

WE ARE

EFFICIENT

SUSTAINABLE

INNOVATIVE

INTERNATIONAL

EXPERT



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 share³ 23.2p 2019: 45.1p 48.6% decrease
Trading profit² £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 sales² 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 debt² £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 profit² £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 flow² £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

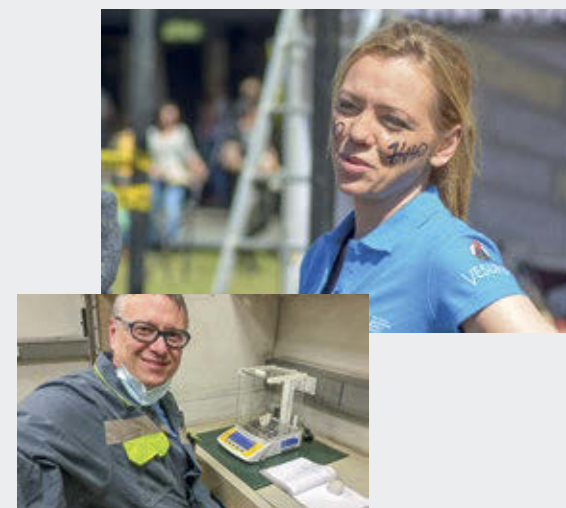
VESUVIUS

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

➤ See p4

Business model

What we do

➤ See p20

Our strategy

Our aims and execution priorities

➤ See p14

Our external environment

How we are helping to tackle climate change

➤ See p16

Our business

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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.

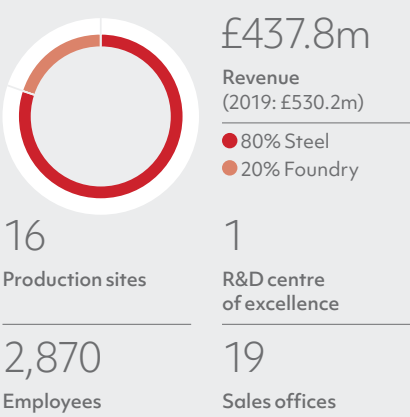
Our global presence



➤ See our Business model on p20
➤ See more about our Steel and Foundry Divisions on p48-55



Americas

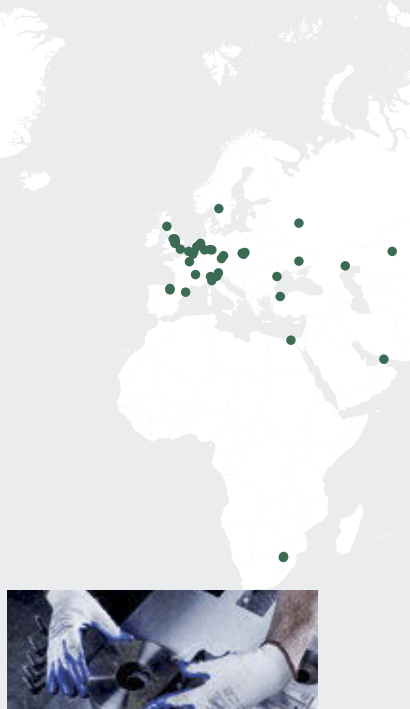
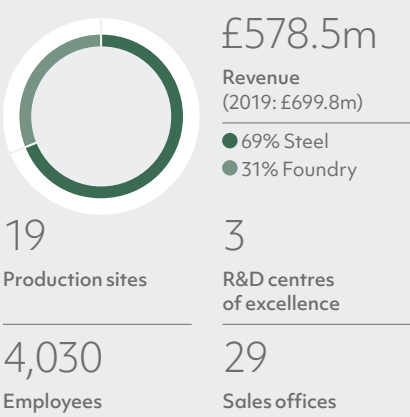


