicitly affirm the part Vesuvius is playing in creating a better tomorrow for our planet, our customers, our people and our communities. Vesuvius became a signatory to the UN Global Compact, committing to support its principles on human rights, labour, environment and anti-corruption and to engage in activities which advance the development of the UN's Sustainable Development Goals.

The Board supported the new stretching targets set by management to focus the Group's sustainability efforts, confirming eight non-financial targets for 2020 (with a ninth added for 2021) and setting ourselves the goal of reaching a net zero carbon footprint at the latest by 2050. More information can be found in the Sustainability section on pages 56-89.

Section 172(1) Statement continued

Interests of the Company's employees

> Throughout 2020, whilst seeking to keep the business operational and supporting customers, the Board carefully monitored the impact of the COVID-19 pandemic on all employees. It took the health and safety of our employees as its primary responsibility. It received updates at each Board meeting on the number of people who had tested positive for COVID-19 and the number of people quarantining as a result of contact. It monitored the measures taken throughout the Group to change workplace layouts and practices, and to promote social distancing, the use of personal protective equipment (PPE) and other measures aimed at protecting the health of all employees. It received details of the action being taken to facilitate home-working, together with regular updates on the number of people working from home, and noted the imposition of travel restrictions.

> During 2020, as the Group sought to conserve cash to match the reduced demand for its products, staff around the world were furloughed, put on reduced hours or asked to take annual leave. The Board was cognisant of the financial impact of this on the employees affected and sought to limit the use of such measures to the minimum period necessary. By accessing government support, the Group was able to manage the impact of the pandemic on the workforce seeking wherever possible to reduce to a minimum the number of redundancies associated with it.

> At each Board meeting, the Board received a report on the Group's performance against the Health and Safety KPIs and reviewed, in detail, the circumstances of any Lost Time Injuries that had been recorded since its last meeting.

> The Board approved a new intermediate Safety target for the Group to reach a Lost Time Injury Frequency Rate below 1.0, underpinning its commitment to ensure the safety of the Group's employees and the target of zero accidents. Further information on Safety can be found on pages 74-79.

> As part of the regular schedule of business unit presentations, the Board reviewed progress against the specific HR objectives for each business unit and monitored the initiatives that are being implemented to enhance the career and personal development of employees, and talent development as a whole within the Group.

> At the end of 2020, the Company undertook its second global employee engagement exercise. The Board oversaw this process, which commenced with an engagement survey, aimed at canvassing the opinions of all of our >10,000 employees worldwide. The Board received feedback on the results and considered what this indicated about the culture of the Group. It reviewed management's response to the outcome of the survey and the follow-up actions that would be undertaken throughout the Group. Further information about the survey can be found on page 80.

> Further information about the work of the Board's Committees in considering and supporting the interests of the Company's employees can be found in the Nomination and Remuneration Committee Reports on pages 115-143.

Need to foster the Company's business relationships with suppliers, customers and others

> During 2020, the Board received regular updates from the Chief Executive on the actions being taken throughout the Group to ensure continuity of supply for the Group's customers despite the impact of the COVID-19 pandemic. The Board received detailed analysis of the impact of COVID-19 on the Group's significant customers along with information on the availability of raw materials, logistics support and the impact of the pandemic on the Group's suppliers.

> The Board received presentations from the business unit Presidents and President Operations and Technology on end markets, the Group's relationships with customers and key matters of concern to them. They discussed the steps being taken by the Group to respond to customers' ongoing requirements, and the product research and development, marketing and new product launch strategies being actioned to respond to these. The Board reviewed information on the Group's performance against key manufacturing quality targets each month and was updated at Board meetings on actions undertaken to rectify any significant quality issues or customer complaints. The Board considered market trends at each meeting and undertook a more thorough review of macro-trends and their likely long-term implications at the annual Strategy Meeting.

> The usual Directors' visits to customers were curtailed during 2020, but the Chief Executive kept in regular contact with the Group's key customers, primarily through virtual means, to hear about their immediate challenges and longer-term expectations.

> In addition to understanding business unit-specific procurement issues during the year, the Board also received an update from the Group's Chief Purchasing Officer and discussed the Group's procurement organisation structure, raw material supply, relationships with its suppliers and its purchasing practices.

Impact of the Company's operations on the community and the environment

> In 2020, the Board approved the Group's new Sustainability initiative aimed at ensuring that sustainability is consistently at the front and centre of the Group's strategy. A key tenet of Vesuvius' business has always been to support our customers' efforts to reduce their own environmental footprint and improve safety on the shop floor (especially exposure to hot metal). The Sustainability initiative provides further detail about the Group's efforts in this regard and the actions Vesuvius has committed to take to reduce its own environmental footprint and create a better tomorrow for our people and stakeholders.

> The Board received presentations from the VP HSE and Quality detailing the Group's existing activities with regard to sustainability, including considering the actions being taken in the Group to reduce water and material wastage, to conserve energy and to utilise recycled materials. The Board supported the appointment of a VP Sustainability. Further details of the Board's oversight of the Group's sustainability activities can be found in the Sustainability section on pages 56-89.

> The Board recognises that the success of the Group's operations is dependent on maintaining positive relations with the communities in which they operate. The Board encourages Vesuvius' sites to support their local communities through charitable activities and community events. Throughout the pandemic Vesuvius' sites have been supporting their local communities with donations and assistance. Examples of the Group's activities can be found in the Community section on page 88.

Employee involvement

Vesuvius adopts an open and honest approach to employee communications, with regular updates from senior management across businesses and operations within the Group. In 2020 the majority of these were conducted on a virtual basis. During the initial stages of the COVID-19 crisis the Senior Leadership Group comprising the 160 most senior managers in the Group participated in weekly webcasts with the Group Executive Committee, to ensure clear communication of the actions being taken across the Group in the context of the pandemic. Senior leaders also maintained regular calls with their teams, as lockdown and travel restrictions came into force. These regular webinars became a feature of the Group's approach to management which will be continued – albeit less regularly – on an ongoing basis.

The Board and Group Executive Committee normally visit operations throughout the year, touring the sites, meeting with employees and conducting 'town hall' meetings when they do. These activities were curtailed in 2020 by COVID-19-related travel restrictions. To the extent possible, these were replaced by online or virtual interactions. Other regular employee communications include direct email updates on the financial performance of the Group, the industrial environment in which Vesuvius operates and other significant operational developments. The Company operates an employee intranet which distributes Company news and events, an employee 'app' for information dissemination, as well as undertaking local initiatives for employee engagement on a site-by-site basis.

The HR department is the primary point of contact for employees on employment and workplace matters, operating with an open-door policy and advising employees of any local legal, tax, pension or other employment changes. There are numerous employee-sponsored and led representative bodies within Vesuvius which differ with respect to jurisdiction and geography.

During the year the Group's agreement constituting its European Works Council (EWC) terminated. With the departure of the United Kingdom from the European Union, management nominated Poland as its representative country under the relevant legislation. Management began the process of constituting a Special Negotiating Body to engage in discussions on the formation of a new EWC Agreement and Council.

Senior management, supported and facilitated by the HR department, encourage open dialogue and consult with all employee representative bodies, as appropriate.

All members of the Group Executive Committee participate in the Vesuvius Share Plan and receive awards of Performance Shares, which vest in accordance with measures and targets set against earnings per share (EPS) and total shareholder return (TSR). For certain senior managers, awards are made under the Vesuvius Medium Term Plan (MTP). These managers participate in the MTP at varying percentage levels, and awards are made in shares and based on the same measures and targets as the Annual Incentive Plan. In this way, a broad cadre of management has incentives that are aligned with shareholders' interests.

Employee engagement

In accordance with the UK Corporate Governance Code, Holly Koeppel is the designated Non-executive Director responsible for overseeing engagement with the workforce.

Vesuvius is a diverse, multi-national Group, with four business units, employing more than 10,000 people located in 41 different countries. The Board has adopted an approach that builds on existing engagement initiatives and targets specific issues for attention when considering employee engagement. These processes engage the entire Board and are overseen by Holly Koeppel. The primary mode of engagement for Directors is through direct interaction with the workforce during the Directors' comprehensive range of site visits.

During 2020, these engagement activities were severely curtailed by the COVID-19-related travel restrictions. Whilst the Executive Directors were, initially, able to undertake a number of essential business-related trips to the Group's sites, the Non-executive Directors' visits were limited to a trip by Holly Koeppel to Charlotte, NC. The Non-executive Directors held video calls with senior managers in China and Japan in November, to hear more about the activities of the Group in China and North Asia, respectively. It is hoped that an extensive site visit schedule will be able to be followed in 2021, as soon as travel restrictions allow. Until then, virtual meetings will continue to be scheduled. Whilst Non-executive Director site visits usually present an opportunity for broad discussion, the Group does not operate a central workforce engagement mechanism. As such, the Remuneration Committee did not engage systematically with the workforce during the year to explain how executive remuneration aligns with wider Company pay policies.

Whilst opportunities for direct interaction with employees were limited in 2020, the Board was able to oversee the launch of the Group's second employee engagement survey. This provided the Board with valuable insight into the attitudes, engagement and concerns of employees. This data was analysed in a number of different ways, identifying the results of various sub-groups of employees, providing the Board with a valuable opportunity to track areas of organisational strength and weakness, and ensuring that appropriate follow-up actions are put in place. The Board considered the key workforce-related issues highlighted in the survey and other employee feedback in reviewing management actions with regard to employee engagement. Further information about the survey can be found on page 80.

Section 172(1) Statement continued

Desirability of the Company maintaining a reputation for high standards of business conduct

> The Group's Code of Conduct states that Vesuvius must maintain an unquestioned reputation for integrity. The Board takes seriously the Group's obligation to maintain this high standard of business conduct and assessed compliance with this requirement through a variety of mechanisms during 2020, including reports from Internal and External Audit, along with feedback from the Group's employee engagement survey.

> Vesuvius agrees terms with its suppliers and seeks to pay in accordance with those terms.

> When reviewing the Group's tax strategy, the Board ensured that the Group's approach to tax management reinforced the need for the Company to maintain a reputation for high standards of business conduct.

> In addition, the Board received formal reports during 2020 on the Group's compliance activities, including the Group's risk assessment programme and training practices, and specific issues raised through the Group's Speak Up helpline and internal reporting processes. Further details of the Group's compliance activities can be found in the Our communities section on pages 84-89.

Need to act fairly as between members of the Company

> The primary focus of the Board's business decisions is on ensuring the long-term sustainability of the Group. The Board recognises that, in seeking to maintain long-term profitability, the Group is reliant on the support of all of its stakeholders, including the Group's workforce, its customers, suppliers and the communities in which its businesses operate.

> In taking capital allocation decisions during 2020, the Board was cognisant of the need to balance the interests of different stakeholders. As the full extent of the pandemic became clear, the Board moved quickly to focus on liquidity and cash preservation, taking the difficult decision to withdraw its recommendation to pay the final dividend for 2019 of 14.3 pence per share, whilst at the same time recognising that the Group had placed staff on furlough, reduced working hours, curtailed capital expenditure and reduced operational expenditure. The Board also carefully considered its approach to investment opportunities, capital expenditure, R&D and investment in people during the year, given the need to balance the interests of all stakeholders.

Relations with shareholders

The Board is committed to communicating with shareholders and other stakeholders in a clear and open manner and seeks to ensure effective engagement through the Company's regular communications, the AGM and other investor relations activities. During 2020, the Company undertook an ongoing programme of meetings with investors, managed by the Investor Relations team. The majority of these meetings were led by the Chief Executive and Chief Financial Officer, and during 2020 a large portion were conducted by virtual means.

In advance of each AGM, we write to our largest shareholders inviting discussion on any questions they might like to raise and making the Chairmen of the Board, the Audit Committee and the Remuneration Committee available to meet shareholders should they so wish.

In 2020, we engaged with shareholders on the Group's remuneration proposals, further details of which can be found in the Directors' Remuneration Report on page 122.

The Company reports its financial results to shareholders twice a year, with the publication of its annual and half-year financial reports. In addition, to maintain transparency in performance, we also issued a number of trading updates during 2020. Presentations or teleconference calls were held by the Chief Executive and Chief Financial Officer with institutional investors and analysts on each of these dates.

In a normal year all the Directors attend the Company's AGM, providing shareholders with the opportunity to question them about issues relating to the Group, either during the meeting or informally afterwards.

In 2020 travel restrictions operating in the UK curtailed attendance at the AGM. The Group will revert to its more normal format once COVID-19-related restrictions are removed.

WE ARE

EXPERT

Vesuvius supports my career ambitions by **providing opportunities** for additional experience and growth.

Talicia Temelkovski
Account Manager – Iron and Steel, Advanced Refractories
Port Kembla, Australia

Section 172(1) Statement continued

Our stakeholders

Why we engage	Types of engagement undertaken	Issues relevant to the stakeholder group
Our people The dedication and professionalism of our people, their capacity for owning their roles and their drive for results are the most significant contributors to Vesuvius' success. We focus on the health and safety of all our staff, and engage with our people, encouraging and rewarding high performance to create an environment where all can realise their individual potential.	Fundamental focus on health and safety and the care of all employees Continuing dialogue between employees and their managers, including the conduct of regular performance reviews Competitive remuneration and benefits strategy, emphasising talent development with tailored career-stage programmes. Living the Values and other award schemes celebrate individual achievements Global communication mechanisms include an internal intranet, global email communications and a Vesuvius app, alongside forums such as local 'town hall' meetings. The Group is reconstituting its European Works Council, operates local works councils and recognises trade unions Wide-ranging internal training is offered on key job-related issues, with programmes such as the Vesuvius University – HeaTt – and the Foseco University In a normal year many businesses operate family days, when the facility is open to friends and family. In 2020 these activities were not possible	Personal development Health and safety Diversity and inclusion Remuneration evolution International mobility Employee engagement Development and retention Career opportunities Sustainability performance
Students and graduates Attracting new talent to Vesuvius is vital. Recruiting new students and graduates feeds the talent pipeline and allows us to tap into new sources of up-to-date business ideas and R&D capability.	The Group maintains contact with universities and undertakes R&D collaborations to identify and develop talent, and complement our in-house R&D capability Our businesses attend careers fairs and provide student work placements and internships. University visits and student interactions were limited by COVID-19 restrictions in 2020 Vesuvius' website provides prospective applicants with detailed information about the Group	Career opportunities, personal development, engagement and retention Research and innovation Training and mobility Business sustainability
Customers Engaging with our customers helps us to understand their needs and identify opportunities and challenges. Collaborating with our customers enables us to use our expertise to improve the safety and efficiency of their manufacturing processes, enhance their end-product quality and reduce their costs.	Senior-level dialogue is maintained with all key customers. In a normal year the Directors regularly visit customers' sites . In 2020 visits were not possible Our business model focuses on collaboration with customers, to provide customised solutions, and more than 2,500 Vesuvius representatives are embedded at customer locations The Group manages customer relationships on a global basis as required, complemented by diverse local servicing capability We engage with customers on safety leadership and support their training requirements. In 2020 virtual training initiatives were set up We provide technical customer training, including the Foseco University, and participate in industry forums and events. In 2020 these interactions had to be conducted virtually with more focus on e-learning	Customer satisfaction Product performance and efficiency Innovation and provision of solutions Health and safety Sustainability performance
Suppliers and contractors Maintaining a flexible workforce through the use of contractors and cost-effective access to high-quality raw materials is vital to our success. Our contractors and suppliers are critical to our business.	In a normal year Vesuvius conducts regular visits to key suppliers. In 2020 opportunities for such visits were more limited Senior-level relationships are built with large suppliers. In 2020 virtual meetings were conducted All suppliers/brokers have regular interaction with the Global Purchasing Team Dedicated category directors build long-term relationships and product expertise There is a rigorous and consistent supplier accreditation procedure Effective working protocols, including work risk assessments, are established with contractors	Operational performance Responsible procurement Trust and ethics Payment practices
Investors Continued access to funding is vital to the performance of our business. We work to ensure that our investors have a clear understanding of our strategy, performance and objectives. Supportive investors are more likely to provide the Company with funds for expansion.	Vesuvius' Investor Relations Strategy managed by the Group Finance Director and Chief Executive includes regular meetings with key and prospective investors The Group's Annual Report provides an overview of the Group. Regular announcements and press releases are published to provide updates on the Group's performance and progress The AGM provides all shareholders with an opportunity to directly engage with the Board There is ongoing dialogue with the Company's analysts to address enquiries and promote the business	Financial performance Strong governance and transparency Sustainability performance Diversity and inclusion Director remuneration Board performance
Lenders (Banks and debt investors) The Group needs to access funding to ensure it has sufficient financing to run the business and fund future growth. We ensure that our relationship banks have a clear understanding of our strategy, performance and objectives. We engage with lenders to fulfil our compliance obligations and to ensure that we have clear knowledge and awareness of market sensitivities and trends.	Group Treasury maintains an ongoing dialogue with key lenders through the relationship banks and other local banks in the countries in which Vesuvius operates. In 2020 this dialogue was maintained by virtual means The Group Treasurer, Group Head of Corporate Finance and CFO hold regular meetings with key personnel from banks and other lenders who provide the Group's debt funding. In 2020 these meetings were held virtually Representatives from the banks are invited to the Group's results presentations In 2020 almost all dialogue with lenders moved online with extensive use of video-conferencing	Financial performance Group internal control and audit processes Strategic planning and ability to repay debt Gearing and monitoring of financial covenant ratios Business continuity planning Transparency/ ethical behaviour
Communities We are committed to maintaining positive relationships with the communities in which we operate. Our social responsibility activities complement our Values and we encourage our employees to engage with communities and groups local to our operations.	In a normal year the Group provides work experience and internships to local university and school children. Such activities were curtailed by the impact of COVID-19 in 2020 Sponsoring of charitable activities Participation in local volunteering initiatives In 2020 community outreach was significantly curtailed. Our sites provided essential PPE and, in many cases, also engaged in other health-related activities in our communities	Operational performance Transparency and ethical behaviour Environmental performance
Environmental agencies and organisations Good environmental management is aligned with our focus on cost optimisation and operational excellence. We engage with appropriate organisations to ensure that we are complying with regulatory requirements, and to publicise our performance.	Signatory to the UN Global Compact Online Sustainability Report to be published in 2021 Visits and inspection of sites by government agencies Annual Report and Financial Statements Response to environmental research as part of customer and supplier due diligence Participation in environmental and social responsibility research and questionnaires	Governance and transparency Operational performance Reporting on performance metrics
Governments and regulatory agencies National governments set the regulatory framework within which we operate. We engage where appropriate to ensure that we can help in shaping new policies, regulations and standards, and ensure compliance with existing requirements.	Transparent communication with government officials as required Participation in appropriate government and industry working groups Membership of industry associations and contribution to best practice guidance Lobbying and direct contact with appropriate bodies on key business issues	Trust and ethics Governance and transparency
Pensioners and deferred pensioners Providing for and managing future pension liabilities in our defined benefit schemes is an important part of our financial planning.	Ongoing contact with members of the Group's pension plans, including annual member updates and contact on specific regulatory developments Regular contact with the trustees and custodians of the Group's benefit plans, as appropriate	Financial performance

Risk, viability and going concern

The Board continually monitors the internal and external risks that could significantly impact the Group's long-term performance

The Group undertakes a continuous process to review and understand existing and emerging risks.

Risk management in 2020

The Board's oversight of principal risks involves a specific review of the processes by which the Group manages those risks. This establishes a clear understanding at Board level of the individuals and groups within the business formally responsible for the management of specific risks and the mitigation in place to address them. The Board also establishes the Group's risk appetite, considering the nature and extent of the principal risks that the Group should take and the associated adequacy of the steps being taken to mitigate them.

The Board has overall responsibility for establishing and maintaining a system of risk management and internal control, and for reviewing its effectiveness. The Group undertakes a continuous process of risk identification and review, which includes a formal process, conducted annually for mapping risks from the bottom up, with each major business unit and key operational, senior functional and senior management staff identifying their principal risks. This assessment undergoes a formal review at half-year. The results are compiled centrally to deliver a coordinated picture of the key operational risks identified by the business. These are further reviewed by the Group Executive Committee. In conjunction with this process, each Director contributes their individual view of top-down strategic risks facing the Group – drawing on their broad commercial and financial experience gained both inside and outside the Group. The results of this assessment are then overlaid on the internal assessment of risks to build a comprehensive analysis of existing and emerging risk. This review process extends to cover both financial and non-financial risks, and considers the risks associated with the impact of the Group's activities on employees, customers, suppliers, the environment, local communities and society more generally. As in previous years, in 2020 the Group's assessment of principal risks was also reviewed and considered against any emerging risks and uncertainties that were identified through our Board review process.

The Board continues to monitor the implications of certain other emerging 'macro' trends such as automation in manufacturing and increasing digitalisation and electrification, which could act as disruptors to industry. Commentary on some of these areas is contained in the Our external environment section on pages 16 and 17 of this Report. In addition, the Board monitors the developing issues posed by cyber threats, receiving regular reports on relevant issues in this area, including general developments and concerns specific to the Vesuvius business. Work on maintaining and, where appropriate, improving the integrity of our system security remains an area of focus. See page 111 of the Audit Committee Report for further information. No additional critical macro trends were identified in 2020.

This Report sets out, on page 25, the work done in 2020 to engage with the workforce, and to ensure that Vesuvius fosters an appropriate culture that embeds Vesuvius' Values throughout the Group. This reflects the Board's recognition of the challenges that could arise from a failure by the Group to support the retention of the appropriate talent and to foster the correct culture for success. Whilst the travel restrictions imposed in 2020 curtailed the Directors' face-to-face engagement with staff around the world, they continued where possible to solicit feedback to ensure that the Group was taking the necessary steps to mitigate risk in this area.

The Directors' views on each of the above issues, and on emerging risks in general, were independently gathered and integrated into the management discussions and actions taken on risk.

Risk remains an integrated part of all business unit presentations to the Board, informing the Board of the operational approach taken to risk management on a day-to-day basis.

Changes to risk in 2020

As with most companies, the COVID-19 pandemic impacted the Group's staff, customers, shareholders and suppliers as well as the Group's financial performance. With the economic and social pressures brought about by COVID-19 during 2020, the Board continued to focus on the Group's existing and emerging risks, and the processes to mitigate and manage them.

A key mitigant in 2020 was our devolved decision-making structure and empowered regional managers, who responded swiftly to issues as they arose, relying both on Group processes and resources, and acting to respond to specific local circumstances.

Issues identified by certain of the Group's Principal Risks materialised during the year. The Group's existing measures in mitigation were initiated and additional actions taken specific to the challenges posed by the COVID-19 pandemic. These were most notably:

> End Market Risk: Vesuvius experienced a drop in demand for its products, with an associated impact on revenue, driven by the impact of COVID-19 on the Group's end markets. Our geographic diversification shielded us from an acute impact on revenue, and we flexed our cost base to respond to the drop in demand. Other mitigating factors came into play, with our focus on working capital management and credit control, and close monitoring of manufacturing performance. The Group also accessed government initiatives around the world to ease the financial impact, taking advantage of Tax Deferral schemes, and temporarily seeking additional government financing, and furlough financial support.

> People, Culture and Performance: The Values of Vesuvius have never been more at the fore. At the start of the crisis, across the world our staff worked tirelessly to provide support for travel/repatriation, changes to office and site working conditions, the provision of increased PPE, IT connectivity, and staying connected with a significantly increased body of remote workers. The Group strengthened its internal communication with weekly interactive calls from the Chief Executive and Group Executive Committee, a bi-weekly newsletter, regular Chief Executive messages and the sharing of best practices, successes and news from around the Group. The focus on Values was maintained, involving employee family initiatives, and continuing our Living the Values Awards competition. Where physical meetings had been expected, these were moved online, including the Group's annual Senior Leaders' conference.

> Business interruption: Whilst the Group suffered some disruption in its manufacturing processes, driven predominantly by government shutdowns, management responded swiftly and effectively to reduce this impact, minimising plant closures and downtime, and maintaining our ability to supply customers safely. Our management's responsiveness has also resulted in other risks not being manifest, with product quality remaining at its high level, our safety culture driving key responses to protect employees and our continued investment in R&D and market-leading research. Finally, the Group's IT function supported the transition of around 2,000 employees to work from home, increasing server capacity, rolling out technology and expanding, as appropriate, the Group's programme of cyber security and controls.

> Health and Safety: Our very strong focus on health and safety and the consistency of its application across the Group placed us extremely well to respond to the pandemic's challenges. We adapted production layouts to allow for social distancing, implemented site-by-site safety plans, ensured the availability of appropriate PPE and were able to respond to government requirements on a country-by-country basis while keeping our sites operating. We established weekly group-wide reporting on instances of COVID-19, supporting our staff who were affected, or who needed to self-isolate.

The Board also monitored the effect of the pandemic on other risks, where it considered it could have a specific or longer-term effect. Whilst the Group saw the beginnings of a recovery towards the end of 2020, there still remains uncertainty about the longer-term economic effects of the pandemic. Similarly, further protectionism remains possible, though this has not specifically been manifested in the Group's business as a result of the pandemic. Finally, the social impact of the pandemic remains at the forefront of the Board's concerns, both in relation to our communities and workforce, and in the individual health – both mental and physical – of our staff as we continue to adapt to different ways of working.

Overall, the Board has not identified any material change to the Group's principal risks and uncertainties during the year and the COVID-19 pandemic did not give rise to any change in the Principal Risks previously identified by the Group. As such, the Group's statement of Principal Risk and Uncertainties was unchanged in 2020 from 2019.

Risk, viability and going concern continued

Climate Change

The Group's risk management processes also incorporate consideration of the potential impact of climate-related risks on the Group. The Group does not regard climate change itself to represent a material stand-alone risk for the Group's operations. However, a significant proportion of the Group's revenue is generated from Steel manufacture and automotive castings, industries that are under transition as a result of their focus on improving environmental performance. As such, the opportunities in the Group's business strategy, which is founded on helping our customers to improve their manufacturing efficiency and the quality of their products – and therefore reduce their climate impact – will play a critical part in the development of the Group going forward. The Group recognises that climate change could present further uncertainty for the Group in terms of increasing climate change-related regulations, evolution of the geographical distribution of our customer base and the costs of meeting more onerous disclosure requirements.

ESG is identified as a separate element of the Group risk register – recognising the work Vesuvius can do to mitigate the environmental impact of our customers' processes. Other elements of this risk are incorporated into the appropriate Principal Risk and Uncertainties that the Group has identified. The Group continues to focus internally on the action we can take to drive our business' sustainability. In 2020, the Group adopted a new Sustainability initiative, which sets out the Group's approach to environmental issues, sets targets in specific areas and, as such, seeks to mitigate issues such as the increasing costs of energy, and the potential reduction in capital accessibility as investor sentiment focuses on environmentally-conscious companies.

Brexit

As we have previously noted, for our customers located in the EU27 countries, most of our products are manufactured by Vesuvius outside the UK, so we did not envisage a material impact from Brexit after the expiry of the Transition Period. To date this has been borne out in our experience. For those customers located in the UK or located in the EU27 and supplied from our UK plants, we have contingency plans and we continue to work with these customers to meet their needs in a cost-efficient way.

Risk mitigation

The Principal Risks identified are actively managed in order to mitigate exposure. Senior management 'owners' have been identified for each principal risk, and they manage the mitigations of that specific risk and contribute to the analysis of its likelihood and materiality. This analysis is reported to the Board. The risks are analysed in the context of our business structure which gives protection against a number of principal risks we face with diversified currencies, a widespread customer base, local production matching the diversity of our markets and intensive training of our employees. Additionally, we seek to mitigate risk through contractual measures. Where cost-effective, the risk is transferred to insurers.

Business continuity

In partnership with our risk management advisers and our insurers, we seek to identify the most effective means of reducing or eliminating insurable risks, through a combination of risk management and the placing of insurance cover.

Our Insurer Property Loss Control Programme is based upon insurer loss modelling and focuses on insured losses. The insurer's loss control engineers undertake a series of on-site inspections focused on machinery breakdown, fire, natural catastrophe and other property damage and business interruption risks. These surveys yield a series of loss-reduction recommendations. The execution of these recommendations is agreed with site management and then followed through to completion.

In parallel, Vesuvius' own loss management programme focuses on strategic sites and sites not covered by insurers. Assisted by an independent consultant, we undertake property loss control and business continuity surveys using Vesuvius' bespoke risk and exposure-based protocol.

These reports yield further risk reduction recommendations, and improvement actions and timescales are agreed and followed through by site management. To support the Group's loss control activities, risk management workshops are conducted covering loss prevention, emergency planning, crisis management and business recovery.

With regard to fire safety, the Group monitors all fire-related near misses or minor dangerous occurrences. Any fires, including overheating, are reported and analysed locally and by senior HSE management in order that safety improvement initiatives can be prioritised. Underlying causes are established with detailed analysis undertaken as a means of proposing improvement priorities in order that safety and process safety initiatives can be targeted on a risk-assessed basis.

The Group's Cyber Security Committee meets on a regular basis to review and progress the Group's plans for tackling cyber issues, and the Audit Committee receives regular updates on the Group's activities in this area. A comprehensive plan is in place to strengthen Vesuvius' overall IT security, and this is continually adapted as new risks emerge. During 2020 we conducted further work to strengthen our IT security and focused on mitigating risks in Operations Technology in response to the changing dynamics of external cyber threats. A holistic approach is taken to addressing cyber challenges, focusing on the improvement of the Group's overall IT infrastructure, procedures and framework. The Group continues to run regular training programmes on cyber/IT security.

Internal control

The Group's internal control system is designed to manage, rather than eliminate, the financial risks facing the Group and safeguard its assets. No system of internal control can provide absolute assurance against material misstatement or loss. The Group's system is designed to provide the Directors with reasonable assurance that problems are identified on a timely basis and are dealt with appropriately.

The Audit Committee assists the Board in reviewing the effectiveness of the Group's system of internal control, including financial, operational and compliance controls, and risk management systems. The key features of the Group's system of internal control are set out in the table opposite.

Reviewing the effectiveness of risk management and internal control

The internal control system covers the Group as a whole and is monitored and supported by the Group's Internal Audit function, which conducts reviews of Vesuvius' businesses and reports objectively both on the adequacy and effectiveness of the system of internal control and on those businesses' compliance with Group policies and procedures. The Audit Committee receives reports from the Group Head of Internal Audit and reports to the Board on the results of its review.

Key features of risk management and internal control

Strategy and financial reporting	> Comprehensive strategic planning and forecasting process > Annual budget approved by the Board > Monthly operating financial information reported against budget > Key trends and variances analysed and action taken as appropriate
Vesuvius GAAP	> Accounting policies and procedures formulated and disseminated to all Group operations > Covers the application of accounting standards, the maintenance of accounting records and key financial control procedures
Operational controls	> Operating companies and corporate offices maintain internal controls and procedures appropriate to their structure and business environment > Compliance with Group policies on items such as authorisation of capital expenditure, treasury transactions, the management of intellectual property and legal/regulatory issues > Use of common accounting policies and procedures and financial reporting software used in financial reporting and consolidation > Significant financing and investment decisions reserved to the Board > Monitoring of policy and control mechanisms for managing treasury risk by the Board > Clearly delegated authority for capital expenditure, purchasing, customer contracts and hiring
Risk assessment and management	> Continuous process for identifying, evaluating and managing any significant risks > Risk management process designed to identify the key risks facing each business > Reports made to the Board on how those risks are managed > Each major Group business unit produces a risk map to identify key risks, assess the likelihood of risks occurring, as well as their impact and mitigating actions > Top-down risk identification undertaken at Group Executive Committee and Board meetings > Board review of insurance and other measures used in managing risks across the Group > The Board is notified of major issues and makes an annual assessment of how risks have changed > Ongoing assurance processes by the legal function and Internal Audit including the annual self-certification process > Externally supported 'Speak Up' whistleblowing line
Internal Audit	> Reviews Vesuvius' businesses and reports on the adequacy and effectiveness of their systems of internal control and compliance with Group policies and procedures > Agrees action plans for the resolution of any improvement actions identified by their audits, and monitors with local management and the business unit Presidents, progression with their completion > Reports to the Audit Committee on the results of each audit and provides regular updates on high-priority action items > The Audit Committee discusses the key risks identified by Internal Audit

The Group also conducts a self-certification exercise by which senior financial, operational and functional management certify the compliance throughout the year of the areas under their responsibility with the Group's policies and procedures and highlight any material issues that have occurred during the year.

As part of the Board's process for reviewing the effectiveness of the system of internal control, it delegates certain matters to the Audit Committee.

Following the Audit Committee's review of internal financial controls and of the processes covering other controls, the Board annually evaluates the results of the internal control and risk management procedures conducted by senior management.

Since the date of this evaluation, there have been no significant changes in internal controls or other matters identified which could significantly affect them.

In accordance with the provisions of the UK Corporate Governance Code, the Directors confirm that they have carried out a robust assessment of the principal risks facing the Company, including those that threaten its business model, future performance, solvency or liquidity. They have also reviewed the effectiveness of the Group's system of internal control and confirm that the necessary actions have been taken to remedy any control weaknesses identified during the year and to the date of this report.

Further detail regarding the Audit Committee's review of the effectiveness of the Group's risk management and internal control systems is contained in the Audit Committee report on pages 110 and 111.

Risk, viability and going concern continued

Principal risks

The risks identified on pages 36 and 37 are those the Board considers to be the most relevant to the Group in relation to their potential impact on the achievement of its Strategic Objectives. All of the risks set out on these pages could materially affect the Group, its businesses, future operations and financial condition, and could cause actual results to differ materially from expected or historical results. As a result of COVID-19 there is heightened focus on risks and their mitigation, but the Principal risks remain the same. These risks are not the only ones that the Group will face. Some risks are not yet known and some currently not deemed to be material could become so.

Viability Statement

In accordance with the UK Corporate Governance Code, the Directors have assessed the viability of the Group over a three-year period to 31 December 2023, taking into account the Group's current position and the potential impact of the principal risks and uncertainties. The Directors have determined that three years is an appropriate period over which to provide the Viability Statement because this is the Company's planning cycle and it is sufficiently funded by financing facilities with average maturity terms of approximately six years. In making this statement, the Directors have carried out a robust assessment of the principal risks that may threaten the business model, future performance, solvency and liquidity of the Group. This is embodied in the annual review of a three-year business plan which includes a review of sensitivity to 'business as usual' risks, such as profit growth and working capital variances, severe but plausible events and the impact these could have on the Group's debt covenants and available liquidity. The results take account of the availability and likely effectiveness of the mitigating actions that could be taken to avoid or reduce the impact or occurrence of the underlying risks. Whilst the review has considered all the principal risks identified by the Group, the following were selected for enhanced stress testing: an unplanned drop in customer demand; debt recovery risk due to customer default; business interruption due to the unplanned closure of several key plants; and raw material price inflation. The Group's prudent balance sheet management, flexible cost base able to react quickly to end-market conditions, access to long-term capital at acceptable financing costs and well-diversified international businesses leave it well placed to manage these principal risks. In performing the stress testing, certain assumptions were made, including that: customer failures result in write-offs of the full value of the receivables with no lost revenue replacement; and cash flow is supported by working capital releases, restricted capital expenditure and operating cost reductions.

These sensitivities were applied to our actual performance in 2020, which has already been significantly impacted by the COVID-19 pandemic, with sales declining c.15% compared to 2019. Under the enhanced stress testing described above, a potential breach of a covenant would only occur in the event of an unforeseen reduction in revenue of greater than 20% from the level achieved in 2020. Accordingly, the Directors confirm that they have a reasonable expectation that the Group will be able to continue in operation and meet its liabilities as they fall due over the three-year period to 31 December 2023. Furthermore, the Board believes that the Group continues to be well positioned for success in the longer term because of: our exposure to end-markets that are growing faster through the cycle than underlying global GDP; our market-leading position that is supported by ongoing investment in innovation and R&D; our strong degree of customer intimacy with around a third of our employees working at customer facilities; and the focus we have on building quality teams with clear organisational responsibility.

Going Concern Statement

The COVID-19 pandemic has had a significant impact on business activity in all of Vesuvius' end markets. The World Steel Association reported that, in 2020, steel production in the world (excluding China) declined 8.2% year-on-year. The impact on our Foundry division has been even greater, primarily as a result of significant declines in automotive production.

The impacts of COVID-19 on the Group have included:

> A c.15% decline in revenues in 2020 compared with the same period in 2019

> The temporary and short-lived closure of our plants in South Africa, Malaysia and India due to national lockdowns. As of 1 May 2020, all operations had been reopened

In response to the sudden and significant decline in business activity, the Group took the following actions:

> Significant cost reduction and cash preservation initiatives, in addition to the £20.6m of recurring savings from our restructuring programmes which we delivered during the year

> Temporary cost reduction measures delivered savings of £39.0m in 2020 (£15.9m in reduced employment costs, £11.8m in reduced discretionary spend and a reduction in planned employee incentives of £11.3m). The savings resulted from:

  > restricting all discretionary expenses

  > a hiring freeze on all non-critical roles

  > accessing government programmes to reduce labour costs, in line with available local regulatory options, together with other flexible workforce solutions

  > the Board and the Group Executive Committee voluntarily reduced their fees and salary by 20% for six months

> c.£21m (c.34%) reduction in our net capital expenditures in 2020 compared to 2019

> c.£38m saving from withdrawal of the final dividend for 2019

> deferral of tax and social security payments whenever possible in accordance with local legislation

In April 2020, Vesuvius also took steps to boost its liquidity, borrowing £200m from the Bank of England's Covid Corporate Financing Facility (CCFF) programme and raising c.£115m (US$140m) from the US private placement (USPP) market.

The £200m borrowed from the CCFF programme was due to mature in March 2021, but was repaid early in September 2020, as a result of our positive free cash flow generation in the preceding months and early signs of marginally improving levels of business activity. The funds had been drawn down as a liquidity buffer in case of an extreme and prolonged downturn.

The USPP fundraising raised an amount equivalent to the existing US$140m USPP which was due to mature in December 2020, which we repaid early in August 2020. As a result, our net debt / EBITDA covenant increased to 3.25x from 3.0x previously. Excluding IFRS 16 lease liabilities, which is consistent with the calculation under our debt covenants, net debt / LTM EBITDA was 1.0x at 31 December 2020, broadly in-line with the level at year-end 2019.

The Group's available committed liquidity stood at £437m at year-end 2020, up from £354m at year-end 2019, as a result of the Group's cash flow generation, which benefited from a reduction in working capital due to the decline in business activity.

The Directors have prepared cash flow forecasts for the Group for a period in excess of 12 months from the date of approval of the Financial Statements. These forecasts reflect an assessment of current and future end-market conditions and their impact on the Group's future trading performance. The analysis undertaken includes a plausible and severe downside scenario based on an assumed protracted COVID-19 related demand impact, despite current markets showing emerging confidence in relation to vaccine roll out. This downside case is the 'low' case from a strategic planning exercise which we undertook in October 2020, which was approved by the Board, since when the outlook has improved. In this downside scenario, average revenue is 6% lower than the Group's base case, and the forecasts show that the Group has significant headroom in terms of both available committed liquidity and required compliance with financial covenants.

On the basis of the exercise described above and the Group's available committed liquidity, the Directors consider that the Group and the Company have adequate resources to continue in operational existence for a period of at least 12 months from the date of signing of these Financial Statements and that there is no material uncertainty in respect of going concern. Accordingly, they continue to adopt a going concern basis in preparing the Financial Statements of the Group and the Company.

Viability process

Identify
Viability time horizon and risk analysis framework

Assess
Principal risks and stress scenarios

Model
Viability against risk scenarios, examining probabilities and impacts

Report
See Viability Statement

WE ARE INTERNATIONAL

Working with a **truly international** company like Vesuvius offers our people **incredible opportunities** to expand their experience and skills.

Roberto L Castro
Marketing & Technology Manager – Binders & Molding Materials
Foundry Technologies, São Paulo, Brazil

Principal risks and uncertainties

Risk	Potential impact	Mitigation
End-market risks Vesuvius suffers an unplanned drop in demand, revenue and/or margin because of market volatility beyond its control Strategic alignment	Unplanned drop in demand and/or revenue due to reduced production by our customers Margin reduction Customer failure leading to increased bad debts Loss of market share to competition Cost pressures at customers leading to use of cheaper solutions	Geographic diversification of revenues Product innovation and service offerings securing long-term revenue streams and maintaining performance differential Increase in service and product lines by the development of the Technical Services offering R&D includes assessment of emerging technologies Manufacturing capacity rationalisation and flexible cost base Diversified customer base: no customer is greater than 10% of revenue Robust credit and working capital control to mitigate the risk of default by counterparties
Protectionism and globalisation The Vesuvius business model cannot adapt or respond quickly enough to threats from protectionism and globalisation Strategic alignment	Restricted access to market due to enforced preference of local suppliers Increased barriers to entry for new businesses or expansion Increased costs from import duties, taxation or tariffs Loss of market share Trade restrictions	Highly diversified manufacturing footprint with manufacturing sites located in 26 countries Strong local management with delegated authority to run their businesses and manage customer relationships Cost flexibility Tax risk management and control framework together with a strong control of inter-company trading
Product quality failure Vesuvius staff/contractors are injured at work or customers, staff or third parties suffer physical injury or financial loss because of failures in Vesuvius products Strategic alignment	Injury to staff and contractors Product or application failures lead to adverse financial impact or loss of reputation as technology leader Incident at customer plant causes manufacturing downtime or damage to infrastructure Customer claims from product quality issues	Quality management programmes including stringent quality control standards, monitoring and reporting Experienced technical staff knowledgeable in the application of our products and technology Targeted global insurance programme Experienced internal legal function overseeing third-party contracting
Complex and changing regulatory environment Vesuvius experiences a contracting customer base or increased transaction and administrative costs due to compliance with changing regulatory requirements Strategic alignment	Revenue reduction from reduced end-market access Disruption of supply chain and route to market Increased internal control processes Increased frequency of regulatory investigations Reputational damage	Compliance programmes and training across the Group Independent Internal Audit function Experienced internal legal function including dedicated compliance specialists Global procurement category management of strategic raw materials
Failure to secure innovation Vesuvius fails to achieve continuous improvement in its products, systems and services Strategic alignment	Product substitution by customers Increased competitive pressure through lack of differentiation of Vesuvius offering Commoditisation of product portfolio through lack of development Lack of response to changing customer needs Loss of intellectual property protection	Enduring and significant investment in R&D, with market-leading research A shared strategy for innovation throughout the Group, deployed via our R&D centres Stage gate process from innovation to commercialisation to foster innovation and increase alignment with strategy Programme of manufacturing and process excellence Quality programme, focused on quality and consistency Stringent intellectual property registration and defence

Risk	Potential impact	Mitigation
Business interruption Vesuvius loses production capacity or experiences supply chain disruption due to physical site damage (accident, fire, natural disaster, terrorism), industrial action, cyber attack or global health crisis Strategic alignment	Loss/closure of a major plant temporarily or permanently impairing our ability to serve our customers Damage to or restriction in ability to use assets Denial of access to critical systems or control processes Disruption of manufacturing processes Inability to source critical raw materials	Diversified manufacturing footprint Disaster recovery planning Business continuity planning with strategic maintenance of excess capacity Physical and IT control systems security, access and training Cyber risks integrated into wider risk-management structure Well-established global insurance programme Group-wide safety management programmes Dual sourcing strategy and development of substitutes
People, culture and performance Vesuvius is unable to attract and retain the right calibre of staff, fails to instil an appropriate culture or fails to embed the right systems to drive personal performance in pursuit of the Group's long-term growth Strategic alignment	Organisational culture of high performance is not achieved Staff turnover in growing economies and regions Stagnation of ideas and development opportunities Loss of expertise and critical business knowledge Reduced management pipeline for succession to senior positions	Internal focus on talent development and training, with tailored career-stage programmes and clear performance management strategies Contacts with universities to identify and develop talent Career path planning and global opportunities for high-potential staff Internal programmes for the structured transfer of technical and other knowledge Clearly defined Values underpin business culture
Health and safety Vesuvius staff or contractors are injured at work because of failures in Vesuvius' operations, equipment or processes Strategic alignment	Injury to staff and contractors Health and safety breaches Manufacturing downtime or damage to infrastructure from incident at plant Inability to attract the necessary workforce Reputational damage	Active safety programmes, with ongoing wide-ranging monitoring and safety training Independent safety audit team Quality management programmes including stringent manufacturing process control standards, monitoring and reporting
Environmental, Social and Governance criteria Vesuvius fails to capitalise on the opportunity to help its customers significantly reduce their carbon emissions as environmental pressure grows on the steel industry or Vesuvius fails to meet the expectations of its various stakeholders including employees and investors Strategic alignment	Loss of opportunity to grow sales Loss of opportunity to increase margin Loss of stakeholder confidence including investors Reputational damage	Development and implementation of a new Sustainability initiative, which includes stretching targets focused on reducing the Group's Energy usage, CO_2 emissions, waste and recycled materials R&D focus on products that assist customers to reduce carbon emissions and improve their own sustainability measures Skilled technical sales force to develop efficient solutions for our customers Globally disseminated Code of Conduct sets out standards of conduct expected and ABC Policy adopted with a zero tolerance regarding bribery and corruption Internal Speak Up mechanisms to allow reporting of concerns Extensive use of due diligence to assess existing and potential business partners and customers

Strategic alignment

- Deliver growth
- Generate sustainable profitability and create shareholder value
- Maintain strong cash generation and an efficient capital structure
- Provide a safe working environment for our people
- Be at the forefront of innovation
- Run top-quality, cost-efficient and sustainable operations
- Foster talent, skill and motivation in our people

See more about Our strategy on p14 and 15

Our performance

Find out more at
report2020.vesuvius.com

WE ARE

SUSTAINABLE

I work for a company that is genuinely doing what it can to cut our impact on the **environment** and **help our customers** do the same.

Purushottam Bedare
Head, Cement Business
Advanced Refractories
Vizag, India

Key Performance Indicators

Financial KPIs*

Strategic alignment	KPI	Purpose	Link to remuneration
Deliver growth	**Underlying revenue growth** % 2020 -12.7 2019 -5.7 2018 10.7	Provides an important indicator of organic (like-for-like) growth of Group businesses between reporting periods. This measure eliminates the impact of exchange rates, acquisitions, disposals and significant business closures	
Generate sustainable profitability and create shareholder value	**Trading profit** £m 2020 101.4 2019 181.4 2018 197.2	Used to assess the trading performance of Group businesses	**Vesuvius Share Plan** – Read more about this on p138 and 139
	Return on sales % 2020 7.0 2019 10.6 2018 11.0		
	Headline profit before tax £m 2020 91.6 2019 171.4 2018 188.9	Used to assess the financial performance of the Group as a whole	
	Headline EPS p 2020 23.2 2019 45.1 2018 49.6	Used to assess the underlying earnings performance of the Group as a whole	**Annual Incentive Plan and Vesuvius Share Plan** – Read more about this on p135-139
	Return on net assets % 2020 16.0 2019 26.4 2018 30.4	Used to assess the financial performance and asset management of the Group	
Maintain strong cash generation and an efficient capital structure	**Free cash flow** £m 2020 113.5 2019 121.5 2018 102.6	Used to assess the underlying cash generation of the Group. One of the factors driving the generation of free cash flow is the average working capital to sales ratio, which indicates the level of working capital used in the business	**Annual Incentive Plan** – Read more about this on p135 and 136
	Average working capital to sales % 2020 23.2 2019 24.0 2018 23.9		
	Interest cover 2020 14.5x 2019 22.9x 2018 22.8x	These two ratios are used to assess the financial position of the Group and its ability to fund future growth	
	Net debt to EBITDA 2020 1.2x 2019 1.1x 2018 1.0x		

* For definitions of alternative performance measures, refer to Note 4 of the Group Financial Statements.

Non-financial KPIs

Strategic alignment	KPI	Description/target	Link to remuneration
Provide a safe working environment for our people	**Lost time injury frequency rate** 2020 1.12 2019 1.55 2018 1.42	LTIFR of below 1 Work-related illness or injuries which resulted in an employee being absent for at least one day – measured per million hours worked	**Annual Incentive Plan** – Read more about this on p135 and 136
Be at the forefront of innovation	**Total R&D spend** £m 2020 27.9 2019 28.9 2018 33.9	At constant 2020 currency	**Annual Incentive Plan** – Read more about this on p135 and 136
	New product sales % 2020 12.4 2019 16.3 2018 15.4	Sales of products launched within the last five years as a % of total revenue	
Run top-quality, cost-efficient and sustainable operations	**Total energy consumption** kWh per metric tonne of product packed for shipment -3.4%	10% reduction of energy consumption per metric tonne of product packed for shipment by 2025 (vs 2019)	**Annual Incentive Plan** – Read more about this on p135 and 136
	Energy CO_2e emissions -3.9%	10% reduction of Scope 1 and Scope 2 Energy CO_2e emissions per metric tonne of product packed for shipment by 2025 (vs 2019)	
	Waste water -7.5%	25% reduction of waste water per metric tonne of product packed for shipment by 2025 (vs 2019)	
	Solid waste -16.1%	25% reduction of solid waste (hazardous and sent to landfill) per metric tonne of product packed for shipment by 2025 (vs 2019)	
	Recycled material 5.8%	7% of recovered or recycled materials from external sources to be used by 2025	
	Compliance training 100%	At least 90% of targeted staff to complete Anti-Bribery and Corruption training annually	
Foster talent, motivation and skill	**Gender diversity** 20%	30% female representation in Top Management by 2025 (Group Executive Committee plus key direct reports)	**Annual Incentive Plan** – Read more about this on p135 and 136

Financial review

A keen focus on cost savings and cash management helped preserve our balance sheet strength

Our 2020 achievements have proven the resilience of both our business and our dedicated teams.

Guy Young
Chief Financial Officer

£1,458.3m
Revenue

Reported	Underlying[1]
-14.7%	-12.7%

£101.4m
Trading profit[2]

Reported	Underlying[1]
-44.1%	-43.3%

15.3p
Statutory EPS

Reported
-48.7%

7.0%
Return on sales[2]

Reported	Underlying[1]
-360bps	-370bps

1. Underlying basis is at constant currency and excludes separately reported items and the impact of acquisitions and disposals.
2. For definitions of alternative performance measures, refer to Note 4 of the Group Financial Statements.

Basis of preparation

All references in this financial review are to headline performance unless stated otherwise. See Note 4.1 to the Group Financial Statements for the definition of headline performance.

Introduction

In a period of unprecedented global disruption, the Group's overall performance reflects its resilience, founded on its market-leading positions, flexible business model and strong balance sheet. The Group was able to quickly implement cost-saving measures, in addition to the planned savings from our restructuring programme, ensuring that we were able to limit the negative impact of the COVID-19 pandemic on our results. At the same time, strong cash flow generation, a conservative balance sheet and the various cash preservation measures taken, enabled us to maintain high liquidity and significant covenant headroom. Reflecting the Group's performance and strong financial position, the Board felt comfortable declaring an interim dividend in October 2020.

2020 performance overview

The Group performance in 2020 was inevitably affected by the global outbreak of COVID-19 which has materially disrupted our key end markets for both Steel and Foundry Divisions and led to a 12.7% fall in underlying revenue. Reported revenue decreased by £252.1m over the prior year and by £208.9m on an underlying basis. Against this challenging backdrop, the Group was quick to implement decisive cash preservation and cost-saving measures to mitigate the impact of the disruption caused by the pandemic. These decisive measures included, cost savings of £39.0m, efficient management of inventories and receivables and reduction of planned capital expenditure. At the same time, we continued to deliver on our planned restructuring programme, with a total of £20.6m incremental savings reported. Trading profit for the year was £101.4m, 44.1% lower than the prior year. Return on sales for 2020 on a reported basis was 7.0%, lower than the prior year by 360bps. The Group's improving discipline in aligning working capital with sales and managing capital expenditure delivered a strong 173% cash conversion ratio.

The achievement of our 2020 results involved an outstanding effort by all our employees and I want to join our Chairman and Chief Executive in thanking them for their hard work, dedication and professionalism during this challenging year.

Dividend

The Board considers the dividend to be an important component of shareholder returns. However, in April 2020, the Board took the difficult decision to withdraw its recommendation to pay the final dividend of 14.3 pence per share announced with the publication of the full year 2019 results due to uncertain trading conditions and the need to preserve financial flexibility. Reflecting the Group's 2020 performance and strong financial position, the Board declared in October 2020 an interim dividend of 3.1 pence per share. The Board has recommended a final dividend of 14.3 pence, bringing the total dividend for the year to 17.4 pence per share (2019: 6.2 pence per share, following the cancellation of the 14.3p proposed final 2019 dividend). If approved at the Annual General Meeting on 12 May 2021, the final dividend will be paid on 21 May 2021 to shareholders on the register at the close of business on 16 April 2021.

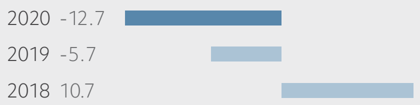
It remains the Board's intention to deliver long-term dividend growth, provided this is supported by underlying earnings, cash flows, capital expenditure requirements and the prevailing market outlook.

Key Performance Indicators

We have identified a number of KPIs against which we have consistently reported. As with prior years, we measure our results on an underlying basis, where we adjust to ensure appropriate comparability between periods, irrespective of currency fluctuations and any business acquisitions and disposals.

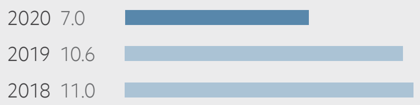
Underlying revenue growth %

-12.7%



Return on sales %

7.0%



This is done by:

> Restating the previous period's results at the same foreign exchange (FX) rates used in the current period

> Removing the results of disposed businesses in both the current and prior years

> Removing the results of acquired businesses in both the current and prior years

Therefore, for 2020, we have:

> Retranslated 2019 results at the FX rates used in calculating the 2020 results

> Removed the results of CCPI, which was acquired during 2019

Objective: Deliver growth

KPI: Underlying revenue growth

Reported revenue for 2020 was £1,458.3m, which equated to £1,436.2m on an underlying basis. Reported revenue for 2019 was £1,710.4m, which equated to £1,645.1m on an underlying basis. 2020 underlying revenue decreased by 12.7% year-on-year, almost entirely as a result of the steep volume of declines due to the COVID-19 pandemic.

Objective: Generate sustainable profitability and create shareholder value

KPI: Trading profit and Return on Sales

We continue to measure underlying trading profit of the Group as well as trading profit as a percentage of sales, which we refer to as our Return on Sales.

Trading profit for 2020 was £101.4m and Return on Sales was 7.0%. On an underlying basis, trading profit decreased by 43.3% and Return on Sales by 370bps. The significant decline in trading profit was driven by the steep decline in revenues due to the pandemic, partially mitigated by cost-saving measures and the ongoing delivery of benefits from the restructuring programmes.

The Steel Division recorded Return on Sales of 7.3%, a 270bps contraction year-on-year, as underlying trading profit fell 36.2% to £72.4m during the period. Return on Sales in the Foundry Division declined 580bps year-on-year to 6.1% in 2020 on the back of a 57.1% reduction in underlying trading profit.

KPI: Headline PBT and Headline EPS

Headline profit before tax (PBT) and headline earnings per share (EPS) are used to measure the underlying financial performance of the Group. The main difference between trading profit and PBT is net finance costs which were £10.9m in 2020, £0.1m lower than 2019.

Our Headline PBT was £91.6m, 46.6% below last year on a reported basis. Including amortisation (£9.9m), restructuring charges (£6.1m), guaranteed minimum pension equalisation charges (£0.8m) and vacant site remediation costs (£10.3m), our PBT of £64.5m was 45.6% lower than 2019. Headline EPS from continuing operations at 23.2p was 48.6% lower than 2019.

KPI: Return on net assets (RONA)

RONA is our principal measure of capital efficiency. We do not exclude the results of businesses acquired and disposed from this calculation, as capital efficiency is an important consideration in our portfolio decisions. It is calculated as trading profit plus share of post-tax profit of joint ventures and associates for the previous 12 months, divided by average net operating assets, at constant currency (being the average over the previous 13 months of property, plant and

Revenue

	2020 Revenue			2019 Revenue				% change	
£m	As reported	Acquisitions/ (disposals)	Underlying	As reported	Currency	Acquisitions/ (disposals)	Underlying	Reported	Underlying
Steel	**1,045.4**	**(22.1)**	**1,023.3**	1,195.3	(29.8)	(23.6)	1,141.9	(12.5%)	(10.4%)
Foundry	**412.9**	**–**	**412.9**	515.1	(11.9)	–	503.2	(19.8%)	(17.9%)
Total Group	**1,458.3**	**(22.1)**	**1,436.2**	1,710.4	(41.7)	(23.6)	1,645.1	(14.7%)	(12.7%)

Trading profit

	2020 Trading profit			2019 Trading profit				% change	
£m	As reported	Acquisitions/ (disposals)	Underlying	As reported	Currency	Acquisitions/ (disposals)	Underlying	Reported	Underlying
Steel	**76.4**	**(4.0)**	**72.4**	120.1	(4.1)	(2.5)	113.5	(36.4%)	(36.2%)
Foundry	**25.0**	**–**	**25.0**	61.3	(2.9)	–	58.4	(59.2%)	(57.1%)
Total Group	**101.4**	**(4.0)**	**97.5**	181.4	(7.0)	(2.5)	171.9	(44.1%)	(43.3%)

Financial review continued

Operating profit £m

£74.3m -41.7%

2020 74.3
2019 127.5
2018 164.5

Headline earnings per share* pence

23.2p -48.6%

2020 23.2
2019 45.1
2018 49.6

Statutory earnings per share pence

15.3p -48.7%

2020 15.3
2019 29.8
2018 51.3

RONA moving average* %

16.0%

2020 16.0
2019 26.4
2018 30.4

Net debt* £m

£175.1m

2020 175.1
2019 245.8
2018 247.8

* For definitions of alternative performance measures, refer to Note 4 of the Group Financial Statements.

equipment, trade working capital, interests in joint ventures and associates, investments, other operating receivables, payables and provisions).

As with most of our KPIs, we measure this on a moving average basis at average exchange rates for the period to ensure that we focus on sustainable underlying improvements. Our RONA for 2020 was 16.0% (2019: 26.4%).

Objective: Maintain strong cash generation and an efficient capital structure

KPI: Free cash flow and working capital

Robust cash management was set as one of the top priorities for the Group, with comprehensive cash preservation actions being successfully implemented in each Division. As a result of these strong cash management initiatives and a reduction in capital expenditure versus 2019, the Group was able to generate adjusted operating cash flow of £175.2m (2019: £217.7m), and a cash conversion rate of 173% (2019: 120%) in the period. Free cash flow was £113.5m in 2020 (2019: £121.5m).

We measure working capital both in terms of actual cash flow movements, and as a percentage of sales revenue. Trade working capital as a percentage of sales in 2020 was 23.2% (2019: 24.0%), measured on a 12-month moving average basis. In absolute terms on a constant currency basis trade working capital decreased by £37.5m in 2020 following the decline in sales and an efficient management of inventories and receivables.

KPI: Net debt and interest cover

During the first half of 2020, the Group accessed the Bank of England's Covid Corporate Financing Facility (CCFF) as a precautionary measure whilst the full impact of the pandemic remained uncertain. We want to thank the Bank of England for their support during this challenging year. We also successfully launched a new US private placement (USPP) note to cover an older tranche that was going to mature in December 2020. In September, we repaid the £200m of debt issued through the CCFF and in August, we repaid the US$140m USPP maturing in December 2020. As at 31 December 2020, the Group had committed borrowing facilities of £586.6m (2019: £609.7m), of which £246.6m was undrawn (2019: £174.2m).

Net debt at 31 December 2020 was £175.1m, a £70.7m decrease from 31 December 2019, including the free cash flow of £113.5m, derivative and foreign exchange adjustments of £17.5m, an increase in leases of £15.7m and a £8.4m dividend paid to shareholders.

At the end of 2020, the net debt to EBITDA ratio was 1.2x (2019: 1.1x) and EBITDA to interest was 14.5x (2019: 22.9x). These ratios are monitored regularly to ensure that the Group has sufficient financing available to run the business and fund future growth.

The Group's debt facilities have two financial covenants: the ratios of net debt to EBITDA and EBITDA to interest (minimum four times limit). The net debt to EBITDA covenant has been raised from 3.0x to 3.25x, following redemption of the USPP Notes in August 2020. The EBITDA to interest covenant is a minimum of 4x. Certain adjustments are made to the net debt calculations for bank covenant purposes, the most significant of which is to exclude the impact of IFRS 16.

Objective: Be at the forefront of innovation

KPI: R&D Spend

We believe that our market-leading product technology and services deliver fundamental value to our customers and that the primary mechanism to deliver that value is to invest significantly in research and development. In 2020, while the major focus was naturally on cost reduction, we protected our investment in R&D and continued to develop market-leading products. In 2020 we spent £27.9m on R&D activities (2019: £28.9m at constant 2020 currency), which represents 1.9% of our revenue (2019: 1.7%).

Financial Risk Factors

The Group undertakes regular risk reviews and, as a minimum, a full risk assessment process twice a year. As in previous years this included input from the Board in both the assessment of risk and the proposed mitigation. We consider the main financial risks faced by the Group as being those posed by a decline in our end-markets, leading to reduced revenue and profit as well as potential customer default. We also monitor carefully the challenges that come from broader financial uncertainty, which could bring lack of liquidity and market volatility. Important but lesser risk exists in interest rate movements, foreign exchange rate movements and cost

WE ARE

INTERNATIONAL

Vesuvius is **truly international** with operations in more than 40 countries, which helps keep us at the **top of our industry**.

Hoai Le – Finance Assistant Manager
Ha Pham – HR Assistant
Huyen Nguyen – Purchasing Executive
Hanh Bui – Customer Service Executive
Nguyet Nguyen – Receptionist
Foundry Technologies, Hanoi, Vietnam

Unutilised committed debt facilities £m

£246.6m

2020 246.6
2019 174.2
2018 119.2

Total R&D spend* £m

£27.9m -3.5%

2020 27.9
2019 28.9
2018 33.9

* At constant 2020 currency.

inflation, but these are not expected to have a material impact on the business after considering the controls we have in place. See Note 25 to the Group Financial Statements.

Our key mitigation of end-market risk is to manage the Group's exposure through balancing our portfolio of business geographically and to invest in product innovation. We do so through targeted capital investment in new and growing businesses and a combination of capital and human resource in emerging markets. When considering other financial risks, we mitigate liquidity concerns by financing, using both the bank and private placement markets. The Group also seeks to avoid a concentration of debt maturities in any one period to spread its refinancing risk. In April 2020, Vesuvius took steps to boost its liquidity, through borrowing £200m from the CCFF programme and raising c.£115m (US$140m) from the USPP market. In August, we repaid in advance the US$140m USPP Notes maturing in December 2020, and in September we repaid the debt issued through the CCFF. As at 31 December 2020, our liquidity stood at £437.3m. See Note 4.20 of the Group Financial Statements.

Restructuring

Despite the significant disruption associated with the COVID-19 pandemic, we successfully progressed with the finalisation of our previously announced restructuring programmes, with £20.6m of recurring savings delivered in 2020 relative to 2019. During the period, we reported £6.1m of restructuring costs (2019: £39.8m) within separately reported items that all related to finalisation of programmes announced in previous years and were predominantly made up of redundancy, plant closure costs and asset write-offs. We are carrying forward into 2021 a restructuring provision of £9.2m, which will be utilised by the end of 2022.

Mitigation actions in response to the COVID-19 pandemic

In response to the pandemic, we implemented several temporary cost-reduction measures that delivered savings of £39.0m for the full year 2020 (£18.6m in Q2, £20.3m in H2). These measures included a reduction of £15.9m in employment costs and £11.8m in discretionary spend, as well as an £11.3m reduction in planned employee incentives.

Financial review continued

Net defined benefit pension deficit £m

£2.1m

2020 2.1
2019 8.5
2018 15.3

During the year, we also suspended some of our planned capital expenditures and we prioritised strategic growth investments, resulting in capex spend of £59.0m (including additions of right of use assets of £15.7m), a reduction of 21% versus 2019.

In the last quarter of 2020, the Group initiated an opex restructuring programme in EMEA, to ensure that it is better positioned for long-term growth and consistent outperformance. This programme has impacted all business units and central functions with a total cost of £5.1m which was fully incurred during the months of November and December in 2020.

Thanks to changes to working practices which will be maintained beyond the end of the pandemic, and together with opex reductions undertaken in Q4 2020, we expect more than £8m of savings to become permanent.

Vacant site remediation

The Group owns a number of disused properties in the US, which do not form part of our trading operations. Costs are being incurred at one of these sites to address the significant increase in the volume of water run-off occurring from 2019. We have engaged waste management specialists, who are taking actions to reduce the level of water (including hydrological studies), and improving treatment processes, and are in contact with the relevant regulatory authorities. We estimate that it will take a further 18 months to finalise initial works and that there will then be a period for which unavoidable associated and ongoing running costs will be incurred. The charges related to remediation and these unavoidable associated and ongoing running costs have been recorded in 2020 and are £10.3m (2019: £4.1m).

Taxation

A key measure of tax performance is the Effective Tax Rate (ETR), which is calculated on the income tax associated with headline performance, divided by the headline profit before tax and before the Group's share of post-tax profit of joint ventures (2020: £90.5m, 2019: £170.4m). The Group's ETR, based on the income tax costs associated with headline performance of £24.4m (2019: £43.8m), was 26.9% (2019: 25.7%).

Our ETR in H1 2020 was 27.2%. The actual ETR of 26.9% for the year ended 31 December 2020 is slightly lower than that reported at H1 2020 and is primarily driven by changes in the geographic mix of realised profits and the impact of withholding taxes as a proportion of the reduced total Group profits. The ETR for the full year 2020 is in line with the original guidance issued at the time of the 2019 results for a rate between 26% and 27%.

We expect the Group's effective tax rate on headline profit before tax and before the share of post-tax profits from joint ventures to be between 26% and 27% in 2021.

Capital expenditure

Capital expenditure in 2020 was £59.0m (2019: £74.7m) of which £45.9m was in the Steel Division (2019: £53.6m) and £13.1m in the Foundry Division (2019: £21.1m). Capital expenditure on revenue-generating customer installation assets, primarily in Steel, was £8.7m (2019: £7.8m).

Pensions

The total gross defined benefit obligations at 31 December 2020 are £610.0m funded (2019: £590.5m funded) and £88.3m unfunded (2019: £79.3m unfunded). After asset funding there is a net deficit of £2.1m (2019: £8.5m) representing an improvement of £6.4m.

The Group has a limited number of historical defined benefit plans located mainly in the UK, US, Germany and Belgium. The main plans in the UK and US are largely closed to further benefits accrual and 56.4% of the liabilities in the UK have already been insured.

The improvement is driven by £9.0m from cash contributions and payments of unfunded benefits and £7.7m from changes to actuarial assumptions (attributable to reducing discount rates; updated mortality assumptions and pension membership data). These were offset by additional accrual and administrative expenditure paid for the year of £7.4m and £2.9m from foreign exchange movements.

The majority of the ongoing pension plans are defined contribution plans, where our only obligation is to make contributions, with no further commitments on the level of post-retirement benefits. During 2020, cash contributions of £9.7m (2019: £11.3m) were made into the defined contribution plans and charged to trading profit.

Guy Young
Chief Financial Officer

3 March 2021

WE ARE

INNOVATIVE

Vesuvius creates an environment where ideas can connect and brings **innovation** for **sustainable business models**.

K. Arulraj
Manager, Strategic Initiatives, Foundry Technologies
Pune, India

Operating reviews

Steel Division

The Group's Steel Division reported revenues of £1,045.4m for 2020, a 12.5% decline from the prior year, reflecting the negative impact of COVID-19 on steel production volumes across the world. However, the sales volume of the Steel Division in 2020 outperformed steel production in the world (excluding China and Iran) by 1.1%, with particularly strong relative performance in the growing markets of India, Vietnam, Turkey, Russia, Ukraine and South America. Sales in China progressed by only 0.4% in volume , as priority was given to profitability over volumes in the Advanced Refractory business unit. No sales were made in Iran. The Steel Division revenues incorporate a negative price impact of 1.7 % in 2020, mostly in the Advanced Refractory Business Unit, as raw material price decline was passed through to customers.

Trading profit in the Steel Division declined 36.4% year-on-year to £76.4m. Return on Sales contracted 270bps to 7.3% during the year as the cost savings from the restructuring programme and from the temporary measures we put in place during the pandemic only partially offset the negative volume impact from the COVID-19 crisis.

Note: Unless otherwise stated, all references to revenue and trading profit in the Operating reviews relate to reported figures.

The COVID-19 crisis led to sharp declines in steel production volumes across the world in 2020. Steel production in the world, excluding China and Iran, which accounts for approximately 90% of Vesuvius' sales, fell 8.8% year-on-year according to the World Steel Association. Including China and Iran, global production was down 0.9% during the year. Steel production fell 11.8% in Europe (EU 27 + UK), 8.6% in South America, and 15.5% in NAFTA. China was one of very few countries where production grew despite the pandemic.

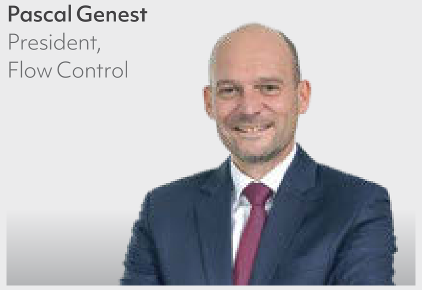
The table below presents the change in steel production in 2020 vs. 2019 and also H1 2020 and H2 2020 vs. the equivalent periods of 2019. The bulk of the impact of COVID-19 is reflected in the steep declines in H1, with world (excluding China) crude steel production falling 14.3% compared to H1 2019.

The like-for-like decline in steel production volume in the world (excluding China) slowed to 2.9% in H2 2020 versus H2 2019. Despite the recovery in H2 2020, steel production in NAFTA and Europe (EU 27 + UK) remained well below 2019 levels.

WSA Steel Production Growth (YoY Change)	H1 2020	H2 2020	FY 2020
China	1.4%	9.5%	5.2%
India	-24.2%	1.9%	-10.6%
NAFTA	-17.6%	-13.7%	-15.5%
South America	-19.9%	3.3%	-8.6%
EEMEA excl Iran	-7.3%	5.9%	-0.5%
Europe (EU 27 + UK)	-18.7%	-5.0%	-11.8%
World	-6.0%	3.9%	-0.9%
World excl China	-14.3%	-2.9%	-8.2%
World excl China and Iran	-15.0%	-3.5%	-8.8%

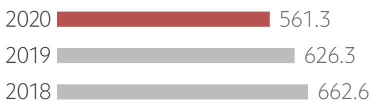
Steel Flow Control

Pascal Genest
President,
Flow Control



Revenue £m

£561.3m



2020 performance

Steel Flow Control revenues were down 10.4% on a reported basis to £561.3m. On an underlying basis, Flow Control revenues were down 8.0% during the year, with sales volume outperforming total steel production in the world (excluding China and Iran).

In EMEA, Steel Flow Control revenues declined 10.8% to £204.7m in 2020 on a reported basis, with strong relative performance against the market in EU 27 + UK, Russia, Ukraine and Turkey, partially offsetting the weaker performance in the rest of the region, and in particular the absence of sales in Iran in 2020.

Our Flow Control revenues fell 14.9% to £182.9m in the Americas. In NAFTA, we outperformed the market, posting a decline of 14.0% versus the 15.5% market decline. In South America, we also significantly outperformed the market, generating growth of 8.4% versus a general market decline of 8.6%.

In Asia-Pacific, our Flow Control revenues declined 4.6% to £173.7m in 2020 versus a 1.5% growth in steel production. We recorded a slightly below-market volume

WE ARE

EFFICIENT

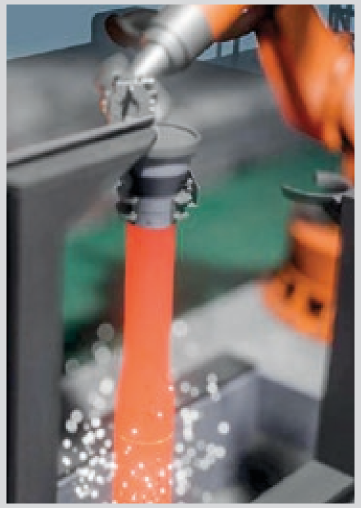
Working efficiently is a part of life at Vesuvius. We strive to give the very **best service** to our customers, and being efficient gives us a **real edge**.

Pham Le Nhu Y
Application Engineer, Flow Control
Hanoi, Vietnam

Operating reviews – Steel Flow Control continued

Duraflex L*: More than a ladle shroud!

New breakthrough generation of ladle shroud including multiple new features, creating value for our customers and, in particular, extended life, reducing waste (by a factor of up to 4) and increasing operator safety.



Steel Flow Control's value-added solutions include:

- **Refractories:** Consumable ceramic products to contain the flow of molten steel, e.g. ladle shroud and slide-gate refractory
- **Systems:** Mechanisms using ceramic products that control the flow of molten steel, e.g. slide-gate and stopper mechanisms
- **Robotics:** Installing and replacing Vesuvius' consumables in very harsh environments, increasing the safety and consistency of our customers' operations
- **Digital services:** Control of the continuous casting process, including mould level control, laser measurements of the ladle and continuous temperature measurement devices
- **Technical support:** Teams of experts available to our customers, helping them with the design and modelling of the molten steel through the continuous casting process

growth in China of 3.2% (versus general market growth of 5.2%) due largely to temporary changes in Steel product mix, where the crisis temporarily drove greater growth in long steel, which is typically used in construction and is benefitting from fiscal stimuli to support the economy. Long steel typically uses less of our products per tonne than higher-quality flat steel.

Strategic highlights from the year

In 2020, we commissioned our new VISO research centre and completed the expansion of our mechatronics competence centre in Ghlin, Belgium. Despite the significant market slowdown we installed three mechatronics systems during the year at customer locations in Asia, and have five active projects for customers in the pipeline.

We continued to develop our capabilities in Flow Control's digital services offering, focusing on providing our customers with a complete solution for the collection and analysis of data to improve the efficiency of their continuous casting processes. Our solution includes continuous temperature measurement sensors for the tundish and the mould, as well as surface quality sensors monitoring the quality of the cast steel slab. Our equipment allows the customer to monitor and control their continuous casting process, optimising productivity and yield, whilst also improving the quality and consistency of the steel produced.

During the year, we reinforced our focus on R&D for casting fluxes to support our objective of becoming the technological leaders in certain key markets. During the year, we developed optimised thin slab flux offerings to improve steel quality, as well as extend the life of the VISO refractory. Our team of experienced engineers continues to work closely with our customers on novel mould flux designs for casting the next generation of high-strength steels. We also rolled out our PDM 300 Flux Feeder* offering, one of the most sophisticated in the market, in South America following successful product trials during the year, driving customer penetration and market share gains.

Despite the difficult market conditions, we successfully launched several high-value-added Flow Control products including Duraflex L*, a breakthrough generation of ladle shroud, offering multiple value-creating features, including increased operator safety and extended life. We also launched robot-ready ladle gates in the market, which improve the safety, quality and consistency of our customers' operations.

Towards the end of 2020, we launched our new Advanced Tundish Outlet Modifier (ATOM)* product, which significantly improves the quality of our customers' steel output by reducing mould flow behaviour changes related to cold steel influence, and mould level variations during first heats, limiting surface defects. ATOM is particularly beneficial in the high-technology steel production process.

Looking forward

For 2021, we have committed to performing a portfolio analysis to evaluate the contribution of our offering to the reduction in our customers' CO_2 emissions and define a baseline. This will help us establish a clear path to accelerate the development of high-value technological solutions that will support our customers' initiatives to reduce their environmental footprint. Also, as announced at the last Metallurgical Trade Fair METEC, we expect to launch additional functionalities to our mechatronics/robot offering before the end of 2021, which should expand customer penetration as well as demonstrate our customer-centric innovations. This coming year, we will continue our investments in automation and digitalisation to ensure we are always at the cutting-edge of our industry. We will also be rolling out a dedicated E-learning platform to ensure that our technical and commercial teams maintain their expertise and reputation for being the industry reference.

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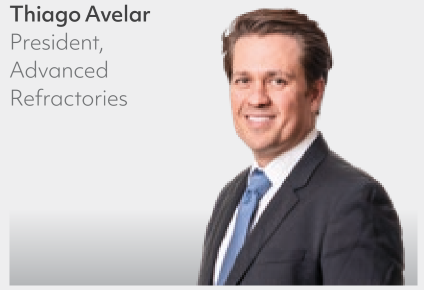
Steel Advanced Refractories

Thiago Avelar
President, Advanced Refractories



Revenue £m

£458.6m

2020	458.6
2019	539.8
2018	541.1

2020 performance

Our Steel Advanced Refractories business recorded revenues of £458.6m in 2020, a decrease of 15.0% compared to 2019 on a reported basis (-13.6% on an underlying basis), with performance relative to the steel markets varying across regions.

In the Americas, Advanced Refractories revenue declined 15.3% to £153.0m (-14.6% on an underlying basis). In the US, our Advanced Refractories revenues declined by 16.3% against domestic steel production which declined by 17.2%. This outperformance was supported by increased penetration of products into Electric Arc Furnaces (EAF), in addition to increased sales to traditional core integrated mills, which were more negatively impacted by the pandemic. In South America, we recorded a limited revenue decline of 3.1%, versus the 8.6% decline in steel production in the region.

In EMEA, our Advanced Refractories revenue declined by 20.5% to £187.8m during the year (-19.2% on an underlying basis). Our sales volume outperformed the underlying market in EU 27 + UK, Turkey, South Africa, Ukraine and Russia, partially compensating for weakness in other areas including the absence of sales to Iran in 2020.

In Asia-Pacific, revenues from Advanced Refractories were £117.9m, a decrease of 4.1% compared to the previous year, underperforming steel production in the region, which grew 1.5%. This underperformance was driven almost entirely by China, where our sales volume declined by 11.8% due to our strategy of prioritising profitability over volumes in Advanced Refractories. In the rest of the region, our Advanced Refractories business outperformed the underlying steel market, in particular in the key growth countries of India and Vietnam.

Strategic highlights from the year

In 2020, we completed the relocation of our European bricks manufacturing hub from Poland to South Africa as part of our restructuring programme to streamline our production footprint and increase efficiencies. We also successfully completed the integration of CCPI, the specialist refractory producer in the US, focused on tundish (steel continuous casting) applications and aluminium. CCPI's main facility in Blanchester, OH was closed in 2019, and its production has now been fully absorbed into the Group's North American manufacturing footprint.

Following positive responses from customers to the new Process Metrix Anteris 360i* laser scanner for Basic Oxygen Furnace and Torpedo car applications, we have launched a solutions package with these products which includes refractories as well. During the year, the Group's mechatronics centre also rolled out the next generation of our Tundish Spray Robot technology, a CE-certified fully-integrated spray application system solution.

Looking forward

In 2021, we will continue to invest in the capabilities of our R&D centres of excellence to introduce new value-adding products into the market. In addition, we are committed to accelerating the development of a sustainable products portfolio to help improve our customers' environmental footprint significantly, as well as ensure the long-term sustainability of our business. We will also advance our strategic growth initiatives in our core product lines, leveraging our latest robotic and distinct innovative laser technologies by combining our high-performance

refractory products with advanced application and performance monitoring solutions. This unique range of products and services will allow us to accelerate our penetration in new markets in Steel, Aluminium and Foundry. Meanwhile, following the completion of our restructuring in 2020, we continue to invest in our well-positioned and competitive manufacturing footprint to support the increase in product volume demand in 2021.

