VESUVIUS PLC

A Better Tomorrow

Vesuvius plc Sustainability Report 2020

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Find out more in our annual report

Including more detailed information on what we do, our plans for the future, financial performance and how we run our business.

Download the full report

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Visit our website at www.vesuvius.com

Visit our online annual report at report2020.vesuvius.com/

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.

Introduction: A Better Tomorrow

2020 was a turning point in Vesuvius' sustainability journey

Sustainability is at the heart of our company.

From our very beginnings, our core business has been to help our customers improve their operational performance. This delivers a number of environmental benefits, including reduced consumption of materials, less scrap and waste and improved metal yield and energy consumption, which, in turn, result in lower CO_2 emissions.

Our solutions and services allow our customers to manufacture thinner, lighter and higher-performance materials, reducing the environmental footprint of their own customers' products.

Alongside this, we have for many years worked to improve our own operations through a range of energy conservation programmes and environmental initiatives, safety and compliance activities and human resource plans, as well as supporting charitable and outreach activities in our communities.

2020 marked a new beginning in this journey.

We launched an initiative to incorporate all of these Environmental, Social and Governance programmes into a co-ordinated sustainability programme, developing a new governance structure to support our objectives and a new set of targets to direct our efforts.

We also set an overarching objective to reach a net zero carbon footprint at the latest by 2050.

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 goal: to create a better tomorrow for our planet, our customers, our people and our communities.

In this, our first Sustainability Report, we outline the measures we are taking to move towards achieving our objectives. We explain how we manage our impact on society and the benefits of our work.

We are proud of what has been achieved; and there is much more to come.

We would welcome any input or feedback to sustainability@vesuvius.com

Alexander Laugier-Werth
VP, Sustainability, HSE & Quality

Vesuvius at a glance: regional overview

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

41 Countries

10,350 Employees

6 Continents

76 Sales offices

53 Production sites

6 R&D centres of excellence

Americas

£437.8m

Revenue
(2019: £530.2m)

- 80% Steel
- 20% Foundry

Production sites	16
R&D centre of excellence	1
Employees	2,870
Sales offices	19

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

EMEA

£578.5m

Revenue
(2019: £699.8m)

- 69% Steel
- 31% Foundry

Production sites	19
R&D centre of excellence	3
Employees	4,030
Sales offices	29

Asia-Pacific

£442.0m

Revenue
(2019: £480.4m)

- 66% Steel
- 34% Foundry

Production sites	18
R&D centres of excellence	2
Employees	3,450
Sales offices	28

Vesuvius at a glance: divisional overview

Steel division

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.

£1,045.4m
Revenue

7.3%
Return on sales

£76.4m
Trading profit

Steel Advanced Refractories
Steel Flow Control

Vesuvius at a glance: divisional overview continued

Steel division

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.

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. These solutions enhance the control and monitoring of our customers' production processes,and include temperature sensors, oxygen, hydrogen and sublance probes, iron oxide and metal sampling for the steel, aluminium and foundry industries. By using these technologies, customers can focus on critical parameters within their processes, enabling them to refine their production methods to improve quality, lower production costs and maximise efficiency.

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.

Vesuvius at a glance: divisional overview continued

Foundry division

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

£412.9m
Revenue

6.1%
Return on sales

£25.0m
Trading profit

Vesuvius at a glance: divisional overview continued

Foundry division

What we do

The foundry 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.

Our Sustainability strategy and objectives

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

Our purpose is to 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.

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.

Our Sustainability strategy and objectives continued

The key objectives and priorities of our Sustainability initiative are outlined here

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.

P21

Our planet

> To tackle climate change by reducing our CO_2 emissions and helping our customers reduce theirs with our products and services. Our objective is to reach a net zero carbon footprint at the latest by 2050.

> To engage in the circular economy by reducing our waste, recovering more of our products after they have been used and increasing the usage of recycled materials.

P31

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.

P51

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.

P74

Our sustainability targets

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.

KPI	Measure	Target	2020 progress	Our customers	Our planet	Our people	Our communities
Energy Consumption	By 2025, reduce energy consumption per metric tonne of product packed for shipment (vs 2019)	-10%	-3.4%		✓		
Energy CO_2e Emissions	10% reduction of energy CO_2e emissions per metric tonne of product packed for shipment by 2025 (vs 2019) (Scope 1 and Scope 2)	-10%	-3.9%		✓		
Water Waste	By 2025, reduce waste water per metric tonne of product packed for shipment (vs 2019)	-25%	-7.5%		✓		✓
Solid Waste	By 2025, reduce solid waste (hazardous and sent to landfill) per metric tonne of product packed for shipment (vs 2019)	-25%	-16.1%		✓		✓
Recovered and recycled Material	By 2025, recovered or recycled materials used from external sources	7%	5.8%	✓	✓		
Safety	LTIFR of below 1	<1	1.12	✓		✓	✓
Gender diversity	By 2025, 30% female representation in Top Management GEC plus key direct reports	30%	20%			✓	✓
Compliance training	At least 90% of targeted staff to complete Anti-Bribery and Corruption training annually	90%	100%			✓	✓
Supply chain	By the end of 2023, conduct sustainability assessments of suppliers covering at least 50% of Group spend. Programme launched in 2020	50%	N/A		✓		✓

United Nations Global Compact

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).