The map shows our production, R&D and commercial sites worldwide



Steel Flow Control
Operating review
➤ See p48

EMEA

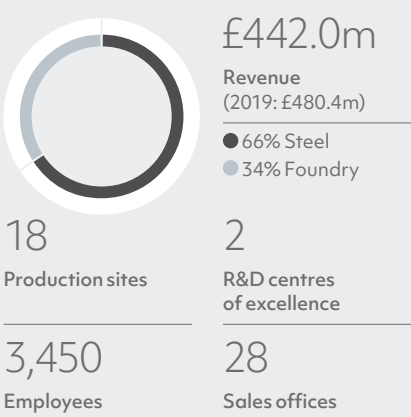


Steel Sensors & Probes
Operating review
➤ See p52



Steel Advanced Refractories
Operating review
➤ See p51

Asia-Pacific



Foundry
Operating review
➤ See p54

Divisional overviews

Steel Division

Revenue
£1,045.4m
2019: £1,195.3m

Return on sales
7.3%
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

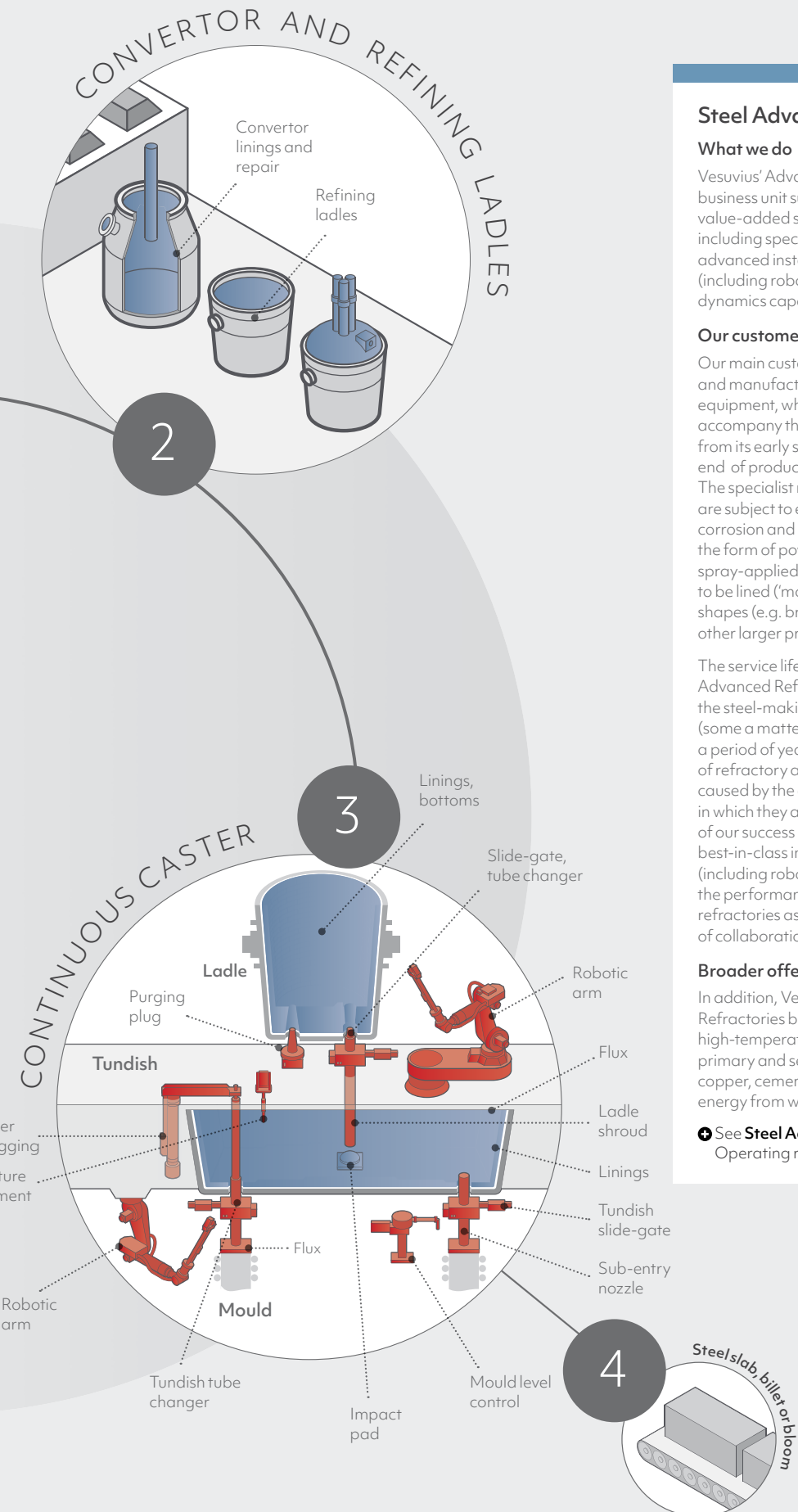
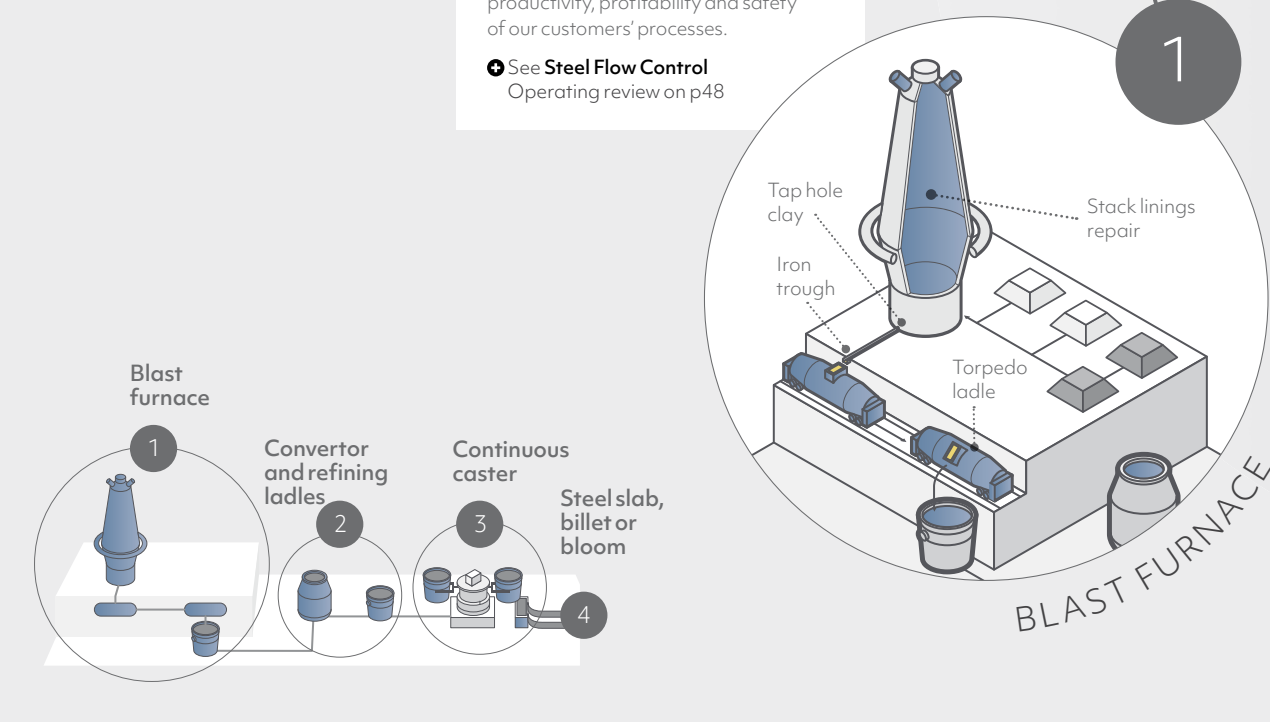
The consumable ceramic products that Vesuvius supplies have a short service life (often a matter of a few hours) due to the significant wear caused by the extremely demanding environment in which they are used. These products must withstand extreme temperature changes, whilst resisting liquid steel and 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 substance 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
£412.9m
2019: £515.1m

Return on sales
6.1%
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 Fosco 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