Advanced Refractories' value-added solutions include:

- **Monolithics and shaped refractory materials:** (In both magnesia (basic) and alumina silicate (non-basic) formulations) supplied by Vesuvius in the form of powder mixes, which are spray-applied or cast onto the vessel to be lined (i.e. monolithics) and in the form of shapes (e.g. bricks, pads, dams and other larger precast shapes)
- **Tap hole clay:** A refractory mass used to plug the tapping hole at the base of a blast furnace. When molten iron is ready to be extracted from the blast furnace, a drilling machine perforates a hole through the solidified clay to start the tapping process
- **Advance robotic installation solutions:** Offering our customers tailormade cost-effective solutions to improve the safety, quality and efficiency during the installation of refractory products in their operations
- **Lasers:** To help track the performance of the installed refractories and instruct the customer in advance, where specific wear can be repaired or where a vessel becomes unsuitable for further use
- **Computational fluid dynamic capabilities:** Used by our engineers to simulate the flow of molten metal during the process of steel-making, aluminium-making, etc. Our engineers help our customers optimise their molten metal flow by designing customised refractory shapes to ensure the most efficient flow dynamics

Steel Sensors & Probes

Davide Guarnieri
Director Sensors & Probes

Revenue £m

£25.5m

	£m
2020	25.5
2019	29.2
2018	33.0

2020 performance

The slowdown in global steel production as well as the significant market uncertainty faced by steel producers negatively impacted our Sensors and Probes business unit, where revenues fell 12.9% (-4.2% on an underlying basis), driven mostly by lower steel production in the Americas and EMEA. However, sales evolution in both regions outperformed the general steel market decline due to market share gains over competition.

Future plans

In 2021, we will continue our work to create longer term value for our stakeholders. Whilst continuing to supply our core products, we will focus on service improvements, research and innovation, and robotic solutions to bring greater safety and efficiency to our customers and add value to their operations. The lean organisation we have developed over the past few years is paying dividends, and with a more focused product portfolio we will be able to respond more effectively to our customers' needs as a trusted partner. While doing this, we are committed to design and use an environmentally responsible approach in our operations to contribute to Vesuvius' overall vision for a sustainable future.

WE ARE

EFFICIENT

Efficiency is very important to us – finding ways to be more **productive**, and ensuring that we are not wasteful of **our resources**.

Ofelia Vasquez
Credit & Collection Coordinator
Flow Control, Monterrey, Mexico

Operating reviews – Foundry Division

Foundry Division

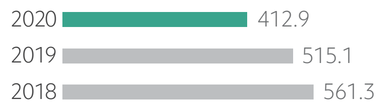
Foundry's value-added solutions include:

- **Feeding systems:** Our customised insulating and exothermic feeding systems allow for the efficient supply of molten metal to key areas of complex and/or large castings, and prevent liquid shrinkage defects in the finished casting, improving yields and productivity by reducing the amount of molten metal required per casting. In addition, our exothermic feeding systems provide a secondary heat source which can also control metal cooling, minimising the adverse effects of shrinkage during solidification
- **Filters:** Remove impurities from the liquid metal and reduce turbulence during pouring
- **Coatings:** Protect both sand and permanent moulds from the effects of being filled with liquid metal
- **Crucibles:** Used in a wide range of melting and holding applications for non-ferrous alloys, particularly aluminium, copper and zinc. Each of these applications requires a crucible with specific properties to maximise productivity and minimise energy use
- **Other products:** These include binders which are used to prepare the sand moulds and cores, inoculants used for ferrous castings, flux degassing equipment for removing hydrogen in liquid aluminium and refractory materials used in the melting and transportation of liquid metal

Karena Cancilleri
President, Foundry

Revenue £m

£412.9m



2020 performance

As a result of the COVID-19 crisis, Foundry end markets declined significantly across all regions. Production output in vehicle (light, medium and heavy vehicles) and mining and construction equipment sectors, which together make up approximately 53% of our Foundry end-markets, fell 16.5% and 8.0%, respectively during 2020. Although the auto industry saw a significant rebound in H2 2020, global light vehicle production was still down 16.7% from the previous year, whilst heavy vehicle production was down 11.2%, according to IHS data. On the back of these trends, revenues in the Foundry Division fell 19.8% year-on-year to £412.9m in 2020, with the rate of decline broadly consistent across most regions, except in China and South America, where we significantly outperformed key end-markets.

In the Americas, our Foundry revenues fell 25.9% during the year. Our Foundry revenues in NAFTA decreased 27.3%, broadly in line with the declines in production output in light vehicles and heavy commercial vehicles of 20.5% and 34.3% respectively. Our Foundry business in South America remained stable during the year, as strong market share gains led to significant outperformance of end markets in the region, where light vehicle production output fell 31.3% and heavy commercial vehicle production fell 22.8%.

Foundry revenues declined 21.1% in EMEA, in line with the weak trends across end markets. In Europe (EU27 + UK), our Foundry revenues fell 22.1% against a light vehicle production output decline of 23.8% and heavy commercial vehicle production decline of 27.2%.

Likewise in the rest of EMEA, the results from our Foundry Division were in line to slightly ahead of vehicle production declines, with our revenues declining 10.7%, compared to a 15.9% decline in light vehicle production output and an 8.6% decline in heavy commercial vehicle production. Overall, results from our Foundry business in EMEA reflected the general economic conditions in the region, where the pandemic significantly curtailed industrial production, and consumer demand remained depressed.

Our Foundry revenue in Asia-Pacific decreased by 14.3%, despite revenue growth of 10.5% in China, which was supported by increased market penetration and higher relative levels of business activity. In India, our Foundry business was negatively impacted by plant shutdowns in H1, posting a 25.1% decline during the year, whilst production output in light vehicles and heavy commercial vehicles was down 24.7% and 57.7% respectively.

Underlying Foundry trading profit fell 57.1% during the year, implying a 560bps contraction in Return on Sales. The contraction reflects the extent, as well as the speed of volume declines in Foundry end-markets, and in particular the automotive market, resulting in reduced capacity utilisation at our plants.

WE ARE

EXPERT

At Vesuvius, we are **always learning** and constantly striving to deepen our expertise to better support our customers and **strengthen our relationships**.

Yogesh Patil
Solutions Executive – West, Foundry Technologies
Pune, India

Strategic highlights from the year

In 2020, our Foundry Division launched several products that create value for our customers through increased efficiencies in their processes. We rolled out ENERTEK*, a new family of energy-efficient crucibles that reduce temperature loss and improve process consistency, reducing energy costs and the CO_2 footprint of a foundry. We also launched DIAMANT*, a new suite of degassing consumables that regulate hydrogen gas levels in aluminium production that can increase service life by over 200% compared to alternative degassers (mostly graphite) in demanding, high-production metal treatment applications.

During the year, our Foundry Division established a dedicated commercial organisation focusing on the non-ferrous sector in EMEA, and realigned our commercial organisation in North America. We also made progress on further streamlining our organisational structure in EMEA and NAFTA, although due to the COVID-19 crisis, we have delayed our feeding systems automation project to 2021.

Looking forward

In 2021, we intend to build on the R&D optimisation which we started in 2020 to accelerate our efforts in filling our pipeline with innovative solutions that create value for our customers both in terms of process efficiency and environmental footprint reduction.

We will start tracking our progress towards our objective of doubling the proportion of our product portfolio that positively impact our customers' environmental footprint by 2025. We will also further reinforce our sales and marketing resources to maximise commercialisation of new and existing new products, increase market share and accelerate penetration into high-growth markets, and strengthen our best-in-class customer service.
In particular, we plan to accelerate our push into the non-ferrous foundry sector with the launch of several solutions and technologies. We will also accelerate our digitalisation and automation projects, with nearly 30% of 2021 capex earmarked for this.

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Sustainability

Find out more at
report2020.vesuvius.com

WE ARE

SUSTAINABLE

Whether in helping our customers **reduce** their **environmental footprint** or ensuring we meet our responsibilities to be a good employer for our people, we are working towards **a better tomorrow**.

Queenie Hong
HR Advisor, Flow Control
Suzhou, China

Introduction: A Better Tomorrow

2020 was a turning point in Vesuvius' sustainability journey

Alexander Laugier-Werth
VP, Sustainability, HSE & Quality

Non-financial information statement

This non-financial information statement provides information on the Group's activities and policies in respect of:

Environmental matters
Our planet p 68-73

The Company's employees
Our people p74-83

Social matters
Our communities p84-88

Respect for human rights
Our communities p84

Anti-corruption and anti-bribery matters
Our communities p84-88

The statement also details, where relevant, the due diligence processes implemented by the Company in pursuance of these policies.

Further information, disclosed in other sections of the Strategic Report, is incorporated into this statement by reference, including:

Information on the Group's principal risks
Details of the Group's principal risks relating to these non-financial matters are detailed in the Group's schedule of Principal risks and uncertainties on p36 and 37.

Risk, viability and going concern
p30-37

Details of the Group's business model
p20 and 21

Details of the Group's non-financial KPIs
p41

In 2020, we launched a new Sustainability initiative to reinforce the part Vesuvius is playing in creating a better tomorrow for our planet, our customers, our people and our communities. Sustainability has always been at the core of Vesuvius and a key part of our value proposition. Our new Sustainability initiative incorporates all of our existing Environmental, Social and Governance dimensions into our plans.

In addition in 2020, we became signatories to the UN Global Compact, making a formal public commitment to support its principles on human rights, labour, environment and anti-corruption, and to engage in activities which advance the development of the UN's Sustainable Development Goals.

Our core business is to help our customers improve their operational performance. This directly translates into a number of environmental benefits, including reduced consumption of materials, less scrap and waste to landfill and improved metal yield and energy consumption, which in turn result in lower CO_2 emissions. Beyond improving operational performance, our technologies and services also allow our customers to manufacture thinner, lighter and higher-performance materials, thus also reducing the environmental footprint of their customers' products.

We have set an overarching objective to reach a net zero carbon footprint at the latest by 2050. This commits us not only to reducing the impact of our operations on the environment, but also means we will work hard to improve and then quantify the more significant impact our products can have on our customers' processes, and hence their emissions of CO_2.

For many years, our sustainability efforts have also been directed towards improving our own operations through a range of energy conservation programmes, safety initiatives and human resource plans. Alongside these we have undertaken charitable and outreach activities in the communities in which we are based.

2020 marked an important inflection and acceleration point for the Group as we built on this work to launch our new Sustainability initiative. This focuses on ensuring we continue to affirm our place as a responsible corporate citizen across each of its four areas. It defines a new governance structure to support both new and redefined objectives and incorporates a set of new targets to direct our efforts. Our new initiative supports the Group's Strategic Objectives and will ensure that we contribute to a better tomorrow for **our planet**, **our communities**, **our people**, and **our customers**.

This section of the Annual Report describes our enhanced approach and outlines the measures we are taking to move towards achieving our objectives. It not only explains how we responsibly manage our impacts on society but also the benefits of our work. We are proud of what has been achieved, but there is much more to come.

Our Sustainability strategy and objectives

Creating a Better Tomorrow for our planet, our communities, our people and our customers

Vesuvius' purpose is to develop innovative solutions which enable our customers to improve their manufacturing costs, product and service quality, and safety performance – whilst at the same time helping them to become more efficient in their processes. We aim to deliver sustainable, profitable growth to our shareholders, while providing each of our employees with a safe workplace where their talents and skills are recognised, developed and properly rewarded.

Our Sustainability initiative embodies this purpose. It sets out the Group's formal objectives and targets for supporting our customers, our employees and our communities, and for protecting our planet for future generations. It is embedded in the Group's overall strategy and informs how we deliver on the Group's Execution Priorities.

The key objectives and priorities of our Sustainability initiative are outlined below. They were defined following the identification and analysis of the Group's most important and material non-financial risks and opportunities.

Our customers

- To support our customers' efforts to improve safety on the shop floor (especially exposure to hot metal).
- To help customers improve their operational performance and thereby reduce their environmental footprint.

Our planet

- To tackle climate change by reducing our CO_2 emissions and helping our customers reduce theirs with our products and services. Our objective is to reach a net zero carbon footprint at the latest by 2050.
- To engage in the circular economy by reducing our waste, recovering more of our products after they have been used and increasing the usage of recycled materials.

Our people

- To ensure the safety of our people and everyone else who accesses our sites. This is our first priority. We take safety very seriously and are constantly striving to improve.
- To offer growth opportunities to all our employees through training and career progression to develop diverse, engaged and high-performing teams.

Our communities

- To support the communities in which we operate, with a particular focus on promoting and supporting women's education in scientific fields.
- To ensure ethical business conduct both internally and with our trading partners.
- To extend our sustainability commitment to our suppliers and encourage them to progress.

Our sustainability targets

We have defined a broad set of Sustainability Performance Indicators, covering all aspects of Vesuvius' Sustainability initiative

The Board has identified ten significant non-financial KPIs for the business. For eight of these we have set stretching targets for the Group to reach within set timeframes. An eleventh KPI and target, relating to the conduct of sustainability assessments for suppliers, has been added for 2021.

The table below illustrates how achieving each target will contribute to achieving our objectives.

	Our customers	Our planet	Our people	Our communities
Energy consumption 10% reduction of energy consumption per metric tonne of product packed for shipment by 2025 (vs 2019)		✓		
Energy CO_2e emission 10% reduction of energy CO_2e emissions per metric tonne of product packed for shipment by 2025 (vs 2019) (Scope 1 and Scope 2)		✓		
Waste water 25% reduction of waste water per metric tonne of product packed for shipment by 2025 (vs 2019)		✓		✓
Solid waste 25% reduction of solid waste (hazardous and sent to landfill) per metric tonne of product packed for shipment by 2025 (vs 2019)		✓		✓
Recovered and recycled materials 7% of recovered or recycled materials from external sources to be used by 2025	✓	✓		
Safety LTIFR of below 1	✓		✓	✓
Gender diversity 30% female representation in Top Management by 2025 (Group Executive Committee plus key direct reports)			✓	✓
Compliance training At least 90% of targeted staff to complete Anti-Bribery and Corruption training annually			✓	✓
New in 2021: Supply chain Conduct sustainability assessments of suppliers covering at least 50% of Group spend by the end of 2023		✓		✓
Total R&D spend	✓	✓		
New product sales	✓	✓		

United Nations Global Compact and Sustainable Development Goals

In October 2020, Vesuvius became a signatory to the United Nations Global Compact. We have committed to base our business approach on its ten Principles on human rights, labour, environment and anti-corruption, and to engage in activities which advance the development of the UN Sustainable Development Goals (SDGs)

Human rights

Principle 1 Businesses should support and respect the protection of internationally proclaimed human rights within the scope of their influence

Principle 2 Businesses should make sure that they are not complicit in human rights abuse

Labour standards

Principle 3 Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining

Principle 4 Businesses should uphold the elimination of all forms of forced and compulsory labour

Principle 5 Businesses should uphold the abolition of child labour

Principle 6 Businesses should uphold the elimination of discrimination in respect of employment and occupation

Environment

Principle 7 Businesses should support a precautionary approach to environmental challenges

Principle 8 Businesses should undertake initiatives to promote greater environmental responsibility

Principle 9 Businesses should encourage the development and diffusion of environmentally friendly technologies

Anti-corruption

Principle 10 Businesses should work against corruption in all its forms, including extortion and bribery

Sustainable Development Goals

Vesuvius has identified the practices within its operations that can directly or indirectly contribute to the SDGs. We will focus our efforts on the following six SDGs – three priority goals and three supporting goals – which are particularly relevant to our business and where we believe we can make the most meaningful contribution.

Priority SDGs

Goal 8
Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

Goal 9
Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation

Goal 12
Ensure sustainable consumption and production patterns

Supporting SDGs

Goal 3
Ensure healthy lives and promote well-being for all at all ages

Goal 5
Achieve gender equality and empower all women and girls

Goal 6
Ensure availability and sustainable management of water and sanitation for all

Our Principles, Approach and Governance

Vesuvius is a geographically and culturally diverse group, employing more than 10,000 people in 41 countries

Our geographical diversity places us close to our customers around the globe. It also highlights the importance of maintaining and applying strong and consistent values and ethical principles in our worldwide approach to business. Our employees' engagement with our Values and culture is vital to our success and the sustainable delivery of the Group's strategy.

Vesuvius has established a framework for explaining and embedding the culture and principles we consider to be fundamental to our success. To do this we communicate openly and transparently within the organisation, through 'town hall' meetings, senior management visits, management feedback, performance evaluation, measuring staff engagement and responding to the feedback we receive. Critically, there is ongoing and consistent communication of our CORE Values and the principles of our Code of Conduct. This is underpinned by engaging staff across the Group in both general and targeted training, to ensure a consistent understanding of our policies and procedures.

This transparency of communication also extends to our stakeholders. We want to increase the knowledge and understanding of our stakeholders, through internal and external reporting and transparent and meaningful disclosure. Our extended 2020 Sustainability Report, which we will publish for the first time in 2021, is a key part of this.

In 2021, we will continue to develop our Sustainability initiative. We plan to continue building our analyses, focusing on the evaluation of our Scope 3 emissions and the emissions avoided by our customers. We will also further develop and map our risks and opportunities linked to climate change. This will allow us to strengthen our strategy, refine our longer-term operational plans, reduce risks, unlock opportunities, and create more value for all of our stakeholders.

Sustainability initiative development

Vesuvius' Sustainability initiative was developed to focus on our most significant sustainability issues and opportunities. Vesuvius undertook a materiality assessment to identify and prioritise these issues based on two criteria: the impact or likely impact on the achievement of Vesuvius' Strategic Objectives; and the impact or potential impact on Vesuvius' stakeholders and their interests.

In undertaking the assessment and drawing up our new approach, we engaged with our key stakeholders to understand their concerns, identifying the material risks and opportunities for the Group. We listened to our internal experts, reviewed external agency ratings, and benchmarked our current policies, targets and reporting practices against our peers and customers.

The Group Executive Committee then proposed a set of key focus areas for the Group, defining targets and building the new Sustainability initiative for Board approval prior to its launch across the Group.

Material topics

The materiality analysis led to the confirmation of the following as material topics for the Group:

> Climate change (energy efficiency, CO_2e emissions, renewable energy, sustainable products)

> Circular economy (solid waste, recovered and recycled materials)

> Protection of the environment (waste water, hazardous waste, environmental management)

> Human rights (modern slavery, gender diversity, employee well-being)

> Work relationships and conditions (health and safety, employee representation, engagement and development, values)

> Communities (education, business practices, supply chain)

> Governance (Code of Conduct, anti-bribery and corruption, privacy and data security)

The exclusion of topics from this list does not mean that they are not considered important to Vesuvius or are not being managed, but only that we have chosen not to address them in detail in this report. Where appropriate we have incorporated some commentary on these additional topics in our report, including water stress and water consumption, conflict minerals and environmental compliance.

Step 1

> Survey of key internal and external stakeholders

> Review of external agency ratings

> Benchmark of current policies, targets, reporting practices vs peers and customers

> Interviews with senior managers and experts

Step 2

> Evaluation of current activities and reporting

> Selection and definition of a broad set of metrics

> Assessment of capabilities

> Selection of key KPIs covering the most important objectives

Step 3

> Identification of metrics and setting of targets by the Group Executive Committee

> Approval by the Board

Step 4

> Strategy launch with top 160 managers of the Group

> Constitution of Sustainability Council

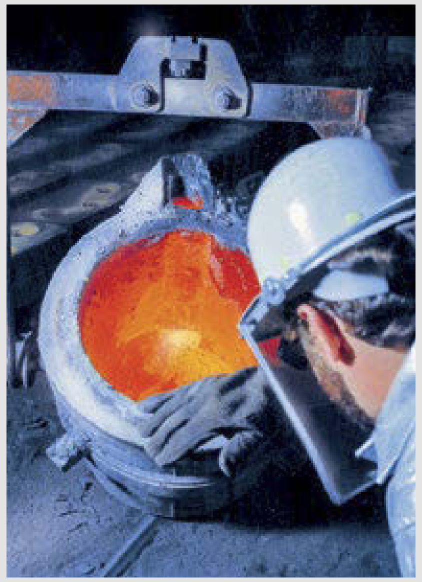
> Deployment throughout the Group

Task Force on Climate-related Financial Disclosures (TCFD)

Our Sustainability initiative supports our efforts to align our risk management and reporting practices to the recommendations of the TCFD. In this Report we outline the Group's governance practices for Sustainability matters, describe our views of the actual and potential impacts of climate-related risks and opportunities for the Group, and outline the Group's processes for identifying, assessing and managing climate-related risks. For a number of years we have disclosed the metrics and targets we use to assess and manage relevant climate-related risks and opportunities, but we acknowledge that we have more work to do quantifying the impact on the Group of different climate-related scenarios. We have only just begun the journey to assess our Scope 3 emissions. As our Sustainability initiative states, we are committed to continuing our progress to create a better tomorrow for our planet.

Climate-related risks and opportunities analysis

Each year the Group undertakes a robust assessment of the principal risks facing the Group. A number of sustainability risks are recorded in this analysis (see Risk, viability and going concern on pages 30-37). As part of this review, and in line with the recommendations of the Task Force on Climate-related Disclosures, Vesuvius continues to identify and assess the principal climate-related risks. As more companies place greater emphasis on their climate-related risks, and public pressure to tackle climate change grows, we believe this will present further opportunities for Vesuvius to grow its business as we help new customers to mitigate their climate impact. (See Our customers on pages 66 and 67).



Climate change related risks and opportunities

In its broadest context we believe that climate change, and more particularly the initiatives being implemented to reduce society's impact on the planet, will have a significant effect on our customers, as pressure grows on them to improve their efficiency and reduce their environmental impact. Vesuvius monitors the impact of these megatrends on the steel and foundry industries, and develops products and services to help our customers meet these challenges.

Vesuvius operates in 41 countries. From time to time our operations are subject to physical damage driven by weather events, such as severe storms and flooding, water shortages, or wildfires. Such events may also impact the manufacturing capabilities of our customers , our tier 1 and lower tier suppliers and our supply chain logistics. We anticipate the occurrence of such weather events will continue to increase and we therefore manage our business to prepare for them and mitigate their impact when they do occur. Vesuvius sites maintain and exercise emergency plans to deal with such events as part of their normal risk management and business continuity processes.

In 2020, Vesuvius manufacturing sites in India suffered some damage from Cyclone Amphan. This disrupted normal operations for a few days but sound emergency and business recovery planning meant there was no significant impact on the Vesuvius business and assets.

Further details of the risks and opportunities that climate change present for Vesuvius can be found in the Our external environment section on pages 16 and 17 and in our commentary on Principal risks and uncertainties on pages 36 and 37.

Risk management and business continuity

As the Group has restructured and concentrated some our manufacturing footprint on a reduced number of manufacturing locations, our strategy to address short-term risks and approach have transitioned from a focus on redundant capacity to improved prevention and risk management. Local and product line business continuity plans are maintained by our manufacturing sites and are regularly reviewed. Sites are routinely audited by our insurers and our external risk manager. Exercises and drills are organised covering IT disaster recovery, fire, explosion, weather and geophysical events, and our processes are improved based on the lessons learned.

Next steps

In 2021, we will conduct a formal update of our risk analysis of climate-related risks, in line with the recommendations of the Task Force on Climate-related Disclosures. We will place further emphasis on assessing the long-term climate-related risks and opportunities and their impact on the Group's businesses, strategy, and financial planning.

Governance structure

Responsibility for the progress of the Group against its sustainability objectives lies with the Group Executive Committee and each business unit President. These Presidents are also responsible for incorporating execution plans to address the climate-related risks and opportunities into their strategy and action plans.

To ensure its progress, our Sustainability initiative is underpinned by a newly created governance structure, comprising a Sustainability Council and a VP Sustainability, and a clear set of KPIs and targets.

The Vesuvius Sustainability Council is chaired by the Chief Executive. Its role is to oversee the sustainability activity, monitor progress against our targets and assist the Chief Executive and Group Executive Committee in identifying and assessing the implications of long-term risks and opportunities.

The newly created role of VP Sustainability spearheads our Sustainability activity, leading Sustainability Council meetings, developing quarterly performance reports, providing specific analysis within business unit teams and managing Group-wide communications.

The Board receives biannual reports on the performance of the Group against sustainability targets and other reporting metrics. It will review the Group's approach to sustainability annually.

Our Principles, Approach and Governance continued

Business unit Presidents and regional business unit Vice Presidents are responsible for communicating the sustainability targets inside their organisations and for implementing the action plans to achieve these targets.

Escalation mechanisms, routine reviews, and internal controls such as auditing and due diligence are in place to ensure transparency, consistency and completeness of information. For certain topics, they are supported and completed by independent third-party verification.

Communication of progress

Vesuvius will report annually on its sustainability activities, commitments and progress in the Annual Report and also in a separate Sustainability Report to be published in each year. This will cover the environmental, social, and governance issues defined in the four dimensions of the Group's Sustainability initiative: our planet, our customers, our people, our communities. In particular, we will include updates on the Sustainability Performance Indicators and progress against the targets.

Our CORE Values

The Group's CORE Values – Courage, Ownership, Respect and Energy – are actively supporting the Group's priorities, encouraging consistent behaviours across the Group to sustain our business success in the future.

These Values, and the behaviours underpinning them, convey the mindset and attitudes we expect each employee to show every day. They are at the heart of the culture of the Group, promoting our image to external stakeholders, and underpinning the commercial promise we provide to our customers. The Values are reinforced through our performance management systems and are celebrated each year through our Living the Values Awards (LTVA) which select regional and global winners for each Value. At each of our sites we display CORE Values posters in local languages and use tools such as screen savers as a constant reminder of the behaviours our people display.

Courage

> I systematically say, decide and do what is right for Vesuvius including when it is difficult, unpopular, or not consensual

> I express my opinions openly during discussions, but I also defend group decisions once they've been taken, even if they do not correspond to my initial position

> I proactively take leadership responsibility on difficult projects and topics that are important to the Group's performance, motivated by the perspective of success rather than paralysed by the risk of personal failure

Ownership

> I am personally accountable for the consequences of my actions and for the performance of the Group in my area of responsibility or oversight, without blaming external circumstances or the actions of others

> I demonstrate an entrepreneurial spirit, looking for and seizing business opportunities and I immediately address problems that come up as soon as I become aware of them

> I manage the Group's money and resources as though they were my own

Respect

> I demonstrate respect for other people's ideas and opinions even if I disagree with them

> I welcome open debate

> I listen to others, foster esteem and fairness with customers, suppliers, co-workers, shareholders and the communities where we operate

> I communicate my objectives clearly and take time to explain all decisions. I behave with the highest level of integrity

> I promote diversity at all levels of the Company

Energy

> I work hard and professionally in pursuit of excellence

> I constantly raise the bar and challenge the status quo. For me, the sky is the limit

> I lead by example, inspiring and motivating my team to go the extra mile. I promote a positive and energising work environment. I continuously deliver outstanding customer experience and innovative solutions

> I never underestimate competitors and permanently strive to reinforce the Group's leadership position

WE ARE

EXPERT

We are a community of experts at Vesuvius, and sharing our **knowledge and expertise** is one of the ways we keep **moving forward**.

Dale Bower
District Manager, Flow Control
Pittsburgh, US

Code of Conduct

Our Code of Conduct sets out the standards of conduct expected, without exception, of everyone who works for Vesuvius in any of our worldwide operations.

The Code of Conduct emphasises our commitment to ethics and compliance with the law, and covers every aspect of our approach to business, from the way that we engage with customers, employees, the markets and other stakeholders, to the safety of our employees and workplaces.

Everyone within Vesuvius is individually accountable for upholding its requirements. We recognise that lasting business success is measured not only in our financial performance, but in the way we deal with our customers, business associates, employees, investors and local communities. The Code of Conduct is displayed prominently at all our sites and is published in our 29 major functional languages. It is available to view at www.vesuvius.com.

We continue to enhance the policies that underpin the principles set out in the Code of Conduct. These assist employees to comply with our ethical standards and the legal requirements of the jurisdictions in which we conduct our business. They also give practical guidance on how this can be achieved.

The Code of Conduct covers:

- Health, safety and the environment
- Trading, customers, products and services
- Anti-bribery and corruption
- Employees and human rights
- Disclosure and investors
- Government, society and local communities
- Conflicts of interest
- Competitors

The Code of Conduct is available in 29 languages at **www.vesuvius.com**

Our customers

Sustainability has always been at the heart of Vesuvius' business. Our technology helps our customers improve their processes and their environmental footprint.

Advancements in material science, pioneered by Vesuvius, have helped to ensure that the amount of refractory material required to cast one tonne of steel has reduced by 80% in the past 60 years.

Our core business is about helping our customers protect their employees and improve their operational performance. Customers rely on the quality and integrity of our products to safely control the flow of molten metal in their facilities. Not only do they rely on the structural integrity of our products to protect their employees, but they also rely on our products and solutions to improve their operational efficiency.

The reliability and performance of our products are therefore critical to our customers, as they directly contribute to the safety of their employees on the shop floor, the quality of the products they manufacture, the efficiency of their processes (in terms of overall equipment effectiveness, labour productivity and metal yield), and their environmental impact (reducing energy consumption, CO_2 emissions and refractory material waste).

Environmental footprint

Under the Vesuvius and Foseco brands, we deliver a wide range of solutions that help our customers improve the productivity of their operations. These solutions also improve the quality of our customers' products and reduce the environmental footprint of their processes. Thermal optimisation and reject reduction are key factors in the efficiency of the processes for which we supply solutions. We help customers use less energy and consequently cut CO_2 emissions through the provision of insulating materials and metal flow management, each of which facilitates extended manufacturing sequences and improves product quality, which means less reheating and reduced downtime.

How does Vesuvius contribute?

We offer energy-efficient solutions in our portfolio of products and services and support the deployment of energy-efficient and sustainable solutions engineered by our technology departments.

Vesuvius' products and services facilitate environmental benefits by:

> Enabling lighter, thinner and stronger components, leading to lighter vehicles and less energy consumption

> Improving customer processes through the supply of innovative consumables to reduce energy intensity and the CO_2e intensity ratio

> Reducing customers' refractory usage per tonne of steel produced through higher-quality, longer service-life products

> Increasing the level of sound castings produced per tonne of molten metal through improved mould design and the application of molten metal filtration and feeding systems

Our customers are investing significantly in technology for the long term. As a responsible business partner, we support and contribute to their effort through:

> Improving the performance of our products and especially their lifetime

> Technology to improve their operational performance

> Developing the recycling of used products

In 2021 we will focus on the determination of our Scope 3 emissions and modelling the emissions avoided by our customers by using our products. We will embed an assessment of the environmental benefits of our products in the evaluation criteria for new product development projects.

Operational performance

Our products and solutions reduce our customers' costs and energy usage, and reduce waste, by improving their yields, reducing their scrap rates, and enabling them to reduce their casting temperatures and accelerate castings, increasing throughput.

Customer satisfaction

We have a global commercial network that constantly monitors the performance of our products and technologies, developing deep and lasting relationships with our customers. Issues are dealt with through a rigorous problem-solving methodology and in-depth investigation. This ensures we learn from problems and prevent them recurring, as well as enabling us to constantly evolve and update our services in line with changing customer expectations and technological development.

All issues raised by the Vesuvius field teams or by customers are reported, documented and classified. All Customer Corrective Action Requests (CCARs) are classified, based on their nature and severity. They are systematically investigated, with the following objectives:

> Implementing immediate containment actions to protect customers

> Identifying the root causes

> Implementing corrective actions

> Learning lessons and providing feedback for the development of future products

Regional business unit management teams are responsible for organising problem-solving teams to address issues and lead routine reviews of ongoing quality performance. Quality performance, including the number of customer complaints, the number of repeat complaints for the same issue and their severity is reported to the Board on a regular basis, and reviewed during each Group Executive Committee meeting. The most serious issues and those that affect, or could potentially affect, multiple customers are described in detail during these meetings. Adverse trends result in prompt, clearly defined initiatives by cross-functional teams, to permanently solve issues, to prevent repeats.

Along with our focus on the completeness and quality of reporting, a strong emphasis is placed on the effectiveness of our problem-solving.

Our cross-functional teams involve sales, Research and Development, and manufacturing experts, who work collaboratively to address the most challenging technical issues. The 8D practical problem-solving methodology is used. In 2020, our teams recorded, reported and investigated 2,427 complaints.

Problem-solving methodology and capabilities

The 8D methodology is implemented as the primary problem-solving tool across the Group. It is a consistent approach designed to identify root causes and ensure corrective action.

8D – The eight Disciplines of Practical Problem Solving

D1	Clarify the problem
D2	Grasp the current situation
D3	Contain & set target
D4	Analyse causes
D5	Define countermeasures
D6	Execute & track progress
D7	Check results
D8	Standardise & establish controls

In 2020, we undertook a thorough assessment of the problem-solving capabilities and practices in each of our business units regionally, identifying the gaps and required actions to reinforce them where necessary, especially in terms of staffing and training.

An annual 8D Awards Competition is organised to recognise the best teams and projects. This competition is organised across all business units, in each region, with a jury composed of senior managers and sponsored by members of the Group Executive Committee. More than 125 projects were presented in the last round of Regional 8D Competitions. In addition to recognising the best problem-solving and projects, these events are an opportunity to recognise talent and disseminate knowledge.

Certification and recognition

Vesuvius places a high value on ISO 9001:2015 certification and the business assurance that this quality management system brings from the global auditors Lloyd's Register. We have 67 certified Vesuvius and customer sites, employing quality professionals to maintain and develop quality systems under our quality policy.

Our products and systems are designed to comply with the most stringent safety regulations. We pursue CE marking or equivalent certification for the equipment we design and manufacture.

Some examples include:

> The Piedade Sensors & Probes plant was awarded preferred supplier status by ArcelorMittal and received a 1A rating from Höganäs

> Vesuvius Malaysia received an A certification from Dosh Malaysia

> Vesuvius China was awarded the Excellent Supplier award by Sinotruk (Foundry)

> Vesuvius China was recognised as an "Excellent Cooperative Unit of Steelmaking Plant" by Shaoguan

> Vesuvius received a 100 grade from the Fuyao group (glass industry)

Sustainable products

Existing product portfolio

As part of our new Sustainability initiative we will be assessing the environmental impact of our existing portfolio over the full product life cycle. This will take into account the environmental benefits for our customers, including the energy consumption and CO_2 emissions required to prepare and use the product (Scope 3 emissions), the energy consumption and CO_2 emissions avoided by replacing current practices with the product, product durability and end-of-life product management. Comparing all this with the environmental impact of the resources required to manufacture it. Undertaking this analysis will allow us more accurately to calculate our Scope 3 emissions and provide us with valuable insight into the sale and design of new products which will enable us to reduce our customers' emissions.

New product development

Vesuvius invests significantly in new product development, working closely with our customers to offer optimised solutions for their specific needs. We have a unique combination of expertise coming from a wide range of fields including metallurgy, refractory ceramics, robotics and mechatronics, and IT. This combines with close contact with customers through our network of account managers and service teams, and through regular technical and R&D meetings with our key customers to drive our innovation roadmap.

In designing new products, we listen to our customers, closely observing the nature of their business to understand their current and future challenges, needs and expectations. Combined with the integration of learning from past issues, we seek to achieve both incremental improvements and breakthrough innovations in safety, robustness, reliability and performance, and to steer the development of next-generation products and services.

Rigorous alpha and beta trial processes are conducted to confirm that the targeted performance and robustness objectives are met, and to allow for fine-tuning before product launch.

Our broad portfolio of product development includes many projects that offer sustainability benefits for our customers.

We have significantly improved the focus and accelerated our new product development process, with ten new product launches in 2020, and a much-improved innovation pipeline. In 2021, we will launch 22 new products, of which seven will have direct environmental benefits for our customers.

To further enhance the sustainability benefits of our products and services to our customers, we will formally integrate environmental considerations in product design and development processes into the evaluation criteria for new projects. These will be based on the same criteria as those used in the assessment of the existing product portfolio.

Our planet

Vesuvius takes seriously its responsibility for managing the impact of its operations and its supply chain on the environment. We recognise the finite nature of the majority of natural resources and the obligation we have to preserve the environment for future generations.

We are committed to reducing the environmental footprint of both our own and our customers' operations and to growing our engagement in the circular economy by reducing the amount of waste we generate, recovering more of our products after they have been used and increasing the usage of recycled materials.

To transition to a low-carbon global economy, Vesuvius supports the call for policymakers to:

> Build a global level playing field, including carbon border adjustments and robust and predictable carbon pricing for companies. This will strengthen incentives to invest in sustainable technologies and to change behaviours

> Develop the necessary energy production and distribution infrastructure to provide access to abundant and affordable clean energy

Tackling climate change

Vesuvius actively participates in measures to tackle climate change by reducing our CO_2 emissions and use of raw materials, and helping our customers reduce their own CO_2 footprint thanks to the use of our products and services. We have set ourselves the goal of reaching a net zero carbon footprint at the latest by 2050. Vesuvius embraces society's expectations for greater transparency around climate change, expressed by initiatives such as the recommendations of the Financial Stability Board's Task Force on Climate-related Financial Disclosures.

According to estimates from Worldsteel (the World Steel Association), on average for 2019, 1.83 tonnes of CO_2 were emitted for every tonne of steel produced. Worldsteel also estimated that the steel industry generates between 7% and 9% of global direct emissions from the use of fossil fuel. With around 10kg of refractory material required per tonne of steel produced, the careful selection and use of energy-saving refractories can beneficially impact on the net emission of CO_2 in the steel manufacturing process. In the foundry process, the amount of metal melted versus the amount sold as finished castings is the critical factor impacting a foundry's environmental efficiency. Vesuvius continuously works with its customers to increase this metal yield.

With respect to our own operations, the Board recognises that good environmental management is aligned with our focus on cost optimisation and operational excellence. Whilst Vesuvius' products differ significantly in the energy intensity of their manufacture, most of our manufacturing processes are not energy intensive nor do they produce significant quantities of waste and emissions. Two of our 33 main manufacturing processes (VISO and Dolime production) account for 38% of our energy consumption and 55% of our CO_2e emissions. (We report in kg of CO_2 equivalents (CO_2e)). A further five processes consume 32% of the Group's total energy consumption and represent 22% of our CO_2e emissions, giving a clear focus for 70% of the energy and 77% of our emissions-reduction initiatives. The Group has clear targets for energy saving, with ongoing efforts focused on increasing the efficiency of our production processes. Dolime production, which uses coal to calcine dolomite, is a major emitter of CO_2 and, building on the successes of previous years, continues to be a clear focus for our investment to reduce CO_2 emissions.

Vesuvius' 2020 total energy costs of £32.6m are circa 2.3% of revenue. Only 1.4% of the total energy requirements across the Group are consumed in the UK, producing less than 0.8% of the Group's CO_2e emissions.

Vesuvius' energy consumption and CO_2e emissions

In 2020, the Group's normalised energy consumption decreased by 3.4% to 1,273 kWh per metric tonne (2019: 1,317), and the Group's normalised CO_2e emissions reduced to the lowest level ever recorded, by 5.0% to 455.5 kg per metric tonne (2019: 479.4). These reductions and the 12.8% decrease in energy consumed were primarily driven by changes in product mix to lower energy intensity products and the significant decline in production volumes (9.7%). Natural gas use decreased by 12.9%, electricity consumption by 9.4% and coal (a CO_2 intensive fuel) consumption by 11%, from 31 thousand metric tonnes in 2019 to 27.6 thousand metric tonnes in 2020. During 2020, the Group also consumed 250 cubic metres of diesel (-31% versus 2019) in the operation of forklift trucks on its sites and 195 cubic metres of fuel oil (-31% versus 2019). (Total 445 cubic metres of oils as fuel).

The decrease in energy consumption and improved energy mix not only resulted in the 5.0% reduction in the Group's normalised CO_2e emissions in 2020, but also in a 14.2% reduction in absolute CO_2e emissions.

Measures taken to improve energy efficiency during the year

> Our plants in Suzhou and Weiting, China, have improved the efficiency of their kilns by 10% through improvement of the operating parameters and refractory insulation upgrades.

> We closed our energy-intensive brick plant in Skawina, Poland.

> The Wuhan slide-gate plates JV plant has shut down its coke oven gas kiln and replaced it with a gas-fired tunnel kiln.

> The Sao Paulo plant in Brazil has upgraded its compressors, increasing efficiency and reducing its electricity consumption by 66%.

> The refurbishment of the curing oven at our Anshan plant in China has yielded a 26% reduction in gas consumption.

> Thanks to its new burner system, energy CO_2 emissions per tonne of product manufactured using the Rotary kiln in Olifantsfontein, South Africa, are expected to reduce by nearly 15%.

Greenhouse gas reporting

In reporting GHG emissions, we have used the GHG Protocol Corporate Accounting and Reporting Standard (revised edition) methodology to identify our GHG inventory of Scope 1 (direct) and Scope 2 (indirect) CO_2e. We report in kg of CO_2 equivalent (CO_2e).

Our energy-related greenhouse gas (GHG) emissions, reported as Carbon dioxide equivalents (CO_2e), include emissions of three GHGs (Carbon Dioxide (CO_2), Methane Emissions (CH_4 and N_2O Emissions) with process emissions of other GHGs (Methane Emissions, Direct N_2O Emissions, Direct Sulphur Hexafluoride Emissions in CO_2 equivalent, Direct Methane Emissions in CO_2 equivalent, Direct N_2O Emissions in CO_2 equivalent, Direct HFC Emissions in CO_2 equivalent, Direct PFC Emissions in CO_2 Equivalent, Direct SF6 Emissions in CO_2 equivalent) all not significant.

The Group also meets all its obligations in relation to the Producer Responsibility Packaging Waste regulations and the Energy Saving Opportunity Scheme by which the UK implemented the EU Energy Efficiency Directive.

All sites report their energy consumption and GHG emissions on a quarterly basis. Figures are verified for consistency and coherence.

The table below details the fuel consumption (kWh), emissions and normalised emissions for the main fuels consumed across the Group in 2020.

Category	Energy Used MWh 2020	Energy Used MWh 2019	% change	CO_2e m kg 2020	CO_2e m kg 2019	% change	CO_2e kg per tonne of product 2020	CO_2e kg per tonne of product 2019	% change
Coal	204,693	230,090	-11.0%	65.6	76.4	-14.1%	81.4	85.5	-4.9%
Electricity	194,072	214,287	-9.4%	95.4	105.4	-9.5%	118.4	118.1	0.3%
External Heat	2,324	3,382	-31.3%	0.7	1.1	-36.6%	0.9	1.2	-29.8%
LPG	61,605	66,232	-7.0%	13.2	14.2	-7.0%	16.4	15.9	3.0%
Natural Gas	559,011	641,688	-12.9%	102.8	118.0	-12.9%	127.5	132.1	-3.5%
Other Fuels	4,351	20,327	-78.6%	1.1	6.3	-82.8%	1.3	7.1	-81.0%
Total Fuels	1,026,055	1,176,005	-12.8%	278.8	321.4	-13.2%	345.8	360.0	-3.9%
Non-Fuel Emissions	0	0	0.0%	88.4	106.6	-17.1%	109.7	119.5	-8.2%
Total	1,026,055	1,176,005	-12.8%	367.2	428.0	-14.2%	455.5	479.4	-5.0%

Notes to table and additional information:

1. All fuel consumption is converted to MWh for reporting.
2. In 2020, the Group consumed 50,800 thousand m³ of natural gas.
3. Vesuvius does not use any alternative fuels (% used zero).
4. Heat from Biomass 0.01%.
5. Includes all Group operations except for the terminated (March 2019) joint venture Anshan Angang Vesuvius Refractory Company Ltd.

Global GHG emissions (kg of CO_2e) and energy consumption (MWh)

	UK and Offshore CO_2e m kg 2020	Global CO_2e m kg 2020	Proportion relating to the UK and Offshore Area 2020	Global CO_2e m kg 2019	UK and Offshore Energy Used MWh 2020	Global Energy Used MWh 2020	Proportion relating to the UK and Offshore Area 2020	Global MWh 2019
Emissions and Energy Sources								
Combustion of fuel and operation of facilities (Scope 1)	2.206	271	0.8%	322	11,484	829,659	1.4%	958,336
Electricity, heat, steam and cooling purchased for own use (Scope 2)	0.611	96	0.6%	107	2,619	196,396	1.3%	217,669
Total GHG emissions and energy	2.817	367	0.8%	428	14,104	1,026,055	1.4%	1,176,005
Change		-14.2%				-12.8%		

	kg of CO_2e per metric tonne of product packed for shipment			kWh of energy per metric tonne of product packed for shipment		
	UK and Offshore 2020	Global 2020	Global 2019	UK and Offshore 2020	Global 2020	Global 2019
Vesuvius' chosen intensity measurement						
Emissions and energy reported above, normalised to per tonne of product output	2,721.7	455.5	479.4	13,627	1,273	1,317
Change		-5.0%			-3.4%	

Methodology:

We have reported to the extent reasonably practicable on all the emission sources required under Part 7 of the Accounting Regulations which fall within our Group Financial Statements. Includes all Group operations except for the terminated (March 2019) joint venture Anshan Angang Vesuvius Refractory Company Ltd.

Scope 1 covers emissions from fuels used in our factories and offices and non-fuel emissions.

Scope 2 relates to the indirect emissions resulting from the generation of electricity, heat, steam and hot water we purchase to supply our offices and factories.

We have used emission factors from the UK Government's and the IEA GHG Conversion Factors for Company Reporting 2020 in the calculation of our GHG.

Our planet continued

Energy conservation plan and CO_2e emissions reduction targets

Our objective is to reach a net zero carbon footprint at the latest by 2050.

Vesuvius launched its Energy Conservation Plan in 2011. Between 2015 and 2020, the Group achieved an overall reduction in normalised energy consumption of 13.1% and an 18% reduction in normalised CO_2e emissions, comprising a 16.8% reduction in normalised energy CO_2e usage and a 22.0% reduction in normalised process CO_2. Our energy conservation plan is now entering its third cycle of improvement.

In 2020 the Board set a new objective targeting an additional 10% improvement in the Group's normalised energy consumption, measured per metric tonne of product packed for shipment by 2025 vs 2019.

The Board also set a related target for the Group to achieve a 10% reduction in Energy CO_2e emissions per metric tonne of product packed for shipment (Scope 1 and Scope 2) vs 2019.

Managing our energy intensity not only has an environmental benefit but is also part of our long-term strategy to enhance our cost-competitiveness.

In seeking to meet these new targets, the Group will focus on four main areas:

> Invest to upgrade equipment and reduce our energy consumption

> When possible, replace high CO_2e emission electricity (generated from coal) with greener electricity or other sources of energy

> Reduce our energy wastage, recuperate heat to feed processes and hot water

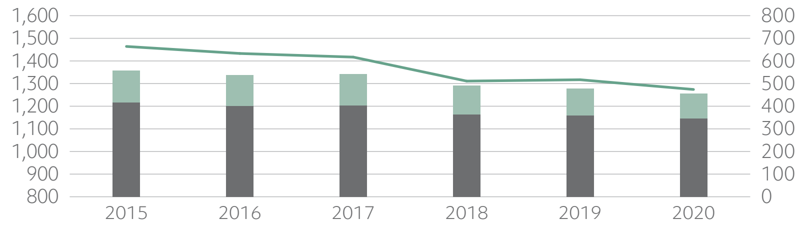
> Generate clean energy

A number of capital expenditure projects have already been identified, with some already approved and programmed.

CO_2 free and renewable energy sources

The Group supports the transition towards renewable energy sources and cleaner fossil-free technology when possible. In 2020, 37% of the grid electricity consumed in our sites was generated using processes that did not emit CO_2, of which 26% was generated from renewable sources . At the end of 2020, 4 sites were equipped with renewable energy installations, and 1 had invested in a combined heat and power installation.

Energy conservation and CO_2e reduction



— Energy kWh per metric tonne of product packed for shipment
■ kg Process CO_2 per metric tonne of product packed for shipment
■ kg Energy CO_2e per metric tonne of product packed for shipment

Scope 3 and avoided emissions

Vesuvius recognises that its Scope 3 CO_2 emissions, mainly upstream and downstream, contribute to a greater part of its total CO_2 emissions than its Scope 1 and 2 emissions. In 2021 we will focus our efforts to determine the most relevant and influenceable elements of our Scope 3 emissions, with a goal to set material science-based targets. We also plan to develop models and calculate the emissions avoided by our customers by using our products, focusing on the product families having the largest impact. This will enable us to build quantifiable targets for our suppliers and inform our future product development.

Growing our engagement in the circular economy

Recovered and recycled materials

Vesuvius is determined to increase the usage of recovered and recycled materials in its product formulations. A comprehensive quarterly reporting system for usage of recovered and recycled materials by all manufacturing sites was launched in 2019. It includes the reporting of recovered and recycled materials from sources external to Vesuvius and across Vesuvius facilities. Following on from this, in 2020 the Board set a target for the Group to utilise 7% of recovered and recycled materials from external sources in its production by 2025. In 2020, the percentage of recovered or recycled materials from external sources used in production was 5.8%.

Increasing the share of recovered and recycled materials in product formulations poses multiple challenges, in terms of availability, consistency of quality, competitiveness versus virgin material whose prices fluctuate, regulatory frameworks for the transportation of end-of-life waste materials, and validations to ensure that product performance and reliability remain unaffected.

Cross-functional teams incorporating experts from R&D, Purchasing, and Manufacturing are working to identify and analyse opportunities in order to increase the share of recovered and recycled materials.

We support initiatives being pursued by authorities to improve the regulatory framework for the circulation of waste materials across borders, making it easier for them to be recovered and recycled in different countries.

Material waste

Alongside the monitoring of recovered and recycled materials, a quarterly reporting system for material waste from all manufacturing sites was implemented in 2019. This was enhanced in 2020, and now includes the reporting of waste to landfill, toxic and hazardous waste, waste for recycling, waste to sewers and by-products (materials recovered and recycled outside the site where they were generated).

Sites were already actively working to reduce their waste, but a Group-wide data collection, benchmarking and improvement programme was initiated in 2019. Following analysis of initial results, action plans were implemented at ten pilot sites during 2020 by regional business unit management, with an increased sharing of action plans and results. The ultimate objective is to extend the programme throughout Vesuvius manufacturing sites based on lessons learned at these plants. The Board has set a target of a 25% reduction of our solid waste (hazardous and sent to landfill) per metric tonne of product packed for shipment by 2025 (vs the 2019 baseline).

All manufacturing sites will build action plans to reach this goal, covering both hazardous and non-hazardous waste to eliminate, reduce and recycle waste.

Strong initial progress can be seen in the table below with cost savings already being realised.

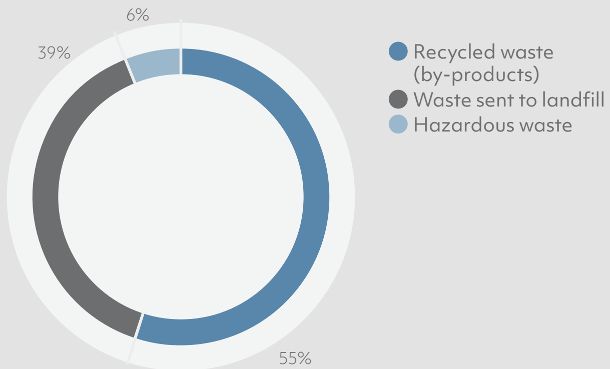
Manufacturing Site Raw Materials and Waste/(metric tonnes)	**2020**	2019	variation
Raw materials			
Recovered and recycled materials used (from external sources)	**55,935**	(*)	(*)
Raw materials and intermediates used excluding recycled (from external sources)	**901,137**	(*)	(*)
Total raw materials and intermediates used (**)	**957,073**	1,075,298	-11.0%
% recovered and recycled materials (from external sources)	**5.8%**		
Waste			
Recycled solid waste	**31,920**	41,496	-23.1%
Hazardous solid waste	**3,842**	5,471	-29.8%
Solid waste sent to landfill	**22,697**	29,587	-23.3%
Solid waste, hazardous and sent to landfill	**26,539**	35,058	-24.3%
Total solid waste	**58,459**	76,554	-23.6%
Tailings waste	**0**	0	0
Waste water (**)	**132,498**	158,855	-16.6%
Total waste (metric tonnes)	**190,957**	235,409	-18.9%
Ratio of solid waste, hazardous and sent to landfill in metric tonnes per tonne of product packed for shipment	**0.033**	0.039	-16.1%
Ratio of total solid waste in metric tonnes per tonne of product packed for shipment	**0.073**	0.086	-15.3%
Ratio of waste water in metric tonnes per tonne of product packed for shipment	**0.165**	0.178	-7.5%
Ratio of hazardous solid waste to solid waste, hazardous and sent to landfill (**)	**14.5%**	15.6%	-110bps

(*) Not available for 2019.
(**) 1 m^3 Waste water = 1 Metric tonne.

Hazardous waste

Hazardous waste monitoring and KPIs were introduced in 2019. In 2020, 14.5% of our solid waste, was classified as hazardous, a reduction of 110bps on 2019. Whenever relevant, action plans to reduce hazardous waste are incorporated by manufacturing sites into their solid waste reduction action plans.

Breakdown of 2020 waste



Our planet continued

Water consumption and conservation

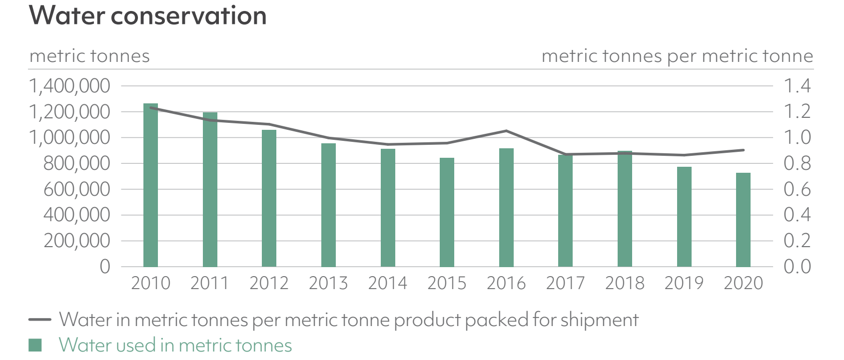
Water conservation

Vesuvius works to reduce the consumption of water in its manufacturing operations by recycling and improving water management processes. No saltwater or cooling water is abstracted with no related outflow. As with energy use, normalised consumption of water varies with product mix. In 2020, there was a slight decrease in absolute water consumption and an increase in normalised water consumption – that is, water use per tonne of product manufactured – reflecting changes in quantity and mix of products packed for shipment. A small number of the areas in which Vesuvius operates are water-stressed. In these areas, we make strenuous efforts to reclaim, recycle and minimise the overall use of water.

Water consumption and waste water

In 2020, our overall water usage per tonne of product packed for shipment increased by 4.0%. This increase was driven by an evolution in our product mix towards products that require more water in their processing. This was partly offset by the reduction of our waste water per tonne of product packed for shipment by 7.5%. We have action plans in place to reduce our waste water generation globally.

The Board has set a target for the Group to reduce the amount of waste water per metric tonne of product packed for shipment by 25% by 2025 (vs the 2019 baseline).



	2020	2019	change
Water in m³	723,355	769,834	-6.0%
Water in m³ used per metric tonne of product packed for shipment	0.897	0.862	4.0%

Emissions into the air

Some Vesuvius manufacturing processes can lead to low levels of emissions into the air. These include post thermal treatment residual Volatile Organic Compounds (from the curing and firing of products including solvents and resin binders, or pitch impregnation), residual GHGs from the combustion of fuels and process emissions, and residual dusts post capture and filtration. All manufacturing plants comply with local regulations and Vesuvius standards. They monitor their levels of emissions into the air and actively work to reduce them. Where local authorities carry out routine inspections, recommendations and actions are recorded and acted upon appropriately.

Environmental policy

All employees are expected to adhere to the Group's Environmental Policy, which is translated into local languages and displayed prominently in all locations. The Policy is supported with standards and procedures which are reviewed and updated on an ongoing basis. A copy is available to view on our website at: www.vesuvius.com.

Environmental monitoring and environmental regulation

Vesuvius operates sites in some developing markets where environmental concerns have become politically significant as air quality deteriorates and residential expansion takes people closer to areas historically reserved for manufacturing. In addition, some of the sites Vesuvius operates have known ecological sensitivities, being in the vicinity of watercourses or environmentally sensitive areas.

Vesuvius takes seriously its obligations to its local communities and to ecological preservation. Environmental compliance at our sites, reduction in waste, increased recycling and treatment of emissions are key to Vesuvius' operations, and can be a significant differentiator for our business.

All our factory emissions to air, ground and water, as well as waste are proactively managed in accordance with local regulations. All our manufacturing operations monitor key environmental indicators.

WE ARE INTERNATIONAL

We bring together **skills and experience** from all over the world to offer the very **best solutions** to our customers.

Ernesto Cisneros: Ferrous Marketing Manager, Foundry Technologies, Ramos Arizpe, Mexico
Raphael Vazami: M&T Manager, Iron Filtration & FMT (South America), Foundry Technologies, São Paulo, Brazil

Regular analysis enables us to act to reduce our emissions where possible and to operate more efficiently. Environmental performance records are kept for the period of time required to comply with local regulations.

Manufacturing plants maintain and test emergency plans to ensure compliance with local regulations and Vesuvius standards in the event of an accidental release.

Reports from external inspections, including those with findings, are centrally stored and shared internally with executive and senior management. Where local authorities carry out routine inspections, observations, recommendations and actions are recorded and acted upon appropriately.

Vesuvius is committed to addressing exceedances and complying with local regulations. All exceedances are reported in a central database. In 2020, Vesuvius recorded 20 minor environmental incidents. Of these, five related to minor emissions to air, two to emissions to water and 13 to ground. Total environmental releases across the Group in 2020 are estimated to have totalled 1.3 tonnes (including 1.13 tonnes of water-based coatings) with 0.14 m³ hydrocarbon resins. All releases were contained apart from releases to air. Where incidents occur, they are managed via Vesuvius' site environmental response plans and reported through the Vesuvius incident reporting system. We comply with local reporting requirements in respect of such incidents.

No action was taken by any authority in relation to an environmental incident in 2020 which resulted in financial penalties against Vesuvius. An existing earlier action in relation to a disused US property for waste water exceedances remains open.

The Group does not operate any mines and consequently the Group generates zero tailings waste.

Internal CO_2 pricing

In 2020, Vesuvius took the decision to include an environmental impact analysis in the evaluation of all its capital expenditure projects. An internal CO_2 price is incorporated into the financial evaluation of all significant industrial projects. Vesuvius views this internal CO_2 pricing mechanism as a useful tool to better appreciate the environmental impact of long-term investment decisions. The internal price of CO_2 has initially been set at €30 per tonne of CO_2. This price will be reviewed annually.

Environmental management/ certifications

We have 20 manufacturing sites, one customer location and one warehouse certified to ISO 14001:2015, representing 38% of our 53 production sites. Where previously the decision to pursue ISO 14001 certification was taken at a local level, Group policy is now to encourage sites to seek ISO 14001 certification. A list of certified sites is available to view on the Vesuvius website: www.vesuvius.com.

Our people

We believe that the safety, diversity, personal growth and job satisfaction of our people are key to the success and growth of our business.

Our strategic ambition is to provide a safe working environment for all our people and to deliver value to them by providing development opportunities.

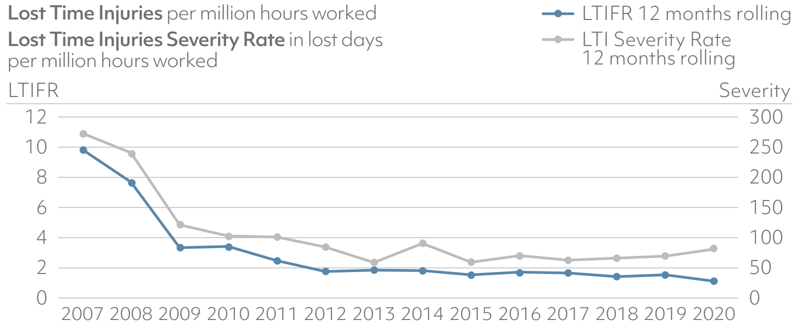
This section details our performance and initiatives in both Health and Safety and Human Resources.

Safety and well-being at work

Health and safety is one of Vesuvius' key Strategic Objectives, and our overriding commitment to health and safety is embedded throughout the organisation. Our approach is to identify, eliminate, reduce or control all workplace risks, and an ongoing system of training, assessment and improvement is in place to focus on achieving this. We remain fundamentally committed to protecting the health and safety of employees, contractors, visitors, customers and any other persons affected by our activities.

Safety is therefore our top priority. We want to become a zero-accident company and are striving to become a best-in-class organisation for safety performance and leadership.

Safety performance in 2020



COVID-19

In 2020, the COVID-19 pandemic affected Vesuvius in a wide variety of ways, impacting our employees profoundly. We share the grief of the families and friends of our colleagues who passed away from COVID-19 in 2020.

Protecting the health and well-being of our employees, suppliers and all those entering our sites during the COVID-19 crisis was our priority throughout 2020. Immediately the threat from the pandemic became apparent, the Board ensured that the Group adopted specific site-by-site actions to protect our employees. We adhered to World Health Organization guidelines and specific government regulations in each of the countries in which we operate, and developed global guidelines on a range of issues for local implementation in line with local circumstances and regulations.

We leveraged our global presence and capabilities, coordinating logistics to supply face masks and other personal protective equipment to all our operating companies, and sharing resources and best practice around the world with training and information campaigns.

We monitored the number of people who had tested positive, along with those quarantining, on a weekly basis. Strict sanitation practices were implemented at each of our manufacturing locations with hand sanitiser distributed and temperature monitoring put in place. Social distancing measures were introduced and workplace layouts modified to facilitate this.

Colleagues who could work from home were required to do so, and around the world our sites quickly coordinated the delivery of computers, screens and office furniture to our people to enable this. We upgraded our network and security infrastructure for remote access to company resources, including online meetings.

The number of colleagues working remotely varied during the year but peaked in June with 2,104 people working from home. At the end of the year, 1,863 colleagues were still primarily or wholly working from home.

As the full effects of the pandemic became apparent, local government regulations forced the temporary closure of our sites in several countries including India, Malaysia and South Africa. All our facilities experienced reduced demand, requiring the implementation of measures to reduce costs and conserve cash, including furloughing employees and instigating mandatory annual leave and part-time working.

As schools closed around the world, the Company recognised that many colleagues needed to adapt their working hours to care for children, as well as supporting family members who became ill, and flexible working arrangements were adopted at many sites and offices. Sites in many countries organised a range of webinars and training to promote health awareness and boost mental well-being. Staff in some regions were also offered psychological counselling.

We intensified our communication efforts to keep people up to date with developments and increase the visibility of our leadership community. Our Chief Executive launched a weekly Senior Leaders Call with top-level managers, as well as issuing regular newsletters.

More widely, a range of communications including posters and screen savers, were developed and delivered to maintain awareness of safe work practices around social distancing, the use of personal protective equipment, and hygiene.

A great deal of effort was put towards recognising the incredible commitment of our people to keeping the Group operational. This included a global 'selfie' campaign, which included the Group Executive Committee, featuring photographs of our colleagues thanking each other for their work.

Safety performance in 2020 is detailed below:

Performance Indicators	Employees and directly supervised Contractors 2020	Third-party Contractors and Visitors 2020	All Employees Contractors and Visitors 2020
Work Related Death	0	0	0
Severe Injuries	3	0	3
Lost Time Injuries (LTI)	27	0	27
LTIFR per m hours	1.17	0	1.12
Recordable Injuries	122	3	125
RFR per m hours	5.28	3.29	5.20
Medically Treated Injuries (MTI)	159	4	163
MTIFR per m hours	6.88	4.38	6.78
Total Number of Injuries	404	13	417
Injury FR per m hours	17.47	14.24	17.35
LTI Lost Days	1,957	0	1,957
LTI Severity Frequency Rate (Lost Days) per m hours	85	0	81
Dangerous Occurrences (DO)	776	0	776
DOFR per m hours	33.56	0.00	32.29
Safety Audits	94,324	n/a	94,324
Safety Audits per 20 Employees per month	14	n/a	14
Employees Participating in monthly Safety Audits	8,420	n/a	8,420
Employees Participating in monthly Safety Audits %	72%	n/a	72%
SIOPA	80,692	n/a	80,692
Other IOPA	29,186	n/a	29,186
IOPA Total	109,878	n/a	109,878
SIOPA per Emp	7	n/a	7
Other IOPA per Employee	3	n/a	3
IOPA Total per Employee	9	n/a	9
Hours Worked (thousands)	23,122	913	24,035

All frequency rates are per million hours worked.
IOPA: Improvement opportunities implemented with a permanent corrective action.
SIOPA: Safety improvement opportunities implemented with a permanent corrective action.
There were no safety incidents involving visitors to Vesuvius' operations in 2020.
Average Third-party Contractors and Visitors in 2020: 512.

2020 Safety performance

With a Lost Time Injury Frequency Rate (LTIFR) of 1.12 in 2020, we recorded our lowest frequency rate ever.

Despite the improvement in the number of incidents in 2020, tragically three of our colleagues did still suffer severe injuries.

With the aim of becoming 'best in class', the Group has re-energised our safety agenda to further enhance efforts to achieve our safety goals.

Severe injuries

Two of the three severe injuries suffered in 2020 occurred in our plants, one resulting in the loss of sight in one eye and the other in the amputation of the tip of a finger. The third happened in a customer location, resulting in third-degree burns to an individual. All three injuries were extensively investigated and changes made to our HSE standards to try to prevent any recurrences.

Lost Time and Medically Treated Injuries

Vesuvius operates a robust and comprehensive process for the timely reporting of incidents including all fires, explosions and any material spill or other chemical releases. In our internal standards, we use more stringent definitions for Lost Time Injuries (LTIs) and 'severe accidents' than the definitions used by many regulatory bodies, and we also require all sites to report on all Medically Treated Injuries (MTIs), broader than recordables, to maintain the focus on safety, with investigation extended to all serious Dangerous Occurrences and all MTIs.

Vesuvius has set an intermediate target to reach an LTIFR below 1.0, underpinning the Group's commitment to ensure the safety of the Group's employees and the objective of zero accidents.

In 2020, 27 LTIs were reported which resulted in 1,957 lost days giving the LTI frequency rate for the year of 1.12 per million hours. This was a significant decrease versus the 1.55 recorded in 2019. 163 MTIs were reported in 2020 (versus 198 in 2019) out of a total of 417 injuries reported, resulting in an MTI frequency rate of 6.78. Whilst 2020 was an unusual

Our people continued

year, we believe that these significant improvements in incident rates reflect a broader trend of underlying improvement for the Group, and result from a strong management commitment to change. The Group has improved staffing in key places, deployed a set of core safety rules for the Group, and focused safety professionals and employees at each of our sites to improve safety, including the implementation of Site Safety Improvement Plans. All of these activities are supported by Group safety audits and remote assessments to monitor progress.

Main types of work-related injuries

In 2020, the main causes of work-related injuries were, in descending order of frequency: lifting and carrying; striking against something fixed or stationary; slips, trips, and falls; and being struck by moving objects. The main injuries suffered were contusions, sprains and strains, lacerations, fractures and abrasions to the eye. The main body parts affected were hands and fingers, backs, eyes, knees and ankles. Based on the incident data, targeted campaigns are launched by the business units.

Dangerous occurrences

There was renewed emphasis on the reporting of dangerous occurrences and injuries in 2020 so that root cause analysis could be undertaken, and preventative action plans implemented to prevent future occurrences. Consequently, there was an increase in the number of dangerous occurrences reported in 2020 to 776 (2019: 735).

Our principles

1. Good health and safety is good business
2. Safety is everybody's responsibility
3. Working safely is a condition of employment
4. All work-related injuries and work-related ill health are preventable

Safety leadership

Safety performance remains the priority item on the agenda at all our Group Executive Committee and management meetings, and safety performance is reported to the Board by the Chief Executive as a matter of priority at each Board meeting.

The Group Executive Committee reviews all of the more serious incidents, including all LTIs, and the responses to these from local management. The Group remains fully committed to continuing safety improvement with a Group Health and Safety Policy stating a clear goal of:

> No Lost Time Injuries

> No repeat injuries

> No harm to our people or contractors

Health and safety responsibility and accountability

The business units are directly accountable for their health and safety performance, with each business unit determining its own priorities and resource allocations. Health and safety performance is included in the objectives and linked to the remuneration of all senior managers. It is regarded as a core management responsibility, with executives and line managers directly accountable for health and safety matters in the operations under their control, and performance against objectives.

A majority of senior managers have a portion of their variable compensation tied to the achievement of safety performance targets.

This tone from the top is also demonstrated by the requirement for all senior managers to perform executive safety tours, report on their findings to local operations management and follow up on improvement requirements. In this structure, all employees understand that they have a responsibility to take care of themselves and others whilst at work. We expect everyone to participate positively in the task of preserving workplace health and safety.

The Group VP Sustainability, HSE and Quality is responsible for setting the Group's policies for health and safety and controlling their application, with the business units taking full responsibility for their implementation and accountability for performance against them.

Every business facility has an appointed health and safety manager, who works with management and all employees to review site health and safety, assess training needs and develop and implement site safety improvement plans. These local health and safety managers are assisted by central experts who not only identify adverse trends and respond to them, but also enable the sharing of best practice across Vesuvius.

We continue to work hard to reduce incident severity and generate actionable insights from the performance indicators we capture. The LTI frequency charts prepared monthly for each business unit and site, show where injuries have been reduced and where further effort is required, through a combination of behaviour-based approach to safety and the implementation of physical safeguards. We focus on the safety of all personnel, whether they are employees, third-party contractors or visitors.

Based on the analysis of the kind of accident, type of injury and parts of the body affected, the businesses develop risk-based action plans that consider both the frequency and severity of incidents and track progress. Every site management team receives a monthly dashboard of health and safety-related performance indicators, covering both lagging and leading metrics. As part of management reporting, the Board receives a detailed monthly update on all LTIs.

All site management teams must develop and implement Site Safety Improvement Plans, incorporating the identification and reduction of the site's main risks, compliance with the Group safety standards, deployment of shop floor safety leadership practices and resolution of issues highlighted during Group Safety Audits. Improvement plans are now in place for all production sites, with implementation being the direct responsibility of local managers.

Any site experiencing a severe incident, an LTI, a medically treated injury, or a serious dangerous occurrence is required to investigate the incident. Vesuvius' investigation procedures are based on the 8D practical problem-solving ('8D') tool, which aims to identify the true root causes of incidents to prevent a repeat. Results are formally presented to management, with details of the 8D-based root causes and improvement actions cascaded throughout the organisation. They must then incorporate findings into their site safety improvement plans and share their incident investigation and action plans across the Group.

Our employees are highly supportive of the Group's efforts to improve workplace safety and acknowledge how seriously we take this issue. In the 2020 I-Engage employee engagement survey, 83% agreed that the Company will address safety concerns if they are raised, an increase of 2% on the previous year.

Health and safety auditing

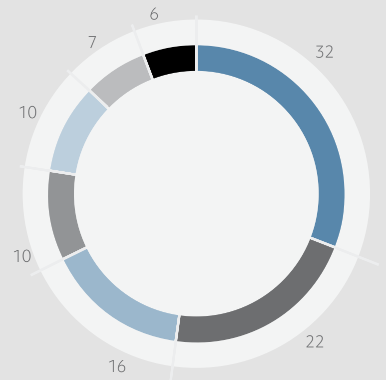
Executive safety tours

Our executive safety tours engage senior management across all disciplines and functions in the observation of the Group's operations, encouraging dialogue with staff and setting action points for discussion and implementation. These tours provide visible safety leadership on the shop floor in our sites and at our customer locations. They, along with our daily safety audits, are a pillar of our Safety Breakthrough initiative. In 2020, 103 Executive Safety Tours, of which six were in customer locations, were carried out by members of the Group Executive Committee and their direct reports. This represented a decline from the 135 conducted in 2019, primarily as a result of travel restrictions imposed by the COVID-19 pandemic. Nonetheless, senior management strove to perform tours in their regions and locations wherever possible. Many more Safety Tours are carried out by middle management, and safety audits are also carried out by employees, generating more than 110,000 improvement opportunities across Vesuvius in 2020. See the Safety Performance table on page 75 for further details.

Group safety audits

The Group operates a central safety auditing team of two auditors, each with more than 20 years' experience, who report to the VP Sustainability, HSE and Quality. The team's main purpose

Executive safety tours 2020



is to verify the deployment and ongoing application of the Group's standards and policies in our locations, including our manufacturing sites, R&D facilities and the customer locations in which a significant number of our employees operate daily. Each audit also includes an assessment of the site's HSE leadership.

During 2020, the team conducted 29 audits visiting manufacturing locations, R&D sites and customer locations with 40 employees or more, as part of a programme of systematic audits of all Group locations worldwide.

Travel restrictions due to the COVID-19 crisis prevented the team from completing the 2020 audit plan. A remote assessment programme was therefore developed to reach sites that could not be physically audited. Remote assessments were carried out via videoconferences, during which the site management team presented the progress made in the implementation of Group safety standards, and improvement plans for the coming months.

Following each audit, action plans are created by the site management teams to address any issues identified and work on completing those assessed on a regular basis. The observations made during audits have been used to improve the Group's training programmes and the enhancement of the Group's health and safety standards. The Group HSE audit team reports the results of audits, as well as the progress of action plans addressing the most critical issues, to the Board twice a year.

Sites are encouraged to carry out self-assessments, based on the Group safety audit compliance checklist, to monitor their progress.

Safety audits and improvement opportunities

In our plants in 2020, more than 70% of our working population performed routine safety audits every month. This generated an average of more than seven implemented safety improvement opportunities per person from more than 8,400 employees, resulting in an improvement in worker safety. This audit programme involves employees at all levels – from the Group Executive Committee and safety specialists through to local site management, employees and directly supervised contractors.

Our people continued

Health and Safety Policy and standards

All employees are required to adhere to the Group's Health and Safety Policy and Alcohol and Drug Policy. Copies of the policies signed by all members of the Group Executive Committee are translated into local languages and displayed prominently in all locations. The Health and Safety Policy is supported with standards, procedures and ISO certifications, which are reviewed and updated on an ongoing basis. The findings and lessons learned from incident investigations are incorporated into updates to prevent any recurrence and new or improved standards are issued for implementation across the Group.

In 2020, new standards were created relating to customer locations and on-site vehicle operations. In addition, the standards relating to Risk Assessments, Ergonomics, Working Safely with Fibres and Road Safety were reviewed and updated.

Process Safety initiative

In 2020, Vesuvius launched a new Process Safety initiative, starting with an analysis of the high-risk processes in the Company, the elaboration of a global Process Safety Framework and a first technical standard covering high-pressure isostatic presses. The deployment plan includes training, the development of a centralised database and the implementation of a routine reporting process.

Customer Location Standard

The safety of our people is Vesuvius' number one priority and we have spent decades improving systems, processes and technology at our sites to protect our people at work. We also apply the same safety standards for our teams working at customer locations.

In 2020, a new standard was issued to address the specific risks faced by our employees whilst operating in customer locations. This builds on learning from past issues and best practice, structuring the cooperation in terms of health and safety between our customers' management teams and our own to ensure issues are jointly identified and addressed.

For new contracts in customer locations, we use a formal risk assessment which aims to identify significant risks to our employees and contractors. This enables appropriate control measures to be agreed and implemented with the support of our customers in advance of work commencing.

Roll-out of Core Safety Rules

In 2019 we launched the Vesuvius 8 Core Safety Rules that outline our colleagues' basic safety responsibilities. In 2020, these were rolled out across the organisation as the mandated practices for employee and manager conduct. In conjunction with this, the Group implemented procedures to ensure the rules are followed. The rules were incorporated into the contractual terms of all employees, and all employees are expected to report breaches and violations of the rules, with appropriate sanctions imposed whenever required.

Health and Safety Awards

The composition of Vesuvius' safety regions was reviewed in 2019, increasing their average size and reducing their number to 39. In 2020, we distributed Safety Awards to 12 regions, as recognition of their outstanding performance in the previous year. These regions completed 2019 without recording a single LTI, recorded a participation of over 80% of employees in monthly Safety Audits and implemented more than ten improvement opportunities per person per year.

In addition to our efforts to keep our employees and contractors safe, we take pride in sharing our safety management practices with our customers. In 2020, we received a wide range of customer awards globally, including a record ten awards for several of our businesses in India alone.

Pillars of health and safety

Training employees to work safely: TurboS

TurboS training pulls together all of our safety management practices. Using a train-the-trainer approach, TurboS training sessions are tailored to the audience and their activities. For example, there is a special training course developed for employees at customer locations that focuses on the specific risks faced by these individuals. We conduct Permit to Work training in all Group facilities, including customer locations, which ensures that all non-standard work conducted in our facilities, whether by our employees or contractors, is the subject of a pre-commencement risk assessment and a formal permission to commence activity, setting out the safety requirements. We have developed machinery safety training with an outside industry leader, Pilz GmbH & Co, a company specialising in safe automation technology. Recognised best practices are extended throughout the Group through a series of machinery assessments and training programmes, with each site identifying and addressing the top five issues by severity as a matter of priority.

Training activities routinely undertaken for our employees and contractors include more than 36 different courses ranging from managing arc flash hazards to working at heights.

TurboS is a part of our Safety Breakthrough initiative and includes a strong focus on the standardisation of all our repetitive activities. TurboS also integrates good management practices in the workplace, with a strong emphasis on developing an organisation that enables everybody to work to the same high standards in safety performance.

As part of the continuing TurboS initiative:

> Senior executives regularly lead safety tours at all locations

> Severe accidents are formally reviewed by the Group Executive Committee

> Employees are routinely engaged in safety audits

> We invest significantly in safety training for all employees, irrespective of their role and function within our business

> All employees are expected to routinely raise and implement safety improvement opportunities; we focus on the number of implemented ideas

> Safety standards are continually updated, translated and deployed throughout the Group

> All injuries and dangerous occurrences are analysed locally, with a formal presentation of findings, root causes and improvement actions cascaded through management

Working in tidy plants – 5S

The continuing use of 5S, the workplace organisation method, throughout the Group has driven significant improvements in our workplace environment. Employees are encouraged to develop ownership of their working areas and take pride in their cleanliness and organisation. The added support of our lean specialists has been key to improving plant safety by removing hazards for employees and offering a clean, bright and safe working environment. Regular 5S audits led by team leaders ensure continuous improvement of working conditions and promote a safer workplace.

Take 2 initiative

Our Take 2 initiative ensures that employees think again before performing any unusual or non-standard activity. Simply stated, the employees take 2 minutes to discuss the task, any hazards and how to prevent accidents before any work is started. This process allows the team to consider and reflect on hazards and the controls required before work commences.

Contractor management

Contractor management is a particularly important area of attention, as it involves employees of third-party companies working on our premises to perform various types of project work. Vesuvius has defined strict rules which are outlined in the Control of Contractors standard. These rules include a pre-screening for safety performance and risks before a contract is signed, a commitment to respecting the same safety standards as Vesuvius employees, and a safety induction for all contractor employees on Vesuvius sites. All activities subject to a Permit to Work are audited on a daily basis.

Contractor safety management and performance is monitored. Safety performance targets for contractors are set at the same level as for Vesuvius employees.

Investing in technology for safety

Safety can be improved through the evolution of procedures and better behaviours, but technology offers new opportunities to continue to make our workplaces safer. Vesuvius is therefore investing in a range of technologies with the goal to automate strenuous or dangerous tasks and improve ergonomics. We are also exploring a range of new technologies including exoskeletons, wearable sensors and autonomous guided vehicles.

Health and safety certifications

We have six manufacturing sites (representing 11% of our 53 manufacturing sites), one warehouse and four Vesuvius operations in customers certified to ISO 45001:2018/OHSAS 18001:2007. Vesuvius sites choose to certify based on local regulatory and customer requirements.