Communication on 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 Charter: Our Planet, Our Customers, Our People, Our Communities. In particular, we will include updates on key performance indicators and progress against targets.

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

Vesuvius and the United Nations Global Compact

Vesuvius supports the United Nations' Ten Principles on human rights, labour, environment and anti-corruption and is committed to advancing the development of the UN Sustainable Development Goals (SDG). Progress on our efforts to implement the UN Principles and initiatives to advance the SDGs are contained in our Annual and Sustainability Reports.

Patrick André
Chief Executive

WE SUPPORT UN GLOBAL COMPACT

United Nations Sustainable Development Goals

In September 2015, 193 member States of the United Nations adopted 17 Sustainable Development Goals (SDGs) with the aim to end extreme poverty, protect the planet and ensure prosperity for all within a new universal agenda. Vesuvius supports the ambitions of this global programme.

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.

Our Principles, Approach and Governance continued

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

Material topics

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

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

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

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

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

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

> Communities (education, business practices, supply chain)

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

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

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.

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 KPI's covering the most important objectives

Step 3

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

> Approval by Board of directors

Step 4

> Strategy launch with top 160 managers of the Group

> Constitution of Sustainability Council

> Deployment throughout the Group

Our Principles, Approach and Governance continued

Climate-change-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. 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.

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.

Our Principles, Approach and Governance continued

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.

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.

Our Principles, Approach and Governance continued

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.

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.

Our Principles, Approach and Governance continued

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

The winners of the annual Living The Values Awards are featured on posters throughout the company

Code of Conduct

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

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

Everyone within Vesuvius is individually accountable for upholding its requirements. We recognise that lasting business success is measured not only in our financial performance, but in the way we deal with our customers, business associates, employees, investors and local communities.

The Code of Conduct is displayed prominently at all our sites and is published in our 29 major functional languages. It is available to view at www.vesuvius.com.

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

The Code of Conduct covers:

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

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

Our customers

Sustainability has always been at the heart of Vesuvius' business. Our technology has helped 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.

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Our customers

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

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

CASE STUDY

Robotics improving safety and productivity

The increasing use of robotics in the steel making process is improving safety and productivity for our customers.

A great example are robotic shroud and nozzle changers now being used in growing number of sites to preheat, insert and extract, transport and discard shrouds and sub-entry nozzles.

The ladle shroud is a refractory tube located between the ladle and the tundish. Its main function is to protect the steel flow from secondary oxidation. In the past, the process for changing and ladle shroud was performed manually, requiring operators to carry heavy loads and exposing them to the potential hazards of hot metal.

Robotic technology now delivers a remotely-controlled casting operation where no operators are exposed to liquid steel, and they no longer have to carry hot, heavy loads.

In the tundish, productivity is increased thanks to faster tube changes, minimising mould level perturbation, while steel quality output is maximised through synchronized tube changing on the tundish sub-entry nozzles at the same time as the ladle is changed during the steel casting sequence. Lastly, refractory product performance is also increased because of smoother tube handling, accurate insertion and removal from the mould, meaning no splashes or contact and consistent preheating. The process also allows for enhanced traceability on the refractory products used.

Our customers continued

Environmental footprint

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

How does Vesuvius contribute?

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

Vesuvius' products and services facilitate environmental benefits by:

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

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

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

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

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

> Improving the performance of our products and especially their lifetime

> Technology to improve their operational performance

> Developing the recycling of used products

In 2021 we will focus on the determination of our Scope 3 emissions and modelling the emissions avoided by our customers by using our products.

We will embed an assessment of the environmental benefits of our products in the evaluation criteria for new product development projects.

Operational performance

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

Our customers continued

CASE STUDY

Advanced Refractories TUNDEX* Tundish Linings Reduce CO_2 emissions, costs and waste

The Vesuvius Advanced Refractories TUNDEX Tundish Lining System is a great example of a Vesuvius solution that helps customers reduce their environmental impact and their costs.

In traditional spray tundish lining systems, a wet refractory mixture is sprayed onto the tundish walls and then heated for a period to dry the refractory lining, to strengthen it for use. In comparison, both hot set and cold set TUNDEX systems can provide a significant reduction in energy consumption and CO_2 emissions.

Cold Set TUNDEX does not require any heating to develop enough strength for handling before use. In the Hot Set TUNDEX system, the setting of the lining is generated by a chemical reaction at about 200°C, significantly below the temperature a traditional lining requires to dry.

Thus, TUNDEX can offer a much shorter curing cycle time, leading to a reduction in gas use and energy savings of up to 50 to 75%. At one of our customers, CO_2 emissions were reduced by up to 8kg per tonne of steel cast compared with using a traditional spray lining system. For a caster producing 750,000 tonnes of steel per year, this would translate into an annual reduction in CO_2 emissions of 6000 tonnes.

In addition to energy savings, TUNDEX systems can provide additional benefits over spray lining systems. These include reduced water usage (as no water is required), less wastage and cleaner working conditions and increased safety lining service life.