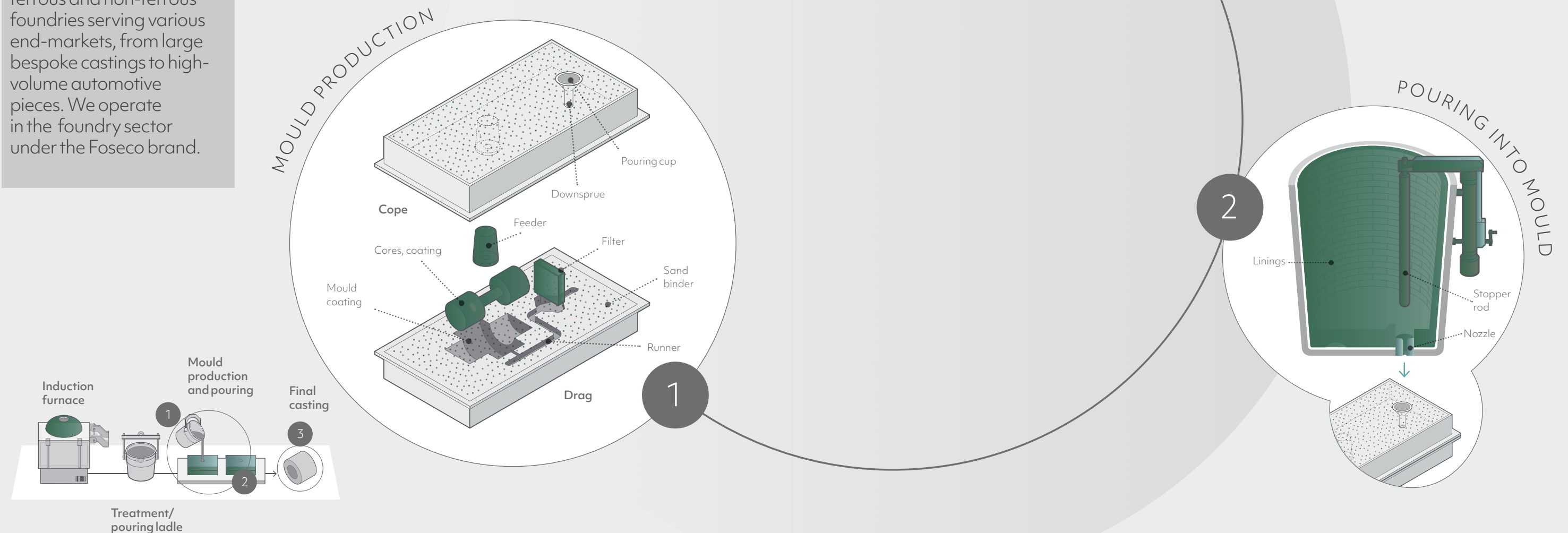
represents a small element of the overall cost of the foundry process but contributes significantly to product quality and yield, thus driving efficiency and reducing environmental impact.

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.

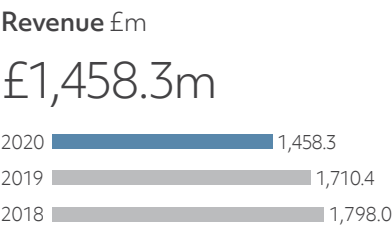
➔ See Foundry Operating review on p54 and 55



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.



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-CO₂ 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 Koepfel 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).

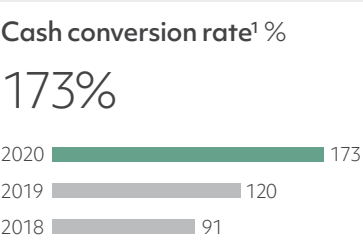
John McDonough CBE
Chairman

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.



- 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 liquidity² 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.

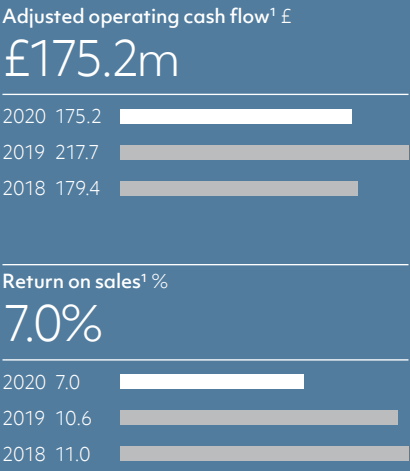
Our cash generation enabled us to reduce net debt to £175.1m at the end of 2020 from £245.8m at the end of 2019. At the end of 2020, Group liquidity stood at £437.3m, significantly higher than the £354.4m at the beginning of the year.

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



£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 CO₂ emissions and helping our customers reduce their own CO₂ 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



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.

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



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.

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



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.

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 CO₂. 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 CO₂ impact of our products.

The future

- > The pressure on the steel and foundry industries to reduce GHG emissions, particularly CO₂, is increasing significantly, with energy price increases used to compel change.
- > Failing to introduce a 'CO₂ 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 CO₂ emissions (through the elimination of higher emission processes) and reducing normalised energy consumption and CO₂ emissions (via increased efficiency).
- > A rise in scrap availability and its recycling will reduce CO₂ 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).

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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'

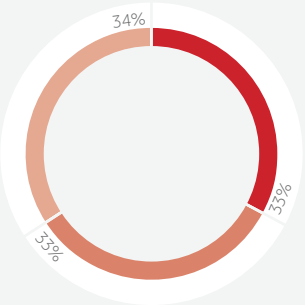
'High-technology steel' is our internal marketing segmentation that describes steel which is either high performing e.g. high-strength steel for wind turbines, and/or where the production process to produce the steel is complex, e.g. the near net shape production process, which is a continuous casting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

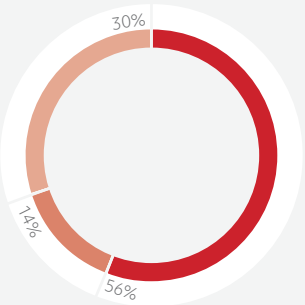
Advanced steel cans are produced from 'high-technology steel' because of the need to achieve a challenging combination of thin gauge and high rigidity/strength.



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

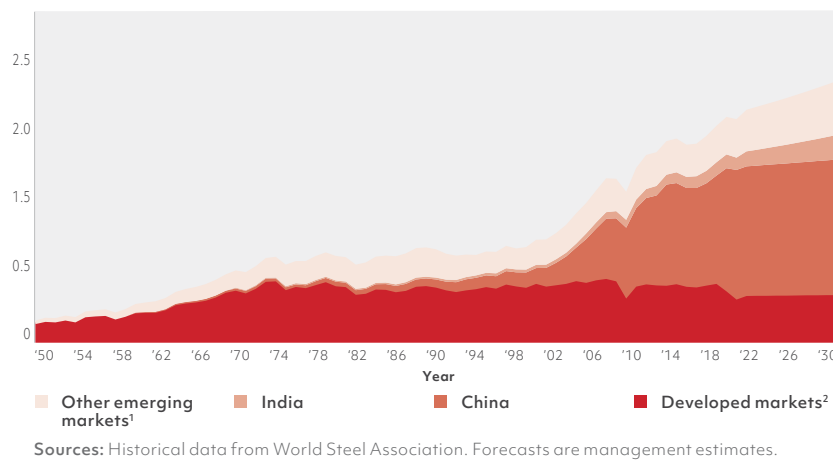
Crude steel production is a structurally growing market

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).