Well-being at work

A critical aspect of our employees' health and safety is their physical, emotional and mental well-being.

In 2020, this saw an increased focus as the COVID-19 pandemic brought about many changes to work practices and unprecedented challenges. Around the world, our businesses responded with a range of initiatives including virtual sporting activities and events, conferences on health topics, personal support and coaching and workplace exercise programmes.

Vesuvius maintains a working hours policy and monthly reporting of headcount and hours worked. This allows us to identify if maximum working hours are being exceeded which can then be investigated by management. Other measures in place include a drive towards automation and investment in ergonomics, with many sites offering employee training on ergonomic practices.

Our people continued

People and Culture Strategy

Our People and Culture Strategy was launched in 2020 and aims to contribute to building an outstanding business by ensuring we have critical people skills and capabilities. We aim to grow outstanding people: we ensure our people managers have what they need to lead their diverse, engaged and high-performing teams for business and personal growth. These goals are then strongly underpinned by a values-driven, winning culture, that embraces diversity of thinking and continuous innovation to achieve high levels of performance and growth.

We create this culture by building broad organisational understanding of our strategy, goals and accountability, supported by our CORE Values and positive management behaviours. We also foster a working environment that is inclusive and diverse, where people can be themselves without fear of harassment, bullying or discrimination.

True to our decentralised business model, each of our business units has their own strategic HR agenda supporting delivery of their unique business strategies. In early 2020, the global COVID-19 pandemic forced us to shift our attention to the most urgent business needs and the immediate aspects of our employees' safety, health and well-being. While this was our absolute priority, much was still achieved during the year.

Employee Engagement

Since 2019, in partnership with Mercer Sirota, Vesuvius has operated an annual employee engagement survey to measure our employees' attitudes to Vesuvius and their work. The results are clustered in eight strategic categories and benchmarked externally against global and manufacturing industry results.

In 2020, despite the challenges caused by the COVID-19 pandemic, and thanks to a tremendous effort by local management, supported by an effective communication campaign, we achieved a record participation level with 92% of all employees completing the survey (one percentage point over the prior year).

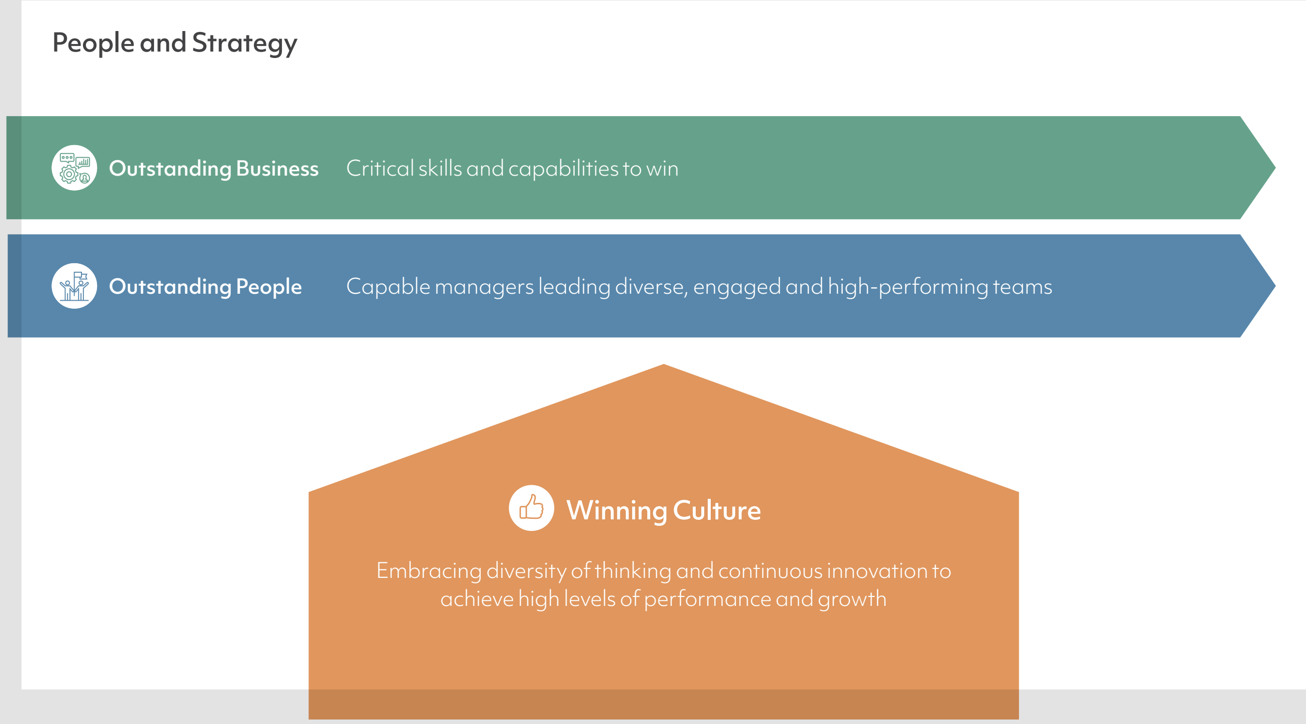
The overall engagement score increased by three percentage points vs 2019, with an improvement in all categories.

For the second consecutive year, safety remains our top strength, increasing by two percentage points vs 2019. Nearly 80% of employees feel positive about safety, placing us eight percentage points above the manufacturing industry average.

The biggest opportunity for improvement, highlighted by nearly 40% of respondents, lies in the implementation across the business of action plans developed from the survey results.

In December 2020, managers received a report of their team's responses. Managers are now sharing these results with their teams and action plans are being developed to address the concerns or issues raised.

We focus action plans not on the pure statistics, but on bringing about meaningful change in line with our CORE Values of Courage, Ownership, Respect and Energy. For example, much of the action taken to date has resulted in improved communications between managers and their teams and on greater cross-functional understanding and collaboration, all of which are key to the principles of our CORE Values.



Living the Values Awards 2020

Our CORE Values are central to the culture we are building at Vesuvius. By living these Values, we will create a truly entrepreneurial culture that focuses on the needs of our customers. One of the ways we encourage and recognise colleagues who display our Values is our Living the Values Awards.

In 2020, we saw even greater participation in our Regional Living the Values Awards. Winners of each of the categories of these Awards were nominated for the Global Living the Values Awards which were announced at a special online ceremony in December 2020. Chief Executive Patrick André paid tribute to all finalists, saying that they provided a remarkable example of what can be achieved by being true to the CORE Values.

Internal Communications

In 2020, we continued to develop our internal communications programme, ensuring we have a strong mix of channels to reach our diverse population. The Chief Executive regularly addresses the whole company via the CEO email channel, on average reaching 75% of the population with email addresses. Strategic messages and announcements are regularly shared on the Group intranet and staff app. 2020 saw an active use of screen savers to communicate main news, and we continued to utilise posters as the on-site communication channel. 'Town halls' held at different levels of the organisation provided the necessary opportunities for interactive Q&A sessions with the business leaders. The Group Executive Committee held 16 interactive virtual sessions with the Senior Leadership Group to share regular business updates and answer questions.

Growth opportunities with training and career progression

Talent Management

In 2020, we improved the visibility of our talent pool, launching integrated Talent and Succession Planning and introducing a talent mentoring programme piloted by the Group Executive Committee.

The Group Executive Committee holds direct responsibility for our senior leaders, jointly reviewing capability needs and deciding on development, succession and cross-organisational moves for the leadership group. This illustrates the strong commitment at the highest level of our organisation towards growing the Group using its Company-wide resources.

We employ individuals with an entrepreneurial mindset and an international outlook. Whether they are recent graduates or seasoned professionals, everybody who wants to leave their mark in a dynamic rapidly developing business environment has a chance to succeed. Special attention is paid to building strong, diverse teams that bring different backgrounds and experiences to our daily work.

Strengthening the leadership pipeline and facilitating people development throughout the organisation remain key areas of focus for Vesuvius. In 2020, we continued to work hard to ensure that we have the right capability in every part of the organisation to drive our strategy and realise market opportunities. As a result, we have built high-calibre leadership teams, many of whom are relatively new to their roles and to Vesuvius. We empower our people to drive the business with an entrepreneurial spirit, and to develop a performance-oriented culture. We align our senior management in their strategic business outlook and performance goals across all operational and functional business areas.

We encourage and reward high performance, foster talent and aim to create an environment where all can realise their individual potential. To meet the demands of the business and add rigour to our employee value proposition, we have launched training programmes to assist our employees to develop their skills and progress their careers.

We aim to balance between external hires and internal promotion, fuelled by a strong process of backup and succession planning, especially for management positions. In 2020, the percentage of Top Management (comprising the key leadership roles reporting directly to members of the Group Executive Committee) with more than three years of service was 45%.

Our people continued

Training and development

Our leaders take responsibility for managing and developing their teams. They are provided with access to a central resource, offering expertise in Global Rewards and Mobility, Talent and Performance Management, Culture and Learning, and supported by Group-wide processes and information systems.

In 2020, we provided training to managers in leading quality performance conversations with their team members. In addition, our recruitment was further improved by enhancements to our HR system, with data accuracy upgraded to allow better reporting and preparing the ground for moving into HR analytics.

We also delivered a redesigned core HeaTt product training programme into a web-based, online version, as participants were unable to travel for face-to-face training. These courses form part of the Vesuvius Technical University aimed at the continuous technical development of Vesuvius employees. Courses range from entry to expert levels and are continuously updated to keep pace with developing technology, thereby guaranteeing that Vesuvius experts are at the forefront of technical innovation. They are a great way for our hugely experienced technical experts to pass on their knowledge to the next generation and ensure the sustainability of our know-how.

Diversity

Vesuvius operates in 41 countries around the world, employing people with 70 nationalities, making us a truly diverse business. We regard this diversity as a critical aspect of our success and future growth as it allows us to access the widest range of skills and experience. At the end of 2020, the Senior Leadership team (comprising c.160 senior managers) consisted of 22 nationalities located in 21 countries.

At the end of 2020, 14% of our workforce were women, which was stable versus 2019, and 20% of the Group Executive Committee and Top Management team were women, which was an increase of 7.5 percentage points versus 2019. The Board has set a target of 30% female representation in this group by 2025 (Group Executive Committee plus key direct reports).

Workforce by gender
(as at 31 December 2020)

	Men	Women	Men	Women
Board	5	4	56%	44%
Group Executive Committee	5	2	71%	29%
Top Management[1]	39	9	81%	19%
Middle Managers	401	65	86%	14%
All other employees	8,476	1,357	86%	14%
All employees	**8,921**	**1,433**	**86%**	**14%**

1. Top Management comprises key leadership roles reporting directly to members of the Group Executive Committee.

Copies of the Board Diversity Policy and Group Policy on Diversity and Equality are available to view on the Vesuvius website: www.vesuvius.com.

Employee consultation and industrial relations

In all of the countries in which we operate, the Group informs and consults local works councils and trade unions in matters concerning the Vesuvius business. These processes and procedures are regulated by local law and generate constructive dialogue between employee representatives and management, which provides benefit to our business. In 2020, 70% of employees were represented by local works councils, trade unions or other bodies and agreements.

In addition to local employee representation, the Group has operated a European Works Council (EWC) containing representatives from each of the EU countries in which Vesuvius has employees. The existing EWC Agreement terminated in 2020, following notice by management. Consequently, the Group commenced preparations to support negotiation of a new agreement for the formation of a new EWC. In this process, employees will be represented by a Special Negotiating Body (SNB) made up of representatives from the 13 European countries we operate in. The new EWC Agreement will be registered in and operated under Polish law, as the representative country of Vesuvius plc, following the departure of the United Kingdom from the European Union. The negotiations with the SNB are scheduled to commence in the first half of 2021.

When a new EWC Agreement is signed, and the Council constituted, European management will expect to meet the EWC formally once a year. At this meeting, management will provide an update on the performance of the business, with a focus on the developments likely to impact European employees.

Global reward

Reward and recognition are integral components of our employee value proposition, enabling us to attract, engage and retain key talent and highly qualified employees. Our reward systems are designed to create a market-competitive and fair pay environment for all our employees and to reinforce the vision, strategy and expectations set by the Board.

We seek to create a culture that champions performance, building a strong link between individual performance and pay. Supported by our online people management platform, 'myVesuvius', performance reviews and subsequent reward decisions are based not only on how employees have performed against their individual objectives but also on assessments of behaviour and commitment to our CORE Values.

Our global job grading framework, based on a structured assessment methodology, enables us to compare roles and ensure internal consistency throughout the organisation. We are committed to creating reward and performance management systems which are transparent and objective, where employees receive equal pay for work of equal value, regardless of their age, race, disability, sexual orientation, gender, marital, civil partnership or parental status, religion or beliefs. Our management Annual Incentive Plans are measured against both Vesuvius' financial targets and personal performance, an incentive structure consistent with that of our Executive Directors. The Vesuvius Share Plan for Executive Directors and Group Executive Committee members encourages decisions based on long-term goals rather than short-term gains and works to align the interests of participants and shareholders.

In 2020, 95% of our salaried permanent employees undertook a performance review with their line management. This compared with 92% in 2019.

Global mobility

Vesuvius operates worldwide. We believe that our companies should be managed and staffed by local personnel. However, we also provide selected groups of employees with a range of international assignments. These assignments are usually for a limited period, most often three years.

Vesuvius expatriates do not come from one or two countries alone. We have a truly international mix of nationalities in our expatriate population. Individuals move not only within a region, but also between regions, with existing assignments including Malaysia to China, UK to UAE, France to Japan, UK to US, Japan to Thailand, Germany to UK and Belgium to UK. Our mobility programme shows that our expatriate population is as diverse as our Group.

Vesuvius operates several international assignment policies to provide for the different circumstances of these assignments – whether they be short-term, longer-term or require extended commuting. These policies are supplemented with clearly identified benefits, delivering support appropriate to the nature of the assignment. By accessing this broad range of policies, we can manage our international assignments with greater flexibility, thus catering for changing expectations and demands from employees, whilst at the same time meeting the needs of the business.

Key rationale behind international assignments

Vesuvius considers individuals for international assignment for three primary reasons:

> **Providing Vesuvius companies with skills that are not locally available and that are required at short notice.** This typically occurs in countries where we are establishing a new presence. The number of expatriates working on this basis diminishes over time as the organisation matures and we recruit and train local talent to take over

> **Career development.** We believe that the personal development plan of any employee being developed for a senior management or senior expert position should include a posting outside their home country. This encourages them to develop the skills necessary to function successfully in an international environment. These postings are tailored to the needs of the organisation and the needs of the individual

> **Enhancing diversity.** Management teams benefit from having a mix of gender and cultures. In specific cases, we use international assignments to achieve this goal

Our communities

Our principles – A responsible company

Vesuvius is committed to making a positive contribution to society. We want to establish strong relationships with all our key stakeholders, founded on mutual benefit and respect. We are particularly conscious of the need to support the communities in which we operate.

Our policies

Vesuvius' operating policies underpin the principles set out in our Code of Conduct. They are the practical representation of our status as a good corporate citizen and they assist employees to understand and comply with our ethical standards and the legal requirements of the jurisdictions in which we conduct our business. They also give practical guidance on how this can be achieved.

Human rights

The Group Human Rights Policy reflects the principles contained within the UN Universal Declaration of Human Rights, the International Labour Organization's Fundamental Conventions on Labour Standards and the UN Global Compact, to which the Group is a signatory. The Policy applies to all Group employees. It sets out the principles for our actions and behaviour in conducting our business and provides guidance to those working for us on how we approach human rights issues. The Group commits not to discriminate in any of our employment practices and to offer equal opportunities to all. The Group respects the principles of freedom of association and the effective recognition of the right to collective bargaining, and opposes the use of, and will not use, forced, compulsory or child labour. These principles have been integrated into the work of our procurement teams as we assess our suppliers and their business practices.

Prevention of slavery and human trafficking

During 2020, we published our fifth transparency statement outlining the Group's approach to the prevention of slavery and human trafficking in our business and supply chain. A copy of our latest statement is available to view on our website www.vesuvius.com.

Since the publication of our first statement we have conducted a risk assessment of our purchasing activities, seeking to identify, by location and industry, where the potential risks of modern slavery are highest. Our assessment identified the following four industries that pose a higher risk of modern slavery for Vesuvius:

1. Mining and extractive industries (raw materials)
2. Textiles (personal protective equipment (PPE) and work clothing)
3. Transport and packaging
4. Maintenance, cleaning, agricultural work and food preparation (contracted workers)

Following our modern slavery risk assessment, we provided webinar training to our key purchasing staff and continue to use an online e-learning module to upgrade the training given to all supplier-facing staff. This provides key guidance on the red flags associated with modern slavery to assist them in identifying these during supplier visits and accreditation. Since the launch of the Modern Slavery red flag training we have trained 96% of the targeted staff.

Conflict minerals

We actively and routinely review our portfolio of purchasing to check for conflict minerals. In 2020 we did not use any conflict minerals in our manufacturing processes.

Lobbying and political expenses

Around the world, we participate in government and industry working groups, are members of industry associations, and engage in direct contact with independent bodies on key business issues. This ensures that we can help in shaping new policies, regulations and standards, and ensure compliance with existing requirements. We do not make any political contributions.

Business ethics/Anti-bribery and corruption and working with third parties

We engage with various third-party representatives and intermediaries in our business. We recognise that they can present an increased anti-bribery and corruption risk. Our procedure on working with third parties clearly outlines our zero-tolerance approach to bribery and provides practical guidance for our employees in identifying concerns and how to report them.

Vesuvius engages with third-party sales agents, many of whom operate in countries where we do not have a physical presence. Our employees' use of, and interaction with, sales agents is supported by an ongoing training programme for those who have specific responsibility for these relationships. Training includes an annual mandatory e-learning course with specific employees receiving additional focused training.

As part of communication around anti-bribery and ethics, employees are actively encouraged to consult on ethical issues. They have open access to the Compliance Director and Legal function who provide support on a regular basis.

Working with third parties

During 2020, the Group continued the due diligence review of our third-party representatives and intermediaries. Following the previous years' enhanced review of sales agents, custom clearance agents and logistics providers, we extended our review to distributors. This included a detailed review of our due diligence activities on active distributors across the Group. This process covers public information searches, regulatory searches and activity reviews. Our due diligence processes will continue to be extended using a risk-based approach during 2021 and beyond. During the year, we also continued our ongoing monitoring of the sales agents used across the Group.

WE ARE

SUSTAINABLE

Sustainability is everything we do as a **good corporate citizen**.

Mahmoud Showeikh
Engineering and Maintenance Manager, Advanced Refractories
Ras Al Khaimah, UAE

This included a review of the agent reporting, invoice data and commission calculation. Such reviews will remain a continuing part of our compliance programme.

Extending our Sustainability drive to our suppliers

Principles

The satisfaction of our customers, the safety and reliability of Vesuvius products, and the efficiency of Vesuvius' internal processes are dependent on the reliability of its network of suppliers. Vesuvius is committed to ensuring that we utilise high-quality raw materials, secured through reliable and well-developed and sustainable supply chains.

Supplier Sustainability Assessments

As part of our sustainability agenda, Vesuvius has implemented a Supplier Sustainability Assessment programme to support decisions on the suitability of the suppliers we choose to do business with. Overall, our objectives are to encourage suppliers to implement a meaningful sustainability programme, embrace the UN Global Compact principles, evaluate and reduce our upstream CO_2 emissions and identify potential risks (and if necessary, address them) in our supply chain.

To assist with the implementation of the programme, Vesuvius has partnered with an external consultancy who will rate our raw materials suppliers based on a detailed set of criteria, covering four dimensions: Labour and Human Rights; Ethics; Environment; and Sustainable Procurement. We aim to enroll suppliers representing at least 50% of our raw materials spend into our Sustainability Assessment programme by 2023.

Supplier Quality Development

Vesuvius is very proud of the close relationships we have with our suppliers around the world. We work with them to ensure that the highest-quality materials and products enter our supply chain.

Supplier quality audits

The Supplier Quality Audit programme is led by company experts from the Purchasing and Quality teams, located in all regions, under the supervision of Group Purchasing. Overall, the goal is to reduce the number of quality issues that may affect our operations or our customers. As part of this, we share expectations with our suppliers, identify risks, and adapt our internal controls accordingly. We encourage our suppliers to improve their own processes and help them prioritise actions to achieve this.

Areas of focus include:

> Quality management rules: final inspection, controls at important process steps, management of incoming materials, data tracking, customer feedback and communication

> Management of non-conformities: reaction to non-conformities, protection of customer, problem resolution and application of lessons learned

Vesuvius also conducts an annual Supplier Audit programme built to cover, in particular, new suppliers, the re-auditing of suppliers with low grades and suppliers with quality issues. In 2020, despite the impact of COVID-19 travel restrictions, 98 audits were conducted at 95 supplier facilities, representing 5% of the active raw materials supplier base. Five suppliers (5% of suppliers audited) received grades below threshold. Actions were taken either to support them or to terminate our relationship with them.

Our communities continued

Supplier Corrective Action Requests

To ensure the integrity of our products, we have a rigorous approach to issues relating to the quality of raw materials and other inputs to our processes.

When a supplier does not meet expectations, we issue a formal Supplier Corrective Action Request. Our proven 8D methodology is then used to investigate the root cause of the issues and define corrective actions. A web-based portal is available for suppliers to document the containment actions implemented and outcome of the investigation, to enable review by us.

In the vast majority of cases, issues are identified and resolved quickly. Suppliers with repeat issues and poor problem-solving are required to undergo a Supplier Quality Audit.

Speak Up: Whistleblowing Policy

Vesuvius employees can speak up without fear of retaliation, either to Vesuvius management or via independent channels. A third-party-operated confidential Speak Up Helpline (Speak Up) is available for employees wishing to raise concerns anonymously or in situations where they feel unable to report internally. This independent facility supports online reporting through a web portal or reporting by phone or by voicemail. Ensuring global accessibility, employees can speak with operators in any of our 29 functional languages.

All reports received are reviewed and, where appropriate, investigated and feedback is provided to the reporter via the helpline portal. Vesuvius' Speak Up helpline is publicised through local language posters at each of our sites, our internal website and during internal compliance training and new joiner inductions. No Vesuvius employee will ever be penalised or disadvantaged for reporting a legitimate concern in good faith.

Reports received via Speak Up channels are managed by the General Counsel and Compliance Director. When received, reports are assessed for risk and category of concern. All reports are considered in line with a protocol for review, investigation, action, closure and feedback, independent of management where necessary, but involving senior business unit or HR management as appropriate. For complex issues, formal investigation plans are drawn up, and support from external experts is engaged where necessary. Feedback is recognised as an important element of the Speak Up process and we aim to provide an update on all reports within 28 days of receipt.

In line with good practice, details of the Group's Speak Up channels, and the Group's approach to addressing such issues, was recommunicated in 2020. This relaunch included an updated poster campaign, local 'town hall' meetings and email communication for those working remotely. We continue to monitor the volume, geographic distribution and range of reports made to the Speak Up facility to ascertain not only whether there are significant regional compliance concerns, but also whether there are countries where access to this facility is less well understood or publicised.

During 2020, the Board monitored and oversaw the Group's procedures for reporting allegations of improper behaviour, and throughout the year received updates on the nature and volume of reports received from the confidential Speak Up Helpline, key themes emerging from these reports and the results of any investigations undertaken. In 2020, we received 95 reports (2019: 26) through the Speak Up facility and 32 walk-in reports. Each one of these was reviewed and, where appropriate, investigated. Similar to 2019, a substantial majority of reports received in 2020 were human resource issues which indicated no compliance concerns, nor serious breaches of the Code of Conduct. Of the small number of reports received that contained allegations of a breach of our Code of Conduct, thorough investigations were performed and, where appropriate, disciplinary action was taken, including individuals leaving the Group as a result.

Data protection

Our Data Protection Policy requires a uniform approach in the handling of personal data to manage the privacy obligations of the Group. Everyone has rights in respect of how their personal data is handled. Our Policy recognises that the lawful and correct treatment of personal data is vital to our continued success in an increasingly regulated global marketplace. During the course of our activities, we may collect, store and process personal data about our staff, customers, suppliers and other third parties. We are committed to treating this data in an appropriate and compliant manner.

In 2020, we continued to implement our uniform approach to data protection across the Vesuvius Group, expanding the implementation of our policies and procedures further outside of Europe (which had previously been updated with the implementation of the General Data Protection Regulation (GDPR)) into more of our jurisdictions. In addition, and replacing the existing GDPR versions, we published a Global Privacy Notice for employees, workers and contractors. In other developments we implemented a Vesuvius Candidate Privacy Notice, relating to the treatment of the personal data of potential employees, and finalised an updated IT Acceptable Use policy, which now includes notification provisions in relation to monitoring of employees' use of the Vesuvius systems.

We also set up a stand-alone internal Data Protection Sharepoint Site, with full access for all employees. This site contains information, resources, policies and procedures and links to training documents. This site includes the Data Protection Handbook which was developed to provide templates and guidance to HR and other personnel, for the initial handling of data protection related matters such as breach reporting and subject access requests.

Another area of focus in 2020 was our response to the implementation of data protection legislation in Turkey and Brazil where we worked with local teams to ensure that our approach to data protection is compliant with these changes, including local workshops, an audit of IT in Turkey and the appointment of local Data Protection Officers in Brazil. The changes in data protection laws in China are being monitored and work has commenced in preparation of implementation of such legislation at a local level.

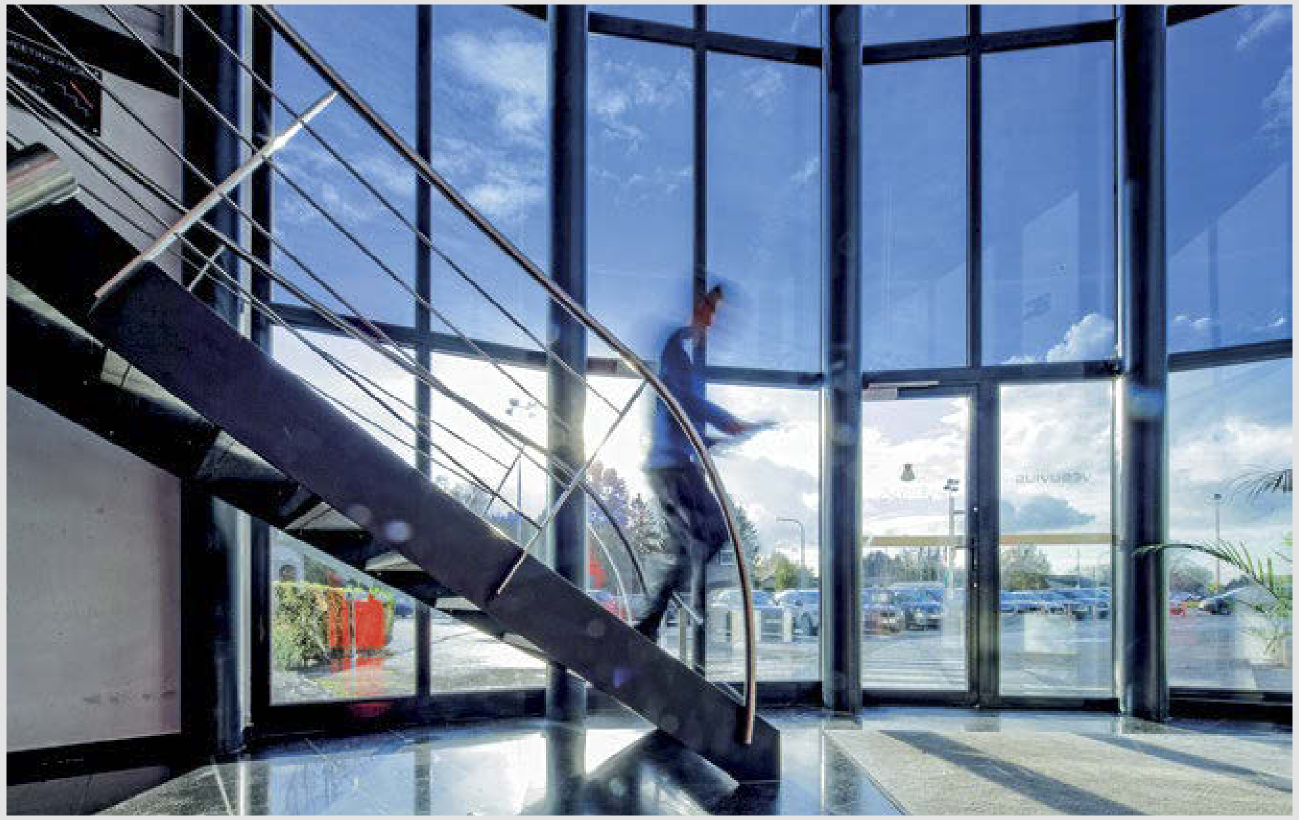
The Data Protection Officer is responsible for raising awareness of data protection issues across the Group, supervising privacy impact assessments (PIAs) and providing advice and guidance in relation to data protection issues. Specific data protection training was extended to global employees through e-learning at the end of 2019 and is a mandatory training course for all employees with email access. At the end of 2020, the completion rate was 98%. It is regularly audited for non-completion. During 2020, we conducted seven PIAs covering operational procedures, compliance-related processes and HR data, and in particular no update or amendment to the central HR database is undertaken without a PIA.

The self-assessment GDPR audit was initially issued to European entities in May 2019, on the anniversary of GDPR implementation, and will continue to be issued in two-yearly intervals to assess and ensure continued compliance with data protection legislation. In 2021, this audit will become a global data protection audit across all Vesuvius entities.

Further due diligence was undertaken, clarifying the data we control and process both globally and within Europe, the methods by which we do this, the security of the systems that hold our data and the assignment of responsibilities for managing data processes. In particular, a review of data protection measures in relation to Brexit was undertaken – the technical and security measures relating to transfer of data to other countries was reviewed and updated with IT security in readiness for new Shared Service Centres to be prepared in the transition period of 2021. Vesuvius Group S.A. (Belgium) was nominated as the main establishment for Vesuvius in Europe (along with Vesuvius Holdings in the UK) for GDPR data protection matters from 1 January 2021.

Other due diligence

The Group continues to undertake focused, country- and function-specific risk assessments, reviewing financial records and the quality of implementation of our policies and procedures, often engaging the assistance of external advisers. These risk assessments can be proactive or reactive (e.g. in response to changing regulation). The outputs of these assessments are used to identify activities that require further attention, ensure that our Group policies and procedures for the management of anti-bribery and corruption risk or other regulatory risk continue to be appropriate for the business, and ensure that within our business there is the necessary awareness and understanding to be able to manage risks appropriately.



Our communities continued

Training

During the year, we continued to develop our training programme on the principles contained in the Vesuvius Code of Conduct and associated anti-bribery, corruption and other compliance policies and procedures. Training gives our employees a clearer understanding of the scope of risks that exist as we conduct our business and gives context to how the Group expects each one of us to respond to those risks. We operate an integrated learning management system which allows us to deliver Vesuvius-specific e-learning modules to employees on topics relevant to their role through an online interactive platform.

Training provided during 2020 included:

> An annual mandatory e-learning module for Anti-Bribery and Corruption, available in 22 of our functional languages

> Webinar and videoconference training hosted by the Compliance team to staff at several sites covering Anti-Bribery and Corruption, Speak Up and trade sanctions

Our e-learning platform supplements the face-to-face training provided to employees by the Legal and Compliance team, enabling us to reach more employees, more quickly and in a more targeted way. In 2021, we will continue to develop the training processes, modules and languages available and we will host additional webinar training to replace the face-to-face training provided in previous years.

The Board has set a target of at least 90% of targeted staff completing the Anti-Bribery and Corruption training annually. 100% of the targeted staff completed the 2020 Anti-Bribery and Corruption training, compared with 99.3% in 2019.

Supporting our communities

Vesuvius wants to make a positive contribution to the communities in which we work by supporting a wide variety of fundraising and community-based programmes around the world. Below are some details about a selection of the community programmes our colleagues were involved in throughout 2020, many of which sought to support people and services impacted by the COVID-19 pandemic.

> Piedade (Brazil) provided financial support to employees, cash donations to the local hospital and masks for relatives

> India donated well over 100,000 masks, hydroalcoholic gel and other medical supplies. The Company and co-workers provided support to the family of one of our contractors who passed away

> Multiple plants made donations in kind (Brazil, Czech Republic) and of food (Malaysia, India) or supported local stores by buying from them (Charleston)

Going forward, we plan to increase the focus of our community activities on two areas which we are especially passionate about:

> Educational opportunities for children and young people in less developed countries and from disadvantaged backgrounds

> Encouraging more girls and women into scientific and technical fields of education

In 2021, wherever possible and practical, we are encouraging our people to dedicate their efforts to those areas.

The Strategic Report set out on pages 1-88 contains a fair review of our businesses, strategy and business model, and the associated principal risks and uncertainties. We also deliver a review of our 2020 performance and set out an overview of our markets and our stakeholders. Details of our principles, and our people and community engagement, together with our focus on safety, are also contained in the Strategic Report.

Approved by the Board on 3 March 2021 and signed on its behalf by

Patrick André Chief Executive	**Guy Young** Chief Financial Officer

WE ARE

EFFICIENT

Efficiency at Vesuvius means always looking for **better ways** to do things to create **more value** for our customers and our business.

Agnieszka Romek
Production Department Manager, Flow Control
Skawina, Poland

Governance

Find out more at
report2020.vesuvius.com

WE ARE

INNOVATIVE

Vesuvius is **always innovating** - whether it is in safety, reliability, product performance or any other area of our business.

Pablo Santucci
Commercial Project Coordinator, Digital Services
Piedade, Brazil

Board of Directors

John McDonough CBE

Chairman

Appointed to the Board 31 October 2012

> Proven strategic and leadership skills gained in a complex multinational business
> Strong engineering background and global commercial experience
> Clear leadership understanding of safety issues
> Operational and strategic understanding of a range of business environments gained from working in Asia-Pacific, EMEA and the UK
> Experience as CEO with an international listed company

Current external appointments

John is Chairman of Sunbird Business Services Limited and a Non-executive Director of Cornerstone Property Assets Limited and Inceptum2 Solutions Limited.

Career experience

John spent 11 years as Group Chief Executive Officer of Carillion plc until he retired in 2011. Prior to this, he spent nine years working for Johnson Controls. He served as Chairman of The Vitec Group plc for seven years, retiring from the board in 2019. He has also previously served as a Non-executive Director and Chairman of the Remuneration Committee of Tomkins plc, as a non-executive Director of Exel plc and as a Trustee of Team Rubicon UK.

John was awarded a CBE in 2011 for services to industry.

Patrick André

Chief Executive

Appointed to the Board 1 September 2017

> Global career serving the steel industry
> Strong background in strategic development and implementation
> Consumer focus and proven record of delivery, with strong commercial acumen
> Drive and energy in promoting his strategic vision

Current external appointments – None

Career experience

Patrick joined the Group as President of the Vesuvius Flow Control business unit in 2016, until his appointment as Chief Executive in September 2017. During 2020, Patrick again took direct responsibility for the Flow Control business unit on an interim basis pending the appointment of a permanent successor following the departure of Roel van der Sluis in late 2019.

Before joining the Group, Patrick served as Executive Vice President Strategic Growth, CEO Europe and CEO for Asia, CIS and Africa for Lhoist company, the world leader in lime production. Prior to this, he was CEO of the Nickel division, then CEO of the Manganese division of ERAMET group, a global manufacturer of nickel and special alloys.

Guy Young

Chief Financial Officer

Appointed to the Board 1 November 2015

> Extensive international experience gained in the mining and industrial sectors
> Qualified Chartered Accountant, with significant financial and business development experience
> Drive and energy in managing people and teams
> Focus on strategic execution and business optimisation

Current external appointments – None

Career experience

Guy was Chief Financial Officer of Tarmac and latterly Lafarge Tarmac, the British building materials company, between 2011 and 2015. Prior to this he spent 13 years working at Anglo American plc in various senior financial and business development positions, including as Chief Financial Officer of Scaw Metals Group, the South African steel products manufacturer.

Guy is qualified with the South African Institute of Chartered Accountants.

Key to Board Committee membership

A Audit Committee
N Nomination Committee
R Remuneration Committee
● Committee Chairman

Engagement with the workforce

E Holly Koeppel serves as the designated Non-executive Director responsible for overseeing engagement with the workforce.

Changes to the Board during the year

The Directors named were in office during the year and up to the date of this Annual Report, with the exception of Kath Durrant who was appointed to the Board on 1 December 2020.

Kath Durrant will take over as Chair of the Remuneration Committee when Jane Hinkley steps down as Chair of the Remuneration Committee at the close of the 2021 AGM.

* Cevian Capital is a shareholder of Vesuvius plc and, at 3 March 2021, held 21.11% of Vesuvius' issued share capital.

Douglas Hurt

Senior Independent Director (SID)

Appointed to the Board 2 April 2015

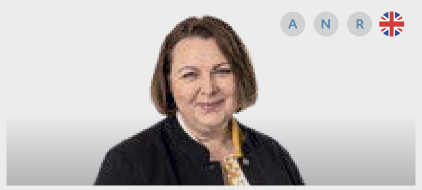
> Qualified Chartered Accountant, with recent and relevant financial experience
> Highly knowledgeable in operational and corporate financial matters, with significant US and European experience
> Proven management and leadership skills

Current external appointments

SID and Chair of the Audit Committee of Countryside Properties PLC, and a Non-executive Director and Chair of the Audit Committees of Hikma Pharmaceuticals PLC and the British Standards Institution.

Career experience

Douglas was Finance Director of IMI plc, a UK listed company, until 2015. He spent 23 years at GlaxoSmithKline plc where he held senior finance and general management positions. Douglas served as SID and Chair of the Audit Committee of Tate & Lyle plc until 2019.



Kath Durrant

Non-executive Independent Director

Appointed to the Board 1 December 2020

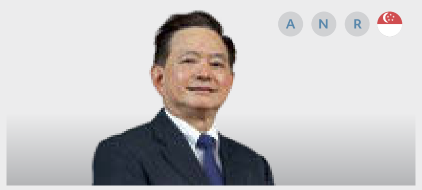
> 30 years' experience of people management
> Strong operational and strategic track record, gained working at a number of large global manufacturing companies
> Experienced UK governance professional

Current external appointments

Non-executive Director and Chair of the Remuneration Committees of Calisen plc and SIG plc.

Career experience

Kath held various operational and specialist HR roles at GlaxoSmithKline plc and AstraZeneca plc and was Group HR Director of Rolls-Royce plc. She was most recently Group HR Director of Ferguson plc and Chief HR Officer of CRH plc. Kath served as a Non-executive Director and Chair of the Remuneration Committee of Renishaw plc from 2015 to 2018.



Hock Goh

Non-executive Independent Director

Appointed to the Board 2 April 2015 and will step down from the Board at the 2021 AGM

> Strong focus on R&D and technology
> Wealth of experience in sustainability and safety matters gained from more than 35 years working in the oil and gas industry
> Strong international commercial experience and in-depth knowledge of Asian markets

Current external appointments

Non-executive Director of AB SKF, Santos Ltd and Stora Enso Oyj.

Career experience

Hock spent 25 years with Schlumberger, serving as President of Network and Infrastructure Solutions in London, President of Asia-Pacific, and Vice President and General Manager of China. He spent seven years as a Partner of Baird Capital Partners Asia, and was Chairman of Advent Energy Ltd and MEC Resources Ltd, and a Non-executive Director of Harbour Energy Ltd.

Friederike Helfer

Non-executive Director

Appointed to the Board 4 December 2019

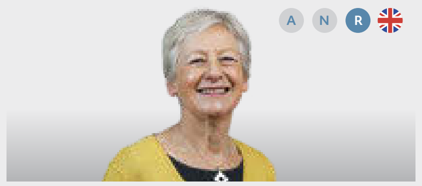
> An experienced strategist, with strong analytic capability
> Commercial acumen and a strong track record of working with a portfolio of companies to identify scope for operational and strategic improvement

Current external appointments

Partner of Cevian Capital* and a Non-executive director of the Supervisory Board of thyssenkrupp AG.

Career experience

Friederike is a Partner of Cevian Capital. She joined Cevian in 2008 and from 2013 to 2017, served on the Board of Directors and the Audit Committee of Valmet, a Finnish engineering company, in which Cevian was also invested. Prior to joining Cevian, Friederike worked at McKinsey & Company. She is a CFA Charterholder.



Jane Hinkley

Non-executive Independent Director

Appointed to the Board 3 December 2012

> Proven track record of managing complex global trading business
> Qualified Chartered Accountant, with significant financial and operational experience in large multinational companies
> Leadership and global management skills

Current external appointments – None

Career experience

Jane is a Chartered Accountant and was Managing Director of Navion Shipping AS for three years until 2001. Prior to this, she spent her executive career as Chief Financial Officer and Managing Director of Gotaas-Larsen Shipping Corporation. She was previously Chairman of Teekay GP LLC, a Non-executive Director and Chairman of the Remuneration Committee of Premier Oil plc, and a Non-executive Director of Revus Energy ASA.

Holly Koeppel

Non-executive Independent Director

Appointed to the Board 3 April 2017 and will step down from the Board at the 2021 AGM

> A strong track record of growing businesses and experience in domestic and international utility, power and infrastructure
> Financial and operational experience managing assets on five continents
> Global board experience as an independent non-executive director and an investor

Current external appointments

Non-executive Director and Chair of the Audit Committee of British American Tobacco p.l.c., Non-executive Director and Chair of the Governance Committee of The AES Corp. and a Non-executive Director of Arch Coal, Inc.

Career experience

Holly was Chief Financial Officer of American Electric Power Company, Inc. Prior to this, she held management roles at the Consolidated Natural Gas Corporation. Holly was Co-Head of Citi Infrastructure Investors (renamed Gateway) until 2007. She has also served as a Director of Integrys Energy Group, Inc., and Reynolds American Inc.

Group Executive Committee

Guy Young
Chief Financial Officer
5 years with the Group

For biographical details please see the Board of Directors on page 92.

Henry Knowles
General Counsel and Company Secretary
7 years with the Group

Appointed as General Counsel and Company Secretary in September 2013. Prior to joining Vesuvius, Henry spent eight years at Hikma Pharmaceuticals PLC, a generic pharmaceutical manufacturer with significant operations in the Middle East, North Africa and the US where he held the roles of General Counsel and Company Secretary. Henry is also responsible for the Group's Intellectual Property function.

Henry is based in London, UK.

Agnieszka Tomczak
Chief HR Officer
2 years with the Group

Appointed as Chief HR Officer in October 2018. Agnieszka has over 25 years of senior leadership experience in multinational companies spanning various business sectors and industries. Prior to joining Vesuvius, she spent 12 years at ICI, which was subsequently acquired by AkzoNobel, in regional and global HR roles.

Agnieszka is based in London, UK.

Patrick André
Chief Executive
5 years with the Group

For biographical details, please see the Board of Directors on page 92.

Pascal Genest
President, Flow Control
1 month with the Group

Appointed President, Flow Control, 18 January 2021. Pascal joined the Group from GFG Alliance where he held the position of CEO Liberty Ostrava in the Czech Republic. Prior to this he was CEO of SULB in Bahrain. Pascal has more than 15 years' experience working in the steel industry, mainly with ArcelorMittal. He has also worked in consulting, in private equity and in the aluminium industry.

Pascal is based in London, UK.

Karena Cancilleri
President, Foundry
1 year with the Group

Appointed President, Foundry in October 2019. Karena joined the Group from Beaulieu International Group, where she served for six years as VP Engineered Products and latterly President Engineered Products. She has a broad breadth of managerial experience spanning various international leadership roles in companies such as FiberVisions, Kraton Corporation and Shell.

Karena is based in London, UK.

Thiago Avelar
President, Advanced Refractories
2 years with the Group

Appointed President, Advanced Refractories on 1 January 2020. Thiago joined Vesuvius in February 2019 as Regional VP Steel, South America, where he was responsible for Vesuvius' Steel Operations in South America. Prior to joining the Group, he worked for RHI Magnesita and ArcelorMittal in various technical and marketing roles based in Europe and Brazil.

Thiago is based in London, UK.

Patrick Bikard
President, Operations and Technology
13 years with the Group

Appointed President, Operations in January 2014, with responsibility for Technology since 2019. He was previously Vice President for Manufacturing, QHSE, Engineering and Purchasing and, prior to joining Vesuvius, he held senior operational roles at Renault, Alstom and Faurecia.

Patrick is based in Ghlin, Belgium.

Corporate Governance Statement
Chairman's governance letter

Dear Shareholder,

On behalf of the Board, I am delighted to present the 2020 Corporate Governance Statement. As a Board, we remain committed to applying the highest standards of corporate governance, recognising that robust governance and culture underpin business success. Within the Corporate Governance Statement we provide investors and other stakeholders with an annual insight into the governance activities of the Board and its Committees.

The COVID-19 pandemic significantly impacted the Board's activities in 2020, curtailing the Non-executive Directors' usual visits to operations and necessitating the holding of a significant number of the Group's Board and Committee meetings online. As the full effects of the crisis began to be felt, the Board held an increased number of shorter and more frequent meetings to oversee the Group's response. However, the Board and its Committees still carried out their scheduled timetable of activities, giving close consideration to the implications of the COVID-19 crisis on the matters that regularly come before the Board.

Opportunities for Board members to engage directly with stakeholders were significantly limited during the year. However, the Board was delighted to see the Group's operations grasp the challenge to strengthen the links with our customers, through a range of initiatives aimed at fully utilising the benefits of virtual communication, and engage with our communities in the supply of PPE and provision of other solutions aimed at responding to the threat of COVID-19. The Group was also able to carry out its second employee engagement survey and was delighted that, despite the challenges presented by remote working, participation in the survey increased by 1% to 92%. Work is currently progressing on communicating the detailed results of the survey and developing action plans for the forthcoming year. Once again, this process engaged management directly, with managers receiving individual reports on their teams, to enable detailed and directly relevant action planning to increase engagement and improve employee experience.

The Nomination Committee has once again focused on succession planning, overseeing the appointment of Kath Durrant to the Board in December 2020 and commencing work on responding to the planned and announced Board rotations of Hock Goh and Holly Koeppel who will both retire at the AGM. In 2021 the Nomination Committee will continue to address succession issues in line with director rotation requirements, including the Senior Independent Director commencing a process for my succession as Chairman. The Committee also continues its focus on encouraging greater diversity among the Group's employees and on supporting the enhancement of the Group's talent pool for senior management.

The Remuneration Committee faced the challenge this year of overseeing the execution of the Group's remuneration programme in the face of the unprecedented impact of the COVID-19 pandemic. In taking decisions throughout the year on the various incentive elements, the Remuneration Committee sought to balance the need to retain, motivate and reward staff with the need to reflect the impact felt across all stakeholders.

In April 2020, the Board oversaw the implementation of a number of cost reduction and cash preservation measures. To show solidarity with the Group's employees the Board, in conjunction with the Group Executive Committee, elected to reduce their fees and salary by 20% for six months, and about 170 further senior managers also agreed a six-month salary sacrifice. The Audit Committee has been focused on carefully assessing the Group's financial situation throughout the year, with a heightened emphasis on the Group's liquidity and debt situation. Further details on the work of each of the Committees can be found in the Committee Reports on pages 106-143.

The Board's formal evaluation process for 2020 was externally facilitated by the corporate advisory firm, Lintstock. The results of the review indicated an improvement in the Board's performance despite the challenges presented by COVID-19, and that the move to online meetings had not curtailed the quality of information or debate at Board meetings. The evaluation concluded that the Board remained strong and effective with a good level of constructive challenge and informed debate. The evaluation highlighted a small number of Board priorities, including the continued need to focus on the Board and senior management succession pipeline and the drive to integrate the Group's new Sustainability initiative into the broader strategy. We look forward to progressing these in 2021.

Yours sincerely

John McDonough CBE
Chairman

3 March 2021

In this section:

- **Board leadership and company purpose** on p98
- **Division of responsibilities** on p100
- **Audit Committee report** on p106
- **Nomination Committee report** on p115
- **Directors' Remuneration Report** on p120

Also see:

- **Group's statement of purpose** on p1
- **Strategic Report** on p1-88

Board Report

2018 UK Corporate Governance Code – Information Availability

Board Leadership and Company Purpose	The Corporate Governance statement ('CG Statement') on pages 96-143 gives information on the Group's compliance with Principles relating to the Board's Leadership and Company Purpose. More detailed information on: > the Group's statement of purpose can be found on page 1 > the Group's strategy, resources and the indicators it uses to measure performance can be found on pages 14 and 15, 20 and 21, and 40 and 41, respectively > the Group's engagement with stakeholders and the Group's Section 172(1) Statement is contained in the Section 172(1) Statement and Stakeholder Engagement section on pages 22-29 > the Group's approach to workforce matters can be found in the Our people section on pages 74-83, with further details of the Group's approach to employee involvement and engagement contained in the Section 172(1) Statement on pages 23-25 Details of the Group's framework of controls is contained in the Audit Committee report on pages 110 and 111 of the CG Statement and in the Risk, viability and going concern section on pages 32 and 33.
Division of Responsibilities	The CG Statement describes the structure and operation of the Board. The Nomination Committee report, describes on page 118, the process the Company conducts to evaluate the Board, to ensure that it continues to operate effectively, that individual Directors' contributions are appropriate and that the oversight of the Chairman promotes a culture of openness and constructive yet challenging debate.
Composition, Succession and Evaluation	Details of the skills, experience and knowledge of the existing Board members can be found in the Board biographies contained on pages 92 and 93. Information on the Board's appointment process and approach to succession planning and Board evaluation is contained in the Nomination Committee report on pages 116 to 119 of the CG Statement.
Audit, Risk and Internal Control	Information on the policies and procedures the Group has in place to monitor the effectiveness of the Group's Internal and External Audit functions, and the integrity of the Group's financial statements is contained in the Audit Committee report on pages 110 to 113 of the CG Statement, along with an overview of the procedures in place to manage risk and oversee the internal control framework. Further information on the Group's approach to risk management is contained in the Risk, viability and going concern section of the Strategic Review on pages 30-35. The Board believes the 2020 Annual Report to be a fair, balanced and understandable assessment of the Company's position and prospects. A description of the Audit Committee's work in enabling the Board to reach this conclusion is contained in the Audit Committee report on page 110.
Remuneration	The Directors' Remuneration Report section of the CG Statement describes the Group's approach to Directors' remuneration, including the procedure for developing policy and the Remuneration Committee's discretion for authorising remuneration outcomes. Details of linkage of the Directors' Remuneration Policy with long-term strategy is contained on page 120 and also highlighted on pages 40 and 41 in the section on Key Performance Indicators.

Board Report continued

Board leadership and company purpose

The Board is responsible for leading the Group in an efficient and entrepreneurial manner, for establishing the Group's purpose, Values and strategy and satisfying itself that these and the Group's culture are aligned. It focuses primarily upon strategic and policy issues and is responsible for ensuring the long-term sustainable success of the Group. It sets the Group's strategy, oversees the allocation of resources and monitors the performance of the Group. It is responsible for effective risk assessment and management. In performance of these duties, the Board has regard to the interests of the Group's key stakeholders and is cognisant of the potential impact of the decisions it makes on wider society.

Purpose

Vesuvius' purpose is to be a global leader in molten metal flow engineering and technology, servicing process industries operating in challenging high-temperature conditions. In order to achieve this, the Group develops innovative solutions that enable our customers to improve their manufacturing costs, quality and safety performance, whilst helping them to become more efficient in their processes. The Group aims to deliver sustainable, profitable growth, providing its shareholders with a superior return on their investment, whilst providing each of its employees with a safe workplace where they are recognised, developed and properly rewarded.

The Board has identified seven Strategic Objectives for achieving long-term sustainable success. It is currently pursuing four shorter-term key execution priorities, along with a fifth over-riding drive for sustainability, which encapsulate the Group's immediate aims. Further information on these can be found on pages 14 and 15. The Board regularly reviews the Group's performance against a number of Key Performance Indicators (KPIs) which provide information on key aspects of the Group's financial and non-financial performance. This information assists the Board to assess progress with the execution of the Group's strategy and to determine any remedial action that needs to be taken. Detailed information on the Group's KPIs can be found on pages 40 and 41.

The Group has established a framework of controls to enable risk to be assessed and managed, and further information on this can be found in the Audit, risk and internal control section on page 105 of this Board Report.

Sustainability

Vesuvius recognises that lasting business success is measured not only in financial performance but in the way in which the Group deals with its customers, business associates, employees, investors and local communities. In 2020 the Group launched a new Sustainability initiative, aimed at supporting the Group's key Strategic Objectives to create a better tomorrow in a profitable and sustainable way. Having set specific targets for the ways in which the Group can improve its impact on our planet, our communities, our people and our customers, the Board intends to drive change throughout the Group. Further information can be found in the Sustainability Report on pages 56 to 89.

Culture

The Board takes seriously its responsibility for shaping and monitoring the corporate culture of the Group. The Group's CORE Values – Courage, Ownership, Respect and Energy – define our behaviours across the business and are the practical representation of the culture we seek to foster, aligning with the Company's purpose and strategy, and supporting our governance and control processes. These Values are prominently displayed at all sites. Our CORE Values are reinforced in our performance management systems, which ensures that they are firmly embedded in our day-to-day conversations and behaviours. Further detail can be found on page 64.

The CORE Values are supported by the Group's Code of Conduct which sets out the standards of conduct expected, without exception, of everyone who works for Vesuvius in any of its worldwide operations. The Code of Conduct emphasises the Group's commitment to ethics and compliance with the law, and covers every aspect of Vesuvius' approach to business, from the way that the Group engages with customers, employees, its markets and each of its other stakeholders, to the safety of its employees and places of work. Everyone within Vesuvius is individually accountable for upholding these requirements.

The Board seeks to ensure that the Group's workforce policies and practices are consistent with the Group's long-term sustainable success. Further information about the Group's remuneration practices for senior managers can be found in the Directors' Remuneration Report on pages 120-143, the Group's approach to diversity in the Nomination Committee report on page 117, the Group's approach to HR matters in the Our people section on pages 74-83 and the Group's policies and procedures, including information on the Speak Up confidential employee concern helpline in the Our communities section on pages 84-88.

The Board recognises the need to 'walk the talk' on our CORE Values and all the Directors act with integrity and are fully committed to leading by example to promote the desired culture.

During the year, the Board's assessment of the Group's culture focused on the Group's:

(1) **Adherence to the CORE Values** – Throughout the year the Board received regular feedback on the Group's response to the COVID-19 pandemic. The Group's strong culture and CORE Values were clearly evident in the many and varied initiatives established across the Group to ensure that we continued to provide the same high-quality service to customers. This included offering online training tutorials and utilising virtual reality to provide service support. Towards the end of the year, nominations were once again sought for the Group's Living the Values Awards. The Board was delighted that there were more than 1,200 nominations, showcasing examples of individuals and teams going the 'extra mile' to live the CORE Values. The Group presented both regional and global awards as part of the process.

(2) **Commitment to safety** – In response to the COVID-19 pandemic, at each meeting during the year, the Board requested and received an update on the health and well-being of the Group's employees, including receiving information on the numbers of individuals testing positive for COVID-19 or isolating as a result of contact. The Board was also apprised of the COVID-19-safety initiatives undertaken in plants and the IT practices implemented to enable those employees who could work from home to do so. The Board received monthly updates on the Group's performance against safety targets, and a thorough analysis of all Lost Time Incidents, all of which were reported in detail at the next Board meeting. In addition, the Board received biannual reports on the progress of the Group's safety programmes. A core tenet of the Group's new Sustainability Charter, is a focus on ensuring the Group affords a safe working environment for its employees. For 2021, a more challenging Group safety target of an LTIFR below 1 was implemented. In addition, the Remuneration Committee included specific safety targets for the Executive Directors as part of their personal objectives for the Annual Incentive Plan.

(3) **Entrepreneurship** – As part of the Board's rolling agenda, the Board received reports from each of the business unit Presidents on their business's strategy, new commercial initiatives and future technology trends. The Board also received reports on the agility of management decision making in response to the pandemic, as travel and face-to-face meetings became impossible, and the fast-moving nature of the pandemic demanded swift responses from empowered regional management. The BU presentations were complemented by a presentation from the President Operations & Technology on R&D activities throughout the Group, including the process of new product launches. In November the Board reviewed the strength and breadth of the R&D teams throughout the Group and subsequently followed up on the structure and experience of these teams. The Board also received reports on the Group's progress on innovation as part of the quarterly reporting on strategic progress.

(4) **Transparency** – The Board was cognisant of the impact that severely reduced travel had on opportunities in the organisation for face-to-face interactions during the year, manifesting itself most clearly by the need to move Board meetings online. As in previous years, the engagement and openness of the employees who contributed in person or virtually to Board meetings over the course of the year was assessed in terms of the Group's culture. These first-hand interactions were complemented by the Board's review of the output of the Group's Speak Up processes, which were updated and recommunicated across the Group during the year. In addition, the Audit Committee sought qualitative feedback from External and Internal Audit on how transparent/engaged managers had been during audit interactions.

(5) **Customer focus** – The Chief Executive undertook regular virtual and telephone meetings with customers in 2020, as well as conducting face-to-face visits wherever this was possible. A critical focus of the Group's response to the pandemic was continuity of supply to customers and the Board received regular reports on the impact of the pandemic on this and the state of the Group's markets. The Board also received regular updates on quality performance, which were supported by a full annual presentation on the Group's ongoing initiatives on quality and a review at each Board meeting of specific quality issues.

(6) **Diversity and respect for local cultures** – During 2020, the Board approved the adoption of a new gender diversity target seeking 30% female representation in the Group Executive Committee and Top Management (the Group Executive Committee plus key direct reports) by 2025. The Board also reviewed the results of the employee engagement survey and subsequent management actions to support its diversity initiatives and support of local cultures.

During 2020, the usually extensive schedule of individual site visits undertaken by the executive and Non-executive Directors was severely curtailed by COVID-19-related travel restrictions. Whilst the Executive Directors undertook a number of essential visits to the Group's sites, the Non-executive Directors' visits were limited to a trip by Holly Koeppel to Charlotte, NC. To seek to replace this face-to-face interaction, the Non-executive Directors held video calls with senior managers in China and Japan in November, to hear more about the activities of the Group in China and North Asia respectively, and their responses to the pandemic. A number of the Directors also had the opportunity to meet in person with members of the Group Executive Committee at the Board's strategy meeting in October.

Section 172 duties

The Directors are cognisant of the duty they have under Section 172 of the Companies Act 2006, to promote the success of the Company over the long term for the benefit of shareholders as a whole, having regard to a range of other key stakeholders. In performance of its duties throughout the year, the Board has had regard to the interests of the Group's key stakeholders and remained cognisant of the potential impact on these stakeholders of the decisions it has made. The effects of business decisions on the broader stakeholder group were particularly brought into sharp focus by the demands of the pandemic. Details of the Board and the Company's engagement with stakeholders during the year can be found in the Section 172(1) Statement and Our Stakeholders section on pages 22-26.

The Board is committed to communicating with shareholders and other stakeholders in a clear and open manner and seeks to ensure effective engagement through the Company's regular activities.

The Company undertakes an ongoing programme of meetings with investors, which is managed by the Investor Relations team. The majority of meetings with investors are led by the Chief Executive and the Chief Financial Officer. In advance of tabling the new Remuneration Policy at the 2020 AGM, the Company wrote to shareholders inviting engagement, and subsequently entered into dialogue with a number of the Group's larger shareholders to discuss the new Policy. The Group's largest shareholders were also contacted in advance of the AGM inviting discussion on any questions they might like to raise and making the Chairmen of the Board, the Audit Committee and the Remuneration Committee available to meet them should they so wish.

Statement on compliance with the UK Corporate Governance Code

Save as set out below, the Company was fully compliant with the Principles and Provisions of the 2018 UK Corporate Governance Code (the 'Code') for the year ended 31 December 2020. A copy of the Code can be found on the FRC website at: https://www.frc.org.uk/directors/corporate-governance-and-stewardship/uk-corporate-governance-code.

Provision 38: The Company is progressing with its plans to align the level of pension allowance for Executive Directors with that applicable to the majority of the workforce. Our incumbent Directors' pension contributions were frozen at the 1 January 2020 amount and will be reduced to 17% at the end of 2022, being the level of the majority of the workforce. Further details can be found on page 122.

Provision 41: During the year, the Remuneration Committee did not engage systematically with the workforce to explain how executive remuneration aligns with wider company pay policies. Further details can again be found on page 122.

Board Report continued

Division of responsibilities

The Board currently comprises nine Directors – the Non-executive Chairman, John McDonough CBE; the Chief Executive, Patrick André; the Chief Financial Officer, Guy Young; and six Non-executive Directors, Kath Durrant, Hock Goh, Friederike Helfer, Jane Hinkley, Douglas Hurt and Holly Koeppel. Douglas Hurt is the Senior Independent Director. Henry Knowles is the Company Secretary. Kath Durrant joined the Board on 1 December 2020 and will take over from Jane Hinkley as Chair of the Remuneration Committee at the close of the 2021 AGM. Holly Koeppel and Hock Goh have signalled their desire to step down from the Board at the close of the 2021 AGM, following 4 years and 6 years of service as Non-executive Directors, respectively.

The Board considers that, for the purposes of the UK Corporate Governance Code, five Non-executive Directors (excluding the Non-executive Chairman), namely Kath Durrant, Hock Goh, Jane Hinkley, Douglas Hurt and Holly Koeppel, are independent of management and free from any business or other relationship which could affect the exercise of their independent judgement.

Friederike Helfer is a Partner of Cevian Capital, which continues to hold 21.11% of Vesuvius' issued ordinary share capital. As a result Friederike Helfer is not considered to be independent. The Chairman satisfied the independence criteria on his appointment to the Board. The Board and its Committees have a wide range of skills, experience and knowledge, and further details of each Director's individual contribution in this regard can be found in their biographical details on pages 92 and 93.

The Chairman and Chief Executive

The division of responsibilities between the Chairman and the Chief Executive is set out in writing. These were reviewed during the year as part of the Company's annual corporate governance review. They are available to view on the Company's website www.vesuvius.com.

Division of responsibilities

The Board
Responsible for Group strategy, risk management, succession and policy issues. Sets the purpose, Values and culture for the Group. Monitors the Group's progress against the targets set

Chairman
Provides leadership and guidance for the Board, promoting a high standard of corporate governance. Sets the Board agenda and chairs and manages meetings. Independent on appointment, he is the link between the Executive and Non-executive Directors

Chief Executive
Develops strategy for review and approval by the Board. Directs, monitors and manages the operational performance of the Company. Responsible for the application of Group policies, implementation of Group strategy and the resources for their delivery. Accountable to the Board for Group performance

Senior Independent Director
Acts as a sounding board for the Chairman, an alternative contact for shareholders and an intermediary for other Non-executive Directors. Leads the annual evaluation of the Chairman and recruitment process for the Chairman's replacement, when required

Non-executive Directors
Exercise a strong, independent voice, constructively challenging and supporting the Executive Directors. Scrutinise performance against objectives and monitor financial reporting. Monitor and oversee risks and controls, determine Executive Director remuneration and manage Board succession through their Committee responsibilities
The Non-executive Directors meet at least twice a year without the Executive Directors being present

Company Secretary
Advises the Chairman on governance, together with updates on regulatory and compliance matters. Supports the Board agenda with clear information flow. Acts as a link between the Board and its Committees and between Non-executive Directors and senior management

The Board

The Board has a formal schedule of matters reserved to it and delegates certain matters to its Committees. It is anticipated that the Board will convene on seven occasions during 2021, holding ad hoc meetings to consider non-scheduled business if required.

Board Committees

The principal governance Committees of the Board are the Audit, Nomination and Remuneration Committees. Each Committee has written terms of reference which were reviewed during the year. A number of minor amendments were made to update the terms of reference in accordance with recent governance updates and to enhance their clarity. These terms of reference are available to view on the Company's website www.vesuvius.com.

Committee composition is set out in the relevant Committee reports. No one, other than the Committee Chairman and members of the Committee, is entitled to participate in meetings of the Audit, Nomination and Remuneration Committees. However, as detailed in the Committee reports, where the agenda permits, other Directors and senior management regularly attend by invitation, supporting the operation of each of the Committees in an open and consensual manner.

The interactions in the governance process are shown in the schematic below.

Group Executive Committee

The Group also operates a Group Executive Committee (GEC), which is convened and chaired by the Chief Executive and assists him in discharging his responsibilities. The GEC comprises the Chief Executive, Chief Financial Officer, the business unit Presidents, the Chief HR Officer, the President Operations and Technology and the General Counsel/Company Secretary. The GEC continued its formal schedule of six meetings and two R&D reviews during 2020, and also, in response to the demands of the pandemic, held weekly virtual meetings to discuss the Group's business activities. These weekly meetings will continue in 2021, alongside the usual schedule of formal meetings.

Board

Governance Committees

Audit Committee
To monitor the integrity of financial reporting and to assist the Board in its review of the effectiveness of the Group's internal controls and risk management systems
Chairman
Douglas Hurt
Membership
All independent Non-executive Directors

Remuneration Committee
To determine the remuneration policy for the Executive Directors and set the appropriate remuneration for the Chairman, Executive Directors and senior management
Chairman
Jane Hinkley
Membership
All independent Non-executive Directors

Nomination Committee
To advise the Board on appointments, retirements and resignations from the Board and its Committees and to review succession planning and talent development for the Board and senior management
Chairman
John McDonough, Chairman
(except when considering his own succession, in which case the Committee is chaired by an appropriate Non-executive Director, usually the Senior Independent Director)
Membership
Chairman and the Non-executive Directors

Administrative Committees

In addition, the Board delegates certain responsibilities to a Finance Committee and Share Scheme Committee, which operate in accordance with the delegated authority agreed by the Board

Finance Committee
To approve specific funding and treasury-related matters in accordance with the Group's delegated authorities or as delegated by the Board
Chairman
John McDonough, Chairman
Membership
Chairman, Chief Executive, Chief Financial Officer and Group Head of Corporate Finance

Share Scheme Committee
To facilitate the administration of the Company's share schemes
Chairman
Any Board member
Membership
Any two Directors or any two Directors and the Company Secretary

Board Report continued

2020 Board programme

The Board discharges its responsibilities through an annual programme of meetings. When the impact of the COVID-19 pandemic became apparent during 2020 the Board began holding regular monthly meetings to ensure that the Directors were kept fully apprised of the impact of the pandemic on the Group and were able to take appropriate mitigating actions in a timely manner. Communication between the Board and the Executive Directors between meetings was frequent and covered operational matters in detail.

At each of the regularly scheduled meetings, the following standard items were considered:

> Directors' duties and conflicts of interest

> Minutes of the previous meeting and matters arising

> Reports from the Chief Executive, the Chief Financial Officer and the Company Secretary on key aspects of the business

> Key Performance Indicators

In 2020, the Board focused on key areas of strategy, performance and governance, including the matters outlined below:

Strategy	> Receiving and reviewing reports on strategy from the Flow Control, Advanced Refractories, Sensors & Probes and Foundry business units > Receiving and reviewing regular reports from the Chief Executive on implementation of the Group's Strategic Objectives, including M&A opportunities > Receiving and considering reports on the Group's quality, health, safety and environmental strategy and objectives > Approving the Group's new Sustainability initiative > Participation in a two-day off-site review of strategy presented by the three main business unit Presidents and the Company's key financial advisers > Receiving and considering reports on the Group's HR, Purchasing, IT, tax and treasury strategies, legal and compliance activities and the management of the Group's key pension liabilities > Receiving and considering a report on the Group's R&D strategy and objectives > Regularly monitoring the Group's financing structure, including compliance with the debt covenants, the Group's going concern status and approving the withdrawal of the 2019 final dividend and the Group's participation in the UK Government's Covid Corporate Financing Facility > Approving the issue of a new US private placement (USPP) and the preparation of additional USPP 'shelf' documentation > Reviewing the Group's internal control and risk management practices
Performance	> Receiving regular reports from the Chief Executive on the impact of COVID-19 on the Group, including: – the number of people infected and the actions being taken to protect employees, – the impact on customers and the measures being taken to ensure continued delivery, – the financial impact, with particular focus on the Group's cash flow and liquidity, the accessing of government support schemes and the measures being taken throughout the Group to mitigate costs, including tracking the number of employees on furlough or similar arrangements – the operational status of our manufacturing sites and the number of people working remotely > Receiving regular reports on the Group's financial performance against key indicators, including each of the Group's KPIs > Receiving regular safety reports setting out performance against key indicators > Receiving regular reports on performance against manufacturing quality targets > Receiving regular monthly updates from the Chief Executive on the performance of the Group's businesses with a critical focus on safety and quality > Scrutinising the Group's financial performance and forecasts > Reviewing and agreeing the annual budget and financial planning > Approving trading updates, and preliminary and half-year results
Governance	> Receiving regular reports from the Board Committees > Approving the Annual Report and Notice of AGM, and approving the revised structure for the AGM in the light of COVID-19 lockdown issues > Approving the payment of the interim dividend > Approving the appointment of Kath Durrant as a new Director > Completing an evaluation of the Board and Committees' performance and regularly reviewing progress against the improvement actions identified in the 2019 evaluation > Reviewing the Group's internal controls and risk appetite, monitoring the Group's key risks and approving the Group's risk register > Reviewing and approving the Group's Modern Slavery Statement > Receiving regular updates on corporate governance and regulatory developments > Completing a formal annual review of the Group's governance arrangements > Reviewing information received through the Group's Speak Up reporting processes > Renewing the Group's delegated authorities > Receiving reports from the Company's brokers on market issues

Information and support

The Board ensures that it receives, in a timely manner, information of an appropriate quality to enable it adequately to discharge its responsibilities. Papers are provided to the Directors in advance of the relevant Board or Committee meeting to enable them to make further enquiries about any matters prior to the meeting should they so wish. This also allows Directors who are unable to attend to submit views in advance of the meeting.

In addition to the formal Board processes, the Chief Executive provides written updates on important Company business issues between meetings, and the Board is provided with a regular report of key financial and management information, including information on safety and quality performance. Regular updates on shareholder matters are provided to the Directors, who also receive copies of analysts' notes issued on the Company. For the distribution of all information, Directors have access to a secure online portal, which contains a reference section containing relevant background information.

All Directors have access to the advice and services of the Company Secretary. There is also an agreed procedure in place for Non-executive Directors, in the furtherance of their duties, to take independent legal advice at the Company's expense. The procedure was not utilised during the year under review.

Directors' conflicts of interest

The Board has established a formal system to authorise situations where a Director has an interest that conflicts, or may possibly conflict, with the interests of the Company (situational conflicts). Directors declare situational conflicts so that they can be considered for authorisation by the non-conflicted Directors.

In considering a situational conflict, these Directors act in the way they consider would be most likely to promote the success of the Company and may impose limits or conditions when giving authorisation or subsequently if they think this is appropriate.

The Company Secretary records the consideration of any conflict and any authorisations granted. The Board believes that the approach it has in place for reporting situational conflicts continues to operate effectively. No situational conflicts were presented to the Board for authorisation during the year under review.

Board Report continued

Board and Committee attendance

The attendance of Directors at the Board meetings and at meetings of the principal Committees of which they are members held during 2020 is shown in the table below. The maximum number of meetings in the period during which the individual was a Board or Committee member is shown in brackets.

	Board	Audit Committee	Remuneration Committee	Nomination Committee
Chairman				
John McDonough CBE	11 (11)	—	—	6 (6)
Executive Directors				
Patrick André	11 (11)	—	—	—
Guy Young	11 (11)	—	—	—
Non-executive Directors				
Kath Durrant[1]	1 (1)	1 (1)	1 (1)	1 (1)
Hock Goh	10 (11)	5 (5	3 (4)	6 (6)
Friederike Helfer	11 (11)	—	—	5 (6)
Jane Hinkley	11 (11)	5 (5)	4 (4)	6 (6)
Douglas Hurt	11 (11)	5 (5)	4 (4)	6 (6)
Holly Koeppel	11 (11)	4 (5)	3 (4)	5 (6)

1. Kath Durrant was appointed to the Board on 1 December 2020 and the table reflects the number of Board and Committee meetings that she could attend following her appointment.

Hock Goh was unable to attend one set of Board and Committee meetings, and Holly Koeppel one set of Committee meetings during the year due to clashes with other professional responsibilities that had been previously notified to the Chairman. Hock Goh, Holly Koeppel and Friederike Helfer consistently attended online meetings, and also attended online at physical meetings where they were precluded from participating in person due to travel restrictions, in the case of Mr Goh and Ms Koeppel, this was despite the challenges posed by time differences to their countries of residence, being Australia and the US, respectively.

To the extent that Directors were unable to attend scheduled meetings, they received the papers in advance and relayed their comments to the Chairman for communication at the meeting. The Chairman followed up after the meeting in relation to the decisions taken.

The Chairman and Non-executive Directors each have a letter of appointment which sets out the terms and conditions of their directorship. An indication of the anticipated time commitment is provided in recruitment role specifications, and each Non-executive Director's letter of appointment provides details of the meetings that they are expected to attend, along with the need to accommodate travelling time. Non-executive Directors are required to set aside sufficient time to prepare for meetings, and regularly to refresh and update their skills and knowledge. Copies of all contracts of service or, where applicable, letters of appointment of the Directors are available for inspection during business hours at the registered office of the Company and are available for inspection at the location of the Annual General Meeting (AGM) for 15 minutes prior to and during each AGM.

All Non-executive Directors have agreed to commit sufficient time for the proper performance of their responsibilities, acknowledging that this will vary from year to year depending on the Group's activities, and will involve visiting operational and customer sites around the Group. The Chairman in particular dedicates a significant amount of time to Vesuvius in discharging his duties.

Directors are expected to attend all scheduled Board and Committee meetings and any additional meetings as required. Each Director's other significant commitments are disclosed to the Board during the process of their appointment and they are required to notify the Board of any subsequent changes.

The Company has reviewed the availability of the Chairman and the Non-executive Directors to perform their duties and considers that each of them can, and in practice does, devote the necessary amount of time to the Company's business.

Composition, evaluation and succession

Appointment and replacement of Directors

The Company's Articles of Association specify that Board membership should not be fewer than five nor more than 15 Directors, save that the Company may, by ordinary resolution, from time to time, vary this minimum and/or maximum number of Directors. Directors may be appointed by ordinary resolution or by the Board. The Board may appoint one or more Directors to any executive office, on such terms and for such period as it thinks fit, and it can also terminate or vary such an appointment at any time. The Articles specify that, at every AGM, any Director who has been appointed by the Vesuvius Board since the last AGM and any Director who held office at the time of the two preceding AGMs, and who did not retire at either of them, shall retire from office. However, in accordance with the requirements of the Code, all the Directors who wish to continue to serve on the Board, will offer themselves for election or re-election at the 2021 AGM. The Board believes that each of the current Directors is effective and demonstrates commitment to his or her respective role. Accordingly, the Board recommends that shareholders approve the resolutions to be proposed at the 2021 AGM relating to the election and re-election of the Directors. The biographical details of the Directors offering themselves for election and re-election, including details of their other directorships and relevant skills and experience, will be set out in the 2021 Notice of AGM. The biographical details of the Directors are also set out on pages 92 and 93.

Recommendations for appointments to the Board and rotation of the Board are made by the Nomination Committee in accordance with a rigorous procedure. The Nomination Committee is also responsible for overseeing the maintenance of an effective succession plan for the Board and senior management. Further information on the activities of the Nomination Committee is set out in the Nomination Committee report on pages 115-119.

A comprehensive induction programme is available to new Directors. The induction programme is tailored to meet the requirements of the individual appointee and explains the dynamics and operations of the Group, and its markets and technology. In normal times, the induction includes as a minimum a series of face to face meetings with key Group executives and advisers, along with site visits to the Group's key strategic sites. During the current COVID-19 travel restrictions, Kath Durrant's induction has been limited to virtual meetings with the Group's executives and senior management. A comprehensive plan of site visits is planned when circumstances allow.

The Chairman, through the Company Secretary, continues to ensure that there is an ongoing process to review training and development needs. Directors are provided with details of seminars and training courses relevant to their role and are encouraged and supported by the Company in attending them. In 2020, regulatory updates were provided as a standing item at each Board meeting in a Secretary's Report. External input on legal and regulatory developments impacting the business was also given, with specialist advisers invited to the Committees' meetings to provide briefings on topics such as the changing landscape of Corporate Governance, particularly the latest pronouncements from the FRC and material developments in the legal environment.

Performance evaluation

The Board carries out an evaluation of its performance and that of its Committees and individual Directors, including the Chairman, every year. Details of the evaluation conducted in 2020 can be found in the Nomination Committee report.

Audit, risk and internal control

The Board is responsible for ensuring that policies and procedures are in place to ensure the independence and effectiveness of the Internal and External Audit functions. The Audit Committee assists the Board in reviewing the effectiveness of the Group's Internal and External Audit functions, in addition to monitoring the integrity of the Group's financial and narrative statements. Further information about the work of the Audit Committee can be found in the Audit Committee report on pages 106-114.

The Board is also responsible for setting the Group's risk appetite and ensuring that appropriate risk management systems are in place. The Audit Committee assists the Board in reviewing the effectiveness of the system of internal control, including financial, operational and compliance controls, and risk management systems. The Group's approach to risk management and internal control is discussed in greater detail on pages 30-34 and the Group's principal risks and how they are being managed or mitigated are detailed on pages 36 and 37. The Viability Statement which considers the Group's future prospects is included on page 34. Risk management and internal control are also discussed in greater detail in the Audit Committee report.

All of the independent Non-executive Directors serve on both the Audit and Remuneration Committees. They therefore bring their experience and knowledge of the activities of each Committee to bear when considering critical areas of judgement. This means that, for example, the Directors are able to consider carefully the impact of incentive arrangements on the Group's risk profile and to ensure that the Group's Remuneration Policy and programme are structured to align with the long-term objectives and risk appetite of the Company.

Remuneration

The Directors' Remuneration Report on pages 120-143 describes the work of the Remuneration Committee in developing the Group's policy on executive remuneration, determining Director and senior management remuneration, reviewing workforce remuneration and related policies – including ensuring that these align with the Group's Strategic Objectives and culture, and overseeing the operation of the executive share incentive plans.

Audit Committee

Dear Shareholder,

On behalf of the Audit Committee, I am pleased to present the Audit Committee Report for 2020. The foundation of the Committee's work each year is a recurring and structured programme of activities which are defined in an annual rolling Audit Committee timetable. The Audit Committee then considers additional items as matters arise and priorities change. During 2020, the Committee closely monitored the impact of the COVID-19 pandemic on the Group's activities, undertaking particularly detailed analysis of the Group's impairment assessments and the Going concern and Viability statements. In addition, the Committee again spent some time focusing on the Group's cyber security measures, as well as receiving updates throughout the year on the implementation of changes to the Group's Finance Operating Model.

As set out in detail in the Audit Committee Report in the 2019 Annual Report, at the start of 2020, the Committee spent a considerable amount of time reviewing management's response to a letter from the Financial Reporting Council (FRC) as part of the usual cycle of the FRC's reviews of listed companies accounts. The Committee approved management's response after review, discussion and input from the Group's External Auditor. The Group adopted several recommendations in preparing the 2019 Annual Report and Financial Statements and the FRC subsequently closed their enquiries. There were no further changes. The FRC's recommendations have been carried through to the 2020 Annual Report.

The Audit Committee Report describes the work of the Committee during the year, including its role in monitoring the integrity of the Company's financial statements and the effectiveness of the internal and external audit processes. It provides an overview of the significant issues the Committee has considered during the year and its material judgements. It also describes how the Committee fulfilled its responsibilities to assist the Board in reviewing the effectiveness of the Group's system of internal financial controls and its internal control and risk management systems.