Up to 50-75%
energy savings

Tundishes with TUNDEX vibratable material

Inside a tundish lined with TUNDEX vibratable material and TURBOSTOP Tundish Impact Pad

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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.

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.

Problem-solving methodology and capabilities

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

8D – The eight Disciplines of Practical Problem Solving

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

Customer satisfaction continued

CASE STUDY

Laser scanning in ladles improves safety and extends product life

The Process Metrix Anteris* 360 Insertable Laser Contouring System offers customers safety improvements and cost savings, as well as reducing their environmental footprint.

The refractory lining of a ladle wears away progressively, as it is used repeatedly to carry molten steel from the melting furnace to the caster. Steelmakers need to extend the number of times a ladle is used – called a 'heat' – to optimise their refractory material cost. However, if pushed too far, steel can penetrate through the refractory lining and ladle shell, leading to a leakage through the ladle bottom or sidewall, thereby creating an extremely dangerous situation. Without a way to quantify the remaining refractory thickness after a heat, a significant safety margin of refractory thickness is required.

The Process Metrix Anteris 360 Insertable Laser Contouring System measures the remaining thickness of a ladle's working refractory lining. It is the only scanner on the market that has been purpose built for molten metal applications. Its use improves the steelmaker's ability to reduce their safety margins by identifying abnormal wear, extending the ladle's life, and drastically improving containment safety.

Capturing reliable, comprehensive data on a ladle's refractory lining thickness using the Anteris 360 Laser, enables more accurate predictions of usable life, that can brings a 5-15% improvement in average ladle lining utilisation. This reduces ladle lining costs per tonne of steel cast by the same amount, leading to large potential savings in refractory use and energy conservation.

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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 solutions

SEMCO FF coatings can be specified to have a colour change on drying

SEMCO FF is particularly designed for application on cores for ventilated brake discs

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CASE STUDY

Controlling formaldehyde emissions with SEMCO FF* water-based coatings

FOSECO's new SEMCO FF range of water-based coatings have been designed to reduce "evolved" formaldehyde emissions from foundries.

Water-based coatings are a more environmentally-friendly alternative to solvent-based coatings, but this brings other challenges, most notably the susceptibility of water-based coatings to attack by microorganisms such as bacteria and fungi.

These microorganisms can impact the performance of the coating and even lead to health issues amongst operators. To protect against microorganisms, biocides are built into the formulation of water-based coatings.

Typically, these biocides provide a slow release of formaldehyde, which is an effective antibacterial and antifungal agent, especially during the coating drying process, when emissions are most concentrated. However, in many regions, formaldehyde is classified as a potential carcinogen and mutagen.

SEMCO FF coatings do not use biocides that release formaldehyde. They can therefore help foundries comply with stricter EU regulations on airborne emissions of formaldehyde, without customers needing to upgrade their installations or invest in new equipment.

In addition to cutting formaldehyde emissions, SEMCO FF coatings can be specified to incorporate colour change on drying technology. This allows operators to easily see when coatings are dry, enabling the optimisation of drying cycles and energy consumption. This not only reduces costs but also the carbon footprint of foundry operations.

Sustainable solutions continued

Existing product portfolio

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

New product development

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

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

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

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

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

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

Sustainable solutions continued

CASE STUDY

DuraFlex™ long-life ladle shroud improves operations, safety, flexibility and sustainability for our Customers

Longer life and re-usable DuraFlex ladle shroud

The Vesuvius DuraFlex* long life ladle shroud offers significant operational and environmental benefits to customers.

The ladle shroud is a refractory tube located between the ladle and the tundish whose main function is to protect the steel flow from secondary oxidation. Ladle shrouds do not require preheating before initial use but do if they are to be re-used after cooling down.

The patented and leading technology used in its production gives the DuraFlex ladle shroud enhanced durability. This reduces the risk of having to change the shroud before the ladle is empty, thus interrupting the consistent flow of metal to the tundish, and the potential downgrade of the quality of the steel being cast. It also enables re-use of the ladle shroud without preheat after completely cooling, giving our customers greater flexibility in optimising their operations.

With average shroud life increased by 100%, this leads to fewer ladle shroud changes – meaning less risks for operators, a reduced potential for downgraded steel and fewer interruptions in the casting process. The knock on effect of this can be the ability to keep lower refractory inventory and fewer forklift truck movements on the shop floor.

Longer life and re-usability reduce shroud consumption. This translates into less waste to dispose of with an associated, positive environmental and operational impact.

100%

increase in average shroud life

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Our planet

Vesuvius takes seriously our responsibility for managing the impact of our 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.

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Tackling climate change

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

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

According to estimates from Worldsteel (the World Steel Association), on average for 2019, 1.83 tonnes of CO_2 were emitted for every tonne of steel produced. Worldsteel also estimated that the steel industry generates between 7% and 9% of global direct emissions from the use of fossil fuel.