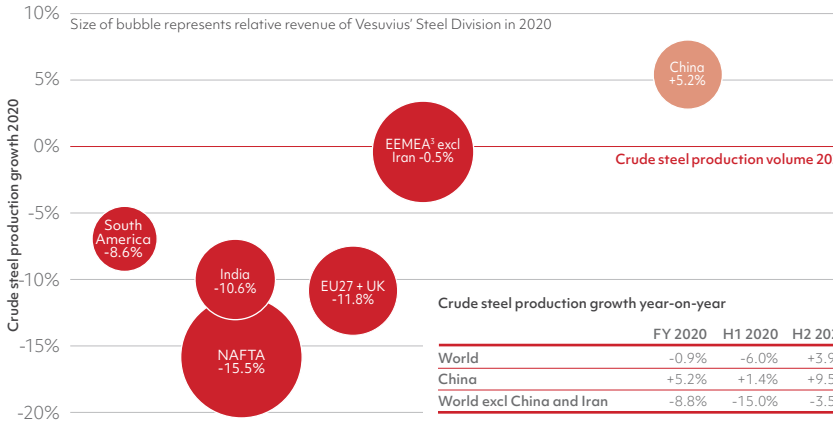
Whilst the growth in crude steel production in the past 20 years has been mostly driven by China, this trend is now likely to decelerate, and the WSA expects Chinese crude steel production in 2021 to remain stable at the 2020 level. We believe that the majority of the growth in crude steel production 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)



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%

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

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

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

Our business

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

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

Our customers

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

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

Our people

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

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

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.

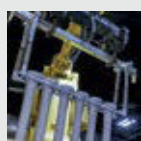


Read more about our **Value-added solutions** on p14 and 15

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.

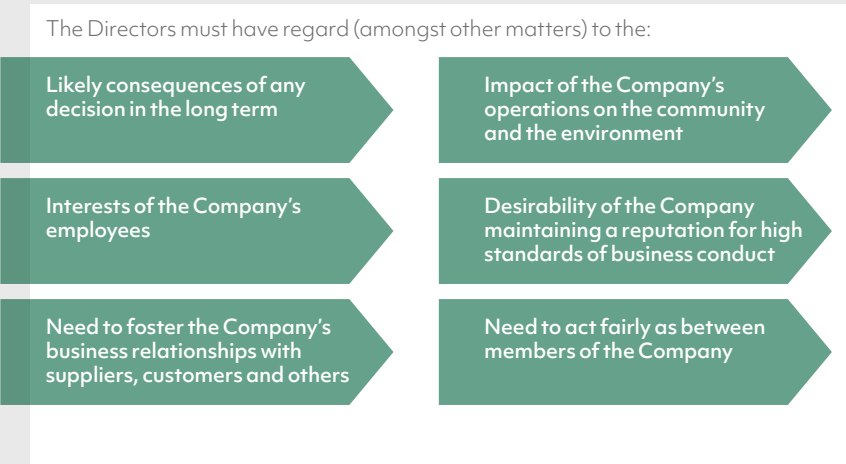


Read more about **Our Operations** on p48-55

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 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.

<p>Operational response to the COVID-19 pandemic</p> <p>Stakeholder alignment</p> <ul style="list-style-type: none">> Employees> Customers> Suppliers <p>Strategic alignment</p>	<p>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.</p>	<p>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.</p>
<p>Preservation of liquidity and conservation of cash</p> <p>Stakeholder alignment</p> <ul style="list-style-type: none">> Shareholders> Employees> Lenders <p>Strategic alignment</p>	<p>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.</p>	<p>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.</p>
<p>Launch of Sustainability initiative</p> <p>Stakeholder alignment</p> <ul style="list-style-type: none">> Customers> Communities> Employees <p>Strategic alignment</p>	<p>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.</p>	<p>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.</p>

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.



WE ARE
V
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	<div>Personal development</div> <div>Health and safety</div> <div>Diversity and inclusion</div> <div>Remuneration evolution</div> <div>International mobility</div> <div>Employee engagement</div> <div>Development and retention</div> <div>Career opportunities</div> <div>Sustainability performance</div>
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	<div>Career opportunities, personal development, engagement and retention</div> <div>Research and innovation</div> <div>Training and mobility</div> <div>Business sustainability</div>
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	<div>Customer satisfaction</div> <div>Product performance and efficiency</div> <div>Innovation and provision of solutions</div> <div>Health and safety</div> <div>Sustainability performance</div>
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	<div>Operational performance</div> <div>Responsible procurement</div> <div>Trust and ethics</div> <div>Payment practices</div>
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	<div>Financial performance</div> <div>Strong governance and transparency</div> <div>Sustainability performance</div> <div>Diversity and inclusion</div> <div>Director remuneration</div> <div>Board performance</div>

Why we engage	Types of engagement undertaken	Issues relevant to the stakeholder group
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	<div>Financial performance</div> <div>Group internal control and audit processes</div> <div>Strategic planning and ability to repay debt</div> <div>Gearing and monitoring of financial covenant ratios</div> <div>Business continuity planning</div> <div>Transparency/ethical behaviour</div>
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	<div>Operational performance</div> <div>Transparency and ethical behaviour</div> <div>Environmental performance</div>
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	<div>Governance and transparency</div> <div>Operational performance</div> <div>Reporting on performance metrics</div>
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	<div>Trust and ethics</div> <div>Governance and transparency</div>
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	<div>Financial performance</div>

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

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.

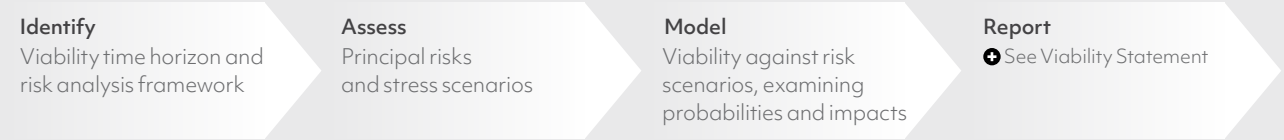
The impacts of COVID-19 on the Group have included:

- > 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

Viability process



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

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.