Yours sincerely

Douglas Hurt
Chairman, Audit Committee

3 March 2021

Committee members

Douglas Hurt (Committee Chairman)
Hock Goh
Jane Hinkley
Holly Koeppel
Kath Durrant – joined the Committee on her appointment to the Board on 1 December 2020

The Company Secretary is Secretary to the Committee.

The Audit Committee

The Audit Committee comprises all the independent Non-executive Directors of the Company, who bring a wide range of financial and commercial expertise to the Committee's decision-making processes. Douglas Hurt is the Senior Independent Director and Chairman of the Audit Committee. He was the Finance Director of IMI plc for nine years prior to his appointment and has worked in various financial roles throughout his career. Douglas currently serves as the Chairman of the Audit Committees of Countryside Properties PLC, Hikma Pharmaceuticals PLC and the British Standards Institution. He is a Chartered Accountant. This background provides him with the 'recent and relevant financial experience' required under the Code.

The Code and Financial Conduct Authority Disclosure Guidance and Transparency Rules also contain requirements for the Audit Committee as a whole to have competence relevant to the sector in which the Company operates. Vesuvius' Non-executive Directors have significant breadth of experience and depth of knowledge on matters related to Vesuvius' operations, both from their previous roles and from their induction and other activities since joining the Vesuvius Board. The Directors' biographies on pages 92 and 93 outline their range of multinational business-to-business experience and expertise in fields such as engineering, manufacturing, services, logistics and human resources, as well as financial and commercial acumen. The Board therefore considers that the Audit Committee as a whole has competence relevant to Vesuvius' business sector.

Meetings

The Committee met five times during 2020. The Committee has also met twice since the end of the financial year and prior to the signing of this Annual Report. The Board Chairman, the non-independent Non-executive Director, the Chief Executive, the Chief Financial Officer, the Head of Finance, the Group Head of Internal Audit and the External Auditors were all invited to each meeting. Other management staff were also invited to attend as appropriate.

Audit Committee meetings are conducted to promote an open debate, a constructive challenge of significant accounting judgements, to provide guidance and oversight to management to ensure that the business maintains an appropriately robust control environment and to provide informed advice to the Board on financial matters. Between Audit Committee meetings, the Chairman of the Audit Committee encourages open dialogue between the External Auditors, the management team and the Group Head of Internal Audit to ensure that emerging issues are addressed in a timely manner.

During the year, as is the Audit Committee's established practice, the Committee members met and discussed business and control matters with senior management during Board presentations. The Committee also met privately with the Group Head of Internal Audit and the External Auditors without any executives present.

The outcomes of Audit Committee meetings were reported to the Board, and all members of the Board received the agenda, papers and minutes of the Committee.

Role and responsibilities

During 2020, the main role and responsibilities of the Committee continued to be to:

> Monitor the integrity of the Financial Statements of the Company and the Group, and any formal announcements relating to the Group's financial performance, reviewing significant financial reporting judgements contained in them

> Provide advice, as requested by the Board, on whether the Annual Report and Financial Statements, taken as a whole, are fair, balanced and understandable and provide the information necessary for the shareholders to assess the Group's position and performance, business model and strategy

> Review and monitor the effectiveness of the Company's internal financial controls and internal control and risk management systems

> Review procedures for detecting fraud, and systems and controls for the prevention of bribery and ensure that a thorough review is carried out of all alleged instances of fraud notified to the Committee

> Monitor and review the role and effectiveness of the Company's Internal Audit function and audit programme, ensuring that the function is adequately resourced and operates free from management or other restrictions

> Make recommendations to the Board on the appointment, reappointment and removal of the External Auditors and negotiate and agree the fees and terms of engagement of the External Auditors

> Monitor and review with the External Auditors the findings of their work, including key accounting and audit judgements, how any risks to audit quality were addressed and the External Auditors' view of its interactions with senior management

> Review and monitor the External Auditors' independence, objectivity and effectiveness, taking into consideration relevant law, regulation, the Ethical Standard, other professional requirements and any FRC audit inspection findings

> Oversee the operation of the policy on the engagement of the External Auditors to supply non-audit services

> Report to the Board on how the Committee has discharged its responsibilities

The Committee operates under formal terms of reference approved by the Board. These were reviewed during the year and minor amendments made to enhance their clarity and alignment with best practice. They are available in the Investors/Corporate Governance section of the Company's website, www.vesuvius.com.

Within these terms, the Committee and its individual members are empowered to obtain outside legal or other independent professional advice at the cost of the Company. These powers were not utilised during the year. The Committee may also secure the attendance at its meetings of any employee or other parties with relevant experience and expertise should it be considered necessary.

Audit Committee continued

Activities in 2020

1. Much of the Committee's activities throughout the year were focused on the potential impact of COVID-19 on the Group:
   – the work of Internal Audit was adjusted to recognise the travel restrictions and reduced availability of operational staff, as furlough schemes and home-working were implemented around the world. The focus of their work was discussed, ensuring that as homeworking was implemented, the critical controls of the Group were adjusted or strengthened accordingly
   – the Group's risk profile and appetite was reviewed, noting the impact of changing customer demand, government responses to the pandemic and internal working patterns
   – the Group's liquidity and cash generation was placed under particular scrutiny, with additional treasury matters reported to the Committee
   – the Committee acted to ensure that despite the changes in working patterns, critical resources in internal control and compliance functions continued to work effectively
   – The work of the External Auditors was carefully considered given the widespread need for the use of virtual tools, both at the half year review and in the planning for the year-end audit. As such, where appropriate and possible, audit work was accelerated to reflect the potentially longer time frames for completion
   – The half year results review was carried out with due consideration of the impact of COVID-19 on the Group's finances and a particularly rigorous analysis of the Group's going concern status was undertaken, covering a range of worst-case scenarios.
2. Against this background, the Committee's agenda covered the usual standing items – the review of financial results, the effectiveness of the Group's internal financial controls, and the review of the internal control and risk management systems – as well as additional topics, including updates on cyber security and in-depth reviews of the Group's foreign exchange exposures.
3. The Committee received feedback throughout the year on the progress of plans to change the Finance Operating Model. This continued the transition of the business unit finance function from purely accounting to forward-looking business support, with clearer accountabilities for controlling functions and a focus on further standardising core processes. Changes were noted to the structure of finance roles and the planned roll-out of the new Model was reviewed and approved.
4. As set out overleaf, the FRC wrote to the Company at the end of 2019 as part of its review of the Group's 2018 Annual Report and Financial Statements. The Committee supervised the Company's response to the matters raised in their review letter and enhanced certain disclosures in the 2019 Annual Report and Financial Statements, revisiting the Company's approach to impairments. The FRC have closed their enquiries.
5. The Audit Committee continued to devote time to ensure that initiatives to mitigate potential risks and financial exposure remained robust and appropriate.
6. The Committee challenged the assumed growth rates and discount rates used for asset impairment assessments.
7. The Committee considered the Company's going concern statement and challenged the nature, quantum and assessment of the significant risks to the business model, future performance, solvency and liquidity of the Group that were modelled as part of the scenarios and stress testing undertaken to support the Viability Statement made by the Company in the 2019 Annual Report and Financial Statements. In particular the Committee examined the potential effect of a combination of risk factors occurring at the same time. At the half year the Committee undertook another detailed look at the Company's going concern statement. The 2020 going concern and Viability Statements, which were also critically reviewed, are contained within the Strategic Report on pages 34 and 35.
8. The Committee monitored the resourcing and delivery of the 2020 Internal Audit plan, in light the of the changes necessitated to accommodate COVID-19 travel restrictions and approved the 2021 Internal Audit plan. The Committee monitored both the responses from and follow-up by management to Internal Audit recommendations arising during the year. The Committee discussed at length the significant issues raised, the root causes for those issues and the actions being taken to resolve the issues.
9. The Committee conducted regular, detailed reviews of provisions, challenging the reasonableness of underlying assumptions and estimates of costs and the quantum of any related insurance assets.
10. The Committee reviewed and updated its terms of reference and approved a revised Non-Audit Services Policy.
11. The Committee reviewed the effectiveness of the External Auditors.
12. The Committee met with Internal and External Audit without management and received valuable feedback on a range of topics including culture, the impact on morale of COVID-19 and the strength of the finance function.
13. The Committee conducted an evaluation of its performance and effectiveness, concluding that the level of information provided to the Committee and the quality of debate had been maintained despite the challenges of COVID-19. As in previous evaluations the cycle of the Committee's work and the outcome of its deliberations were highly regarded.

The Committee members believe that they received sufficient, relevant and reliable information throughout the year from management and the Internal and External Auditors to enable the Committee to fully discharge its responsibilities. The work of the Audit Committee is further elaborated in the paragraphs below.

Statement of compliance with the Competition and Markets Authority (CMA) Order

The Committee considers that the Company has complied with The Statutory Audit Services for Large Companies Market Investigation (Mandatory Use of Competitive Processes and Audit Committee Responsibilities) Order 2014 (Article 7.1), published by the CMA on 26 September 2014, including with respect to the Audit Committee's responsibilities for agreeing the audit scope and fees and authorising non-audit services.

Financial reporting

The Committee fulfilled its primary responsibility to review the integrity of the half year and annual Financial Statements and recommended their approval to the Board.

In forming its views, the Committee assessed:

> The quality, acceptability and consistency of the accounting policies and practices

> The clarity and consistency of the disclosures, including compliance with relevant financial reporting standards and other reporting requirements

> Significant issues where management judgements and/or estimates had been made that were material to the reporting or where discussions had taken place with the External Auditors in arriving at the judgement or estimate

> In relation to the overall Annual Report, whether the Annual Report and Financial Statements taken as a whole were fair, balanced and understandable, taking into consideration all the information available to the Committee

> The application of the FRC's guidance on clear and concise reporting and the FRC guidance notes issued throughout the year on matters that companies should emphasise in their financial statements such as the impact of COVID-19 and enhancements to going concern reporting

> The disclosure and presentation of alternative performance measures, in view of the guidelines issued by the European Securities and Markets Association

The Committee actively deliberated and challenged reports from the Chief Financial Officer and the Head of Finance. These were well prepared and, for areas of judgement and/or estimation, set out the rationale for the accounting treatment and disclosures, and the pertinent assumptions and the sensitivities of the estimates to changes in the assumptions. The External Auditors also delivered memoranda for the half-year and year-end, stating its views on the treatment of significant issues. The External Auditors provided a summary for each issue, including its assessment of the appropriateness of management's judgements or estimates.

Significant issues and material judgements

The Committee considered the following significant issues in the context of the 2020 Financial Statements. It identified these areas to be significant, taking into account the level of materiality and the degree of judgement exercised by management.

The Committee resolved that the judgements and estimates made on each of the significant issues detailed below were appropriate and acceptable.

Impairment of intangible assets

The 2020 year-end carrying value of goodwill of £617.6m was tested against the current and planned performance of the Steel Flow Control, Steel Advanced Refractories, Steel Sensors & Probes and Foundry CGUs. The Committee considered the Board-approved medium-term business plans, medium term and terminal growth assumptions, as well as the discount rates used in the assessments. Relevant sensitivities using reasonably possible changes to key assumptions were evaluated. The detailed assumptions are provided in Note 17 to the Group Financial Statements.

Given that the models indicated, even with the application of reasonable sensitivities to the assumptions, that there remains significant headroom between the value in use and the carrying value, the Committee concurred that no goodwill impairment charges were required.

Other provisions

The Committee continues to monitor the implications of a number of potential exposures and claims arising from ongoing litigation, product quality issues, employee disputes, restructuring, vacant sites, environmental matters, onerous leases, legacy matter lawsuits, indirect tax disputes and indemnities or warranties outstanding for disposed businesses. Due to the long gestation period before settlement for a number of these issues can be reached, provisioning for these items requires careful judgement in order to establish a reasonable estimate of future liabilities. The Committee also assessed the strength of any insurance coverage for certain of these liabilities and challenged the accounting treatment for any amounts deemed to be recoverable from insurers. After due consideration and challenge, and having considered legal advice obtained by the Company, the Committee is satisfied that there are appropriate levels of provisions set aside to settle third-party claims and disputes (Note 30 to the Group Financial Statements) and that adequate disclosure has been made. The Committee also agreed with management's assessment of the estimated costs to manage and remediate the waste water at a disused US property and its disclosure as a separately reported item. Where no reliable estimate of the potential liability can be made for the outcome of an existing issue, no provision has been made and appropriate disclosure is included under contingent liabilities (Note 32 to the Group Financial Statements).

Audit Committee continued

Restructuring charges

The Group's restructuring costs in 2020 principally related to restructuring programmes which had commenced in prior years. The Committee critically reviewed the treatment of the restructuring costs disclosed as separately reported items in 2020 and concluded that these have been treated consistently with the accounting policy. This ensures that only significant restructuring programmes that have a defined scope and are material in nature are reported separately, which enables a clearer understanding of the underlying results of the Group.

Impairment of investment in subsidiaries

The Committee has also reviewed management's impairment analysis of the parent company's investment in subsidiaries. Following this review it concurred that no impairment was required.

Fair, balanced and understandable reporting

The Committee considered all the information available to it in reviewing the overall content of the Annual Report and Financial Statements and the process by which it was compiled and reviewed, to enable it to provide advice to the Board that the Annual Report and Financial Statements are fair, balanced and understandable. In doing so, the Committee ensured that time was again dedicated to the drafting and review process so that internal linkages were identified and consistency was tested. Drafts of the Annual Report and Financial Statements were also reviewed by a senior executive not directly involved in the year-end process who reported to the Committee on his impressions of their clarity, comprehensiveness, and the balance of disclosure in the document. On completion of the process, the Committee was satisfied that it could recommend to the Board that the Annual Report and Financial Statements are fair, balanced and understandable.

Risk management and internal controls

As highlighted in the reviews of strategy and principal risks in the Strategic Report, risk management is inherent in management's thinking and is embedded in the business planning processes of the Group. The Board has overall responsibility for establishing and maintaining a system of risk management and internal control, and for reviewing its effectiveness. The Audit Committee assists the Board in reviewing the effectiveness of the Group's system of internal control, including financial, operational and compliance controls, and risk management systems. This framework is consistent with the Code.

In 2020, Committee members fully participated in the Board review of existing risks and ongoing mitigating actions, further details of which are given on pages 36 and 37. The Committee believes that the Group's process for identifying and understanding its principal risks and uncertainties remains robust and appropriate.

The Committee considered the Company's going concern statement and challenged the nature, quantum and effects of the combination of the unlikely but significant risks to the business model, future performance, solvency and liquidity of the Group. These were all modelled as part of the scenarios and stress testing undertaken to support the Viability Statement. As part of this review, the Committee considered the Group's forecast funding requirements over the next three years and analysed the impact of key risks faced by the Group with reference to the Group's debt covenants, these included stress testing for raw material cost inflation, customer failure, business interruption and a fall in sales. The scenarios considered the impact of multiple risks occurring simultaneously and the additional mitigating actions that the Group could take. The Committee noted that the Group's debt headroom was sufficient to accommodate the modelled stress scenarios. As a result of its review, the Committee was satisfied that the going concern statement and Viability Statement had been prepared on an appropriate basis. The 2020 Going Concern statement and the 2020 Viability Statement are contained within the Risk, viability and going concern section on pages 34 and 35.

The key features of the Group's internal control system, which provides assurance on the accuracy and reliability of the Group's financial reporting, are detailed in the Risk, viability and going concern section on pages 30-37. During 2020, the Committee considered the process by which management evaluates internal controls across the Group. The Group Head of Internal Audit provided the Committee with a summary overview of the assurance provided by the Group's control framework and the testing of these controls. PwC also reviewed controls in the businesses within the scope of its audit.

The Group is made up of several large operating units, but also many small units in geographically diverse locations. Consequently, segregation of duties, overlapping access controls on systems and remote management oversight can give rise to control vulnerabilities and fraud opportunities. The Group has not adopted a common Enterprise Resource Planning system as a Group-wide standard. Over time, the Group is moving towards a shared services model, enabled by control, process and systems standardisation between businesses. This is expected to enhance the overall internal control environment in the smaller operating units.

The Group undertakes a range of activities to mitigate the risk of fraud. This framework is regularly reviewed to determine areas for improvement. Eliminating the risk of fraud remains one of the key areas of focus for Internal Audit, forming a fundamental part of 'full scope' and financial audits. These assess the quality of the balance sheet reconciliations, review key judgement matters, consider ERP access rights, review tenders and quotations, review the entity's controls over master data changes, and review controls over payments, journals and associated applications, along with travel and expense reimbursements.

Any control issues identified by management locally or as a result of the work performed by Internal Audit are escalated as appropriate. Internal Audit rate all control issues they identify in terms of their significance and agree remediation plans with the Auditee and an Action Owner, establishing a target date for remediation. For significant issues, management at all levels within the business are engaged to agree the actions and remediation dates. The status of the remediation is monitored and overdue issues are escalated appropriately with management, and reported at Audit Committee meetings. The Audit Committee continues to challenge management on the root cause where issues arise on the progress of remediation activities.

Cyber risks continue to be a significant area of focus for the Group. Like most other companies, Vesuvius receives a large number of 'phishing' emails presenting fake credentials. It is similarly subject to repeated attempts at social engineering fraud. In 2020, a loss of euro 31k was suffered due to a breach in protocol stemming from the receipt of an email from an account that had been hacked. The issue was addressed immediately, and further enhancements were made to the Group's control processes.

The Group's Cyber Security Committee meets on a regular basis to review and progress the Group's plans for tackling cyber issues, and the Audit Committee receives regular updates on the Group's activities in this area. During 2020 the Group conducted further work to strengthen its IT security and focused on mitigating risks in operations technology in response to the changing dynamics of external cyber threats. A holistic approach is taken to addressing cyber challenges, focusing on the improvement of the Group's overall IT procedures and framework. The Group continues to run regular training programmes on cyber/IT security.

During 2020, the Group continued its review of third-party representatives and intermediaries. This included detailed due diligence for distributors and ongoing monitoring of our sales agents. The Committee also continued its assessment of the Group's potential exposure to bribery and corruption risks, noting the ongoing work conducted by the Group in this context. The face-to-face visits to operations usually conducted to assist with the work were curtailed by the COVID-19 pandemic. However, in line with our continued improvement approach, a detailed review of the existing compliance programme and resources was undertaken in 2020. The output of this review, combined with previous risk assessments, continues to be used to develop the Group's framework, policies and procedures for the management of anti-bribery and corruption risk, reflecting an appropriate level of control for the business.

In line with the requirements of the new Code, responsibility for the oversight and monitoring of the Group's Speak Up helpline, which collates allegations of improper behaviour and employee concerns, has passed from the Audit Committee to the full Board. Procedures remain in place for any complaints received by the Company regarding fraud, accounting, internal accounting controls and auditing matters, to be passed to the Audit Committee for review and appropriate follow-up action. Further details of the operation of the Group's Speak Up policy and helpline can be found in the Sustainability section of the Annual Report on page 86.

Each year, the senior financial, operational and functional management of the businesses self-certify compliance with Group policies and procedures for the areas of the business under their responsibility and confirm the existence of adequate internal control systems throughout the year. The Committee reviews any exceptions noted in this bottom-up exercise.

The work undertaken during the year indicated the existence of an appropriate control environment, albeit with some areas for improvement, for which clearly defined improvement actions have been identified, particularly in respect of the Group's cyber risks. No significant control issues were raised by our External Auditors, PwC and Mazars, and no material issues were identified in 2020. After considering these various inputs, the Committee was able to provide assurance to the Board on the effectiveness of internal financial control within the Group, and on the adequacy of the Group's broader internal control systems.

Internal Audit

The Group's Internal Audit function operates on a global basis through professionally qualified and experienced individual members located around the world. They report to the Group Head of Internal Audit, based in London, who in turn reports directly to the Chairman of the Audit Committee.

Throughout 2020 Internal Audit continued to perform a programme of Compliance & Control ('C&C') audits which focus on internal financial controls and key Board compliance issues. Effectiveness & Efficiency ('E&E') audits which focus on a broader range of business performance issues, were only performed in response to a direct request from Management. This approach allows the Audit Committee to concentrate on key control issues for resolution.

The Committee received, considered and approved the 2020 Internal Audit plan which was constructed using a risk-based approach to cover the Group's control environment. The plan was based on the premise that all operating units are audited at least once every three years, including the smaller operating units. Internal Audit annually audits each of the large operating entities located in Germany, the US, China, Mexico and Brazil. Due to the travel restrictions arising from the COVID-19 pandemic, a modified plan was subsequently presented to the Committee for approval. Whilst the scope of the audit work was modified to facilitate remote testing, the entities tested remained aligned with the original risk-based plan.

Audit Committee continued

On site controls-based testing was replaced with remote Financial Controls Health Check audits supplemented by the continued use of Trial Balance deep dive testing which involved a detailed review of the Trial Balance and its underlying transactions. The Health Check audits required entities to submit evidence of the operation of key Balance Sheet reconciliations and key financial controls which were then reviewed remotely. This approach continued to allow the identification of areas for control improvement. The actions being taken to address these issues have been discussed at length at the Audit Committee with regular updates on the progress made. Internal Audit reported significant progress made against issues reported in previous years.

In 2020, a total of 28 audit assignments were undertaken (29 in 2019). The Committee received a report from the Group Head of Internal Audit at each of its meetings detailing progress against the agreed plan. Key trends and findings and an update on the progress made towards resolving open issues was also given. Common themes emerging from Internal Audit reports coupled with Internal Audit and Management's assessment of risk have informed the development of the 2021 Internal Audit plan.

When necessary Internal Audit uses external auditors to supplement internal resources on an ad hoc basis. This process provides valuable learning opportunities and we expect to continue to use external resources in specialist areas and geographies in the future.

Control issues continue to be recorded in a live web-based database into which management is required to report progress towards addressing any open issues. Internal Audit monitors the progress made and frequent meetings continue to be held with each business unit President to ensure that engagement on the resolution of issues is clearly understood at all levels of the business and responsibility for remediation has been appropriately assigned. The results are communicated to the Audit Committee which also involves senior management as necessary to provide an update against any high-priority actions and Internal Audit undertakes follow-up reviews as required. In situations where audit findings required longer-term solutions, the Committee oversaw the process for ensuring that adequate mitigating controls were in place.

During the year, an internal review was undertaken of the effectiveness of the Internal Audit function, canvassing the views of the divisional finance Vice Presidents, business unit Presidents and other key stakeholders. This highlighted continued satisfaction with the relevance and value of issues raised, and the quality of reporting. It did however highlight the need to continue to upgrade the skills and capabilities of the Internal Audit team. Over the course of the second half of 2020, increased focus was placed on recruitment and a substantially new team of Internal Auditors based in Krakow, Poland has been recruited to deliver the 2021 plan. This includes an IT Audit specialist, recruited in November 2020.

Having considered the work of the Internal Audit function during 2020, including progress against the 2020 Internal Audit plan, the quality of reports provided to the Committee, and the results of the review of the function's effectiveness, the Committee concluded that the Internal Audit function operated effectively during 2020.

External audit

Auditors' appointment

In 2017, the Company appointed PricewaterhouseCoopers LLP (PwC) as External Auditors to the Company and the Group, and Mazars LLP to audit the non-material entities within the Group. PwC nominated Julian Jenkins as the audit partner responsible for the Group audit. After the completion of the 2020 half year audit, Julian Jenkins retired from PwC and was therefore replaced as Vesuvius' engagement partner by Darryl Phillips. In line with the regulations on auditor rotation, the external audit contract will be put out to tender at least every ten years and the audit partner will be rotated at least every five years.

2020 Audit plan

PwC's 2020 year-end audit plan was based on agreed objectives. The audit focused on areas identified as representing significant risk and requiring significant judgement. PwC maintained an ongoing dialogue with the Audit Committee throughout the year providing regular updates, including commentaries on significant issues and its assessment of consistency and appropriateness in the judgements and estimates made by management. Private sessions were held with PwC without management being present. PwC confirmed that its work had not been constrained in any way and that it was able to exercise appropriate professional scepticism and challenge throughout the audit process. The Chairman of the Audit Committee met on a number of occasions with PwC to monitor the progress of the audit and discuss questions as they arose.

The Independent Auditors' Report provided by PwC on pages 150-157 includes PwC's assessment of the key audit matters. These key audit matters are discussed in the significant issues and material judgements comments above. The report also summarises the scope, coverage and materiality levels applied by PwC in its audit. As part of the audit planning process and based on a detailed risk assessment, the Committee agreed a materiality figure of £7.0m for Group financial reporting purposes which is 19% lower than last year (£8.6m). This was set at 4.6% of the average of headline profit before tax in the three years to 31 December 2020, so as not to give undue weight to the 47% reduction to headline profit before tax from the impact of COVID-19 on the Group's results. It represents 7.6% of the Group's 2020 headline profit before tax. Importantly, much lower levels of materiality are used in the audit fieldwork on the individual businesses across the Group and these lower figures drive the scope and depth of audit work. Any misstatement at or above £0.35m was reported to the Committee.

There were no significant changes this year to the coverage of the audit which stood at 68% of the Group's revenue, 74% of profit before tax and 79% of headline profit before tax. This coverage was considered to be sufficient by the Committee. The audit coverage is reflective of the long tail of smaller businesses within the Group that individually are not 'material' to the Group result.

The Committee also received a report from Mazars during the year summarising the findings and recommendations from its statutory audits for the year ended 31 December 2019 of the non-material Group subsidiaries and management agreed to implement certain of these recommendations.

The PwC audit fee approved by the Audit Committee was £1.8m. This was constructed bottom up on a local currency basis and was assessed in light of the audit work required by the agreed materiality level and scope. The fee agreed with Mazars for the audit of the non-material entities was £0.6m, resulting in a combined audit fee with PwC of £2.4m, compared with £2.3m in 2019.

Independence and objectivity

The Committee is responsible for safeguarding the independence and objectivity of the External Auditors in order to ensure the integrity of the external audit process. In discharging this responsibility during 2020, the Committee:

> Sought regular confirmation from the incumbent External Auditors that they considered themselves to be independent of the Company in their own professional judgement, and within the context of applicable professional standards

> Assessed the External Auditors' work and considered whether they were exercising an appropriate level of professional scepticism

> Evaluated all the relationships between the External Auditors and the Group, including compliance with the Group's policy on the employment of former employees of the External Auditors, to determine whether these impaired, or appeared to impair, the Auditors' independence

> Reviewed compliance against the policy on the provision of non-audit services by the External Auditors

> Reviewed details of the non-audit services provided by the External Auditors and associated fees

As a result of its review, the Committee concluded that PwC remained appropriately independent.

Non-audit services

Vesuvius operates a policy for the approval of non-audit services. A copy of the current policy is available to view on the 'Investors/ Corporate Governance' section of the Company's website, www.vesuvius.com. The Committee approved a revised Non-audit Services Policy to comply with the FRC's revised 2019 Ethical Standard in 2020.

The use of the External Auditors for the provision of non-audit services is strictly prohibited except for specific permitted audit related services. These comprise: Category 1 services which the External Auditors are obliged to perform due to law or regulation, such as regulatory and solvency reports; and Category 2 services which could be provided by others (albeit there are typically significant efficiencies to be had when done in combination with the audit such as interim reporting). An annual budget for the additional Category 2 service fees proposed to be paid to the External Auditors in the following year is presented for pre-approval to the Audit Committee each year. Audit Committee approval is required for expenditure in excess of this approved budget.

All audit-related and permissible non-audit services proposed to be carried out for any Group company worldwide by the External Auditors must be pre-approved before an engagement is agreed. Pre-approval must be obtained from the Head of Finance or the Chief Financial Officer, who will confirm that the Audit Committee has approved the engagement. Any assignment proposed to be carried out by the External Auditors must also have been cleared by the External Auditors' own internal pre-approval process, to assess the firm's ethical ability to do the work.

In 2020, the fees for non-audit services payable to PwC amounted to £0.1m (2019: £0.1m). The 2020 fees represent payment for assurance services related to the review of the Group's half-year financial statements, quarterly reviews and tax form audits in India (as required by regulation), Indian certification in respect of deposits along with the auditing of an R&D claim in Italy.

Effectiveness of the External audit process

The Committee and the Board are committed to maintaining the high quality of the external audit process. Each year the Committee carries out a formal assessment of the performance of the External Auditors in carrying out their work and of the audit process in general. Input into the evaluation in 2020 was obtained from management and other key Company personnel, members of the Audit Committee and the External Audit team. The review focused on the External Auditors' mindset and culture, skills, character and knowledge, and the quality of its controls, as set out in the guidance for audit committees prepared by the FRC.

The evaluation of the External Auditors included the following steps:

> a survey of key finance and non-finance stakeholders in Head Office and in-scope countries

> a commentary-based survey of Audit Committee members focused on their experience of working with PwC

> consideration of PwC's approach to assessing the risks to its audit quality and an evaluation of the actions it had taken to mitigate these

> a review of other external evidence on PwC audit quality (e.g. report on PwC by the FRC)

> an assessment against the objectives outlined in PwC's Audit Objectives report

> discussions with PwC and key finance and non-finance personnel

The evaluation concluded that the audit process had been suitably rigorous, with PwC providing an effective, objective and challenging audit process for the 2019 financial year. The learnings from previous audits and the resultant actions taken had had a positive impact on the overall efficiency and effectiveness of the audit. PwC had further improved their audit approach and communications, challenging the team in the right areas and providing strong technical expertise. The PwC team was also seen as independent by the Audit Committee and management. To further improve the process it was proposed that more regular update meetings be held in 2020 and that the focus on earlier communication of audit approach and level of interim testing in advance of year-end, be maintained. Debrief meetings were held at a local level to discuss the 2019 audit and to constructively share feedback that would facilitate further improvements to the audit planning for the 2020 audit and an improved understanding of the audit approach and requirements.

Audit Committee continued

Reappointment of PwC for 2021

The Committee is responsible for making recommendations to the Board in relation to the appointment, reappointment and removal of the External Auditors. In undertaking this duty, the Committee takes into consideration a number of factors concerning the External Auditors and the Group's current activity, including:

> the results of its most recent review of the effectiveness of the Auditors

> the results of its review of the independence and objectivity of the Auditors, particularly in light of the provision of non-audit services

> its ability to coordinate a global audit, working to tight deadlines

> the cost-competitiveness of the Auditors in relation to the audit costs of comparable UK companies

> the tenure of the incumbent Auditors

> the periodic rotation of the senior audit management assigned to the audit of the Company

> external reviews of the performance and quality of the Auditors, including:

– the annual report issued by the Audit Inspection Unit of the Financial Reporting Council on the work of the Auditors

– the Auditors' own annual Transparency Report

Having considered the aforementioned factors, the Committee decided to recommend to the Board that PwC be reappointed for 2021. It confirms that its recommendation is free from the influence of any third party and that there are no contractual restrictions on the choice of auditor. A resolution proposing the reappointment of PwC will be included in the notice of AGM for 2021.

The Committee has noted the ruling by the Securities Exchange Board of India (SEBI) regarding the prohibition placed on PwC network companies performing audits of listed entities in India for two years from 1 January 2018. PwC subsequently won the appeal at the Securities Appellate Tribunal (SAT) allowing PwC to continue with existing audits of listed companies. SEBI appealed against the SAT order in November 2019 and this was stayed by the Supreme Court pending final disposal of the appeal. For the rest of the order, dealing with the ban, there has not been any hearing and no date has been fixed. The Committee continues to monitor developments on this matter in the context of the Group's two listed Indian subsidiaries, Foseco India Limited and Vesuvius India Limited. The Group has contingency plans in place should PwC not be able to continue to audit the Group's entities in India.

Audit Committee evaluation

The Audit Committee's performance was evaluated as part of the overall externally facilitated Board and Committee performance evaluation, which is described in depth on pages 118-119. The management of Audit Committee meetings was rated highly in terms of the annual cycle of work, the level of input in meetings and the wide variety of issues covered in a good level of detail. The quality of the information provided to the Audit Committee was also rated highly and there was noted to be high-quality, open and candid engagement, between the Audit Committee and the Chief Financial Officer and his team, the Head of Internal Audit and the External Audit Partner, with a good rapport with the internal team and Audit partners.

The Committee was judged to monitor the work of the Internal and External Auditors effectively and to provide appropriate challenge to management's assessment of significant audit issues and material accounting judgements. The Committee noted that there was scope to further improve the Group's internal control systems and that action was being taken to strengthen these through further standardisation of processes.

A number of priorities were identified for the Audit Committee over the coming year, including review of the implementation of the new Finance organisation, ensuring there is appropriate and effective implementation of IT systems and solutions, along with continued oversight of the Internal Audit function and its findings, and support for the timely completion of recommendations by both the Internal and External Auditors.

On behalf of the Audit Committee

Douglas Hurt
Chairman, Audit Committee

3 March 2021

Nomination Committee

Dear Shareholder,

On behalf of the Nomination Committee, I am pleased to present the Nomination Committee Report for 2020. The primary responsibility of the Nomination Committee is to focus on Board composition and succession planning, to ensure that the Board is made up of individuals with the appropriate drive, abilities, diversity and experience to lead the Company in the delivery of its strategy.

As part of this work, the Committee is also responsible for overseeing the succession plans that are in place for senior management to ensure that there is a consistent pool of diverse talent as a pipeline for future progression to the Board.

2020 has been a year of significant activity for the Committee as it focused on its succession planning obligations. In December 2021, the Group reaches its ninth anniversary of operation as a stand-alone company. At this point, Jane Hinkley and I, the two remaining Directors who were appointed when the Company initially listed as a separate entity, reach our nine-year tenure thresholds for the purposes of the Code. With this in mind, the Committee has plans in place to add extra non-executive expertise to the Board. The first of these new Non-executive Directors, Kath Durrant, joined the Board on 1 December 2020. Kath has more than 30 years' experience in HR Management and will take over as Chair of the Remuneration Committee from Jane Hinkley at the close of the 2021 AGM. At the end of 2020 Hock Goh and Holly Koeppel, also signalled their desire to step down from the Board at the close of the 2021 AGM, following 6 years and 4 years of service, respectively. Consequently, the Nomination Committee will continue its focus on succession, with a further new Non-executive Director being actively sought. In addition, noting that Jane Hinkley and I reach our ninth anniversaries of appointment in 2021, the Committee will be undertaking further succession activity later in the year, including the Senior Independent Director commencing a process for the appointment of a new Chairman.

Alongside this focus on Board recruitment, the Committee also spent a considerable amount of time during the year reviewing senior management succession, including the pipeline for succession to roles in the divisional executive committees and the potential for progress to the Group's Executive Director positions.

Yours sincerely

John McDonough CBE
Chairman, Nomination Committee

3 March 2021

Committee members

John McDonough CBE (Committee Chairman)
Hock Goh
Friederike Helfer
Jane Hinkley
Douglas Hurt
Holly Koeppel
Kath Durrant – joined the Committee on her appointment to the Board on 1 December 2020

Meetings

The Committee met six times during the year.

Key activities during the year

> **Board composition:** The Committee reviewed the structure, size and composition of the Board, including the skills, knowledge and experience required for the Board to continue to function effectively, taking into consideration the need to ensure an appropriate balance of independence and diversity amongst Board members. The Committee then evaluated the current Board composition against an assessment of these future business needs.

> **Board succession:** The Committee considered the anticipated rotation of Directors from the Board and future requirements for Board composition, with a focus on ensuring that the Board continues to be resourced by a group of Directors with the skills and experience necessary to support the future accomplishment of the Group's Strategic Objectives. The Committee engaged recruitment consultants to assist in the search for new recruits and oversaw the successful recruitment process to appoint Kath Durrant, as a Non-executive Director and the next Chairman of the Remuneration Committee.

> **Senior management development and succession:** The Committee reviewed the Group's succession processes for the Group Executive Committee and the management cadre below this level, taking a particular interest in the progress of plans to recruit a new business unit President for Flow Control. It also examined how the Group's talent management processes were developing, how the Senior management cadre were performing and how the development of individuals flagged as 'high potential' was proceeding – all aimed at providing a pipeline of experienced and talented managers to succeed to roles at the highest level of the business.

> **Diversity:** The Committee reviewed the Group's progress in recruiting more women and supported the adoption by the Group of a new target focused on ensuring that 30% of the top management are female by 2025.

> **Directors' elections:** The Committee considered the Directors' annual elections and re-elections at the AGM.

> **Committee evaluation:** The Committee reviewed its performance and effectiveness during 2020, including evaluating whether each Non-executive Director was spending sufficient time fulfilling their duties.

> **Committee terms of reference:** The Committee reviewed its terms of reference and recommended some minor updates to the Board.

Nomination Committee continued

The Nomination Committee

The Nomination Committee is made up of me, as Chairman of the Company, and the Non-executive Directors. During the year, I continued as Chairman of the Committee, though I did not act as Chairman when the Committee was discussing issues surrounding my succession, when Douglas Hurt our Senior Independent Director served as Chairman in my place. The Company Secretary is Secretary to the Committee. Members' biographies are set out on pages 92 and 93.

Role and responsibilities

The Nomination Committee's foremost priorities are to ensure that the Company has the best possible leadership, to oversee the process for Board appointments, ensure plans are in place for orderly succession to both the Board and Senior Management (being the Group Executive Committee) positions, and oversee the development of a diverse pipeline for succession. The Committee ensures that the procedure for the selection of potential candidates for Board appointments – either as an Executive Director or independent Non-executive Director – is formal, rigorous and transparent and undertaken in a manner consistent with best practice. It also ensures that appointments to the Board are made on merit, against objective criteria and with due regard for the benefits of diversity of gender, social and ethnic backgrounds, and cognitive and personal strengths on the Board. The Nomination Committee advises the Board on appointments, retirements and resignations from the Board and its Committees.

The Committee operates under formal terms of reference. A copy of these terms of reference, which were updated during the year, is available on the Group's website www.vesuvius.com.

The Committee and its members are empowered to obtain outside legal or other independent professional advice at the cost of the Company in relation to its deliberations. These rights were not exercised during the year. The Committee may also secure the attendance at its meetings of any employee or other parties it considers necessary.

Process for Board appointments

The Committee follows formal, rigorous and transparent procedures for the appointment of new Directors. When considering a Board appointment, the Nomination Committee draws up a specification for the role, taking into consideration the balance of skills, knowledge and experience of its existing members, the diversity of the Board, the independence of continuing Board members, and the ongoing requirements and anticipated strategic developments of the Group. The search process is then able to focus on appointing a candidate with the necessary attributes to enhance the Board's performance.

During 2020, the Committee oversaw the selection process to identify a new Non-executive Director, who would take over the Chair of the Remuneration Committee. The Committee reviewed the skills and attributes required for the role and agreed an individual job specification. The Committee utilised the services of the specialist recruitment agency, Spencer Stuart, in this search. Spencer Stuart has adopted the Voluntary Code of Conduct addressing gender diversity and best practice in search assignments. It does not have any other connection with the Group, other than in respect of management recruitment work undertaken during normal trading activities. It was selected for this assignment following a review of potential agencies based on its skills and expertise.

The search for a new Non-executive Director was conducted globally and a long-list of potential appointees was produced by Spencer Stuart. The Committee reviewed the long-list and a short-list of candidates for interview was drawn up, based upon the objective criteria identified at inception. The Chairman, the Chief Executive, the Senior Independent Director and the Remuneration Committee Chair interviewed the short-listed candidates, and the preferred candidate then met with all other Board members, either in person or where travel restrictions prohibited this, virtually by videoconference. Detailed external references were taken up and, following this, the Committee made a formal recommendation to the Board for the appointment of Kath Durrant as a new Non-executive Director. Kath was required to demonstrate that she had sufficient time available to devote to the role and to identify any potential conflicts of interest. No conflicts were identified. Following her appointment, the Committee asked the Company Secretary to put in place a comprehensive induction programme for her.

Board composition

On an ongoing basis, the Committee reviews the current and future needs of the Board and its Committees – reflecting on the balance of skills, knowledge and experience of the current Directors and comparing this against the Board's list of key skills. The independence and diversity of the Board and the balance of skills, experience and development needs of Board members are examined as part of the annual corporate governance review. The Committee also takes into consideration the results of the Board evaluation process each year. In 2020, the evaluation rated highly the skills and experience represented on the Board, along with the diversity amongst Directors noting particularly the excellent regional spread of expertise and culture with Directors from the US, UK, France, Austria, South Africa and Asia. The importance of the Board possessing knowledge of the Company's growth markets was re-emphasised. The Committee's key skills matrix was reviewed in light of the outcome of these deliberations. On an ongoing basis, the Committee considers existing lengths of tenure and the prospective rotation and retirement of Board members, so that it can plan succession accordingly. The Committee has commenced a search for a further new Non-executive Director and begun preparations for finding a successor to the Chairman, in line with anticipated requirements.

Diversity

The Group Diversity and Equality Policy outlines Vesuvius' commitment to encouraging a supportive and inclusive culture amongst its global workforce, promoting diversity and eliminating any potential discrimination in our work environment. Vesuvius' Board Diversity Policy explains how this commitment manifests in relation to the Board. Vesuvius recognises the value of a diverse and skilled workforce and is committed to creating and maintaining an inclusive and collaborative workplace culture that will provide sustainability for the organisation into the future. We believe that the dedication and professionalism of our people is the most significant contributor to our success. Having a balance of cultures, ethnicities and genders helps to promote innovation and creativity. The diversity of our employees is one of the core strengths of the Group. Copies of the Group's Diversity policies can be found on the Group's website: www.vesuvius.com.

As an organisation, Vesuvius has a global, multicultural operational and customer base, and we wish to reflect that inside our organisation with a multiculturally diverse community of excellent professionals of all backgrounds at Vesuvius. This starts by focusing on broad diversity of gender and nationality, with an aim to ensure that all employees and job applicants are given equal opportunity and that our organisation is representative of all sections of society where we operate. Each employee is respected and valued and able to give their best as a result. All employees are given help and encouragement to develop their full potential and utilise their unique talents.

In turn, a more diverse leadership group will result. We expect that Vesuvius' leadership population should increase in diversity significantly over the next two to five years, in terms of age, gender, ethnicity, length of service and educational background.

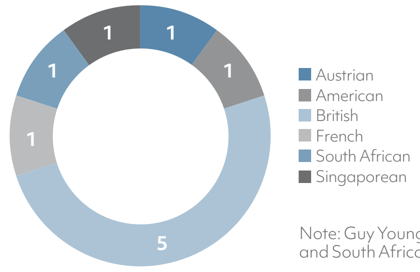
In line with the Group's global commitment to diversity, the Nomination Committee focuses on ensuring that the Board and its Committees also have the appropriate range of diversity, skills, experience, independence and knowledge of the Company and the markets in which it operates, to discharge their duties and responsibilities effectively. We continue to look at diversity in its broadest sense – reflected in the range of backgrounds and experience of Board members who are drawn from different nationalities and have managed a variety of complex global businesses. The Nomination Committee recognises that diversity is a key ingredient in creating a balanced culture for open discussions at Board level and in minimising 'groupthink'.

The Board's overall skills and experience, as well as Non-executive Director independence, were reviewed during the year. The Board's composition also formed part of the Board evaluation process. The Board considers its diversity, size and composition to be appropriate for the requirements of the business. In 2019 it achieved its target of achieving at least 33% female membership, and at the end of 2020, 44% of the Directors were women. Four Directors are non-UK citizens and two of the Directors (22%) identify as having BAME heritage.

The Board Diversity Policy confirms the Group's commitment to maintaining a Board comprising at least 33% female membership, while continuing to appoint candidates based on merit and recognising that over time the proportion of female Directors will fluctuate naturally as Board members retire and new Directors are appointed.

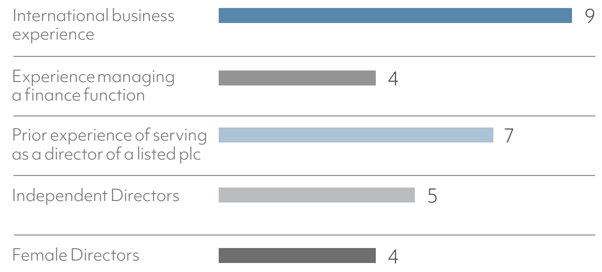
In 2020, 14% of our workforce were women, which was stable versus 2019. The number of women in the Group Executive Committee and Top Management team (members of the Group Executive Committee plus their key direct reports) increased by 7.5 percentage points in 2020 to 20%. The Group has adopted a new target focused on ensuring that 30% of the Group Executive Committee and Top Management are female by 2025. The Committee is committed to continuing to monitor the Group's ongoing progress towards achieving this target.

Board nationalities



Note: Guy Young has dual British and South African citizenship

Board composition



Further information on the Group's approach to promoting diversity can be found on page 82.

As at 31 December 2020, the gender balance of the Group's employees was as follows:

	Female	Male	Total	Female	Male
Group Executive Committee member	2	5	7	29%	71%
Top management[1]	9	39	48	19%	81%
Middle management	65	401	466	14%	86%
All other employees	1,357	8,476	9,833	14%	86%
Grand total	1,433	8,921	10,354	14%	86%
Group Executive Committee members and Top Management	11	44	55	20%	80%
Directors of subsidiaries included in consolidation[2]	40	394	434	9%	91%

Notes:

1. Top Management comprises key leadership roles reporting directly to members of the Group Executive Committee.
2. There are 434 directors of Group subsidiaries, 9% of whom are women. This disclosure is made to comply with regulatory requirements. It includes directors of dormant companies. Some individuals hold multiple directorships.

Governance

Nomination Committee continued

Board evaluation

The Board carries out an evaluation of its performance and that of its Committees every year. This year's evaluation was again externally facilitated by the corporate advisory firm, Lintstock. The Group uses Lintstock's Insider List database tool but has no other connection with the organisation and Lintstock does not have any connection with any of the Directors.

Each evaluation was conducted via a series of targeted questionnaires. As with previous years, the evaluation not only covered the performance of the Board but also that of its Committees, along with individual reviews of each Director and analysis of the performance of the Chairman. Narrative reports were then prepared for the Board, the Audit, Nomination and Remuneration Committees, and the Chairman.

The Board assessment focused on seven core areas: Board composition, oversight of stakeholders, Board dynamics, Board support and focus of meetings, Board oversight, risk management, and priorities for change. It also covered the Group's response to the COVID-19 crisis and the conduct of the Board's strategy meetings.

The outcome of the review was positive, with the Board perceived to have improved its performance despite the challenges of 2020 and the necessity to hold most of its meetings virtually. The Non-Executives' support and challenge of management was rated highly overall and the Directors were particularly supportive of the more frequent, shorter meetings that had been held to respond to the challenges of the COVID-19 pandemic. The Board's understanding of the views and requirements of investors and employees was rated highly, and the Board's understanding of customers was also rated positively overall, although it was noted that there continued to be further scope for improvement. The impact of travel restrictions limiting opportunities for face-to-face meetings was acknowledged and the benefit of re-establishing such interactions as soon as possible recognised.

With regard to the particular challenges of the COVID-19 pandemic, it was noted that the Board had been able swiftly to adjust its focus and priorities, setting clear objectives for the executive team and monitoring their delivery. A programme of additional meetings had quickly been put in place to ensure decisions were taken on a timely basis. A clear imperative for safety, liquidity, rigorous financial management and customer supply was placed on the management team, which the business was able to address clearly and effectively.

In terms of longer-term strategy, Vesuvius' capacity to deliver on this was rated highly overall, though there was an emphasis on the ongoing need to ensure that the Group continued to recruit and retain sufficient and appropriately skilled people to support such delivery in the future. This would continue to be an area of focus in 2021, along with the roll-out of the Group's new sustainability agenda. In addition, the Board resolved to gain further understanding of competitor dynamics in 2021. With the forthcoming changes in Non-executive Directors, succession planning was once again highlighted as an area of focus.

In addition to the primary focus on safety, the top priorities for Vesuvius as a business over the coming year were identified by the Board as being capturing organic and, where possible inorganic growth; driving innovation and launching new products, to gain and maintain market share; operational and commercial performance and cost management.

The individual assessment of Directors concluded that all of the Directors continued to contribute effectively, providing expert and strategic advice as appropriate and holding management to account in an open and constructive manner. They were considered to devote adequate time to their duties and to be engaged and proactive in debate at all meetings. The Chairman was viewed to operate with objective judgement, and his approach to chairing meetings was deemed to be inclusive and to facilitate debate. Each of the Committees was also considered to have operated effectively during the year.

As in previous years, a set of action points was compiled from the output of the evaluation to ensure that its findings are included in the Board's activities. These will be implemented by the Board in 2021, with progress reviewed by the Board throughout the year.

The 2019 evaluation identified the following Board priorities for future Board attention; these were addressed during 2020 as follows:

Area	Issue	Action taken in 2020
Strategy	Review Board requirements for provision of strategic information	The Board held its annual strategy presentation and review, albeit delayed because of the COVID-19 pandemic. Non-executive Director input into the agenda for the day and the presentations was canvassed and reflected in the schedule to ensure that the meetings' aims were achieved.
	Enhance the Board's visibility of the Group's customers	Greater information on the Group's customer base, current requirements and untapped potential was included the Strategy Day presentations.
People and organisation	Senior management succession	The Nomination Committee received more detailed reporting on the enhancement of processes for talent management and succession in the Group, and the focus for further developing the talent pipeline for senior roles in the Group.
	Continued focus on enhancing the Board's understanding of senior management capabilities	The Chief Executive updated the Nomination Committee on senior management performance, recruitment and talent, giving them increased visibility on the strengths and weaknesses of the existing senior management cadre.
Board dynamics	Prioritise Board focus on key strategic and business issues rather than historical performance	Further priority was given to strategic reporting throughout the year, although the COVID-19 pandemic required key Board input on tactical issues to provide a response to the challenges it posed.
	Sharpen focus of Board Strategy Day presentations to clearly delineate immediate term delivery and long-term strategy	In appropriate areas, Board strategy presentations were conformed to give a broader understanding of overall themes.

Senior management succession

The Committee's succession planning activities do not exclusively relate to the Board but encompass the senior management levels immediately below the Board, aiming to support and encourage the growth of a pool of talent able to step up to the top roles in future years. The Committee considers succession plans for all the senior functional and business unit positions, assessing the availability of candidates who could cover the roles on a short term contingency basis should the need arise, along with the pool of medium-term and long-term talent available for future development into specific roles. The Committee continued to focus on the Group's talent development and succession planning processes in 2020, with a continuing emphasis on the development of this senior management cadre. Where gaps arose, the Committee was apprised of the work being undertaken to develop and recruit new executives for this talent pool.

Committee evaluation

The Committee's activities were part of the externally facilitated evaluation of Board effectiveness during the year, with Committee members completing individual questionnaires. The results of these written submissions were then collated and a written report tabled to the Committee. The management of Nomination Committee meetings was highly rated overall, with the quality of information provided also rated positively. The process for the recruitment of a new Non-executive Director was considered to have been conducted appropriately with all necessary rigour, despite the challenging circumstances. It was noted that the Committee needed to continue its focus on reviewing the development of the pipeline of internal successors for Senior Management, particularly the GEC roles. Going forward, it was noted that with the anticipated departures of Hock Goh and Holly Koeppel at the 2021 AGM, the Nomination Committee will continue its focus on recruitment, with further a new Non-executive Director being actively sought. In addition, noting that Jane Hinkley and I reach our ninth anniversaries of appointment in 2021, the Committee will be undertaking further succession activity later in the year, including the Senior Independent Director commencing a process for the appointment of a new Chairman.

On behalf of the Nomination Committee

John McDonough CBE
Chairman, Nomination Committee

3 March 2021

Directors' Remuneration Report

Remuneration overview

Dear Shareholder,

On behalf of the Remuneration Committee, I am pleased to present the Directors' Remuneration Report for the financial year ended 31 December 2020.

The Annual Report on Directors' Remuneration sets out details of the pay received by the Directors in 2020. The report will be subject to an advisory shareholder vote at the 2021 AGM.

COVID-19

As with many organisations around the world, and for the people that work in them, 2020 has been an extraordinarily challenging year with the COVID-19 pandemic impacting our business, employees and communities. The Committee, together with the Board, would like to thank our people for their hard work and dedication during this difficult period, particularly those working tirelessly to maintain the supply of products and services to our customers.

Regardless of the challenges faced during the year, the Group's priority remained the health and safety of all its employees. We are proud of the far-reaching efforts of all our employees around the world to maintain a safe working environment and for their contributions to local communities during this time of heightened need, be it donating PPE to local medical facilities and elderly care homes, donations of essential food and hygiene products to less fortunate families, or sanitising and reconfiguring workplaces to ensure the ongoing functioning of the business while ensuring the well-being of employees.

To protect the Group, management, with the support of the Board, enacted a series of measures to preserve cash, reduce costs and protect the business and jobs. Despite the impact of COVID-19 we have been able to maintain the size of our workforce at around 10,500.

In recognition of the prevailing challenges and to acknowledge the impact of the pandemic on all our stakeholders, including our shareholders, our people, customers and the communities in which we operate, the Group's Executive Committee voluntarily waived 20% of their contractual base salaries, and where legally permissible, a corresponding reduction of their contractual employer pension contributions, for six months of the year. The Chairman and Non-executive Directors also volunteered a 20% reduction in their fees over the same period. The total savings generated by the members of the Group Executive Committee and the Board of Directors amounts to £406,000 inclusive of £56,000 contributed by the Non-executive Directors in sacrificed fees.

The voluntary waiver extended further into the senior management team with the direct reports to the Group Executive Committee electing to reduce their contractual salary (and where permissible, also their corresponding employer pension contributions) by 5-10% over the same period of time. In addition to the savings contributed by the Group Executive Committee and the Board of Directors, a further £1.15m was contributed by approximately 170 managers.

Internal measures adopted very early in the economic downturn included a restriction on discretionary spending, a hiring freeze on non-essential roles, a drive to reduce working capital, a significant reduction in planned capital expenditure, the use of furlough and other temporary absence programmes, utilising tax deferral arrangements where available, and encouraging employees to use up accrued vacation days.

Once the initial impact of the economic downturn on the business started to turn and signs of a slowly improving business became evident, several decisions were made to address the assistance accessed by the organisation.

> While earlier in the year it was deemed appropriate to withdraw the 2019 final dividend payment, the Board determined in October that the improved level of business activity later in the year made the reinstatement of a dividend an affordable action recognising the importance of these payments to shareholders.

> In the UK, given the uncertainty at the time, it was deemed appropriate to use the Government's furlough programme to assist those whose employment may otherwise have been adversely affected by the COVID-19 pandemic. As the Group's financial position became more stable, all furlough amounts received from the UK Government were repaid.

> To reinforce our liquidity position, in April 2020, the Group secured access to the Covid Corporate Financing Facility (CCFF) being offered by the Bank of England. By September 2020, as a result of our positive free cash flow generation and early signs of marginally improving levels of business activity, the Company repaid the debt earlier than its March 2021 maturity.

These actions have formed the backdrop for the discussions and decisions of the Committee during 2020 and early 2021.

Performance in 2020

2020 was a challenging year for the Group, during which we were inevitably affected by the global outbreak of COVID-19, which materially disrupted our key end markets for both the Steel and Foundry Divisions. Despite these challenges, the Group focused swift action on cost control and cash preservation. Our reported results declined compared with 2019, registering £1,458.3m of revenue and £101.4m of trading profit on a reported basis. Cash flow has remained strong (£113.5m v £121.5m) despite the reduced profit, demonstrating the underlying strength and cash-generative nature of our business.

In considering the impact of this difficult year on all our stakeholders, the Committee also noted that, despite the reduced profits, the Company's share price increased from £5.00 as of 31 December 2019 to £5.365 on 31 December 2020, representing an increase of 7.3% on an absolute basis, and 14.6% relative to the FTSE 250.

Strategic alignment

Deliver growth | Generate sustainable profitability and create shareholder value | Maintain strong cash generation and an efficient capital structure | Provide a safe working environment for our people | Be at the forefront of innovation | Run top-quality, cost-efficient and sustainable operations | Foster talent, skill and motivation in our people

2020 Directors' Remuneration

As was disclosed in last year's Directors' Remuneration Report, in December 2019, the Committee reviewed Patrick André's and Guy Young's salaries and increased them by 3% and 10% respectively. During 2020, these were voluntarily reduced by 20% for six months of the year in response to the impact of the COVID-19 pandemic.

In 2020, Patrick André and Guy Young received allocations of Performance Shares under the Vesuvius Share Plan (VSP) worth 200% and 150% of their base salaries, respectively. As outlined in last year's Remuneration Report, in response to lower share prices driven by the growing economic uncertainty, the share price used to determine the number of shares allocated was £4.371 (the average in the five dealing days prior to the February 2020 Remuneration Committee meeting) rather than £3.9248 (the average in the five dealing days prior to grant). Accordingly, the effective value of these awards at the date of grant was 180% and 135% of base salaries for Patrick André and Guy Young, respectively.

Other than as outlined above, the Remuneration Committee did not exercise any further discretion in respect of the Executive Directors' remuneration in 2020.

Remuneration outcomes for 2020

In 2020, the Annual Incentive awards were based 60% on Group headline earnings per share (EPS), 20% on the Group's working capital to sales ratio (based on the 12-month moving average) and 20% on specified personal objectives; 33% of any Annual Incentive earned will be deferred into awards over shares for three years.

In 2020, our adjusted headline EPS of 27.6 pence was below the threshold Annual Incentive target of 39.0 pence and the Group's working capital to sales ratio of 23.2% was better than the threshold target of 23.5%. As a result, partial payments of 34.0% of their maximum entitlement of 25% of contractual base salary (being 20% of their overall Annual Incentive) are due to the Executive Directors in respect of this financial performance metric of the 2020 Annual Incentive. Pay-outs are also due in respect of the personal objectives element of the Annual Incentive, with the Committee awarding Patrick André and Guy Young 65.3% and 69.0% respectively of their maximum entitlements of 25% of contractual base salary (being 20% of their overall Annual Incentive), in respect of the personal objectives they were set for 2020.

The Committee considered the appropriateness of paying Directors' incentives when the EPS target had not been met and in light of other stakeholders' experience. In addition to the factors listed previously, it should be noted that the financial targets were set in a pre-COVID-19 world and that the personal objectives are linked to key strategic, organisational and operational projects designed to strengthen the Company for the long term, and have measurable targets. One of the key financial objectives once the pandemic took hold was the preservation of cash and management of working capital. With the reduced level of business, we would normally expect an impact on the working capital to sales ratio, so it is gratifying to see that management not only reduced this to below last year's figure of 24%, but achieved an outcome within the target set prior to COVID-19. In light of the achievements against targets set pre-COVID-19, the Committee concluded that such pay-outs were in order.

The performance period for the awards made under the VSP in 2018 matured at the end of December 2020 and potentially vest in March 2021. Performance was measured equally by reference to total shareholder return (TSR) relative to the FTSE 250 (excluding investment trusts) and headline EPS growth over the three-year period (adjusted as above). Relative TSR performance was below median; as a result no Performance Share awards will vest under the TSR element (out of a maximum 50%). The annual compound headline EPS growth for the period was -16%, which is below the minimum EPS target. As a result no Performance Share awards will vest under the EPS performance element (out of a maximum of 50%).

The Committee considered whether to exercise its discretion when reviewing the nil vesting of the Performance Shares and considered the underlying financial performance of the Company to satisfy itself that the outcome was appropriate.

The Committee took into account all factors when considering the remuneration outcomes for 2020, including the actions and measures deployed by the management team in response to the COVID-19 pandemic, and the Committee resolved that the Group's Executive Remuneration Policy had operated appropriately in respect of 2020.

Workforce remuneration

The Remuneration Committee has always had clear oversight of the level and structure of remuneration for members of the Group Executive Committee, along with approving the structure and payment of awards to all executives under the Group's share plans. In addition, it has been provided with broad remuneration information on the top cadre of management.

Following the recent revisions to the Code, the remit of the Remuneration Committee has been broadened to include the review of workforce remuneration and related policies and the more general alignment of incentives and rewards with culture.

Given the diverse nature of the Group's operations both geographically and functionally, the Group has a wide variety of different remuneration and incentive arrangements in operation. The Committee has continued a programme to review workforce remuneration, which included the pension arrangements in the Group's largest territories and bonus arrangements across the global workforce. Insights gained from these exercises enabled the Committee to assess the alignment of these arrangements within the Group and amongst employees of different seniority including the Executive Directors, and were taken into account when considering remuneration for the Executive Directors and Senior Management.

Environmental, social and governance issues

The Committee recognises the importance of environmental, social and governance matters in relation to Executive Directors' remuneration. The Executive Directors' personal objectives for the 2021 Annual Incentive contain specific targets in relation to such matters to ensure an increased focus.

In addition, the malus and clawback provisions applicable to the VSP specifically contemplate the reduction of awards should an individual's conduct, a material failure of risk management or a serious breach of health and safety, result in serious reputational damage.

Remuneration overview continued

Implementation of the new Remuneration Policy in 2020

Our new Remuneration Policy came into effect on its approval at last year's AGM, resulting in the following changes:

Enhancement of shareholding guidelines

> The shareholding guideline that applies whilst in employment was increased to 200% of salary for all Executive Directors from 2020.

> A post-employment shareholding guideline was introduced under which Executive Directors remain subject to their shareholding requirement in the first year after their cessation as an Executive Director and to 50% of the shares retained in the first year during the second year after such cessation, recognising that there is no requirement to purchase additional shares if the shares held when they cease to be an Executive Director are less than the applicable shareholding guideline.

Aligning pension provisions

> As required by the new UK Corporate Governance Code, the level of pension allowance for Executive Directors appointed following the adoption of the 2020 Remuneration Policy will be aligned with the post-retirement benefits applicable to the majority of the workforce or, where appropriate, to the majority of the workforce of the relevant geography.

> Our incumbent Executive Directors currently receive a 25% pension contribution. This was frozen at the 1 January 2020 amount and we committed to reduce it to that of the majority of the workforce in line with the Code. The review of workforce pensions referred to above covered pension plans in ten of the major countries in which we operate and where approximately half of our workforce is located. The review highlighted the wide variation in state, mandatory and customary corporate pension arrangements around the globe. On the basis of this review the Committee concluded, and the Executive Directors have agreed, that the contributions they receive in respect of pensions will be reduced to 17%, the average of the workforce as shown by our review, with effect from 1 January 2023.

2021 Remuneration review

Under the terms of the new Directors' Remuneration Policy, and in line with the practice for the wider workforce, Patrick André and Guy Young are entitled to an annual review of their salary. The approach adopted across the Group for 2021 in response to the ongoing pandemic was that salary increases should be the exception other than where required by law. The Committee applied the same approach for the Executive Directors and their salaries for 2021 remain unchanged.

The Committee also reviewed the annual bonus opportunity for the Executive Directors. The year 2020, with all of its inherent challenges, has demonstrated the impact of the focus that annually set targets brings, and the Committee concluded that it was appropriate to increase their maximum bonus opportunity to 150%. In coming to this conclusion, the Committee also took into account its long track record of setting challenging bonus targets and is confident that corporate strategic objectives are aligned and that the performance metrics are incentivising the right behaviours to achieve the strategy.

Finally, in light of the 2020 EPS outcome, when considering targets for the 2021 LTIP awards, the Committee resolved that a range expressed as pence targets rather than a growth target was more appropriate for the EPS element of the award, whilst maintaining the split of 50% between relative TSR and EPS. The Committee retains the discretion to amend the vesting outcome where it considers that it is not a fair and accurate reflection of overall business performance, including consideration of any potential "windfall gains" at the point of vesting.

2021 Chairman and Non-executive Directors' fees

The Board has resolved to not increase the fees of Non-executive Directors for 2021 as the Committee did with respect to the Chairman's fees.

Employee and shareholder engagement

The Group's operations are geographically diverse in nature. The Group does not operate a central workforce engagement mechanism, and as such the Committee has not engaged systematically with the workforce during the year to explain how executive remuneration aligns with wider Company pay policy, although outside of travel restrictions brought about by COVID-19, visits to operations by the Non-executive Directors are designed to provide opportunities for an open forum for discussion with employees. Copies of the Company's Annual Report detailing the Executive Directors' remuneration are, however, widely disseminated throughout the Group and available for employees to view on the Company's website at: www.vesuvius.com.

I would like to draw attention to the results of the recent all-employee engagement survey which delivers a very positive message with its reassuringly high, and increased, participation rate of 92% and with the overall engagement score, which measures the way employees think, feel and act towards Vesuvius, also increased. Whilst the work to respond to employee concerns continues, this reflects the positive impact of the efforts to date.

I am always keen to hear shareholders' views on our remuneration policy and implementation, inviting those shareholders who wish to, to meet with me. During the year I met with a number of shareholders to discuss topics such as the Chief Financial Officer's pay increase, executive pensions, Annual Incentive targets and Long-Term Incentive Plan measures. The comments made are shared with the Committee and taken into account during our deliberations.

At the 2020 AGM, the Remuneration Policy and the Directors' Remuneration Report were passed with votes in favour of 97.18% and 96.94% respectively, showing broad-based support for the developments in the 2020 Remuneration Policy and to the changes proposed to Executive Directors' remuneration.

As ever, I remain keen to hear shareholders' views on remuneration matters.

Change of Remuneration Committee Chairman

After many years serving as the Chairman to the Remuneration Committee, I am very pleased to be succeeded by Kath Durrant who will take over at the close of the 2021 AGM. Kath brings extensive prior experience to this role. She served as a Non-executive Director and Chair of the Remuneration Committee of Renishaw plc from 2015 to 2018 and currently serves as a Non-executive Director and Chair of the Remuneration Committees of SIG plc and Calisen plc. I will remain in the service of Vesuvius as an Independent Non-executive Director.

I would like to express my appreciation to the shareholders, the Board and the management team for the support and constructive engagement afforded me during my time as Remuneration Committee Chairman.

Yours sincerely

Jane Hinkley
Chairman, Remuneration Committee

3 March 2021

Directors' Remuneration Report

2020 Remuneration Policy

At the 2020 AGM, held on 13 May 2020, the Company obtained shareholder support for a new Remuneration Policy which took effect from the close of that meeting. The previous policy applied in its entirety up until this date. The elements of the previous policy that relate to remuneration that remained extant on this date (such as outstanding share awards) continue to apply until these commitments cease. The policy is contained within the 2019 Annual Report and can be viewed in the Investors section (Results, Reports and Presentations) of the Vesuvius website: www.vesuvius.com. The version of the policy set out below contains minor textual amendments to reflect 2021 policy implementation.

The Remuneration Committee reserves the right to make any remuneration payments and payments for loss of office (including exercising any discretions available to it in connection with such payments), notwithstanding that they are not in line with the Policy set out here, where the terms of the payment were agreed: (i) before the date the Company's first Remuneration Policy approved by shareholders in accordance with Section 439A of the Companies Act came into effect; (ii) before the Policy set out here came into effect, provided that the terms of the payment were consistent with the shareholder-approved Remuneration Policy in force at the time they were agreed; or (iii) at a time when the relevant individual was not a Director of the Company and, in the opinion of the Remuneration Committee, the payment was not in consideration for the individual becoming a Director of the Company. For these purposes, 'payments' include the Remuneration Committee satisfying awards of variable remuneration and, in relation to an award over shares, the terms of the payment are 'agreed' at the time the award is granted.

Remuneration Policy Table for Executive Directors

Alignment/purpose	Operation	Opportunity	Performance
Base salary			
Helps to recruit and retain key employees. Reflects the individual's experience, role and contribution within the Company.	Base salary is normally reviewed annually, with changes effective from 1 January. Base salary is positioned to be market competitive when considered against other global industrial companies, and relevant international and FTSE 250 companies (excluding Investment Trusts). Paid in cash, subject to local tax and social security regulations.	Salary increases will normally be in line with the average increase awarded to other employees in the Group, although increases may be made above this level at the Committee's discretion in appropriate circumstances. In considering any increase in base salary, the Committee will also take into account: (i) the role and value of the individual (ii) changes in job scope or responsibility (iii) progression in the role (e.g. for a new appointee) (iv) a significant increase in the scale of role and/or size, value or complexity of the Group (v) the need to maintain market competitiveness. No absolute maximum has been set for Executive Director base salaries. Current Executive Directors' salaries are set out in the Annual Report on Directors' Remuneration section of this Remuneration Report.	Any increase will take into account the individual's performance, contribution and increasing experience.
Other benefits			
Provides normal market practice benefits.	A range of benefits including, but not limited to: car allowance, private medical care (including spouse and dependent children), life insurance, disability and health insurance, expense reimbursement (including costs if a spouse accompanies an Executive Director on Vesuvius business), together with relocation allowances and expatriate benefits, in some instances grossed up for tax, in accordance with the Group's policies, and participation in any employee share scheme operated by the Group.	There is no formal maximum as benefit costs can fluctuate depending on changes in provider, cost and individual circumstances.	None.

2020 Remuneration Policy continued

Alignment/purpose	Operation	Opportunity	Performance
Pension			
Helps to recruit and retain key employees. Ensures income in retirement.	An allowance is given as a percentage of base salary. This may be used to participate in Vesuvius' pension arrangements, invested in own pension arrangements or taken as a cash supplement (or any combination of the above options).	Maximum of 25% of base salary for incumbent Executive Directors at the date that this policy is adopted. This was frozen at the 1 January 2020 amount and will be reduced to 17% from the end of 2022 in line with the average of that received by the majority of the workforce. The level of allowance for Executive Directors appointed following the adoption of this policy will be aligned with the post-retirement benefits applicable to the majority of the workforce or, where appropriate, to the majority of the workforce of the relevant geography.	None.
Annual Incentive			
Incentivises Executive Directors to achieve key short-term financial and strategic targets of the Group. Additional alignment with shareholders' interests through the operation of bonus deferral.	Normally 33% of any Annual Incentive earned by Executive Directors will be deferred into awards over shares under the Vesuvius Deferred Share Bonus Plan which normally vest after at least three years, other than in specified circumstances outlined elsewhere in this Policy. These may be cash or share settled. The Committee has the discretion to determine that actual incentive payments should be lower than levels calculated by reference to achievement against targets if it considers this to be appropriate. The Committee has the discretion to award participants the equivalent value of dividends accrued during the vesting period on any shares that vest. Subject to malus and clawback.	Below threshold: 0%. On-target: 50% of the applicable maximum opportunity in any year. Maximum: Up to 150% of base salary. The Remuneration Committee will set the level of maximum bonus opportunity for each Executive Director at the start of each year, with 50% of the applicable maximum payable for on-target performance. Payments start to accrue on meeting the threshold level of performance, with payments between threshold and on-target and between on-target and maximum made on a pro rata basis.	The Annual Incentive is measured on targets set at the beginning of each year. The Committee establishes threshold and maximum performance targets for each financial year. The majority of the Annual Incentive will be determined by measure(s) of Group financial performance. The remainder of the Annual Incentive will be based on financial, strategic or operational measures appropriate to the individual Director. Performance is measured over a one-year period. Actual performance targets will be disclosed after the performance period has ended. They are not disclosed in advance due to their commercial sensitivity.
Vesuvius Share Plan (VSP)			
Aligns Executive Directors' interests with those of shareholders through the delivery of shares. Rewards Executive Directors for achieving the strategic objectives of growth in shareholder value and earnings. Assists retention of Executive Directors over a three-year performance period.	VSP awards to Executive Directors are granted as Performance Share awards. These may be cash or share settled. Awards vest three years after their award date, other than in specified circumstances outlined elsewhere in this Policy, subject to the achievement of specified conditions. All vested shares, net of any tax liabilities, are then subject to a further two-year holding period after the vesting date, which will continue to apply notwithstanding the termination of employment of the participants during this holding period, except at the Committee's discretion in exceptional circumstances, including a change of control or where the participant dies or has left employment due to ill health, injury or disability. The Committee has the discretion to award participants the equivalent value of dividends accrued during the vesting period and further two-year holding period on any shares that vest. Subject to malus and clawback.	Executive Directors are eligible to receive an annual award with a face value of up to 200% of base salary in Performance Share awards. Vesting at threshold performance is at 25% of the award, rising to vesting of the full award at maximum.	Vesting will be subject to performance conditions as determined by the Remuneration Committee ahead of each award. Those conditions will be disclosed in the Annual Report on Directors' Remuneration section of the Remuneration Report. The performance conditions will initially be Group EPS and relative TSR, although the Remuneration Committee will retain discretion for future awards to include additional or alternative performance conditions which are aligned with the corporate strategy. At its discretion, the Committee may elect to add additional underpinning performance conditions. The Company reserves the right only to disclose certain of the performance targets after the performance period has ended, due to their commercial sensitivity. Prior to any vesting, the Remuneration Committee reviews the underlying financial performance of the Group over the performance period, and the non-financial performance of the Group and participants, to ensure that the vesting is justified. Following this review, the Committee has the discretion to amend the final vesting level if it does not consider that it is justified.

Malus/clawback arrangements

The Executive Directors' variable remuneration is subject to malus and clawback provisions. These provide the Committee with the flexibility, if required, to withhold or recover payments made to Executive Directors under the Annual Incentive Plan (including deferred awards) and/or to withhold or recover share awards granted to Executive Directors under the Vesuvius Share Plan, including any dividends granted on such awards. The circumstances in which the Committee could potentially elect to apply malus and clawback provisions include: a material misstatement in the Group's financial results; an error in the calculation of the extent of payment or vesting of an incentive; gross misconduct by an individual; or significant financial loss or serious reputational damage to Vesuvius plc resulting from an individual's conduct, a material failure of risk management or a serious breach of health and safety. These malus and clawback provisions apply for a period of up to three years after the end of a performance period (or end of the deferral period in respect of awards made under the Vesuvius Deferred Share Bonus Plan).

Performance measures

In selecting performance measures for the Annual Incentive, the Committee seeks to reflect key strategic aims and the need for a rigorous focus on financial performance. Each year, the Committee agrees challenging targets to ensure that underperformance is not rewarded. The Company will not be disclosing the specific financial or personal objectives set until after the relevant performance period has ended because of commercial sensitivities. The personal objectives are all job-specific in nature and track performance against key strategic, organisational and operational goals.

In selecting performance measures for the Vesuvius Share Plan, the Committee seeks to focus Executive Directors on the execution of long-term strategy and also align their rewards with value created for shareholders. On this basis, the performance conditions for the Vesuvius Performance Share awards will initially include measures based on TSR and EPS performance.

Within the Policy period, the Committee will continually review the performance measures used to ensure that awards are made on the basis of challenging targets that clearly support the achievement of the Group's strategic aims.

The Committee may vary or waive any performance condition(s) if circumstances occur which cause it to determine that the original condition(s) have ceased to be appropriate, provided that any such variation or waiver is fair, reasonable and not materially less difficult to satisfy than the original condition (in its opinion). In the event that the Committee were to make an adjustment of this sort, a full explanation would be provided in the next Remuneration Report.

The Committee may: (a) in the event of a variation of the Company's share capital, demerger, special dividend or any other corporate event which it reasonably determines justifies such an adjustment, adjust; and (b) amend the terms of awards granted under the share schemes referred to above in accordance with the rules of the relevant plans.

Share awards may be settled by the issue of new shares or by the transfer of existing shares. In line with prevailing best practice at the time this Policy was approved, any issuance of new shares is limited to 5% of share capital over a rolling ten-year period in relation to discretionary employee share schemes and 10% of share capital over a rolling ten-year period in relation to all employee share schemes.

Remuneration Policy Design

The Committee is satisfied that the Remuneration Policy is designed to promote the long-term success of the Company in accordance with the requirements of the Code with regard to:

Clarity:	Simplicity:	Risk:
There is complete transparency on the executive remuneration arrangements with full disclosure in the Annual Report. The Annual Incentive bonus structure for the Executive Directors is based on the same structure utilised for annual bonus arrangements for senior executives throughout the Group. The focus of incentive arrangements on long-term sustainable growth clearly aligns the interests of executives with those of the Group's shareholders. The Vesuvius Share Plan, with its emphasis on the retention of shares for a period of at least five years, clearly aligns the long-term objectives of the Directors with that of its investors.	The new Policy with its focus on three core elements: fixed pay, Annual Incentive and Long-Term Incentive is clear, simple and easy to understand.	The Committee has carefully analysed the range of possible outcomes of awards and believes the Policy to be fair and proportionate, with the clear linkage to Group profitability mitigating the potential for excessive rewards and the reliance on audited profit numbers and externally verified TSR targets serving to mitigate behavioural risk. The Committee has discretion under the Vesuvius Share Plan to determine the vesting of awards in accordance with the Code requirement and malus and clawback provisions also apply.
Predictability:	**Proportionality:**	**Alignment to culture:**
The charts on page 126 provide estimates of the total remuneration for the Executive Directors for 2021 for minimum, on-target and maximum performance, showing the split between fixed and variable remuneration. The charts also indicate the maximum potential remuneration assuming 50% share price appreciation. Prior to any vesting under the Vesuvius Share Plan the Committee reviews the underlying financial performance of the Company over the performance period, and the non-financial performance of the Group and participants, to ensure that the vesting is justified. Following this review, the Committee has the discretion to amend the final vesting level if it does not consider that it is justified.	The Committee believes that the performance-related elements of remuneration have financial targets which are transparent, stretching and clearly align the Executive Directors' remuneration with the delivery of the Group's strategy. The Vesuvius Share Plan rewards long-term performance directly linked with the Group's strategy and results, ensuring that only strong performance is rewarded.	The Executive Directors' incentive arrangements are consistent with the Group's core strategic objective of delivering long-term sustainable and profitable growth and support our performance-orientated culture. The inclusion of personal objectives in the Annual Incentive Plan affords the opportunity for attention to be focused on key non-financial strategic objectives each year.

2020 Remuneration Policy continued

Illustration of the application of the Remuneration Policy for 2021

The charts below show the total remuneration for Executive Directors for 2021 for minimum, on-target and maximum performance. The fixed elements of remuneration comprise base salary, pension and other benefits, using 2021 salary data. The assumptions on which they are calculated are as follows:

Minimum: Fixed remuneration only.

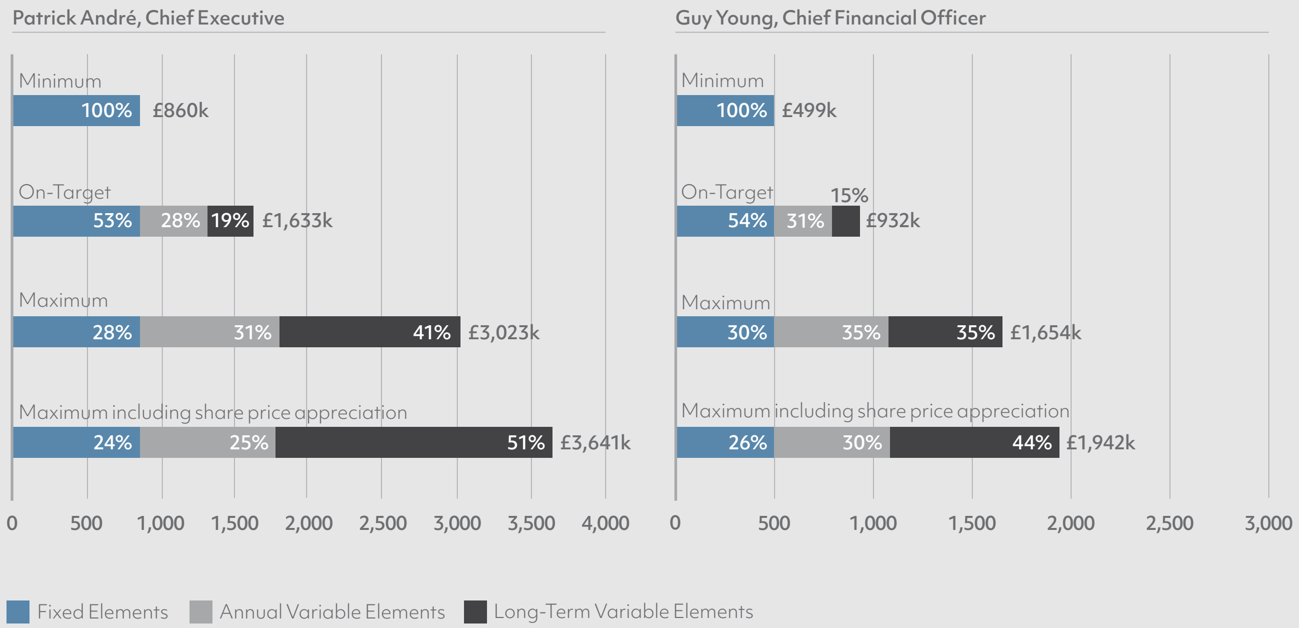
On-target: Fixed remuneration plus on-target Annual Incentive (made at 75% of base salary for Patrick André and Guy Young) and threshold vesting (i.e. median performance for TSR and threshold for EPS) for Performance Share awards (made at 200% of base salary for Patrick André and 150% of base salary for Guy Young) under the Vesuvius Share Plan. No share price appreciation is assumed.