A few examples of measures taken to improve energy efficiency

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

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

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

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

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

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

Tackling climate change continued

With around 10kg of refractory material required per tonne of steel produced, the careful selection and use of energy-saving refractories can beneficially impact on the net emission of CO_2 in the steel manufacturing process. In the foundry process, the amount of metal melted versus the amount sold as finished castings is the critical factor impacting a foundry's environmental efficiency. Vesuvius continuously works with its customers to increase this metal yield.

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

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

Reducing energy consumption and CO_2 emissions

CASE STUDY

Pattern redesign with Feedex* sleeves improves customer's metal yield and reduces CO_2 emissions

One of the key drivers of the operational and environmental performance of a foundry is the metal yield – being the weight of metal in the finished castings as a percentage of the total metal melted to make those castings. Significant energy (with its associated CO_2 emissions) is required to melt metal, so foundries are focused on metal yield to reduce costs and drive environmental efficiency.

Some of our foundry customers face significant challenges in the design of their moulds because of the complex geometry of the castings they make. This can lead to there being very limited availability of space in the mould for placing a feeding system that can improve metal yield.

In this case, a customer manufacturing liner castings for large compressors weighing 6.9kg each was operating at a metal yield of just under 40%.

Due to the cylindrical shape of the casting, it was necessary to use sleeves which can operate efficiently in a small footprint area. Furthermore, the method by which the sleeve needed to be applied was complex, as it had to be first assembled from two separate parts to form the overall sleeve unit.

Thanks to the combination of our Feedex VAK sleeves and our application engineering expertise, our customers mould was completely redesigned bringing the metal yield to more than 70%.

In addition, the customer's other processes were considerably simplified, as the feeders were delivered ready to use and, due to the smaller neck of the feeder used, the contact area with the casting was reduced by 45% which led to significant reduction in post-casting fettling costs.

Redesigned Feedex sleeves improve metal yield and cut CO_2

70%

metal yield increase

As well as the operational improvements and cost savings, this has reduced CO_2 emissions by 2.62kg per casting.

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Reducing energy consumption and CO_2 emissions continued

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

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

Greenhouse gas reporting

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

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

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

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

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

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

Notes to table and additional information:

1. All fuel consumption is converted to MWh for reporting.
2. In 2020, the Group consumed 50,800 thousand m^3 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.

Reducing energy consumption and CO_2 emissions continued

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

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

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

Methodology:

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

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

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

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

2020 Energy Consumption by Fuel Type %

Reducing energy consumption and CO_2 emissions continued

The new burner

The Stapildos feed system

CASE STUDY

New burner system in South Africa to cuts CO_2 emissions

The introduction of a new burner system into the rotary kiln for producing Slagdol in Olifantsfontein, South Africa is expected to cut CO_2 emissions from the rotary kiln in Olifantsfontein, South Africa, by up to 15%.

This new indirect firing system, which has been commissioned in 2020 at the Advanced Refractories' site in South Africa, offers many benefits.

Slagdol is the Vesuvius commercial name for dolomitic lime, a source of refractory oxides (CaO and MgO) required for steelmaking slags. It is a critical part of the steel making process.

The new firing system reduces coal consumption by making use of unburnt coal that would otherwise end up as particulate matter in emissions. This means that not only are emissions reduced, but also the amount of coal consumed to achieve production of calcined dolomite is reduced. This directly correlates to an annual emissions reduction of 13,000 tonnes of CO_2.

Apart from the CO_2 reduction, the new burner also enables more efficient combustion, producing less harmful greenhouse gas equivalent pollutants such as nitrogen oxides.

Altogether this means the Olifantsfontein Slagdol plant will be able to reduce the impact on the environment for every tonne of Slagdol produced, as well as increasing energy efficiency at the site.

13,000 Tonnes

reduced CO_2 emissions

Reducing energy consumption and CO_2 emissions continued

Energy conservation plan and CO_2e emissions reduction targets

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

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

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

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

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

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

> Invest to upgrade equipment and reduce our energy consumption

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

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

> Generate clean energy

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

CO_2 free and renewable energy sources

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

Scope 3 and avoided emissions

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

Energy conservation and CO_2e reduction

Reducing energy consumption and CO_2 emissions continued

CASE STUDY

Solar panels power Advanced Refractories manufacturing plant in Port Kembla, Australia

Solar panels installed at the Advanced Refractories plant in Port Kembla are now providing 50% of the site's electricity needs.

The solar panels were installed in a two-stage process accessing various financial incentives under the Australian Government's Renewable Energy Target (RET) programme. Stage One was completed in June 2016, with Stage Two completed in June 2020.

The Port Kembla solar panel system generates 325,000kWh of electricity every year. To put that in perspective, an average Australian household uses about 15,000 kWh of electricity every year. The estimated annual reduction in CO_2 that would otherwise be produced in energy generation is 300 tonnes.

Other Vesuvius sites have invested in solar energy, including Pune, India and Ghlin, Belgium.

50%

provided of the site's electricity needs

Solar panels provide 50% of the site's electricity

Reducing energy consumption and CO_2 emissions continued

CASE STUDY

Vesuvius Sao Paulo converts to green electricity

In 2020, the Vesuvius Sao Paulo plant became the third Vesuvius site in Brazil to switch 100% to the use of green electricity, following our Rio de Janeiro and Piedade sites.