Principal risks and uncertainties

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

Risk	Potential impact	Mitigation
<div>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 <div>Strategic alignment</div><div></div></div>	<div>Loss/closure of a major plant temporarily or permanently impairing our ability to serve our customers</div> <div>Damage to or restriction in ability to use assets</div> <div>Denial of access to critical systems or control processes</div> <div>Disruption of manufacturing processes</div> <div>Inability to source critical raw materials</div>	<div>Diversified manufacturing footprint</div> <div>Disaster recovery planning</div> <div>Business continuity planning with strategic maintenance of excess capacity</div> <div>Physical and IT control systems security, access and training</div> <div>Cyber risks integrated into wider risk-management structure</div> <div>Well-established global insurance programme</div> <div>Group-wide safety management programmes</div> <div>Dual sourcing strategy and development of substitutes</div>
<div>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 <div>Strategic alignment</div><div></div></div>	<div>Organisational culture of high performance is not achieved</div> <div>Staff turnover in growing economies and regions</div> <div>Stagnation of ideas and development opportunities</div> <div>Loss of expertise and critical business knowledge</div> <div>Reduced management pipeline for succession to senior positions</div>	<div>Internal focus on talent development and training, with tailored career-stage programmes and clear performance management strategies</div> <div>Contacts with universities to identify and develop talent</div> <div>Career path planning and global opportunities for high-potential staff</div> <div>Internal programmes for the structured transfer of technical and other knowledge</div> <div>Clearly defined Values underpin business culture</div>
<div>Health and safety Vesuvius staff or contractors are injured at work because of failures in Vesuvius' operations, equipment or processes <div>Strategic alignment</div><div></div></div>	<div>Injury to staff and contractors</div> <div>Health and safety breaches</div> <div>Manufacturing downtime or damage to infrastructure from incident at plant</div> <div>Inability to attract the necessary workforce</div> <div>Reputational damage</div>	<div>Active safety programmes, with ongoing wide-ranging monitoring and safety training</div> <div>Independent safety audit team</div> <div>Quality management programmes including stringent manufacturing process control standards, monitoring and reporting</div>
<div>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 <div>Strategic alignment</div><div></div></div>	<div>Loss of opportunity to grow sales</div> <div>Loss of opportunity to increase margin</div> <div>Loss of stakeholder confidence including investors</div> <div>Reputational damage</div>	<div>Development and implementation of a new Sustainability initiative, which includes stretching targets focused on reducing the Group's Energy usage, CO₂ emissions, waste and recycled materials</div> <div>R&D focus on products that assist customers to reduce carbon emissions and improve their own sustainability measures</div> <div>Skilled technical sales force to develop efficient solutions for our customers</div> <div>Globally disseminated Code of Conduct sets out standards of conduct expected and ABC Policy adopted with a zero tolerance regarding bribery and corruption</div> <div>Internal Speak Up mechanisms to allow reporting of concerns</div> <div>Extensive use of due diligence to assess existing and potential business partners and customers</div>
<div><div>Strategic alignment</div><div><div><div>Deliver growth</div></div><div><div>Generate sustainable profitability and create shareholder value</div></div><div><div>Maintain strong cash generation and an efficient capital structure</div></div><div><div>Provide a safe working environment for our people</div></div><div><div>Be at the forefront of innovation</div></div><div><div>Run top-quality, cost-efficient and sustainable operations</div></div><div><div>Foster talent, skill and motivation in our people</div></div></div><div>See more about Our strategy on p14 and 15</div></div>		

Our performance

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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	 Vesuvius Share Plan – Read more about this on p138 and 139
	Trading profit £m 2020 101.4 2019 181.4 2018 197.2	Used to assess the trading performance of Group businesses	
	Return on sales % 2020 7.0 2019 10.6 2018 11.0		
Generate sustainable profitability and create shareholder value 	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	 Annual Incentive Plan and Vesuvius Share Plan – Read more about this on p135-139
	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	
	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
	Total R&D spend £m 2020 27.9 2019 28.9 2018 33.9	At constant 2020 currency	
	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 CO₂e emissions -3.9%	10% reduction of Scope 1 and Scope 2 Energy CO ₂ e 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.



£1,458.3m

Revenue

Reported

-14.7%

Underlying¹

-12.7%

£101.4m

Trading profit²

Reported

-44.1%

Underlying¹

-43.3%

15.3p

Statutory EPS

Reported

-48.7%

7.0%

Return on sales²

Reported

-360bps

Underlying¹

-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.

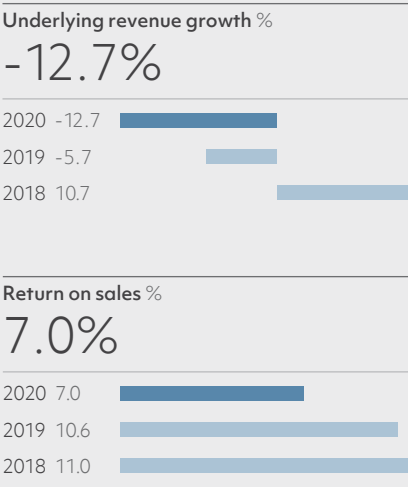
Dividend

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.



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

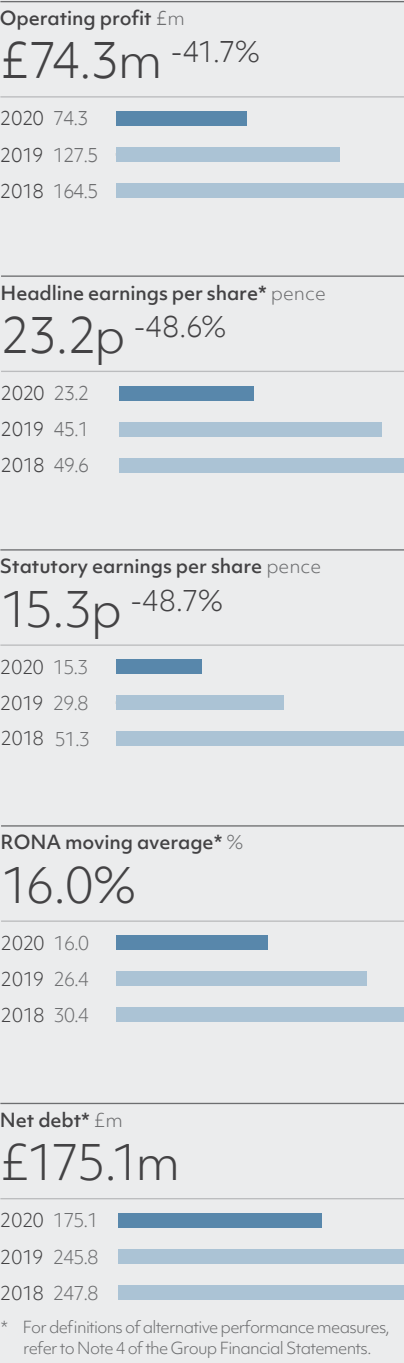
Revenue

£m	2020 Revenue			2019 Revenue				% change	
	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

£m	2020 Trading profit			2019 Trading profit				% change	
	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



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.