Maximum: Fixed remuneration plus maximum Annual Incentive (being full achievement of financial and personal targets, made at 150% of base salary for Patrick André and Guy Young) and 100% vesting for Performance Share awards (made at 200% of base salary for Patrick André and 150% of base salary for Guy Young) under the Vesuvius Share Plan. No share price appreciation is assumed.

Maximum including assumed 50% share price appreciation: This shows the value of the maximum scenario if 50% share price appreciation is assumed over the three-year performance period of the Performance Share awards.

Note: In addition, the Committee retains the discretion to award dividends (either shares or their cash equivalent) on any shares that vest.

Remuneration Illustrations £000



Service contracts of Executive Directors

The Committee will periodically review the contractual terms for new Executive Directors to ensure that these reflect best practice. Service contracts currently operate on a rolling basis and are limited to a 12-month notice period.

Patrick André is employed as Chief Executive of Vesuvius plc pursuant to the terms of a service agreement made with the Company dated 17 July 2017. Guy Young is employed as Chief Financial Officer pursuant to the terms of a service agreement with Vesuvius plc dated 16 September 2015. Each Executive Director's appointment is terminable by Vesuvius on not less than 12 months' written notice, and by each Executive Director on not less than six months' written notice.

External appointments of Executive Directors

The Executive Directors do not currently serve as Non-executive Directors of any other quoted company. Subject always to consent being granted by the Company for them to take up such an appointment were they to so serve, the Company would allow them to retain any fees they received for the performance of their duties.

Remuneration Policy for Non-executive Directors

The Company seeks to appoint Non-executive Directors who have relevant professional knowledge and have gained experience in a relevant industry and geographical sector, to support diversity of expertise at the Board and match the wide geographical spread of the Company's activities.

Non-executive Directors attend Board, Committee and other meetings, held mainly in the UK, together with an annual strategy review to debate the Company's strategic direction. All Non-executive Directors are expected to familiarise themselves with the scale and scope of the Company's business and to maintain their specific technical skills and knowledge.

The Board sets the level of fees paid to the Non-executive Directors after considering the role and responsibilities of each Director and the practice of other companies of a similar size and international complexity. The Non-executive Directors do not participate in Board discussions on their own remuneration.

Alignment/purpose	Operation	Opportunity	Performance
Fees			
To attract and retain Non-executive Directors of the necessary skill and experience by offering market-competitive fees.	Fees are usually reviewed every year by the Board. Non-executive Directors are paid a base fee for the performance of their role plus additional fees for roles that involve significant additional time commitment and/or responsibility. Such roles could include, but are not limited to, Committee chairmanship (and, where appropriate, membership) or acting as the Senior Independent Director. Fees are paid in cash. The Chairman is paid a single cash fee and receives administrative support from the Company.	Non-executive Directors and the Chairman will be paid market-appropriate fees, with any increase reflecting changes in the market or adjustments to a specific Non-executive Director's role. No eligibility for bonuses, retirement benefits or to participate in the Group's employee share plans. Base fees paid to Non-executive Directors will in aggregate remain within the aggregate limit stated in our Articles, currently being £500,000.	None.
Benefits and expenses			
To facilitate execution of responsibilities and duties required by the role.	All Non-executive Directors are reimbursed for reasonable expenses incurred in carrying out their duties (including any personal tax owing on such expenses).	Non-executive Directors' expenses are paid in accordance with Vesuvius' expense procedures.	None.

Terms of service of the Chairman and other Non-executive Directors

The terms of service of the Chairman and the Non-executive Directors are contained in letters of appointment. Each Non-executive Director is appointed subject to their election at the Company's first Annual General Meeting following their appointment and re-election at subsequent Annual General Meetings. During the first year of his/her appointment, the Chairman is entitled to 12 months' notice from the Company; thereafter, he/she is entitled to six months' notice from the Company. None of the other Non-executive Directors is entitled to receive compensation for loss of office at any time. All Non-executive Directors are subject to retirement, and election or re-election, in accordance with the Company's Articles of Association. The current policy is for Non-executive Directors to serve on the Board for a maximum of nine years, with review at the end of three and six years, subject always to mutual agreement and annual performance evaluation. The Board retains discretion to extend the tenure of Non-executive Directors beyond this time, subject to the requirements of Board balance and independence being satisfied.

The table below shows the date of appointment for each of the Non-executive Directors:

Non-executive Director	Date of appointment
John McDonough CBE	31 October 2012
Kath Durrant	1 December 2020
Hock Goh	2 April 2015
Friederike Helfer	4 December 2019
Jane Hinkley	3 December 2012
Douglas Hurt	2 April 2015
Holly Koeppel	3 April 2017

2020 Remuneration Policy continued

Recruitment policy

On appointment or promotion of a new Executive Director, the Committee will typically use the Remuneration Policy in force at the time of the Committee's decision to determine ongoing remuneration.

Base salary levels will generally be set in accordance with the Remuneration Policy current at the time of the Committee's decision, taking into account the experience and calibre of the appointee. If it is appropriate to appoint an individual on a base salary initially below what is adjudged to be market positioning, contingent on individual performance, the Committee retains the discretion to realign base salary over the one to three years following appointment, which may result in a higher rate of annualised increase than might otherwise be awarded under the Policy. If the Committee intends to rely on this discretion, it will be noted in the first Remuneration Report following an individual's appointment. Other than in exceptional circumstances, other elements of annual remuneration will, typically, be set in line with the Remuneration Policy, including a limit on awards under the Annual Incentive and Vesuvius Share Plan of 350% of salary in aggregate. The Committee retains the discretion to make the following further exceptions:

> In the event that an internal appointment is made, or where a Director is appointed as a result of transfer into the Group on an acquisition of another Company, the Committee may continue with existing remuneration provisions for this individual, where appropriate

> If necessary and appropriate to secure the appointment of a candidate who has to move locations as a result of the appointment, whether internal or external, the Committee may make additional payments linked to relocation, above those outlined in the policy table, and would authorise the payment of a relocation allowance and repatriation, as well as other associated international mobility terms. Such benefits would be set at a level which the Committee considers appropriate for the role and the individual's circumstances

> If appropriate the Committee may apply different performance measures and/or targets to a Director's first incentive awards in his/her year of appointment

Service contracts will be entered into on terms similar to those for the existing Executive Directors, summarised in the service contracts of Executive Directors section above.

In addition to the annual remuneration elements noted above, the Committee may consider buying out terms, incentives and any other compensation arrangements forfeited on leaving a previous employer that an individual forfeits in accepting an appointment with Vesuvius. The Committee will have the authority to rely on Listing Rule 9.4.2R(2) or to apply the existing limits within the Vesuvius Share Plan to make Restricted Share awards on recruitment. In making any such awards, the Committee will review the terms of any forfeited awards, including, but not limited to, vesting periods, the expected value of such awards on vesting and the likelihood of the performance targets applicable to such awards being met, while retaining the discretion to make any buy-out award the Committee determines is necessary and appropriate. The Committee may also require the appointee to purchase shares in Vesuvius to a pre-agreed level prior to vesting of any such awards. The value of any buy-out award will be capped, to ensure its maximum value is no higher than the value of the awards that the individual forfeited on joining Vesuvius. Any such awards will be subject to malus and clawback.

With respect to the appointment of a new Chairman or Non-executive Director, appointment terms will be consistent with those applicable at the time the appointment is agreed. Variable pay will not be considered. With respect to Non-executive Directors, fees will be consistent with the Policy at the time the appointment is agreed. If, in exceptional circumstances, a Non-executive Director was asked to assume an interim executive role, the Company retains the discretion to pay them appropriate executive compensation, in line with the Policy.

Exit payment policy

Vesuvius has the option to make a payment in lieu of part or all of the required notice period for Executive Directors. Any such payment in lieu will consist of the base salary, pension contributions and value of benefits to which the Director would have been entitled for the duration of the remaining notice period, net of statutory deductions in each case. Half of any payments in lieu of notice would be made in a lump sum, the remainder in equal monthly instalments commencing in the month in which the midpoint of their foregone notice period falls (and are reduced or extinguished by salary from any role undertaken by the departing Executive in this time). Executive Directors are subject to certain non-compete covenants for a period of nine months, and non-solicitation covenants for a period of 12 months, following the termination of their employment. Their service agreements are governed by English law.

Executive Directors' contracts do not contain any change of control provisions; they do contain a duty to mitigate should the Director find an alternative paid occupation in any period during which the Company must otherwise pay compensation on early termination.

The table below summarises how the awards under the annual bonus and Vesuvius Share Plan are typically treated in different leaver scenarios and on a change of control.

Whilst the Committee retains overall discretion on determining 'good leaver' status, it typically defines a 'good leaver' in circumstances such as retirement with agreement of the Company, ill health, disability, death, redundancy, or part of the business in which the individual is employed or engaged ceasing to be part of the Group. Final treatment is subject to the Committee's discretion.

Event	Timing	Calculation of vesting/payment
Annual Incentive Plan – during period prior to payment		
Good leaver	Paid at the same time as to continuing employees.	Annual bonus is paid only to the extent that any performance conditions have been satisfied and is prorated for the proportion of the financial year worked before cessation of employment. In determining the level of bonus to be paid, the Committee may, at its discretion, take into account performance up to the date of cessation or over the financial year as a whole based on appropriate performance measures as determined by the Committee. The bonus may, at the Committee's discretion, be paid entirely in cash.
Bad leaver	Not applicable.	Individuals lose the right to their annual bonus.
Change of control	Paid on the effective date of change of control.	Annual bonus is paid only to the extent that any performance conditions have been satisfied and is prorated for the proportion of the financial year worked.
Annual Incentive Plan – in respect of any amount deferred into awards over shares under the Vesuvius Deferred Share Bonus Plan		
Good leaver	On the date of the event.	Deferred awards vest in full.
Bad leaver	On the date of the event.	Other than dismissal for cause, deferred awards will vest in full.
Change of control[2]	Within seven days of the event.	Deferred awards vest in full.
Vesuvius Share Plan		
Good leaver[1]	On normal release date (or earlier at the Committee's discretion).	Unvested awards vest to the extent that any performance conditions have been satisfied and a pro rata reduction applies to the value of the awards to take into account the proportion of vesting period not served, unless the Committee decides that the reduction in the number of vested shares is inappropriate.
Bad leaver	Unvested awards lapse.	Unvested awards lapse on cessation of employment.
Change of control[2]	On the date of the event.	Unvested awards vest to the extent that any performance conditions have been satisfied and a pro rata reduction applies for the proportion of the vesting period not served, unless the Committee decides that the reduction in the number of vested shares is inappropriate.

Notes:

1. Under the rules of the Vesuvius Share Plan, any vested shares, net of any tax liabilities, are subject to a further two-year holding period after the vesting date. The holding period may be terminated early at the Committee's discretion in exceptional circumstances, including a change of control or where the award holder dies or leaves employment due to ill health, injury or disability.
2. In certain circumstances, the Committee may determine that unvested awards under the Vesuvius Deferred Bonus Plan and Vesuvius Share Plan will not vest on a change of control but will instead be replaced by an equivalent grant of a new award, as determined by the Committee, in the new company.

Benefits normally cease to be provided on the date employment ends. However, the Committee has the discretion to allow some minor benefits (such as health insurance, tax advice and repatriation expenses) to continue to be provided for a period following cessation where this is considered fair and reasonable, or appropriate on the basis of local market practice. In addition, the Committee retains discretion to fund other expenses for the Executive Director; for example, payments to meet legal fees incurred in connection with termination of employment, or to meet the costs of providing outplacement support, and de minimis termination costs up to £5,000 to cover transfer of mobile phone or other administrative expenses.

The Committee reserves the right to make any other payments in connection with a Director's cessation of office or employment where the payments are made in good faith in discharge of an existing legal obligation (or by way of damages for breach of such an obligation) or by way of a compromise or settlement of any claim arising in connection with the cessation of a Director's office or employment.

In certain circumstances, the Committee may approve new contractual arrangements with departing Executive Directors, including (but not limited to) settlement, confidentiality, restrictive covenants and/or consultancy arrangements. These would be used only where the Committee believed it was in the best interests of the Company to do so.

2020 Remuneration Policy continued

Comparison of Remuneration Policy for Executive Directors with that for other employees

The Remuneration Policy for Executive Directors is designed in line with the remuneration philosophy set out in this report – which also underpins remuneration for the wider Group. Remuneration arrangements for Executive Directors draw on the same elements as those for other employees – base salary, fixed benefits and retirement benefits – with performance-related pay extending to the management cadres and beyond. However, given that remuneration structures for other employees need to reflect both seniority and local market practice, they differ from the policy for Executive Directors. In particular, Executive Directors receive a higher proportion of their remuneration in performance-related pay and share-based payments. Individual percentages of variable versus fixed remuneration and participation in share-based structures increase as seniority increases.

As for Executive Directors, all employees receive an annual performance appraisal, and receive salary reviews on an annual basis. Middle and senior managers participate in the Annual Incentive Plan. For functional members of the Group Executive Committee, the award is predominantly based on Group performance, with the remainder focused upon the achievement of personal objectives. For business unit Presidents and other operational business unit employees, any potential award is based upon four separate measures relating to Group performance, business unit performance, regional performance, where relevant, and achievement of personal objectives.

All members of the Group Executive Committee participate in the Vesuvius Share Plan and receive awards of Performance Shares, which vest on the basis of the same performance targets set for the Executive Directors. The level of awards granted to members of the Group Executive Committee who don't serve on the Board are lower than those payable to the Executive Directors.

For certain senior and middle managers, awards are made under the Vesuvius Medium Term Plan (MTP). These managers participate in the MTP at varying percentage levels, and awards are based on the same measures and targets as the Annual Incentive Plan. The senior management cadre receives MTP awards made over Vesuvius shares, whilst other managers who participate in the MTP receive their awards in cash. In each case, awards are granted following the end of the relevant financial year. The MTP share awards vest on the second anniversary of the date of grant, subject to continuing employment.

Consideration of conditions elsewhere in the Group in developing policy

The Company does not consult directly with employees on Executive Directors' remuneration arrangements. However, the Remuneration Committee will take into account the pay and employment conditions of other Group employees when determining Executive Directors' remuneration, particularly when determining base salary increases, when the Committee will consider the salary increases for other Group employees in the same jurisdiction.

Consideration of shareholder views

Vesuvius is committed to open and transparent dialogue with its shareholders on remuneration as well as other governance matters. As Chair of the Committee, Jane Hinkley welcomes shareholder engagement and is available for any discussions investors wish to have on remuneration matters. In early 2020, the Committee wrote to its largest shareholders and key governance agencies outlining its proposals for the 2020 Remuneration Policy and inviting comments. Vesuvius received responses from each governance agency contacted and from 53% of the shareholders and entered into dialogue with a number of shareholders as a result. The overall shareholder response was supportive both of the developments in the 2020 Remuneration Policy and of the changes proposed to executive remuneration. Also, during 2020, as in previous years, Jane Hinkley directly contacted significant shareholders to offer discussions on remuneration matters and a number of meetings were conducted by her accordingly. The feedback from such meetings is always shared with the Committee and taken into consideration when decisions are made about future remuneration strategy and arrangements.

Shareholding guidelines

The Remuneration Committee encourages Executive Directors to build and hold a shareholding in the Company equivalent in value to at least 200% of base salary.

Compliance with the shareholding policy is tested at the end of each year for application in the following year, with the valuation of any holding being taken at the higher of: (1) the share price on the date of vesting of any shares derived from a share award, in respect of those shares only; and (2) the average of the closing prices of a Vesuvius ordinary share for the trading days in that December.

Unless exceptionally the Committee determines otherwise, under the post-employment shareholding guideline the Executive Directors will remain subject to their shareholding requirement in the first year after their cessation as an Executive Director and to 50% of the shares retained in the first year during the second year after such cessation, recognising that there is no requirement to purchase additional shares if the shares held when they cease to be an Executive Director are less than the applicable shareholding guideline.

General

The Committee may make minor amendments to the policy set out in this Policy Report (for regulatory, exchange control, tax or administrative purposes or to take account of a change in legislation) without obtaining shareholder approval for that amendment.

Directors' Remuneration Report

Annual Report on Directors' Remuneration

Directors' Remuneration at a glance

Our remuneration for Executive Directors

The table below sets out the phasing of receipt of the various elements of Executive Director remuneration for 2021.

	2021	2022	2023	2024	2025	2026	Description and link to strategy
Base salary							Salaries are set at an appropriate level to enable the Company to recruit and retain key employees, and reflect the individual's experience, role and contribution within the Company.
Benefits							Provides normal market practice benefits.
Pension							The pension benefit helps to recruit and retain key employees and ensures income in retirement.
Annual Incentive							The Annual Incentive incentivises the Executive Directors to achieve key short-term financial and strategic targets of the Group.
Deferred Annual Incentive							The deferral of a portion of the Annual Incentive increases alignment with shareholders.
Vesuvius Share Plan (VSP)					Holding Period		Awards under the VSP align Executive Directors' interests with those of shareholders through the delivery of shares and assist in the retention of the Executive Directors. The VSP rewards the Executive Directors for achieving the strategic objectives of growth in shareholder value and earnings.

2021 Directors' Remuneration

The table below sets out how the Remuneration Policy will be applied to the Executive Directors' remuneration for 2021. Further details about each of the elements of remuneration are set out in the Remuneration Policy and the Annual Report on Directors' Remuneration.

Remuneration element	Remuneration structure
Base salary	Current salaries as follows: > Patrick André – £618,000 (2020: £618,000) > Guy Young – £ 385,000 (2020: £385,000) Values reflect the full year equivalent without the voluntary reduction. There has been no increase in salaries for 2021.
Benefits	Benefits for Executive Directors include car allowance, private medical care, relocation expenses, tax advice and tax reimbursement, commuting costs, school fees, Directors' spouse's travel and administrative expenses.
Pension	Pension allowance of 25% of base salary. This allowance can be used to participate in Vesuvius' pension arrangements, be invested in their own pension arrangements or be taken as a cash supplement (or any combination of these alternatives). The pension allowance is frozen at the 1 January 2020 amount and will be reduced to 17% from the end of 2022 in line with the average of that received by the majority of the workforce.
Annual Incentive	For 2021 the maximum Annual Incentive potential for the Executive Directors will be 150% of base salary with target Annual Incentive potential being 75% of base salary. Their incentives are based 60% on Group headline earnings per share, 20% on the Group's working capital to sales ratio (based on the 12-month moving average) and 20% on specified personal objectives. 33% of any Annual Incentive earned will be deferred into awards over shares, to be held for a period of three years.
Vesuvius Share Plan (VSP)	Performance Share awards with a maximum value of 200% of salary will be awarded to Patrick André and 150% for Guy Young. Vesting of 50% of shares awarded will be based upon the Company's TSR performance relative to that of the constituent companies of the FTSE 250 (excluding investment trusts), and 50% on headline EPS performance. Performance will be measured over three years with awards vesting after three years. There will then be a further two-year holding period applicable to the awards.

Annual Report on Directors' Remuneration continued

Remuneration Committee structure

The current members of the Remuneration Committee are all the independent Non-executive Directors of the Company.

The Committee Chairman is Jane Hinkley. Jane Hinkley, Hock Goh, Douglas Hurt and Holly Koeppel have all served on the Committee throughout 2020 and Kath Durrant joined the Committee in December. All continue in office as at the date of this report. Jane Hinkley will retire from the role as Committee Chair at the end of the upcoming AGM, and Kath Durrant will take over the role of Committee Chair at that date. Kath Durrant meets the requirements of having previously served on a Remuneration Committee. The Committee complies with the requirements of the UK Corporate Governance Code for the composition of remuneration committees. Each of the members brings a broad experience of international businesses and an understanding of their challenges to the work of the Committee. The Company Secretary is Secretary to the Committee. Members' biographies are on pages 92 and 93.

Meetings

The Committee met four times during the year. The Group's Chairman, Chief Executive and Chief HR Officer were invited to each meeting, together with Friederike Helfer, Vesuvius' non-independent Non-executive Director, though none of them participated in discussions regarding their own remuneration. In addition, a representative from Deloitte, the Remuneration Committee adviser, attended the meetings. The attendees supported the work of the Committee, giving critical insight into the operational demands of the business and their application to the overall remuneration strategy within the Group. In receiving views on remuneration matters from the Executive Directors and senior management, the Committee recognised the potential for conflicts of interest to arise and considered the advice accordingly. The Chairman of the Committee reported the outcomes of all meetings to the Board.

The Committee operates under formal terms of reference which were reviewed during the year. The terms of reference are available on the Group website www.vesuvius.com. The Committee members are permitted to obtain outside legal advice at the Company's expense in relation to their deliberations. These powers were not exercised during the year. The Committee may also secure the attendance at its meetings of any employee or other parties it considers necessary.

Role and responsibilities

The Committee is responsible for:

> Determining the overall remuneration policy for the Executive Directors, including the terms of their service agreements, pension rights and compensation payments

> Setting the appropriate remuneration for the Chairman, the Executive Directors and Senior Management (being the Group Executive Committee)

> Reviewing workforce remuneration and related policies, and the alignment of incentives and rewards with culture, taking these into account when setting the policy for Executive Director remuneration

> Overseeing the operation of the executive share incentive plans

Advice provided to the Remuneration Committee

Deloitte is appointed directly by the Remuneration Committee to provide advice on executive remuneration matters, including remuneration structure and policy, updates on market practice and trends, and guidance on the implementation and operation of share incentive plans. The Committee appointed Deloitte, a signatory to the Remuneration Consultants Group Code of Conduct in relation to Executive Remuneration Consulting in the UK, following a formal tender process in 2014. Deloitte also provides the Remuneration Committee with ongoing calculations of total shareholder return (TSR) to enable the Committee to monitor the performance of long-term share incentive plans.

Deloitte does not have any other connection with any individual Director.

In addition, in 2020, Deloitte provided the Group with IFRS 2 calculations for the purposes of valuing the share plan grants and, within the wider Group, was engaged in various jurisdictions to provide tax and treasury advisory work, and some consultancy services. During 2020, Deloitte's fees for advice to the Remuneration Committee, charged on a time spent basis, amounted to £50,325. The Committee conducted a review of the performance of Deloitte as remuneration adviser during the year and concluded that Deloitte continued to provide effective, objective and independent advice to the Committee. No conflict of interest arises as a result of other services provided by Deloitte to the Group.

Activities of the Remuneration Committee

The key matters the Remuneration Committee considered during its four meetings in 2020 included:

> Considering and approving the 2021 salaries for the Chairman, Chief Executive, Chief Financial Officer and senior management

> Reviewing and approving achievement against performance targets for the 2019 Annual Incentive arrangements

> Setting performance targets and approving the structure of the 2020 Annual Incentive arrangements

> Reviewing and assessing the Company's attainment of performance conditions applicable to the Vesuvius Performance Share awards made in 2017

> Setting the performance measures and targets, and authorising the grant of new awards in 2020 under the VSP, the Deferred Share Bonus Plan and Medium-Term Incentive Plan

> Considering the Company's ongoing share sourcing requirements to meet obligations under the Company's share plans, and funding of the employee share ownership plan (ESOP)

> Obtaining shareholder approval for the 2020 Directors' Remuneration Policy

> Reviewing the Annual Incentive Plan structure applicable to the Group and approving changes to this structure for executives below the Board to incorporate a regional trading performance at business unit level into the bonus plan structure

> Approving the 2019 Directors' Remuneration Report and reviewing the 2020 Directors' Remuneration Report

> Reviewing the Committee's Terms of Reference

> Reviewing Group pension arrangements

As in previous years, the Committee was the subject of an externally moderated performance evaluation in 2020. The management of Remuneration Committee meetings was highly rated, with the meetings being seen to be well run, and the work being well prepared and organised. The quality of information provided to the Remuneration Committee from management and internal sources was positively rated, as was the quality of information and advice provided to the Remuneration Committee by the external remuneration adviser, Deloitte. The Committee noted that it had a good understanding of senior executive remuneration, but that there was more work to do for it to gain a deeper understanding of the remuneration of the workforce in general, a complex task given the number of countries and variables involved. The Committee also reflected on the process that had been undertaken for the revision of the Group's Remuneration Policy and concluded that this had worked effectively.

Regulatory compliance

The Remuneration Policy, which is set out on pages 123-130, was prepared in accordance with the Companies Act 2006 and the Large and Medium-sized Companies and Groups (Accounts and Reports) Regulations 2008 (as amended). It also meets the requirements of the Financial Conduct Authority's Listing Rules and the Disclosure Guidance and Transparency Rules.

This Remuneration Report sets out how the principles of the Code are applied by the Company in relation to matters of remuneration. Save as set out below, the Company was compliant with the provisions of the Code for the year under review.

Provision 38: The Company is progressing with its plans to align the level of pension allowance for Executive Directors with that applicable to the majority of the workforce. Our incumbent Directors' pension contributions were frozen at the 1 January 2020 amount and will be reduced to 17% at the end of 2022, being the level of the majority of the workforce.

Provision 41: During the year, the Remuneration Committee did not engage systematically with the workforce to explain how executive remuneration aligns with wider company pay policies.

Share usage

Under the rules of the VSP, the Company has the discretion to satisfy awards either by the transfer of Treasury shares or other existing shares, or by the allotment of newly issued shares. Awards made under the Deferred Share Bonus Plan to satisfy shares awarded to Directors in respect of their Annual Incentive, and awards made to management of the Company over shares pursuant to the Medium-Term Incentive Plan, must be satisfied out of Vesuvius shares held for this purpose by the Company's ESOP trust.

The decision on how to satisfy awards is taken by the Remuneration Committee, which considers the most prudent and appropriate sourcing arrangement for the Company.

At 31 December 2020, the Company held 7,271,174 ordinary shares in Treasury and the ESOP held 1,093,098 ordinary shares. The ESOP can be gifted Treasury shares by the Company, can purchase shares in the open market or can subscribe for newly issued shares, as required, to meet obligations to satisfy options and awards that vest.

The VSP complies with the current Investment Association guidelines on headroom which provide that overall dilution under all plans over a rolling ten-year period should not exceed 10% of the Company's issued share capital, with a further limitation over a rolling ten-year period of 5% for discretionary share schemes. More than 9.9% of the 10% limit and more than 4.9% of the 5% limit remains available as headroom for the issue of new shares or the transfer of Treasury shares for the Company. No Treasury shares were transferred, or newly issued shares allotted under the VSP during the year under review.

Policy implementation

The following section provides details of how the Company's current Remuneration Policy was implemented during the financial year 2020 and how it will be implemented in the financial year 2021.

Annual Report on Directors' Remuneration continued

Directors' Remuneration – audited

The table below sets out the total remuneration received by Executive Directors in the financial year under review:

	Patrick André		Guy Young	
	2020 (£000)	2019 (£000)	2020 (£000)	2019 (£000)
Total salary[1]	556	600	347	350
Taxable benefits[2]	88	118	17	20
Pension[3]	139	150	87	88
Total fixed pay[4]	783	868	451	458
Annual Incentive[5]	153	84	99	64
Long-Term Incentives[6,7]	0	268	0	237
Total variable pay[8]	153	352	99	301
Total[9]	936	1,220	550	759

The table below sets out the fees and taxable benefits received by Non-executive Directors in the financial year under review and the total remuneration received by both Executive and Non-executive Directors during the year under review:

	2020			2019		
	Total fees[1] (£000)	Taxable benefits[2] (£000)	Total (£000)	Total fees[1] (£000)	Taxable benefits[2] (£000)	Total (£000)
John McDonough CBE	185	6	191	205	11	216
Kath Durrant[10]	4	—	4	—	—	—
Christer Gardell[11]	—	—	0	47	5	52
Hock Goh	45	2	47	50	5	55
Friederike Helfer[12]	45	0	45	4	—	4
Jane Hinkley	59	1	60	65	3	68
Douglas Hurt	63	1	64	70	1	71
Holly Koeppel	45	0	45	50	8	58
Total 2020 Non-executive Director remuneration			456			
Total 2020 Executive Director remuneration			1,486			
Total 2020 Director remuneration			1,942			

Notes:

1. Base salary (or Non-executive Director fees, as appropriate), including 20% voluntarily waived salaries and fees for 6 months, earned in relation to services as a Director or Non-executive Director during the financial year. The voluntary waiver did not apply to Christer Gardell who did not receive fees in 2020 or Kath Durrant who joined on 1 December 2020.
2. The UK regulations require the inclusion of benefits for Directors where these would be taxable in the UK on the assumption that the Director is tax resident in the UK. The figures in the table therefore include expense reimbursement and associated tax relating to travel, accommodation and subsistence for the Director (and, where appropriate, their spouse) in connection with attendance at Board meetings and other corporate business during the year, which are considered by HMRC to be taxable in the UK. Standard benefits for the Executive Directors include car allowance and private medical care. As an expatriate, Patrick André also receives relocation benefits under Vesuvius' applicable expatriate localisation policy, as detailed in the 18 July 2017 RNS announcement of Mr André's appointment. Those relocation benefits (totalling£56,325 in 2020) comprise housing costs, tax advice and school fees.
3. Patrick André and Guy Young currently receive a pension allowance of 25% of base salary capped at the January 2020 level. The figures in the table represent the value of all cash allowances and contributions received in respect of pension benefits, at voluntarily reduced rates.
4. The sum of total salary, taxable benefits and pension.
5. This figure includes the Annual Incentive payments to be made to the Executive Directors in relation to the year under review. 33% of these Annual Incentive payments will be deferred into awards over shares, to be held for a period of three years. See pages 135, 136 and 137 for more details.
6. The 2019 figures represent the vested value of the Performance Share awards granted to Patrick André and Guy Young in 2017 under the VSP. The figures are inclusive of the vested value of the additional shares equivalent in value to the dividends that would have been paid on the vested shares (as detailed in Note 2 of the Vesuvius Performance Share award allocations table on page 139). Market prices on the dates of vesting were £3.5059 (16 March 2020) and £3.953 (1 September 2020), which were both lower than the equivalent grant date share prices, so none of the vested value is attributable to share price growth. These values have been restated from those shown in the 2019 Remuneration Report to reflect the value on the vested shares on the date of vesting.
7. The 2020 figures represent the Performance Share awards granted to Patrick André and Guy Young in 2018 under the VSP that will lapse in 2021.
8. The sum of the value of the Annual Incentive and the Long-Term Incentives where the performance period ended during the financial year.
9. The sum of base salary, benefits, pension, Annual Incentive and Long-Term Incentives where the performance period ended during the financial year.

Additional notes:

10. Kath Durrant joined the Board on 1 December 2020.
11. Christer Gardell retired from the Board on 4 December 2019; amounts have been restated from 2019 report for expenses reimbursed in 2020 related to 2019.
12. Total 2019 Director remuneration for the Directors who served during 2019 was £2.503m.

Base salary and fees

As outlined in last year's Remuneration Report, the Chief Executive's salary was increased to £618,000 p.a. with effect from 1 January 2020. The Chief Financial Officer's base salary was increased on the same date to £385,000. In line with the Group's remuneration policy, the base salaries for each of the Executive Directors was reviewed in 2020. It was resolved that no salary change would be made for 1 January 2021, thus aligning the approach for the Executive Directors with that taken for the majority of the Group's workforce.

As outlined in last year's Remuneration Report, the Chairman's fee was increased to £205,000 p.a. with effect from 1 January 2020. The Non-executive Directors' fees were increased on the same date to £50,000 p.a. No further changes have been made to the Chairman or Non-executive Directors' fees for 2021, or to the supplementary fees, which remain at £15,000 p.a. for the Chairmen of the Audit and Remuneration Committees, and £5,000 for the Senior Independent Director.

Pension arrangements – audited

In accordance with their service agreements, Patrick André and Guy Young are entitled to pension allowances of 25% of base salary. This allowance can be used to participate in Vesuvius' pension arrangements, be invested in their own pension arrangements or be taken as a cash supplement (or any combination of these alternatives). The Remuneration Committee has determined that this level of pension allowance be frozen at the 1 January 2020 amount and will be reduced to 17% from the end of 2022 in line with the average of that received by the majority of the workforce. In 2020 the level of pension allowances for each of the Executive Directors was 25% including for the period of their voluntarily reduced salary.

Annual Incentive – audited

The Executive Directors are eligible to receive an Annual Incentive calculated as a percentage of base salary, based on achievement against specified financial targets and personal objectives. Each year, the Remuneration Committee establishes the performance criteria for the forthcoming year. The financial targets are set by reference to the Company's financial budget. The target range is set to ensure that Annual Incentives are only paid out at maximum for significantly exceeding performance expectations. The Remuneration Committee considers that the setting and attainment of these targets is important in the context of achievement of the Company's longer-term strategic goals.

The Annual Incentive has a threshold level of performance below which no award is paid, a target level at which 50% of the maximum opportunity is payable, and a maximum performance level at which 100% of the maximum opportunity is earned, on a pro rata basis.

2020 Annual Incentive – audited

For 2020, the maximum Annual Incentive potential for the Executive Directors was 125% of base salary and their target Annual Incentive potential was 62.5% of base salary.

For the financial year 2020, the Executive Directors' Annual Incentives were based 60% on Group headline EPS, 20% on the Group's working capital to sales ratio (based on the 12-month moving average) and 20% on specified personal objectives.

Financial targets

The 2020 Vesuvius Group headline EPS performance targets set out below were set at the December 2019 full-year average foreign exchange rates, being the rates used for the 2020 budget process:

Threshold:	On-target:	Maximum:
39.0p	41.4p	46.1p

The 2020 Group's working capital to sales ratio targets were set as follows:

Threshold:	On-target:	Maximum:
23.5%	23.0%	22.5%

In assessing the Group's performance against these targets, the Committee uses a constant currency approach. Thus, the 2020 full-year EPS performance was retranslated at December 2019 full-year average foreign exchange rates to establish performance. This is consistent with practice in previous years.

In 2020, Vesuvius' retranslated EPS performance at the December 2019 full-year average foreign exchange rates was 27.6 pence and working capital to sales ratio was 23.2%. Consequently, EPS performance was below the required threshold target, and the Group working capital to sales ratio was between threshold and target with an outcome of 34% of the maximum achievable for this target.

As a result, in respect of the financial performance metrics of the 2020 Annual Incentive, no payment is due on the EPS target (related to a maximum bonus opportunity of 75% of contractual salary), and a partial pay-out of 8.5% of contractual salary (of the maximum potential bonus of 25% of contractual salary) is due on the Working Capital to Sales ratio target.

Personal objectives

In 2020, a proportion (20%) of the Annual Incentive for Executive Directors (representing 25% of base salary out of the maximum 125% bonus entitlement) was based on the achievement of personal objectives. The Committee considered the appropriateness of paying Directors' incentives under the personal objectives element of the Annual Incentive for 2020 with partial achievement of the financial targets. Given that the personal objectives are linked to key strategic, organisational and operational projects with measurable targets, the Committee concluded that such pay-outs are in order. A summary of the objectives set and performance achieved is set out on the next page.

Annual Report on Directors' Remuneration continued

Patrick André

Summary of objective	Summary outcome
Drive Group performance	> Delivered the best safety results since Vesuvius became an independent company in 2012 > Very strong cash generation and cash conversion (173%) despite the COVID-19 crisis > Strong temporary cash savings of £39m to mitigate the crisis > Strong restructuring recurring cash savings of £20.6m > Market share gains in the Company's main markets
Reinforce talent management	> Increase in employee engagement as measured by external survey despite the crisis > Strengthening of the management team with a new experienced Flow Control business unit President
Review and Implementation of Group Strategy	> Elaborate action plan for improved long-term return on sales > On-target delivery of strategic capex to improve manufacturing efficiency, increase capacity and accelerate automation
Improve Group ESG performance	> Decreased CO_2 emissions per tonne of product manufactured > Increased female representation in top management > Launched new Group Sustainability Initiative with net zero carbon footprint objective

In summary, after considering performance as outlined above, the Committee approved an Annual Incentive pay-out of 16.3% of contractual base salary, out of the maximum potential 25%, in respect of the personal objectives of Patrick André.

Guy Young

Summary of objective	Summary outcome
Improve Group financial control and metrics	> Improved financial controls environment with satisfactory audit outcomes > Reduced working capital and increased trade creditor days > Delivered improved cash management and significant savings
Performance of IT function	> Achieved zero major cyber security incidents > Significant progress of major technology project for launch in 2021
Improve Group ESG performance	> Decreased CO_2 emissions per tonne of product manufactured > Increased female representation in top management

In summary, after considering performance as outlined above, the Committee approved an Annual Incentive pay-out of 17.3% of contractual base salary, out of the maximum potential 25%, in respect of the personal objectives of Guy Young.

The total Annual Incentive awards payable to Patrick André and Guy Young in respect of their services as a Director during 2020 are therefore 24.8% and 25.8% of salary respectively. Of these Annual Incentive payments, 33% will be deferred into awards over shares, to be held for a period of three years.

The Committee considered the appropriateness of paying Directors' incentives when the EPS target had not been met with respect to other stakeholders' experience. As has been detailed, the financial targets were set in a pre-COVID-19 world and the personal objectives are linked to key strategic, organisational and operational projects designed to strengthen the Company for the long term and have measurable targets. One of the key financial objectives during the pandemic was cash preservation and strong working capital management. The reduced level of business would normally result in an increased working capital to sales ratio, whereas management succeeded in reducing this to below last year's 24% and achieved this within the pre-COVID-19 targets. As a result, the Committee concluded that such pay-outs were in order.

On balance, the Committee feels that the formulaic outcome against the financial performance targets set is a fair reflection of performance and is satisfied that the resulting compensation for the Group's leadership team is an appropriate reflection of the performance delivered.

2021 Annual Incentive

The Annual Incentive opportunity for the Executive Directors in 2021 will be changed to 150 % of salary, with potential pay-outs of 75.0% of base salary for the achievement of target performance in all three elements. Pay-outs will commence and increase incrementally from 0% once the threshold performance for any of the three elements has been met. The structure of the Annual Incentive will also remain the same as for 2020: 60% of the Executive Directors' Annual Incentives will therefore be based on Group headline EPS, 20% on the Group's working capital to sales ratio (based on the 12-month moving average) and 20% on the achievement of personal objectives. The Company will not be disclosing the targets set until after the relevant performance period has ended because of commercial sensitivities. The personal objectives for 2021 are focused on long-term strategic objectives, or are job-specific in nature and track performance against the Group's key strategic, organisational and operational goals with a specific focus on ESG outcomes. 33% of any Annual Incentive earned will be deferred into awards over shares, to be held for a period of three years.

Deferred Share Bonus Plan allocations – audited

33% of the Annual Incentives earned by Patrick André and Guy Young in respect of their periods of service as Directors of Vesuvius plc during 2017, 2018 and 2019 were deferred into shares under the Company's Deferred Share Bonus Plan. The following table sets out details of these awards:

Grant and type of award	Total share allocations as at 1 Jan 2020	Additional shares allocated during the year	Allocations lapsed during the year	Shares vested during the year	**Total share allocations as at 31 Dec 2020**	Market price of the shares on the day before award (p)	Earliest vesting date
Patrick André							
15 March 2018[1] Deferred Bonus Shares	10,128	—	—	—	**10,128**	605.5	15 Mar 2021
14 March 2019[2] Deferred Bonus Shares	29,646	—	—	—	**29,646**	608	14 Mar 2022
12 March 2020[3] Deferred Bonus Shares	—	7,044	—	—	**7,044**	391.8	12 Mar 2023
Total	39,774	7,044	—	—	**46,818**		
Guy Young							
15 March 2018[1] Deferred Bonus Shares	18,118	—	—	—	**18,118**	605.5	15 Mar 2021
14 March 2019[2] Deferred Bonus Shares	19,028	—	—	—	**19,028**	608	14 Mar 2022
12 March 2020[3] Deferred Bonus Shares	—	5,345	—	—	**5,345**	391.8	12 Mar 2023
Total	37,146	5,345	—	—	**42,491**		

Notes:

1. In 2018, Patrick André and Guy Young received Annual Incentive bonuses in respect of their service as Directors of Vesuvius plc in 2017 of £185,544 and £331,906 respectively. 33% of each bonus was awarded in deferred shares (conditional awards) under the Vesuvius Deferred Share Bonus Plan. These shares will vest on the third anniversary of their award date.
2. In 2019, Patrick André and Guy Young received Annual Incentive bonuses in respect of their service as Directors of Vesuvius plc in 2018 of £546,131 and £350,525 respectively. 33% of each bonus was awarded in deferred shares (conditional awards) under the Vesuvius Deferred Share Bonus Plan. The allocations of shares were made on 14 March 2019 and were calculated based upon the average closing mid-market price of Vesuvius' shares on the five dealing days before the award was made, being £6.079. The total value of these awards based on this share price was £180,218 and £115,671 respectively. There are no additional performance conditions applicable to these awards, therefore these shares will vest in full on the third anniversary of their award date.
3. In 2020, Patrick André and Guy Young were awarded Annual Incentive bonuses in respect of their service as Directors of Vesuvius plc in 2019 of £83,775 and £63,569 respectively. 33% of each bonus was awarded in deferred shares (conditional awards). The allocations of shares were made on 12 March 2020 and were calculated based upon the average closing mid-market price of Vesuvius' shares on the five dealing days before the award was made, being £3.9248. The total value of these awards based on this share price was £27,646 and £20,978 respectively. There are no additional performance conditions applicable to these awards, therefore these shares will vest in full on the third anniversary of their award date.

Additional note:

4. The mid-market closing price of Vesuvius' shares during 2020 ranged between 302.2 pence and 541 pence per share, and on 31 December 2020, the last dealing day of the year, was 536.5 pence per share.

Annual Report on Directors' Remuneration continued

Longer-term Pay (LTIPs) – audited

Performance Share awards are allocated to the Executive Directors under the Vesuvius Share Plan (VSP). In accordance with the Remuneration Policy and the rules of the VSP, they are eligible to receive, on an annual basis, a Performance Share award with a face value of up to 200% of salary. Vesting of 50% of shares awarded is based upon the Company's three-year TSR performance relative to that of the constituent companies of the FTSE 250 (excluding investment trusts), and 50% on headline EPS performance. The level of EPS growth specified in the targets is set by the Remuneration Committee each year, taking into account the Group's prospects and the broader global economic environment. Considering the 2020 EPS outturn, the Committee have expressed the target range for this award as pence targets (to be assessed in Financial Year 2023) rather than growth targets. The target range is deliberately wider than usual in recognition of the current high level of economic uncertainty. The schedule of EPS targets is designed at the maximum level to be highly challenging, whilst remaining an effective incentive for the management team. The EPS and TSR measures operate independently. The use of these performance measures is intended to align executive remuneration with shareholders' interests. Prior to the vesting of Performance Shares, the Remuneration Committee reviews the underlying financial performance of the Company and non- financial performance of the Company and individuals over the performance period to ensure that the vesting is justified, and to consider whether to exercise its discretion including consideration of any potential windfall gains. UK executives receive awards in the form of nil-cost options with a flexible exercise date and non-UK executives receive conditional awards which are exercised on the date of vesting. Performance Share awards vest after three years and, commencing with awards made in 2019, are then subject to a further two-year holding period.

2020 Entitlement

In 2020, Patrick André and Guy Young were entitled to receive allocations of Performance Shares worth 200% and 150% of their base salaries, respectively. As outlined in last year's Remuneration Report, because of share price volatility as a result of the growing COVID-19 pandemic, the share price used to determine the number of allocated shares was capped at £4.371 (the average in the five dealing days prior to the February Remuneration Committee meeting) rather than £3.9248 (the average in the five dealing days prior to grant). Accordingly, the actual value of these awards at the date of grant was reduced to 180% and 135% of base salary for Patrick André and Guy Young respectively.

2021 Entitlement

The Remuneration Committee has determined that Patrick André will again receive a Performance Share award in 2021 equivalent in value to 200% of his base salary and Guy Young an award equivalent in value to 150% of his base salary. The Committee considered the risk of windfall gains in making the award for 2021 but concluded, due to the stability of the share price, this was not a risk at this time.

2018 Performance Share Award (vesting in 2021)

The performance period applicable to the awards made in 2018 ended on 31 December 2020. These awards lapsed as the threshold performance level was not met for either the TSR or EPS performance conditions. (TSR:below median at -14.5%/ EPS:below threshold at-16%)

Targets for the Performance Share awards for the years 2018, 2019 and 2020 – audited

TSR ranking relative to FTSE 250 excluding investment trusts	Vesting percentage
Below median	0%
Median	12.50%
Between median and upper quintile	Pro rata between 12.50% and 50%
Upper quintile and above	50%

Annual compound headline EPS growth	Vesting percentage
Less than 3%	0%
3%	12.50%
Between 3% and 6%	Pro rata between 12.50% and 25%
6%	25%
Between 6% and 15%	Pro rata between 25% and 50%
15% or more	50%

Targets for the Performance Share awards for the year 2021 – unaudited

TSR ranking relative to FTSE 250 excluding investment trusts	Vesting percentage
Below median	0%
Median	12.50%
Between median and upper quintile	Pro rata between 12.50% and 50%
Upper quintile and above	50%

Headline EPS as at FY2023	Vesting percentage
Less than 35p	0%
35p	12.50%
Between 35p and 47.5p	Pro rata between 12.50% and 25%
47.5p	25%
Between 47.5p and 60p	Pro rata between 25% and 50%
60p or more	50%

Vesuvius Performance Share award allocations – audited

The following table sets out the Performance Share awards that were allocated in 2017, 2018, 2019 and 2020 under the VSP:

Grant and type of award	Total share allocations as at 1 Jan 2020	Additional shares allocated during the year	Allocations lapsed during the year	Shares vested during the year	**Total share allocations as at 31 Dec 2020**	Market price of the shares on the day before award (p)	Performance period	Earliest vesting date	End of holding period[1]
Patrick André									
16 March 2017[2]							1 Jan 17 – 31 Dec 19		
Performance Shares	60,413	—	(22,570)	(37,843)	—	524.5		16 Mar 2020	n/a
1 September 2017[2]							1 Jan 17 – 31 Dec 19		
Performance Shares	42,257	—	(15,787)	(26,470)	—	578		1 Sep 2020	n/a
15 March 2018[3]							1 Jan 18 – 31 Dec 20		
Performance Shares	173,697	—	—	—	**173,697**	605.5		15 Mar 2021	n/a
14 March 2019[4]							1 Jan 19 – 31 Dec 21		
Performance Shares	197,400	—	—	—	**197,400**	608		14 Mar 2022	14 Mar 2024
12 March 2020[5]							1 Jan 20 – 31 Dec 22		
Performance Shares	—	282,772	—	—	**282,772**	391.8		12 Mar 2023	12 Mar 2025
Total	473,767	282,772	(38,357)	(64,313)	**653,869**				
Guy Young									
16 March 2017[2]							1 Jan 17 – 31 Dec 19		
Performance Shares	93,355	—	(34,877)	(58,478)	—	524.5		16 Mar 2020	n/a
15 March 2018[3]							1 Jan 18 – 31 Dec 20		
Performance Shares	86,848	—	—	—	**86,848**	605.5		15 Mar 2021	n/a
14 March 2019[4]							1 Jan 19 – 31 Dec 21		
Performance Shares	86,362	—	—	—	**86,362**	608		14 Mar 2022	14 Mar 2024
12 March 2020[5]							1 Jan 20 – 31 Dec 22		
Performance Shares	—	132,120	—	—	**132,120**	391.8		12 Mar 2023	12 Mar 2025
Total	266,565	132,120	(34,877)	(58,478)	**305,330**				

Notes:

1. Performance shares granted from 2019 onwards are subject to a further two-year holding period.
2. In 2017, Patrick André and Guy Young received an allocation of Performance Shares worth 200% of base salary (prorated) and 150% of base salary respectively. As outlined in last year's Remuneration Report, 62.64% of the shares vested during 2020. In addition, the Remuneration Committee determined that Messrs André and Young were entitled to receive 8,558 and 9,241 additional shares respectively, equivalent in value to the dividends that would have been paid on the number of vested shares in respect of dividend record dates occurring during the period between the award date and the date of vesting.
3. In 2018, Patrick André and Guy Young received allocations of Performance Shares worth 200% and 150% of their base salaries. These allocations were calculated based upon the average closing mid-market price of Vesuvius' shares on the five dealing days before the award was made, being £6.045. The total value of these awards based on this share price on the date of grant was £1,049,998 and £524,996 respectively. Following an assessment of the performance conditions, these awards will lapse in full during 2021.
4. In 2019, Patrick André and Guy Young received allocations of Performance Shares worth 200% and 150% of their base salaries. These allocations were calculated based upon the average closing mid-market price of Vesuvius' shares on the five dealing days before the award was made, being £6.079. The total value of these awards based on this share price was £1,199,994 and £524,994 respectively.
5. In 2020, Patrick André and Guy Young were entitled to receive allocations of Performance Shares worth 200% and 150% of their base salaries respectively. In light of the volatile share price, the Committee applied its discretion so that the number of shares in these allocations were capped at a level based upon the average closing mid-market price of Vesuvius' shares on the five dealing days before the February 2020 Remuneration Committee meeting of £4.371. As a result, Patrick André received an award of 282,772 shares which, at grant, was equivalent in value to 180% of his base salary (£1,109,823*) and Guy Young received an award of 132,120 shares which, at grant, was equivalent in value to 135% of his base salary (£518,544*).

* Grant values are based on the average closing mid-market price of Vesuvius' shares on the five dealing days prior to grant (£3.9248).

Additional notes:

6. If the respective performance conditions for Patrick André's and Guy Young's awards are not met, then the awards will lapse. If the threshold level of either of the two performance conditions applicable to the awards is met, then 12.50% of the awards will vest.
7. The Remuneration Committee also has the discretion to award cash or shares equivalent in value to the dividend that would have been paid during the vesting period on the number of shares that vest.
8. The mid-market closing prices of Vesuvius' shares during 2020 ranged between 302.2 pence and 541 pence per share, and on 31 December 2020, the last dealing day of the year, was 536.5 pence per share.

Annual Report on Directors' Remuneration continued

Malus/clawback arrangements in 2021

Vesuvius has malus and clawback arrangements in respect of Executive Directors' variable remuneration. The structure of those arrangements is outlined in our Remuneration Policy.

Statement of Directors' shareholding – audited

The interests of Directors and their closely associated persons in ordinary shares as at 31 December 2020, including any interests in share options and shares provisionally awarded under the VSP, are set out below:

		Outstanding share incentive awards	
	Beneficial holding in shares	With performance conditions[1]	Without performance conditions[2]
Executive Directors			
Patrick André	101,032	653,869	46,818
Guy Young	120,658	305,330	42,491
Non-executive Directors			
John McDonough CBE (Chairman)	120,000	—	—
Kath Durrant	—	—	—
Friederike Helfer[3]	—	—	—
Hock Goh	5,000	—	—
Jane Hinkley	12,000	—	—
Douglas Hurt	18,000	—	—
Holly Koeppel	27,500	—	—

Notes:
1. These are Performance Shares granted under the VSP. The awards were all granted subject to performance conditions.
2. These are awards granted under the Deferred Share Bonus Plan. These awards are not subject to any additional performance conditions.
3. Friederike Helfer is a Partner of, and has a financial interest in, Cevian Capital which held 21.11% of Vesuvius' issued share capital as at 31 December 2020 and at the date of this report.

Additional notes:
4. None of the other Directors, nor their spouses, nor their minor children, held non-beneficial interests in the ordinary shares of the Company during the year.
5. There were no changes in the interests of the Directors in the ordinary shares of the Company in the period from 1 January 2021 to the date of this Report.
6. All awards under the VSP are subject to performance conditions and continued employment until the relevant vesting date as set out on page 138.
7. Full details of Directors' shareholdings and incentive awards are given in the Company's Register of Directors' Interests, which is open to inspection at the Company's registered office during normal business hours.

Payments to past Directors and loss of office payments – audited

There were no payments made to any Director for loss of office during the year ended 31 December 2020, and no payments were made to any other past Directors of the Company during the year ended 31 December 2020.

Shareholding guidelines

The Remuneration Committee encourages Executive Directors to build and hold a shareholding in the Company. Under the 2020 Remuneration Policy, the required holding is 200% of salary for all Executive Directors. Executive Directors are required to retain at least 50% (measured as the value after tax) of any shares received through the operation of share schemes; in addition, permission to sell shares held – whether acquired through the operation of share schemes or otherwise – will not be given, other than in exceptional circumstances, if, following the disposal, the shareholding requirement is not achieved or is not maintained.

Compliance with the shareholding policy is tested at the end of each year for application in the following year. Under the 2020 Remuneration Policy, the valuation of any holding is taken at the higher of: (1) the share price on the date of vesting of any shares derived from a share award, in respect of those shares only; and (2) the average of the closing prices of a Vesuvius ordinary share for the trading days in that December.

Executive Directors' shareholdings – audited

As at 31 December 2020, the Executive Directors' shareholdings against the shareholding guidelines contained in the Directors' Remuneration Policy in force on that date (using the Company's share price averaged over the trading days of the period 1 December to 31 December 2020, of 512.6 pence per share) were as follows:

Director	Actual share ownership as a percentage of salary at 31 Dec 2020	Policy share ownership as a percentage of salary	Policy met?
Patrick André	84%	200%	In the build-up period
Guy Young	161%	200%	In the build-up period

Annual changes in Executive Directors pay versus employee pay

Executive Directors pay comparison

The London headquartered salaried employee workforce are presented as a voluntary disclosure of the representative comparator group for the Vesuvius Group parent company as there are only two non-director employees in the parent company.

		Executive Directors[2]		Non-Executive Directors[3]						
2020	Average employee[1]	Patrick André	Guy Young	John McDonough CBE	Kath Durrant[4]	Friederike Helfer[5]	Hock Goh	Jane Hinkley	Douglas Hurt	Holly Koeppel
Salary	(0%)	(7%)	(1%)	(10%)	n/a	(10%)	(10%)	(10%)	(10%)	(10%)
Bonus	165%	183%	155%	—	—	—	—	—	—	—
Benefits	18%	(25%)	(14%)	(46%)	n/a	(60%)	(60%)	(60%)	(63%)	(100%)

Notes:
1. This is the average change calculated by dividing the staff cost related to salaries, median bonus and benefits by the average number of full-time equivalent employees in the Vesuvius headquarters in London, excluding the Executive Directors. Salaries, bonus and benefits relate to the relevant financial reporting year. The financial performance in 2019 resulted in a pay-out on only the personal performance element of Executive Directors and the workforce bonus plans, whereas the financial performance in 2020 resulted in a partial pay-out on financial performance alongside the personal performance for Executive Directors and the workforce.
2. Calculated using data from the single figure table in the annual report.
3. Calculated using data from the audited Directors Emoluments.
4. Kath Durrant joined on 1 December 2020.
5. Friederike Helfer's comparison shown against a notional 2019 full year equivalent.

Additional notes:
6. No taxable benefits in 2019.
7. The Non-executive Directors' fees were reviewed and increased in 2015 and 2019.

CEO pay ratio

The UK salaried employee workforce are the representative comparator group to the Chief Executive, Patrick André, who is based in the UK (albeit with a global role and responsibilities) and levels of pay vary widely across the Group depending on geography and local market conditions.

	Year	Method	25th percentile pay ratio	50th percentile (median) pay ratio	75th percentile pay ratio
Total remuneration (£)	2019	Option A	35:1 (37,119)	28:1 (45,000)	17:1 (75,293)
Salary (£)	2019	Option A	22:1 (27,338)	15:1 (39,890)	9:1 (66,784)
Total remuneration (£)	2020	Option A	32:1 (34,661)	24:1 (45,574)	13:1 (85,888)
Salary (£)	2020	Option A	19:1 (29,609)	13:1 (43,715)	8:1 (73,939)

The table above shows the Chief Executive pay ratios versus our UK employees for 2020. The pay ratios compare amounts disclosed in the single total figure table for the Group Chief Executive to the annual full-time equivalent remuneration of our UK employees for 2020. The data has been calculated in accordance with 'Option' A in The Companies (Miscellaneous Reporting) Regulations 2018, because it allows the Company to show the total annualised full-time equivalent remuneration (salary, incentives, allowances, fees, taxable benefits) and percentiles across the financial year as at 31 December 2020.

Amounts have been annualised for those who joined part way through the year or who are on part-time arrangements and exclude those who left the organisation during the reporting period.

The approach to calculating the pay ratios is consistent with the prior year and there have not been any changes to the compensation models in the reporting period.

Annual Report on Directors' Remuneration continued

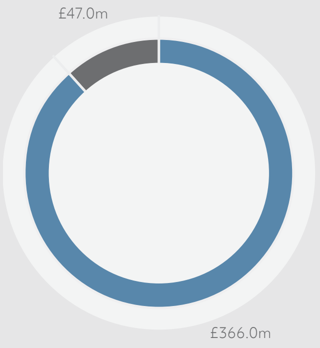
The reduction in pay ratios compared with last year can be attributed to a number of factors, including the CEO's voluntary waiver of salary and employer pension contributions and the lapsing of the CEO's long term incentive payable in the reporting period.

The Committee is comfortable that the principles applied and the quantum of compensation are appropriate across the Group's employee base. These are regularly benchmarked to ensure market competitiveness. There is a consistent approach of measuring against both business and personal performance for all those who participate in incentive programmes. The Group continues to monitor the effectiveness of all compensation practices to identify future opportunities to ensure they remain fair, consistent and in line with best practice.

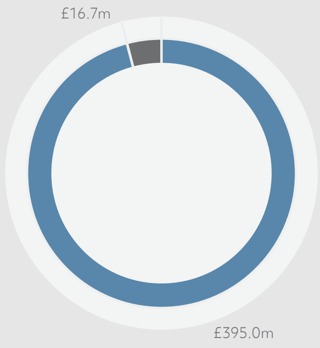
Annual spend on employee pay[1] versus shareholders' distributions[2]

The charts below show the annual spend on all employees (including Executive Directors) compared with distributions made and proposed to be made to shareholders for 2019 and 2020:

Relative importance of spend on pay (2020) £m



Relative importance of spend on pay (2019) £m



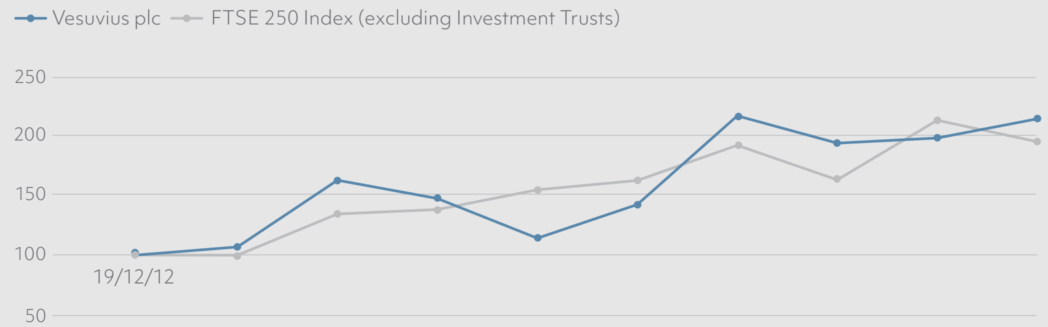
	2020 (£m)	2019 (£m)	Change
Employee pay[1]	**366.0**	395.0	(7.3)%
Dividends[2] (based on final proposed dividend)	**47.0**	16.7	281.4%

Notes:
1. Employee pay includes wages and salaries, social security, share-based payments and pension costs, and other post-retirement benefits. See Note 8 to the Group Financial Statements.
2. Shareholder distributions/dividends includes interim and final dividends paid in respect of each financial year. See Note 24 of the Group Financial Statements.

TSR performance and Chief Executive pay

The TSR performance graph compares Vesuvius TSR performance with that of the same investment in the FTSE 250 Index (excluding investment trusts). This index has been chosen as the comparator index to reflect the size, international scope and diversity of the Company. TSR is the measure of the returns that a company has provided for its shareholders, reflecting share price movements and assuming reinvestment of dividends. The demerger of Vesuvius plc was effective on 19 December 2012 and therefore the graph shows the period from 19 December 2012 to 31 December 2020.

Vesuvius' total shareholder return compared against total shareholder return of the FTSE 250 index (excluding investment trusts) since demerger



Chief Executive pay – financial year ended	François Wanecq[1]					Patrick André[2]			
	31/12/12	31/12/13	31/12/14	31/12/15	31/12/16	31/12/17	31/12/18	31/12/19	**31/12/20**
Total remuneration (single figure (£000))	£1,227	£2,447	£1,519	£752	£1,173	£1,675[1] £465[2]	£2,022	£1,220	**£936**
Annual variable pay (% of maximum)	0%	100%	64%	0%	50%	81%[1] 85%[2]	83%	11%	**20%**
Long-term variable pay (% of maximum)	67%	28%	27%	0%	0%	43.7%[1] n/a[2]	100%	62.6%	**0%**

Notes:
1. Amounts shown in respect of François for 2017 reflect payments in respect of his service as Chief Executive from 1 January 2017 to 31 August 2017 and the full value of his VSP award in relation to the performance period 2015–2017.
2. Amounts shown in respect of Patrick André for 2017 reflect payments in respect of his service as Chief Executive from 1 September 2017 to 31 December 2017.

Shareholder voting on remuneration resolutions

	Votes for	Votes against	Votes withheld
Approval of the Directors' Remuneration Policy 2020 AGM	244,618,671 (97.2%)	7,105,663 (2.8%)	3,640
Approval of the Annual Report on Remuneration 2020 AGM	244,015,719 (96.9%)	7,708,484 (3.1%)	3,771

The Directors' Remuneration Report has been approved by the Board and is signed on its behalf by

Jane Hinkley
Chairman, Remuneration Committee

3 March 2021

Directors' Report

Directors' Report

The Directors submit their Annual Report together with the audited financial statements of the Group and of the Company, Vesuvius plc, registered in England and Wales No. 8217766, for the year ended 31 December 2020.

The Companies Act 2006 requires the Company to provide a Directors' Report for Vesuvius plc for the year ended 31 December 2020.

Information incorporated by reference

The information that fulfils this requirement and which is incorporated by reference into, and forms part of, this report is included in the following sections of the Annual Report:

> The Section 172(1) statement

> The Non-financial information statement

> The Governance section, including the Corporate Governance Statement

> Financial instruments: the information on financial risk management objectives and policies contained in Note 25 to the Group Financial Statements

This Directors' Report and the Strategic Report contained on pages 1 to 88 together represent the management report for the purpose of compliance with DTR 4.1.8R of the Financial Conduct Authority's Disclosure and Transparency Rules.

Going concern	Information on the business environment in which the Group operates, including the factors that are likely to impact the future prospects of the Group, is included in the Strategic Report. The principal risks and uncertainties that the Group faces throughout its global operations are shown on pages 36 and 37. The financial position of the Group, its cash flows, liquidity position and debt facilities are also described in the Strategic Report. In addition, the Group's Viability Statement is set out within the Strategic Report on page 34. Note 25 to the Group Financial Statements sets out the Group's objectives, policies and processes for managing its capital; financial risks; financial instruments and hedging activities; and its exposures to credit, market (both currency and interest rate related) and liquidity risk. Further details of the Group's cash balances and borrowings are included in Notes 13, 14 and 25 to the Group Financial Statements. The Directors have prepared profit and loss, balance sheet and cash flow forecasts for the Group for a period in excess of 12 months from the date of approval of the 2020 financial statements. On the basis of the exercise described above, the Directors have prepared a Going Concern Statement which can be found on pages 34 and 35.
Events since the balance sheet	Since 31 December 2020, there have been no material items to report.
Future developments	A full description of the activities of the Group, including performance, significant events affecting the Group in the year and indicative information in respect of the likely future developments in the Group's business, can be found in the Strategic Report.
Financial instruments	Information on Vesuvius' financial risk management objectives and policies can be found in Note 25 to the Group Financial Statements.
Research and development	The Group's investment in research and development (R&D) during the year under review amounted to £27.9m (representing approximately 1.9% (2019: 1.7%) of Group revenue). Further details of the Group's R&D activities can be found in the Operating Reviews and Sustainability section of the Strategic Report.
Political and charitable donations	In accordance with Vesuvius policy, the Group did not make any political donations or incur any political expenditure in the UK or the EU during 2020 (2019: nil). The Company made no charitable donations of more than £2,000 in the UK in 2020.
Energy consumption and efficiency/greenhouse gas emissions	Information on our reporting of greenhouse gas emissions, and the methodology used to record these, is set out on page 69 of the Strategic Report. Details of the Group's energy usage for 2020, and the efficiency initiatives currently being undertaken, can be found in the Sustainability section on pages 68-73.
Branches	A number of the Group's subsidiary undertakings maintain branches; further details of these can be found in Note 33.1 to the Group Financial Statements.
Dividends	In light of the rapidly deteriorating business environment, in April 2020 the Board withdrew its recommendation to pay the final dividend of 14.30 pence per share announced with the publication of the full year 2019 results. An interim dividend of 3.10 pence (2019: 6.20 pence) per Vesuvius ordinary share was paid on 4 December 2020 to Vesuvius shareholders. The Board is recommending a final dividend in respect of 2020 of 14.30 pence (2019: no dividend paid) per ordinary share which, if approved, will be paid on 21 May 2021 to shareholders on the register at 16 April 2021.

Accountability and audit	A responsibility statement of the Directors and a statement by the auditor about its reporting responsibilities can be found on pages 149, and 150-157, respectively. The Directors fulfil the responsibilities set out in their statement within the context of an overall control environment of central strategic direction and delegated operating responsibility. As at the date of this report, so far as each Director of the Company is aware, there is no relevant audit information of which the Company's auditor is unaware and each Director hereby confirms that they have taken all the steps that they ought to have taken as a Director in order to make themselves aware of any relevant audit information and to establish that the Company's auditor is aware of that information.
Auditors' reappointment	PricewaterhouseCoopers LLP (PwC) was reappointed as External Auditor for Vesuvius plc for the year ended 31 December 2020, at the 2020 AGM. PwC has been Vesuvius' external Auditor since 2017 and has expressed its willingness to continue in office as Auditor of the Company for the year ending 31 December 2021. Consequently, resolutions for the reappointment of PwC as auditor of the Company and to authorise the Directors to determine their remuneration are to be proposed at the 2021 AGM.
Directors	The current Directors of the Company are Patrick André, Kath Durrant, Hock Goh, Friederike Helfer, Jane Hinkley, Douglas Hurt, Holly Koeppel, John McDonough CBE and Guy Young. Kath Durrant was appointed to the Board on 1 December 2020. All the Directors will retire at the 2021 AGM and offer themselves for election or re-election at the AGM, other than Hock Goh and Holly Koeppel who intend to retire from the Board at the close of the 2021 AGM. Biographical information for the Directors is given on pages 92 and 93. Further information on the remuneration of, and contractual arrangements for, the Executive and Non-executive Directors is given on pages 131-143 in the Directors' Remuneration Report. The Non-executive Directors do not have service agreements.
Directors' indemnities	The Directors have been granted qualifying third-party indemnity provisions by the Company and the Directors of the Group's UK Pension Plans Trustee Board (none of whom is a Director of Vesuvius plc) have been granted qualifying pension scheme indemnity provisions by Vesuvius Pension Plans Trustees Ltd. The indemnities for Directors of Vesuvius plc have been in force since the date of their appointment. The Pension Trustee indemnities were in force throughout the last financial year and remain in force.
Annual General Meeting	The Annual General Meeting of the Company will be held at the Company's head office, 165 Fleet Street, London EC4A 2AE on Wednesday 12 May 2021 at 11.00 am. The meeting will be conducted in line with the UK Government guidelines in force at that time with respect to travel and gatherings. The Company will announce any changes to arrangements for the AGM as required.
Amendments of Articles of Association	The Company may make amendments to the Articles by way of special resolution in accordance with the Companies Act. It is proposed to adopt amended Articles at the 2021 AGM, primarily to update the current Articles to reflect changes in the law and developments in market practice and technology since the current Articles were adopted in November 2012.
Share capital	As at the date of this report, the Company had an issued share capital of 278,485,071 ordinary shares of 10 pence each; 7,271,174 of these ordinary shares are held in Treasury. Therefore, the total number of Vesuvius plc shares with voting rights is 271,213,897. Further information relating to the Company's issued share capital can be found in Note 9 to the Company Financial Statements. The Company's Articles specify that, subject to the authorisation of an appropriate resolution passed at a General Meeting of the Company, Directors can allot relevant securities under Section 551 of the Companies Act up to the aggregate nominal amount specified by the relevant resolution. In addition, the Articles state that the Directors can seek the authority of shareholders in a General Meeting to allot equity securities for cash, without first being required to offer such shares to existing ordinary shareholders in proportion to their existing holdings under Section 561 of the Companies Act, in connection with a rights issue and in other circumstances up to the aggregate nominal amount specified by the relevant resolution. At the AGM on 13 May 2020, the Directors were authorised to issue relevant securities up to an aggregate nominal amount of £9,040,463, and, in connection with a rights issue, to issue relevant securities up to a further nominal value of £9,040,463. In addition, the Directors were empowered to allot equity securities, or sell Treasury Shares, for cash on a non pre-emptive basis up to an aggregate nominal amount of £1,356,069, and for the purposes of financing (or refinancing, if the authority is to be used within six months after the original transaction) a transaction which the Board of the Company determines to be an acquisition or other capital investment, to allot equity securities, or sell Treasury Shares, for cash on a non pre-emptive basis up to an additional nominal amount of £1,356,069. Each of the authorities given in these resolutions expires on 30 June 2021 or the date of the AGM to be held in 2021, whichever is the earlier. The resolutions were all tabled in accordance with the terms of the Pre-Emption Group's Statement of Principles. The Directors propose to renew these authorities at the 2021 AGM for a further year. In the year ahead, other than potentially in respect of Vesuvius' ability to satisfy rights granted to employees under its various share-based incentive arrangements, the Directors have no present intention of issuing any share capital of Vesuvius plc.

Directors' Report continued

Authority for purchase of own shares

Subject to the provisions of company law and any other applicable regulations, the Company may purchase its own shares. At the AGM on 13 May 2020, Vesuvius shareholders gave authority to the Company to make market purchases of up to 27,121,389 Vesuvius ordinary shares, representing 10% of the Company's issued ordinary share capital as at the latest practicable day prior to the publication of the Notice of AGM. This authority expires on 30 June 2021 or the date of the AGM to be held in 2021, whichever is the earlier. The Directors will seek renewal of this authority at the 2021 AGM.

In 2013, the Company acquired 7,271,174 ordinary shares, representing a nominal value of £727,117 and 2.6% of the entire called-up share capital of the Company prior to the purchase. These shares were purchased pursuant to the Board's commitment to return the majority of the net proceeds of the disposal of the Precious Metals Processing division to shareholders. These shares are currently held as Treasury shares. The Company has not subsequently disposed of any of the repurchased shares. During the year, the Company did not make any further acquisitions of shares nor did it dispose of any shares previously acquired. The Company does not have a lien over any of its shares.

Share plans

Vesuvius operates a number of share-based incentive plans. Under these plans, the Group can satisfy entitlements by the acquisition of existing shares, the transfer of Treasury shares or by the issue of new shares. Existing shares are held in an employee share ownership plan trust (ESOP). The Trustee of the ESOP purchases shares in the open market as required to enable the Group to meet liabilities for the issue of shares to satisfy awards that vest. The Trustee does not register votes in respect of these shares at the Company's Annual General Meetings and has waived the right to receive any dividends.

At 31 December 2019, the ESOP held 1,718,615 ordinary shares in the Company. During the year, the ESOP sold/transferred 625,517 shares to satisfy the vesting of awards under the Company's share-based incentive plans. As at 31 December 2020, the ESOP held 1,093,098 ordinary shares. The trustee of the ESOP did not purchase any additional shares during the year.

Restrictions on transfer of shares and voting

The Company's Articles do not contain any specific restrictions on the size of a holding or on the transfer of shares. The Directors are not aware of any agreements between holders of the Company's shares that may result in restrictions on the transfer of securities or voting rights.

No person has any special rights with regard to the control of the Company's share capital and all issued shares are fully paid. This is a summary only and the relevant provisions of the Articles should be consulted if further information is required.

Change of control provisions

The terms of the Group's committed bank facility and US Private Placement Loan Notes contain provisions entitling the counterparties to exercise termination or other rights in the event of a change of control on takeover of the Company. A number of the arrangements to which the Company and its subsidiaries are party, such as other debt arrangements and share incentive plans, may also alter or terminate on a change of control in the event of a takeover. In the context of the Group as a whole, these other arrangements are not considered to be significant.

Interests in the Company's shares

The Company has been notified in accordance with DTR 5 of the Disclosure and Transparency Rules of the following interests of 3%, or more, of its issued ordinary shares:

	As at 31 Dec 2020	As at 3 Mar 2021
Cevian Capital	21.11%	21.11%
Standard Life Aberdeen	10.96%	10.96%
Aberforth Partners	4.93%	4.93%
Phoenix Asset Management	4.05%	4.00%

The interests of Directors and their connected persons in the ordinary shares of the Company as disclosed in accordance with the Listing Rules of the Financial Conduct Authority are as set out on page 140 of the Directors' Remuneration Report and details of the Directors' Deferred Share Bonus Plan and Long-Term Incentive awards are set out on pages 137 and 139.

Suppliers, customers and others

Information summarising how the Directors have regard to the need to foster the Company's business relationships with suppliers, customers and others is included in the Group's Section 172(1) Statement on pages 22-27. This also details how that regard impacted the principal decisions taken by the Directors during the year.

Our approach to business places a significant number of Vesuvius Steel employees at customer sites on a permanent basis. In the Foundry Division, our success is built on our deep understanding of customer processes and technical requirements, and our ability to assist them in delivering the greatest efficiency from their operations.

During the year, our supplier audit programme covered the operations of 95 suppliers. This approach allows Vesuvius to gain a deep understanding of our suppliers' operations to ensure sustainability and quality of supply.

Vesuvius agrees payment terms with its suppliers and seeks to pay in accordance with those terms.

Equal opportunities employment

Vesuvius is an equal opportunities employer, and decisions on recruitment, development, training and promotion, and other employment-related issues are made solely on the grounds of individual ability, achievement, expertise and conduct. These principles are operated on a non-discriminatory basis, without regard to race, colour, nationality, culture, ethnic origin, religion, belief, gender, sexual orientation, age, disability or any other reason not related to job performance or prohibited by applicable law. In cases where employees are injured or disabled during employment with the Group, support, including appropriate training, is provided to those employees and workplace adjustments are made as appropriate in respect of their duties and working environment, supporting recovery and continued employment.

Employee engagement

Information on the mechanisms through which Vesuvius engages with its workforce is included in the Section 172(1) Statement on pages 22-29.

Pensions

In each country in which the Group operates, the pension arrangements in place are considered to be consistent with good employment practice in that particular area. Independent advisers are used to ensure that the plans are operated in accordance with local legislation and the rules of each plan. Group policy prohibits direct investment of pension fund assets in the shares of Vesuvius plc. Outside the UK, the US, Germany and Belgium, the majority of pension plans in the Group are of a defined contribution nature.

In 2016, the main German defined benefit plan was closed for new entrants and existing members were offered a buy-out of their benefits under this plan. Those who accepted this buy-out then joined the new defined contribution plan. The Group's UK defined benefits plan (the 'UK Plan') and the main US defined benefits plans are closed to new entrants and have ceased providing future benefits accrual, with all eligible employees instead being provided with benefits through defined contribution arrangements.

For the Group's closed UK Plan, a Trustee Board exists comprising employees, former employees and an independent trustee. The Board currently comprises six trustee Directors, of whom two are member-nominated. The administration of the UK Plan is outsourced. The Company is mindful of its obligations under the Pensions Act 2004 and of the need to comply with the guidance issued by the Pensions Regulator. Regular dialogue is maintained between the Company and the Trustee Board of the UK Plan to ensure that both the Company and Trustee Board are apprised of the same financial and other information about the Group and the UK Plan. This is pertinent to each being able to contribute to the effective functioning of the UK Plan.

Vesuvius continues to seek ways to de-risk its existing pension plans through a combination of asset matching, buy-in opportunities and, where prudent, voluntary cash contributions.

The total gross defined benefit obligations at 31 December 2020 were £610.0m funded (2019: £590.5m funded) and £88.3m unfunded (2019: £79.3m unfunded). After asset funding there was a net deficit of £2.1m (2019: £8.5m) representing an improvement of £6.4m. The improvement is driven by £9.0m from cash contributions and payments of unfunded benefits and £7.7m from changes to actuarial assumptions (attributable to lower discount rates; updated mortality assumptions and pension membership data). These were offset by additional accrual and administrative expenditure paid for the year of £7.4m and £2.9m from foreign exchange movements.

The majority of the ongoing pension plans are defined contribution plans, where our only obligation is to make contributions, with no further commitments on the level of post-retirement benefits. During 2020, cash contributions of £9.7m (2019: £11.3m) were made into the defined contribution plans and charged to trading profit.

Directors' Report continued

Listing Rule 9.8.4C R Disclosures

The following disclosures are made in compliance with the Financial Conduct Authority's Listing Rule 9.8.4C R:

	Disclosure requirements under LR 9.8.4R	Reference/Location
(1)	Interest capitalised by the Group during the year	None
(2)	Publication of unaudited financial information	Not applicable
(3)	Details of any Long-Term Incentive schemes	Pages 124 and 125
(4)	Director waiver of emoluments	The Directors responded to the COVID-19 crisis by sacrificing 20% of their salary and fees for six months during 2020. For further details please see page 120
(5)	Director waiver of future emoluments	Not applicable
(6)	Allotment for cash of equity securities made during the year	Not applicable
(7)	Allotment for cash of equity securities made by a major unlisted subsidiary during the year	Not applicable
(8)	Details of participation of parent undertaking in any placing made during the year	Not applicable
(9)	Details of relevant material contracts in which a Director or controlling shareholder was interested during the year	Not applicable
(10)	Contracts for the provision of services by a controlling shareholder during the year	Not applicable
(11)	Details of any arrangement under which a shareholder has waived or agreed to waive any dividends	Vesuvius plc holds 7,271,174 of its 10 pence ordinary shares as Treasury shares. No dividends are payable on these shares. The Trustee of the Company's ESOP, has agreed to waive, on an ongoing basis, any dividends payable on shares it holds in trust for use under the Company's Employee Share Plans, details of which can be found on pages 133, 137, 138, 139 and 146
(12)	Details of where a shareholder has agreed to waive future dividends	See above
(13)	Statements relating to controlling shareholders and ensuring company independence	Not applicable

The Directors' Report has been approved by the Board and is signed, by order of the Board, by the Secretary of the Company.