Brazil operates a Free Energy Market to encourage competition and reduce the cost of electricity. This enables the free trade of electrical energy, allowing industrial, commercial, and service company consumers to contract electric energy directly from generators and trading companies.

Vesuvius Sao Paulo

Benefiting from these new market conditions, the Sao Paulo plant switched over its electricity supply to a new supplier offering 100% green electricity, generated from a combination of solar, wind, and hydro sources.

The estimated annual reduction in CO_2 that would otherwise be produced in energy generation is 300 tonnes.

100%

green electricity

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).

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

Growing our engagement in the circular economy continued

Using recycled aluminium offers CO_2 reductions

86,000 TONNES

reduction in Co_2 emissions

CASE STUDY

Recycled aluminium reduces CO_2 emissions

Using recycled aluminium in foundry feeding systems, rather than using new material, has allowed Vesuvius to cut CO_2 emissions by approximately 86,000 tonnes.

The Vesuvius Foundry division manufactures exothermic feeding systems. These products are used on the casting mould to avoid shrinkage defects and improve casting yields, by 'feeding' the casting from a small reservoir of molten metal contained inside them as the metal in the mould shrinks as it solidifies. These sleeves use aluminium, in the form of powder, as the fuel to maintain the intensity of the exothermic reaction required to keep the metal in the reservoir molten.

In the past, virtually all the aluminium fuel has come from newly produced ingots. The production of aluminium from bauxite is very energy intensive. Using recycled aluminium consumes an estimated 94% less energy than the production of virgin material from mined Bauxite.

Vesuvius has been increasingly sourcing recycled aluminium as the development of more efficient technologies have made it possible to recycle scrap aluminium metal into high performance aluminium powder.

Using recycled aluminium is just the beginning and we are exploring many other opportunities to increase the usage of recovered and recycled materials and reduce the CO_2 footprint of our supply chain.

Growing our engagement in the circular economy continued

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 & 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.

Growing our engagement in the circular economy continued

CASE STUDY

Recycling slide gates plates cuts waste and costs

A slide gate is a mechanical valve system used to control the flow of steel from one vessel to another. It uses highly engineered refractory plates and nozzles, the working surfaces of which are corroded and eroded by the molten steel passing through them. However, even though the harsh environment in which they are used means that they have a short service life, after they come out of service the plates contain a significant amount of recyclable refractory material.

In 2014, our plant in Wuhan, China, took the first steps in a long-term circular economy programme to recover and recycle our slide gate plates after usage by our customers.

Once we had started to recover the used plates, we worked hard on the formulation of the slide gate refractory mix, which, together with the overall manufacturing process, required some careful adaptation to incorporate the recycled material. Critically, we had to ensure that this was done without compromising the finished plate's quality and its performance.

In 2020, approximately 750 metric tonnes of slide gate plates were recycled. We plan to extend this process to more customers in the future.

750MT

of recycled slide gate plates

Growing our engagement in the circular economy continued

CASE STUDY

Cleveland upgrade leads to waste and cost reduction

The Cleveland team

After a thorough analysis of their sources of hazardous waste, the Cleveland team spent a year upgrading their machinery and developing and testing new processes to reduce environment impact.

Among other products, Cleveland produces refractory coatings, which are used to coat the inside surfaces of the casting mould and core that will be exposed to the molten metal to ensure a smooth surface finish on the solidified casting. As such, they are a critical element in making quality castings.

Part of the production process includes the use of Isopropyl alcohol as a raw material. In the past, Isopropyl alcohol had also been used to wash out mixing vessels at the end of a production cycle. The waste from this was hazardous and had to be disposed of accordingly.

In 2019, a decision was made to commence washing out mixing vessels with water, and, throughout the year, samples were taken to ensure that the residual waste was no longer hazardous. The process was continually adapted, and once implemented, approval was received from the local authorities that the waste water was safe to dispose of via sewers.

The reduction in hazardous waste generation was considerable, with a knock effect to a reduction in disposal costs. Productivity has also improved as the new process allows the operator to remain at their work station during the wash cycle and pump out, and then commence the manufacture of another batch sequence with very little interruption.

Proud to be helping the environment while reducing costs

Water conservation and air emissions

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).

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.

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%

Water conservation and air emissions continued

CASE STUDY

Newest plant designed to minimise environmental impact

Vesuvius's newest site in Ramos Arizpe, Mexico, was built to minimise its environmental footprint by incorporating a string of environmentally friendly design elements into the building and site equipment from the very first stages of the project.

The plant, which was inaugurated in 2019, is already one of our most efficient. Yet, more improvements are to come.

Located in the Mexican desert, the plant is exposed to particularly hot weather, so the building was designed to maximise natural air flow and with minimal need for artificial ventilation.

Over 5% of the building roof area is skylight to reduce the need for artificial lighting. Energy efficient LED lighting is used throughout, while energy efficient motors were installed to reduce anticipated energy consumption by 20% or more. The site also features a wastewater treatment plant to clean and reuse waste water generated by our manufacturing processes.