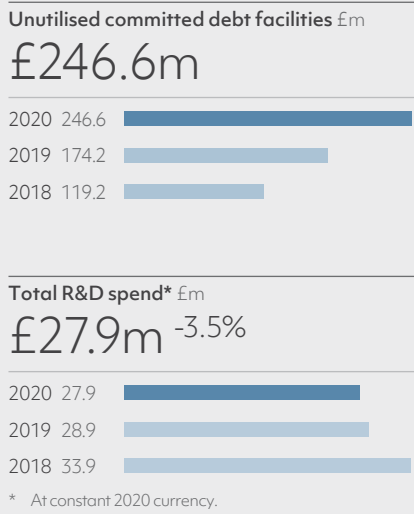
Objective: Be at the forefront of innovation

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



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.



WE ARE
INTERNATIONAL

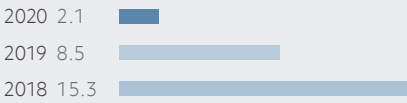
Vesuvius is **truly international** with operations in more than 40 countries, which helps keep us at the **top of our industry**.

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

Financial review continued

Net defined benefit pension deficit £m

£2.1m



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.

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%

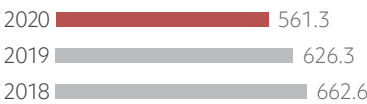
Steel Flow Control

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

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

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.

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

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.

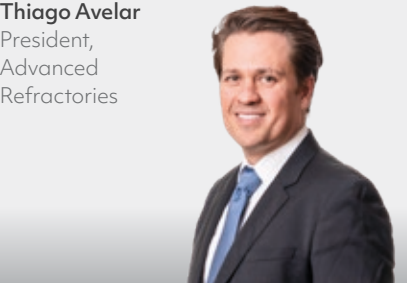
Towards the end of 2020, we launched our new Advanced Tundish Outlet Modifier (ATOM)* product, which significantly improves the quality of our customers' steel output by reducing mould flow behaviour changes related to cold steel influence, and mould level variations during first heats, limiting surface 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' CO₂ 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.

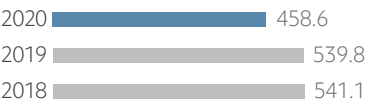
Steel Advanced Refractories

Thiago Avelar
President,
Advanced
Refractories



Revenue £m

£458.6m



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



Operating reviews – Steel Advanced Refractories continued

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

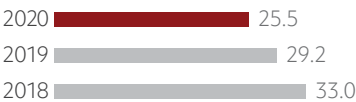
Steel Sensors & Probes

Davide Guarnieri
Director Sensors & Probes



Revenue £m

£25.5m



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:

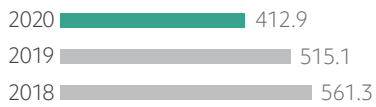
- > **Feeding systems:** Our customised insulating and exothermic feeding systems allow for the efficient supply of molten metal to key areas of complex and/or large castings, and prevent liquid shrinkage defects in the finished casting, improving yields and productivity by reducing the amount of molten 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.

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 CO₂ 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.

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

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.

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

Sustainability

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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



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 CO₂ 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 CO₂.

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 CO₂ 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 ₂ e emission				
10% reduction of energy CO ₂ e 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, CO₂e 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

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



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

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, CO₂ 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 CO₂ 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 CO₂e 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.

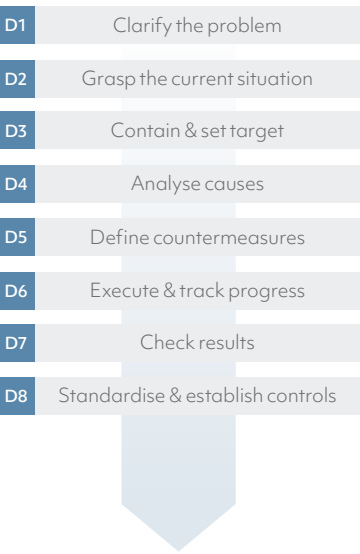


Our cross-functional teams involve sales, Research and Development, and manufacturing experts, who work collaboratively to address the most challenging technical issues. The 8D practical problem-solving methodology is used. In 2020, our teams recorded, reported and investigated 2,427 complaints.

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



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 CO₂ emissions required to prepare and use the product (Scope 3 emissions), the energy consumption and CO₂ 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 CO₂ emissions and use of raw materials, and helping our customers reduce their own CO₂ 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 CO₂ 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 CO₂ 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 CO₂e emissions. (We report in kg of CO₂ equivalents (CO₂e)). A further five processes consume 32% of the Group's total energy consumption and represent 22% of our CO₂e 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 CO₂ and, building on the successes of previous years, continues to be a clear focus for our investment to reduce CO₂ 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 CO₂e emissions.

Vesuvius' energy consumption and CO₂e 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 CO₂e 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 CO₂ 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 CO₂e emissions in 2020, but also in a 14.2% reduction in absolute CO₂e 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.
- > 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.
- > We closed our energy-intensive brick plant in Skawina, Poland.
- > Thanks to its new burner system, energy CO₂ emissions per tonne of product manufactured using the Rotary kiln in Olifantsfontein, South Africa, are expected to reduce by nearly 15%.
- > The Wuhan slide-gate plates JV plant has shut down its coke oven gas kiln and replaced it with a gas-fired tunnel kiln.

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) CO₂e. We report in kg of CO₂ equivalent (CO₂e).