Henry Knowles
Company Secretary

3 March 2021

Statement of Directors' Responsibilities in respect of the Annual Report and Financial Statements

The Directors are responsible for preparing the Annual Report and Financial Statements in accordance with applicable law and regulation.

Company law requires the Directors to prepare financial statements for each financial year. Under that law the Directors have prepared the Group financial statements in accordance with international accounting standards in conformity with the requirements of the Companies Act 2006. Additionally, the Financial Conduct Authority's Disclosure Guidance and Transparency Rules require the Directors to prepare the group financial statements in accordance with international financial reporting standards adopted pursuant to Regulation (EC) No 1606/2002 as it applies in the European Union. The company financial statements have been prepared in accordance with United Kingdom Generally Accepted Accounting Practice (United Kingdom Accounting Standards, comprising FRS 101 "Reduced Disclosure Framework", and applicable law).

Under company law, the Directors must not approve the financial statements unless they are satisfied that they give a true and fair view of the state of affairs of the Group and Company and of the profit or loss of the Group and Company for that period. In preparing the financial statements, the Directors are required to:

> Select suitable accounting policies and then apply them consistently

> State whether for the Group, international accounting standards in conformity with the requirements of the Companies Act 2006 and international financial reporting standards adopted pursuant to Regulation (EC) No 1606/2002 as it applies in the European Union have been followed for the Group financial statements and for the Company, United Kingdom Accounting Standards, comprising FRS 101 have been followed for the company financial statements, subject to any material departures disclosed and explained in the financial statements

> Make judgements and accounting estimates that are reasonable and prudent

> Prepare the financial statements on the going concern basis unless it is inappropriate to presume that the Group and Company will continue in business

The Directors are also responsible for safeguarding the assets of the Group and Company and hence for taking reasonable steps for the prevention and detection of fraud and other irregularities.

The Directors are responsible for keeping adequate accounting records that are sufficient to show and explain the Group's and Company's transactions and disclose with reasonable accuracy at any time the financial position of the Group and Company and enable them to ensure that the financial statements and the Directors' Remuneration Report comply with the Companies Act 2006 and, as regards the Group Financial Statements, Article 4 of the IAS Regulation.

The Directors are responsible for the maintenance and integrity of the Company's website. Legislation in the United Kingdom governing the preparation and dissemination of financial statements may differ from legislation in other jurisdictions.

Directors' confirmations

The Directors consider that the annual report and financial statements, taken as a whole, is fair, balanced and understandable and provides the information necessary for shareholders to assess the Group and Company's position and performance, business model and strategy.

Each of the Directors, whose names and functions are listed below, confirm that, to the best of their knowledge:

> The Company Financial Statements, which have been prepared in accordance with United Kingdom Generally Accepted Accounting Practice (United Kingdom Accounting Standards, comprising FRS 101 Reduced Disclosure Framework, and applicable law), give a true and fair view of the assets, liabilities, financial position and loss of the Company

> The Group Financial Statements, which have been prepared in accordance with international accounting standards in conformity with the requirements of the Companies Act 2006 and international financial reporting standards adopted pursuant to Regulation (EC) No 1606/2002 as it applies in the European Union, give a true and fair view of the assets, liabilities, financial position and profit of the Group

> The Strategic Report includes a fair review of the development and performance of the business and the position of the Group and Company, together with a description of the principal risks and uncertainties that the Group faces

The names and functions of the Directors of Vesuvius plc are as follows:

John McDonough CBE	Chairman
Patrick André	Chief Executive
Guy Young	Chief Financial Officer
Kath Durrant	Non-executive Director
Hock Goh	Non-executive Director
Friederike Helfer	Non-executive Director
Jane Hinkley	Non-executive Director and Chairman of the Remuneration Committee
Douglas Hurt	Non-executive Director, Senior Independent Director and Chairman of the Audit Committee
Holly Koeppel	Non-executive Director

On behalf of the Board

Guy Young
Chief Financial Officer

3 March 2021

Independent auditors' report to the members of Vesuvius plc

Report on the audit of the financial statements

Opinion

In our opinion:

> Vesuvius plc's Group financial statements and Company financial statements (the "financial statements") give a true and fair view of the state of the Group's and of the Company's affairs as at 31 December 2020 and of the Group's profit and the Group's cash flows for the year then ended;

> the Group financial statements have been properly prepared in accordance with international accounting standards in conformity with the requirements of the Companies Act 2006;

> the Company financial statements have been properly prepared in accordance with United Kingdom Generally Accepted Accounting Practice (United Kingdom Accounting Standards, comprising FRS 101 "Reduced Disclosure Framework", and applicable law); and

> the financial statements have been prepared in accordance with the requirements of the Companies Act 2006.

We have audited the financial statements, included within the Annual Report and Financial Statements (the "Annual Report"), which comprise: the Group and Company Balance Sheets as at 31 December 2020; the Group Income Statement and Group Statement of Comprehensive Income, the Group Statement of Cash Flows and the Group and Company Statements of Changes in Equity for the year then ended; and the Group and Company notes to the financial statements, which include a description of the significant accounting policies.

Our opinion is consistent with our reporting to the Audit Committee.

Separate opinion in relation to international financial reporting standards adopted pursuant to Regulation (EC) No 1606/2002 as it applies in the European Union

As explained in note 2 to the Group financial statements, the Group, in addition to applying international accounting standards in conformity with the requirements of the Companies Act 2006, has also applied international financial reporting standards adopted pursuant to Regulation (EC) No 1606/2002 as it applies in the European Union.

In our opinion, the Group financial statements have been properly prepared in accordance with international financial reporting standards adopted pursuant to Regulation (EC) No 1606/2002 as it applies in the European Union.

Basis for opinion

We conducted our audit in accordance with International Standards on Auditing (UK) ("ISAs (UK)") and applicable law. Our responsibilities under ISAs (UK) are further described in the Auditors' responsibilities for the audit of the financial statements section of our report. We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Independence

We remained independent of the Group in accordance with the ethical requirements that are relevant to our audit of the financial statements in the UK, which includes the FRC's Ethical Standard, as applicable to listed public interest entities, and we have fulfilled our other ethical responsibilities in accordance with these requirements.

To the best of our knowledge and belief, we declare that non-audit services prohibited by the FRC's Ethical Standard were not provided to the Group.

Other than those disclosed in note 6 to the financial statements, we have provided no non-audit services to the Group in the period under audit.

Our audit approach

Overview

Audit scope

> Our audit included full scope audits of 17 components and specific audit procedures on certain balances and transactions for 9 additional components.

> Taken together, the components at which either full scope audit work or specified audit procedures were performed enabled us to get coverage on 68% of revenue, 74% of profit before tax and 79% of profit before tax and separately reported items (Headline profit before tax).

Key audit matters

> Impairment of goodwill and other non-financial assets (Group)

> Impairment of investment in subsidiaries (Company)

> Provisions for exposures (Group)

> Impact of COVID-19 (Group and Company)

Materiality

> Overall Group materiality: £7,000,000 (2019: £8,600,000) based on approximately 4.6% of a 3 year average profit before tax and separately reported items ('Headline profit before tax').

> Overall Company materiality: £7,000,000 (2019: £8,600,000) based on 1% of total assets, capped at the level of overall Group materiality.

> Performance materiality: £5,250,000 (Group) and £5,250,000 (Company).

The scope of our audit

As part of designing our audit, we determined materiality and assessed the risks of material misstatement in the financial statements.

Capability of the audit in detecting irregularities, including fraud

Irregularities, including fraud, are instances of non-compliance with laws and regulations. We design procedures in line with our responsibilities, outlined in the Auditors' responsibilities for the audit of the financial statements section, to detect material misstatements in respect of irregularities, including fraud. The extent to which our procedures are capable of detecting irregularities, including fraud, is detailed below.

Based on our understanding of the Group and industry, we identified that the principal risks of non-compliance with laws and regulations related to tax, international trade restrictions, health and safety and anti-bribery, and we considered the extent to which non-compliance might have a material effect on the financial statements. We also considered those laws and regulations that have a direct impact on the preparation of the financial statements such as the Companies Act 2006 and Listing Rules of the Financial Conduct Authority (FCA). We evaluated management's incentives and opportunities for fraudulent manipulation of the financial statements (including the risk of override of controls) and determined that the principal risks were related to posting inappropriate journal entries and management bias in accounting estimates. The Group engagement team shared this risk assessment with the component auditors so that they could include appropriate audit procedures in response to such risks in their work. Audit procedures performed by the Group engagement team and/or component auditors included:

> Enquiries of Group and local management, those charged with governance, internal audit and the Group's legal counsel (internal and, where relevant, external), including consideration of known or suspected instances of non-compliance with laws and regulations and fraud.

> Understanding and evaluation of the design and implementation of management's controls designed to prevent and detect irregularities, including compliance, whistleblowing arrangements and the results of management's investigation of such matters.

> Inspecting management reports and Board minutes in relation to health and safety and other compliance matters.

> Reading key correspondence with regulatory authorities, including in respect of provisions for uncertainty over income tax treatments.

> Challenging assumptions and judgements made by management in their critical accounting estimates, in particular relating to impairment of goodwill and non-financial assets, impairment of investment in subsidiaries and provisions for exposures (see related key audit matters below).

> Identifying and testing journal entries, in particular any journal entries posted with unusual account combinations including in respect of journals posted to revenue, cash and other credits to non- revenue accounts in the Group Income Statement.

> Obtained an understanding of the nature of any trade restrictions and our component auditors tested relevant supporting evidence that exists locally.

There are inherent limitations in the audit procedures described above. We are less likely to become aware of instances of non-compliance with laws and regulations that are not closely related to events and transactions reflected in the financial statements. Also, the risk of not detecting a material misstatement due to fraud is higher than the risk of not detecting one resulting from error, as fraud may involve deliberate concealment by, for example, forgery or intentional misrepresentations, or through collusion.

Key audit matters

Key audit matters are those matters that, in the auditors' professional judgement, were of most significance in the audit of the financial statements of the current period and include the most significant assessed risks of material misstatement (whether or not due to fraud) identified by the auditors, including those which had the greatest effect on: the overall audit strategy; the allocation of resources in the audit; and directing the efforts of the engagement team. These matters, and any comments we make on the results of our procedures thereon, 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.

This is not a complete list of all risks identified by our audit.

The impact of COVID-19 is a new key audit matter this year. Provisions for uncertainty over income tax treatments, which was a key audit matter last year, is no longer included because of the assessed decrease in the estimation uncertainty associated with this and therefore reduced relative significance in the audit of the financial statements compared to last year. Otherwise, the key audit matters below are consistent with last year.

Independent auditors' report to the members of Vesuvius plc
continued

Key audit matter	How our audit addressed the key audit matter
Impairment of goodwill and other non-financial assets (Group) At 31 December 2020, the carrying value of goodwill is £617.6 million (2019: £620.2 million). Goodwill arising from acquisitions has an indefinite expected useful life and so is not amortised but rather is tested for impairment at least annually at the cash-generating unit ("CGU") level. Management has determined its CGUs to align with the operating segments, which are Steel Advanced Refractories, Steel Flow Control and Foundry. Steel Sensors and Probes has no goodwill. The Group also carries Property, Plant and Equipment assets of £337.5 million (2019: £337.7 million) and other intangible assets of £78.5 million (2019: £88.3 million). The carrying value of these assets was assessed for impairment as a part of the impairment test performed in respect of the CGUs. Management prepares a Value in Use (VIU) model (discounted cash flow) to test for impairment of the above CGUs. This is based on a Board approved 3 year forecast, of which a terminal value is calculated based on long term growth rates. The VIU model requires estimation of projected future cash flows and involves making key assumptions of revenue growth rates, an appropriate discount rate and long term growth rates for each of the CGUs. In making such future assumptions there is an inherent level of estimation uncertainty to consider. This has become increasingly challenging in 2020 due to the COVID-19 pandemic where further consideration needs to be given to assumptions of recovery and timeframes to achieve this. We focused on valuation due to material carrying value of goodwill and other non-financial assets, and with regard to the increased uncertainties arising from the factors set out above. Refer to Impairment of Tangible and Intangible Assets (Note 17), Critical Accounting Judgements and Estimates (Note 3) and Significant issues and material judgements in the Audit Committee report.	Our audit procedures included: > For each CGU we obtained management's Value in Use model. We ensured the calculations were mathematically accurate and that the valuation methodology conformed with the requirements of IAS 36 'Impairment of Assets'. > For key assumptions made by management in respect of forecast revenue and cash flow growth: – We obtained management's supporting evidence such as the Board approved budget and 3 year strategy plan and agreed the forecast cash flows and underlying assumptions to these. – We also obtained evidence through our own independent research. This included evidence supporting expected periods of recovery to 'pre-COVID' production levels for the CGUs end markets, historical evidence of Vesuvius growth rates and recoveries in cyclical end markets. – We further considered market valuation evidence such as current and target share price and understood any differences. – Our audit evidence supported the cash flows modelled, although in year 3 and into perpetuity it is challenging to obtain definitive evidence, particularly given current uncertainties (see our sensitivities below). > We utilised internal valuations experts to support our audit procedures over the discount rate and long term growth rate assumptions used in the impairment model and sensitised the impacts of changes in the discount rate within our view of a reasonable range. > We remained professionally sceptical of the impacts of forecasting uncertainty, particularly where evidence in later years is more judgemental as set out above. We determined alternative sensitivity scenarios to ascertain the extent of changes in projections that would be required for the goodwill and other non-financial assets to be impaired. These included scaling back year 3 forecasts and factoring in historical levels of forecasting inaccuracy. We did not identify reasonable sensitivities that would result in impairment of any of the CGUs being tested. In addition to the above procedures (which comprised our area of focus), we instructed our component audit teams to evaluate the appropriateness of management impairment indicator assessments performed within territory components. These assessments focused on individual or groups of assets below the levels of the CGUs. Our component teams, under our supervision, did not identify any additional impairments required. From our procedures we concluded that estimates and key assumptions made by management in performing impairment testing, including reasonably possible downside sensitivities which showed no scenarios of impairment, were supported. Appropriate sensitivity disclosures have been included within the Annual Report. Critical Accounting Judgements and Estimates (Note 3) accordingly highlights this area as a critical accounting estimate although it is not expected to materially impact the financial statements in the next 12 months. Our findings were discussed with the Audit Committee.

Key audit matter	How our audit addressed the key audit matter
Impairment of investment in subsidiaries (Company) The Company holds investments in subsidiaries with a total carrying amount of £1,778.0m at 31 December 2020 (2019: £1,778.0 million). IAS 36 'Impairment of assets' requires management to consider whether there are any indicators of impairment in respect of non-financial assets. Due to the quantum of the carrying amount and levels of estimation uncertainty that exist similar to assumptions used in testing for impairment of goodwill and other non-financial assets (Group) this was an area of focus for the audit of the Company. Consistent with the prior year management performed an impairment test at 31 October 2020. This utilises cash flow forecasts used for testing for impairment of the Group's goodwill together with additional considerations of cash flows relevant to the subsidiaries that the Company owns. The judgements and estimates required to determine the cash flow forecasts are aligned with those set out in 'Impairment of goodwill and other non-financial assets (Group)' above. Refer to Investment (Note 7), Critical Accounting Judgements and Estimates (Note 3) in the Company financial statements and Significant issues and material judgements in the Audit Committee report.	Our audit procedures included: > We assessed the results of the Value in Use model used for the impairment test for goodwill and other non-financial assets, together with adjustments made to reflect cash inflows to subsidiaries due from the Company. > Our testing of the Group Value in Use model, including procedures performed over management's model and evidence obtained in respect of key assumptions made is set out in Key audit matter 'Impairment of goodwill and other non-financial assets'. We also compared the carrying value of the investment in subsidiaries and the Group Value in Use to the market capitalisation and market valuation expectations. > We performed sensitivity analyses including consideration of historical forecasting inaccuracies which showed there was no reasonably possible scenarios of impairment when taking account of estimation uncertainty in key assumptions. > This indicated significant headroom in the determined Value in Use and that the investment in subsidiaries balance was not impaired. We reviewed financial statement disclosures and these are consistent with the results of management's testing and our audit evidence. Critical Accounting Judgements and Estimates (Note 3) in the Company financial statements highlights this area as a critical accounting estimate although it is not expected to materially impact the financial statements in the next 12 months. Our findings were discussed with the Audit Committee.
Provisions for exposures (Group) The Group holds a provision for 'Disposal, closure and environmental costs' (which includes provisions relating to legacy legal matters for closed businesses) amounting to £42.2 million (2019: £34.8 million). Determining the quantum of this provision involves modelling and estimation of expected future legal claim volumes and amounts, with the support of an external expert. It also requires the directors to use judgement to determine whether associated insurance recoverable amounts should be recognised within assets. We focused on this area due to the material quantum of the provision and associated insurance asset, and the judgement and estimates involved in determining its valuation. Refer to Critical Accounting Judgements and Estimates (Note 3), Trade and Other Receivables (Note 18), Provisions (Note 30), Contingent Liabilities (Note 32) and Significant issues and material judgements in the Audit Committee report.	Our audit procedures included: > Obtaining management's model of the estimated legal costs, associated insurance recoverable and testing the mathematical accuracy and integrity of this model. > We discussed claims arising, settlements made and expected trends with the Group's in-house and external experts. > We tested the accuracy of historical source data which is used to determine estimates of future trends of volumes and amounts of claims, to supporting claim documentation. > We utilised our own internal expert to support our audit of the key assumptions and to provide a view of a range of potential outcomes due to the estimation uncertainty involved. We independently sensitised the model for changes in the average cost of claims, increase in the level of larger value claims and duration over which claims are expected to be received. > We inspected evidence of available insurance cover, the routine and consistent collection of this and considered the financial condition of insurance providers to gain comfort over the recognition and recoverability of the insurance asset. We also verified that this was appropriately presented as gross of the associated provisions (within 'Other receivables'). From our procedures, we concluded the amount of the provision held was within our acceptable range, albeit towards the optimistic end of the range. We challenged management in respect of the level of disclosure and that these adequately explain estimation uncertainty of key assumptions including over the long term. Additional disclosure of the indicative sensitivities of the provision amount, for changes in key assumptions has been included. Critical Accounting Judgements and Estimates (Note 3) highlights this area as a critical accounting estimate although it is not expected to materially impact the financial statements in the next 12 months. Our findings were discussed with the Audit Committee.

Independent auditors' report to the members of Vesuvius plc
continued

Key audit matter	How our audit addressed the key audit matter
Impact of COVID-19 (Group and Company) COVID-19 has had a significant impact on the Group and Company during 2020 and this continues into 2021.The directors and management have assessed the impact of the COVID-19 pandemic on the Company and the Group financial statements. (Refer to Going concern (Note 2.3) in the Group financial statements and Going concern (Note 2.2) in the Company financial statements). The main impacts considered: > Potential impairment (see 'Impairment of goodwill and other non-financial assets' above but also consideration of the recognition of deferred tax assets, expected credit losses on financial assets and inventory obsolescence). > Going concern and viability statement as a result of reduced profitability and cash flows and the need to maintain covenants related to debt instruments held. > Determining the appropriate accounting for any government assistance received during the year to support the business during the course of the pandemic. This includes accounting for 'furlough' type assistance of £3.0 million (Note 8) and also the COVID Corporate Financing Facility ('CCFF') of £200 million obtained and later repaid during the year (Note 25). > Ensuring Annual Report and financial statements disclosures explain the impacts of the pandemic, actions taken and ongoing risks arising (including within the going concern and viability statement disclosures).	Our procedures in respect of the 'Impairment of goodwill and other non-financial assets' and 'Impairment of investment in subsidiaries (Company)' are set out in separate key audit matters above. Other procedures we performed included: > Understanding any changes to management assumptions used in making estimates as a result of COVID-19, including those in respect of level of recognition of deferred tax assets, expected credit losses on financial assets and provisions for inventory obsolescence, and that these are supported by audit evidence obtained from either management or externally. From our procedures we concluded that the carrying value of these assets was supportable and management's estimates appropriately reflected the uncertainties arising from COVID-19. > We instructed our component audit teams to ensure this was specifically addressed in testing accounting estimates and we reviewed the results of their testing and findings. > Assessing that disclosures made in the financial statements provide clear explanation of impacts experienced and mitigating actions taken by the Group. > Evaluating management's accounting for the CCFF and furlough type assistance, and that the assistance received was disclosed within the financial statements. > With respect to management's going concern assessment, we evaluated management's base case and downside case focussing on key assumptions together with assessing the Group's available facilities. Further details of our audit procedures and conclusion in respect of going concern are set out separately in this report.

How we tailored the audit scope

We tailored the scope of our audit to ensure that we performed enough work to be able to give an opinion on the financial statements as a whole, taking into account the structure of the Group and the Company, the accounting processes and controls, and the industry in which they operate.

The Vesuvius Group (Vesuvius plc together with its subsidiaries) has operations in 41 countries and has 53 production sites. The Group consolidates financial information through reporting from its components which include divisions and functions at these sites.

Our audit scope was determined by considering the significance of the component's contribution to profit before tax and separately reported items (Headline profit before tax), revenue and contribution to individual financial statement line items, with specific consideration to obtaining sufficient coverage over areas of heightened risk and locations and entities where we identified other areas of higher risk.

We identified two financially significant components. These are located in China and Germany. These comprise 11% of Headline profit before tax and 18% of the Group's revenue. The audit scope, including the financially significant components, comprised 17 components for which we determined that full scope audits would need to be performed and 9 components for which specific audit procedures on certain balances and transactions were performed. This collectively provided audit coverage of 68% of the Group's revenue, 74% of the Group's profit before tax and 79% of the Group's Headline profit before tax. This, together with the additional procedures performed at the Group level, including testing the consolidation process, gave us the evidence we needed for our opinion on the financial statements as a whole.

In establishing the overall approach to the Group audit, we determined the type of work that needed to be performed at the components by us, as the Group engagement team, or by component auditors of other PwC network firms. Where the work was performed by component auditors, we determined the level of involvement and oversight we needed to have in the audit work at those reporting units to be able to conclude whether sufficient appropriate audit evidence had been obtained as a basis for our opinion on the financial statements as a whole. This was achieved through regular communications with the component auditors, attendance at audit clearance meetings by senior team members, meetings with local management, discussion of their audit approach and audit findings with the component teams via video conference, including for certain components with the quality review partner and review of selected component auditors' workpapers. The Group audit team also performed the audit of the Company.

Materiality

The scope of our audit was influenced by our application of materiality. We set certain quantitative thresholds for materiality. These, together with qualitative considerations, helped us to determine the scope of our audit and the nature, timing and extent of our audit procedures on the individual financial statement line items and disclosures and in evaluating the effect of misstatements, both individually and in aggregate on the financial statements as a whole.

Based on our professional judgement, we determined materiality for the financial statements as a whole as follows:

	Financial statements – Group	Financial statements – Company
Overall materiality	£7,000,000 (2019: £8,600,000).	£7,000,000 (2019: £8,600,000).
How we determined it	Approximately 4.6% of 3 year average profit before tax and separately reported items ('Headline profit before tax')	1% of total assets, capped at the level of overall Group materiality
Rationale for benchmark applied	We believe that profit before tax and separately reported items ('Headline profit before tax') provides us with an appropriate basis for determining our overall Group materiality given it is a key measure used by users of the financial statements both internally and externally. Headline profit before tax is an Alternative Performance Measure presented and defined in the Annual Report and Financial Statements. In the current year, due to the volatility caused in the results by COVID-19, a 3 year average of the Headline profit before tax has been used as a benchmark as this provides a more normalised threshold for determining materiality. (2019: Based on 5% of 2019 profit before tax and separately reported items)	We believe that total assets is an appropriate basis for determining materiality for the Company, given this entity is an investment holding company and this is an accepted auditing benchmark. The materiality was capped to the level of Group overall materiality. The Company is not an in-scope component for our Group audit. (2019: 1% of total assets, capped at the level of overall Group materiality)

For each component in the scope of our Group audit, we allocated a materiality that is less than our overall Group materiality. The range of materiality allocated across components was between £600,000 and £5,500,000.

We use performance materiality to reduce to an appropriately low level the probability that the aggregate of uncorrected and undetected misstatements exceeds overall materiality. Specifically, we use performance materiality in determining the scope of our audit and the nature and extent of our testing of account balances, classes of transactions and disclosures, for example in determining sample sizes. Our performance materiality was 75% of overall materiality, amounting to £5,250,000 for the Group financial statements and £5,250,000 for the Company financial statements.

In determining the performance materiality, we considered a number of factors – the history of misstatements, risk assessment and aggregation risk and the effectiveness of controls – and concluded that an amount at the upper end of our normal range was appropriate.

We agreed with the Audit Committee that we would report to them misstatements identified during our audit above £350,000 (Group audit) (2019: £430,000) and £350,000 (Company audit) (2019: £430,000) as well as misstatements below those amounts that, in our view, warranted reporting for qualitative reasons.

Conclusions relating to going concern

Our evaluation of the directors' assessment of the Group's and the Company's ability to continue to adopt the going concern basis of accounting included:

> Evaluating management's base case and downside case for liquidity and available financial resources and obtaining supporting evidence for key assumptions. This included agreeing the underlying cash flow projections to a Board approved forecast, assessing how these forecasts are compiled and assessing the historical accuracy of the forecasts. We also take account of performance and actions able to be taken during the pandemic to date (e.g. cost savings) and assessing available financing facilities and related liquidity headroom.

> Testing the accuracy of cash flow models used to assess available liquidity during the going concern periods disclosed.

> Inspected facility agreements to ensure key terms were considered including covenants.

> Determining alternative sensitivity scenarios to ascertain the impact of changes in assumptions. These included scaling back forecasts and increasing working capital as a percentage of forecast revenue.

> Reading management's disclosures in the financial statements and relevant 'other information' and assessing consistency with the financial statements and our knowledge based on our audit.

Independent auditors' report to the members of Vesuvius plc
continued

Based on the work we have performed, we have not identified any material uncertainties relating to events or conditions that, individually or collectively, may cast significant doubt on the Group's and the Company's ability to continue as a going concern for a period of at least twelve months from when the financial statements are authorised for issue.

In auditing the financial statements, we have concluded that the directors' use of the going concern basis of accounting in the preparation of the financial statements is appropriate.

However, because not all future events or conditions can be predicted, this conclusion is not a guarantee as to the Group's and the Company's ability to continue as a going concern.

In relation to the Company's reporting on how they have applied the UK Corporate Governance Code, we have nothing material to add or draw attention to in relation to the directors' statement in the financial statements about whether the directors considered it appropriate to adopt the going concern basis of accounting.

Our responsibilities and the responsibilities of the directors with respect to going concern are described in the relevant sections of this report.

Reporting on other information

The other information comprises all of the information in the Annual Report other than the financial statements and our auditors' report thereon. The directors are responsible for the other information. Our opinion on the financial statements does not cover the other information and, accordingly, we do not express an audit opinion or, except to the extent otherwise explicitly stated in this report, any form of assurance thereon.

In connection with our audit of the financial statements, our responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements or our knowledge obtained in the audit, or otherwise appears to be materially misstated. If we identify an apparent material inconsistency or material misstatement, we are required to perform procedures to conclude whether there is a material misstatement of the financial statements or a material misstatement of the other information. If, based on the work we have performed, we conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report based on these responsibilities.

With respect to the Strategic report and Directors' Report, we also considered whether the disclosures required by the UK Companies Act 2006 have been included.

Based on our work undertaken in the course of the audit, the Companies Act 2006 requires us also to report certain opinions and matters as described below.

Strategic report and Directors' Report

In our opinion, based on the work undertaken in the course of the audit, the information given in the Strategic report and Directors' Report for the year ended 31 December 2020 is consistent with the financial statements and has been prepared in accordance with applicable legal requirements.

In light of the knowledge and understanding of the Group and Company and their environment obtained in the course of the audit, we did not identify any material misstatements in the Strategic report and Directors' Report.

Directors' Remuneration

In our opinion, the part of the Directors' Remuneration Report to be audited has been properly prepared in accordance with the Companies Act 2006.

Corporate governance statement

The Listing Rules require us to review the directors' statements in relation to going concern, longer-term viability and that part of the corporate governance statement relating to the Company's compliance with the provisions of the UK Corporate Governance Code specified for our review. Our additional responsibilities with respect to the corporate governance statement as other information are described in the Reporting on other information section of this report.

Based on the work undertaken as part of our audit, we have concluded that each of the following elements of the corporate governance statement, included within the 'Risk, viability and going concern' section is materially consistent with the financial statements and our knowledge obtained during the audit, and we have nothing material to add or draw attention to in relation to:

> The directors' confirmation that they have carried out a robust assessment of the emerging and principal risks;

> The disclosures in the Annual Report and Financial Statements that describe those principal risks, what procedures are in place to identify emerging risks and an explanation of how these are being managed or mitigated;

> The directors' statement in the financial statements about whether they considered it appropriate to adopt the going concern basis of accounting in preparing them, and their identification of any material uncertainties to the Group's and Company's ability to continue to do so over a period of at least twelve months from the date of approval of the financial statements;

> The directors' explanation as to their assessment of the Group's and Company's prospects, the period this assessment covers and why the period is appropriate; and

> The directors' statement as to whether they have a reasonable expectation that the Company will be able to continue in operation and meet its liabilities as they fall due over the period of its assessment, including any related disclosures drawing attention to any necessary qualifications or assumptions.

Our review of the directors' statement regarding the longer-term viability of the Group was substantially less in scope than an audit and only consisted of making inquiries and considering the directors' process supporting their statement; checking that the statement is in alignment with the relevant provisions of the UK Corporate Governance Code; and considering whether the statement is consistent with the financial statements and our knowledge and understanding of the Group and Company and their environment obtained in the course of the audit.

In addition, based on the work undertaken as part of our audit, we have concluded that each of the following elements of the corporate governance statement is materially consistent with the financial statements and our knowledge obtained during the audit:

> The directors' statement that they consider the Annual Report, taken as a whole, is fair, balanced and understandable, and provides the information necessary for the members to assess the Group's and Company's position, performance, business model and strategy;

> The section of the Annual Report that describes the review of effectiveness of risk management and internal control systems; and

> The section of the Annual Report describing the work of the Audit Committee.

We have nothing to report in respect of our responsibility to report when the directors' statement relating to the Company's compliance with the Code does not properly disclose a departure from a relevant provision of the Code specified under the Listing Rules for review by the auditors.

Responsibilities for the financial statements and the audit

Responsibilities of the directors for the financial statements

As explained more fully in the Statement of Directors' Responsibilities in respect of the Annual Report and Financial Statements, the directors are responsible for the preparation of the financial statements in accordance with the applicable framework and for being satisfied that they give a true and fair view. The directors are also responsible for such internal control as they determine is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the directors are responsible for assessing the Group's and the Company's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the directors either intend to liquidate the Group or the Company or to cease operations, or have no realistic alternative but to do so.

Auditors' responsibilities for the audit of the financial statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs (UK) will always detect a material misstatement when it exists. 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.

Our audit testing might include testing complete populations of certain transactions and balances, possibly using data auditing techniques. However, it typically involves selecting a limited number of items for testing, rather than testing complete populations. We will often seek to target particular items for testing based on their size or risk characteristics. In other cases, we will use audit sampling to enable us to draw a conclusion about the population from which the sample is selected.

A further description of our responsibilities for the audit of the financial statements is located on the FRC's website at: www.frc.org.uk/auditorsresponsibilities. This description forms part of our auditors' report.

Use of this report

This report, including the opinions, has been prepared for and only for the Company's members as a body in accordance with Chapter 3 of Part 16 of the Companies Act 2006 and for no other purpose. We do not, in giving these opinions, accept or assume responsibility for any other purpose or to any other person to whom this report is shown or into whose hands it may come save where expressly agreed by our prior consent in writing.

Other required reporting

Companies Act 2006 exception reporting

Under the Companies Act 2006 we are required to report to you if, in our opinion:

> we have not obtained all the information and explanations we require for our audit; or

> adequate accounting records have not been kept by the Company, or returns adequate for our audit have not been received from branches not visited by us; or

> certain disclosures of directors' remuneration specified by law are not made; or

> the Company financial statements and the part of the Directors' Remuneration Report to be audited are not in agreement with the accounting records and returns; or

> a corporate governance statement has not been prepared by the Company.

We have no exceptions to report arising from this responsibility.

Appointment

Following the recommendation of the Audit Committee, we were appointed by the members on 10 May 2017 to audit the financial statements for the year ended 31 December 2017 and subsequent financial periods. The period of total uninterrupted engagement is 4 years, covering the years ended 31 December 2017 to 31 December 2020.

Darryl Phillips (Senior Statutory Auditor)
for and on behalf of PricewaterhouseCoopers LLP
Chartered Accountants and Statutory Auditors
London

3 March 2021

Financial Statements

Group Income Statement

For the year ended 31 December 2020

		2020			2019		
	Notes	(1) Headline performance £m	(1) Separately reported items £m	Total £m	(1) Headline performance £m	(1) Separately reported items £m	Total £m
Continuing operations							
Revenue	4, 5	**1,458.3**	**—**	**1,458.3**	1,710.4	—	1,710.4
Manufacturing costs		**(1,084.7)**	**—**	**(1,084.7)**	(1,233.5)	—	(1,233.5)
Administration, selling and distribution costs		**(272.2)**	**—**	**(272.2)**	(295.5)	—	(295.5)
Trading profit (2)	5	**101.4**	**—**	**101.4**	181.4	—	181.4
Amortisation of acquired intangible assets	16	**—**	**(9.9)**	**(9.9)**	—	(10.0)	(10.0)
Restructuring charges	7	**—**	**(6.1)**	**(6.1)**	—	(39.8)	(39.8)
Vacant site remediation costs	2	**—**	**(10.3)**	**(10.3)**	—	(4.1)	(4.1)
GMP equalisation charge	26	**—**	**(0.8)**	**(0.8)**	—	—	—
Operating profit/(loss)		**101.4**	**(27.1)**	**74.3**	181.4	(53.9)	127.5
Finance expense		**(18.8)**	**—**	**(18.8)**	(19.5)	—	(19.5)
Finance income		**7.9**	**—**	**7.9**	8.5	—	8.5
Net finance costs	9	**(10.9)**	**—**	**(10.9)**	(11.0)	—	(11.0)
Share of post-tax profit of joint ventures and associates	33	**1.1**	**—**	**1.1**	1.0	1.1	2.1
Profit/(loss) before tax		**91.6**	**(27.1)**	**64.5**	171.4	(52.8)	118.6
Income tax (charge)/credits	10	**(24.4)**	**5.7**	**(18.7)**	(43.8)	11.7	(32.1)
Profit/(loss)		**67.2**	**(21.4)**	**45.8**	127.6	(41.1)	86.5
Profit/(loss) attributable to:							
Owners of the parent		**62.7**	**(21.4)**	**41.3**	121.4	(41.1)	80.3
Non-controlling interests		**4.5**	**—**	**4.5**	6.2	—	6.2
Profit/(loss)		**67.2**	**(21.4)**	**45.8**	127.6	(41.1)	86.5
Earnings per share — pence	11						
Total operations — basic				**15.3**			29.8
— diluted				**15.2**			29.6

(1) Headline performance is a non-GAAP measure which is defined in Note 4.1. Separately reported items is defined in Note 2.5.

(2) Trading profit is defined in Note 4.4.

The above results were derived from continuing operations. The separately reported items would form part of Administration, selling and distribution costs if classified within headline performance, which including these amounts would total £299.3m (2019: £349.4m).

Group Statement of Comprehensive Income

For the year ended 31 December 2020

	Notes	2020 £m	2019 £m
Profit		45.8	86.5
Items that will not subsequently be reclassified to Income Statement			
Remeasurement of defined benefit liabilities/assets	26.6	7.7	(3.6)
Income tax relating to items not reclassified	10.4	(3.2)	1.9
Items that may subsequently be reclassified to Income Statement			
Exchange differences on translation of the net assets of foreign operations		(14.9)	(73.4)
Reclassification of foreign currency translation reserve on disposal of share in joint venture		—	(1.1)
Exchange differences on translation of net investment hedges	23	(9.7)	14.1
Net change in costs of hedging		0.4	—
Change in the fair value of the hedging instrument		(8.1)	
Amounts reclassified from the income statement		6.3	—
Other comprehensive loss, net of income tax		(21.5)	(62.1)
Total comprehensive income		24.3	24.4
Total comprehensive income attributable to:			
Owners of the parent		22.0	20.6
Non-controlling interests		2.3	3.8
Total comprehensive income		24.3	24.4

The above results were derived from continuing operations.

Group Statement of Cash Flows

For the year ended 31 December 2020

	Notes	2020 £m	2019 £m
Cash flows from operating activities			
Cash generated from operations	12	193.7	240.7
Interest paid		(18.9)	(17.3)
Interest received		5.2	5.2
Net interest paid		(13.7)	(12.1)
Income taxes paid		(27.5)	(44.5)
Net cash inflow from operating activities		152.5	184.1
Cash flows from investing activities			
Capital expenditure		(40.5)	(65.4)
Proceeds from the sale of property, plant and equipment		1.1	3.7
Proceeds from the sale of assets classified as held for sale		—	1.8
Acquisition of subsidiaries and joint ventures, net of cash acquired	20	(1.4)	(32.7)
Disposal of joint ventures, net of cash disposed		—	6.8
Dividends received from joint ventures		2.3	0.1
Net cash outflow from investing activities		(38.5)	(85.7)
Net cash inflow before financing activities		114.0	98.4
Cash flows from financing activities			
Proceeds from borrowings	14	320.4	154.6
Repayment of borrowings	14	(438.6)	(169.8)
Settlement of derivatives	25	1.4	(5.1)
Purchase of ESOP shares	22	—	—
Dividends paid to equity shareholders	24	(8.4)	(53.9)
Dividends paid to non-controlling shareholders		(1.9)	(2.8)
Net cash outflow from financing activities		(127.1)	(77.0)
Net (decrease)/increase in cash and cash equivalents	14	(13.1)	21.4
Cash and cash equivalents at 1 January		222.1	213.4
Effect of exchange rate fluctuations on cash and cash equivalents	14	(2.2)	(12.7)
Cash and cash equivalents at 31 December	13	206.8	222.1

Alternative performance measure (non-statutory):

	2020 £m	2019 £m
Free cash flow (Note 4.11)		
Net cash inflow/(outflow) from operating activities	152.5	184.1
Capital expenditure	(40.5)	(65.4)
Proceeds from the sale of property, plant and equipment	1.1	3.7
Proceeds from the sale of assets classified as held for sale	—	1.8
Dividends received from joint ventures	2.3	0.1
Dividends paid to non-controlling shareholders	(1.9)	(2.8)
Free cash flow (Note 4.11)	113.5	121.5

Group Balance Sheet
As at 31 December 2020

	Notes	2020 £m	2019 £m
Assets			
Property, plant and equipment	15	**337.5**	337.7
Intangible assets	16	**696.1**	708.5
Employee benefits – surpluses	26	**117.1**	102.6
Interests in joint ventures and associates	33	**12.1**	12.7
Investments		**0.7**	0.8
Income tax receivable		**—**	—
Deferred tax assets	10	**96.1**	94.9
Other receivables	18	**18.6**	22.1
Derivative financial instruments	25	**—**	0.5
Total non-current assets		**1,278.2**	1,279.8
Cash and short-term deposits	13	**209.7**	229.2
Inventories	19	**187.3**	212.9
Trade and other receivables	18	**369.9**	379.6
Income tax receivable	10	**3.7**	2.9
Derivative financial instruments	25	**0.2**	0.1
Assets classified as held for sale		**0.9**	—
Total current assets		**771.7**	824.7
Total assets		**2,049.9**	2,104.5
Equity			
Issued share capital	21	**27.8**	27.8
Retained earnings	22	**2,502.9**	2,463.1
Other reserves	23	**(1,451.3)**	(1,427.5)
Equity attributable to the owners of the parent		**1,079.4**	1,063.4
Non-controlling interests		**51.4**	51.0
Total equity		**1,130.8**	1,114.4
Liabilities			
Interest-bearing borrowings	25	**333.1**	303.2
Employee benefits – liabilities	26	**119.2**	111.1
Other payables	28	**13.2**	15.1
Provisions	30	**34.0**	31.1
Deferred tax liabilities	10	**43.9**	43.6
Derivative financial instruments	25	**7.0**	—
Total non-current liabilities		**550.4**	504.1
Interest-bearing borrowings	25	**45.0**	171.7
Trade and other payables	28	**288.7**	273.6
Income tax payable	10	**12.2**	14.3
Provisions	30	**22.8**	25.7
Derivative financial instruments	25	**—**	0.7
Total current liabilities		**368.7**	486.0
Total liabilities		**919.1**	990.1
Total equity and liabilities		**2,049.9**	2,104.5

Company number 8217766

The Financial Statements on pages 158 to 213 were approved and authorised for issue by the Directors on 3 March 2021 and signed on their behalf by:

Patrick André
Chief Executive

Guy Young
Chief Financial Officer

Group Statement of Changes in Equity
For the year ended 31 December 2020

	Issued share capital £m	Other reserves £m	Retained earnings £m	Owners of the parent £m	Non-controlling interests £m	Total equity £m
As at 1 January 2019	27.8	(1,369.5)	2,433.9	1,092.2	50.0	1,142.2
Profit	—	—	80.3	80.3	6.2	86.5
Remeasurement of defined benefit liabilities/assets	—	—	(3.6)	(3.6)	—	(3.6)
Income tax relating to items not reclassified	—	—	1.9	1.9	—	1.9
Exchange differences on translation of the net assets of foreign operations	—	(71.0)	—	(71.0)	(2.4)	(73.4)
Reclassification of foreign currency translation reserve on disposal of share in joint venture	—	(1.1)	—	(1.1)	—	(1.1)
Exchange differences on translation of net investment hedges	—	14.1	—	14.1	—	14.1
Income tax relating to items that may be reclassified	—	—	—	—	—	—
Other comprehensive (loss) net of income tax	—	(58.0)	(1.7)	(59.7)	(2.4)	(62.1)
Total comprehensive income/(loss)	—	(58.0)	78.6	20.6	3.8	24.4
Recognition of share-based payments	—	—	4.5	4.5	—	4.5
Dividends paid (Note 24)	—	—	(53.9)	(53.9)	(2.8)	(56.7)
Total transactions with owners	—	—	(49.4)	(49.4)	(2.8)	(52.2)
As at 1 January 2020	27.8	(1,427.5)	2,463.1	1,063.4	51.0	1,114.4
Profit	—	—	41.3	41.3	4.5	45.8
Remeasurement of defined benefit liabilities/assets	—	—	7.7	7.7	—	7.7
Income tax relating to items not reclassified	—	—	(3.2)	(3.2)	—	(3.2)
Exchange differences on translation of the net assets of foreign operations	—	(12.7)	—	(12.7)	(2.2)	(14.9)
Exchange differences on translation of net investment hedges	—	(9.7)	—	(9.7)	—	(9.7)
Net change in costs of hedging	—	0.4	—	0.4	—	0.4
Change in the fair value of the hedging instrument	—	(8.1)	—	(8.1)	—	(8.1)
Amounts reclassified from the income statement	—	6.3	—	6.3	—	6.3
Income tax relating to items that may be reclassified	—	—	—	—	—	—
Other comprehensive (loss) net of income tax	—	(23.8)	4.5	(19.3)	(2.2)	(21.5)
Total comprehensive income/(loss)	—	(23.8)	45.8	22.0	2.3	24.3
Recognition of share-based payments	—	—	2.4	2.4	—	2.4
Dividends paid (Note 24)	—	—	(8.4)	(8.4)	(1.9)	(10.3)
Total transactions with owners	—	—	(6.0)	(6.0)	(1.9)	(7.9)
As at 31 December 2020	27.8	(1,451.3)	2,502.9	1,079.4	51.4	1,130.8

Notes to the Group Financial Statements

1. General Information

Vesuvius plc ('Vesuvius' or 'the Company') is a public company limited by shares. It is incorporated and domiciled in England and Wales, United Kingdom, and listed on the London Stock Exchange. The nature of the operations and principal activities of the Company and its subsidiary and joint venture companies ('the Group') is set out in the Strategic Report on pages 1 to 88 and its registered address is shown on page 223.

2. Basis of Preparation

2.1 Basis of accounting

The Group Financial Statements have been prepared in accordance with International Accounting Standards in conformity with the requirements of the Companies Act 2006 (IFRS) and the applicable legal requirements of the Companies Act 2006. In addition to complying with International Accounting Standards in conformity with the requirements of the Companies Act 2006, the Group Financial Statements also comply with International Financial Reporting Standards adopted pursuant to Regulation (EC) No 1606/2002 as it applies in the European Union. The Financial Statements have been prepared under the historical cost convention, with the exception of fair value measurement applied to defined benefit pension plans, certain provisions, investments and derivative financial instruments.

2.2 Basis of consolidation

The Group Financial Statements incorporate the Financial Statements of the Company and entities controlled directly and indirectly by the Company (its 'subsidiaries'). Control exists when the Company has the power to direct the relevant activities of an entity that significantly affect the entity's return so as to have rights to the variable return from its activities. In assessing whether control exists, potential voting rights that are currently exercisable are taken into account. The results of subsidiaries acquired or disposed of during the year are included in the Group Income Statement from the effective date of acquisition or up to the effective date of disposal, as appropriate.

The principal accounting policies applied in the preparation of these Group Financial Statements are set out in the Notes. These policies have been consistently applied to all of the years presented, unless otherwise stated. Where necessary, adjustments are made to the financial statements of subsidiaries to bring their accounting policies into line with those detailed herein to ensure that the Group Financial Statements are prepared on a consistent basis. All intra-Group transactions, balances, income and expenses are eliminated on consolidation.

Non-controlling interests in the net assets of consolidated subsidiaries are identified separately from the Group's interest therein. Non-controlling interests consist of the amount of those interests at the date of the original business combination together with the non-controlling interests' share of profit or loss, each component of other comprehensive income, less dividends paid since the date of the combination. Total comprehensive income is attributed to the non-controlling interests even if this results in the non-controlling interests having a deficit balance.

2.3 Going concern

The COVID-19 pandemic has had a significant impact on business activity in all of Vesuvius' end markets. The World Steel Association reported that, in 2020, steel production in the world (excluding China) declined 8.2% year-on-year. The impact on our Foundry Division has been even greater, primarily as a result of significant declines in automotive production.

The impacts of COVID-19 on the Group have included:

> A 15% decline in revenues in 2020 compared with the same period in 2019

> The temporary and short-lived closure of our plants in South Africa, Malaysia, Argentina and India due to national lockdowns. As of 1 May 2020, all operations had been reopened

In response to the sudden and significant decline in business activity, the Group took the following actions:

> Significant cost reduction and cash preservation initiatives, in addition to the £20.6m of recurring savings from our restructuring programmes which we delivered during the year

> Cost reduction initiatives mentioned above delivered savings of £39.0m in 2020 (£15.9m in reduced employment costs, £11.8m in reduced discretionary spend and a reduction in planned employee incentives of £11.3m). The savings include:

- restricting all discretionary expenses
- a hiring freeze on all non-critical roles
- accessing government programmes to reduce labour costs, in line with available local regulatory options, together with other flexible workforce solutions
- the Board and the Group Executive Committee voluntarily reduced their fees and salary by 20% for six months

> £21m (c.34%) reduction in our net capital expenditures in 2020 compared with 2019

> c.£38m saving from withdrawal of the final dividend for 2019

> Deferral of tax and social security payments whenever possible in accordance with local legislation

In April 2020, Vesuvius also took steps to boost its liquidity, through borrowing £200m from the Bank of England's Covid Corporate Financing Facility (CCFF) programme and raising c.£115m ($140m) from the US private placement (USPP) market.

The £200m borrowed from the Bank of England was due to mature in March 2021, but was repaid early in September 2020, as a result of our positive free cash flow generation in the preceding months and early signs of marginally improving levels of business activity. The funds had been drawn down as a liquidity buffer in case of an extreme and prolonged downturn.

The USPP fundraising raised an equivalent amount to an existing $140m USPP which was due to mature in December 2020, which we repaid early in August 2020. As a result, our net debt/EBITDA covenant increased to 3.25x from 3.0x previously. Excluding IFRS 16 lease liabilities, which is consistent with the calculation under our debt covenants, net debt/LTM EBITDA was 1.0x at 31 December 2020, broadly in-line with the level at year-end 2019.

The Group's available committed liquidity stood at £437m at year-end 2020, up from £354m at year-end 2019, as a result of the Group's cash flow generation, which benefited from a reduction in working capital due to the decline in business activity.

The Directors have prepared cash flow forecasts for the Group for a period in excess of 12 months from the date of approval of the Financial Statements. These forecasts reflect an assessment of current and future end-market conditions and their impact on the Group's future trading performance. The analysis undertaken includes a plausible and severe downside scenario based on an assumed protracted COVID-19-related demand impact, despite current markets showing emerging confidence in relation to vaccine roll-out. This downside case is the 'low' case from a strategic planning exercise which we undertook in October 2020, which was approved by the Board and since then the outlook has improved. In this downside scenario, average revenue is 6% lower than Group's base case, and the forecasts show that the Group has significant headroom in terms of both available committed liquidity and required compliance with financial covenants.

On the basis of the exercise described above and the Group's available committed debt facilities, the Directors consider that the Group and Company have adequate resources to continue in operational existence for a period of at least 12 months from the date of signing of these Financial Statements and that there is no material uncertainty in respect of going concern. Accordingly, they continue to adopt a going concern basis in preparing the Financial Statements of the Group and the Company.

2.4 Functional and presentation currency

The Financial Statements are presented in millions of pounds sterling, which is the functional currency of the Company, and rounded to one decimal place. Foreign operations are included in accordance with the policies set out in Note 25.1.

2.5 Disclosure of 'separately reported items'

Columnar presentation

The Group has adopted a columnar presentation for its Group Income Statement, to separately identify headline performance results, as the Directors consider that this gives a useful view of the underlying results of the ongoing business. As part of this presentation format, the Group has adopted a policy of disclosing separately on the face of its Group Income Statement, within the column entitled 'Separately reported items', the effect of any components of financial performance for which the Directors consider separate disclosure would assist users both in a useful understanding of the financial performance achieved for a given year and in making projections of future results.

Separately reported items

Both materiality and the nature of the components of income and expense are considered in deciding upon such presentation. Such items may include, inter alia, the financial effect of exceptional items which occur infrequently, such as major restructuring activity (which may require more than one year to complete), significant movement in the Group's deferred tax balances such as was, for example, caused by the impact of US tax reform in 2017, items reported separately for consistency, such as amortisation charges relating to acquired intangible assets, profits or losses arising on the disposal of continuing or discontinued operations and the taxation impact of the aforementioned items reported separately.

The amortisation charge in respect of intangible assets recognised on business combinations is excluded from the trading results of the Group since they are non-cash charges and are not considered reflective of the core trading performance of the Group.

The Group owns a number of disused properties in the US, which do not form part of our trading operations. Costs are being incurred at one of these sites to address the significant increase in the volume of water run-off occurring from 2019. We have engaged waste management specialists, are taking actions to reduce the level of water (including hydrological studies), improving treatment processes and are in contact with the relevant regulatory authorities. We estimate that it will take a further 18 months to finalise initial works and that there will then be a period for which unavoidable associated and ongoing running costs will be incurred. The charges related to remediation and unavoidable associated and ongoing running costs have been recorded in 2020 and are £10.3m (2019: £4.1m). These non-recurring charges have been treated as a separately reported item. There has been no impact upon performance.

In its adoption of this policy, the Company applies an even-handed approach to both gains and losses and aims to be both consistent and clear in its accounting and disclosure of such items.

2.6 Changes in accounting policies

There have been no changes in accounting policies during the year.

Notes to the Group Financial Statements continued

2. Basis of Preparation continued

2.7 New and revised IFRS

Certain new accounting standards and interpretations have been published that are not mandatory for 31 December 2020 reporting periods and have not been early adopted by the Group. The Group's assessment of the impact of these new standards and interpretations is that they are not expected to have a significant impact on the Group's financial position, performance, cash flows and disclosures.

3. Critical Accounting Judgements and Estimates

Determining the carrying amount of some assets and liabilities and amounts recognised as reported profit requires judgement and/or estimation of the effect of uncertain future events. The major sources of judgement and estimation uncertainty that have a significant risk of resulting in a material adjustment to the carrying amounts of assets and liabilities and amounts recognised as reported profit are noted below. All other accounting policies are included within the respective Notes to the Financial Statements.

3.1 Separately reported items (Judgement)

In accordance with IAS 1, the Group has adopted a policy of disclosing separately on the face of its Group Income Statement, within the column entitled 'Separately reported items', the effect of any components of financial performance for which the Directors consider separate disclosure would assist both in a useful understanding of the financial performance achieved for a given year and in making projections of future results. Both materiality and the nature of the components of income and expense are considered in deciding upon such presentation. Such items may include, inter alia, the financial effect of exceptional items which occur infrequently, such as major restructuring activity, and items reported separately for consistency, such as amortisation charges relating to acquired intangible assets, profits or losses arising on the disposal of continuing or discontinued operations and the taxation impact of the aforementioned exceptional items and other items reported separately.

3.2 Deferred tax asset recognition (Judgement)

The Directors apply judgement in determining whether temporary differences, including historical tax losses, should be recognised as deferred tax assets. The judgement considers the time horizon of expected utilisation and the history of taxable profits generated. See Note 10.4.

3.3 Employee benefits (Estimate)

The Group's Financial Statements include the costs and obligations associated with the provision of pension and other post-retirement benefits to current and former employees. It is the Directors' responsibility to set the assumptions used in determining the key elements of the costs of meeting such future obligations. These assumptions are set after consultation with the Group's actuaries and include those used to determine regular service costs and the financing elements related to the plans' assets and liabilities. Whilst the Directors believe that the assumptions used are appropriate, a change in the assumptions could affect the Group's profit and financial position. The pension obligations are most sensitive to a change in the discount rate and therefore could materially change in the next financial year if the discount rate changes significantly. Sensitivity disclosures are included in Note 26.3.

For the estimates below, the Group does not have any key assumptions concerning the future, or other key sources of estimation uncertainty in the reporting period that are reasonably expected to have a significant risk of causing a material adjustment to the carrying amounts of assets/liabilities within the next financial year. Nonetheless, these estimates have the potential to materially vary over time and are therefore highlighted.

3.4 Impairment testing of intangible assets (Estimate)

Determining whether intangible assets are impaired requires an estimation of the value-in-use of the cash-generating units to which these assets have been allocated. The value-in-use calculation requires estimation of future cash flows expected to arise for the cash-generating unit, the selection of suitable discount rates and the estimation of long-term growth rates. As determining such assumptions is inherently uncertain and subject to future factors, there is the potential these may differ in subsequent periods and therefore materially change the conclusions reached. In light of this, consideration is made each year as to whether sensitivity disclosures are required for reasonably possible changes to assumptions. Sensitivity disclosures are included in Note 17.2.

3.5 Provisions (Judgement and Estimate)

Vesuvius has extensive international operations and is subject to various legal and regulatory regimes, including those covering taxation and environmental matters. Some of the Group's subsidiaries are parties to legacy matter and other lawsuits, certain of which are insured claims, which have arisen in the ordinary course of the operations of the company involved. These provisions relate to businesses that are closed or have been disposed of. Provisions are made for the expected amounts payable in respect of known or probable costs resulting both from these third-party lawsuits or other regulatory requirements. To the extent insurance is in place, an asset is recognised in other receivables in respect of associated insurance reimbursements.

As the resolution of many of the potential obligations for which provision is made is subject to legal or other regulatory process, it requires estimation of the timing, quantum and amount of associated outflows, which are subject to some uncertainty. The Directors use their judgement, using historical evidence, current information and expert experience, to determine whether to recognise a provision, and make appropriate estimates of provisions in the Financial Statements for amounts relating to such matters. Associated assets for insurance recoverable are recognised which involves assessing the likelihood of insurance being paid, which is a critical judgement. The Directors have considered the available cover and the historical evidence, to determine that this is virtually certain. Estimating the amount of provisions and insurance receivable is subject to estimation uncertainty. See Note 30 for further information.

4. Alternative Performance Measures

The Company uses a number of alternative performance measures (APMs) in addition to those reported in accordance with IFRS. The Directors believe that these APMs, listed below, are important when assessing the underlying financial and operating performance of the Group and its divisions, providing management with key insights and metrics in support of the ongoing management of the Group's performance and cash flow. A number of these align with Key Performance Indicators (KPIs) and other key metrics used in the business and therefore are considered useful to also disclose to the users of the Financial Statements. The following APMs do not have standardised meaning prescribed by IFRS and therefore may not be directly comparable with similar measures presented by other companies.

4.1 Headline performance

Headline performance, reported separately on the face of the Group Income Statement, is from continuing operations and before items reported separately on the face of the Group Income Statement.

4.2 Underlying revenue, underlying trading profit and underlying return on sales

Underlying revenue, underlying trading profit and underlying return on sales are the headline equivalents of these measures after adjustments to exclude the effects of changes in exchange rates, business acquisitions and disposals. Reconciliations of underlying revenue and underlying trading profit can be found in the Financial Review. Underlying revenue growth is one of the Group's KPIs and provides an important measure of organic growth of Group businesses between reporting periods, by eliminating the impact of exchange rates, acquisitions, disposals and significant business closures.

4.3 Return on sales (ROS)

ROS is calculated as trading profit divided by revenue. It is one of the Group's KPIs and is used to assess the trading performance of Group businesses. A reconciliation of ROS is included in Note 5.3.

4.4 Trading profit/adjusted EBITA

Trading profit/adjusted EBITA is defined as operating profit before separately reported items. It is one of the Group's KPIs and is used to assess the trading performance of Group businesses. It is also used as one of the targets against which the annual bonuses of certain employees are measured.

4.5 Headline profit before tax

Headline profit before tax, reported separately on the face of the Group Income Statement, is calculated as the net total of trading profit, plus the Group's share of post-tax profit of joint ventures and total net finance costs associated with headline performance. It is one of the Group's KPIs and is used to assess the financial performance of the Group as a whole.

4.6 Effective tax rate (ETR)

The Group's ETR is calculated on the income tax costs associated with headline performance, divided by headline profit before tax and before the Group's share of post-tax profit of joint ventures and associates.

4.7 Headline earnings

Headline earnings is profit after tax before separately reported items attributable to owners of the parent.

4.8 Headline earnings per share

Headline earnings per share is calculated by dividing headline profit before tax less associated income tax costs, attributable to owners of the parent by the weighted average number of ordinary shares in issue during the year. It is one of the Group's KPIs and is used to assess the underlying earnings performance of the Group as a whole. It is also used as one of the targets against which the annual bonuses of certain employees are measured. Headline earnings per share is disclosed in Note 11.

4.9 Adjusted operating cash flow

Adjusted operating cash flow is cash generated from continuing operations before restructuring and net retirement benefit obligations but after deducting capital expenditure net of asset disposals. It is used in calculating the Group's cash conversion.

	2020 £m	2019 £m
Cash generated from continuing operations (Note 12)	**193.7**	240.7
Add: Outflows relating to restructuring charges	**16.7**	30.0
Add: Net retirement benefit obligations	**2.3**	5.1
Less: Capital expenditure	**(40.5)**	(65.4)
Add: Vacant site remediation costs	**1.9**	1.8
Add: Proceeds from the sale of property, plant and equipment	**1.1**	3.7
Add: Proceeds from the sale of assets classified as held for sale	**—**	1.8
Adjusted operating cash flow	**175.2**	217.7
Trading profit	**101.4**	181.4
Cash conversion	**173%**	120%

Notes to the Group Financial Statements continued

4. Alternative Performance Measures continued

4.10 Cash conversion

Cash conversion is calculated as adjusted operating cash flow from continuing operations divided by trading profit. It is useful for measuring the rate at which cash is generated from trading profit. It is also used as one of the targets against which the annual bonuses of certain employees are measured. The calculation of cash conversion is detailed in Note 4.9 above.

4.11 Free cash flow

Free cash flow is defined as net cash flow from operating activities after net outlays for the purchase and sale of property, plant and equipment, dividends from joint ventures and dividends paid to non-controlling shareholders. It is one of the Group's KPIs and is used to assess the underlying cash generation of the Group and is one of the measures used in monitoring the Group's capital. A reconciliation of free cash flow is included underneath the Group Statement of Cash Flows.

The definition of free cash flow has been amended such that it includes additional funding contributions to Group pension plans. The prior year free cash flow has been restated accordingly. The impact of the restatement to the 2019 free cash flow is immaterial.

4.12 Average trade working capital to sales ratio

The average trade working capital to sales ratio is calculated as the percentage of average trade working capital balances to the total revenue for the previous 12 months, at constant currency. Average trade working capital (comprising inventories, trade receivables and trade payables) is calculated as the average of the 13 previous month-end balances. It is one of the Group's KPIs and is useful for measuring the level of working capital used in the business and is one of the measures used in monitoring the Group's capital.

	2020 £m	2019 £m
Average trade working capital	337.8	410.2
Total revenue	1,458.3	1,710.4
Average trade working capital to sales ratio	23.2%	24.0%

4.13 Adjusted earnings before interest, tax, depreciation and amortisation (adjusted EBITDA)

Adjusted EBITDA is calculated as the total of trading profit before depreciation and amortisation of non-acquired intangible assets. It is used in the calculation of the Group's interest cover and net debt to adjusted EBITDA ratios. A reconciliation of adjusted EBITDA is included in Note 5.

4.14 Net interest payable on borrowings

Net interest payable on borrowings is calculated as total interest payable on borrowings less finance income, excluding interest on net retirement benefit obligations, adjustments to discounts and any item separately reported. It is used in the calculation of the Group's interest cover ratio.

	2020 £m	2019 £m
Total interest payable on borrowings (Note 9)	17.9	17.9
Finance income (Note 9)	(7.4)	(7.8)
Net interest payable on borrowings	10.5	10.1

4.15 Interest cover

Interest cover is the ratio of adjusted EBITDA for the last 12 months to net interest payable on borrowings for the last 12 months. It is one of the Group's KPIs and is used to assess the financial position of the Group and its ability to fund future growth.

	2020 £m	2019 £m
Adjusted EBITDA (Note 5)	152.0	231.1
Net interest payable on borrowings	10.5	10.1
Interest cover	14.5x	22.9x

4.16 Net debt

Net debt comprises the net total of current and non-current interest-bearing borrowings (including IFRS 16 lease liabilities), cash and short-term deposits and derivative financial instruments. Net debt is a measure of the Group's net indebtedness to banks and other external financial institutions. A reconciliation of the movement in net debt is included in Note 14.

4.17 Net debt to adjusted EBITDA

Net debt to adjusted EBITDA is the ratio of net debt at the year-end to adjusted EBITDA for that year. It is one of the Group's KPIs and is used to assess the financial position of the Group and its ability to fund future growth and is one of the measures used in monitoring the Group's capital.

	2020 £m	2019 £m
Net debt (Note 14)	175.1	245.8
Adjusted EBITDA (Note 5)	152.0	231.1
Net debt to adjusted EBITDA	1.2x	1.1x

4.18 Return on net assets (RONA)

RONA is calculated as trading profit plus share of post-tax profit of joint ventures and associates for the previous 12 months, divided by average net operating assets, at constant currency (being the average over the previous 13 months of property, plant and equipment, trade working capital, interests in joint ventures and associates, investments, other operating receivables, payables and provisions). It is one of the Group's KPIs and is used to assess the financial performance and asset management of the Group and is one of the measures used in monitoring the Group's capital.

	2020 £m	2019 £m
Average net operating assets	642.0	690.2
Trading profit	101.4	181.4
Share of post-tax profit from joint ventures and associates	1.1	1.0
	102.5	182.4
RONA	16.0%	26.4%

4.19 Constant currency

Figures presented at constant currency represent 2019 amounts retranslated at average 2020 exchange rates.

4.20 Liquidity

Liquidity is the Group's cash and short-term deposits plus undrawn committed debt facilities less cash used as collateral on loans.

	2020 £m	2019 £m
Cash and short-term deposits	209.7	229.2
Undrawn committed debt facilities	246.6	174.2
Cash used as collateral on loans	(19.0)	(49.0)
Liquidity	437.3	354.4

4.21 Last twelve months (LTM)

Some results are presented or calculated using data from the last 12 months from the reference date.

5. Segment Information

The segment information contained in this Note refers to several alternative performance measures, definitions of which can be found in Note 4.

5.1 Business segments

Operating segments for continuing operations

The Group's operating segments are determined taking into consideration how the Group's components are reported to the Group's Chief Executive, who makes the key operating decisions and is responsible for allocating resources and assessing performance of the component. Taking into account the Group's management and internal reporting structure, the operating segments are Steel Flow Control, Steel Advanced Refractories, Steel Sensors and Probes, and the Foundry Division. The principal activities of each of these segments are described in the Strategic Report.

Steel Flow Control, Steel Advanced Refractories, and Steel Sensors and Probes operating segments are aggregated into the Steel reportable segment. In determining that aggregation is appropriate, judgement is applied which takes into account the economic characteristics of these operating segments which include a similar nature of products, customers, production processes and margins.

Segment revenue represents revenue from external customers (inter-segment revenue is not material). Trading profit includes items directly attributable to a segment as well as those items that can be allocated on a reasonable basis.

5.2 Accounting policy – revenue recognition

The Group derives all of its revenue from contracts with customers. The Group enters into contracts to provide one or multiple products to customers in the steel and foundry industries globally.

Revenue recognition at a point in time

Where the Group provides consumable products only, one performance obligation is present. The performance obligation is to deliver consumables to the customer and is satisfied upon delivery of these items. Similarly, where a contract is for the supply of standard equipment, there is one performance obligation and revenue is primarily recognised at a point in time being upon delivery of these items. The form of a contract is typically a purchase order from a customer.

Notes to the Group Financial Statements continued

5. Segment Information continued

5.2 Accounting policy – revenue recognition continued

The Group also enters into some contracts with customers in the steel industry under which they primarily provide consumable items, but also supply equipment and/or technical assistance ('service contracts') to facilitate these customers' steel production processes. The Group applies judgement in assessing whether the performance obligations (i.e. provision of consumables, equipment and technical assistance) are distinct performance obligations or if these may be bundled when assessing the point at which the customer obtains control of or consumes the benefit of promised goods or services. The judgement takes into account:

> Equipment provided in these contracts remains the property of Vesuvius and is used by Vesuvius technicians at customer sites

> The customer benefits from the combined output of the contract, being the use of Vesuvius consumables, equipment and technicians to support the customers' production of steel

> The value of the equipment and technician services is minimal relative to the total value of the contract to the customer being the benefit of use of Vesuvius consumables

Based on the above, the individual elements of the contract are not considered distinct and therefore the performance obligations are deemed to be bundled into a single performance obligation. Revenue is therefore recognised at a point in time, every time the customers purchase and consume materials as they produce steel. In the event this judgement was not applied and the performance obligations were not bundled, this would likely result in minor amounts of revenue being recognised earlier primarily in respect of the technician support.

Approximately 87% (2019: 87%) of the aforementioned revenue relates to the sale of consumables and equipment only. Approximately 13% (2019: 13%) of revenue relates to contracts which contain multiple performance obligations which in the majority of cases are deemed to be bundled into a single performance obligation and revenue recognised over the course of the contract as the customer consumes and benefits from Vesuvius products.

Revenue recognition over time

The Group enters into bespoke equipment design and build (and installation in some cases) contracts with customers. Performance obligations are usually defined by milestones agreed with the customers in the contract. The customer usually does not have a right to refund as work progresses towards achieving the milestones in the contract. Revenue is recognised over time by measuring the progress of completion or achievement of a milestone for each performance obligation identified within the contract, usually with reference to cost inputs incurred against overall estimated costs for the contract. This does not typically entail significant estimation or judgements as the contracts are usually not material in isolation and do not span more than 12 months. This approach to revenue recognition is considered to reflect faithfully the value and timing of goods or services transferred and the rights of Vesuvius to revenue.

Determining and allocating the transaction price to performance obligations

For revenue recognised at a point in time, the transaction price is determined and allocated with reference to the individual prices of consumables or equipment specified in the contract or customer purchase order. If a standalone selling price is not available, the Group will estimate the selling price with reference to the price that would be charged for the goods or services if they were sold separately. This estimate is not considered complex.

For service contracts, where the bundled performance obligation is deemed to be the provision of consumables to facilitate production of customer steel, the determined transaction price is determined and allocated with reference to either an agreed price list for each of the consumables input, or for some contracts the transaction price is determined and allocated as an amount per unit of customer steel output.

For revenue recognised over time, the transaction price is determined with reference to the prices set out in the contract. For bespoke equipment builds the transaction price is allocated to performance obligations (milestones) within the contract and the payment schedules agreed with the customer that align to these milestones. For installations, the transaction price is allocated with reference to the progress of completion. Where payment schedules include customer advance payments (i.e. not aligned with a milestone/performance obligation), the amounts received are included within contract liabilities until the performance obligation to which they relate is satisfied.

Contracts are to be settled in cash. They do not typically contain any variable consideration, discounts, refunds, rebates, warranties or significant financing components.

Duration and costs of obtaining contracts

The duration of the Group's contracts with customers is typically less than one year and accordingly the Group has taken the practical expedient within IFRS 15 to not disclose the transaction price allocated to unsatisfied (whole or partially) performance obligations as of the end of the reporting period. Service contracts may span over more than one year as they remain in effect up to a specified level of customer production of steel. However, the choice to purchase from Vesuvius under the contract remains with the customer and therefore there is no commitment for the customer/Vesuvius to purchase/produce up to the specified level.

Costs of obtaining contracts are not considered significant and these are expensed as incurred.

Customer credit risk and payment terms

The Group assesses customer credit risk and recognises revenue when such risk is considered low and the consideration cash flows due are reasonably expected to flow to the Group. Typically the Group will not transact with customers where credit risk concerns are identified and therefore there is no material unrecognised revenue as a result of credit risk. For trade receivables and contract assets in respect of revenue recognised, an expected credit loss allowance is determined.

Customer payment terms are set out in revenue contracts and do not exceed one year. Customer payments typically follow the satisfaction of performance obligations at which point revenue is recognised and invoiced. Accordingly, trade receivables and contract assets are expected to derive cash inflows for the Group within less than 12 months.

Contract assets and contract liabilities

A contract asset is recorded when revenue is recognised but an invoice has not been raised to the customer. Contract assets are short term and typically are invoiced in the following month.

Customer advance payments are included in contract liabilities. These are typically not material and relate to over time revenue projects as set out further above.

Uncertainties

There are no uncertainties involving economic factors, significant estimation or judgements (other than as disclosed above) in respect of revenue recognition. Credit risk relating to the collection of cash inflows from revenue recognised is addressed through an allowance for expected credit losses, as set out in the trade and other receivables accounting policy.

The following table provides information about receivables, contract assets and contract liabilities from contracts with customers.

	2020 £m	2019 £m
Receivables, which are included in 'Trade and other receivables'	**302.0**	306.7
Contract assets, which are included in 'Trade and other receivables'	**1.3**	1.1
Contract liabilities, which are included in 'Trade and other payables'	**1.5**	3.3

Contract liabilities of £1.5m (2019: £3.3m) include advances received from a customer that precede the satisfaction of performance obligations by the Group. £3.3m of the contract liabilities recognised in the prior year was recognised as revenue in 2020.

5.3 Segmental analysis

The reportable segment results from continuing operations for 2020 and 2019 are presented below.

	2020					
	Flow Control £m	**Advanced Refractories £m**	**Sensors & Probes £m**	**Total Steel £m**	**Foundry £m**	**Total £m**
Segment revenue	561.3	458.6	25.5	1,045.4	412.9	1,458.3
at a point in time				*1,035.7*	*412.9*	*1,448.6*
over time				*9.7*		*9.7*
Segment adjusted EBITDA				**110.6**	**41.4**	**152.0**
Segment depreciation				**(34.2)**	**(16.4)**	**(50.6)**
Segment trading profit				**76.4**	**25.0**	**101.4**
Return on sales margin				*7.3%*	*6.1%*	*7.0%*
Amortisation of acquired intangible assets						**(9.9)**
Restructuring charges						**(6.1)**
Vacant site remediation costs						**(10.3)**
GMP equalisation charge						**(0.8)**
Operating profit						**74.3**
Net finance costs						**(10.9)**
Share of post-tax profit of joint ventures						**1.1**
Profit before tax						**64.5**
Capital expenditure additions				**45.9**	**13.1**	**59.0**

Notes to the Group Financial Statements continued

5. Segment Information continued

5.3 Segmental analysis continued

	2019					
	Flow Control £m	Advanced Refractories £m	Sensors & Probes £m	Total Steel £m	Foundry £m	Total £m
Segment revenue	626.3	539.8	29.2	1,195.3	515.1	1,710.4
at a point in time				*1,188.9*	*515.1*	*1,704.0*
over time				*6.4*		*6.4*
Segment adjusted EBITDA				153.4	77.7	231.1
Segment depreciation				(33.3)	(16.4)	(49.7)
Segment trading profit				120.1	61.3	181.4
Return on sales margin				*10.0%*	*11.9%*	*10.6%*
Amortisation of acquired intangible assets						(10.0)
Restructuring charges						(39.8)
Vacant site remediation costs						(4.1)
Operating profit						127.5
Net finance costs						(11.0)
Share of post-tax profit of joint ventures						2.1
Profit before tax						118.6
Capital expenditure additions				53.6	21.1	74.7

The Chief Operating Decision Maker does not review non-current assets at a segmental level so these disclosures are not included.

5.4 Geographical analysis

	External revenue		Non-current assets	
	2020 £m	2019 £m	**2020 £m**	2019 £m
EMEA	**578.5**	699.8	**474.2**	459.5
Asia	**442.0**	480.4	**225.5**	227.3
North America	**346.8**	419.0	**328.6**	345.8
South America	**91.0**	111.2	**36.7**	49.2
Continuing operations	**1,458.3**	1,710.4	**1,065.0**	1,081.8

External revenue disclosed in the table above is based upon the geographical location of the operation. Non-current assets exclude employee benefits net surpluses and deferred tax assets. Information relating to the Group's products and services is given in the Strategic Report. The Group is not dependent on any single customer for its revenue and no single customer, for either of the years presented in the table above, accounts for more than 10% of the Group's total external revenue. £56.2m (2019: £66.3m) of revenue was generated from the UK, and total non -current assets in the UK amounted to £97.1m (2019:£99.1m).

6. Operating Profit

6.1 Operating profit is stated after charging

	2020 £m	2019 £m
Cost of inventories recognised as an expense (Note 19)	**533.5**	642.6
Research and development	**27.9**	29.1
Employee expenses (Note 8)	**366.0**	395.0
Depreciation (Note 15)	**50.6**	49.7
Amortisation (Note 16)	**9.9**	10.0
Operating lease charges (Note 29)	**4.2**	6.0

6.2 Amounts payable to PricewaterhouseCoopers LLP and their Associates

	2020 £m	2019 £m
Fees payable to the Company's auditors and their associates for the audit of the parent Company and Consolidated Financial Statements	**0.7**	0.5
Fees payable to the Company's auditors and their associates for other services:		
Audit of the Company's subsidiaries	**1.0**	1.2
Audit-related assurance services	**0.1**	0.1
Total auditors' remuneration	**1.8**	1.8

Total auditors' remuneration of £1.8m in 2020 all related to continuing operations, of which £1.7m related to audit fees and £0.1m of non-audit fees, in respect of the Group's half-year financial statements, quarterly reviews and tax form audits in India (as required by regulation) along with review of an R&D claim in Italy (2019: £1.8m, including £1.7m of audit fees and £0.1m of non-audit fees, the latter in respect of the Group's half-year review fee and quarterly reviews and tax form audits in India). It is the Group's policy not to use the Group's auditors for non-audit services other than for audit related services that are required to be performed by an auditor.

Mazars LLP acts as external auditor of the non-material entities within the Group. Total remuneration for the audit of the non-material entities was £0.6m (2019: £0.5m). This amount is not included in the table above.

7. Restructuring Charges and Vacant Site Remediation Costs

As explained in the Financial Review on page 45, the 2020 restructuring charges were £6.1m (2019: £39.8m) and relate to the completion of the programme first announced in March 2018, which was predominantly focused on rationalising our manufacturing footprint, consolidating production and streamlining various back office functions. The charges reflect redundancy costs of £2.7m (2019: £24.8m), plant closure costs of £1.8m (2019: £4.4m), asset write-offs of £1.5m (2019: £8.9m) and consultancy fees and travel of £0.1m (2019: £1.7m).

The net tax credit attributable to the total restructuring charges was £1.1m (2019: £9.2m).

Cash costs of £16.7m (2019: £30.0m) (Note 12) were incurred in the year in respect of the restructuring programme, leaving provisions made but unspent of £9.2m (Note 30) as at 31 December 2020 (2019: £19.1m).

The Group owns a number of disused properties in the US, which do not form part of our trading operations. Costs are being incurred at one of these sites to address the significant increase in the volume of water run-off occurring from 2019. We have engaged waste management specialists, are taking actions to reduce the level of water (including hydrological studies), improving treatment processes and are in contact with the relevant regulatory authorities. We estimate that it will take a further 18 months to finalise initial works and that there will then be a period for which unavoidable associated and ongoing running costs will be incurred. The charges related to remediation and unavoidable associated and ongoing running costs have been recorded in 2020 and are £10.3m (2019: £4.1m). These non-recurring charges have been treated as a separately reported item. There has been no impact upon performance.

Notes to the Group Financial Statements continued

8. Employees

8.1 Employee expenses

	2020 £m	2019 £m
Wages and salaries	302.9	323.4
Social security costs	43.5	50.6
Share-based payments (Note 27)	2.4	4.9
Pension costs — defined contribution pension plans (Note 26)	9.7	11.3
— defined benefit pension plans (Note 26)	7.1	4.3
Other post-retirement benefits (Note 26)	0.4	0.5
Total employee expenses	366.0	395.0

Included within wages and salaries is income from governments of £3.0m in respect of staff who have been furloughed due to the COVID-19 pandemic. This income falls within IAS 20 Government grants as the Group receives income in return for meeting the conditions included within each of the relevant government schemes. The income approach has been applied and therefore the income is recognised when the salary and wages expense which the schemes are intended to compensate are incurred. There are no unfulfilled conditions or other contingencies that have been recognised in respect of these schemes. The Group also accessed the Bank of England's Covid Corporate Financing Facility (CCFF) (see Note 25.2).

8.2 Monthly average number of employees

	2020 no.	2019 no.
Steel	7,613	7,731
Foundry	2,710	2,845
Total monthly average number of employees	10,323	10,576

As at 31 December 2020, the Group had 10,354 employees (2019: 10,496).

8.3 Remuneration of key management personnel

The remuneration of the Directors, who are the key management personnel of the Group, is set out below in aggregate for each of the categories specified in IAS 24 Related Party Disclosures. Further information about the remuneration of individual Directors is provided in the audited part of the Directors' Remuneration Report on pages 131 to 143.

	2020 £m	2019 £m
Short-term employee benefits	1.4	1.2
Post-employment benefits	0.2	0.2
Share-based payments	1.2	1.2
Total remuneration of key management personnel	2.8	2.6

9. Net Finance Costs

	2020 £m	2019 £m
Interest payable on borrowings		
Loans and overdrafts	15.6	15.7
Interest on lease liabilities	1.8	1.6
Amortisation of capitalised arrangement fees	0.5	0.6
Total interest payable on borrowings	17.9	17.9
Interest on net retirement benefit obligations	(0.1)	0.3
Adjustment to discounts on provisions and other liabilities	1.0	1.3
Adjustment to discounts on receivables	(0.5)	(0.7)
Finance income	(7.4)	(7.8)
Total net finance costs	10.9	11.0

Within the table above, total finance costs are £18.8m (2019: £19.5m) and total finance income is £7.9m (2019: £8.5m). Net finance costs are £10.9m (2019: £11.0m).