The focus on the environment goes further, with various processes being redesigned to reduce CO_2 emissions and create an efficient workplace. Projects in the pipeline include:

> Conversion from use of small 25kg bags of raw material to using much larger bags carried via a pneumatic conveying system

> Re-use of water from the dedicated waste-water treatment plant for cleaning of Totes, the reusable containers used to transport our products to customers

> Continuing improvement to the coatings manufacturing process to reduce solid and water waste

Located in the desert, the plant is exposed to hot weather

Skylights reduce the need for artificial lighting

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.

We will operate all work and business activities in a manner which ensures appropriate care and protection of the environment.

We will comply with all applicable legal and other local environmental obligations. We will be pro-active in preventing negative effects to the environment and will continuously improve our environmental management systems and performance.

Organisation and Responsibilities

We regard environmental matters as a mainstream management responsibility. Executives and line managers are directly responsible for environmental matters in operations under their control. Management is accountable for environmental performance against objectives.

Each and every employee is responsible and accountable for environmental matters in activities under their control.

We will encourage our Suppliers to adhere to the same Environmental standards as we do.

We expect everyone to participate positively in achieving our environmental aims.

Our Beliefs

> Preserving the Environment is Good Business

> All employees must contribute to protect the environment

> All environmental incidents are preventable

Our Aims

> Reduce waste at source and during production

> Minimise consumption of energy, water and other resources

> Minimise releases of substances which could adversely affect humans or the environment

Our Commitments

> We will raise environmental issues at all levels and openly address them

> We will build environmental protection into our products and processes

> Environmental risk assessments will be undertaken to identify hazards, prioritise any deficiencies and correct them in an appropriate way as well as to develop appropriate procedures

> We will provide training to all employees and contractors to ensure that they understand their responsibilities and are able to act accordingly

> Every business facility will have an appointed Environmental Manager

This policy has been approved by the Group Executive Committee and is displayed and implemented at all facilities.

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.

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 m^3 hydrocarbon resins. All releases were contained apart from releases to air. Where incidents occur, they are managed via Vesuvius' site environmental response plans and reported through the Vesuvius incident reporting system. We comply with local reporting requirements in respect of such incidents.

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

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

Internal CO_2 Pricing

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

Environmental management/certifications

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

List of ISO 14001:2015 certifications

Country	Company name	Site
Australia	Foseco Pty Ltd	Sydney
Belgium	Vesuvius Belgium N.V.	Ostend
Brazil	Foseco Industrial e Comercial Ltda	Sao Paulo
China	Vesuvius Advanced Ceramic (China) Co., Ltd	Suzhou
China	Vesuvius Advanced Ceramics (Anshan) Co., Ltd	Anshan
Czech Republic	Vesuvius Česká Republika, a.s.	Trinec
Germany	SIR Feuerfestprodukte GmbH	Siegen
Germany	SIR Feuerfestprodukte GmbH	Kreuztal
Germany	Vesuvius Europe GmbH & Co.KG., Vesuvius Mülheim GmbH & Co.KG.	Mülheim an der Ruhr
Germany	Vesuvius GmbH	Grossalmerode
Germany	Vesuvius GmbH	Borken
India	Foseco India Limited	Puducherry
India	Foseco India Limited	Pune
Indonesia	P.T.Foseco Indonesia	Jakarta
Japan	Foseco Japan Limited	Toyokawa
Netherlands	Foseco Nederland BV	Hengelo
Poland	Vesuvius Poland Sp. z o.o.	Skawina
South Africa	Vesuvius South Africa (Pty) Limited	Olifantsfontein
South Korea	Foseco Korea Limited	Gyeonggi-do
Sweden	Vesuvius Scandinavia AB	Amal
Taiwan	Foseco Golden Gate Co. Limited	Ping Tung
United Kingdom	Vesuvius UK Limited	Tamworth

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.

In this section

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Safety and well-being at work

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

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

Safety performance in 2020

Lost Time Injuries per million hours worked
Lost Time Injuries Severity Rate in lost days per million hours worked

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.

Safety and well-being at work continued

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 and well-being at work continued

CASE STUDY

Global art competition supports children of employees

In May 2020, as the pandemic began to spread more widely around the world and countries went into lockdown, Vesuvius took a number of steps to help our employees and their families cope with its impacts.

One initiative was an art competition in which the children of our employees were asked to illustrate what our CORE Values of Courage, Ownership, Respect and Energy meant to them and their families during the pandemic.

Parents were asked to talk to their children about our CORE Values and illustrate the positive and uplifting things they were seeing in their communities in response to the virus.

The competition attracted nearly 100 entries from all over the world. The artworks were then posted on our intranet and colleagues asked to "like" their favourite entries.

The 10 most "liked" pieces were used as screen savers on all company computers in the weeks to follow, bringing our CORE Values to life and emphasising the important role our families play in our people's lives.

The most popular entry was the illustration below from Japan.

Safety and well-being at work continued

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

ll 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.

Safety and well-being at work continued

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 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.

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 and well-being at work continued

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).

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.

Safety and well-being at work continued

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.

Safety and well-being at work continued

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.

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 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.

Safety and well-being at work continued

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.

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.