Our energy-related greenhouse gas (GHG) emissions, reported as Carbon dioxide equivalents (CO₂e), include

emissions of three GHGs (Carbon Dioxide (CO₂), Methane Emissions (CH₄ and N₂O Emissions) with process emissions of other GHGs (Methane Emissions, Direct N₂O Emissions, Direct Sulphur Hexafluoride Emissions in CO₂ equivalent, Direct Methane Emissions in CO₂ equivalent, Direct N₂O Emissions in CO₂ equivalent, Direct HFC Emissions in CO₂ equivalent, Direct PFC Emissions in CO₂ Equivalent, Direct SF₆ Emissions in CO₂ 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 ₂ e m kg 2020	CO ₂ e m kg 2019	% change	CO ₂ e kg per tonne of product 2020	CO ₂ e 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 CO₂e) and energy consumption (MWh)

	UK and Offshore CO ₂ e m kg 2020	Global CO ₂ e m kg 2020	Proportion relating to the UK and Offshore Area 2020	Global CO ₂ e 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 ₂ e 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 CO₂e 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 CO₂e emissions, comprising a 16.8% reduction in normalised energy CO₂e usage and a 22.0% reduction in normalised process CO₂. 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 CO₂e 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.

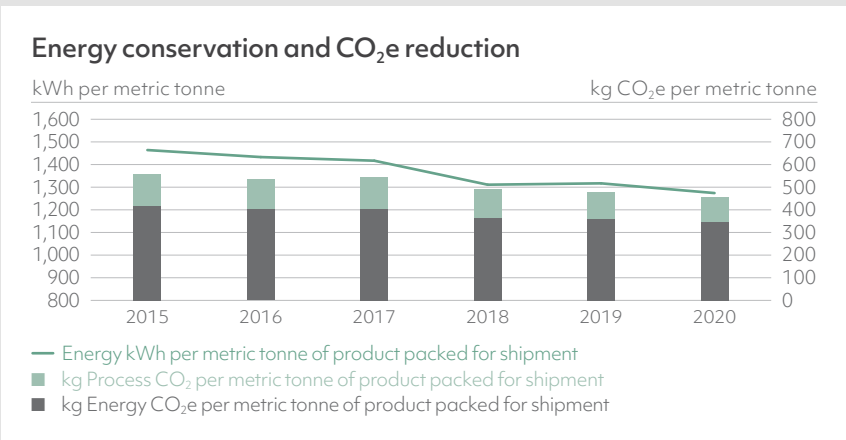
In seeking to meet these new targets, the Group will focus on four main areas:

- > Invest to upgrade equipment and reduce our energy consumption
- > When possible, replace high CO₂e 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.

CO₂ 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 CO₂, 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.



Scope 3 and avoided emissions

Vesuvius recognises that its Scope 3 CO₂ emissions, mainly upstream and downstream, contribute to a greater part of its total CO₂ 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.

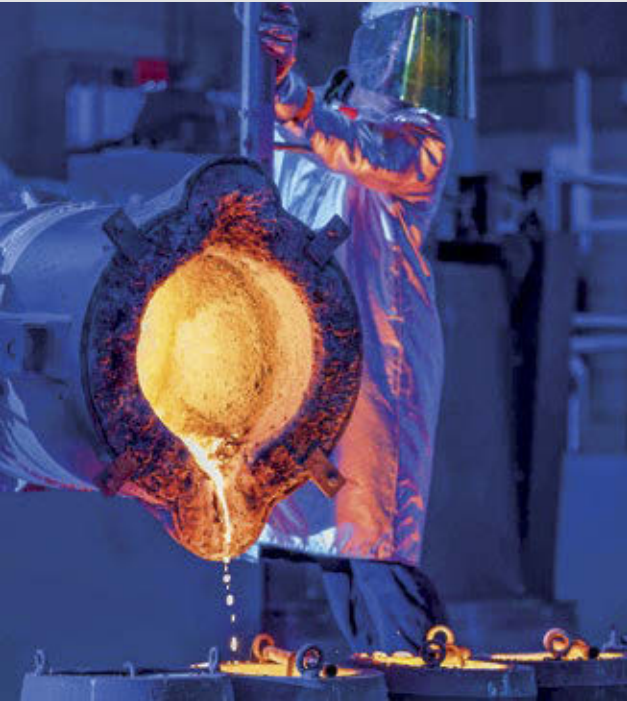
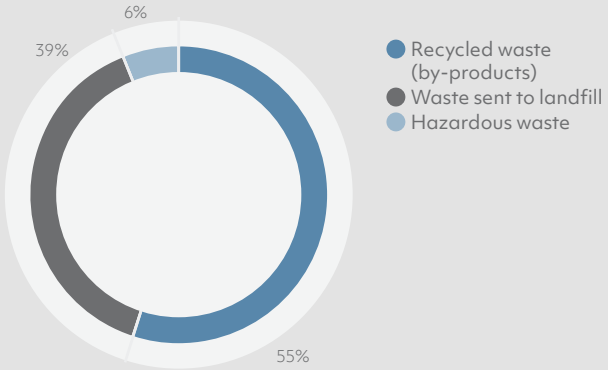
Manufacturing Site Raw Materials and Waste/(metric tonnes)	2020	2019	variation
Raw materials			
Recovered and recycled materials used (from external sources)	55,935	(*)	(*)
Raw materials and intermediates used excluding recycled (from external sources)	901,137	(*)	(*)
Total raw materials and intermediates 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 m³ 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

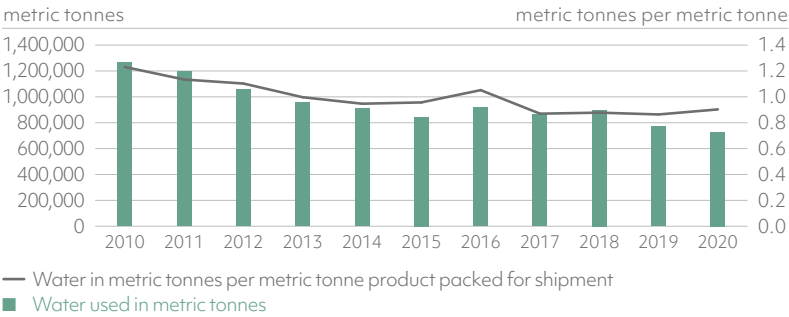
Vesuvius works to reduce the consumption of water in its manufacturing operations by recycling and improving water management processes. No saltwater or cooling water is abstracted with no related outflow. As with energy use, normalised consumption of water varies with product mix. In 2020, there was 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).