10. Income Tax

10.1 Accounting policy

Tax expense represents the sum of current tax and deferred tax. Current and deferred tax are recognised in profit or loss except to the extent that they relate to items charged or credited in the Group Statement of Comprehensive Income or Group Statement of Changes in Equity, in which case the associated tax is also recognised in those statements.

Current tax

Current tax is based on taxable profit for the year. Taxable profit differs from profit before tax as reported in the Group Income Statement because it excludes items of income or expense that are taxable or deductible in other years and it further excludes items that are never taxable or deductible. The Group's liability for current tax is calculated using tax rates and laws that have been enacted, or substantively enacted, by the balance sheet date.

A provision is recognised when the Group considers it has a present tax obligation as the result of a past event and it is probable that the Group will be required to settle that obligation. Provisions established for such uncertain tax positions are made using a best estimate of the tax expected to be paid, based on a qualitative and quantitative assessment of all relevant information. Such a provision is typically required where the underlying tax issue is subject to interpretation and remains to be agreed, and therefore is uncertain as to outcome. Principally the uncertain tax positions for which a provision is made relate to the interpretation of tax legislation and guidance regarding transfer pricing arrangements that have been entered into in the normal course of business. In accordance with IAS 12, tax provisions are included as income tax payable on the face of the Group Balance Sheet, and movements in tax provisions are included within income tax charges or credits in the Group Income Statement.

In assessing any appropriate provision requirements for uncertain tax items, the Group considers progress made in discussions with the tax authorities, expert advice on the likely outcome and any recent developments in case law. Due to the uncertainty associated with such tax items, it is possible that at a future date, on conclusion of the open matters, the final outcome may vary materially. Any such variations will affect the financial results in the year in which such a determination is made.

IFRIC 23 Uncertainty over Income Tax Treatments took effect from 1 January 2019. It clarifies how to recognise and measure deferred and current income tax assets and liabilities where there is uncertainty over tax treatment under IAS 12.

Deferred tax

Deferred tax is recognised on differences between the carrying amounts of assets and liabilities in the Financial Statements and the corresponding tax bases used in the computation of taxable profit and is accounted for using the balance sheet liability method. Deferred tax liabilities are generally recognised for all taxable temporary differences and deferred tax assets are recognised to the extent that it is probable that taxable profits will be available against which deductible temporary differences can be utilised. Such assets and liabilities are not recognised if the temporary difference arises from the initial recognition of goodwill or from the initial recognition (other than in a business combination) of other assets and liabilities in a transaction that affects neither the taxable profit nor the accounting profit. Deferred tax is calculated at the tax rates that are expected to apply in the period when the liability is settled or the asset is realised, based on tax rates and laws that have been enacted, or substantively enacted, by the balance sheet date.

Deferred tax liabilities are recognised for taxable temporary differences arising on investments in subsidiaries and interests in joint ventures, except where the Group is able to control the reversal of the temporary difference and it is probable that the temporary difference will not reverse in the foreseeable future. The carrying amount of deferred tax assets is reviewed at each balance sheet date and reduced to the extent that it is no longer probable that sufficient taxable profits will be available to allow all or part of the asset to be recovered. Deferred tax assets and liabilities are offset when there is a legally enforceable right to set off current tax assets against current tax liabilities and when they relate to income taxes levied by the same taxation authority and the Group intends to settle its current tax assets and liabilities on a net basis.

Notes to the Group Financial Statements continued

10. Income Tax continued

10.2 Income tax charge

	2020 £m	2019 £m
Current tax		
Overseas taxation	**28.1**	32.2
Adjustments in respect of prior years	**(3.0)**	(1.1)
Total current tax, continuing operations	**25.1**	31.1
Deferred tax		
Origination and reversal of temporary taxable differences	**(7.8)**	1.7
Adjustments in respect of prior years	**1.4**	(0.7)
Total deferred tax, continuing operations	**(6.4)**	1.0
Total income tax charge	**18.7**	32.1
Total income tax charge attributable to:		
Continuing operations — headline performance	**24.4**	43.8
— separately reported	**(5.7)**	(11.7)
Total income tax charge	**18.7**	32.1

Included in the Group's total income tax charge are charges and credits meeting the criteria set out in Note 2.5 to be treated as separately reported items, as analysed in the following table:

Separately reported items	2020 £m	2019 £m
Restructuring charges	**(1.1)**	(9.2)
Amortisation and utilisation of acquired intangibles	**(2.3)**	(2.5)
Vacant site remediation costs	**(2.3)**	—
Total tax charge/(credit) separately reported	**(5.7)**	(11.7)

The net tax debit reflected in the Group Statement of Comprehensive Income in the year amounted to £3.2m (2019: £1.9m credit), comprising a £2.8m debit (2019: £1.9m credit) related to tax on net actuarial gains and losses on the employee benefits plan and a debit of £0.4m (2019: £nil) relating to other temporary timing differences.

The Group operates in a number of countries that have differing tax rates, laws and practices. Changes in any of these areas could, adversely or positively, impact the Group's tax charge in the future. Continuing losses, or insufficiency of taxable profit to absorb all expenses, in any subsidiary, could have the effect of increasing tax charges in the future as effective tax relief may not be available for those losses or expenses. Other significant factors affecting the tax charge are described in Notes 10.1 and 10.6.

10.3 Reconciliation of income tax charge to profit before tax

	2020 £m	2019 £m
Profit before tax	**64.5**	118.6
Tax at the UK corporation tax rate of 19.0% (2019: 19.0%)	**12.3**	22.5
Overseas tax rate differences	**2.7**	5.1
Withholding taxes	**7.2**	5.4
Amortisation of intangibles	**(0.4)**	(0.8)
Expenses not deductible for tax purposes	**2.7**	2.1
Income taxed in advance	**(4.2)**	1.2
Deferred tax asset not previously recognised – Other	—	(0.9)
Deferred tax assets not recognised	**1.3**	3.0
Utilisation of previously unrecognised tax losses	**(1.3)**	(3.7)
Adjustments in respect of prior years	**(1.6)**	(1.8)
Total income tax charge	**18.7**	32.1

10.4 Deferred tax

	Interest £m	Other operating losses £m	Pension costs £m	Intangible assets £m	Other temporary differences £m	Total £m
As at 1 January 2019	34.7	19.5	3.4	(21.9)	20.1	55.8
Exchange adjustments/other	(0.3)	(0.2)	(1.2)	0.8	(1.8)	(2.7)
Acquisition	—	—	—	(3.4)	0.6	(2.8)
Other net (charge)/credit to Group Statement of Comprehensive Income	—	—	1.9	—	—	1.9
Other net (charge)/credit to Group Income Statement	—	4.0	(0.7)	2.5	(3.0)	2.8
Other net (charge)/credit to Group Income Statement US	(10.5)	(4.5)	0.1	(0.4)	11.6	(3.7)
As at 1 January 2020	**23.9**	**18.8**	**3.5**	**(22.4)**	**27.5**	**51.3**
Exchange adjustments/other	**(0.6)**	**(2.2)**	**0.4**	**0.1**	—	**(2.3)**
Acquisition	—	—	—	—	—	—
Other net (charge)/credit to Group Statement of Comprehensive Income	—	—	**(2.8)**	—	**(0.4)**	**(3.2)**
Other net (charge)/credit to Group Income Statement	**(0.1)**	**(1.6)**	**0.2**	**2.3**	**3.1**	**3.9**
Other net (charge)/credit to Group Income Statement US	**(1.2)**	**3.9**	**(0.5)**	**(0.3)**	**0.6**	**2.5**
As at 31 December 2020	**22.0**	**18.9**	**0.8**	**(20.3)**	**30.8**	**52.2**

	2020 £m	2019 £m
Recognised in the Group Balance Sheet as:		
Non-current deferred tax assets	**96.1**	94.9
Non-current deferred tax liabilities	**(43.9)**	(43.6)
Net total deferred tax assets	**52.2**	51.3

Included in these deferred tax assets and liabilities are amounts to be expected to be utilised in 2020 as follows:

	2020 £m	2019 £m
Deferred tax assets	**8.4**	10.8
Deferred tax liabilities	**(2.3)**	(2.5)

Included in non-current deferred tax assets is £61.8m (2019: £61.3m) in respect of the partial recognition of temporary differences arising in the US computed in accordance with the policy set out in Note 10.1 above. The Group remains confident of the recovery of this asset. £19.3m (2019: £19.5m) remains unrecognised.

Tax loss carry-forwards and other temporary differences with a tax value of £17.7m (2019: £10.4m) were recognised by subsidiaries reporting a loss. Based on approved business plans of these subsidiaries, the Directors consider it probable that the tax loss carry-forwards and temporary differences can be offset against future taxable profits of these subsidiaries.

The total deferred tax assets not recognised as at 31 December 2020 were £182.5m (2019: £167.8m), as analysed below. In accordance with the accounting policy in Note 10.1, these items have not been recognised as deferred tax assets on the basis that their future economic benefit is not probable. In total, there was an increase of £14.7m (2019: £0.9m increase) in net unrecognised deferred tax assets during the year, primarily driven by the cancellation of the proposed reduction of UK corporation tax from 19% to 17%. All UK unrecognised deferred tax assets are now reported at the 19% rate.

	2020 £m	2019 £m
Operating losses (further described below)	**109.3**	95.6
Unrelieved US interest (may be carried forward indefinitely)	**17.9**	19.5
Capital losses available to offset future UK capital gains (may be carried forward indefinitely)	**35.1**	32.1
UK ACT credits (may be carried forward indefinitely)	**14.6**	13.1
US tax credits	**1.4**	—
Other temporary differences	**4.2**	7.5
Total deferred tax assets not recognised	**182.5**	167.8

Notes to the Group Financial Statements continued

10. Income Tax continued

10.4 Deferred tax continued

The Group has significant net operating losses with a tax value of £128.2m (2019: £114.4m), only £18.9m (2019: £18.8m) of which meet the criteria set out in Note 10.1 to be recognised on the Group Balance Sheet.

	Operating losses recognised 2020 £m	Operating losses not recognised 2020 £m	Total 2020 £m	Operating losses recognised 2019 £m	Operating losses not recognised 2019 £m	Total 2019 £m
UK (may be carried forward indefinitely)	—	87.9	87.9	—	74.6	74.6
US (due to expire 2024-2031)	13.1	—	13.1	9.7	—	9.7
ROW (may be carried forward indefinitely)	5.6	21.4	27.0	9.1	21.0	30.1
ROW (due to expire within 5 years)	0.2	—	0.2	—	—	—
	18.9	109.3	128.2	18.8	95.6	114.4

The £27.0m (2019: £30.1m) operating losses available to set against future income in the rest of the world arise in a number of countries, reflecting the spread of the Group's operations.

An amount of £0.9m (2019: £3.1m) has been recognised in respect of withholding taxes that will be due on a repatriation of funds from the group's Chinese subsidiaries.

Deferred tax is not recognised in respect of the value of the Group's investments in subsidiaries and interests in joint ventures where we are able to control the timing of the reversal of the temporary differences and it is probable that such differences will not reverse in the foreseeable future. The amount of these temporary differences for which deferred tax liabilities have not been recognised was £12.7m (2019: £22.6m).

10.5 Income tax payable and recoverable

	2020 £m	2019 £m
Liabilities for income tax payable	3.7	2.5
Provisions for uncertain tax positions	8.5	11.8
	12.2	14.3
Income tax recoverable within one year	3.7	2.9
Net liability	8.5	11.4

Provisions for uncertain tax positions are calculated in accordance with the policy outlined in Note 10.1, and are treated as income tax payable in accordance with IAS 12.

These provisions cover litigated tax matters as well as provisions for other risks where the Group believes it is more likely than not that there would be a successful challenge by a tax authority to positions it has taken in its tax filings. By its nature, litigation can result in sharp fluctuations in cash flow, both in and out, relating to taxes. Currently, management do not expect any material adjustments to these provisions in 2021.

During the year the provisions for uncertain tax positions have reduced to £8.5m (2019: £11.8m). The decrease of £3.3m (2019: £6.9m) can be explained by the settlement of a tax audit in Switzerland £nil (2019: £4.1m) with a corresponding provision release £nil (2019: £1.4m) as well as the reassessment of potential uncertain tax positions following a lack of previously expected challenge by the tax authorities £2.0m (2019: £0.4m), the expiration of the statute of limitations on certain other exposures £1.6m (2019: £0.4m) and foreign exchange movements on the remaining balances £0.3m charge (2019: £0.6m credit).

10.6 Key factors impacting the sustainability of the effective tax rate are as follows:

Material changes in the geographic mix of profits

The Group's effective tax rate is sensitive to changes in the geographic mix of profits and level of profits and reflects a combination of higher rates in certain jurisdictions such as Brazil, China, Germany, India, Mexico and the US, a nil effective tax rate in the UK due to the availability of unutilised tax losses, and rates that lie somewhere in between.

Changes in tax rates, tax reform and its interpretation

Changes in tax rates and laws in the jurisdictions in which the Group operates could have a material effect on the Group's effective tax rate.

Availability of tax advantaged rates

Vesuvius in China qualifies for a tax advantaged rate of 15% (rather than the headline rate of 25%), on part of its profits due to the high technology nature of its business. Eligibility for this rate is reviewed on a regular basis by the Chinese tax authority and was worth approximately £1.1m in 2020 (2019: £1.5m). Without that benefit, the Group's effective tax rate on headline performance would have been 1.2% higher in 2020 (2019: 0.9%).

Resolution of tax judgements

At any one time, the Group can be subject to a number of challenges by tax authorities in the jurisdictions in which it operates. The outcome of these challenges is inherently uncertain, potentially resulting in a different tax charge from the amounts initially provided.

Impact of Brexit on Vesuvius' tax position

Following Brexit, the EU Parent Subsidiary and Interest and Royalty directives no longer apply to dividend, interest and other payments to Vesuvius in the UK. Additional withholding taxes will therefore become payable subject to reliefs available under applicable tax treaties. The Group does not expect the impact of the changes to be material to its tax position.

11. Earnings per Share (EPS)

11.1 Earnings for EPS

Basic and diluted EPS from continuing operations are based upon the profit attributable to owners of the parent, as reported in the Group Income Statement. The table below reconciles these different profit measures.

	2020 £m	2019 £m
Profit attributable to owners of the parent	41.3	80.3
Adjustments for separately reported items:		
Amortisation of acquired intangible assets	9.9	10.0
Restructuring charges	6.1	39.8
Gain on disposal of share in joint venture	—	(1.1)
Vacant site remediation costs	10.3	4.1
GMP equalisation charge	0.8	—
Income tax (credit)/charge	(5.7)	(11.7)
Headline profit attributable to owners of the parent	62.7	121.4

11.2 Weighted average number of shares

	2020 millions	2019 millions
For calculating basic and headline EPS	269.9	269.1
Adjustment for potentially dilutive ordinary shares	1.7	1.9
For calculating diluted and diluted headline EPS	271.6	271.0

For the purposes of calculating diluted and diluted headline EPS, the weighted average number of ordinary shares is adjusted to include the weighted average number of ordinary shares that would be issued on the conversion of all potentially dilutive ordinary shares expected to vest, relating to the Company's share-based payment plans. Potential ordinary shares are only treated as dilutive when their conversion to ordinary shares would decrease EPS or increase loss per share.

Notes to the Group Financial Statements continued

11. Earnings per Share (EPS) continued

11.3 Per share amounts

		2020 pence	2019 pence
Earnings per share	— basic	15.3	29.8
	— headline	23.2	45.1
	— diluted	15.2	29.6
	— diluted headline	23.1	44.8

12. Cash Generated from Operations

	2020 £m	2019 £m
Operating profit	74.3	127.5
Adjustments for:		
Amortisation of acquired intangible assets (Note 16)	9.9	10.0
Restructuring charges	6.1	39.8
Vacant site remediation costs	10.3	4.1
GMP equalisation charge	0.8	—
Trading profit	101.4	181.4
Loss/(profit) on disposal of non-current assets	1.3	(0.3)
Depreciation	50.6	49.7
Defined benefit retirement plans net charge	6.7	4.8
Net decrease/(increase) in inventories	21.7	24.9
Net decrease/(increase) in trade receivables	3.4	54.4
Net increase/(decrease) in trade payables	12.4	(15.2)
Net decrease/(increase) in other working capital	23.8	(17.3)
Outflow related to restructuring charges	(16.7)	(30.0)
Defined benefit retirement plans cash outflows	(9.0)	(9.9)
Vacant site remediation costs paid	(1.9)	(1.8)
Cash generated from operations	193.7	240.7

13. Cash and Cash Equivalents

13.1 Accounting policy

Cash and short-term deposits in the Group balance sheet consist of cash at bank, in hand and short-term deposits with original maturity of three months or less. Bank overdrafts that are repayable on demand and form an integral part of the Group's cash management are included as a component of cash and cash equivalents for the purpose of the Group Statement of Cash Flows.

	2020 £m	2019 £m
Cash at bank and in hand	169.7	229.2
Short-term deposits	40.0	—
Cash and short-term deposits	209.7	229.2
Bank overdrafts	(2.9)	(7.1)
Cash and cash equivalents in the Group Statement of Cash Flows	206.8	222.1

14. Reconciliation of Movement in Net Debt

	Balance as at 1 Jan 2020 £m	Foreign exchange adjustments £m	Fair value gains/ (losses)	Non-cash movements* £m	Cash flow £m	Balance as at 31 Dec 2020 £m
Cash and cash equivalents						
Cash at bank and in hand	229.2	(2.2)	—	—	(57.3)	169.7
Short-term deposits	—	—	—	—	40.0	40.0
Bank overdrafts	(7.1)	—	—	—	4.2	(2.9)
	222.1	(2.2)	—	—	(13.1)	206.8
Borrowings, excluding bank overdrafts	(469.0)	(10.0)	—	(15.7)	118.2	(376.5)
Capitalised arrangement fees	1.2	—	—	0.2	—	1.4
Derivative financial instruments	(0.1)	—	(5.3)	—	(1.4)	(6.8)
Net debt	(245.8)	(12.2)	(5.3)	(15.5)	103.7	(175.1)

	Balance as at 1 Jan 2019 £m	Transition to IFRS 16 on 1 Jan 2019* £m	Foreign exchange adjustments £m	Fair value gains/ (losses)	Non-cash movements £m	Cash flow £m	Balance as at 31 Dec 2019 £m
Cash and cash equivalents							
Cash at bank and in hand	236.9	—	(12.9)	—	—	5.2	229.2
Bank overdrafts	(23.5)	—	0.2	—	—	16.2	(7.1)
	213.4	—	(12.7)	—	—	21.4	222.1
Borrowings, excluding bank overdrafts	(463.2)	(32.8)	21.0	—	(9.2)	15.2	(469.0)
Capitalised arrangement fees	1.8	—	—	—	(0.6)	—	1.2
Derivative financial instruments	0.2	—	—	(5.4)	—	5.1	(0.1)
Net debt	(247.8)	(32.8)	8.3	(5.4)	(9.8)	41.7	(245.8)

* The Group adopted IFRS 16 leases from 1 January 2019 and, in accordance with the simplified approach, did not restate comparatives on transition. £15.7m (2019: £9.2m) of new leases were entered into during the year.

Net debt is a measure of the Group's net indebtedness to banks and other external financial institutions and comprises the total of cash and short-term deposits, current and non-current interest-bearing borrowings and derivative financial instruments.

£320.4m proceeds from borrowings, shown in the Statement of cash flows, includes £67.0m ($86.0m) and £44.4m (€50.0m) US Private Placement Notes ('USPP') refinancing, £9.0m of Sterling drawings under the UK syndicated bank facility and £200.0m issued through the Bank of England Covid Corporate Financing Facility ('CCFF') (see Note 25).

£438.6m repayment of borrowings, shown in the statement of cash flows, includes £109.1m ($140.0m) of USPP repayments, £87.0m (€98.0m) of Euro drawings repaid under the UK syndicated bank facility, £30.0m repaid under the collateralised bi-lateral loan facility, £12.5m of lease repayments and the £200.0m CCFF loan repayment.

15. Property, Plant and Equipment

15.1 Accounting policy

Freehold land and construction in progress are carried at cost less accumulated impairment losses. Other items of property, plant and equipment are carried at cost less accumulated depreciation and accumulated impairment losses. Costs are capitalised only when it is probable that they will result in future economic benefits flowing to the Group and when they can be measured reliably. Costs are capitalised to construction in progress where an asset is being developed. This is then transferred and depreciated when the asset is ready for use. All other repairs and maintenance expenditures are charged to the Group Income Statement in the period in which they are incurred.

On adoption of IFRS 16 Leases, right of use assets were recognised and assets accounted for previously under finance leases were reclassified into the right of use categories. Newly recognised right of use assets were measured at the amount equal to the lease liability, adjusted by the amount of any prepaid or accrued lease payments relating to that lease recognised in the balance sheet as at 31 December 2018.

Notes to the Group Financial Statements continued

15. Property, Plant and Equipment continued

15.1 Accounting policy continued

Freehold land is not depreciated, as it has an infinite life. Depreciation on other items of property, plant and equipment begins when the asset is available for use and is charged to the Group Income Statement on a straight-line basis so as to write off the cost less residual value of the asset over its estimated useful life as follows:

Asset category	Estimated useful life
Freehold property	between 10 and 50 years
Leasehold property	the term of the lease
Right of use assets	shorter of the asset's useful life and lease term
Plant and equipment — motor vehicles and information technology equipment	between 1 and 5 years
— other	between 3 and 15 years

The depreciation method used, residual values and estimated useful lives are reviewed annually and changed, if appropriate. As described in Note 17.1, an asset's carrying amount is immediately written down to its recoverable amount if its carrying amount is greater than its estimated recoverable amount. Gains and losses arising on disposals are determined by comparing sales proceeds with carrying amount and are recognised in the Group Income Statement.

15.2 Movement in net book value

	Freehold property £m	Leasehold property £m	Right of use assets – land & buildings (Note 29.2) £m	Right of use assets – plant & equipment (Note 29.2) £m	Plant and equipment £m	Construction in progress £m	Total £m
Cost							
As at 1 January 2019	210.4	2.3	—	—	572.1	46.0	830.8
Impact of IFRS 16 adoption	—	—	22.3	11.3	—	—	33.6
Exchange adjustments	(10.7)	—	(0.7)	(0.8)	(28.4)	(2.9)	(43.5)
Capital expenditure additions	3.9	—	1.5	6.2	33.7	29.4	74.7
Acquisitions through business combinations	1.8	0.1	1.5	—	1.7	0.1	5.2
Disposals	(1.1)	—	—	(2.8)	(13.3)	(0.6)	(17.8)
Assets classified as held for sale	—	—	—	—	—	—	—
Reclassifications	16.8	—	—	8.7	(11.2)	(14.3)	—
As at 31 December 2019 and 1 January 2020	**221.1**	**2.4**	**24.6**	**22.6**	**554.6**	**57.7**	**883.0**
Exchange adjustments	**(0.2)**	**—**	**(0.3)**	**—**	**(6.3)**	**(0.7)**	**(7.5)**
Capital expenditure additions	**1.9**	**—**	**8.4**	**7.3**	**19.6**	**21.8**	**59.0**
Disposals	**(0.1)**	**(1.5)**	**(1.9)**	**(3.2)**	**(8.1)**	**—**	**(14.8)**
Assets classified as held for sale	**(1.0)**	**—**	**—**	**—**	**—**	**—**	**(1.0)**
Reclassifications	**19.0**	**—**	**—**	**—**	**26.5**	**(45.5)**	**—**
As at 31 December 2020	**240.7**	**0.9**	**30.8**	**26.7**	**586.3**	**33.3**	**918.7**
Accumulated depreciation and impairment losses							
As at 1 January 2019	98.8	1.7	—	—	426.6	—	527.1
Exchange adjustments	(4.8)	(0.1)	(0.1)	(0.3)	(20.8)	—	(26.1)
Depreciation charge	6.6	0.1	4.0	6.6	32.4	—	49.7
Impairment	1.7	—	—	—	5.8	—	7.5
Disposals	(0.2)	—	—	(1.7)	(11.0)	—	(12.9)
Reclassifications	7.4	—	—	4.3	(11.7)	—	—
As at 31 December 2019 and 1 January 2020	**109.5**	**1.7**	**3.9**	**8.9**	**421.3**	**—**	**545.3**
Exchange adjustments	**0.4**	**—**	**(0.1)**	**—**	**(5.2)**	**—**	**(4.9)**
Depreciation charge	**6.8**	**0.1**	**4.0**	**6.8**	**32.9**	**—**	**50.6**
Impairment	**1.0**	**—**	**—**	**—**	**0.5**	**—**	**1.5**
Disposals	**—**	**(1.0)**	**(1.2)**	**(2.5)**	**(6.7)**	**—**	**(11.4)**
Assets classified as held for sale	**0.1**	**—**	**—**	**—**	**—**	**—**	**0.1**
As at 31 December 2020	**117.8**	**0.8**	**6.6**	**13.2**	**442.8**	**—**	**581.2**
Net book value as at 31 December 2020	**122.9**	**0.1**	**24.2**	**13.5**	**143.5**	**33.3**	**337.5**
Net book value as at 31 December 2019	111.6	0.7	20.7	13.7	133.3	57.7	337.7
Net book value as at 1 January 2019	111.6	0.6	—	—	145.5	46.0	303.7

Capital expenditure on customer-installation assets was £8.7m (2019: £7.8m). The impairment charge of £1.5m (2019: £7.5m) is included within restructuring charges for asset write-offs in Note 7.

Capital commitments as at 31 December 2020 were £nil (31 December 2019: £nil).

In 2020 the Group decided the sell a property which is held in the Steel operating segment. There is an interested party and the sale is expected to be completed by the third quarter of 2021, subject to environmental approval. The asset is classified as held for sale on the balance sheet and is recorded at a carrying amount of £0.9m with no impact to the Income Statement.

The impact of climate change has been considered in the estimation of useful lives of assets and no impacts were noted.

16. Intangible Assets

Intangible assets comprise goodwill and other intangible assets that have been acquired through business combinations.

16.1 Accounting policy

(a) Goodwill

Goodwill arising in a business combination is initially recognised as an asset at cost, measured as the excess of the aggregate of the acquisition-date fair value of the consideration transferred and the amount of any non-controlling interest acquired over the net of the acquisition-date fair value amounts of the identifiable assets acquired and liabilities assumed. When the excess is negative, a bargain purchase gain is recognised immediately in profit or loss. Goodwill is subsequently measured at cost less accumulated impairment losses, with impairment testing carried out annually, or more frequently when there is an indication that the cash-generating unit (CGU) to which the goodwill has been allocated may be impaired. On disposal of a business, the attributable amount of goodwill is included in the calculation of the profit or loss on disposal.

(b) Other intangible assets

Intangible assets other than goodwill are recognised on business combinations if they are separable, or if they arise from contractual or other legal rights, and their value can be measured reliably. They are initially measured at cost, which is equal to the acquisition-date fair value, and subsequently measured at cost less accumulated amortisation charges and accumulated impairment losses. Other intangible assets are subject to impairment testing when there is an indication that an impairment loss may have been incurred and are amortised over their estimated useful lives.

(c) Research and development costs

The Group's research activity involves long-range, 'blue sky' investigation, the findings from which may be used in the future to develop new or substantially improved products. Expenditure on research activities is recognised in the Group Income Statement as an expense in the year in which it is incurred.

Development is the application of research findings for the production of new or substantially improved products, processes and services before the start of commercial production. Development expenditure is capitalised only if the expenditure can be measured reliably, the product or process is technically and commercially feasible, future economic benefits are probable and the Group intends to and has sufficient resources to complete development and to use or sell the asset. Otherwise, it is recognised in the Group Income Statement as an expense in the year in which it is incurred. Capitalised development expenditure, where there is any, is stated at cost less accumulated amortisation and impairment losses.

In determining whether development expenditure is capitalised as an intangible asset, management considers whether the strict intangible asset recognition criteria set out in IAS 38, Intangible Assets, have been met at the time the expenditure is incurred. In making this determination, management recognises that a significant amount of the development expenditure undertaken by the Group is focused on dealing with local customer technical support issues and incremental developments to existing products as opposed to new or substantially improved products, and that at the time the feasibility of the project is determined, a significant proportion of the development expenditure for that project has already been incurred. In 2020 and 2019 no projects met the criteria for IAS 38 capitalisation.

Notes to the Group Financial Statements continued

16. Intangible Assets continued

16.2 Movement in net book value

	Goodwill £m	Other intangible assets £m	2020 total £m	Goodwill £m	Other intangible assets £m	2019 total £m
Cost						
As at 1 January	620.2	279.2	899.4	637.1	271.5	908.6
Exchange adjustments	(2.6)	0.2	(2.4)	(28.4)	(6.1)	(34.5)
Business combinations (Note 20)	—	—	—	11.5	13.8	25.3
As at 31 December	617.6	279.4	897.0	620.2	279.2	899.4
Accumulated amortisation and impairment losses						
As at 1 January	—	190.9	190.9	—	184.6	184.6
Exchange adjustments	—	0.1	0.1	—	(3.7)	(3.7)
Amortisation charge for the year	—	9.9	9.9	—	10.0	10.0
As at 31 December	—	200.9	200.9	—	190.9	190.9
Net book value as at 31 December	617.6	78.5	696.1	620.2	88.3	708.5

Amortisation charge of £9.9m (2019: £10.0m) in respect of other intangible assets includes £5.6m (2019: £5.7m) recognised in respect of Foseco customer relationships, £3.6m (2019: £3.6m) in respect of Foseco tradename and £0.7m (2019: £0.7m) in respect of CCPI customer relationships.

The impact of climate change has been considered in the estimation of useful lives of assets and no impacts were noted.

16.3 Analysis of goodwill by cash-generating unit (CGU)

Goodwill acquired in a business combination is allocated to each of the Group's CGUs expected to benefit from the synergies of the combination. For the purposes of impairment testing, the Directors consider that the Group has four CGUs: Steel Advanced Refractories, Steel Flow Control, Steel Sensors and Probes, and the Foundry Division. These CGUs represent the lowest level within the Group at which goodwill is monitored (Note 17.2).

	2020 £m	2019 £m
Steel Flow Control	276.5	277.5
Steel Advanced Refractories	130.3	131.1
Foundry	210.8	211.6
Total goodwill	617.6	620.2

16.4 Analysis of other intangible assets

Other intangible assets are amortised on a straight-line basis over their estimated useful lives. The assets acquired and their remaining useful lives are shown below.

	Remaining useful life years	Net book value as at 31 Dec 2020 £m	Net book value as at 31 Dec 2019 £m
Foseco			
— customer relationships (useful life: 20 years)	7.3	40.2	45.2
— trade name (useful life: 20 years)	7.3	26.3	30.0
CCPI			
— customer relationships (useful life: 20 years)	18.2	12.0	13.1
Total		78.5	88.3

17. Impairment of Tangible and Intangible Assets

17.1 Accounting policy

The Directors regularly review the performance of the business and the external business environment to determine whether there is any indication that the Group's tangible and intangible assets have suffered an impairment loss. If such indication exists, the higher of the value in use and the fair value less costs to sell off the asset is estimated and compared with the carrying value in order to determine the extent, if any, of the impairment loss. Where it is not feasible to estimate the recoverable amount of an individual asset, the Directors estimate the recoverable amount of the CGU to which the asset belongs. In addition, goodwill is tested for impairment on an annual basis. Goodwill acquired in a business combination is allocated to each of the Group's CGUs expected to benefit from the synergies of the combination and the Directors carry out annual impairment testing of the carrying value of each CGU, to assess the need for any impairment of the carrying value of the associated goodwill and other intangible and tangible assets.

For the purpose of impairment testing, the recoverable amount of an asset or CGU is the higher of (i) its fair value less costs to sell and (ii) its value in use. If the recoverable amount of a CGU is less than its carrying amount, the resulting impairment loss is allocated first to reduce the carrying amount of any goodwill allocated to the CGU and then to the other assets of the CGU pro rata on the basis of the carrying amount of each asset in the CGU. An impairment loss recognised for goodwill is not reversed in a subsequent period. An impairment loss recognised in a prior year for an asset other than goodwill may be reversed where there has been a change in the estimates used to measure the asset's recoverable amount since the impairment loss was recognised.

17.2 Key assumptions and methodology

The key assumptions in determining value in use are projected cash flows, growth rates and discount rates. These are disclosed as critical accounting estimates in Note 3.4.

Projected cash flows for the next three years have been based on the latest Board-approved budgets and strategic plans. They reflect management's expectations of revenue, EBITDA growth, capital expenditure, working capital and adjusted operating cash flows, based on past experience and future expectations of business performance and take into account the cyclicality of the business in which the CGU operates. Cash flows beyond the period of the strategic plans have been extrapolated using a perpetuity growth rate of 2.5% (2019: 2.5%). The growth rate has been calculated using GDP growth forecasts published by the International Monetary Fund for the Group's end-markets. These GDP growth forecasts have been weighted to reflect the Group's weighted average sales in each end-market during 2020.

The cash flows have been discounted to their current value using pre-tax discount rates, which represent each CGU's weighted average cost of capital (WACC). The assumptions used in the calculation of the WACC for each CGU have been benchmarked to externally available data. These are industry-specific beta coefficients, risk-free rates and equity risk premiums. The pre-tax discount rate used for the Steel Flow Control, Steel Advanced Refractories and Steel Sensors and Probes CGUs was 13.7% (2019: 13.3%) and for the Foundry CGU was 15.0% (2019: 13.1%). The increase in the pre-tax discount rates has been driven by an increase in the equity risk premiums partially offset by a reduction in risk free rates – these changes are not specific to Vesuvius.

The Group carried out its annual goodwill impairment test as at 31 October 2020 (2019: 31 October 2019). The recoverable amount of each CGU significantly exceeded its carrying value, therefore no impairment charges have been recognised. The recoverable amount of each CGU was also checked against its carrying value as at 31 December 2020 and no impairment triggers were identified.

Sensitivity of impairment reviews

Steel Flow Control (FC), Steel Advanced Refractories (AR) and the Foundry Division are the key CGUs. There were no intangible assets in the Steel Sensors and Probes CGU. The recoverable amount of all CGUs exceeded their carrying value on the basis of the assumptions set out above and any reasonably possible changes thereof. A sensitivity analysis was carried out using reasonably possible changes to the key assumptions as set out in the table below. The following decreases to the recoverable amount of the Group's goodwill and intangible assets were observed:

Key assumption	Relevant CGUs	Assumption	Sensitivity	Decrease in recoverable value, £m	Impairment arising
Free cash flow average annual growth rate	FC, AR, Foundry	4.0% – 9.5%	Decrease (cash flows) by 20%	(399.6)	None
Pre-tax discount rate	FC, AR	13.7%	Increase by 1%	(111.9)	None
Pre-tax discount rate	Foundry	15.0%	Increase by 1%	(48.5)	None
Long-term growth rate	FC, AR, Foundry	2.5%	Decrease by 1.5%	(198.6)	None

18. Trade and Other Receivables

18.1 Accounting policy

Trade and other receivables are initially recognised at fair value and subsequently measured at amortised cost, using the effective interest method, less impairment losses. Details on impairment of financial assets are disclosed in Note 25.

18.2 Analysis of trade and other receivables (current)

	2020 Gross £m	2020 ECL provision £m	2020 Net £m	2020 ECL provision coverage (1)	2019 Gross £m	2019 ECL provision £m	2019 Net £m	2019 ECL provision coverage (1)
Trade receivables — current	250.6	(0.5)	250.1	0.2%	235.9	(0.6)	235.3	0.3%
— 1 to 30 days past due	35.6	(0.3)	35.3	0.8%	44.5	(0.4)	44.1	0.9%
— 31 to 60 days past due	9.1	(0.1)	9.0	1.1%	17.1	(0.1)	17.0	0.6%
— 61 to 90 days past due	3.0	(0.2)	2.8	6.7%	5.0	(0.7)	4.3	14.0%
— over 90 days past due	27.7	(22.9)	4.8	82.7%	30.8	(24.8)	6.0	80.5%
Trade receivables	326.0	(24.0)	302.0		333.3	(26.6)	306.7	
Other receivables			49.1				55.4	
Prepayments			18.8				17.5	
Total trade and other receivables			369.9				379.6	

(1) ECL provision coverage is expected credit loss provision divided by gross trade receivables.

Historical experience has shown that the Group's trade receivable provisions are maintained at levels that are sufficient to absorb actual bad debt write-offs, without being excessive. The Group considers the credit quality of financial assets that are neither past due nor impaired as good.

Included within Other receivables are promissory notes of £20.4m (2019: £26.6m). The majority of these notes relate to customers in China and have typical maturities of six months from issuing date. The full amount of revenue is recognised from the customer when performance obligations are satisfied in accordance with IFRS 15. Other receivables also include VAT receivables of £18.6m (2019:£14.3m) and insurance reimbursements (see Note 30.2) of £2.0m.

18.3 Other receivables (non-current)

Non-current other receivables of £18.6m (2019: £22.1m) include insurance reimbursements (see Note 30.2) of £10.4m (2019: £14.3m) and prepaid taxes of £4.1m (2019: 3.5m).

The Group applies the expected credit loss model under IFRS 9 to these other receivables. The expected credit loss for other receivables is immaterial.

The maximum exposure to credit risk at the end of the reporting period is the net carrying amount of these trade and other receivables.

18.4 Impairment of trade and other receivables

Details relating to the impairment of trade receivables are disclosed in Note 25, Financial Risk Management.

19. Inventories

19.1 Accounting policy

Inventories are stated at the lower of cost (using the first in, first out method) and net realisable value. Cost comprises expenditure incurred in purchasing or manufacturing inventories together with all other costs directly incurred in bringing the inventory to its present location and condition and, where appropriate, attributable production overheads based on normal activity levels. Net realisable value represents the estimated selling price less all estimated costs of completion and costs to be incurred in marketing, selling and distribution. The amount of any write-down of inventories to net realisable value is recognised as an expense in the year in which the write-down occurs.

19.2 Analysis of inventories

	2020 £m	2019 £m
Raw materials	62.3	67.3
Work-in-progress	16.9	18.5
Finished goods	108.1	127.1
Total inventories	187.3	212.9

The cost of inventories recognised as an expense and included in manufacturing costs of continuing operations in the Group Income Statement during the year was £533.5m (2019: £642.6m).

The net inventories of £187.3m include a provision for obsolete stock of £12.8m (2019: £11.9m). There were inventory write-downs of £1.5m (2019: write-down reversals of £0.3m).

20. Acquisitions and Divestments

20.1 CCPI

There were no acquisitions or divestments in the year.

On 1 March 2019, Vesuvius plc acquired 100% of the share capital of CCPI Inc (CCPI), a specialty refractory producer focused on tundish (steel continuous casting) applications (65% of sales) and aluminium (35% of sales). CCPI is based in Ohio, USA, and has become part of the Group's Advanced Refractories business unit. The transaction valued CCPI at $43.4m (£33.3m) on a cash and debt-free basis and was funded from Vesuvius' internal resources. The acquisition increased Vesuvius' share of the tundish market and gives the Group an entry to the aluminium market.

The fair values of the assets and liabilities recognised as a result of the acquisition were as follows:

	£m
Cash and cash equivalents	0.9
Property, plant and equipment	5.2
Intangible asset (customer relationships)	13.8
Inventories	4.2
Receivables	5.1
Payables	(3.1)
Lease liabilities	(1.5)
Deferred tax	(2.8)
Net identifiable assets acquired	21.8
Goodwill	11.5
Consideration	**33.3**

The goodwill is attributable to CCPI's reputation in the marketplace and the synergies that Vesuvius expects to gain from integrating its tundish business into the Advanced Refractories business unit and is expected to be tax deductible.

Included within the property, plant and equipment acquired were right-of-use leased assets of £1.5m.

The decision to acquire CCPI was driven by its long-standing customer relationships and these are the identifiable intangible assets acquired. The fair value of these intangibles is provisional pending final valuations. A deferred tax liability of £3.4m has been provided in relation to these fair value adjustments.

On acquisition, CCPI was subsumed into Steel Advanced Refractories activities and goodwill is monitored at the level of the Steel Advanced Refractories operating segment.

The net cash outflow on acquisition was £32.4m, being cash consideration of £33.3m less cash and cash equivalents acquired of £0.9m. Acquisition-related costs of £0.7m were included in administrative expenses in the Income Statement.

20.2 Joint venture disposal

In June 2019, Vesuvius completed the sale of its 50% interest in Angang Vesuvius Refractory Company Limited. The value of the investment was £6.9m. The consideration received (in early July 2019) was cash of £6.8m resulting in a profit after foreign currency adjustments of £1.1m.

20.3 Other acquisitions

The Group did not acquire any material interests in any companies in the year ended 31 December 2020. Contingent consideration of £1.4m was paid during the year in respect of the previous acquisition of Ecil Met Tec.

The Group did not acquire any material interests in any companies other than CCPI during the year ended 31 December 2019; however, contingent consideration of £0.3m was paid during 2019 in respect of the previous acquisition of Process Metrix.

21. Issued Share Capital

21.1 Accounting policy

Equity instruments issued by the Company are recorded as the proceeds received, net of direct issue costs.

21.2 Analysis of issued share capital

The issued and fully paid ordinary share capital of the Company as at 31 December 2020 was 278,485,071 shares of 10 pence each (2019: 278,485,071 shares of 10 pence each). Further information relating to the Company's share capital is given in Note 9 to the Company's Financial Statements.

Notes to the Group Financial Statements continued

22. Retained Earnings

	Reserve for own shares £m	Share option reserve £m	Other retained earnings £m	Total retained earnings £m
As at 1 January 2019	(46.1)	6.8	2,473.2	2,433.9
Profit for the year	—	—	80.3	80.3
Remeasurement of defined benefit liabilities/assets	—	—	(3.6)	(3.6)
Recognition of share-based payments	—	4.5	—	4.5
Release of share option reserve on exercised and lapsed options	6.8	(6.8)	—	—
Income tax on items recognised in other comprehensive income	—	—	1.9	1.9
Dividends paid (Note 24)	—	—	(53.9)	(53.9)
As at 31 December 2019 and January 2020	**(39.3)**	**4.5**	**2,497.9**	**2,463.1**
Profit for the year	—	—	41.3	41.3
Remeasurement of defined benefit liabilities/assets	—	—	7.7	7.7
Recognition of share-based payments	—	2.4	—	2.4
Release of share option reserve on exercised and lapsed options	3.4	(3.4)	—	—
Income tax on items recognised in other comprehensive income	—	—	(3.2)	(3.2)
Dividends paid (Note 24)	—	—	(8.4)	(8.4)
As at 31 December 2020	**(35.9)**	**3.5**	**2,535.3**	**2,502.9**

23. Other Reserves

	Other reserves £m	Cash flow hedge reserve £m	Translation reserve £m	Total other reserves £m
As at 1 January 2019	(1,499.3)	—	129.8	(1,369.5)
Exchange differences on translation of the net assets of foreign operations	—	—	(71.0)	(71.0)
Reclassification of foreign currency translation reserve on disposal of share in joint venture	—	—	(1.1)	(1.1)
Exchange differences on translation of net investment hedges	—	—	14.1	14.1
As at 31 December 2019 and January 2020	**(1,499.3)**	**—**	**71.8**	**(1,427.5)**
Exchange differences on translation of the net assets of foreign operations	—	—	(12.7)	(12.7)
Exchange differences on translation of net investment hedges	—	—	(9.7)	(9.7)
Net change in costs of hedging	—	0.4	—	0.4
Change in the fair value of the hedging instrument	—	(8.1)	—	(8.1)
Amounts reclassified from the income statement	—	6.3	—	6.3
As at 31 December 2020	**(1,499.3)**	**(1.4)**	**49.4**	**(1,451.3)**

Within other reserves as at 31 December 2020 is £1,499.0m (2019: £1,499.0m) arising from the demerger of Cookson Group plc, being the excess of the Vesuvius plc share capital of £1,777.9m over the total share capital and share premium of Cookson Group plc as at 14 December 2012 of £278.9m.

The translation reserve in the table above comprises foreign exchange differences attributable to the owners of the parent. These exchange differences arise from the translation of the financial statements of foreign operations and from the translation of financial instruments that hedge the Group's net investment in foreign operations. In addition to foreign exchange differences attributable to the owners of the parent, the Group Statement of Comprehensive Income includes foreign exchange differences attributable to non-controlling interests.

24. Dividends

In light of the COVID-19 trading situation, the Directors withdrew their recommendation to pay the final dividend of 14.3 pence per ordinary share, announced with the publication of the 2019 financial results (2018: £37.2m, equivalent to 13.8 pence per ordinary share). An interim dividend in respect of the year ended 31 December 2020 of £8.4m (2019: £16.7m), equivalent to 3.1 pence per ordinary share (2019: 6.2 pence per ordinary share) was paid in December 2020 (September 2019).

A proposed final dividend for the year ended 31 December 2020 of £38.6m, equivalent to 14.3 pence per ordinary share, is subject to approval by shareholders at the Company's Annual General Meeting and has not been included as a liability in these financial statements. If approved by shareholders, the dividend will be paid on 21 May 2021 to ordinary shareholders on the register at 16 April 2021.

25. Financial Risk Management

25.1 Accounting policy

(a) Valuation of financial assets and liabilities

The Group's financial assets and liabilities are measured as appropriate either at amortised cost or at fair value through other comprehensive income or at fair value through profit and loss.

IFRS 13 Fair Value Measurement requires classification of financial instruments within a hierarchy that prioritises the inputs to fair value measurement. The three levels of the fair value hierarchy are:

Level 1 – Unadjusted quoted prices in active markets for identical assets or liabilities

Level 2 – Inputs other than quoted prices that are observable for the asset or liability, either directly or indirectly

Level 3 – Inputs that are not based on observable market data

Trade receivables are amounts due from customers for goods sold or services performed in the ordinary course of business. Trade receivables are recognised initially at their fair value, which is the amount of consideration that is unconditional. The Group holds the trade receivables with the objective of collecting the contractual cash flows (held to collect) and therefore measures them subsequently at amortised cost using the effective interest method.

Derivatives which do not meet the hedge accounting criteria are classified as fair value through profit and loss (held for trading).

The cross-currency interest rate swaps (see Note 25.2) which meet the hedging criteria are measured at fair value through other comprehensive income.

Loans and borrowings are initially recognised at fair value net of directly attributable transaction costs. After initial recognition they are measured at amortised cost, using the effective interest method.

(b) Foreign currencies

The individual financial statements of each Group entity are prepared in their functional currency, which is the currency of the primary economic environment in which that entity operates. For the purpose of the Group Financial Statements, the results and financial position of each entity are translated into pounds sterling, which is the presentational currency of the Group.

Reporting foreign currency transactions in functional currency

Transactions in currencies other than the entity's functional currency are initially recorded at the rates of exchange prevailing at the end of the preceding month or on the date of the transaction itself. At each subsequent balance sheet date:

(i) Foreign currency monetary items are retranslated at the rates prevailing at the balance sheet date. Exchange differences arising on the settlement or retranslation of monetary items are recognised either in the Group Income Statement or the Group Statement of Comprehensive Income

(ii) Non-monetary items measured at historical cost in a foreign currency are not retranslated

Translation from functional currency to presentational currency

When the functional currency of a Group entity is different from the Group's presentational currency (pounds sterling), its results and financial position are translated into the presentational currency as follows:

(i) Assets and liabilities are translated using exchange rates prevailing at the balance sheet date

(ii) Income and expense items are translated at average exchange rates for the year, except where the use of such average rates does not approximate the exchange rate at the date of a specific transaction, in which case the transaction rate is used

(iii) All resulting exchange differences are recognised in other comprehensive income and presented in the translation reserve in equity and are reclassified to profit or loss in the period in which the foreign operation is disposed of

Net investment in foreign operations

Exchange differences arising on a monetary item that forms part of a reporting entity's net investment in a foreign operation are initially recognised in other comprehensive income and presented in the translation reserve in equity and reclassified to profit or loss on disposal of the net investment.

Notes to the Group Financial Statements continued

25. Financial Risk Management continued

25.1 Accounting policy continued

Financial reporting in hyperinflationary economies

Entities with a functional currency of the Argentine peso are required to apply IAS 29, Financial Reporting in Hyperinflationary Economies, in accounting periods ending on or after 1 July 2018.

The results for the year ended 31 December 2020 from Group subsidiaries with a functional currency of the Argentine peso have therefore been restated to current cost using indices prescribed by the Government Board of the Argentine Federation of Professional Councils of Economic Sciences (FACPCE). Comparative figures have not been restated.

Transactions in Argentine pesos have been translated using exchange rates prevailing at the balance sheet date.

(c) Derivative financial instruments

The Group uses derivative financial instruments ('Derivatives') to manage the financial risks associated with its underlying activities and the financing of those activities. Derivatives are measured at fair value using market prices at the balance sheet date. Any Derivatives which form part of a hedge accounting relationship are designated as such on the date on which they are executed. Any Derivatives which do not form part of a designated hedge accounting relationship are classified as 'held for trading' for accounting purposes and are accounted for at fair value through profit or loss. They are presented as current assets or liabilities to the extent they are expected to be settled within 12 months after the end of the reporting period.

(d) Cash flow hedges

Changes in the fair value of Derivatives designated as cash flow hedges are recognised in other comprehensive income to the extent that the hedges are effective. Any ineffective portion would immediately be recognised in net finance costs in the profit or loss. If a forecast transaction is no longer expected to occur, the amounts previously recognised in other comprehensive income would be transferred to net finance costs in the profit or loss.

(e) Net investment hedges

The Group designates certain of its borrowings and Derivatives as net investment hedges of its foreign operations. As with cash flow hedges, the effective portion of the gain or loss on hedging instruments is recognised in other comprehensive income whilst any ineffective portion would immediately be recognised in net finance costs in the profit or loss. In the event a foreign operation is disposed of or liquidated, amounts recognised in other comprehensive income are reclassified from equity to profit or loss.

25.2 Financial risk factors

The Group's Treasury department, acting in accordance with policies approved by the Board, is principally responsible for managing the financial risks faced by the Group. The Group's activities expose it to a variety of financial risks, the most significant of which are market risk and liquidity risk.

Analysis of financial instruments

The following table summarises Vesuvius' financial instruments measured at fair value and shows the level within the fair value hierarchy in which the financial instruments have been classified.

	2020		2019	
	Assets £m	Liabilities £m	Assets £m	Liabilities £m
Investments (Level 2)	0.7	—	0.8	—
Derivatives not designated for hedge accounting purposes (Level 2)	0.2	—	0.6	(0.7)
Derivatives designated for hedge accounting purposes (Level 2)	—	(7.0)	—	—

(a) Derivative financial instruments

The Group uses Derivatives, in the form of forward foreign currency contracts to manage the effects of its exposure to foreign exchange risk on trade receivables, trade payables and cash. Derivatives are only used for economic hedging purposes and not as speculative investments.

In June 2020, the Group executed a US$86m cross-currency interest rate swap (CCIRS) with three of its relationship banks. The effect of this is to convert the $86m Private Placement Notes issued in June 2020 into €76.6m. The timing and amount of the US dollar cash flows under the CCIRS exactly mirror those of the Private Placement Notes and the maturity date of the CCIRS also matches the repayment date of the Notes. The CCIRS would by default be revalued through the Income Statement; however, as it is in a designated hedging relationship it is instead revalued through other comprehensive income. More specifically, the US dollar exposure is designated as a cash flow hedge of the underlying Private Placement Notes and the euro exposure is designated as a net investment hedge of part of the Group's foreign operations. The CCIRS is presented as a non-current asset or liability as it is expected to be settled more than 12 months after the end of the reporting period.

With the exception of the CCIRS, the fair value of Derivatives outstanding at the year-end has been booked through the Income Statement in 2020. All of the fair values shown in the table above are classified under IFRS 13 as Level 2 measurements which have been calculated using quoted prices from active markets, where similar contracts are traded and the quotes reflect actual transactions in similar instruments. All of the derivative assets and liabilities not designated for hedge accounting purposes reported in the table above will mature within a year of the balance sheet date.

(b) Market risk

Market risk is the risk that either the fair values or the cash flows of the Group's financial instruments may fluctuate because of changes in market prices. The Group is principally exposed to market risk through fluctuations in exchange rates and interest rates.

Currency risk

The Group Income Statement is exposed to currency risk on monetary items that are denominated in currencies other than the functional currency of the companies in which they are held. The currency profile of these financial assets and financial liabilities is shown in the table below.

	2020			2019		
	Euro £m	US dollar £m	Other £m	Euro £m	US dollar £m	Other £m
Trade receivables	31.3	34.8	30.5	29.2	35.0	19.6
Cash at bank	9.8	5.3	16.1	5.2	9.1	12.6
Trade payables	(18.7)	(21.8)	(27.5)	(15.3)	(23.2)	(18.5)
Private Placement Notes	(160.8)	(106.8)	—	(109.7)	(150.8)	—
Bank loans and overdrafts	(29.6)	(0.1)	—	(113.5)	(0.6)	(0.4)
Finance leases	(0.5)	—	(1.1)	(0.8)	—	(0.7)
Cross-currency interest rate swaps	(68.4)	62.9	—	—	—	—
Foreign currency forward contracts						
— Buy foreign currency (Private Placement)	—	—	—	84.5	—	—
— Buy foreign currency (Other)	1.1	1.2	—	1.0	1.5	1.2
— Sell foreign currency	(17.7)	(23.5)	—	(18.0)	(15.9)	—
	(253.5)	(48.0)	18.0	(137.4)	(144.9)	13.8

The Group previously arranged a rolling short-dated euro/sterling foreign exchange swap in respect of €100m of its Private Placement fixed rate financial liabilities. This had the effect of reducing the currency exposure of the Group's net debt by €100m. Following a review of this exposure, and in combination with issuing the CCIRS referred to in Note 25.2 (a), this arrangement was stopped on 30 April 2020.

The Group has £(1.3)m (2019: £(1.4)m) of exchange differences recognised in the Income Statement of which £(0.7)m arose on the revaluation of derivatives (2019: £0.2m).

The tables below show the net unhedged monetary assets and liabilities of Group companies that are not denominated in their functional currency and which could give rise to exchange gains and losses in the Group Income Statement.

	Net unhedged monetary assets/(liabilities)			
	Euro £m	US dollar £m	Other £m	Total £m
Functional currency				
Sterling	(253.6)	(44.1)	—	(297.7)
Other	0.1	(3.9)	18.0	14.2
As at 31 December 2020	(253.5)	(48.0)	18.0	(283.5)

	Net unhedged monetary assets/(liabilities)			
	Euro £m	US dollar £m	Other £m	Total £m
Functional currency				
Sterling	(139.7)	(150.6)	0.8	(289.5)
Other	2.3	5.7	13.0	21.0
As at 31 December 2019	(137.4)	(144.9)	13.8	(268.5)

The Group finances its operations partly by obtaining funding through external borrowings. Where these borrowings are not in sterling they may be designated as net investment hedges. This enables gains and losses arising on retranslation to be charged to other comprehensive income, providing a partial offset in equity against the gains and losses arising on translation of overseas net assets.

As at 31 December 2020, €213m and $60m of borrowings were designated as hedges of net investments in €213m and $60m worth of overseas foreign operations. In addition the €76.6m CCIRS liability has been designated as a net investment hedge of a further €76.6m worth of overseas foreign operations.

As the value of the borrowings and the CCIRS liability exactly matches the designated hedged portion of the net investments, the relevant hedge ratio is 1:1. The net investment hedges are therefore 100% effective with no ineffectiveness. It is noted that hedge ineffectiveness would arise in the event there were insufficient euro-denominated overseas foreign operations to be matched against the €76.6m CCIRS liability.

Notes to the Group Financial Statements continued

25. Financial Risk Management continued

25.2 Financial risk factors continued

The total retranslation impact of the borrowings and CCIRS designated as net investment hedges was £9.7m (2019: £14.1m).

The $86m CCIRS asset has been designated as a cash flow hedge of the $86m USPP Notes issued in 2020. As all principal and interest cash flows under the CCIRS exactly mirror those under the USPP Notes, the cash flow hedge is 100% effective with no ineffectiveness. It is noted that hedge ineffectiveness would arise in the event there was a change in the contractual terms of either the USPP Notes or the CCIRS.

Hedge effectiveness is determined at inception of the hedge relationship and through periodic effectiveness assessments, to ensure that an economic relationship exists between the hedged item and hedging instrument.

Interest rate risk

The Group's interest rate risk principally arises in relation to its borrowings. Where borrowings are held at floating rates of interest, fluctuations in interest rates expose the Group to variability in the cash flows associated with its interest payments, and where borrowings are held at fixed rates of interest, fluctuations in interest rates expose the Group to changes in the fair value of its borrowings. The Group's policy is to maintain an appropriate mix of fixed and floating rate borrowings based on the Vesuvius trading environment, market conditions and other economic factors.

As at 31 December 2020, the Group had $146m and €180m (£267.7m in total) of US Private Placement Loan Notes (USPP) outstanding, which carry a fixed rate of interest, representing 78% of the Group's total borrowings outstanding at that date. The interest rate profile of the Group's borrowings is detailed in the tables below.

	Financial liabilities (gross borrowings)		
	Fixed rate £m	Floating rate £m	Total £m
Sterling	—	43.3	43.3
US dollar	106.8	0.3	107.1
Euro	160.8	31.5	192.3
Other	—	0.5	0.5
Capitalised arrangement fees	(1.3)	(0.1)	(1.4)
As at 31 December 2020	266.3	75.5	341.8

	Financial liabilities (gross borrowings)		
	Fixed rate £m	Floating rate £m	Total £m
Sterling	—	66.2	66.2
US dollar	150.8	0.9	151.7
Euro	109.9	113.4	223.3
Other	—	1.5	1.5
Capitalised arrangement fees	(1.2)	—	(1.2)
As at 31 December 2019	259.5	182.0	441.5

Information in respect of the currency risk management of €100m of euro-denominated fixed rate financial liabilities and $86m of US dollar-denominated fixed rate financial liabilities is provided above.

The floating rate financial liabilities shown in the tables above typically bear interest at the inter-bank offered rate of the appropriate currency, plus a margin. The fixed rate financial liabilities of £267.6m (2019: £260.7m) have a weighted average interest rate of 3.4% (2019: 3.9%) and a weighted average period for which the rate is fixed of 6.2 years (2019: 4.8 years).

The financial assets attract floating rate interest.

Based upon the interest rate profile of the Group's financial liabilities shown in the tables above, a 1% increase in market interest rates would increase both the finance costs charged in the Group Income Statement and the interest paid in the Group Statement of Cash Flows by £0.8m (2019: £1.8m), and a 1% reduction in market interest rates would decrease both the finance costs charged in the Group Income Statement and the interest paid in the Group Statement of Cash Flows by £0.8m (2019: £1.8m).

(c) Credit risk

Credit risk arises from cash and cash equivalents, derivative financial assets and deposits with banks and financial institutions, as well as credit exposures to customers, including outstanding receivables.

(i) Risk management

For banks and financial institutions, Group policy is that only independently rated entities with a minimum rating of 'A-' are accepted as counterparties. In addition, the Group's operating companies have policies and procedures in place to assess the creditworthiness of the customers with whom they do business.

(ii) Impairment of financial assets

The Group subjects trade receivables for sales of inventory and from the provision of services to the expected credit loss model.

While cash and cash equivalents are also subject to the impairment requirements of IFRS 9, the identified impairment loss was immaterial.

The Group applies the IFRS 9 simplified approach to measuring expected credit losses which uses a lifetime expected loss allowance for all trade receivables and contract assets. The expected loss rates are based on the payment profiles of sales over a period of 60 months before 31 December 2020 and the corresponding historical credit losses experienced within this period. The historical loss rates are adjusted to reflect current and forward-looking information on macroeconomic factors affecting the ability of the customers to settle the receivables. The Group has identified the current state of the economy (such as market interest rates or growth rates) and particular industry issues in the countries in which it sells its goods and services to be the most relevant factors, and accordingly adjusts the historical loss rates based on expected changes in these factors.

Regardless of the analysis above, a significant increase in credit risk is presumed if a debtor is more than 30 days past due in making a contractual payment. Where objective evidence exists that a trade receivable balance may be impaired, provision is made for the difference between its carrying amount and the present value of the estimated cash that will be recovered.

Evidence of impairment may include such factors as a change in credit risk profile of the customer, the customer being in default on a contract, or the customer entering bankruptcy or financial reorganisation proceedings. All significant balances are reviewed individually for evidence of impairment.

Trade receivables and contract assets are written off when there is no reasonable expectation of recovery. Indicators that there is no reasonable expectation of recovery include, amongst others, the failure of a debtor to engage in a repayment plan with the Group, and a failure to make contractual payments for a period of greater than 120 days past due. Where loans or receivables have been written off, the Company continues to engage in enforcement activity to attempt to recover the receivable due.

Where recoveries are made, these are recognised within the Income Statement.

The closing expected credit loss allowance for trade receivables as at 31 December 2020 reconciles to the opening loss allowances as follows:

	2020 £m	2019 £m
As at 1 January	26.6	28.2
(Decrease)/increase in expected credit loss allowance recognised in profit or loss during the year	(0.3)	2.3
Receivables written off during the year as uncollectable	(2.2)	(3.0)
Exchange adjustments	(0.1)	(0.9)
As at 31 December	24.0	26.6

The credit for the year shown in the table above is recorded within administration, selling and distribution costs in the Group Income Statement.

Historical experience has shown that the Group's trade receivable provisions are maintained at levels that are sufficient to absorb actual bad debt write-offs, without being excessive. The Group considers the credit quality of financial assets that are neither past due nor impaired as good.

The Group also applies the expected credit loss model under IFRS 9 to other receivables. If, at the reporting date, the credit risk of the receivables has not increased significantly since initial recognition, the Group measures the loss allowance at an amount equal to 12-month expected credit losses. If the credit risk on that receivable has increased significantly since initial recognition, the Group measures the loss allowance at an amount equal to the lifetime expected credit losses. The expected credit loss on other receivables is not material.

Notes to the Group Financial Statements continued

25. Financial Risk Management continued

25.2 Financial risk factors continued

(d) Liquidity risk

Liquidity risk is the risk that the Group might have difficulties in meeting its financial obligations. The Group manages this risk by ensuring that it maintains sufficient levels of committed borrowing facilities and cash and cash equivalents to ensure that it can meet its operational cash flow requirements and any maturing financial liabilities, whilst at all times operating within its financial covenants. The level of operational headroom provided by the Group's committed borrowing facilities is reviewed at least annually as part of the Group's three-year planning process. Where this process indicates a need for additional finance, this is addressed on a timely basis by means of either additional committed bank facilities or raising finance in the capital markets.

During the first half of 2020, the Group accessed the Bank of England's Covid Corporate Financing Facility (CCFF) as a precautionary measure whilst the full impact of the pandemic remained uncertain. The £200m issued through the CCFF was repaid in September 2020.

As at 31 December 2020, the Group had committed borrowing facilities of £586.6m (2019: £609.7m), of which £246.6m (2019: £174.2m) were undrawn. These undrawn facilities are due to expire in June 2022. The Group's borrowing requirements are met by USPP, a multi-currency committed syndicated bank facility of £300m (2019: £300.0m) and a bilateral bank facility of £19m (2019: £49.0m) which is fully collateralised against £21.1m of the Group's cash balance in China. USPP Notes issued as at 31 December 2020 amounted to £267.6m ($146.0m and €180.0m) and had a weighted average period to maturity of 6.2 years. €15.0m is repayable in December 2021, $30.0m in 2023, €15.0m and $60.0m in 2025, €100.0m and $26.0m in 2027, $30.0m in 2028 and €50.0m in 2029. The maturity analysis of the Group's gross borrowings (including interest) is shown in the tables below. The cash flows shown are undiscounted.

As at 31 December 2020	Within 1 year £m	Between 1 and 2 years £m	Between 2 and 5 years £m	Over 5 years £m	Total contractual cash flows £m	Carrying amount £m
Trade payables	185.7	—	—	—	185.7	185.7
Loans and overdrafts	44.7	84.2	80.5	187.4	396.8	343.2
Lease liabilities	11.2	9.1	11.1	12.9	44.3	36.3
Capitalised arrangement fees	—	—	—	—	—	(1.4)
Derivative liability	(0.5)	(0.4)	2.7	1.4	3.2	7.0
Total financial liabilities	241.1	92.9	94.3	201.7	630.0	570.8

As at 31 December 2019	Within 1 year £m	Between 1 and 2 years £m	Between 2 and 5 years £m	Over 5 years £m	Total contractual cash flows £m	Carrying amount £m
Trade payables	173.8	—	—	—	173.8	173.8
Loans and overdrafts	171.8	17.4	157.0	134.9	481.1	442.8
Lease liabilities	12.0	9.9	9.2	9.3	40.4	33.3
Capitalised arrangement fees	—	—	—	—	—	(1.2)
Derivative liability	0.8	—	—	—	0.8	0.7
Total financial liabilities	358.4	27.3	166.2	144.2	696.1	649.4

Capitalised arrangement fees shown in the tables above, which have been recognised as a reduction in borrowings in the Financial Statements, amounted to £1.4m as at 31 December 2020 (31 December 2019: £1.2m), of which £1.3m (2019: £0.8m) related to the USPP and £0.1m (2019: £0.4m) related to the syndicated bank facility.

25.3 Capital management

The Company considers its capital to be equal to the sum of its total equity, disclosed on the Group Balance Sheet, and net debt (Note 14). It monitors its capital using a number of KPIs, including free cash flow, average working capital to sales ratios, net debt to EBITDA ratios and RONA (Note 4). The Group's objectives when managing its capital are:

> To ensure that the Group and all of its businesses are able to operate as going concerns and ensure that the Group operates within the financial covenants contained within its debt facilities

> To have available the necessary financial resources to allow the Group to invest in areas that may deliver acceptable future returns to investors

> To maintain sufficient financial resources to mitigate against risks and unforeseen events

> To maximise shareholder value through maintaining an appropriate balance between the Group's equity and net debt

The Group operated within the requirements of its debt covenants throughout the year and has sufficient liquidity headroom within its committed debt facilities. Details of the Group's covenant compliance and committed debt facilities can be found in the Strategic Report on page 44.

25.4 Cash pooling arrangements

The Group enters into zero balancing and notional cash pooling arrangements as part of its ongoing Treasury management activities. Certain notional cash pooling arrangements meet the criteria for offsetting as clarified in amendments to IAS 32 Financial Instruments: Presentation, about a legally enforceable right of set-off both in the ordinary course of business and in the event of default. The following tables set out the amounts of recognised financial assets and liabilities shown as cash and cash borrowings and those amounts which are subject to these agreements.

	Gross amounts of recognised financial assets/liabilities £m	Gross amounts of recognised financial assets/liabilities offset in the statement of financial position £m	Net amounts of financial assets/liabilities presented in the statement of financial position £m
Financial assets/liabilities			
Cash deposits	209.8	(0.1)	209.7
Cash borrowings	(3.0)	0.1	(2.9)
As at 31 December 2020	206.8	—	206.8
Financial assets/liabilities			
Cash deposits	229.7	(0.5)	229.2
Cash borrowings	(7.6)	0.5	(7.1)
As at 31 December 2019	222.1	—	222.1

26. Employee Benefits

26.1 Accounting policy

The net liability or net surplus recognised in the Group Balance Sheet for the Group's defined benefit plans is the present value of the defined benefit obligation at the balance sheet date, less the fair value of the plan assets. The defined benefit obligation is calculated by independent actuaries using the projected unit credit method and by discounting the estimated future cash flows using interest rates on high-quality corporate bonds that have durations approximating the terms of the related pension liability.

Any asset recognised in respect of a surplus arising from this calculation is limited to the asset ceiling, where this is the present value of any economic benefits available in the form of refunds or reductions in future contributions in respect of the plans. The Group has an unconditional right to a refund of surplus, as defined under IFRIC 14, and considers that the possibility that a surplus could be reduced or extinguished by discretionary actions by the Trustee does not affect the existence of the asset at the end of the reporting period. The Group therefore recognises a pension asset with respect to the scheme valued on an IAS 19 basis. No liability is recognised with respect to further funding contributions.

The expense for the Group's defined benefit plans is recognised in the Group Income Statement as shown in Note 26.8. Actuarial gains and losses arising on the assets and liabilities of the plans are reported within the Group Statement of Comprehensive Income; and gains and losses arising on settlements and curtailments are recognised in the Group Income Statement in the same line as the item that gave rise to the settlement or curtailment or, if material, separately reported as a component of operating profit.

26.2 Group post-retirement plans

The Group operates a number of pension plans around the world, both defined benefit and defined contribution, and accounts for them in accordance with IAS 19.

The Group's principal defined benefit pension plans are in the UK and the US, the benefits of which are based upon the final pensionable salaries of plan members. The assets of these plans are held separately from the Group in trustee-administered funds. The trustees are required to act in the best interests of the plans' beneficiaries. The Group also has defined benefit pension plans in other territories but, except for those in Germany, these are not individually material in relation to the Group.

(a) Defined benefit pension plans – UK

The Group's main defined benefit pension plan in the UK ('the UK Plan') is closed to new members and to future benefit accrual. The existing plan was established under a trust deed and is subject to the Pensions Act 2004 and guidance issued by the UK Pensions Regulator.

A full actuarial valuation of the UK Plan is carried out every three years by an independent actuary for the UK Plan Trustee in line with the requirements of the Pensions Act 2004, and the last full valuation was carried out as at 31 December 2018. At that date, the market value of plan assets was £605.1m and this represented a funding level of 110% of the accrued plan benefits at the time of £552.0m. Calculated on a 'buy-out' basis (using an estimation of the cost of buying out the UK Plan benefits with an insurance company), the liabilities at that date were £626.7m, representing a funding level of 95%.

Notes to the Group Financial Statements continued

26. Employee Benefits continued

26.2 Group post-retirement plans continued

There is a 'long-term scheme-specific funding standard' in Part 3 of the Pensions Act 2004. In terms of Part 3, the UK Plan is subject to a requirement ('the statutory funding objective') that it must have sufficient and appropriate assets to cover its technical provisions. Such technical provisions are determined as part of the triennial valuation. Under the rules of the UK Plan, the Trustee, after consultation with the Company, has the power to set the funding contributions taking into account the results of the triennial valuation, and the Pension Act 2004 legislation.

(b) Defined benefit pension plans – US

The Group has several defined benefit pension plans in the US, providing retirement benefits based on final salary or a fixed benefit. The Group's principal US defined benefit pension plans are closed to new members and to future benefit accrual for existing members. Actuarial valuations of the US defined benefit pension plans are carried out every year and the last full valuation was carried out as at 31 December 2020. At that date the market value of the plan assets was $66.0m, representing a funding level of 76.5% of funded accrued plan benefits at that date (using the projected unit method of valuation) of $86.3m. Funding levels for the Group's US defined benefit pension plans are based upon annual valuations carried out by independent qualified actuaries and are governed by US Government regulations.

The Group's US qualified defined benefit pension plan is subject to the minimum contribution requirements of the Internal Revenue Code Sections 412 and 430. Contributions are determined by trustees, in consultation with the Company, based on the annual valuations which are submitted to the Internal Revenue Service. During the fiscal year beginning 1 January 2020, total minimum required contributions were approximately $2.8m. Under these funding laws and based on the plan deficit, the required minimum annual contribution for the 2021 fiscal year is expected to be no greater than $3.0m and the required annual contributions for the period 2022-2023 are expected to be in the $3.0m to $5.0m range. Contributions of $2.8m were made during 2020.

There is a $0.2m settlement gain reported in the main US defined benefit pension plan in 2020 which relates to annuity purchases of $7.8m being made in May 2020 (the defined benefit obligation settled was $8.0m). There was a $1.8m settlement gain reported in the main US defined benefit pension plan in 2019 which relates to lump sum payments of $4.7m being made in mid-December 2019 to employees who have accepted the offer to receive a lump sum in full settlement of their pension (the defined benefit obligation settled was $6.5m).

(c) Defined benefit pension plans – Germany

The Group has several defined benefit pension arrangements in Germany which are unfunded, as is common practice in that country. The main plan was closed to new entrants on 31 December 2016 and replaced by a defined contribution plan for new joiners. The German Defined Benefit plan contains mainly direct pension promises based on works council agreements as well as on some individual pension promises. The legal framework is the German Company Pensions Act ("Betriebsrentengesetz"). The plan is unfunded (book reserved) and the company pays all benefit payments when they fall due.

(d) Defined benefit pension plans – ROW and other post-retirement benefits

The Group has several defined benefit pension arrangements across the rest of the world, the largest of which are in Belgium. The net liability of the ROW plans at 31 December 2020 was £20.7m (2019: £18.0m). The Group also has liabilities relating to medical insurance arrangements and termination plans which provide for benefit to be paid to employees on retirement. The net liability of these other post-retirement benefits at 31 December 2020 was £7.0m (2019: £6.9m).

(e) Defined contribution pension plans

The total expense for the Group's defined contribution plans in the Group Income Statement amounted to £9.7m (2019: £11.3m) and represents the contributions payable for the year by the Group to the plans.

(f) Multi-employer plans

Due to collective agreements, Vesuvius in the US participates, together with other enterprises, in union-run multi-employer pension plans for temporary workers hired on sites. These are accounted for as defined contribution plans. The bulk of the multi-employer pension plans related to BMI, which was disposed in 2018. The BMI sale transaction was structured to ensure as best as possible that any pension liability would go to the acquiring company. There is a five-year window where Vesuvius US could still have some liability for any shortfall in the BMI plans should the buyer cease to exist.

26.3 Post-retirement liability valuation

The main assumptions used in calculating the costs and obligations of the Group's defined benefit pension plans, as detailed below, are set by the Directors after consultation with independent professionally qualified actuaries and include those used to determine regular service costs and the financing elements related to the plans' assets and liabilities. It is the Directors' responsibility to set the assumptions used in determining the key elements of the costs of meeting such future obligations. Whilst the Directors believe that the assumptions used are appropriate, a change in the assumptions used could affect the Group's profit and financial position.

(a) Mortality assumptions

The mortality assumptions used in the actuarial valuations of the Group's UK, US and German defined benefit pension liabilities are summarised in the table below and have been selected to reflect the characteristics and experience of the membership of those plans.

For the UK Plan, the assumptions used have been derived from the Self-Administered Pension Schemes (SAPS) All table, with future longevity improvements in line with the 'core' mortality improvement tables published in 2019 by the Continuous Mortality Investigation (CMI), with a long-term rate of improvement of 1.25% per year. For the Group's US plans, the assumptions used have been based on the Pri-2012 mortality tables and MP-2020 projection scale. The Group's major plans in Germany have been valued using the modified Heubeck Richttafeln 2018G mortality tables. In respect of the life expectancy tables below, current pensioners are assumed to be 65 years old, while future pensioners are assumed to be 45 years old.

		2020			2019		
Life expectancy of pension plan members		UK years	US years	Germany years	UK years	US years	Germany years
Age to which current pensioners are expected to live	— Men	87.1	85.4	85.3	87.0	85.6	85.2
	— Women	89.4	87.4	88.8	89.2	87.6	88.7
Age to which future pensioners are expected to live	— Men	87.5	86.9	88.1	87.3	87.2	88.0
	— Women	90.8	88.8	91.0	90.1	89.1	90.9

(b) Other main actuarial valuation assumptions

	2020			2019		
	UK % p.a.	US % p.a.	Germany % p.a.	UK % p.a.	US % p.a.	Germany % p.a.
Discount rate	1.40	2.05	0.60	1.95	2.85	1.00
Price inflation — using RPI for UK	2.90	2.00	1.50	3.00	2.25	1.50
— using CPI for UK	2.20	n/a	n/a	1.90	n/a	n/a
Rate of increase in pensionable salaries	n/a	n/a	2.25	n/a	n/a	2.25
Rate of increase to pensions in payment	2.80	n/a	1.50	2.90	n/a	1.50

The discount rate used to determine the liabilities of the UK Plan for IAS 19 accounting purposes is required to be determined by reference to market yields on high-quality corporate bonds. The UK discount rate in the above table is based on analysis using the expected future cash flows of the Vesuvius Pension Plan and the AON Hewitt AA yield curve; the US discount rate is based on the Citigroup pension discount curve; and the Germany discount rate is based on AA corporate bond yields included in the iBoxx Euro AA corporate bond indices.

The assumptions for UK price inflation are set by reference to the difference between yields on longer-term conventional government bonds and index-linked bonds, except for CPI, for which no appropriate bonds exist, which is assumed to be 0.7 points lower (2019: 1.1 points lower) than RPI-based inflation.

Notes to the Group Financial Statements continued

26. Employee Benefits continued

26.3 Post-retirement liability valuation continued

(c) Sensitivity analysis of the impact of changes in significant IAS 19 actuarial assumptions

The UK Plan Trustee has entered into a pension insurance buy-in agreement with the Pension Insurance Corporation (PIC). The US pensions are not inflation linked. The rate of increase in pensionable salaries and of pensions in payment is therefore not significant to the valuation of the Group's overall pension liabilities.

The sensitivity of the defined benefit obligation to changes in the weighted principal assumptions is:

Assumption	Change in assumption	UK	US	Germany
Discount rate	Increase/decrease by 0.1%			
	— impact on plan liabilities	Decrease/increase by £8.2m	Decrease/increase by £0.8m	Decrease/increase by £1.4m
	— impact on plan assets	Decrease/increase by £3.4m	n/a	n/a
Price inflation	Increase/decrease by 0.1%			
	— impact on plan liabilities	Increase/decrease by £5.7m	n/a	Increase/decrease by £0.3m
	— impact on plan assets	Increase/decrease by £2.3m	n/a	n/a
Mortality	Increase by one year			
	— impact on plan liabilities	Increase by £27.0m	Increase by £3.1m	Increase by £2.5m
	— impact on plan assets	Increase by £19.0m	n/a	n/a

26.4 Defined benefit obligation

The average duration of the obligations to which the liabilities of the Group's principal pension plans relate is 17 years for the UK, 21 years for Germany and 11 years for the US.