8 Core Safety Rules

1. I always wear mandated personal protective equipment

2. I only operate equipment or vehicles if trained and authorised

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

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

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

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

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

8. I only perform electrical work if certified and authorised

Unique Executive Safety Tours 2020

Safety and well-being at work continued

Health & safety policy

All employees 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.

We will encourage our Suppliers to adhere to the same Health & Safety standards as we do.

Our Beliefs

> Good Health and Safety is Good Business

> Safety is everybody's responsibility

> Working safely is a condition of employment

> All work-related injuries and work-related ill-health are preventable

Our Aims

> No Accidents

> No Repeat Injuries

> No Harm to People

Our Commitments

> Every business facility will follow the agreed H&S plans

> We will thoroughly investigate any incident to learn, share and avoid repeats

> Risk assessments will be undertaken to identify hazards, prioritise any deficiencies and correct them in an appropriate way as well as to develop appropriate safe work procedures

> We will abide with simple and non-negotiable standards

> We will provide training for all employees and contractors to ensure that they understand their responsibilities and are able to act accordingly

> Every business facility will have an appointed H&S Manager

This policy has been approved by the Group Executive Committee and is displayed and implemented at all facilities.

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.

Rollout 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.

Safety and well-being at work continued

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.

Training activities routinely undertaken for our employees and contractors include:

> Arc Flash Hazard
> Bike Safety
> Control of Contractors
> Crane Operation
> Defensive Driving
> Electrical Testing
> Environmental Waste Reporting
> Ergonomics
> Executive Safety Tour Leader
> Exoskeleton
> Fire Fighting
> First Aid
> Forklift Truck
> Gas Safety
> General Health and Safety and refresher training
> Hand Hazard and Protection
> Hazard Perception
> Hazardous Goods
> Health and Safety Representatives
> ISO 45001:2018
> Legionella
> Lock, Tag and Try
> Incident and Performance reporting
> Machine Safety
> Permit to Work
> PPE Safety
> Practical Safety in Steel Customers
> Radiation
> Road Safety
> Safe Stacking
> Safety and Environmental Auditing
> Steel mill orientation
> Turbo S Safety and Safety Leadership
> Warehouse Material Stacking and Handling
> Welding Certification
> Working at Heights

Pillars of health and safety

Training employees to work safely: Turbo S

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.

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.

Safety and well-being at work continued

As part of the continuing Turbo S 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

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.

Safety and well-being at work continued

CASE STUDY

HSE Awards won by Vesuvius India Customer Location Team in 2020

Our JSPL Angul team received the award for Best Safety Performer Contractor

Vesuvius employs over 1000 people who work at customer-location sites in India. In recent years, we have brought a real focus to develop our safety leadership at these sites, seeking to ensure that Vesuvius safety standards are observed and maintained even though the site is not one operated by Vesuvius. We have not experienced any LTIs in these locations for more than two years – the equivalent of more than 5 million hours of work.

In 2020, these efforts were recognised in several of our customer-location sites, with our teams maintaining a superb safety record, despite lockdowns, travel restrictions and manpower shortages, and receiving a range of awards for their performance and contribution.

Ten safety awards were received from major customers, including JSW Vijayanagar, TATA KPO, AM/NS Essar and JSPL Angul.

10

safety awards received from major customers in India

Safety and well-being at work continued

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.

> Accident & Incident Reporting
> 5S Colour Standard
> Business Continuity
> Control of Contractors
> Customer Location
> Crisis Management & Crisis Communication
> Ergonomics
> Executive Safety Tour
> Gas Safety
> High-Risk Activities
> Inspection Maintenance and Testing of Fixed Electrical Installations
> Isolated and Lone Working
> Isostatic Presses
> Legionella
> Lifting and Handling
> Lock, Tag and Try
> Machine Safety
> Overtime Policy
> Permit to Work
> Personal Protective Equipment
> Process Safety
> On Site Vehicle operations
> Road Safety
> Risk Assessment
> Safe Storage of Bulk Bags and Pallets of 25kg Bags
> Warehousing Racking
> Working Safely with Fibres

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.

Safety and well-being at work continued

CASE STUDY

Monterrey focuses on health and well-being during pandemic

A COVID-safe session discusses well-being

The health and well-being of our people is always our top priority, and never more so than during the pandemic. In Monterrey, an enormous range of initiatives were put in place to provide team members with the support, education and guidance they needed in these challenging times.

Many face to face and online sessions were organised throughout the year on a wide variety of health-related topics, such as weight control, understanding and managing hypertension, prostate and breast cancer awareness, dealing with heatstroke, help to stop smoking and mental health and mindfulness.

The programme proved extremely popular and was a great success, particularly in supporting colleagues to reach and maintain a healthy weight, and to manage stress levels during the crisis.

Maintaining health and well-being during the pandemic

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.

People and culture strategy continued

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.

People and culture strategy continued

CASE STUDY

Piedade tackles challenge of training during the pandemic

Vesuvius' commitment to the ongoing development and well-being of our employees was demonstrated by our team in Piedade, Brazil, during the pandemic.

With many people working from home, Piedade developed an extensive online training plan, as well as various initiatives to ensure colleagues who continued to work on site could access development opportunities.