Water conservation



	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 CO₂ pricing

In 2020, Vesuvius took the decision to include an environmental impact analysis in the evaluation of all its capital expenditure projects. An internal CO₂ price is incorporated into the financial evaluation of all significant industrial projects. Vesuvius views this internal CO₂ pricing mechanism as a useful tool to better appreciate the environmental impact of long-term investment decisions. The internal price of CO₂ has initially been set at €30 per tonne of CO₂. 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

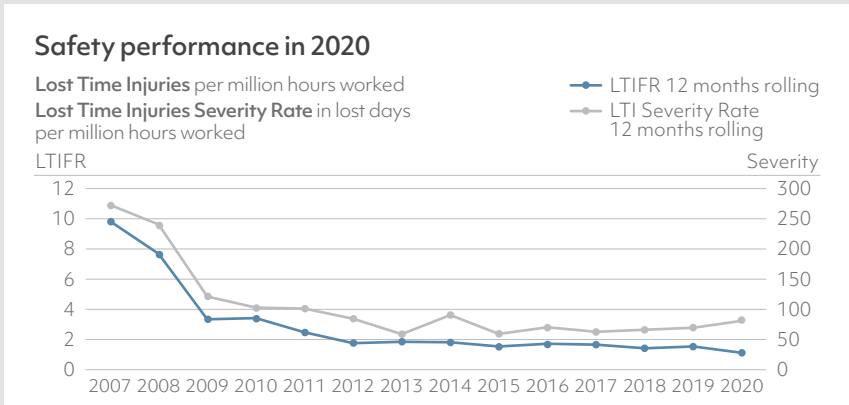
We believe that the safety, diversity, personal growth and job satisfaction of our people are key to the success and growth of our business.

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.

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

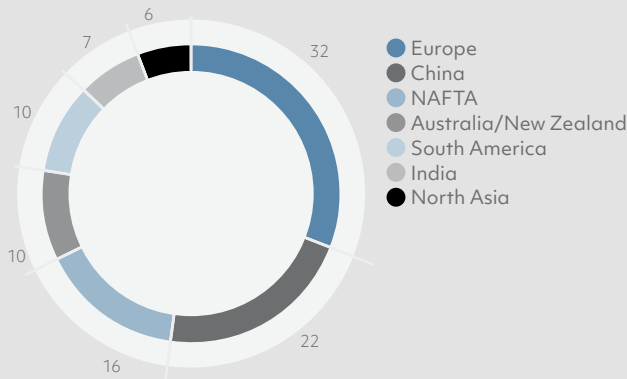
Executive safety tours

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.

8 Core Safety Rules

I always wear mandated personal protective equipment

I only operate equipment or vehicles if trained and authorised

I do not remove, bypass or tamper with machine guarding and safety devices

I lock, tag and try before any intervention on a machine

I make sure all high-risk activities are covered by a Daily Permit to Work

I always ensure my fall protection is secure before working at height

Before entering a confined space, I check I will be able to breathe and escape

I only perform electrical work if certified and authorised

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%.



People and Strategy



Outstanding Business Critical skills and capabilities to win



Outstanding People Capable managers leading diverse, engaged and high-performing teams



Winning Culture

Embracing diversity of thinking and continuous innovation to achieve high levels of performance and growth

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 CO₂ 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 recomunicated 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.

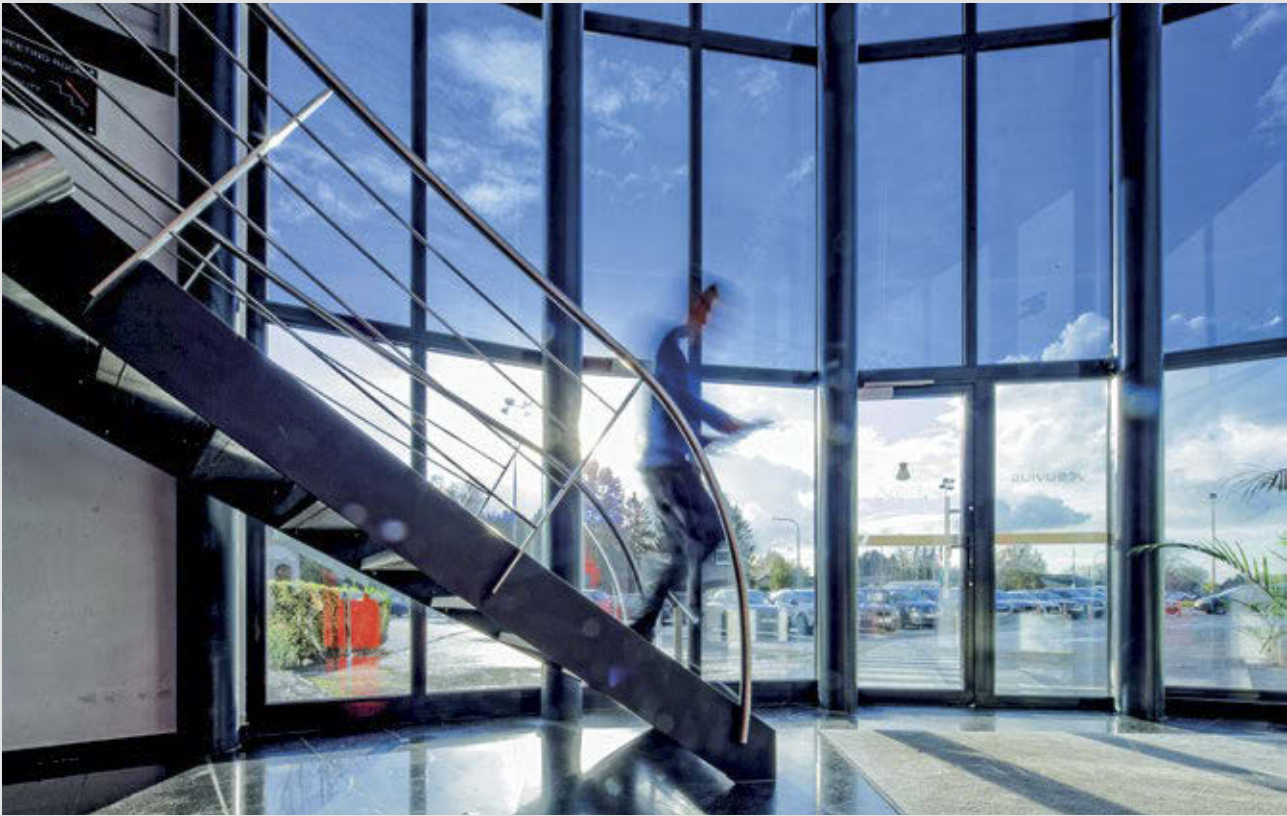
The self-assessment GDPR audit was initially issued to European entities in May 2019, on the anniversary of GDPR implementation, and will continue to be issued in two-yearly intervals to assess and ensure continued compliance with data protection legislation. In 2021, this audit will become a global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