	Defined benefit pension plans					Other post-retirement benefit plans	
	UK £m	US £m	Germany £m	ROW £m	Total £m	£m	Total £m
Present value as at 1 January 2020	482.0	78.9	54.5	47.5	662.9	6.9	669.8
Exchange differences	—	(2.2)	3.1	1.7	2.6	—	2.6
Current service cost	—	0.1	1.6	3.1	4.8	0.4	5.2
Past service cost	0.8	—	—	(0.1)	0.7	—	0.7
Interest cost	9.0	2.0	0.6	0.7	12.3	0.2	12.5
Settlements	—	(6.2)	—	—	(6.2)	—	(6.2)
Remeasurement of liabilities:							
— demographic changes	2.2	(0.7)	—	—	1.5	—	1.5
— financial assumptions	38.2	6.4	4.8	1.9	51.3	0.3	51.6
— experience losses/(gains)	(6.2)	0.5	—	0.3	(5.4)	0.1	(5.3)
Benefits paid	(24.2)	(4.5)	(1.5)	(3.0)	(33.2)	(0.9)	(34.1)
Present value as at 31 December 2020	501.8	74.3	63.1	52.1	691.3	7.0	698.3

	Defined benefit pension plans					Other post-retirement benefit plans	
	UK £m	US £m	Germany £m	ROW £m	Total £m	£m	Total £m
Present value as at 1 January 2019	455.9	79.5	47.8	44.6	627.8	7.3	635.1
Exchange differences	—	(3.2)	(3.1)	(2.7)	(9.0)	(0.2)	(9.2)
Current service cost	—	0.1	1.2	2.8	4.1	0.4	4.5
Past service cost	—	—	—	0.2	0.2	0.1	0.3
Interest cost	12.6	3.1	0.9	1.0	17.6	0.2	17.8
Settlements	—	(5.1)	—	—	(5.1)	—	(5.1)
Remeasurement of liabilities:							
— demographic changes	(5.6)	(0.5)	—	—	(6.1)	—	(6.1)
— financial assumptions	49.4	9.2	9.6	4.3	72.5	0.7	73.2
— experience losses/(gains)	2.6	0.4	(0.3)	(0.3)	2.4	(0.5)	1.9
Benefits paid	(32.9)	(4.6)	(1.6)	(2.4)	(41.5)	(1.1)	(42.6)
Present value as at 31 December 2019	482.0	78.9	54.5	47.5	662.9	6.9	669.8

26.5 Fair value of plan assets

	2020				2019			
	UK £m	US £m	ROW £m	Total £m	UK £m	US £m	ROW £m	Total £m
As at 1 January	581.6	50.3	29.4	661.3	543.8	47.0	29.0	619.8
Exchange differences	—	(1.5)	1.2	(0.3)	—	(1.8)	(1.7)	(3.5)
Interest income	11.0	1.2	0.4	12.6	15.1	1.8	0.6	17.5
Settlements	—	(6.0)	—	(6.0)	—	(3.7)	—	(3.7)
Acquisitions	—	—	—	—	—	—	—	—
Remeasurement of assets	49.1	6.3	0.1	55.5	55.4	9.3	0.7	65.4
Contributions from employer	—	2.2	2.5	4.7	0.8	2.0	2.4	5.2
Contributions from members	—	—	—	—	—	—	—	—
Administration expenses paid	(1.2)	(0.6)	—	(1.8)	(0.7)	(0.7)	—	(1.4)
Benefits paid	(24.1)	(3.5)	(2.2)	(29.8)	(32.8)	(3.6)	(1.6)	(38.0)
As at 31 December	616.4	48.4	31.4	696.2	581.6	50.3	29.4	661.3

The Group's pension plans in Germany are unfunded, as is common practice in that country, and accordingly there are no assets associated with these plans.

26.6 Remeasurement of defined benefit liabilities/assets

	2020 total £m	2019 total £m
Remeasurement of liabilities:		
— demographic changes	(1.5)	6.1
— financial assumptions	(51.6)	(73.2)
— experience (losses)/gains	5.3	(1.9)
Remeasurement of assets	55.5	65.4
Total movement	7.7	(3.6)

The remeasurement of defined benefit liabilities and assets is recognised in the Group Statement of Comprehensive Income.

Notes to the Group Financial Statements continued

26. Employee Benefits continued

26.7 Balance sheet recognition

The amount recognised in the Group Balance Sheet in respect of the Group's defined benefit pension plans and other post-retirement benefit plans is analysed in the following tables, which all relate to continuing operations. All equity securities and bonds have quoted prices in active markets.

	Defined benefit pension plans					Other post-retirement benefit plans £m	2020 total £m
	UK £m	US £m	Germany £m	ROW £m	Total £m		
Equities	29.7	4.3	—	1.7	35.7	—	35.7
Bonds	301.3	43.2	—	3.3	347.8	—	347.8
Annuity insurance contracts	282.1	—	—	22.4	304.5	—	304.5
Other assets	3.3	0.9	—	4.0	8.2	—	8.2
Fair value of plan assets	616.4	48.4	—	31.4	696.2	—	696.2
Present value of funded obligations	(500.0)	(63.2)	—	(46.8)	(610.0)	—	(610.0)
	116.4	(14.8)	—	(15.4)	86.2	—	86.2
Present value of unfunded obligations	(1.8)	(11.1)	(63.1)	(5.3)	(81.3)	(7.0)	(88.3)
Total net surpluses/(liabilities)	114.6	(25.9)	(63.1)	(20.7)	4.9	(7.0)	(2.1)
Recognised in the Group Balance Sheet as:							
Net surpluses	116.4	—	—	0.7	117.1	—	117.1
Net liabilities	(1.8)	(25.9)	(63.1)	(21.4)	(112.2)	(7.0)	(119.2)
Total net surpluses/(liabilities)	114.6	(25.9)	(63.1)	(20.7)	4.9	(7.0)	(2.1)

	Defined benefit pension plans					Other post-retirement benefit plans £m	2019 total £m
	UK £m	US £m	Germany £m	ROW £m	Total £m		
Equities	44.2	3.2	—	2.1	49.5	—	49.5
Bonds	229.3	46.3	—	3.3	278.9	—	278.9
Annuity insurance contracts	280.3	—	—	20.4	300.7	—	300.7
Other assets	27.8	0.8	—	3.6	32.2	—	32.2
Fair value of plan assets	581.6	50.3	—	29.4	661.3	—	661.3
Present value of funded obligations	(480.1)	(67.6)	—	(42.8)	(590.5)	—	(590.5)
	101.5	(17.3)	—	(13.4)	70.8	—	70.8
Present value of unfunded obligations	(1.9)	(11.3)	(54.5)	(4.7)	(72.4)	(6.9)	(79.3)
Total net surpluses/(liabilities)	99.6	(28.6)	(54.5)	(18.1)	(1.6)	(6.9)	(8.5)
Recognised in the Group Balance Sheet as:							
Net surpluses	101.5	—	—	1.1	102.6	—	102.6
Net liabilities	(1.9)	(28.6)	(54.5)	(19.2)	(104.2)	(6.9)	(111.1)
Total net surpluses/(liabilities)	99.6	(28.6)	(54.5)	(18.1)	(1.6)	(6.9)	(8.5)

(a) (i) UK Plan asset allocation

As at 31 December 2020, of the UK Plan's total assets, 45.8% (2019: 48.2%) were represented by the annuity insurance contracts covering the UK Plan's pension liabilities; 4.8% (2019: 7.6%) were allocated to equities; 48.9% (2019: 39.4%) to fixed income securities; 0.5% (2019: 0.4%) to cash; and nil% (2019: 4.4%) to other assets. The fixed income asset class of the UK Plan includes a liability-driven investment portfolio of financial derivative contracts which reduces the risk that the UK Plan's assets would fall materially, relative to the value of its economic liabilities. Of the UK Plan's fixed income securities, £190.0m (2019: £150.3m) have a quoted market price in an active market.

The UK Plan Trustee has entered into a pension insurance buy-in agreement with the Pension Insurance Corporation (PIC), whereby the UK Plan Trustee has paid insurance premiums to PIC to insure a significant portion of the UK Plan's liabilities. Under this arrangement, the value of the PIC insurance contract matches the value of the liabilities because the inflation, interest rate, investment and longevity risk for Vesuvius in respect of these liabilities are eliminated. As at 31 December 2020, the IAS 19 valuation of the PIC insurance contract value associated with the bought-in liabilities was £282.1m (2019: £280.3m). The buy-in agreement ensures that the UK pension plan obligations in respect of all its retired members and their approved dependants are insured. The policy and the associated valuation are updated annually to reflect retirements and mortality. In the current year, the agreement based on specific membership data covers 56.4% (2019: 58.4%) of UK pension plan obligations, removing substantially all financial risks associated with this tranche of the liability.

(a) (ii) US Plan asset allocation

All of the assets in the main US Plan have a quoted market price in an active market. The Plan mitigates exposure to interest rates by employing a liability matching investment strategy. All non-derivative assets are invested in liability matching bonds with a similar average duration to the liabilities of the Plan. Since 2018, the investment allocation has been de-risked from an allocation of 72% liability matching and 28% return seeking assets, to an allocation of 100% liability matching. The Plan retains equity risk through use of equity derivative contracts, which provides equity market exposure with some level of equity downside protection.

(b) Defined benefit contributions in 2021

In 2021, the Group is expected to make contributions into its defined benefit pension and other post-retirement benefits plans of around £4.8m with specific contributions of approximately £2.2m and £1.8m anticipated for the US Plan and Belgian Plans respectively.

26.8 Income statement recognition

The expense recognised in the Group Income Statement in respect of the Group's defined benefit retirement plans and other post-retirement benefit plans is shown below:

	2020			2019		
	Defined benefit pension plans £m	Other post-retirement benefit plans £m	Total £m	Defined benefit pension plans £m	Other post-retirement benefit plans £m	Total £m
Current service cost	4.8	0.4	5.2	4.1	0.4	4.5
Past service cost	0.7	—	0.7	0.2	0.1	0.3
Settlements	(0.2)	—	(0.2)	(1.4)	—	(1.4)
Administration expenses	1.8	—	1.8	1.4	—	1.4
Net interest cost/(gain)	(0.3)	0.2	(0.1)	0.1	0.2	0.3
Total net charge	6.8	0.6	7.4	4.4	0.7	5.1

The total net charge of £7.4m (2019: £5.1m) recognised in the Group Income Statement in respect of the Group's defined benefit pension plans and other post-retirement benefits plans is recognised in the following table:

		2020 £m	2019 £m
In arriving at trading profit	— within other manufacturing costs	1.7	1.7
	— within administration, selling and distribution costs	5.0	3.1
In arriving at profit before tax	— guaranteed minimum pension equalisation charge	0.8	—
	— within net finance costs	(0.1)	0.3
Total net charge		7.4	5.1

GMP equalisation

A UK High Court ruling was made on 26 October 2018 in respect of the gender equalisation of guaranteed minimum pensions (GMPs) for occupational pension schemes. The impact of GMP equalisation as at 31 December 2018 was estimated to be £4.5m.

A second UK High Court GMP equalisation ruling was issued on 20 November 2020. This second ruling considered the treatment of historic transfers out, i.e. those members who had transferred out before 26 October 2018. The 2020 ruling covers both individual and bulk transfers out. It does not revisit any of the issues addressed in the 2018 ruling. The impact of GMP equalisation for the second ruling is estimated to be £0.8m at 31 December 2020.

The increase in pension liabilities resulting from these judgements have been treated for IAS 19 purposes as plan amendments and resulted in an increase in the pension deficit in the balance sheet and a corresponding past service cost in the Income Statement. These amendments have been treated as separately reported items so that there has been no impact on headline performance. We are working with the trustees of our UK pension plan and our actuarial and legal advisers to understand the extent to which these judgements crystallise additional liabilities for the UK pension plan.

26.9 Risks to which the defined benefit pension plans expose the Group

The principal risks faced by these plans comprise: (i) the risk that the value of the plan assets is not sufficient to meet all plan liabilities as they fall due; (ii) the risk that plan beneficiaries live longer than envisaged, causing liabilities to exceed the available plan assets; and (iii) the risk that the market-based factors used to value plan liabilities and assets change materially adversely to increase plan liabilities over the value of available plan assets. Further details are given below:

Asset volatility

> The liabilities are calculated using a discount rate set with reference to corporate bond yields; if assets underperform against this yield, this will create a deficit. To reduce this risk, the pension plans are largely invested in government and corporate bonds

Notes to the Group Financial Statements continued

26. Employee Benefits continued

26.9 Risks to which the defined benefit pension plans expose the Group continued

Counterparty risk

> There are a number of other risks of running the UK Pension Fund including counterparty risks from using derivatives. These are mitigated by using a diversified range of counterparties of high standing and ensuring positions are collateralised as required

Changes in bond yields

> A decrease in corporate bond yields will increase the scheme liabilities, although this will be partially offset by an increase in the value of the schemes' bond holdings

Inflation risk

> Much of the UK scheme's benefit obligations are linked to inflation and higher inflation will lead to higher liabilities (although, in most cases, caps on the level of inflationary increases are in place to protect against extreme inflation). The UK scheme also holds index-linked government bonds to provide protection against this risk

Life expectancy

> The majority of the plans' obligations are to provide benefits for the life of the member and in some cases their spouse on death of the member, so increases in life expectancy will result in an increase in the liabilities

> In July 2012 Vesuvius entered into an agreement with the Pension Insurance Corporation (PIC) to insure pensions in payment for the pensioners in the UK main Plan. These annuities are owned by the UK Pension Plan. Further annuity purchases have taken place at regular intervals since then and the Plan now holds annuity contracts to cover the majority of pensions in payment thereby removing substantially all risks in respect of these pensions

> In August 2016 the pensions for the majority of current pensioners in the US main plan were bought out with an insurance company, removing all responsibility and risk related to these pensions from the Group

> In late 2016 and in late 2019 deferred members in the US main plan were offered lump sums in lieu of their deferred pension benefits, settling the liabilities for those members accepting this offer in full

27. Share-based Payments

27.1 Accounting policy

The Group operates an equity-settled share-based payment arrangement for its employees. Equity-settled share-based payments are measured at fair value at the date of grant. For grants with market-based conditions attached to them, such as total shareholder return, fair value is measured using a form of stochastic option pricing model. For grants with non-market-based conditions, such as growth in headline earnings per share, fair value is measured using the Black-Scholes option pricing model. The fair value is expensed on a straight-line basis over the vesting period with a corresponding increase in equity. The cumulative expense recognised is adjusted for the best estimate of the shares that will eventually vest.

27.2 Income statement recognition

The total expense recognised in the Group Income Statement is shown below:

	2020 £m	2019 £m
Long-Term Incentive Plan	0.8	2.5
Other plans	1.6	2.4
Total expense	2.4	4.9

The Group operates a number of different share-based payment plans, the most significant of which is the Long-Term Incentive Plan (LTIP), details of which can be found in the Directors' Remuneration Report.

27.3 Details of outstanding options

	As at 1 Jan 2020 no.	Outstanding awards: Granted no.	Exercised no.	Forfeited/ lapsed no.	Expired no.	As at 31 Dec 2020 no.
LTIP	1,833,220	847,503	(345,500)	(617,998)	nil	1,717,225
Weighted average exercise price	nil	nil	nil	nil	nil	nil
Other plans	685,099	198,891	(207,211)	(41,748)	nil	635,031
Weighted average exercise price	nil	nil	nil	nil	nil	nil

For the options exercised during 2020, the market value at the date of exercise ranged from 351 pence to 540 pence.

	As at 1 Jan 2019 no.	Outstanding awards: Granted no.	Exercised no.	Forfeited/ lapsed no.	Expired no.	As at 31 Dec 2019 no.
LTIP	2,360,478	654,534	(1,048,487)	(133,305)	nil	1,833,220
Weighted average exercise price	nil	nil	nil	nil	nil	nil
Other plans	298,890	563,715	(176,183)	(1,323)	nil	685,099
Weighted average exercise price	nil	nil	nil	nil	nil	nil

For the options exercised during 2019, the market value at the date of exercise ranged from 418 pence to 625 pence.

Details of market performance conditions are included in the Directors' Remuneration Report.

	2020 Awards exercisable as at 31 Dec 2020 no.	2020 Weighted average outstanding contractual life of awards years	2020 Range of exercise prices pence	2019 Awards exercisable as at 31 Dec 2019 no.	2019 Weighted average outstanding contractual life of awards years	2019 Range of exercise prices pence
LTIP	—	8.4		—	7.0	
Weighted average exercise price	—		n/a	—		n/a
Other plans	—	0.5		—	1.0	
Weighted average exercise price	—		n/a	—		n/a

27.4 Options granted under the LTIP during the year

	2020 EPS element	2020 TSR element
Fair value of options granted	392p	242p
Share price on date of grant	392p	392p
Expected volatility	n/a	30.3%
Risk-free interest rate	n/a	0.2%
Exercise price (per share)	nil	nil
Expected term (years)	3	3
Expected dividend yield	nil	nil

Vesting of 50% of shares awarded is based on the Group's three-year total shareholder return (TSR) performance relative to that of the constituent companies of the FTSE 250 (excluding investment trusts) and vesting of the remaining 50% of shares awarded is based on headline EPS growth.

Expected volatility was determined by calculating the historical volatility of the Group's share price over the 2.8 years (2019: 2.8 years) prior to the grant date for the March 2020 grant. The risk-free rate of return was assumed to be the yield to maturity on a UK fixed gilt with the term to maturity equal to the expected life of the option. At the discretion of the Remuneration Committee, award holders receive the value of dividends that would have been paid on their vested shares in the period between grant and vesting. Accordingly, there is no discount to the valuation for dividends foregone during the vesting period.

Notes to the Group Financial Statements continued

28. Trade and Other Payables

28.1 Accounting policy

Trade and other payables are initially recognised at fair value and subsequently measured at amortised cost, using the effective interest method.

28.2 Analysis of trade and other payables

	2020 £m	2019 £m
Non-current		
Accruals and other payables	13.1	14.7
Deferred purchase and contingent consideration	0.1	0.4
Total non-current other payables	13.2	15.1
Current		
Trade payables	185.7	173.8
Other taxes and social security	31.5	29.9
Deferred purchase and contingent consideration	—	1.5
Accruals and other payables	71.5	68.4
Total current trade and other payables	288.7	273.6

There is no significant difference between the fair value of the Group's trade and other payables balances and the amount at which they are reported in the Group Balance Sheet.

Included within trade payables in the table above is £17.5m (2019: £8.0m) subject to a supplier financing agreement entered into with one of the Group's core relationship banks. Under the terms of the agreement, the Group's suppliers in certain countries can elect to be paid earlier than the terms of their agreement with Vesuvius by requesting discounted early settlement from the arranging bank. This early settlement is effected between the bank and the supplier; from the perspective of the Group the terms of each payable remain unchanged. The Group is not charged any interest cost or fee in respect of the agreement.

29. Leases

29.1 Accounting policy

Lease liabilities are recognised at the present value of the remaining lease payments, discounted using the interest rate implicit in the lease if that rate can be readily determined. If that rate cannot be readily determined the lessee's incremental borrowing rate is used, calculated as the local government bond rate plus an interest rate spread. In cases where there was an option to terminate or extend a lease, the duration of the lease assumed for this purpose reflected the Group's existing intentions regarding such options. Lease liabilities include the net present value of the following lease payments:

> Fixed payments (including in-substance fixed payments), less any lease incentives receivable

> Variable lease payments that are based on an index or a rate

> Amounts expected to be payable by the lessee under residual value guarantees

> The exercise price of a purchase option if the lessee is reasonably certain to exercise that option, and

> Payments of penalties for terminating the lease, if the lease term reflects the lessee exercising that option.

Leases of low-value assets and short-term leases (shorter than 12 months) are classified as operating leases and neither the asset nor the corresponding liability to the lessor is recognised in the Group Balance Sheet. Rentals payable under operating leases are charged to the Group Income Statement on a straight-line basis over the term of the lease. Benefits received and receivable as an incentive to enter an operating lease are also spread on a straight-line basis over the lease term.

29.2 Lease liabilities

The maturity analysis of the lease liabilities is disclosed in Note 25 (d).

The net book value of the Group's property, plant and equipment assets held as right-of-use assets under lease contracts at 31 December 2020 was £37.7m (2019: £34.4m), (Note 15). The right-of-use asset is depreciated over the shorter of the asset's useful life and the lease term on a straight-line basis. The cash payments of leases during the year were £14.3m (2019: £13.3m).

29.3 Operating lease commitments

The future aggregate minimum lease payments under non-cancellable operating leases are payable as follows:

	2020 £m	2019 £m
Not later than one year	0.9	1.3
Later than one year and not later than five years	0.6	0.6
Later than five years	0.1	0.1
Total operating lease commitments	1.6	2.0

The cost incurred by the Group in the year in respect of assets held under operating leases, all of which was charged within trading profit, amounted to £4.2m (2019: £6.0m), of which £3.7m (2019: £5.3m) related to short-length leases and £0.5m (2019: £0.7m) related to leases of low-value items.

30. Provisions

30.1 Accounting policy

Provisions are recognised when the Group has a present obligation as a result of a past event and it is probable that the Group will be required to settle that obligation. Provisions are measured at the Directors' best estimate of the expenditure required to settle the obligation at the balance sheet date. Where the effect of the time value of money is material, provisions are discounted using a pre-tax discount rate that reflects both the current market assessment of the time value of money and the specific risks associated with the obligation. Where discounting is used, the increase in the provision due to the passage of time is recognised as a finance cost.

30.2 Analysis of provisions

	Disposal, closure and environmental costs £m	Restructuring charges £m	Other £m	Total £m
As at 1 January 2020	34.8	19.1	2.9	56.8
Exchange adjustments	(1.7)	0.7	—	(1.0)
Charge to Group Income Statement – separately reported items	10.3	6.1	—	16.4
Charge to Group Income Statement – trading profit	4.8	—	11.8	16.6
Unused amounts released to Group Income Statement	—	—	—	—
Adjustment to discount	1.0	—	—	1.0
Cash spend	(7.0)	(16.7)	(9.3)	(33.0)
Transferred to other balance sheet accounts	—	—	—	—
As at 31 December 2020	42.2	9.2	5.4	56.8

Of the total provision balance as at 31 December 2020 of £56.8m (2019: £56.8m), £34.0m (2019: £31.1m) is recognised in the Group Balance Sheet within non-current liabilities and £22.8m (2019: £25.7m) within current liabilities.

Disposal, closure and environmental charges

The provision for disposal, closure and environmental costs includes the Directors' current best estimate of the amounts to be payable in respect of known or probable costs resulting from third-party claims, including legacy matter lawsuits.

There remains inherent uncertainty associated with estimating the future costs of legacy matter lawsuits. In assessing the probable costs and realisation certainty of these provisions, or related assets, management has made reasonable assumptions including projections of the number of future claims, the approximate average cost of those claims (including legal costs and infrequent larger value claims) and the length of time taken to resolve such claims. The provision reflects the Directors' best estimate of the future liability and the value of the corresponding asset. By nature, these assumptions are uncertain and therefore changes to the assumptions used could significantly alter the Directors' assessment of the value, volume of claims, timing or certainty of the costs or related amounts. Sensitivity analyses have been conducted using variations to the key assumptions listed above and indicatively show:

> A 10% change in the average cost of claims would impact the gross provision by approximately £1.1m

> A 20% change in the level of larger value claims would impact the gross provision by approximately £0.8m

> An increase in the duration over which claims are received of 10% would increase the gross provision by approximately £1.9m

As assumptions can vary individually or in combination, over the longer term, there can be no guarantee that the assumptions used to estimate the provision will result in an accurate prediction of the actual costs that may be incurred.

Notes to the Group Financial Statements continued

30. Provisions continued

30.2 Analysis of provisions continued

As the resolution of many of the obligations for which provision is made is subject to legal or other regulatory process, the timing of the associated cash outflows is also subject to some uncertainty. However, the majority of the amounts provided are expected to be utilised over the next ten years. The provision, underlying estimates of costs and associated insurance estimates are regularly assessed, to reflect any changed circumstances with regard to individual matters. Any movements impacting the Income Statement are included within headline performance.

As set out above, where insurance cover exists for any of these known or probable costs, a related asset is recognised in the Group Balance Sheet only when its value can be reliably measured and reimbursement is considered to be virtually certain by management. As at 31 December 2020, £12.4m (2019: £16.4m) was recorded in other receivables in respect of associated insurance reimbursements, of which £10.4m (2019: £14.3m) is non-current.

In addition, this provision covers the estimate of costs to be payable both in the fulfilment of obligations incurred in connection with former Group businesses, resulting from either disposal or closure, together with those related to the demolition and clean-up of closed sites.

The Group owns a number of disused properties in the US, which do not form part of our trading operations. Costs are being incurred at one of these sites to address the significant increase in the volume of water run-off occurring from 2019. We have engaged waste management specialists, are taking actions to reduce the level of water (including hydrological studies), improving treatment processes and are in contact with the relevant regulatory authorities. We estimate that it will take a further 18 months to finalise initial works and that there will then be a period for which unavoidable associated and ongoing running costs will be incurred. The charges related to remediation and unavoidable associated and ongoing running costs have been recorded in 2020 and are £10.3m (2019: £4.1m). These non-recurring charges have been treated as a separately reported item. There has been no impact upon headline performance.

Restructuring charges provisions

The provision for restructuring charges includes the costs to complete the Group's major restructuring programmes. The majority of this balance is expected to be paid out over the next two years. The balance of £9.2m as at 31 December 2020 (2019: £19.1m) comprises £nil (2019: £4.3m) in relation to onerous lease provisions in respect of leases terminating between one and six years.

Other

Other provisions comprise amounts payable in respect of known or probable costs resulting both from legal or other regulatory requirements, workers' compensation and medical claims, and from third-party claims. As the settlement of many of the obligations for which provision is made is subject to reasonable assumptions, legal or other regulatory process, the timing of the associated outflows is subject to some uncertainty, but the majority of amounts provided are expected to be utilised over the next two years and the underlying estimates of costs are regularly updated to reflect changed circumstances with regard to individual matters. During 2020 the Group recognised net charges of £11.8m (2019: £8.4m) in the Group Income Statement to provide for various litigation settlements and other claims.

31. Off-Balance Sheet Arrangements

In compliance with current reporting requirements, certain arrangements entered into by the Group in its normal course of business are not reported in the Group Balance Sheet. Of such arrangements, the largest amounts are future lease payments in relation to assets used by the Group under non-cancellable operating leases (Note 29).

32. Contingent Liabilities

Guarantees given by the Group under property leases of operations disposed of amounted to £nil (2019: £0.3m). Details of guarantees given by the Company, on behalf of the Group, are given in Note 11 to the Company Financial Statements.

Vesuvius has extensive international operations and is subject to various legal and regulatory regimes, including those covering taxation and environmental matters.

Certain of Vesuvius' subsidiaries are subject to legacy matter lawsuits, predominantly in the US, relating to a small number of products containing asbestos manufactured prior to the acquisition of those subsidiaries by Vesuvius. These suits usually also name many other product manufacturers. To date, Vesuvius is not aware of there being any liability verdicts against any of these subsidiaries. Each year, a number of these lawsuits are withdrawn, dismissed or settled.

As the settlement of many of the obligations for which reserve is made is subject to legal or other regulatory process, the timing and amount of the associated outflows is subject to some uncertainty (see Note 30 for further information). The amount paid, including costs in relation to this litigation, has not had a material effect on Vesuvius' financial position or results of operations in the current year.

33. Investments in Subsidiaries, Joint Ventures and Associates

33.1 Investment in subsidiaries

A subsidiary is an entity over which the Group has control. The Group controls an entity when the Group is exposed to, or has rights to, variable returns from its involvement with the entity and can affect those returns through its power over the entity. Subsidiaries are fully consolidated from the date on which control is transferred to the Group.

The subsidiaries, joint ventures and associates of Vesuvius plc and the countries in which they are incorporated are set out below. With the exception of Vesuvius Holdings Limited, whose ordinary share capital was directly held by Vesuvius plc, the ordinary capital of the companies listed below was wholly owned by a Vesuvius plc subsidiary as at 31 December 2020.

Company legal name	Registered office address	Jurisdiction
A.C.N. 000 227 609 Pty Limited	40-46 Gloucester Boulevarde, Port Kembla, NSW, 2505, Australia	Australia
Advent Process Engineering Inc.	333 Prince Charles Drive, Welland, Ontario, L3B 5P4, Canada	Canada (Ontario)
BMI Refractory Services Inc.	600 N 2nd Street, Suite 401, Harrisburg, PA 17101-1071, United States	US (Pennsylvania)
Brazil 1 Limited	165 Fleet Street, London, EC4A 2AE, England	England
CCPI Inc.	Suite 201, 910 Foulk Road, Wilmington, New Castle, DE 19803, United States	US (Delaware)
Cookson Dominicana, SRL	Km 7 1/2, Autopista San Isidro, Edificio Modelo A, Zona Franca San Isidro, Santo Domingo Oeste, Dominican Republic	Dominican Republic
East Moon Investment (HK Holding) Company Limited	Unit 01, 82/F, International Commerce Centre, 1 Austin Road West, Kowloon, Hong Kong	Hong Kong
Flo-Con Holding, Inc.	CT Corporation, 1209 Orange Street, The Corporation Trust Company, Wilmington, DE 19801, United States	US (Delaware)
Foseco (FS) Limited	1 Midland Way, Central Park, Barlborough Links, Derbyshire, S43 4XA, England	England
Foseco (GB) Limited	165 Fleet Street, London, EC4A 2AE, England	England
Foseco (Jersey) Limited	44 Esplanade, St Helier, JE4 9WG, Jersey	Jersey
Foseco (MRL) Limited	165 Fleet Street, London, EC4A 2AE, England	England
Foseco (RUL) Limited	165 Fleet Street, London, EC4A 2AE, England	England
Foseco (UK) Limited	165 Fleet Street, London, EC4A 2AE, England	England
Foseco Canada Limited	181 Bay Street, Suite 1800, Toronto, Ontario, M5J 2T9, Canada	Canada (Ontario)
Foseco Espanola SA	5, Barrio Elizalde, Izurza, Bizkaia, 48213, Spain	Spain
Foseco Foundry (China) Co Limited	Room 819, Shekou Zhaoshang Building, Nanshan District, Shenzhen, Guangdong, 518067, China	China
Foseco Fundición Holding (Espanola), S.L.	5, Barrio Elizalde, Izurza, Bizkaia, 48213, Spain	Spain
Foseco Holding (Europe) Limited	165 Fleet Street, London, EC4A 2AE, England	England
Foseco Holding (South Africa) (Pty) Limited	12 Bosworth Street, Alrode, Alberton, 1449, South Africa	South Africa
Foseco Holding BV	Rivium Boulevard 301, Capelle aan den Ijssel, Rotterdam 2909LK, Netherlands	Netherlands
Foseco Holding International Limited	165 Fleet Street, London, EC4A 2AE, England	England
Foseco Holding Limited	165 Fleet Street, London, EC4A 2AE, England	England
Foseco Industrial e Comercial Ltda	Km 15, Rodovia Raposo Tavares, Butanta Cep, São Paulo, 05577-100, Brazil	Brazil
Foseco International Holding (Thailand) Limited	170/69, 22nd Floor Ocean Tower 1, Ratchadapisek Road, Klongtoey, Bangkok, 10110, Thailand	Thailand
Foseco International Limited	1 Midland Way, Central Park, Barlborough Links, Derbyshire, S43 4XA, England	England
Foseco Japan Limited	9th Floor, Orix Kobe Sannomiya Building, 6-1-10, Goko dori, Chuo-ku, Kobe Hyogo, 651-0087, Japan	Japan
Foseco Korea Limited	74 Jeongju-ro, Wonmi-gu, Bucheon-si, Gyeonggi-do, 14523, South Korea	South Korea
Foseco Limited	165 Fleet Street, London, EC4A 2AE, England	England
Foseco Metallurgical Inc.	CT Corporation, 1209 Orange Street, The Corporation Trust Company, Wilmington, DE 19801, United States	US (Delaware)
Foseco Nederland BV	Binnenhavenstraat 20, 7553 GJ Hengelo (OV), Netherlands	Netherlands
Foseco Overseas Limited	165 Fleet Street, London, EC4A 2AE, England	England
Foseco Pension Fund Trustee Limited	165 Fleet Street, London, EC4A 2AE, England	England
Foseco Philippines Inc.	Unit 401, 4th Floor 8 Antonio Centre, Prime St. Madrigal Business Park 2, Ayala Alabang Muntinlupa City, 1770 Philippines	Philippines
Foseco Portugal Produtos Para Fundiçâo Lda	Rua Manuel Pinto de Azevedo, No 626 4100-320 Porto, Portugal	Portugal
Foseco SAS	Le Newton C, 7 Mail Barthélémy Thimonnier, 77185 Lognes, France	France
Foseco Steel (Holdings) China Limited	165 Fleet Street, London, EC4A 2AE, England	England
Foseco Steel (UK) Limited	1 Midland Way, Central Park, Barlborough Links, Derbyshire, S43 4XA, England	England
Foseco Technology Limited	165 Fleet Street, London, EC4A 2AE, England	England
Foseco Transnational Limited	165 Fleet Street, London, EC4A 2AE, England	England
J.H. France Refractories Company	CT Corporation, 1209 Orange Street, The Corporation Trust Company, Wilmington, DE 19801, United States	US (Delaware)

Notes to the Group Financial Statements continued

33. Investments in Subsidiaries, Joint Ventures and Associates continued

33.1 Investment in subsidiaries continued

Company legal name	Registered office address	Jurisdiction
John G. Stein & Company Limited	1 Midland Way, Central Park, Barlborough Links, Derbyshire, S43 4XA, England	England
Mainsail Insurance Company Limited	Victoria Place, 5th floor, 31 Victoria Street, Pembroke, Hamilton, HM 10, Bermuda	Bermuda
Mascinco Empreendimentos e Participações Ltda	Avenida Brasil, 49550 – parte, Distrito Industrial de Palmares – Campo, Grande – Cep: 23065-480, Rio de Janeiro, RJ, Brazil	Brazil
Mastercodi Industrial Ltda	Rodovia Raposo Tavares, KM15, Butantã, 05577-100, Butantã, São Paulo, Brazil	Brazil
Mercajoya, S.A.	Capitán Haya, 56 – 1ºH, 28020 Madrid, Spain	Spain
Metal Way Equipamentos Metalurgicos Ltda	Estrada Santa Isabel, 7655 KM37, Bairro Do Una, Itaquaquecetuba, São Paulo – SP, CEP: 08580 000, Brazil	Brazil
Minerals Separation Limited	165 Fleet Street, London, EC4A 2AE, England	England
New Foseco (UK) Limited	1 Midland Way, Central Park, Barlborough Links, Derbyshire, S43 4XA, England	England
Process Metrix, LLC	6622 Owens Drive, Pleasanton, CA 94588, United States	US (California)
PT Foseco Indonesia	Jl Rawa Gelam 2/5, Kawasan Industri, Pulogadung, Jakarta, 13930, Indonesia	Indonesia
PT Foseco Trading Indonesia	Jl Rawa Gelam 2/5, Kawasan Industri, Pulogadung, Jakarta, 13930, Indonesia	Indonesia
Realisations 789, LLC	CT Corporation, 1209 Orange Street, The Corporation Trust Company, Wilmington, DE 19801, United States	US (Delaware)
S G Blair & Company Limited	1 Midland Way, Central Park, Barlborough Links, Derbyshire, S43 4XA, England	England
SIDERMES Inc. Business name Vesuvius Sensors and Probes	175, Calixa-Lavallée Verchêres, Québec J0L 2R0, Canada	Canada
SIDERMES Do Brasil Sensores Termicos Ltda	Estrada Municipal PDD 436, S/N, Prédio 'C', Bairro da Boa Vista, Municipio de Piedade, Estado de São Paulo, Brazil	Brazil
SIDERMES Latinoamericana CA	Zona Industrial, San Vicente Av., Anton Phillips Grupo Industrial, San Vicente Local 4, Maracay, Venezuela	Venezuela
SIDERMES S.A.	Urquiza 919 Piso 2 Rosario, Santa Fe, CP 2000, Argentina	Argentina
SIR Feuerfestprodukte GmbH	Siegener Strasse 152, Kreuztal, D-57223, Germany	Germany
SOLED SAS	Centre d'Activités Economiques Zone Industrielle de Franchepré 54240 Joeuf, France	France
Tamworth UK Limited	165 Fleet Street, London, EC4A 2AE, England	England
Unicorn Industries Limited	165 Fleet Street, London, EC4A 2AE, England	England
Veservice Ltda	Av Brasil, 49550, Distrito Industrial de Palmares, Campo Grande, Rio de Janeiro, 23065-480, Brazil	Brazil

Company legal name	Registered office address	Jurisdiction
Vesuvius (Thailand) Co., Limited	170/69, 22nd Floor Ocean Tower 1, Ratchadapisek Road, Klongtoey, Bangkok, 10110, Thailand	Thailand
Vesuvius (V.E.A.R.) S.A.	Street Urquiza, 919, Floor 2, Rosario, Provincia de Santa Fé, Argentina	Argentina
Vesuvius Advanced Ceramics (China) Co., Limited	221 Xing Ming Street, China-Singapore Suzhou Ind Park, Suzhou, Jiangsu Province, 215021, China	China
Vesuvius America, Inc.	1209 Orange Street, Wilmington, DE 19801, United States	US (Delaware)
Vesuvius Australia (Holding) Pty Limited	40-46 Gloucester Boulevarde, Port Kembla, NSW, 2505, Australia	Australia
Vesuvius Australia Pty Limited	40-46 Gloucester Boulevarde, Port Kembla, NSW, 2505, Australia	Australia
Vesuvius Belgium N.V.	Zandvoordestraat 366, Oostende, B-8400, Belgium	Belgium
Vesuvius Canada Inc	181 Bay Street, Suite 1800, Toronto, Ontario, M5J 2T9, Canada	Canada
Vesuvius Ceramics Limited	165 Fleet Street, London, EC4A 2AE, England	England
Vesuvius China Holdings Co. Limited	Unit 01, 82/F International Commerce Centre, 1 Austin Road West, Kowloon, Hong Kong	Hong Kong
Vesuvius China Limited	165 Fleet Street, London, EC4A 2AE, England	England
Vesuvius Colombia SAS	Street 90, number 13 A – 31, floor 6, Bogota, Colombia	Colombia
Vesuvius Corporation S.A.	Via Nassa 17, Lugano, CH 6900, Switzerland	Switzerland
Vesuvius CSD Sp z.o.o.	ul. Jasnogórska 11, Kraków, 31-358, Poland	Poland
Vesuvius Emirates FZE	Warehouse No: 1J-09/3, P O Box 49261, Hamriyah Free Zone, Sharjah, United Arab Emirates	United Arab Emirates
Vesuvius Europe Beteiligungs GmbH	Geschaftsanschrift, Schieferbank 2-16, 45472 Mülheim an der Ruhr, Germany	Germany
Vesuvius Europe GmbH & Co KG	Geschaftsanschrift, Schieferbank 2-16, 45472 Mülheim an der Ruhr, Germany	Germany
Vesuvius Europe S.A.	17 Rue de Douvrain, Ghlin, 7011, Belgium	Belgium
Vesuvius Europe SAS	3, Avenue De L'europe, Parc Les Pivolles, 69150 Décines-Charpieu, France	France
Vesuvius Financial 1 Limited	165 Fleet Street, London, EC4A 2AE, England	England
Vesuvius Finland OY	Pajamäentie 8D7, 00360 Helsinki, Finland	Finland
Vesuvius Foundry Products (Suzhou) Co. Limited.	12 Wei Wen Road, China-Singapore Suzhou Ind Park, Suzhou, Jiangsu Province, 215122, China	China
Vesuvius Foundry Technologies (Jiangsu) Co. Limited	2 Changchun Road, Economic Development Area, Changshu, Jiangsu, 215537, China	China
Vesuvius France S.A.	Rue Paul Deudon 68, Boite Postale 19, Feignies 59750, France	France
Vesuvius GmbH	Gelsenkirchener Strasse 10, Borken, D-46325, Germany	Germany
Vesuvius Group Limited	165 Fleet Street, London, EC4A 2AE, England	England

Company legal name	Registered office address	Jurisdiction
Vesuvius Group S.A.	17 Rue de Douvrain, Ghlin, 7011, Belgium	Belgium
Vesuvius Holding Deutschland GmbH	Gelsenkirchener Strasse 10, Borken, D-46325, Germany	Germany
Vesuvius Holding France S.A.S	68 Rue Paul Deudon, Boite Postale 19, Feignies 59750, France	France
Vesuvius Holding Italia – Società a Responsabilità Limitata	Via Mantova 10, 20835 Muggio MB, Italy	Italy
Vesuvius Holdings Limited	165 Fleet Street, London, EC4A 2AE, England	England
Vesuvius Ibérica Refractarios S.A.	Capitán Haya, 56 – 1ºH, 28020 Madrid, Spain	Spain
Vesuvius International Corporation	CT Corporation, 1209 Orange Street, The Corporation Trust Company, Wilmington, DE 19801, United States	US (Delaware)
Vesuvius Investments Limited	165 Fleet Street, London, EC4A 2AE, England	England
Vesuvius Istanbul Refrakter Sanayi ve Ticaret AS	Gebze OSB2 Mh. 1700., Sok No:1704/1, Cayirova, Kocaeli, 41420, Turkey	Turkey
Vesuvius Italia SPA	Via Mantova 10, 20835 Muggio MB, Italy	Italy
Vesuvius Japan Inc.	Daini-Naruse Akihabara Bldg. 3F, 27-10, 1-chome, Taito, Taito-ku, Tokyo, 110-0016, Japan	Japan
Vesuvius K.S.R. Limited	1 Midland Way, Central Park, Barlborough Links, Derbyshire S43 4XA, England	England
Vesuvius Life Plan Trustee Limited	165 Fleet Street, London, EC4A 2AE, England	England
Vesuvius LLC	502, 5th floor, 1 Myasicsheva str., Zhukovsky, Moscow region, 140180, Russian Federation	Russia
Vesuvius Malaysia Sdn Bhd	Unit 30-01, Level 30 Tower A, Vertical Business Suite Avenue 3, Bangsar South, No 8 Jalan Kirinchi, Kuala Lumpur Wilayah Persekutuan, 59200, Malaysia	Malaysia
Vesuvius Management Limited	165 Fleet Street, London, EC4A 2AE, England	England
Vesuvius Management Services Limited	165 Fleet Street, London, EC4A 2AE, England	England
Vesuvius Mexico S.A. de C.V.	Av. Ruiz Cortinez, Num. 140, Colonia Jardines de San Rafael, Guadalupe, Nuevo León, CP 67119, Mexico	Mexico
Vesuvius Mid-East Limited	56, rd 15, Apt 103, Maadi, Cairo, Egypt	Egypt
Vesuvius Minerals Limited	165 Fleet Street, London, EC4A 2AE, England	England
Vesuvius Moravia, s.r.o.	Konska c.p. 740, Trinec, 739 61, Czech Republic	Czech Republic
Vesuvius Mulheim Beteiligungs GmbH	Geschaftsanschrift, Schieferbank 2-16, 45472 Mülheim an der Ruhr, Germany	Germany
Vesuvius Mulheim GmbH & Co KG	Geschaftsanschrift, Schieferbank 2-16, 45472 Mülheim an der Ruhr, Germany	Germany
Vesuvius NC, LLC.	Corporation Trust Center, 1209 Orange Street, Wilmington, New Castle County, DE 19801, United States	US (Delaware)
Vesuvius New Zealand Limited	Bell Gully, Level 22, Vero Centre, 48 Shortland Street, Auckland, 1010 New Zealand	New Zealand

Company legal name	Registered office address	Jurisdiction
Vesuvius Overseas Investments Limited	165 Fleet Street, London, EC4A 2AE, England	England
Vesuvius Overseas Limited	165 Fleet Street, London, EC4A 2AE, England	England
Vesuvius Pension Plans Trustees Limited	165 Fleet Street, London, EC4A 2AE, England	England
Vesuvius Peru SAC	Jiron Saenz Pena 185, Magdalena del Mar, Lima, Peru	Peru
Vesuvius Pigments (Holdings) Limited	165 Fleet Street, London, EC4A 2AE, England	England
Vesuvius Poland Sp z.o.o.	Ul Tyniecka 12, Skawina, 32-050, Poland	Poland
Vesuvius Ras Al Khaimah FZ-LLC	Street No. F14, RAK Investment Authority Free Zone, Al Hamra, Ras Al Khaimah, PO Box 86408, United Arab Emirates	United Arab Emirates
Vesuvius Refractarios de Chile SA	Street San Martin 870, Room 308, Tower B, Concepcion, Chile	Chile
Vesuvius Refractories S.r.l.	Galati, Marea Unire avenue 107, Galati county, 800329, Romania	Romania
Vesuvius Refractory India Private Limited	Room No. 9, 3rd Floor, 7 Ganesh Chandra Avenue, Kolkata, WB 700013, India	India
Vesuvius Refratários Ltda	Av Brasil, 49550, Distrito Industrial de Palmares, Campo Grande, Rio de Janeiro, 23065-480, Brazil	Brazil
Vesuvius Scandinavia AB	4, Forradsgatan, Amal, S-662 34, Sweden	Sweden
Vesuvius Sensors & Probes Europe S.p.A.	10 Via Mantova, Muggio, Monza e Brianza, 20835, Italy	Italy
Vesuvius-SERT SAS	3, Avenue de l'Europe, Parc, Les Pivolles, Decines-Charpieu 69150, France	France
Vesuvius Solar Crucible (Suzhou) Co., Ltd.	58, KuaChun Road, Kua Tang, China-Singapore Suzou Ind Park, Suzhou, Jiangsu Province, 215122, China	China
Vesuvius South Africa (Pty) Limited	Pebble Lane, Private Bag X2, Olifantsfontein, Gauteng Province, 1665, South Africa	South Africa
Vesuvius Sp z.o.o.	ul. Jasnogórska 11, Kraków, 31-358, Poland	Poland
Vesuvius SSC Sp z.o.o.	ul. Jasnogórska 11, Kraków, 31-358, Poland	Poland
Vesuvius UK Limited	1 Midland Way, Central Park, Barlborough Links, Derbyshire, S43 4XA, England	England
Vesuvius Ukraine LLC	27, Udarnykiv Street, City of Dnipropetrovsk, 49000, Ukraine	Ukraine
Vesuvius USA Corporation	CT Corporation, 208 South LaSalle Street, Chicago, Cook County, IL 60604, United States	US (Illinois)
Vesuvius VA Limited	165 Fleet Street, London, EC4A 2AE, England	England
Vesuvius Vietnam Limited	7th Floor, Peakview Tower Building, No.36 Hoang Cau Street, O Cho Dua Ward, Don Da District, Hanoi City, Vietnam	Vietnam
Vesuvius Zyalons Holdings Limited	Brown Street, Newmilns, Ayrshire, KA16 9AG, Scotland	Scotland
Vesuvius Zyarock Ceramics (Suzhou) Co., Limited	58, KuaChun Road, Kua Tang, China-Singapore Suzou Ind Park, Suzhou, Jiangsu Province, 215122, China	China

Notes to the Group Financial Statements continued

33. Investments in Subsidiaries, Joint Ventures and Associates continued

33.1 Investment in subsidiaries continued

Company legal name	Registered office address	Jurisdiction
Vesuvius-Premier Refractories (Holdings) Limited	1 Midland Way, Central Park, Barlborough Links, Derbyshire, S43 4XA, England	England
Vesv Distribution (Private) Limited	R Tech Park, 13th Floor Western Express Highway, Goregaon (East) Mumbai, Mumbai City, MH 400063, India	India
VSV Advanced Ceramics (Anshan) Co., Limited	Xiaotaizi Village, Ningyuan Town, Qianshan District, Anshan, Liaoning Province, 114011, China	China
Wilkes-Lucas Limited	165 Fleet Street, London, EC4A 2AE, England	England
Yingkou Bayuquan Refractories Co., Limited	Cui Tun Village, Hai Dong Office, Bayuquan District, Liaoning Province, YingKou, 115007, China	China

The following subsidiary companies have branches registered in the named countries: Foseco (Jersey) Limited in England, Foseco Holding BV in England, Vesuvius LLC in Kazakhstan, Vesuvius UK Limited in Taiwan and South Korea and Vesuvius International Corporation in Belgium.

33.2 Investment in joint ventures and associates

A joint venture is a type of joint arrangement whereby the parties that have joint control of the arrangement have rights to the net assets of the joint venture. Joint control is the contractually agreed sharing of control of the arrangement, which exists only when decisions about the relevant activities require unanimous consent of the parties sharing control. An associate is an entity over which the Group has significant influence. Significant influence is the power to participate in the financial and operating policy decisions of an entity, but is not control or joint control over those policies.

The Group's investments in its associates and joint ventures are accounted for using the equity method from the date significant influence/joint control is deemed to arise until the date on which significant influence/joint control ceases to exist or when the interest becomes classified as an asset held for sale. The Group Income Statement reflects the Group's share of profit after tax of the related associates and joint ventures. Investments in associates and joint ventures are carried in the Group Balance Sheet at cost adjusted in respect of post-acquisition changes in the Group's share of net assets, less any impairment in value. None of the joint ventures or associates are deemed individually to be material to the Group's results.

In June 2019, Vesuvius completed the sale of its 50% interest in Angang Vesuvius Refractory Company Limited. Further details are provided in Note 20.

	2020 £m	2019 £m
At 1 January	12.7	19.1
Additions	—	—
Disposals	—	(6.9)
Share of post-tax profit of joint ventures	1.1	1.0
Dividends received from joint ventures	(2.3)	(0.1)
Foreign exchange	0.6	(0.4)
At 31 December	**12.1**	12.7

The investment in joint ventures and associates includes £11.6m (2019: £12.2m) in respect of joint ventures and £0.5m (2020: £0.5m) in respect of associates. Dividends received from joint ventures consists of £0.2m from Wuhan Wugang-Vesuvius Advanced CCR Co., Limited and £2.1m from Wuhan Wugang-Vesuvius Advanced Ceramics Co., Limited.

Joint ventures

Set out below is the summarised financial information in respect of joint ventures.

	2020 £m	2019 £m
Revenue	39.7	50.9
Trading profit	2.9	2.3
Net finance costs	0.1	0.2
Profit before tax	**3.0**	2.5
Income tax expense	(0.7)	(0.7)
Profit after tax	**2.3**	1.8
Non-current assets	7.8	7.7
Current assets	19.1	19.4
Non-current liabilities		
Current liabilities	(4.9)	(3.6)
Net assets	**22.0**	23.5

The table above includes the Group's share of Wuhan Wugang-Vesuvius Advanced Ceramics Co., Limited as set out below.

	2020 £m	2019 £m
Revenue	34.5	35.3
Trading profit	2.4	2.5
Net finance costs	—	—
Profit before tax	**2.4**	2.5
Income tax expense	(0.6)	(0.6)
Profit after tax	**1.8**	1.9
Non-current assets	7.5	7.3
Current assets	11.7	12.5
Non-current liabilities	—	—
Current liabilities	(4.2)	(3.0)
Net assets	**15.0**	16.8

The purpose of the Chinese joint venture companies is to research, develop, manufacture and sell refractory products. The role of Vesuvius is to provide technical personnel, training and access to the Group's international sales network.

Name of entity	Registered address	Jurisdiction	2020 % ownership	2019 % ownership
Wuhan Wugang-Vesuvius Advanced CCR Co., Limited	Gongnong Village Qingshan District, Wuhan, Hubei Province, 430082, China	China	50	50
Wuhan Wugang-Vesuvius Advanced Ceramics Co., Limited	Gongnong Village Qingshan District, Wuhan, Hubei Province, 430082, China	China	50	50

Associates

Name of entity	Registered address	Jurisdiction	% ownership
Sapotech Oy	Paavo Havaksen tie 5 D, 90570 Oulu, Finland	Finland	14.9
Newshelf 480 Proprietary Limited	44 Main Street, Johannesburg, 2001, South Africa	South Africa	45

The Group is considered to hold significant influence over Sapotech Oy despite holding less than 20% of its shares because the agreement under which the Group invested in Sapotech Oy provides that the Group holds one of the four seats on the company's board. This allows the Group to participate in policy-making processes and have additional controls over Sapotech Oy's major decision-making that do not amount to control but give significant influence.

33.3 Non-controlling interests

Non-controlling interests represent the portion of the equity of a subsidiary not attributable either directly or indirectly to the parent company and are presented separately in the Group Income Statement and within equity in the Group Balance Sheet, distinguished from parent company shareholders' equity.

The total profit attributable to non-controlling interests at 31 December 2020 is £4.5m (2019: £6.2m) of which £2.6m relates to Vesuvius India Limited (2019: £4.1m). The profit attributable to non-controlling interests in respect of the Group's other subsidiaries is not considered to be material.

Name of entity	Registered address	Jurisdiction	2020 % ownership	2019 % ownership
Vesuvius India Limited	P-104 Taratala Road, Kolkata, 700 088, India	India	55.57	55.57
Foseco India Limited	922/923, Gat, Sanaswadi, Taluka, Shirur, Pune, 412208, India	India	74.98	74.98
Foseco Golden Gate Company Limited	6 Kung Yeh 2nd Road, Ping Tung Dist, Ping Tung, 90049, Taiwan	Taiwan	51	51
Foseco (Thailand) Limited	170/69, 22nd Floor Ocean Tower 1, Ratchadapisek Road, Klongtoey, Bangkok, 10110, Thailand	Thailand	74	74
Vesuvius Ceska Republika, a.s.	Prumyslová 726, Konská, Trinec, 739 61, Czech Republic	Czech Republic	60	60

Notes to the Group Financial Statements continued

33. Investments in Subsidiaries, Joint Ventures and Associates continued

33.3 Non-controlling interests continued

As with Vesuvius plc, all of the above companies have a 31 December year-end. The summarised financial information for Vesuvius India Limited is presented below:

	2020 £m	2019 £m
Summarised balance sheet		
Current assets	88.6	85.4
Current liabilities	(17.8)	(15.6)
Current net assets	70.8	69.8
Non -current assets	15.7	16.7
Non-current liabilities	(2.3)	(1.9)
Non-current net assets	13.4	14.8
Net assets	84.2	84.6
Accumulated NCI	37.8	37.9
Summarised statement of comprehensive income		
Revenue	82.8	98.3
Profit after tax	5.9	9.4
Profit allocated to NCI	2.6	4.2
Dividends paid to NCI	(0.7)	(0.7)
Summarised cash flows		
Cash flows from operating activities	12.7	10.4
Cash flows from investing activities	(1.4)	(3.5)
Cash flows from financing activities	(1.7)	(1.4)
Net increase/decrease in cash and cash equivalents	9.6	5.5

34. Related Parties

All transactions with related parties are conducted on an arm's-length basis and in accordance with normal business terms. Transactions between related parties that are Group subsidiaries are eliminated on consolidation.

The related parties identified by the Directors include joint ventures, associates and key management personnel. To enable users of our financial statements to form a view on the effects of related party relationships on the Group, we disclose the related party relationship irrespective of whether there have been transactions between the related parties.

34.1 Transactions with joint ventures and associates

All transactions with joint ventures and associates are in the normal course of business. Transactions between the Group and its joint ventures and associates are disclosed below:

	2020 £m	2019 £m
Sales to joint ventures	3.8	3.2
Purchases from joint ventures	26.7	25.4
Purchases from associates	0.3	0.2
Dividends received	2.3	0.1
Injection of equity funding	—	—
Trade payables owed to joint ventures	5.5	5.3
Trade receivables owed by joint ventures	0.6	0.2

Trade payables owed to joint ventures are settled net of trade receivables owed by joint ventures 60 days after the delivery of goods or services. There are no loans to and from joint ventures.

34.2 Transactions with key management personnel

There have been no transactions with key management personnel of the Group other than the Directors' remuneration.

Directors' remuneration is disclosed in Note 8 of the Group Financial Statements and in the Directors' Remuneration Report.

34.3 Transactions with other related parties

There are no controlling shareholders of the Group as defined by IFRS. There have been no material transactions with the shareholders of the Group.

Pension contributions to Group schemes are disclosed in Note 26 of the Group Financial Statements.

Other than the parties disclosed above, the Group has no other material related parties.

Company Balance Sheet

As at 31 December 2020

	Notes	2020 total £m	2019 total £m
Fixed assets			
Investment	7	**1,778.0**	1,778.0
Total fixed assets		**1,778.0**	1,778.0
Current assets			
Debtors – amounts falling due within one year		**1.2**	3.6
Cash at bank and in hand		—	—
Total current assets		**1.2**	3.6
Creditors – amounts falling due within one year			
Bank loans and overdraft		**(0.1)**	(0.6)
Other creditors	8	**(955.4)**	(934.3)
Net current liabilities		**(954.3)**	(931.3)
Total assets less current liabilities		**823.7**	846.7
Net assets		**823.7**	846.7
Equity capital and reserves			
Issued share capital	9	**27.8**	27.8
Retained earnings	9	**795.9**	818.9
Total shareholders' funds		**823.7**	846.7

Company number 8217766

Under Section 408 of the Companies Act 2006, the Company is exempt from the requirement to present its own income statement. During 2020 the Company recognised a loss of £17.0m (2019: £37.3m profit).

The Financial Statements on pages 214 to 221 were approved and authorised for issue by the Directors on 3 March 2021 and signed on their behalf by:

Patrick André
Chief Executive

Guy Young
Chief Financial Officer

Company Statement of Changes in Equity

As at 31 December 2020

	Notes	Share capital £m	Retained earnings £m	Total £m
As at 1 January 2019		27.8	831.0	858.8
Comprehensive income/loss recognised for the year		—	37.3	37.3
Recognition of share-based payments	10	—	4.5	4.5
Dividend paid	6	—	(53.9)	(53.9)
As at 1 January 2020		**27.8**	**818.9**	**846.7**
Comprehensive income/loss recognised for the year		—	**(17.0)**	**(17.0)**
Recognition of share-based payments	10	—	**2.4**	**2.4**
Dividend paid	6	—	**(8.4)**	**(8.4)**
As at 31 December 2020		**27.8**	**795.9**	**823.7**

Notes to the Company Financial Statements

1. General Information

Vesuvius plc ('Vesuvius' or 'the Company') is a public company limited by shares. It is incorporated and domiciled in England and Wales, United Kingdom, and listed on the London Stock Exchange. The nature of the company is a holding company. The address of its registered office is 165 Fleet Street, London EC4A 2AE.

2. Basis of Preparation

2.1 Basis of accounting

The Financial Statements of the Company have been prepared in accordance with Financial Reporting Standard 101 Reduced Disclosure Framework (FRS 101) and the Companies Act 2006 as applicable to companies using FRS 101. The Financial Statements have been prepared under the historical cost convention.

The results of the Company are included in the preceding Group Financial Statements.

In these Financial Statements, the Company has applied the exemptions available under FRS 101 in respect of the following disclosures:

> A cash flow statement and related notes (IAS 1 para 10(d) and IAS 7)

> Disclosures in respect of capital management and financial instruments (IAS 1 para 134-136 and IFRS 7)

> Disclosures in respect of related party transactions with wholly owned members of the Vesuvius plc Group (IAS 24)

> Disclosures in respect of the compensation of key management personnel (IAS 24 para 17)

> Disclosures in respect of fair value measurements (IFRS 13 para 91-99)

> The effects of new but not yet effective IFRSs (IAS 8 para 30-31)

Under Section 408 of the Companies Act 2006, the Company is exempt from the requirement to present its own profit and loss account.

The accounting policies set out below have, unless otherwise stated, been applied consistently to all periods presented in these financial statements.

2.2 Going concern

The Directors have a reasonable expectation that the Group and the Company have adequate resources to continue in operational existence for a period of at least 12 months from the date of approval of these Financial Statements (disclosed in Note 2.3 of the Group Financial Statements) and that there is no material uncertainty in respect of going concern. The net current liabilities are due to amounts owed to subsidiary undertakings, therefore the Directors do not believe that they will affect the Company's ability to continue in operational existence. Accordingly, they continue to adopt a going concern basis in preparing the Financial Statements of the Group and the Company.

2.3 Accounting policy

Taxation

Both current and deferred tax are calculated using tax rates and laws that have been enacted, or substantively enacted, by the balance sheet date.

Current tax payable is based on the taxable result for the year. Deferred taxation is recognised, without discounting, in respect of all temporary differences that have originated, but not reversed, at the balance sheet date, with the exception that deferred taxation assets are only recognised if it is considered more likely than not that there will be suitable future profits from which the reversal of the underlying temporary differences can be deducted. Provision is made for the tax that would arise on remittance of the retained earnings of overseas subsidiaries only to the extent that, at the balance sheet date, dividends have been accrued as receivable. All other accounting policies are set out within the respective notes.

Borrowings

Borrowings are accounted for in accordance with the accounting policy disclosed in Note 25.1 of the preceding Group Financial Statements. During the year the Company borrowed and then subsequently repaid borrowings under the Bank of England Covid Corporate Financing Facility (CCFF). See Note 25.2 of the Group Financial Statements. Interest expense for the year in respect of these borrowings was £0.7m.

3. Critical Accounting Judgements and Estimates

Impairment of investment in subsidiaries and other companies (Estimate and Judgement)

For the below estimate, the Group does not have any key assumptions concerning the future, or other key sources of estimation uncertainty in the reporting period that are reasonably expected to have a significant risk of causing a material adjustment to the carrying amounts of assets/liabilities within the next financial year. Nonetheless, this estimate has the potential to materially vary over time and is therefore highlighted.

The Company assesses its investments in subsidiaries and other companies for impairment shortly before the Company's year-end or whenever events or changes in circumstances indicate that the recoverable amount of the investment could be less than the carrying amount of the investment. If this is the case, the investment is considered to be impaired and is written down to its recoverable amount. Judgement is required in the determination of the recoverable amount as the Company evaluates various factors related to the operational and financial position of the relevant investee business, appropriate discounting and long-term growth rates. The annual investment impairment test is described in Note 7.3 below.

4. Employee Benefits Expense

	2020 £m	2019 £m
Wages and salaries	**2.5**	2.4
Social security costs	**0.5**	0.5
Share-based payments	**1.3**	1.3
Compensation for loss of office	**—**	—
Pension costs – defined contribution pension plans	**—**	—
Total employee benefits expense	**4.3**	4.2

The total average number of employees for 2020 was 3 (2019: 3). As at 31 December 2020, the Company had 3 (2019: 3) employees.

Details of the Directors' remuneration are disclosed in the Directors' Remuneration Report on page 134.

5. Audit and Non-Audit Fees

Amounts payable to PricewaterhouseCoopers LLP in relation to audit and non-audit fees are disclosed within Note 6 to the Group Financial Statements.

6. Dividends

In light of the COVID-19 trading situation, the Directors withdrew their recommendation to pay the final dividend of 14.3 pence per ordinary share, announced with the publication of the 2019 financial results (2018: £37.2m, equivalent to 13.8 pence per ordinary share). An interim dividend in respect of the year ended 31 December 2020 of £8.4m (2019:£16.7m), equivalent to 3.1 pence per ordinary share (2019: 6.2 pence per ordinary share), was paid in December 2020 (September 2019).

A proposed final dividend for the year ended 31 December 2020 of £38.6m, equivalent to 14.3 pence per ordinary share, is subject to approval by shareholders at the Company's Annual General Meeting and has not been included as a liability in these Financial Statements. If approved by shareholders, the dividend will be paid on 21 May 2021 to ordinary shareholders on the register at 16 April 2021.

Notes to the Company Financial Statements continued

7. Investment

7.1 Accounting policy

Shares in subsidiaries, associates and joint ventures are stated at cost less any impairment in value. Impairment is assessed in accordance with Note 17.1 to the Group Financial Statements.

7.2 Analysis of investment

	Shares in subsidiaries £m
As at 1 January 2020 and 31 December 2020	1,778.0

The subsidiaries, joint ventures and associates of Vesuvius plc, their country of incorporation and percentage ownership is set out in Note 33 to the Group Financial Statements. With the exception of Vesuvius Holdings Ltd, whose ordinary share capital was directly held by Vesuvius plc, the ordinary share capital of the other companies was owned by a Vesuvius plc subsidiary as at 31 December 2020.

7.3 Impairment of investment in subsidiaries, associates and joint ventures

The Group carried out its investment impairment test as at 31 October 2020. The recoverable amount of the investment exceeded its carrying value, therefore no impairment charges have been recognised. No further impairment indicators were identified up to 31 December 2020.

The cash flow predictions are based on financial budgets and strategic plans approved by the Board. These assume a level of revenue and profits which are based on both past performance and expectations for future market development and take into account the cyclicality of the business in which the Group operates. In assessing the cash flows of the parent's investment in its subsidiaries, the amounts payable by the parent to subsidiaries are also taken into account. A sensitivity analysis was carried out using reasonably possible changes to the key assumptions set out in Note 17.2 of the Group Financial Statements. No scenarios of impairment were identified.

8. Other Creditors

	2020 £m	2019 £m
Amounts owed to subsidiary undertakings	953.5	933.0
Accruals and other creditors	1.9	1.3
Total amounts falling due within one year	**955.4**	934.3

Amounts owed to subsidiary undertakings are interest free, have no fixed date of repayment and are repayable on demand.

9. Issued Share Capital and Retained Earnings

9.1 Accounting policy

Equity instruments issued by the Company are recorded at the proceeds received, net of direct issue costs.

9.2 Analysis of issued share capital

The issued and fully paid ordinary share capital of the Company as at 31 December 2020 was 278,485,071 shares of £0.10 each (2019: 278,485,071 shares of £0.10 each). 7,271,174 (2019: 7,271,174) shares of £0.10 each were held in Treasury and 1,093,098 (2019: 1,718,615) shares of £0.10 each were held by the Vesuvius Group employee share ownership plan trust (ESOP). The Company has one class of shares in issue, ordinary shares. All shareholders enjoy the same rights in relation to these shares, including rights in relation to voting at General Meetings of the Company, distribution of dividends and repayment of capital.

9.3 Distributable reserves

The Company had distributable reserves of £795.9m as at 31 December 2020 (2019: £818.9m), subject to filing these Financial Statements with Companies House. When making a distribution to shareholders, the Directors determine profits available for distribution by reference to guidance on realised and distributable profits under the Companies Act 2006 issued by the Institute of Chartered Accountants in England and Wales and the Institute of Chartered Accountants of Scotland in April 2017. The profits of the Company have been received in the form of dividends from subsidiaries and through Court-approved capital reduction. The availability of distributable reserves in the Company is dependent on those dividends meeting the definition of qualifying consideration within the guidance and on available cash resources of the Group and other accessible sources of funds. The distributable reserves are subject to any future restrictions or limitations at the time such distribution is made.

10. Share-based Payments

10.1 Accounting policy

The Company operates an equity-settled share-based payment arrangements for its employees. Equity-settled share-based payments are measured at fair value at the date of grant. For grants with market-based conditions attached to them, such as total shareholder return, fair value is measured using a form of stochastic option pricing model. For grants with non-market-based conditions, such as growth in headline earnings per share, fair value is measured using the Black-Scholes option pricing model. The fair value is expensed on a straight-line basis over the vesting period with a corresponding increase in equity. The cumulative expense recognised is adjusted for the best estimate of the shares that will eventually vest.

The Company recharges its subsidiaries for the IFRS 2 expense relating to their employees on an annual basis.

10.2 Profit and loss account recognition

The Company operates a number of different share-based payment schemes, the main features of which are detailed in the Directors' Remuneration Report and Note 27 of the preceding Group Financial Statements. A total of £1.3m was charged to the profit and loss account in the year with regard to share-based payments (2019: £1.3m).

10.3 Details of outstanding options

	Outstanding awards: As at 1 Jan 2020 no.	Granted no.	Exercised no.	Forfeited/ lapsed no.	Expired no.	As at 31 Dec 2020 no.	Awards exercisable as at 31 Dec 2020 no.	Weighted average outstanding contractual life of awards years	Range of exercise prices pence
LTIP	872,737	481,238	(243,276)	—	nil	1,110,699	—	8.4	n/a
Weighted average exercise price	nil	nil	nil	nil	nil	nil	—		n/a
Other plans	76,920	12,389	—	—	nil	89,309	—	0.5	n/a
Weighted average exercise price	nil	nil	nil	nil	nil	nil	—		n/a

For options exercised during 2020, the market value at the date of exercise ranged from 351 pence to 395 pence.

	Outstanding awards: As at 1 Jan 2019 no.	Granted no.	Exercised no.	Forfeited/ lapsed no.	Expired no.	As at 31 Dec 2019 no.	Awards exercisable as at 31 Dec 2019 no.	Weighted average outstanding contractual life of awards years	Range of exercise prices pence
LTIP	968,965	327,560	(423,788)	—	—	872,737	—	7.4	n/a
Weighted average exercise price	nil	nil	nil	nil	nil	nil	—		n/a
Other plans	28,246	48,674	—	—	—	76,920	—	1.2	n/a
Weighted average exercise price	nil	nil	nil	nil	nil	nil	—		n/a

For options exercised during 2019, the market value at the date of exercise was 613 pence.

Details of market performance conditions are included in the Directors' Remuneration Report.

As at 31 December 2020, the total options exercisable by all Group employees over the £0.10 ordinary shares and capable of being satisfied through new allotments of shares or through shares held by the Company's ESOP were as follows:

	Years of award/grant	Option prices	Latest year of exercise/ vesting	Number of options/ allocations outstanding
Long-Term Incentive Plan	2018-2020	nil	2030	1,717,225
Medium-Term Incentive Plan	2019-2020	nil	2022	545,722
Deferred Share Bonus Plan	2018-2020	nil	2023	89,309

Notes to the Company Financial Statements continued

10. Share-based Payments continued

10.3 Details of outstanding options continued

Fair value of options granted under the LTIP during the year:

	2020	
	EPS element	TSR element
Fair value of options granted	392p	242p
Share price on date of grant	392p	392p
Expected volatility	n/a	30.3%
Risk-free interest rate	n/a	0.2%
Exercise price (per share)	nil	nil
Expected term (years)	3	3
Expected dividend yield	nil	nil

Vesting of 50% of shares awarded is based on the Group's three-year total shareholder return (TSR) performance relative to that of the constituent companies of the FTSE 250 (excluding investment trusts) and vesting of the remaining 50% of shares awarded is based on headline EPS growth.

Expected volatility was determined by calculating the historical volatility of the Group's share price over the 2.8 years (2019: 2.8 years) prior to the grant date for the March 2020 grant. The risk-free rate of return was assumed to be the yield to maturity on a UK fixed gilt with the term to maturity equal to the expected life of the option. At the discretion of the Remuneration Committee, award holders receive the value of dividends that would have been paid on their vested shares in the period between grant and vesting. Accordingly, there is no discount to the valuation for dividends foregone during the vesting period.

11. Contingent Liabilities

Where the Company enters into financial guarantee contracts to guarantee the indebtedness of other companies within its Group, the Company considers these to be insurance arrangements and accounts for them as such. In this respect, the Company treats the guarantee contract as a contingent liability until such time as it becomes probable that the Company will be required to make a payment under the guarantee. Guarantees provided by the Company as at 31 December 2020 in respect of the liabilities of its subsidiary companies amounted to £354.0m (2019: £419.4m), which includes guarantees of $146.0m and €180.0m (2019: $200.0m and €130.0m) in respect of US Private Placement Loan Notes and £53.5m (2019: £125.8m) in respect of drawings under the syndicated bank facility; together with £32.9m (2019: £32.9m) in relation to a guarantee provided to the Company's UK subsidiary which acts as Trustee for the Group's UK pension plan. The guarantee is over all present and future pension liabilities of the plan and the contingent liability amount represents the net deficit on a buy-out basis as shown in the most recent triennial valuation.

Vesuvius has extensive international operations and is subject to various legal and regulatory regimes, including those covering taxation and environmental matters. Several of the Company's subsidiaries are parties to legal proceedings, certain of which are insured claims arising in the ordinary course of the operations of the company involved, and are aware of a number of issues which are, or may be, the subject of dispute with tax authorities. Whilst the outcome of litigation and other disputes can never be predicted with certainty, having regard to legal advice received and the insurance arrangements of the Company and its subsidiaries, the Directors believe that none of these matters will, either individually or in the aggregate, have a materially adverse effect on the Company's financial condition or results of operations.

12. Related Parties

All transactions with related parties are conducted on an arm's-length basis and in accordance with normal business terms. Transactions between related parties that are wholly owned Company subsidiaries are not disclosed in this Note.

The related parties identified by the Directors include joint ventures, associates and key management personnel. To enable users of our financial statements to form a view on the effects of related party relationships on the Company, we disclose the related party relationship when control exists, irrespective of whether there have been transactions between the related parties.

Transactions with joint ventures and associates

All transactions with joint ventures and associates are in the normal course of business. Further details of joint ventures and associates are included in Note 33 to the Group Financial Statements.

Transactions with key management personnel

There have been no transactions with key management personnel of the Company other than the Directors' remuneration.

Directors' remuneration is disclosed in the Annual Report on Directors' Remuneration.

Transactions with other related parties

There are no controlling shareholders of the Company as defined by IFRS. There have been no material transactions with the shareholders of the Company.

Pension contributions are disclosed in Note 26 to the Group Financial Statements.

Other than the parties disclosed above, the Company has no other material related parties.

Five-Year Summary: Divisional Results from Continuing Operations

		2020	2019	2018	2017	2016
Steel Division						
Revenue	£m	**1,045.4**	1,195.3	1,236.7	1,148.7	942.0
Trading profit	£m	**76.4**	120.1	128.3	100.4	79.2
Return on sales	%	**7.3**	10.0	10.4	8.7	8.4
Employees: year-end	no.	**7,619**	7,677	7,766	7,930	7,782
Foundry Division						
Revenue	£m	**412.9**	515.1	561.3	535.2	459.4
Trading profit	£m	**25.0**	61.3	68.9	65.1	54.1
Return on sales	%	**6.1**	11.9	12.3	12.2	11.8
Employees: year-end	no.	**2,735**	2,819	3,043	3,080	3,058

Shareholder Information (unaudited)

Enquiries

The share register is managed by Equiniti, who can be contacted if you have any Vesuvius shareholding queries.

Equiniti Limited
Aspect House, Spencer Road
Lancing, West Sussex, BN99 6DA
United Kingdom

Telephone*
0371 384 2335 (UK only)
+44 121 415 7047 (Outside the UK)

Website www.shareview.co.uk

Email customer@equiniti.com

*For the hard of hearing, Equiniti offers a Textel service which can be accessed by dialling 0371 384 2255 (or +44 121 415 7028 if calling from outside the UK).

Any shareholder enquiries not related to the share register should be sent by email to shareholder.information@vesuvius.com or by letter to the Company Secretary at the registered office.

Registered Office and Group Head Office

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Registered in England & Wales No. 8217766
LEI: 213800ORZ521W585SY02

Vesuvius Website

Shareholder and other information about the Company, including details of the current and historic share price, can be accessed on the Vesuvius website, www.vesuvius.com.

Shareview and Electronic Communication

Equiniti's website, www.shareview.co.uk, enables shareholders to access details of their shareholdings online. The Shareview website provides answers to frequently asked questions and information useful for the management of investments. To access online information on your shareholding, you will require your shareholder reference number, which can be found at the top of your share certificate or on your dividend confirmation.

Shareholders can register to receive shareholder communications electronically, including the Company's Annual Report and Financial Statements, rather than in paper form, using Shareview. The registration process requires shareholders to input their shareholder reference number. To receive shareholder communications in electronic form, shareholders should select 'email' as their mailing preference. Once registered, shareholders will receive an email notifying them each time a shareholder communication has been published on the Vesuvius website.

* Lines are open Monday to Friday 9.00 am to 5.00 pm (excluding public holidays in England and Wales).

Share Dealing Service

The Company's shares can be traded through most banks, building societies or stockbrokers. UK resident shareholders can also buy and sell shares by telephone or online using Equiniti's Shareview dealing service.

Telephone 0345 603 7037 between 8.00 am and 4.30 pm on any business day (excluding public holidays in England and Wales)

Website www.shareview.co.uk/dealing

Email sharedealing@equiniti.com

The shareholder reference number (at the top of your share certificate or on your dividend confirmation) is required to use the dealing service.

ShareGift

ShareGift, the charity share donation scheme, is a free service for shareholders wishing to give shares to a wide range of UK charitable causes. It is particularly useful for those shareholders who may wish to dispose of a small quantity of shares where the market value makes it uneconomic to sell on a commission basis. Further information can be obtained from ShareGift.

Telephone +44 (0)20 7930 3737

Website www.sharegift.org

Email help@sharegift.org

Dividend Reinvestment Plan

Equiniti offers a dividend reinvestment plan, through which shareholders can use their Vesuvius cash dividends to buy additional shares in Vesuvius. Further details, including how to sign up, and the terms and conditions of the plan, are available from the Share Dividend Helpline.

Telephone 0371 384 2268 (or +44 121 415 7173 if calling from outside the UK)

Website www.shareview.co.uk

Overseas Payment Service

Equiniti provides a dividend payment service in over 90 countries that automatically converts payments into local currency and pays the funds into a shareholder's bank account. Further details, including an application form and the terms and conditions of the service, are available from Equiniti.

Telephone +44 (0)121 415 7047

Website www.shareview.co.uk

By post Equiniti, Aspect House, Spencer Road, Lancing, West Sussex, BN99 6DA, United Kingdom

Please quote Overseas Payment Service, the Company's name and your shareholder reference number.

Financial Calendar

2021 Annual General Meeting 12 May 2021

Shareholder Information (unaudited) continued

Analysis of ordinary shareholders

	Investor type			Shareholdings			
As at 31 December 2020	Private	Institutional and other	Total	1–1,000	1,001–50,000	50,001–500,000	500,001+
Number of holders	2,395	528	2,923	2,300	423	131	69
Percentage of holders	81.94%	18.06%	100%	78.69%	14.47%	4.48%	2.36%
Percentage of shares held	0.46%	99.54%	100%	0.12%	1.29%	8.76%	89.83%

Share Fraud – Spot the Warning Signs

Investment scams are designed to look like genuine investments.

Have you been…

> Contacted out of the blue

> Promised tempting returns and told the investment is safe

> Called repeatedly

> Told the offer is only available for a limited time?

If so, you might have been contacted by fraudsters.

How to Avoid Share Fraud

1. Reject cold calls

If you have been contacted by telephone, email or post, or via a third party or at a seminar or exhibition, with an offer to buy or sell shares, the chances are that it's a high-risk investment or a scam. You should treat any offer with extreme caution. The safest thing to do is to ignore the approach and if you were contacted by phone to hang up on the call.

2. Check if the firm is authorised by the Financial Conduct Authority (FCA) and recorded on the Financial Services register at https://register.fca.org.uk/

The Financial Services Register is a public record of all the firms and individuals in the financial services industry that are, or have been, regulated by the Prudential Regulation Authority and/or the FCA. If there are no contact details on the Register or if the firm claims the Register is out of date, call the FCA Helpline on 0800 111 6768.

If you're dealing with an overseas firm, you should check with the regulator in that country and also check the scam warnings from foreign regulators.

3. Get impartial advice

Think about getting impartial financial advice before you hand over any money. Seek advice from someone unconnected to the firm that has approached you.

Reporting a Scam

If you suspect that you have been approached by fraudsters please tell the FCA Helpline by contacting them on 0800 111 6768 (or +44 20 7066 1000 from outside the UK) or by using the share fraud reporting form at www.fca.org.uk/scams, where you can find out more about investment scams.

If you have lost money to investment fraud, you should report it to Action Fraud on 0300 123 2040 (or +44 300 123 2040 from outside the UK) or online at www.actionfraud.police.uk.

Find out more at www.fca.org.uk/scamsmart.

Glossary

5S	Five Steps to improve housekeeping and therefore workplace safety and efficiency: separate, sort, shine, standardise and sustain
8D	Eight Disciplines: an eight-step methodology to resolve customer, supplier and internal quality issues
AGM	Annual General Meeting
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
Code	The UK Corporate Governance Code
Company	Vesuvius plc
COVID-19 or COVID-19 pandemic	Coronavirus disease (COVID-19), the infectious disease caused by the newly discovered coronavirus, and the pandemic that has arisen from this
DSBP	Deferred Share Bonus Plan
DTR	The Disclosure and Transparency Rules of the UK Financial Conduct Authority
EBITDA	Trading profit before depreciation and amortisation of non-acquired intangible charges
EMEA	Europe, Middle East and Africa
EPS	Earnings per share
EU	European Union
FRC	Financial Reporting Council
FRS	Financial Reporting Standards
FTSE 250	Equity index whose constituents are the 101st to 350th largest companies listed on the London Stock Exchange in terms of their market capitalisation
FX	Foreign exchange
GHG	Greenhouse gas
Group	Vesuvius plc and its subsidiary companies
IAS	International Accounting Standard
IFRS	International Financial Reporting Standards
KPI	Key Performance Indicator
LTI	Lost time injury
LTIFR	Lost time injury frequency rate, a KPI which calculates the number of LTIs per million hours worked
Median	The middle number in a sorted list of numbers
NAFTA	The area to which the North American Free Trade Agreement applies
Ordinary share	An ordinary share of 10 pence in the capital of the Company
R&D	Research and development
TSR	Total shareholder return
Turbo S	The Vesuvius safety training programme
UK GAAP	UK Generally Accepted Accounting Principles
VSP	Vesuvius Share Plan

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