Online conferences and meetings quickly became the norm, and Piedade supplemented these with online exercise programmes, also offering them to colleagues in other regions. This initiative was also later launched physically on site with a professional personal coach taking staff through a set of exercise routines.

A range of webinars was organised covering everything from home office productivity and mental health to financial health and leadership development.

Colleagues continued training during the pandemic

Committed to training and development

People and culture strategy continued

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%.

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).

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

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.

People and culture strategy continued

Diversity progamme sees 25% of operator roles filled by women

Greater diversity led to a range of benefits

CASE STUDY

Vesuvius Trinec delivers diversity on the shop floor

Vesuvius' Trinec site in the Czech Republic is implementing a long-term strategy to increase gender diversity on the shop floor by adapting our production methods and employing women in roles that, in the past, were considered only suitable for men.

Kicking off in late 2016 with a study to identify suitable roles, the programme saw the progressive implementation of a range of actions, focused on ergonomics, such as the installation of material handling equipment to reduce the maximum weight required by manual handling. The first three women were hired in March 2017 and the business focused on recruiting more women every year. By September 2020, the site is employing women in 25% of operator roles.

As a result of the increased gender diversity on the shop floor, the site observed a number of benefits, such as an overall reduction in absence and staff turnover, improvements in product quality and a better working atmosphere for the whole site.

25%

operator roles filled by women

People and culture strategy continued

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.

People and culture strategy continued

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

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.

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Our principles – a responsible company

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. 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.

Our principles – a responsible company continued

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.

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

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

Supporting our communities continued

CASE STUDY

Monterrey colleagues step up to support disadvantaged people

Supporting kids with cancer in Monterrey

Our colleagues in Monterrey, Mexico, stepped up to help disadvantaged people in their community who were directly or indirectly affected by the Covid-19 crisis.

Among a number of fund-raising and community support initiatives, was a programme to help children with cancer continue to receive the treatment they needed. With the health and economic crisis that has been generated by the pandemic, government programmes to support disadvantaged children with cancer have been severely affected and treatments such as chemotherapy have been dramatically reduced.

In 2020, Vesuvius Mexico employees and their families made an enormous contribution to the ongoing campaign led by an association called Amanec by collecting bottle caps in a giant metal heart constructed by a local company. For every 1000 caps, Amanec can fund a chemotherapy treatment for a child whose family cannot afford it.

1,000

bottle caps fund chemotherapy

Supporting our communities continued

Ghlin colleagues collected 250kg of rubbish

CASE STUDY

Vesuvius Ghlin colleagues support local "Clean Up" Days

For the past three years, colleagues of the Vesuvius Ghlin site in Belgium have taken part in an annual litter collection day in their local area.

This event is promoted by the Wallonia Region local authority and is normally held in Spring. However, this year, due to Covid-19, the event was postponed to the end of October.

Even though participation was a little lower in 2020 because of the pandemic, and many colleagues were working from home, those who could join the effort brought with them real Vesuvius energy, keen to make a positive environmental impact and demonstrate our CORE Values.

Between them, they collected 15 bags of rubbish weighing about 250kg in just a few hours.

Vesuvius was happy to encourage its team in participation in this initiative, and supported it by providing protective equipment such as gloves, safety vests, tools and insurance.

Supporting our communities continued

CASE STUDY

Foseco India supporting education in the local communities

Supporting education – in particular encouraging more girls and women into scientific and technical fields of education – is a real focus for Vesuvius' sustainability efforts. Our team in Foseco India has contributed to a variety of education projects in disadvantaged communities for several years.

This has included building classrooms and science laboratories in schools and colleges and providing furniture and instruments for students.

Working with the Rotary Club of Pune East, our colleagues have for several years supported the training of teachers in using online resources and tools to improve student engagement and learning. More than 250 teachers from 46 schools have received the training, benefiting more than 25,000 students every year.

Teacher training provided in 46 schools

+25,000

students benifiting from teachers' training

Supporting our communities continued

CASE STUDY

Vesuvius invests in Skawina to eliminate odour nuisance

Vesuvius Skawina site in Poland has invested more than GBP£3m to cut odour emissions in response to concerns from local residents.

In a 3-year project that concluded in 2020, management and staff responded to local residents' concerns about a non-hazardous odour nuisance associated with the site. Through a comprehensive process, they diagnosed the issues and identified the modifications that were required to address the issue. An investment plan was then developed and approved that included the installation of a new thermal oxidizer, two new modern heat treatment furnaces, and three-stage ventilation.

The project involved considerable community consultation, which included the development of a new website to keep residents informed of the site's progress. Residents also had the opportunity to give direct feedback by completing an online form to report odours, with each response analysed and actions incorporated into the plan.

Site upgrades address community concerns

Extending our sustainability drive to suppliers

Principles

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

Supplier sustainability assessments

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

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

Supplier quality development

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

Supplier quality audits

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

Areas of focus include:

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

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

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

Supplier corrective actions 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.

Whistleblowing policy

Speak up

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

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

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

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

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

General Data Protection Regulation

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 and Training

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.

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.

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